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November 2010

40-mm Grenade Launchers

Headquarters, Department of the Army

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Change No. 1

Headquarters
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Washington DC, 22 February 2011

40-mm Grenade Launchers

1. Change TM 3-22.31, 24 January 2011, as follows:

Remove old pages:	**Insert new pages:**
iii through iv	iii through iv
4-7 through 4-8	4-7 through 4-8
A-5 and A-6	A-5 and A-6
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Technical Manual
No. 3-22.31

Headquarters
Department of the Army
Washington, DC, 17 November 2010

40-mm Grenade Launchers

Contents

*** This publication supersedes FM 3-22.31, dated 13 February 2003.**

Figures

Tables

Preface

This publication provides technical information about training and combat techniques for the M320 grenade launcher. Intended users include leaders and designated grenadiers who will use this information to successfully integrate the M320 into their combat operations. The M320 grenade launcher will replace the M203; however, information about the M203 grenade launcher is contained in Appendix D.

This publication applies to the Active Army, the Army National Guard (ARNG)/Army National Guard of the United States (ARNGUS), and the U.S. Army Reserve (USAR).

Terms that have joint or Army definitions are identified in both the Glossary and the text. Terms for which TM 3-22.31 is the proponent are indicated with an asterisk in the Glossary.

Uniforms depicted in this manual were drawn without camouflage for clarity of the illustration. Unless this publication states otherwise, masculine nouns and pronouns refer to both men and women.

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Chapter 1

Characteristics, Configurations, and Ammunition

This chapter describes the characteristics, configurations, and ammunition for the M320 and M320A1 grenade launchers, and includes a brief explanation of how to mount the various accessories.

SECTION I. CHARACTERISTICS

1-1. The purpose of the M320 and M320A1 grenade launchers is to provide personnel with offensive and defensive capabilities to engage targets in the field. These weapons provide the Soldier a lightweight, operator friendly, flexible, lethal, and reliable tool.

CAPABILITIES AND FEATURES

1-2. The M320/M320A1 grenade launcher is a lightweight grenade launcher that can operate in a stand-alone (Figure 1-1) or attached (Figures 1-2 and 1-3) configuration. The M320/M320A1 grenade launcher uses a double-action-only trigger system. It features a forged aluminum rifled barrel, allowing the Soldier to accurately engage targets as far away as 350 meters with various types of ammunition. Ambidextrous operating controls and a sling mounting point allow the weapon to be fitted to the Soldier. The swing out barrel aids the Soldier in rapid reloading.

TECHNICAL DATA

1-3. Table 1-1 contains the physical and firing characteristics of the M320/M320A1 grenade launcher.

COMPONENTS

1-4. The major components of the M320/M320A1 grenade launcher include (Figures 1-4 and 1-5)—

- Leaf sight assembly.
- Buttstock locking lever.
- Buttstock assembly.
- Hexagonal key wrench.
- Remote Cable switch.
- Ambidextrous selector lever.
- Trigger.
- Barrel release button.
- Folding vertical grip.
- Day/night sight (DNS) assembly.
- Sling attachment points.
- Buttstock position index marks.
- Laser borelight system.

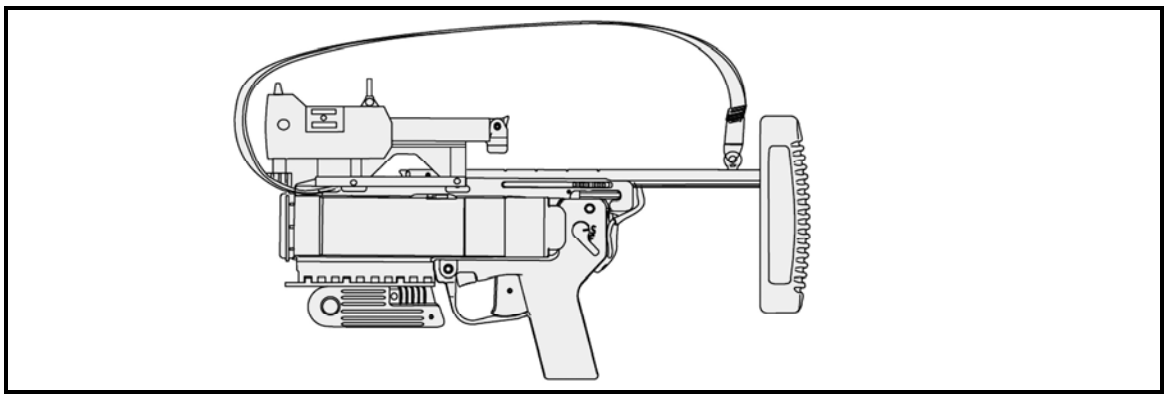


Figure 1-1. M320 grenade launcher in the stand-alone configuration

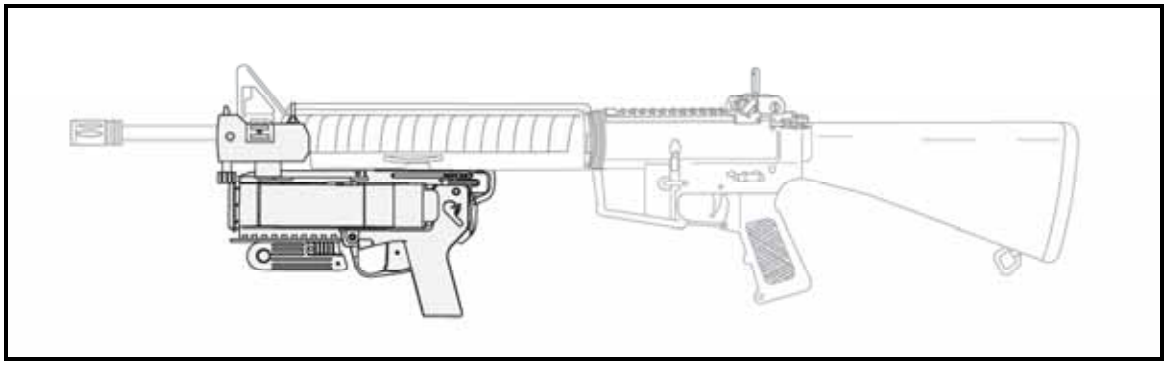


Figure 1-2. M320 grenade launcher mounted on an M16-series rifle

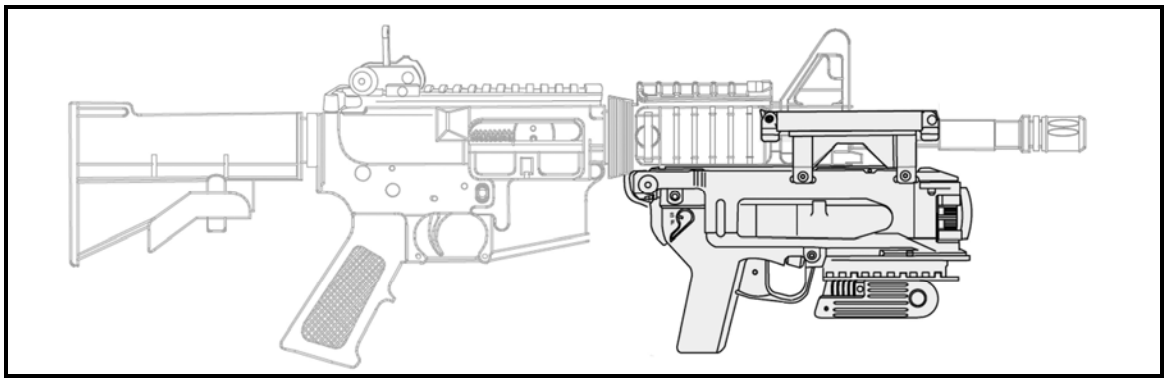


Figure 1-3. M320A1 grenade launcher mounted on an M4 carbine

Table 1-1. Technical data for the M320/M320A1 grenade launcher

PHYSICAL CHARACTERISTICS		
Caliber		40 mm x 46 mm
Weight	Without buttstock	5.0 pounds
	With buttstock	7.0 pounds
Length	Without buttstock	11.18 inches
	With buttstock retracted	14.37 inches
	With buttstock extended	19.69 inches
	Barrel	8.46 inches
Height	Without sights or weapon adapters	6.38 inches
	With mechanical sights down	8.39 inches
	With mechanical sights up	12.05 inches
Width	With mechanical sights	3.62 inches
	Without mechanical sights	2.56 inches
Line of Sight		5.51 inches
Mechanical Features		Lands and grooves rifling
FIRING CHARACTERISTICS		
Muzzle Velocity		236.22 feet per second
Trigger Pull		11.25 to 15.75 pounds
Maximum Effective Range	Area target	350 m
	Point target	150 m
Maximum Range		400 m
Modes of Operation		SAFE and FIRE

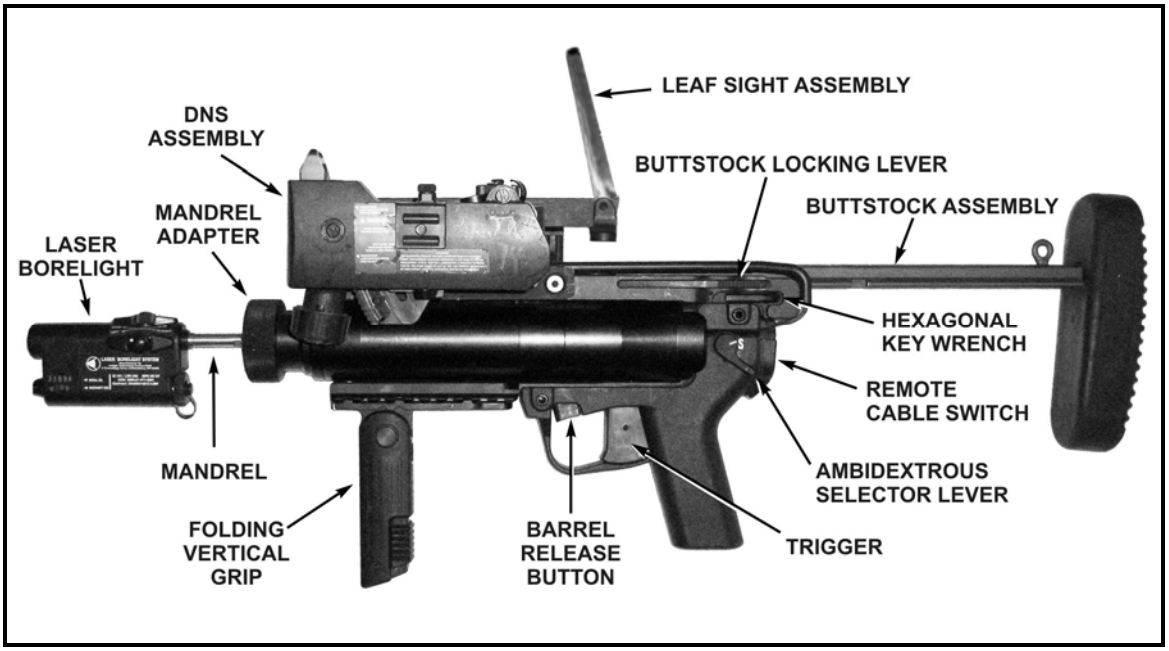


Figure 1-4. Components of the M320 grenade launcher (shown in the stand-alone configuration, side view)

LEAF SIGHT ASSEMBLY

1-5. The leaf sight (Figure 1-4) assembly is a flip-up sight used to make windage and elevation adjustments for targets 50 to 350 meters away.

BUTTSTOCK LOCKING LEVER

1-6. The buttstock locking lever (Figure 1-4) allows the grenadier to select from four positions.

BUTTSTOCK ASSEMBLY

1-7. The buttstock assembly (Figure 1-4) is an adjustable shoulder rest used when in the stand-alone configuration.

HEXAGONAL KEY WRENCH

1-8. The hexagonal key wrench (Figure 1-4) is stowed in the rear of the receiver. It is designed with 3- and 5-mm ends to allow the grenadier to remove and install accessories and to make necessary leaf sight adjustments.

REMOTE CABLE SWITCH

1-9. The Remote Cable switch (Figure 1-4) remotely activates the DNS.

AMBIDEXTROUS SELECTOR LEVER

1-10. The ambidextrous selector lever (Figure 1-4) allows the grenadier to select the SAFE (“S”) and FIRE (“F”) modes.

TRIGGER

1-11. The grenadier squeezes the trigger (Figure 1-4) to initiate the firing sequence.

BARREL RELEASE BUTTON

1-12. The barrel release button (Figure 1-4) releases the rear end of the barrel from the receiver and allows the grenadier to load, unload, or clean the barrel.

FOLDING VERTICAL GRIP

1-13. The folding vertical grip (Figure 1-4) allows for better weapon control when fired from the attached or stand-alone configuration.

DAY/NIGHT SIGHT ASSEMBLY

1-14. The DNS assembly (Figure 1-4) improves firing accuracy. It is used in conjunction with the laser rangefinder (LRF) to establish range to a target. The technical data are listed in Table 1-2.

SLING ATTACHMENT POINTS

1-15. The sling attachment points (Figure 1-5) allows for the sling to be attached to either the right or left side to suit the Soldier’s orientation.

BUTTSTOCK POSITION INDEX MARKS

1-16. The buttstock position index marks (Figure 1-5) provide reference marks for alignment of the locking tabs on the buttstock rail.

LASER BORELIGHT SYSTEM

1-17. The laser borelight system boresights the weapon or aiming device combinations without the need for live weapon fire. Boresighting a 40-mm weapon requires a mandrel adapter be used in conjunction with the 5.56-mm mandrel.

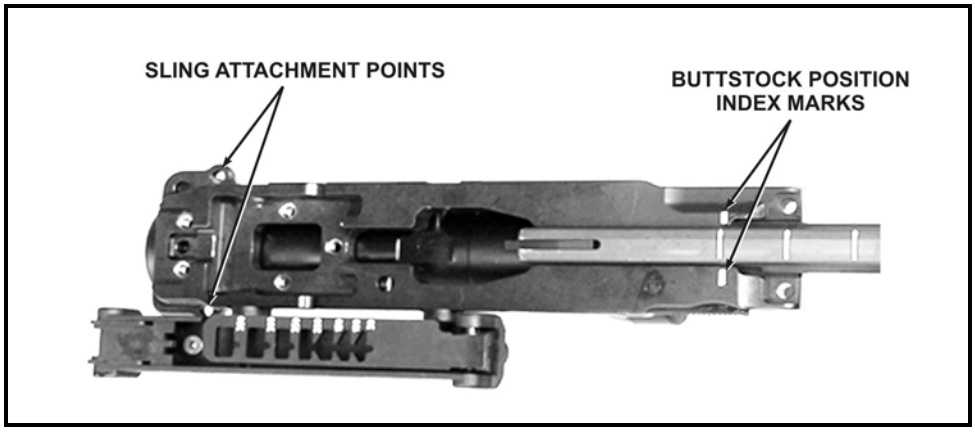


Figure 1-5. Components of the M320 grenade launcher (top view)

Table 1-2. Technical data for the day/night sight

Weight (with battery and interface bracket)	15.5 ounces
Length	5.5 inches
Width	2.9 inches
Height	4.0 inches
Range (maximum)	400 m
Accuracy	5.0 m
Batteries	One 3-volt DL 123A

DAY/NIGHT SIGHT CONTROLS AND INDICATORS

1-18. The DNS has controls and indicators on both sides.

Left Side

1-19. The controls and indicators on the left side include (Figure 1-6)—

- Iron sights.
- Safety block.
- Mode Select switch.
- Azimuth and elevation adjusters.
- Range adjustment knob.
- Infrared (IR) illuminator.
- IR aiming laser.

Iron Sights

1-20. The weapon's iron sights provide for effective aiming in daylight or moderate lighting conditions.

Safety Block

1-21. The safety block prevents selection of the DUAL HIGH position when in the training mode (blue side up). The tactical mode (black side up) allows for selection of the DUAL HIGH position.

Mode Select Switch

1-22. The Mode Select switch allows the grenadier to select the desired mode of operation. When switched to the OFF or DAY positions, the DNS will not emit laser energy.

Azimuth and Elevation Adjusters

1-23. The azimuth and elevation adjusters align the IR aiming and illumination lasers with the azimuth and elevation of the weapon's barrel.

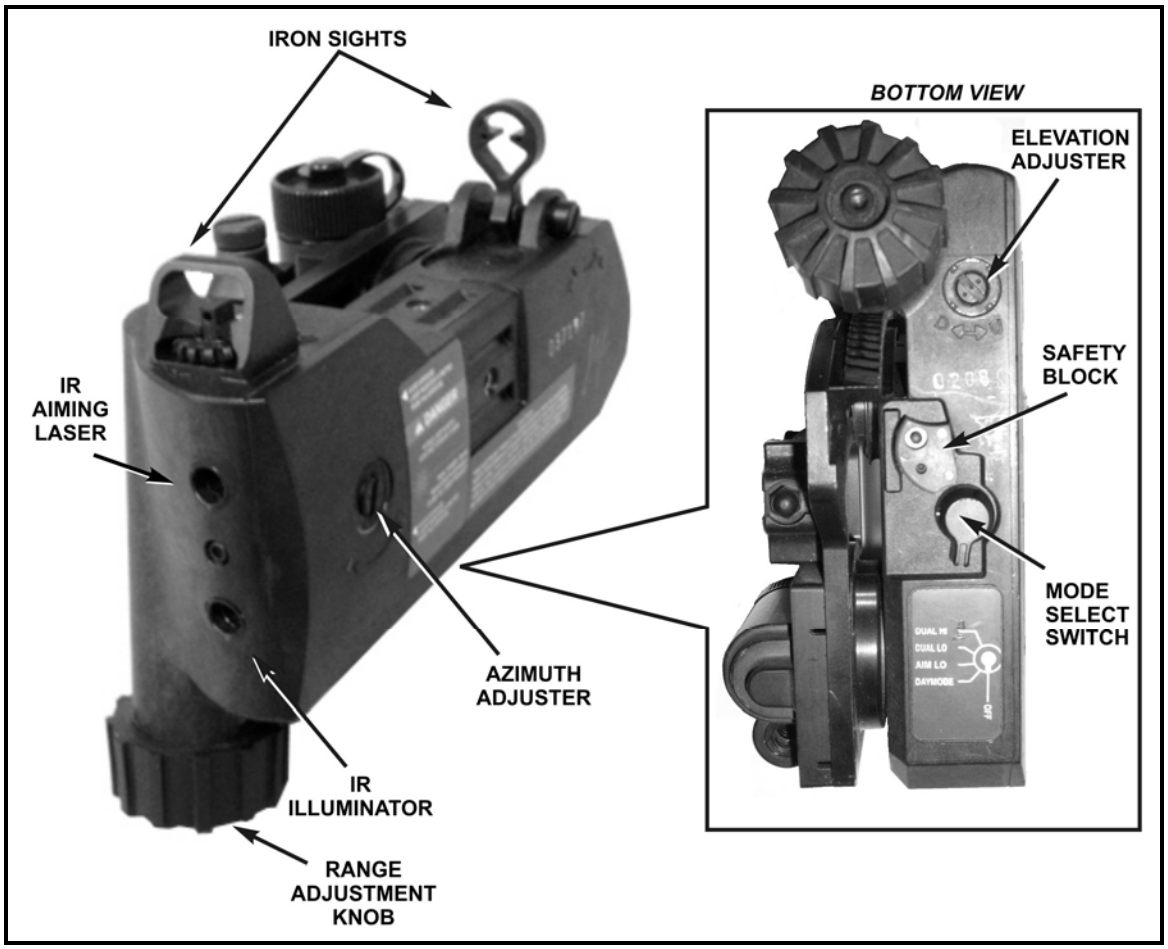


Figure 1-6. Day/night sight controls and indicators (left side view)

Range Adjustment Knob

1-24. The range adjustment knob allows for the rapid adjustment of the range. It is marked in 5-meter increments.

IR Illuminator

1-25. The Soldier uses the IR illuminator with night vision devices to provide IR illumination of the intended target area.

IR Aiming Laser

1-26. The Soldier uses the IR aiming laser with night vision devices to provide a precise aiming point or to mark targets.

Right Side

1-27. The controls and indicators on the right side include (Figure 1-7)—

- Anti-cant indicator.
- Integral rail grabber bracket.
- Battery cap/compartment.
- Remote jack.
- Laser ON light-emitting diode (LED) indicator.
- Liquid crystal display (LCD).

Anti-Cant Indicator

1-28. The anti-cant LED indicator displays a steady green when the DNS is properly oriented and flashes red when the DNS is canted.

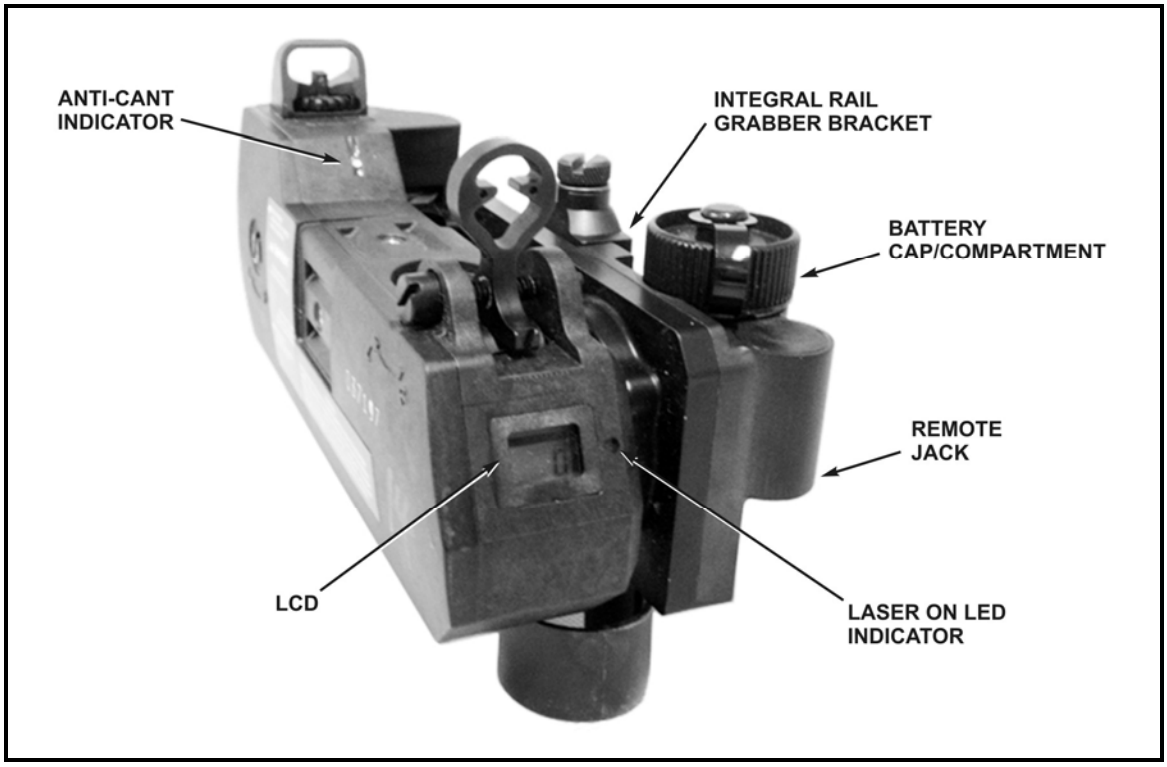


Figure 1-7. Day/night sight controls and indicators (right side view)

Integral Rail Grabber Bracket

1-29. An integral rail grabber bracket mates to the M320 interface bracket to secure the DNS to the weapon.

Battery Cap/Compartment

1-30. The battery cap/compartment provides a secure housing for the 3-volt DL 123A lithium battery that powers the DNS.

Remote Jack

1-31. The remote jack provides an interface for the Remote Cable switch. When the Remote Cable switch is installed in the remote jack, pressing the switch activates the IR laser that corresponds with the position of the Mode Select switch.

Laser ON LED Indicator

1-32. The laser ON LED indicator shows when the DNS is emitting laser energy.

Liquid Crystal Display

1-33. The LCD displays distance in meters, canting information, and battery status in real-time. The LCD is designed with a backlight that illuminates the display when adjusting range and remains illuminated for a period of six seconds after adjustment. When the range has not been adjusted in over three minutes, the DNS enters a low-powered sleep mode. While in the sleep mode, the display will indicate "SLP."

MODE SELECTION

1-34. Modes of operation for the DNS are accessed by turning the Mode Select switch to a desired position. Table 1-3 shows the modes of operation for the DNS.

Table 1-3. Modes of operation

POSITION	DISPLAY INDICATION	REMARKS
OFF	—	The DNS is off. This mode prevents inadvertent emission of laser energy. The DNS can be used with the mechanical range scale, iron sights, and/or other electro-optical devices.
DAY	dAy	The LCD and all LEDs and backlights are functional, but the IR lasers will not operate.
AIM LOW	AL	Class 1. The IR aiming laser is selected at low power. This mode is visible with the use of night vision devices.
DUAL LOW	dL	Class 3a. The IR aiming laser and IR illuminator are selected at low power. This mode is visible with the use of night vision devices.
DUAL HIGH	dH	Class 3b. The IR aiming laser and IR illuminator are selected at high power. This mode is visible with the use of night vision devices.

LASER RANGEFINDER

WARNING

Soldiers should use proper eye protection when using the lasers in the DNS and LRF.

1-35. The DNS is used in conjunction with the LRF to establish range to a target. The LRF has the following components (Figure 1-8):

- Power button.
- Diopter adjustment.
- Eyepiece.
- Mode button.
- Battery cover/compartment.

Power Button

1-36. The Soldier can press the power button once to activate the LRF, or press and hold to acquire the target's range.

Diopter Adjustment Ring

1-37. The diopter adjustment ring allows the grenadier to focus the LCD image.

Eyepiece

1-38. Soldiers can adjust the eyepiece depending on whether they have and do not have eyeglasses.

Mode Button

1-39. The mode button allows the grenadier to select the desired unit of measure and mode of operation. The modes of operation include—

- Standard with automatic SCAN (no LCD display).
- Bullseye (LCD displays bullseye).
- Brush (LCD displays brush and trees).

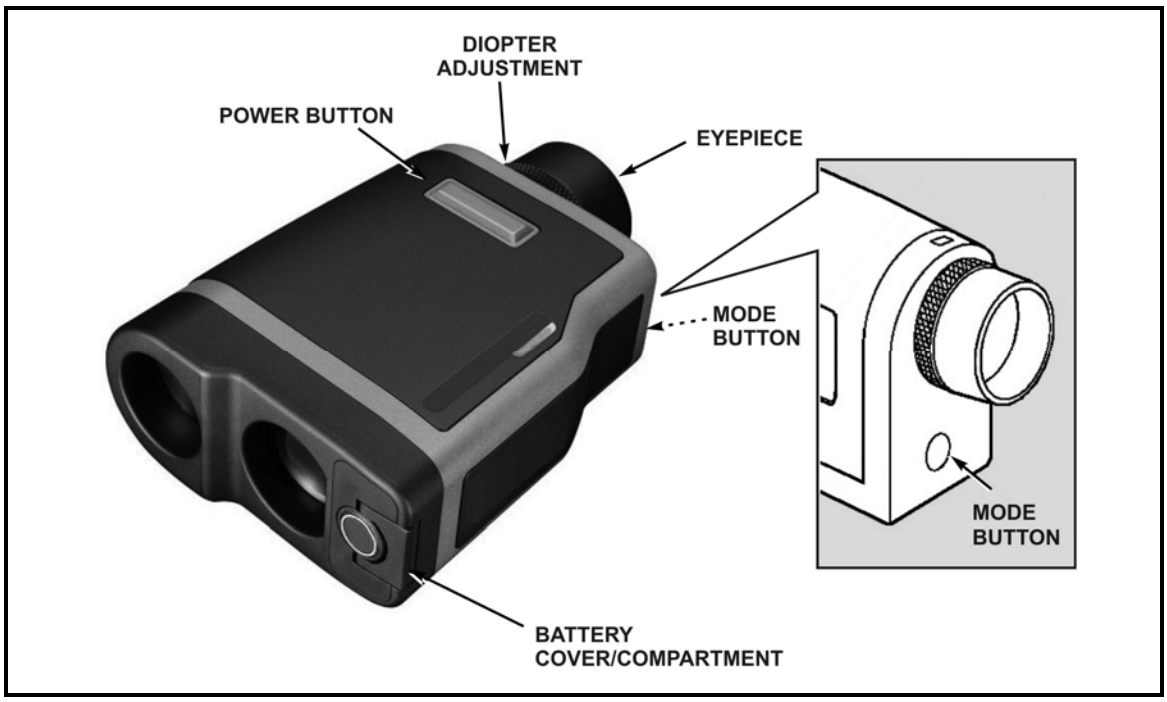


Figure 1-8. Laser rangefinder

Battery Cover/Compartment

1-40. The battery cover/compartment provides a secure housing for the 9-volt, high-quality alkaline battery that powers the LRF.

SECTION II. CONFIGURATIONS

1-41. The M320/M320A1 grenade launcher can operate in stand-alone and attached configurations.

ATTACHED CONFIGURATION

1-42. The M320/M320A1 grenade launcher can be attached under the barrel of two host weapons. The type of grenade launcher can be identified by its host weapon (Table 1-4).

Table 1-4. Host weapons and corresponding types of grenade launchers

HOST WEAPON	TYPES OF GRENADE LAUNCHERS
M16-series rifles	M320
M4 carbines	M320A1

INSTALL MOUNTING ADAPTERS

1-43. To install the mounting adapters for M16- and M4-series weapons—

(1) Remove the stowed hexagonal key wrench (Figure 1-4) from the rear of the receiver.

(2) Screw the adapter locking screw (Figure 1-9, 4) into the right side of the front mounting adapter (Figure 1-9, 5) using the 5-mm end of the hexagonal key wrench (Figure 1-9, 2). Continue until it is flush, but not tightened.

(3) Position the front mounting adapter (Figure 1-9, 5) over the appropriate cutout in the front part of the receiver (Figure 1-9, 1), and align the holes.

(4) Use two socket head cap screws (Figure 1-9, 3) to secure the front adapter. Tighten them using the 5-mm end of the hexagonal key wrench (Figure 1-9, 2).

(5) Press the buttstock locking lever (Figure 1-10, 9), place the rear mounting adapter (Figure 1-10, 7) in the slot in the rear of the receiver (Figure 1-10, 1), and align the holes.

***Note*.** One socket head cap screw is required for the M4 rear mounting adapter, and two cap screws are required for the M16 rear mounting adapter.

(6) From the bottom of the receiver (Figure 1-10, 1), install the longer socket head cap screw (Figure 1-10, 8) in the rear of the rear mounting adapter (Figure 1-10, 7). Tighten it using the 5-mm end of the hexagonal key wrench (Figure 1-10, 2), progressing from bottom to top.

(7) From the top of the rear mounting adapter, install the shorter socket head cap screw(s) (Figure 1-10, 6) in the front of the rear mounting adapter (Figure 1-10, 7). Tighten it using the 5-mm end of the hexagonal key wrench (Figure 1-10, 2).

***Note*.** Failure to mount mounting adapter from bottom to top may cause misalignment.

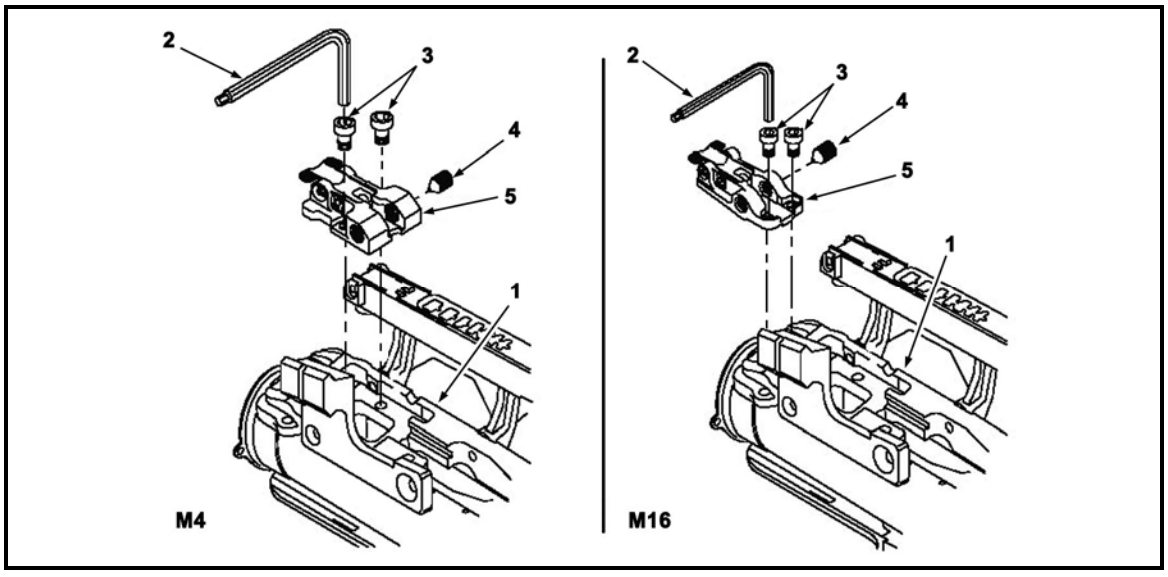


Figure 1-9. Installing the front mounting adapter

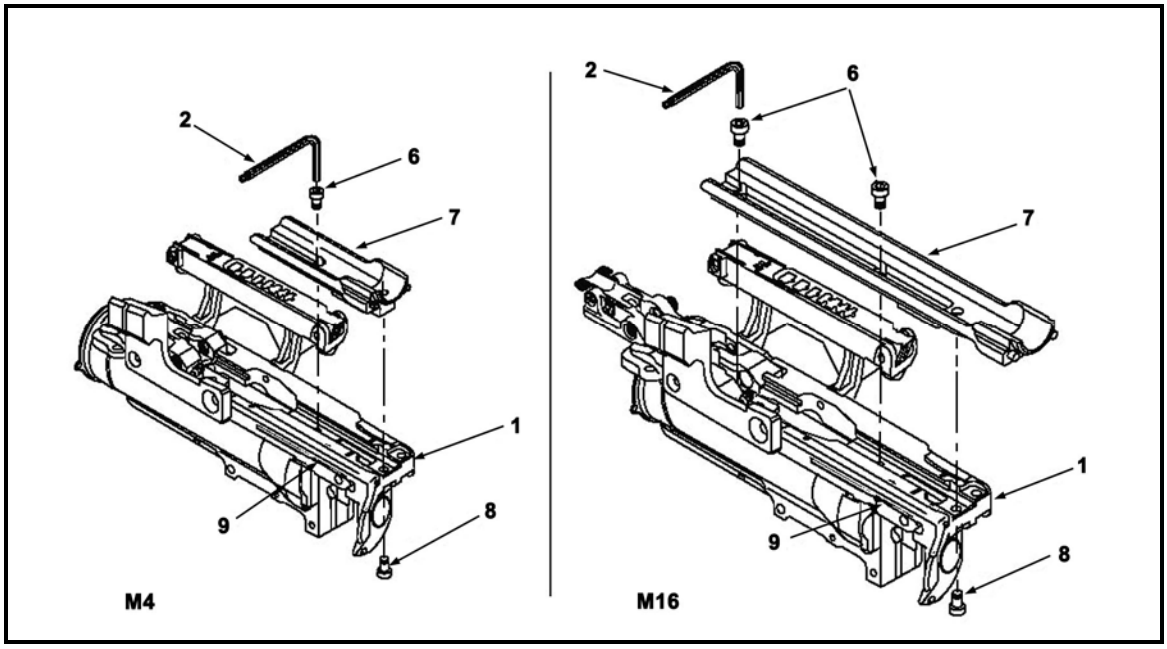


Figure 1-10. Installing the rear mounting adapter

INSTALL THE DAY/NIGHT SIGHT

1-44. To install the DNS (Figure 1-11)—

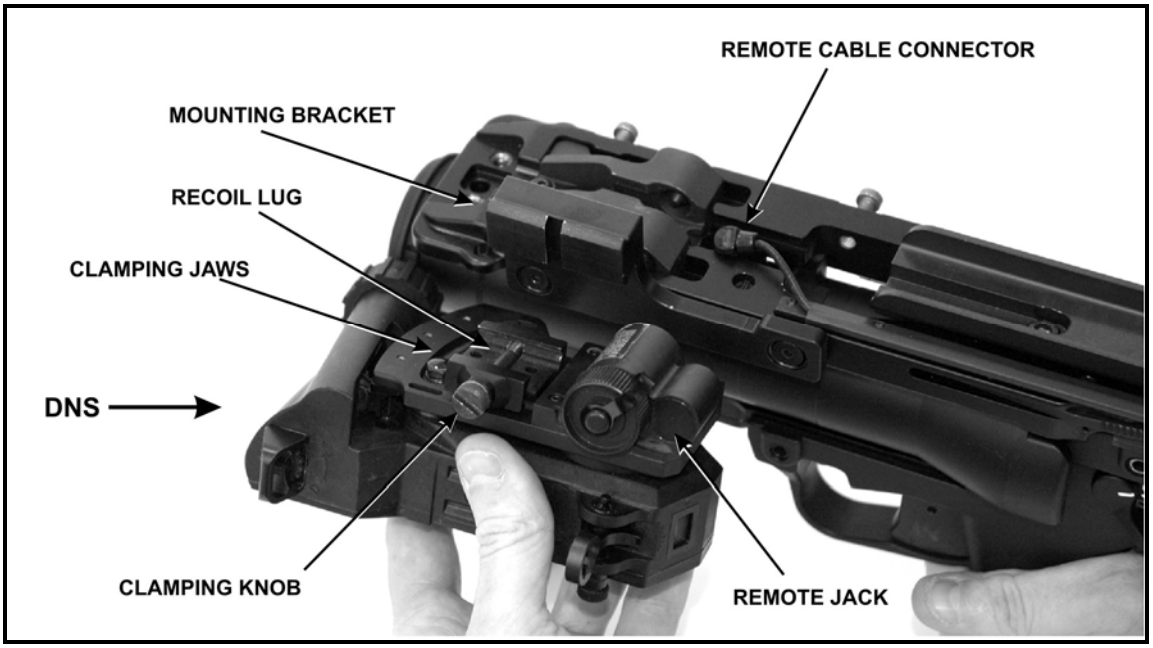


Figure 1-11. Installing the day/night sight to the day/night sight bracket

(1) Loosen the clamping knob on the DNS until the clamping jaws can fit over the rail of the mounting bracket.

(2) Install the remote cable connector into the remote jack.

Note. The DNS works best when it fits securely. Ensure that the DNS is not loose.

(3) Position the recoil lug in the groove of the rail of the mounting bracket. Applying forward pressure, turn the clamping knob clockwise to tighten. Ensure that the DNS is securely seated and tightened in the mounting bracket.

ATTACH THE M320/M320A1 GRENADE LAUNCHER TO A HOST WEAPON

1-45. To attach the M320/M320A1 grenade launcher to a host weapon (Figure 1-12)—

WARNING

To prevent personnel injury, ensure that the host weapon and grenade launcher are cleared of ammunition.

(1) Remove the lower adapter rail or handguard from the host weapon.
(2) Remove the rail covers from each side of the host weapon, if so equipped.
(3) Ensure that the tip of the locking screw on the front adapter does not protrude into the recess of the adapter.
(4) Position the host weapon's sling swivel toward the rear of the weapon (M4) or toward the weapon's muzzle (M16).

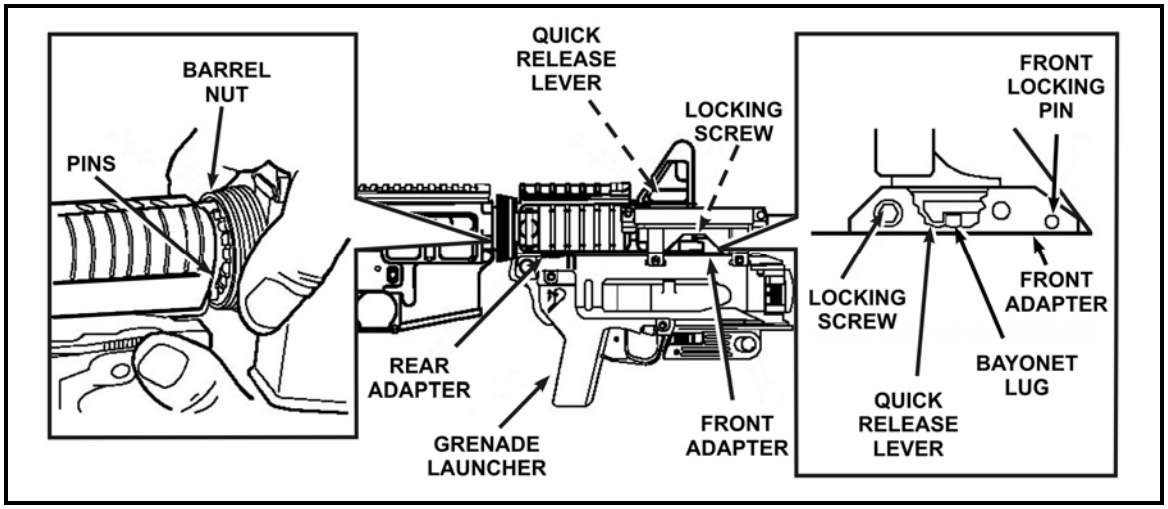


Figure 1-12. Attaching the M320/M320A1 grenade launcher to a host weapon

***Note*.** Do not tighten locking screw. Tightening the locking screw will prevent operation of the quick release function.

(5) Slide the grenade launcher backward under the host weapon's barrel until the two pins on the rear adapter are seated within the teeth spaces of the host weapon's barrel nut and the hook end of the quick release lever snaps onto the host weapon's bayonet lug. Do not tighten the locking screw.
(6) Secure the front locking pin of the front adapter.

REMOVING THE M320/M320A1 GRENADE LAUNCHER FROM A HOST WEAPON

1-46. To remove the M320/M320A1 grenade launcher from a host weapon (Figure 1-13)—

(1) Push the front locking pin from left to right. Slide the front locking pin until it stops to release the quick release lever.

(2) Press the quick release lever of the front adapter so that the hook releases from the bayonet lug.

(3) Slide the grenade launcher from the host weapon's barrel nut.

(4) Install the lower adapter rail or handguard to the host weapon.

(5) If removed, reinstall the rail covers on each side of the host weapon.

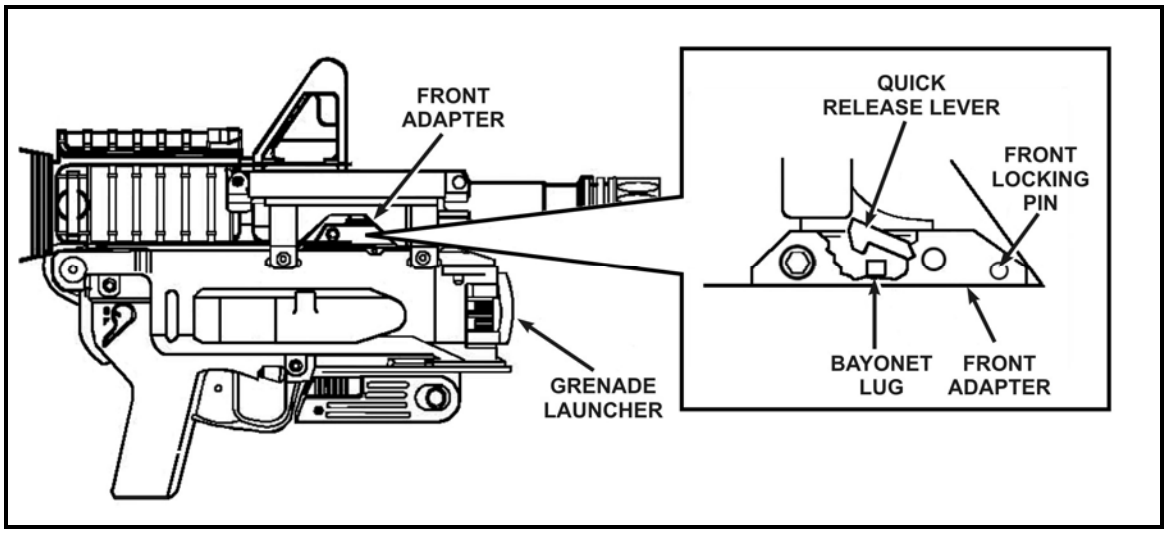


Figure 1-13. Removing the M320/M320A1 grenade launcher from a host weapon

STAND-ALONE CONFIGURATION

1-47. The M320 grenade launcher operates in the stand-alone configuration with the addition of a buttstock system that allows adjustment for length.

INSTALLATION

1-48. For use in the stand-alone configuration, the grenadier must remove the M320 grenade launcher from the host weapon and remove the rear mounting adapter from the receiver.

CAUTION

Failure to depress the vertical locking lever on the front portion of the buttstock when attempting to adjust the length may result in damage to the receiver.

***Note*.** Ensure that the index marks and the sling eyelet are facing up before attempting to install the buttstock in the receiver.

1-49. To install the buttstock and sling—

(1) Align the shaft of the buttstock (Figure 1-14) with the slot in the top of the receiver (Figure 1-14), and push forward into the desired position. Ensure that the index mark (Figure 1-14) on the buttstock aligns with the index marks (Figure 1-14) on the receiver.

(2) Adjust the length of the buttstock (Figure 1-14) to one of five different positions by depressing the serrated end of the buttstock locking lever (Figure 1-14) and sliding the buttstock in or out as needed.

(3) Attach the sling (Figure 1-14) to the mounting hole (Figure 1-14) on the left or right side of the receiver (Figure 1-14) and to the sling eyelet (Figure 1-14) on the buttstock (Figure 1-14). Adjust the length as required.

(4) If the sights are not present, install the leaf sight assembly and the DNS.

(5) Pull the vertical grip assembly (Figure 1-15) downward into the locked position.

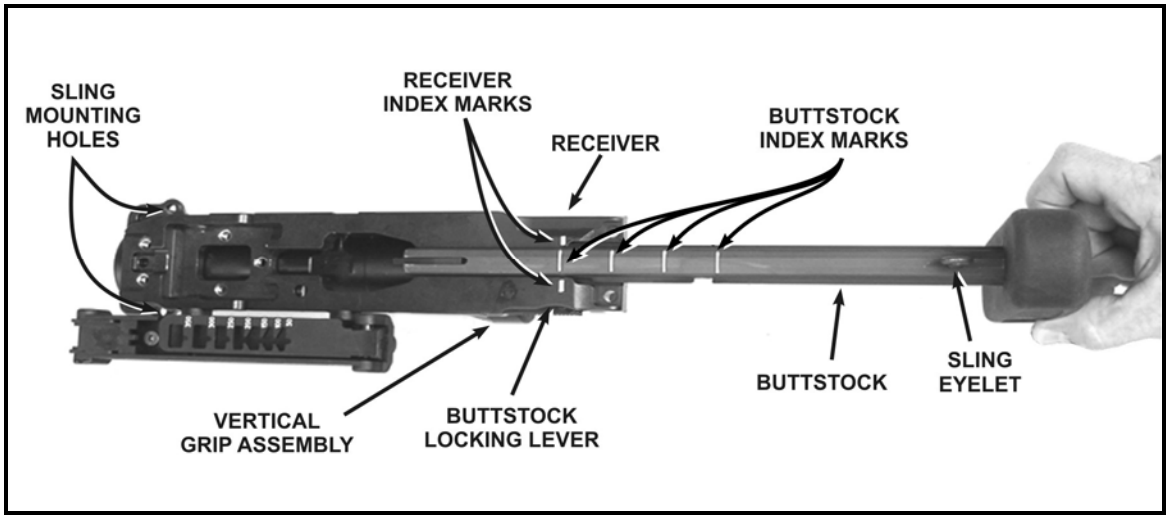


Figure 1-14. Installing the buttstock and sling

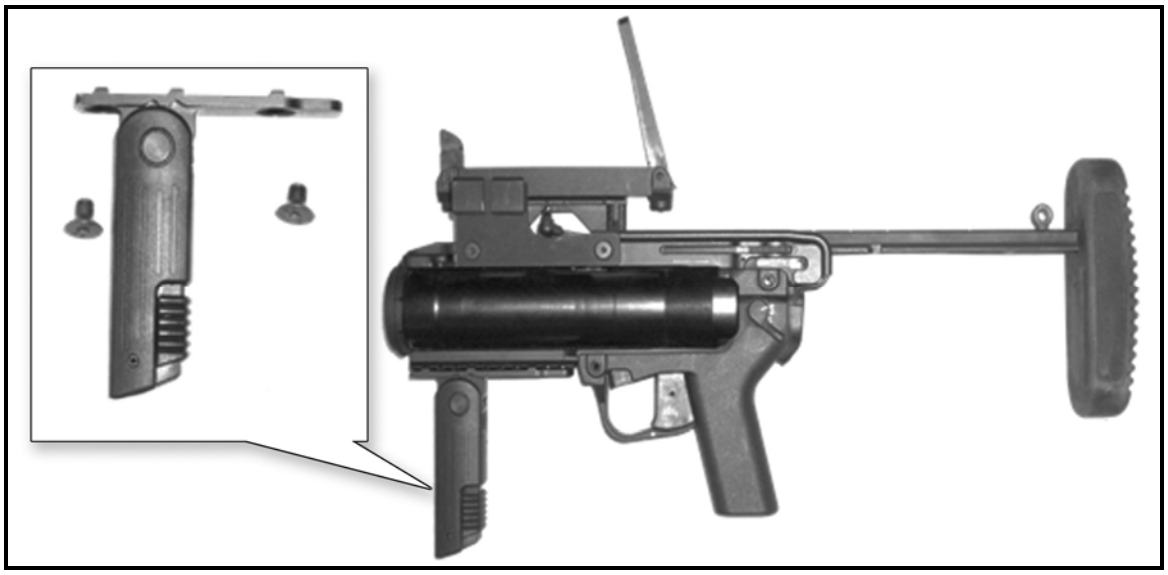


Figure 1-15. Using the vertical grip assembly

REMOVAL

1-50. Removal involves folding and storing the vertical grip assembly, and the removal of the buttstock and the sling.

Vertical Grip Assembly

CAUTION

Do not attempt to fold the vertical grip assembly without first actuating the release. The vertical grip assembly can be damaged.

1-51. To fold and store the vertical grip assembly (Figure 1-16), pull downward on the serrated release while folding the vertical grip assembly upward into the horizontal position.

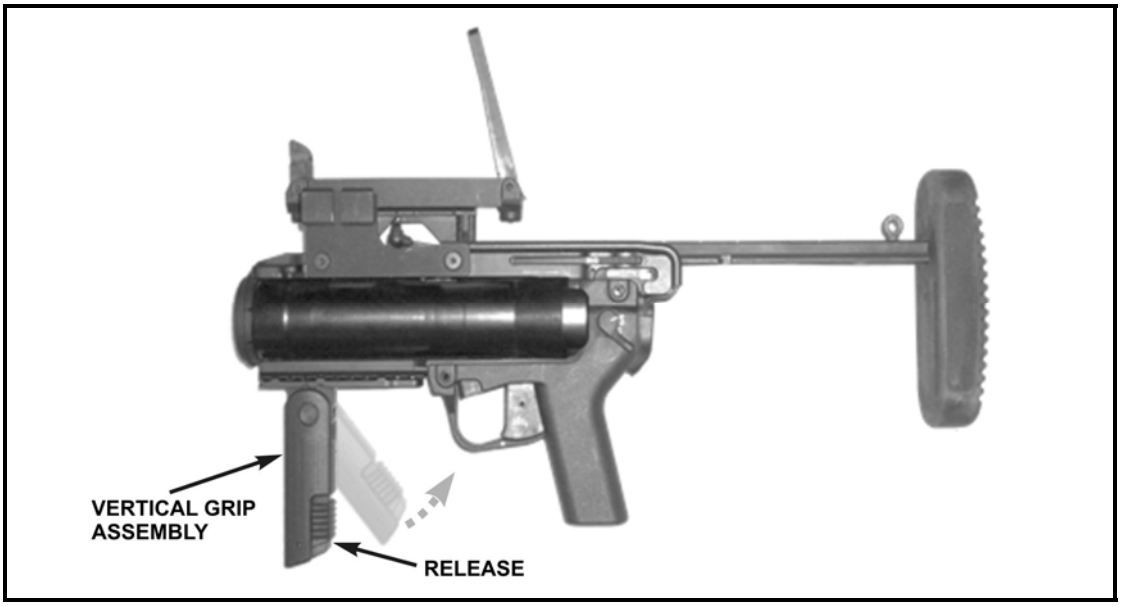


Figure 1-16. Storing of the vertical grip assembly

Sling and Buttstock

1-52. To remove the sling and buttstock (Figure 1-17)—

(1) Remove the sling from the mounting hole on the left or right side of the receiver and from the sling eyelet on the buttstock.

(2) Depress the serrated end of the buttstock locking lever, and lift the vertical locking lever on the front portion of the buttstock.

CAUTION

Failure to lift the vertical locking lever may result in damage to the receiver.

(3) Pull the buttstock rearward, and remove it from the receiver.

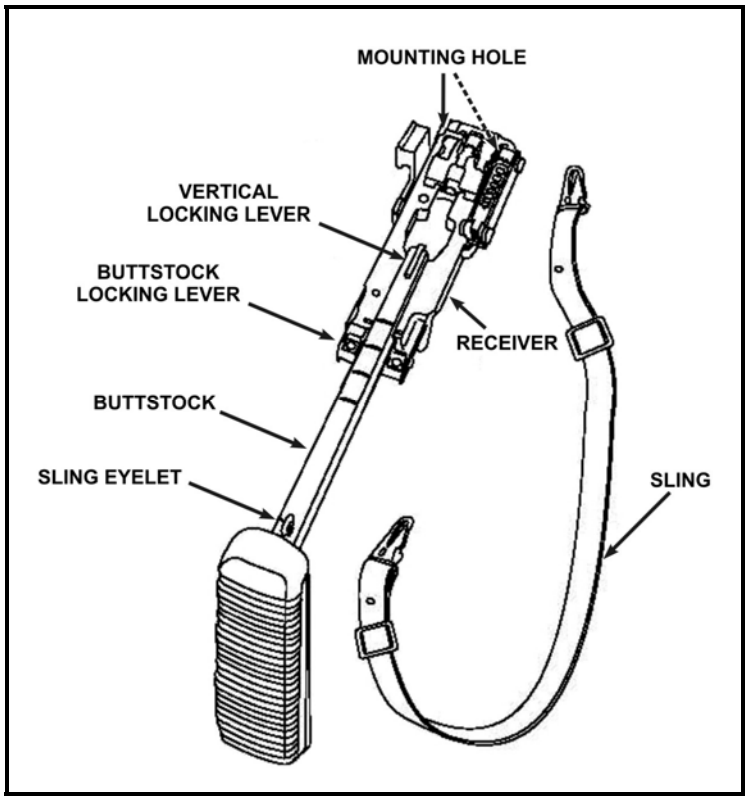


Figure 1-17. Removal of the sling and buttstock

SECTION III. AMMUNITION

1-53. The M320/M320A1 grenade launcher uses fixed-type, low-velocity 40-mm rounds.

***Note*.** This section discusses only the most commonly used ammunition. See TM 9-1010-232-10 for a complete list of authorized ammunition.

DANGER

TO AVOID PERSONNEL INJURY OR DEATH, USE ONLY AUTHORIZED AMMUNITION. DISPOSAL OF AMMUNITION THAT FAILS TO FIRE WILL FOLLOW AUTHORIZED PROCEDURES:

SAFETY PRECAUTIONS TO BE OBSERVED DURING TRAINING ARE PRESCRIBED IN AR 385-63, DA PAM 385-63, AND TM 9-1300-200.

INSTRUCTIONS FOR GENERAL AMMUNITION CARE, HANDLING, AND SAFETY ARE PROVIDED IN DA PAM 385-64, TM 9-1300-200, FM 4-30.13, AND TB 43-0250.

SAFETY PRECAUTIONS GIVEN IN TM 9-1010-232-10 MUST BE FOLLOWED FOR STORING, HANDLING, AND FIRING AMMUNITION.

BE AWARE OF ARMING DISTANCES FOR AUTHORIZED AMMUNITION. FAILURE TO OBSERVE SAFE DISTANCES MAY RESULT IN PERSONNEL INJURY OR DEATH.

TYPES OF AMMUNITION

1-54. Table 1-5 shows the types of ammunition authorized for use in the M320/M320A1 grenade launcher.

WARNING

Hearing protection is required for the grenadier and all personnel within 3 meters (10 feet) of the weapon during training.

CARE AND HANDLING PROCEDURES

1-55. Aluminum cases are easily dented and may be hard to chamber and extract. Use care in handling ammunition. Keep ammunition dry, clean, and free of grease, sand, mud, snow, and ice.

STORAGE

1-56. Since moisture and high temperatures adversely affect ammunition and explosives, take the following precautions:

- When storing ammunition in the open is necessary, raise it on dunnage at least 6 inches from the ground, and protect it with a cover, leaving enough space for air circulation.
- Do not open ammunition containers until they are ready to be used.
- Protect ammunition from high temperatures and the direct rays of the sun.
- Do not attempt to disassemble ammunition or any of its components.

Table 1-5. Authorized ammunition for the M320/M320A1 grenade launcher

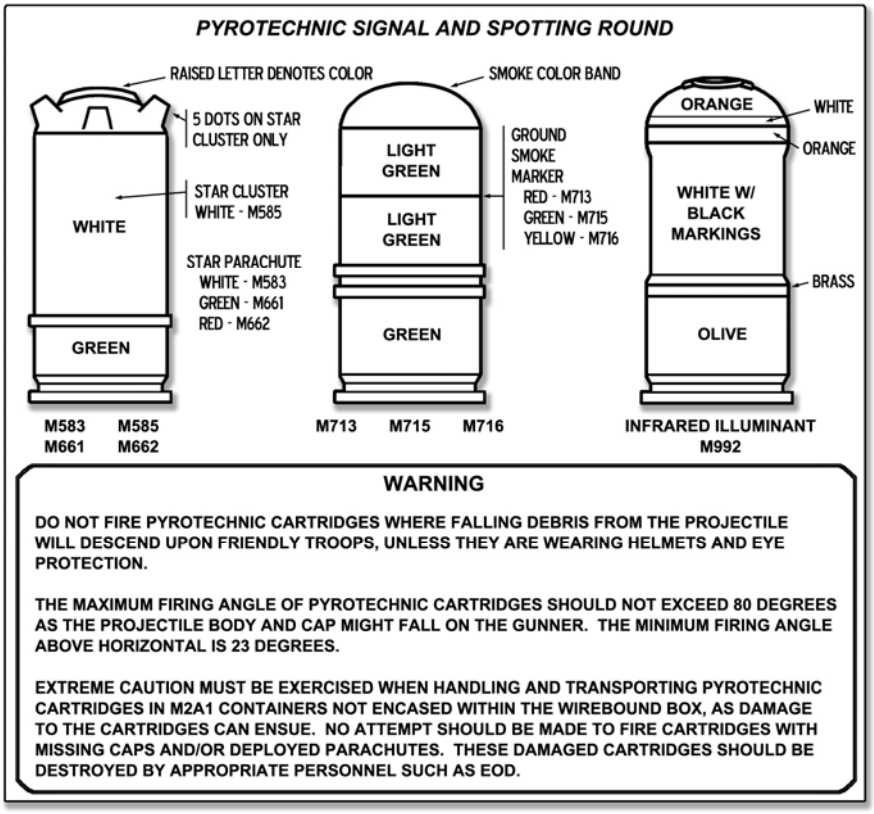
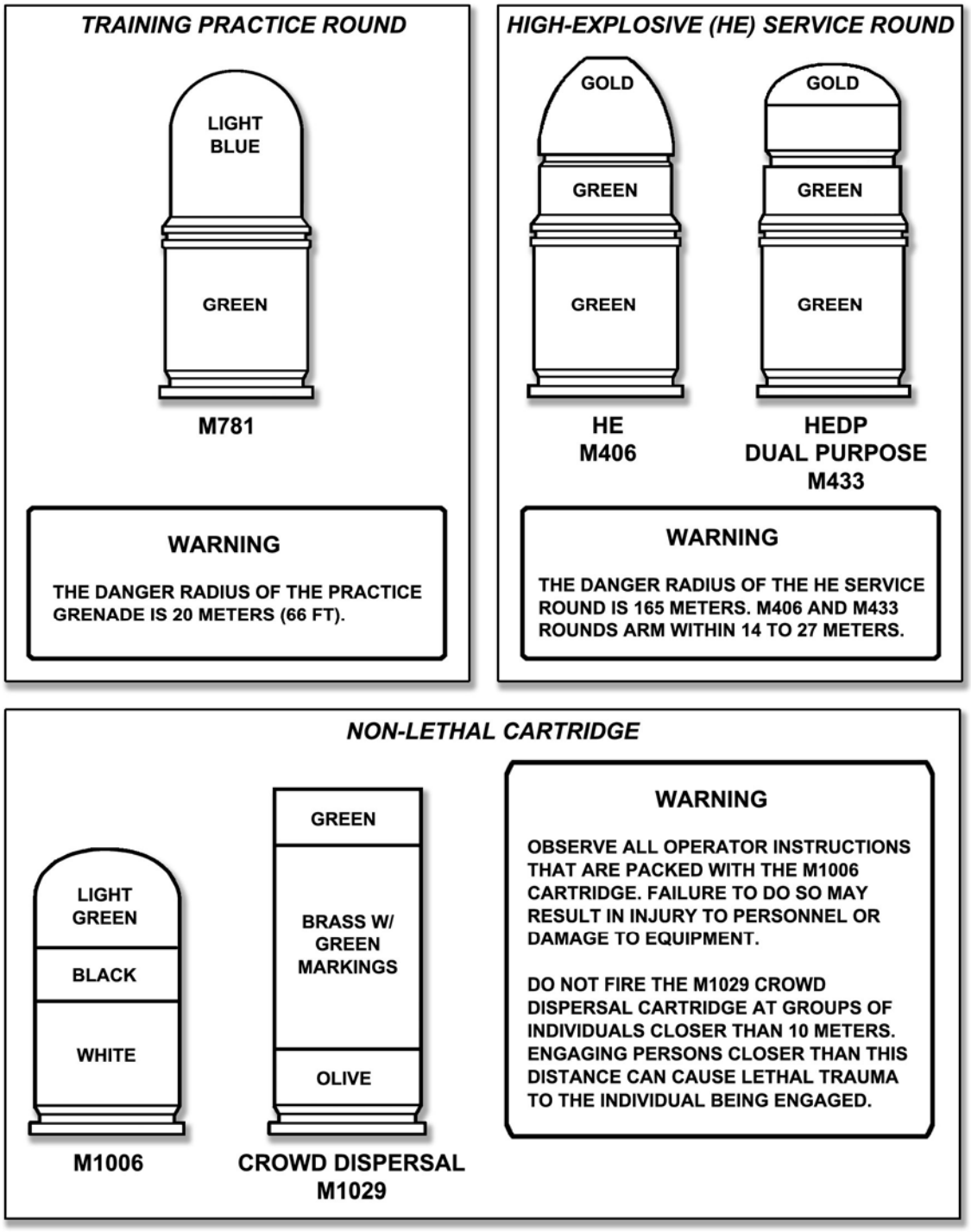


Table 1-5. Authorized ammunition for the M320/M320A1 grenade launcher (continued)



SECTION IV. PERFORMANCE PROBLEMS, DESTRUCTION, AND DECONTAMINATION

1-57. Commanders are responsible for the field level maintenance of weapons and for the destruction of weapons, when necessary. Soldiers are responsible for keeping their weapons clean and operational at all times—in training and in combat—therefore, they should be issued an operator's technical manual and cleaning equipment for their assigned weapons.

PERFORMANCE PROBLEMS

1-58. The grenadier can experience two performance problems when firing the M320/M320A1 grenade launcher: malfunctions and stoppages.

MALFUNCTIONS

1-59. A malfunction occurs when a mechanical failure prevents the weapon from firing properly. Neither defective ammunition nor improper operation of the weapon is a malfunction. The weapon should be cleaned, lubricated, and refired. If it still fails to function, it should be turned in to the unit armorer.

STOPPAGES

1-60. A stoppage is an unintentional interruption in the cycle of operation or functioning that may be cleared by immediate action. A stoppage is classified by its relationship to the cycle of functioning. Table 1-6 shows the types of stoppages.

Table 1-6. Stoppages

STOPPAGE	PROBABLE CAUSE	CORRECTIVE ACTION
Failure to fire	Ambidextrous selector lever in the SAFE position	Move the ambidextrous selector lever to the FIRE position.
	Empty chamber	Load the weapon.
	Faulty ammunition	Reload the weapon.
	Worn or broken firing pin	Notify unit maintenance.
	Dirt or residue in firing pin recess	Clean the weapon.
	Blurred sear or firing pin	Notify unit maintenance.
	Dirty firing pin well opening	Remove from the barrel.
	Weak or broken firing pin spring	
	Defective extractor on spring or spring pin	
Failure to extract	Ruptured cartridge case	
	Worn, broken, or missing ejector spring or retainer	Notify unit maintenance.
Failure to eject	Faulty ammunition	Reload the weapon.
Failure to chamber	Dirty chamber	Clean the bore and chamber.
	Missing spring pin or broken or worn safety	Notify unit maintenance.

1-61. A hangfire may cause a stoppage. Observe the following precautions until the round has been removed from the weapon and the cause of the failure determined. If a cartridge does not fire—

(1) Place the selector lever in the SAFE position.

(2) Keep the weapon pointed downrange for at least one minute.

(3) Place the selector lever in the FIRE position, and attempt to fire the cartridge by pulling the trigger a second time.

Note. If the cartridge fails to fire again, perform the following steps.

---

(4) Place the selector lever in the SAFE position.

(5) Wait one minute.
(6) Pivot the barrel out from the receiver by pressing upward on the barrel release lever.
(7) Inspect the cartridge to see if the primer has been dented.

Note. If the primer is dented, the round is faulty; if the primer is not dented, the weapon is faulty.

(8) If the primer is dented, remove the faulty cartridge. If not, attempt to fire the weapon again.

Note. If the weapon fails to fire again, take the weapon to your armorer.

(9) Dispose of the faulty cartridge in accordance with AR 385-10.

Note. If the previous actions are not successful, perform the following steps.

(10) Check for the following:
- Is the ammunition faulty (corroded, gouged, bulged, or misshapen cartridges)?
- Is the weapon improperly assembled or incomplete?
- Is the firing pin on the hammer or another component part broken?

Note. If weapon still fails to operate properly, perform the following steps.

(11) Clear the weapon.
(12) Perform troubleshooting procedures in accordance with TM 9-1010-232-10, or notify field maintenance for maintenance and repair.

WARNING

If you are unloading a weapon that has not been fired, avoid detonation by catching the ejected round or by holding the weapon close to the ground to reduce the distance the round can fall.

MISFIRES AND HANGFIRES

1-62. An ammunition defect or faulty firing mechanism may cause a misfire and hangfire. Any failure to fire must be considered a hangfire until that possibility is eliminated.

Misfires

1-63. A misfire is a complete failure of the weapon to fire. A misfire in itself is not dangerous, but because it cannot be immediately distinguished from a hangfire, it must be considered to be a hangfire until proven otherwise.

Hangfires

1-64. A hangfire is a delay in the functioning of the round's propelling charge explosive train at the time of firing. The length of this delay is unpredictable, but in most cases, it ranges between a split second and one minute. Such a delay in the functioning of the round could result from the presence of excess oil or grease, grit, sand, frost, or ice.

METHODS OF ADDRESSING PERFORMANCE PROBLEMS

1-65. A Soldier can address performance problems in two ways: immediate action and remedial action.

Immediate Action

1-66. Immediate action refers to anything a Soldier does to reduce a stoppage without taking time to look for the cause. The Soldier should take immediate action in the event of a stoppage, hangfire, or misfire.

Remedial Action

1-67. Remedial action is any action taken by the Soldier to restore his weapon to operational condition.

***Note*.** Take remedial action only if immediate action does not remedy the problem.

DESTRUCTION PROCEDURES

1-68. Destruction of any military weapon is authorized only as a last resort to prevent the enemy from capturing or using it. In combat, the commander has the authority to destroy weapons, but he must report doing so through the proper channels.

1-69. The decision to destroy weapons rests with the commander. The conditions under which destruction will be effected vary depending upon a number of factors, such as—

- Tactical situation.
- Security classification.
- Quantity and location of grenades.
- Facilities for accomplishing destruction.
- Time.

PRIORITIES OF DESTRUCTION

1-70. When lack of time prevents them from completely destroying equipment, Soldiers must destroy the same parts on all like equipment the following order(priority of destruction)s:

- Bolt assembly (M16/M4) and receiver assembly (M320/M320A1).
- Barrels (both M16/M4 and M320/M320A1).
- DNS and LRF.

METHODS OF DESTRUCTION

1-71. The commander must use his imagination and resourcefulness to select the best method of destruction, based on the facilities and time available. Table 1-7 lists the methods of destruction.

Table 1-7. Methods of destruction

METHOD OF DESTRUCTION	DETAILS
Mechanical	Use an axe, pick, sledgehammer, crowbar, or other heavy implement.
Burning	Use gasoline, oil, incendiary grenades, other flammables, or a welding or cutting torch.
Demolition	Use suitable explosives or ammunition or, as a last resort, hand grenades.
Disposal	Bury essential parts, dump them in streams, or scatter them so widely that recovering them would be impossible.

DEGREE OF DAMAGE

1-72. The method of destruction used must damage the weapons and their components to such an extent that they cannot be restored to usable condition in the combat zone. Further, the same essential components

of all weapons must be destroyed so that the enemy cannot assemble complete rounds from undamaged components of several damaged complete weapons.

DECONTAMINATION PROCEDURES

1-73. Leaders must try to reduce the exposure of personnel and equipment to contaminants. Table 1-8 outlines the decontamination procedures.

Note. Contaminated material is disposed of in accordance with standing operating procedures (SOPs).

Table 1-8. Decontamination procedures

TYPE OF DECONTAMINATION	DETAILS
Chemical	Use towelettes from the M258A1 kit to wipe off the weapon. If these are not available, wash the weapon with hot, soapy water.
Biological	Use towelettes from the M258A1 kit to wipe off the weapon. If these are not available, wash the weapon with soap and water.
Radiological or Nuclear	Wipe off the weapon with warm, soapy water. Otherwise, use towelettes or rags.

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Chapter 2
Training

An effective marksmanship program can be measured by the unit's ability to place effective fire on a target. This chapter provides a proven strategy for establishing and conducting an effective marksmanship training program. The strategy begins with the progressive individual training periods taught during initial entry training (IET) and culminates with advanced marksmanship skills trained in units.

A Soldier's marksmanship proficiency depends on proper training and application of the marksmanship fundamentals. Marksmanship training is conducted in three phases. Chapters 3 and 4 discuss the first two phases: preliminary marksmanship and mechanical training and basic marksmanship. In these phases, Soldiers learn to apply the fundamentals of marksmanship and to zero the grenade launcher during qualification exercises in day; chemical, biological, radiological, nuclear (CBRN); and night conditions. The third phase, combat techniques of fire, is discussed in Chapter 5. In this phase, the Soldier learns advanced gunnery skills, fire control methods, and application of fire.

Every phase has the same objective: to teach grenadiers—

- To hit the target accurately with the first round.
- To adjust fire.
- To do both quickly.

SECTION I. TRAINING STRATEGY

2-1. The total Army marksmanship training strategy is the overall concept for integrating resources into a program designed to train, sustain, and improve the individual and collective skills needed to achieve proficiency in individual and collective marksmanship tasks. The training strategy for 40-mm grenade launcher marksmanship is implemented in Training and Doctrine Command (TRADOC) institutions (IET, Noncommissioned Officers Education System [NCOES], Basic Officer Leaders Course [BOLC]) and in units. The overall training strategy is multifaceted and includes supporting strategies that use resources such as publications; ranges; ammunition; and training aids, devices, simulators, and simulations (TADSS). These strategies focus on developing the Soldier and leader skills required for success in combat.

***Note*.** See DA Pam 350-38 for marksmanship training and live-fire frequency requirements.

OBJECTIVES

2-2. The procedures and techniques for implementing the 40-mm grenade launcher marksmanship training strategy are based on the concept that Soldiers must become skilled marksmen. FM 7-0 stresses marksmanship as the paramount Soldier skill. Further, Soldiers should understand common firing principles and be confident in applying their firing skills in combat. Unit leaders accomplish proficiency through practice supervised by qualified instructors/trainers and thorough objective performance assessments.

2-3. The basic firing skills and exercises outlined in this manual must be part of every unit's marksmanship training program. Unit commanders must focus their basic marksmanship and advanced gunnery training programs to support their mission-essential task lists (METLs).

MARKSMANSHIP TRAINING STRATEGY

2-4. The goal of a marksmanship training strategy is to organize, equip, train, and qualify Soldiers in Generating Force facilities and operational Army elements. Soldiers must be able to perform all associated gunnery tasks efficiently, accurately, and with speed in all environments—including live and virtual—in accordance with this manual, Soldier Training Publication 21-1-SMCT, Standards in Training Commission (STRAC), and applicable Combined Arms Training Strategy (CATS). Specifics for the 40-mm grenade launcher marksmanship training strategy follow.

2-5. The 40-mm grenade launcher marksmanship training conducted in Generating Force courses of instruction consists of academic instruction and familiarization firing in accordance with the approved program of instruction (POI). However, most 40-mm grenade launcher training is conducted by operational Army trainers. 40-mm grenade launcher marksmanship training conducted at Generating Force locations includes—

- Maintaining a 40-mm grenade launcher.
- Operating a 40-mm grenade launcher.

***Note*.** Remedial training may be required in initial and sustainment marksmanship training. Leaders must provide time and assets for remedial marksmanship training at each marksmanship training event.

2-6. Operating and Reserve operational Army sustainment training will include initial training on some basic gunnery tasks not taught in IET and all advanced gunnery tasks. The perishability of skills, when not reinforced, and personnel turnovers can affect readiness and combat proficiency of the operational Army. In order to attain and sustain combat proficiency, operational Army elements should plan progressive, sequential training to develop their grenadiers. Therefore, a year-round marksmanship sustainment program is needed to maintain their individual and collective firing proficiency skills (Figure 2-1).

2-7. An effective operational Army marksmanship training program focuses on three battlefield variables: nature of the target (moving or stationary, single or multiple); nature of the grenadier (stationary or moving); and environmental conditions (full or limited visibility, with or without protective mask, day or night). Additionally, an effective program utilizes TADSS to augment/enhance live-fire training events.

TRAINING PHASES

2-8. Soldiers progress through three phases of marksmanship training:

- Phase I—Preliminary Marksmanship Instruction.
- Phase II—Basic Marksmanship Training.
- Phase III—Combat Techniques of Fire.

2-9. When Soldiers are trained in all phases of marksmanship, a solid sustainment program is essential to mission readiness.

PHASE I—PRELIMINARY MARKSMANSHIP INSTRUCTION

2-10. Good preliminary marksmanship instruction improves individual proficiency, which in turn improves the proficiency of collective fire. During preliminary marksmanship instruction, grenadiers learn and demonstrate the individual skills that prepare them to fire live ammunition. After learning the characteristics and mechanics of the weapon, they learn the fundamentals of marksmanship, sight manipulation, and response to fire commands. Dry-fire exercises can be used to train these tasks to proficiency. Chapter 3 details the tasks trained during preliminary marksmanship instruction.

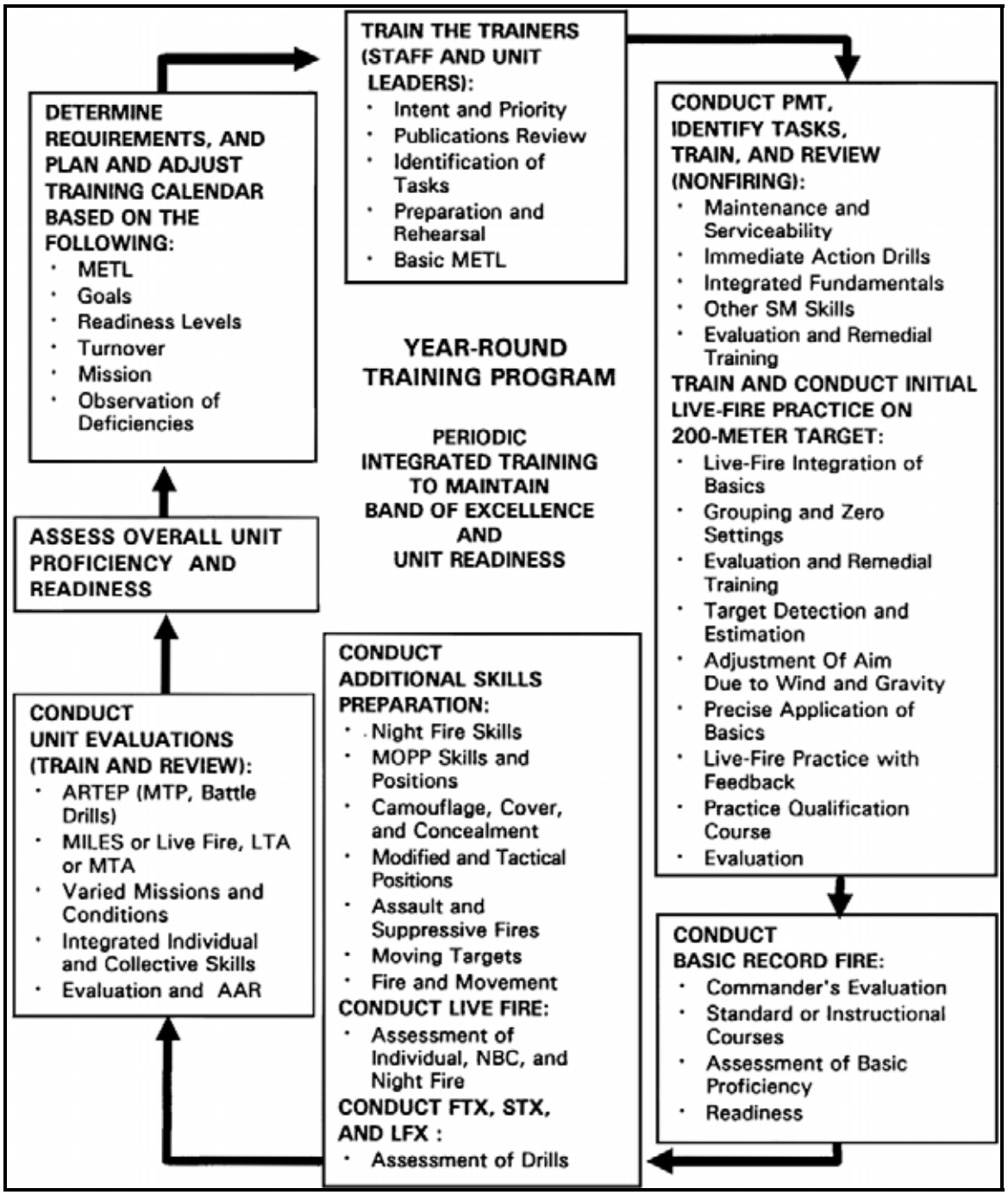


Figure 2-1. Unit gunnery sustainment strategy

PHASE II—BASIC MARKSMANSHIP TRAINING

2-11. Basic marksmanship training teaches the grenadier to zero and apply the fundamentals of marksmanship during live-fire exercises (LFXs) in day, night, and CBRN conditions. Chapter 4 provides information about the tasks covered during basic marksmanship training.

Note. It is recommended to use the EST 2000 whenever possible prior to live firing.

PHASE III—COMBAT TECHNIQUES OF FIRE

2-12. Combat techniques of fire reinforce basic gunnery and teach the grenadier how and when to use these basics in combat situations. Training combat techniques of fire differs slightly from training basic marksmanship. Chapter 5 discusses in detail how to train characteristics of fire, classes of fire, range estimation, and fire commands. It also discusses the easiest and quickest means of applying firing techniques and delivering fire with the 40-mm grenade launcher.

SECTION II. UNIT MARKSMANSHIP TRAINING PROGRAM

2-13. An effective unit marksmanship program reflects the priority, emphasis, and interest of commanders and trainers. This section outlines a 40-mm grenade launcher marksmanship training program strategy as guidance in establishing and conducting an effective unit training program. The strategy consists of the individual and leader refresher training for maintaining the basic skills learned during IET. It progresses to training advanced and collective skills under near-combat conditions during live-fire situational training exercises (STXs).

MISSION-ESSENTIAL TASKS

2-14. Marksmanship proficiency is critical to soldiering and is required for any unit deployed to a wartime operational area. All commanders should develop a METL and organize a training program that devotes adequate time to marksmanship. The unit's combat mission must be considered when establishing training priorities. This not only applies to the tasks selected for the unit's METL, but also to the conditions under which the tasks are to be performed.

TRAINING ASSESSMENT

2-15. To conduct an effective marksmanship program, the unit commander must determine the current marksmanship proficiency of all assigned grenadiers. Constant evaluation provides commanders understanding of where training emphasis is needed. All results are reviewed to determine any areas that need strengthening, along with any individuals that require special attention. Based on this evaluation, training programs are developed and executed. Commanders continually assess the program and modify it as required. To develop a training plan and assess the program, commanders should use the following tools:

- Direct observation of training.
- Spot checks.
- Review of past training.

2-16. Quarterly, semiannual, or annual training events are identified based on the commander's evaluation, goals, and missions. Training programs must be continuous, and to sustain an effective program, resources are required. While the unit may only qualify its grenadiers annually or semiannually, test results show that sustainment training is required at least quarterly to maintain gunnery skills.

DIRECT OBSERVATION OF TRAINING

2-17. Observing and accurately recording performance reveals the status of weapon maintenance, Soldier zero and qualification results, and each Soldier's ability to hit targets. This also allows the commander to identify Soldiers who need special assistance to reach required standards and those who exceed these standards.

SPOT CHECKS

2-18. Spot checks of individual performance, such as interviews and evaluations of Soldiers, provide commanders with valuable information about Soldier proficiency and knowledge of the marksmanship tasks.

REVIEW OF PAST TRAINING

2-19. Commanders review past training to gain valuable information for developing a training plan. The assessment should include—

- The frequency and results of training.
- The basic record fire results.
- The frequency of unit-conducted collective CBRN or night fire training.

COMMANDER'S EVALUATION GUIDE

2-20. The commander's evaluation guide contains three sections:

- Commander's priorities and intent.
- Soldier assessment.
- Trainer assessment.

2-21. The following is an example of a commander's evaluation guide. Commanders can use this guide not only to assess their unit's marksmanship proficiency, but also to assess the unit leaders and their ability to effectively implement a marksmanship program. They can also use it to develop noncommissioned officers (NCOs) into subject matter experts.

Commander's Priorities and Intent

2-22. When considering their priorities and intent, commanders answer the following questions:

- Have you clearly stated the priority of 40-mm grenade launcher proficiency in your unit? What is it? Do the staff and subordinates support this priority? Is your priority based on your knowledge and METL?
- Have you clearly stated the intent of record fire? Are leaders evaluating firing performance based on accurately recorded data and results?
- Have you clearly stated that weapon qualification or record fire is one of the commander's opportunities to assess several skills relating to small arms readiness?
- What qualification course will be used to evaluate your unit's marksmanship readiness?
  - Is the standard 40-mm qualification course used?
  - How will it be conducted? Will the prescribed procedures be followed?
  - Who will collect the data?
- Have you clearly stated the purpose and intent of preliminary marksmanship instruction?
  - What skills will preliminary marksmanship instruction address?
  - Will preliminary marksmanship instruction be performance-oriented? Are tasks integrated?

Soldier Assessment

2-23. During Soldier assessment, commanders answer the following questions:

- Do Soldiers maintain their assigned weapons in accordance with the technical manual? Do they have a manual?
- Do Soldiers conduct serviceability checks of the weapon before training? Were maintenance deficiencies corrected?
- Do Soldiers demonstrate an understanding of the weapon's operation, functioning, and capabilities?

- Can Soldiers correctly apply immediate action procedures to reduce weapon stoppages and then continue to fire? Have they demonstrated this during dry-fire exercises?
- Are Soldiers firing their assigned weapons?
  - How often are weapons reassigned between individuals?
  - What is the value of a recorded zero?
- Can Soldiers precisely and consistently apply the four fundamentals of marksmanship? To what standard have they demonstrated their mastery?
  - During a dry-fire exercise?
  - During an LFX?
- Can Soldiers accurately zero their assigned weapon to standard?
  - Do they understand sight adjustment procedures?
  - Do they record their weapon's zero? How is it done? Why?
  - Do they record the date the Soldier last zeroed his weapon?
- Do Soldiers demonstrate their knowledge of the effects of wind and gravity while firing out to 300 meters? What feedback was provided? How?
- Can Soldiers scan a designated area or sector of fire and detect all targets out to 300 meters? If not, why?
- Can Soldiers quickly engage timed single and multiple targets from both supported and unsupported firing positions out to 300 meters? If not, which targets were not engaged? Which were missed? Why?
- During individual and collective training, do Soldiers demonstrate their ability to manage allocated ammunition and to engage all targets?
- Based on an analysis of individual qualification scores, what is the distribution?
  - Are most Soldiers just meeting the minimum acceptable performance (second class)?
  - Are most Soldiers distributed in the upper half of the performance spectrum (first class, expert)?
- Do Soldiers demonstrate proficiency during night-fire, target detection and acquisition, and night fire engagement techniques?
- Do Soldiers demonstrate individual marksmanship proficiency during mission-oriented protective posture (MOPP) firing conditions? During collective exercises?
- Are marksmanship skills integrated into tactical exercises and unit LFXs? If so, what tasks in the unit training plan are evaluated?
- Based on onsite observations and analysis of training and firing performance, what skills or tasks show a readiness deficiency?
  - What skills need training emphasis? Individual emphasis? Leader emphasis?
  - What are the performance goals?

Trainer Assessment

2-24. The chain of command identifies the Soldiers who have the required knowledge, skills, and motivation in 40-mm grenade launcher marksmanship and trains these Soldiers to pass their knowledge on to other Soldiers.

PERSONNEL

2-25. Training personnel include the following:

- Trainers
- Assistant trainers.
- Cadre coaches.

TRAINERS

2-26. Potential trainers are selected from the best qualified Soldiers.

Selection

2-27. To be trainers, the Soldiers must display motivation and know the 40-mm grenade launcher. They must demonstrate both their proficiency in applying the fundamentals of 40-mm grenade launcher marksmanship and their ability to train professionally. Because knowledgeable trainers are the key to 40-mm grenade launcher marksmanship performance, the commander must maintain high standards for trainer expertise.

Training

2-28. The more time a command invests in training a trainer, the better the result. The chain of command should periodically evaluate trainers and replace any who have lost their desire to accomplish the objectives of the 40-mm grenade launcher marksmanship program. To maintain interest, commanders may promote competitive trainer awards, such as "Trainer of the Month."

ASSISTANT TRAINERS AND CADRE COACHES

2-29. The most valuable Soldiers in the 40-mm grenade launcher marksmanship training program are those who are most proficient in and can best transmit their knowledge of 40-mm grenade launcher marksmanship to others. Soldiers who demonstrate consistency as grenadiers should be identified quickly and developed into competent assistant trainers or coaches. Their main responsibility then becomes to teach other Soldiers to use the 40-mm grenade launcher effectively.

Assistant Trainers

2-30. Assistant trainers maintain discipline on the firing line and constantly enforce compliance with training guidance, range regulations, and safety regulations.

Note. Appendix C discusses range safety.

Coaches

2-31. Coaches must know the fundamentals of both accurate firing and coaching.

ATTRIBUTES

2-32. All trainers should possess the following attributes:

- Knowledge.
- Patience.
- Understanding.
- Consideration.
- Respect.
- Alertness.
- Helpful attitude.
- Encouragement.

Knowledge

2-33. A trainer must know this manual and must be able to answer any questions on the subject of 40-mm grenade launcher marksmanship accurately. He must develop his ability to observe Soldiers' actions in detail and offer quick correction and sound guidance.

Patience

2-34. A trainer will encounter many types of Soldiers who try his patience. This includes dull, know-it-all, uncooperative, and aggressive ones. He must handle each one patiently. Through demonstration and repetition, trainers can train Soldiers to be proficient 40-mm grenadiers.

Understanding

2-35. Because training new grenadiers is stressful to both students and the trainer, a trainer needs a good "firing line manner." Soldiers may be sensitive to abruptness, impatience, or lack of sympathy. If so, they will react immediately and unfavorably to any evidence of these from the trainer.

Consideration

2-36. Most Soldiers, even those who do not fire well, enjoy firing and start out with a positive interest in their performance on the range. A trainer who is considerate of Soldiers' feelings from the beginning and encourages them throughout their training will find coaching a pleasant and rewarding duty.

Respect

2-37. Because a trainer must be an expert grenadier, he should receive the same respect as the primary trainer. A trainer retains that respect by showing that he knows the subject quietly and with dignity.

Alertness

2-38. The most capable Soldier may forget a vital point from his training in the excitement of range firing. The trainer must be alert for this possibility and patiently correct the grenadier when it occurs. The trainer constantly encourages and motivates the grenadier by providing positive feedback on all progress.

Helpful Attitude

2-39. A combative attitude is no more effective on the range than in any other type of training.

Encouragement

2-40. The trainer can encourage Soldiers by convincing them that good firing is no mystery. The weapon and ammunition are mechanically developed for accuracy; poor scores are usually due to lack of maintenance, knowledge, or practice on the part of the grenadier. The coach imparts his knowledge and helps the Soldiers gain the practical experience needed.

COMMAND BENEFITS

2-41. The chain of command must demonstrate active and aggressive leadership in order to establish and maintain a perpetual base of trainer expertise. Unit esprit de corps increases when trainers want to improve and demonstrate they are the best. The goal of a progressive train-the-trainer program is to achieve a high state of combat readiness.

QUALIFICATION TRAINING

Note. Although marksmanship is a continuous training requirement, units normally conduct a refresher program before qualification. A refresher training program prevents Soldiers from becoming frustrated and losing confidence, and conserves ammunition and training time. All Soldiers attend this program so they can meet the standards outlined in this manual and supporting manuals. It is recommended to use the EST 2000 if available prior to qualification.

2-42. Soldiers must be well-versed in marksmanship fundamentals and have preparatory marksmanship training before qualification. This applies to qualification for the entire unit or for newly assigned

personnel. Trainers must understand that unit marksmanship is not a series of exercises to be trained in a planned sequence as is done during IET, but trainers can use the exercises and POI events covered during IET to identify events that the unit can use for a sustainable and effective unit marksmanship program. The unit must prepare for training by—

- Issuing Soldiers a serviceable weapon.
- Issuing and assigning each Soldier his own weapon. Only he will zero and fire the weapon assigned to him.
- Considering available or required resources (targets, ranges, ammunition, training aids, devices, and publications) early in the process.

Note. Many individual marksmanship tasks (such as operation and function checks, immediate action, target detection, and dry-fire) do not require live-firing. Live and virtual simulators can be used to reinforce preliminary marksmanship instruction, zeroing, practice record fire, record fire, CBRN fire, and assisted and unassisted night fire by simulating the LFXs. Building marksmanship confidence by repetition can bring consistency to the unit marksmanship training program.

UNIT LIVE-FIRE EXERCISES

2-43. Unit LFXs are planned, prepared, and performed as outlined in the unit's training plan. Within the framework of these exercises, Soldiers perform marksmanship tasks under realistic combat conditions.

FUNDAMENTALS

2-44. During training, the fundamentals must apply to combat, as well as to the range. Too often, Soldiers disregard the fundamentals while under the pressure of combat, so it is imperative that the Soldier receives feedback regarding his firing results and his use of the fundamentals during collective LFXs. This training should also discuss target acquisition, area fire, assuming firing positions, responding to oral fire commands, and safety. To learn SOPs and proper procedures, Soldiers must participate in dry-fire or multiple integrated laser engagement system (MILES) rehearsals at crawl, walk, and run paces.

EVALUATORS

2-45. During training, enough evaluators must be present to observe each Soldier and provide performance feedback. Evaluators must know the scenario, the location of targets, the friendly plan, and SOPs. They must watch each Soldier to determine if he identifies targets in his sector and successfully engages them. Evaluators must also understand the fundamentals of marksmanship to detect Soldiers' mistakes and review them during the after-action review (AAR).

SECTION III. TRAINER CERTIFICATION PROGRAM

2-46. The certification program sustains the trainer's expertise and develops methods of training. The program standardizes procedures for certifying 40-mm grenade launcher trainers. A trainer's technical expertise must be continuously refreshed, updated, and closely managed.

TRAINING BASE

2-47. Like any organization, the training base has personnel turnover. Additionally, Soldiers assigned as 40-mm grenade launcher trainers have different backgrounds and knowledge of training procedures and methods. Trainer certification is an ongoing process that addresses these variables. Trainers must complete the four phases of trainer certification in order and must update their training quarterly. Formal records document each trainer's progress. One of the goals of trainer certification is to help trainers understand the training mission, which helps them support grenadiers.

CERTIFICATION OUTLINE

2-48. Before they can be certified, trainers attend all phases of the program. Then, under the supervision of the chain of command, they conduct the phases. They must demonstrate that they can train Soldiers as well as they diagnose and correct problem areas. Phases occur in the following sequence:

- Phase I—Orientation.
- Phase II—Preliminary Marksmanship Instruction.
- Phase III—Basic Marksmanship Training.
- Phase IV—Qualification Training.

PHASE I—ORIENTATION

2-49. During this phase, the new trainer must accomplish the following and obtain certification from the chain of command:

- Attend briefing on the concept of trainer certification.
- Attend briefing on the unit's marksmanship training strategy.
- Review the unit's marksmanship training outlines.
- Review issued reference material.
- Visit training sites and firing ranges.

PHASE II—PRELIMINARY MARKSMANSHIP INSTRUCTION

2-50. During this phase, the trainer must demonstrate his mastery of the fundamentals of marksmanship, his ability to diagnose problem areas, and his ability to train others to standards. This phase should be completed within two weeks after Phase I. The following 40-mm grenade launcher marksmanship fundamentals are reviewed by the chain of command, with the results recorded and maintained on the trainer's progress sheet:

- Characteristics.
- Capabilities.
- Disassembly.
- Cleaning, lubricating, and inspecting.
- Assembly.
- Malfunctions, stoppages, and immediate action.
- Types and capabilities of standard 40-mm ammunition.
- Range estimation.
- Classes of fire.
- Application of fire.

PHASE III—BASIC MARKSMANSHIP TRAINING

2-51. During this phase, the trainer must demonstrate his ability to set up and conduct firing on the various ranges. He must brief the chain of command to convince them that he can understand the reasons for firing, targetry, and zeroing and scoring procedures. He must also be able to explain the purpose of transition, night, and CBRN firing exercises. The results of this interview are recorded and maintained on the trainer's progress sheet.

PHASE IV—QUALIFICATION TRAINING

2-52. During this phase, the trainer's knowledge is tested completely. The trainer sets up a range and trains at least one person. If ammunition is available, he conducts a firing exercise. If no ammunition is available, the testing is based on the quality of his training.

Chapter 3

Preliminary Marksmanship and Mechanical Training

This chapter introduces the preliminary marksmanship and mechanical training for the M320/M320A1. With this knowledge, a Soldier will be able to accurately and proficiently handle the 40-mm grenade launcher under any condition. This training program introduces Soldiers to steady position, aiming, breathing, and trigger control. It also teaches characteristics of fire, classes of fire, and sensing and adjustment of fire.

During this phase of instruction, the following tasks are covered:

- Clear the weapon.
- Perform a function check.
- Load the weapon.
- Fire the weapon.
- Unload the weapon.
- Apply the fundamentals of marksmanship.
- Estimate range.
- Understand the characteristics of fire.
- Understand the classes of fire.
- Operate the weapon in unusual conditions.
- Execute fire commands.
- Perform dry-fire exercises.
- Sense the point of impact and adjust fire.

CLEAR THE WEAPON

3-1. To clear the grenade launcher (Figure 3-1)—

(1) Point the muzzle of the weapon in a safe direction, with the trigger finger outside of the trigger guard.

(2) Move the selector lever to the SAFE position ("S").

(3) Press the barrel release, and allow the barrel to swing out from the left side of the receiver.

(4) Inspect the barrel to see if any ammunition is present. If ammunition is present, grasp the rim of the cartridge, and pull it toward the rear of the weapon. Dispose of ammunition in accordance with the unit SOP.

(5) Swivel the barrel into the receiver until the locking lever engages the barrel.

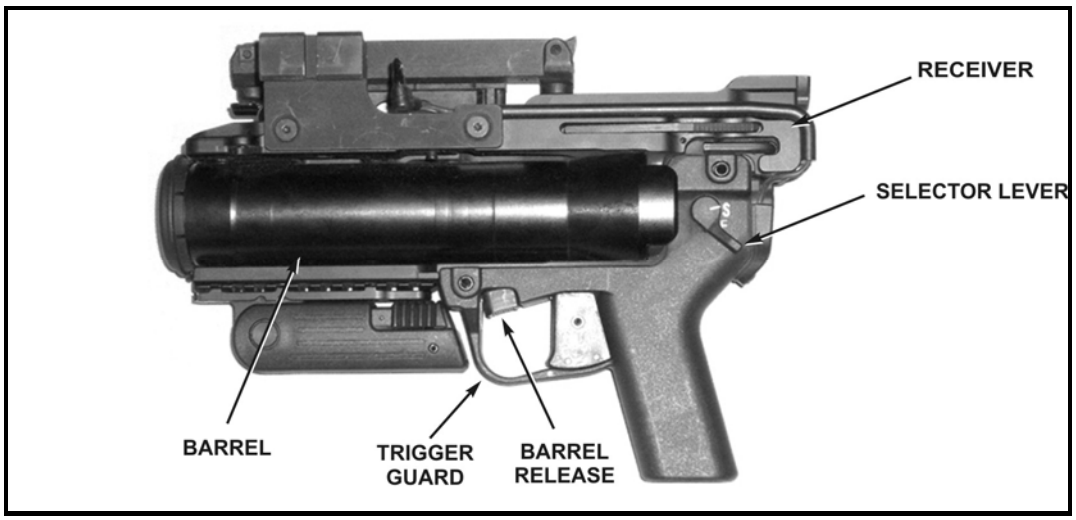


Figure 3-1. Clearing the weapon

PERFORM A FUNCTION CHECK

3-2. To perform a function check—

DANGER

BEFORE CONDUCTING A FUNCTION CHECK, ENSURE THAT THE WEAPON IS UNLOADED AND POINTED IN A SAFE DIRECTION. FAILURE TO DO SO CAN RESULT IN INJURY OR DEATH TO PERSONNEL.

(1) Clear the host weapon.
(2) Clear the grenade launcher.
(3) Rotate the selector lever from the SAFE ("S") to the FIRE (“F”) position and back to the SAFE ("S") position with an audible click.
(4) With the selector lever in SAFE ("S") position, attempt to pull the trigger rearward. The trigger must remain in the forward position (no rearward travel).
(5) Press the barrel release, and allow the barrel to pivot outward.
(6) Place the selector lever in SAFE ("S") position.
(7) Ensure that the firing pin located on the hammer does not protrude from the bolt face into the chamber.
(8) Move the selector lever to the FIRE ("F") position.
(9) Press the barrel release while attempting to pull the trigger. It must not be possible to pull the trigger enough to raise and release the hammer.
(10) With the barrel pivoted outward and the selector lever in the FIRE ("F") position, pull the trigger, and press the finger lightly on the breech face to detect the firing pin protrusion.

LOAD THE WEAPON

DANGER

DO NOT POINT THE MUZZLE IN THE DIRECTION OF PERSONNEL WHEN LOADING OR FIRING THE GRENADE LAUNCHER AS THIS MAY RESULT IN INJURY OR DEATH TO PERSONNEL.

NONLETHAL CARTRIDGES HAVE THE POTENTIAL TO CAUSE LETHAL INJURIES IF THE OPERATOR INSTRUCTIONS ARE NOT PRECISELY FOLLOWED. OPERATOR INSTRUCTIONS FOR NONLETHAL CARTRIDGES ARE OVERPACKED IN THE APPROPRIATE AMMUNITION CONTAINERS.

WARNING

The weapon must be carried in the closed and locked position with the selector lever in the SAFE ("S") position.

3-3. To load the grenade launcher (Figure 3-2)—

(1) Point the muzzle of the weapon in a safe direction.

(2) Ensure that the selector lever is in the SAFE ("S") position.

(3) Remove the muzzle cap.

(4) Press the barrel release and pivot the barrel out from the receiver.

(5) Insert a cartridge into the barrel. Ensure the cartridge is seated fully forward in the rear of the barrel.

(6) Pivot the barrel into the receiver until the barrel locking lever engages the barrel. There should be an audible click.

***Note*.** To quietly load the grenade launcher, insert a cartridge into the chamber of the barrel, depress and hold the barrel release, close the barrel, and release the barrel release to lock the barrel in the closed position.

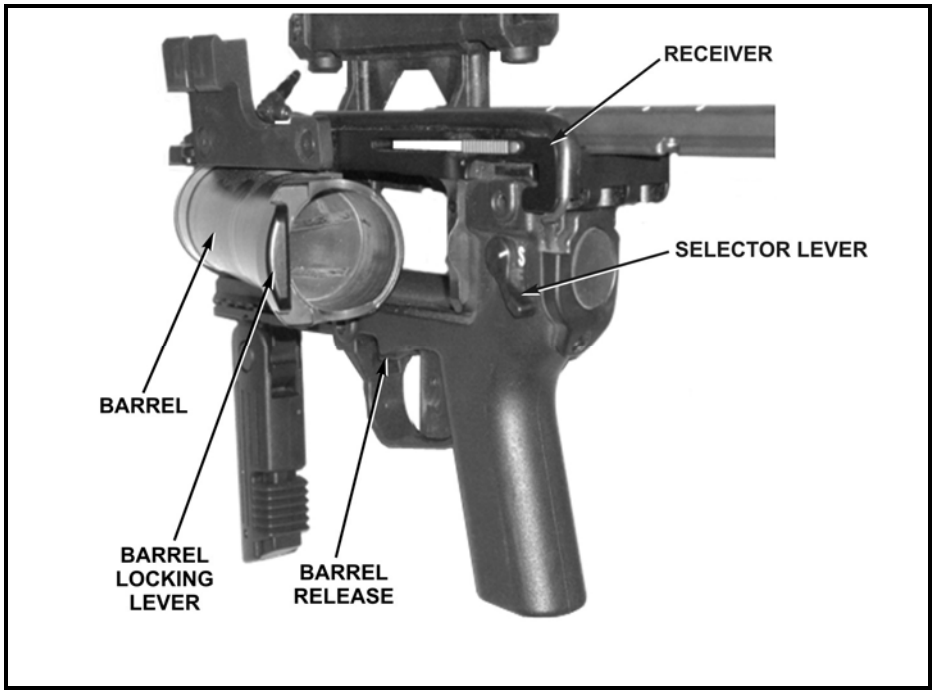


Figure 3-2. Loading the grenade launcher

FIRE THE WEAPON

DANGER

DO NOT POINT THE MUZZLE IN THE DIRECTION OF PERSONNEL WHEN LOADING OR FIRING THE GRENADE LAUNCHER AS THIS MAY RESULT IN INJURY OR DEATH TO PERSONNEL.

WHEN FIRING HIGH-EXPLOSIVE (HE) GRENADES AT TARGETS WITHIN 165 METERS (MINIMUM SAFE DISTANCE), BE IN A PROTECTED POSITION. DO NOT ENGAGE TARGETS WITHIN 165 METERS OF FRIENDLY TROOPS. THE DANGER RADIUS OF THE PRACTICE GRENADE IS 20 METERS.

NON-LETHAL CARTRIDGES HAVE THE POTENTIAL TO CAUSE LETHAL INJURIES IF THE OPERATOR INSTRUCTIONS ARE NOT PRECISELY FOLLOWED. OPERATOR INSTRUCTIONS FOR NON-LETHAL CARTRIDGES ARE OVER-PACKED IN THE APPROPRIATE AMMUNITION CONTAINERS.

WARNING

The weapon must be carried in the closed and locked position with the selector lever in the SAFE ("S") position.

Hearing and eye protection is required for the grenadier and all personnel within 3 meters (10 feet) of the weapon during training.

Do not attempt to fire the grenade launcher in the stand-alone configuration without the buttstock attached. The grenade launcher should always be in the attached or complete stand-alone (fitted with the buttstock) configuration before attempting to fire.

Keep hands, fingers, and other potential obstructions clear of the barrel. The short barrel length of the grenade launcher increases the risk of a barrel obstruction. Injury to personnel can result if barrel is obstructed.

Do not fire canopy smoke cartridges so that a falling ignited projectile could descend upon friendly troops causing injury to personnel and/or damage to equipment.

3-4. To fire the grenade launcher (Figure 3-3)—

(1) Determine the range to the target using the LRF.

(2) Select the range on the DNS to the nearest range in 5-meter increments.

(3) Align and center the post of the front sight in the aperture window of the rear sight of the DNS on the target.

(4) Move the selector lever to the FIRE ("F") position.

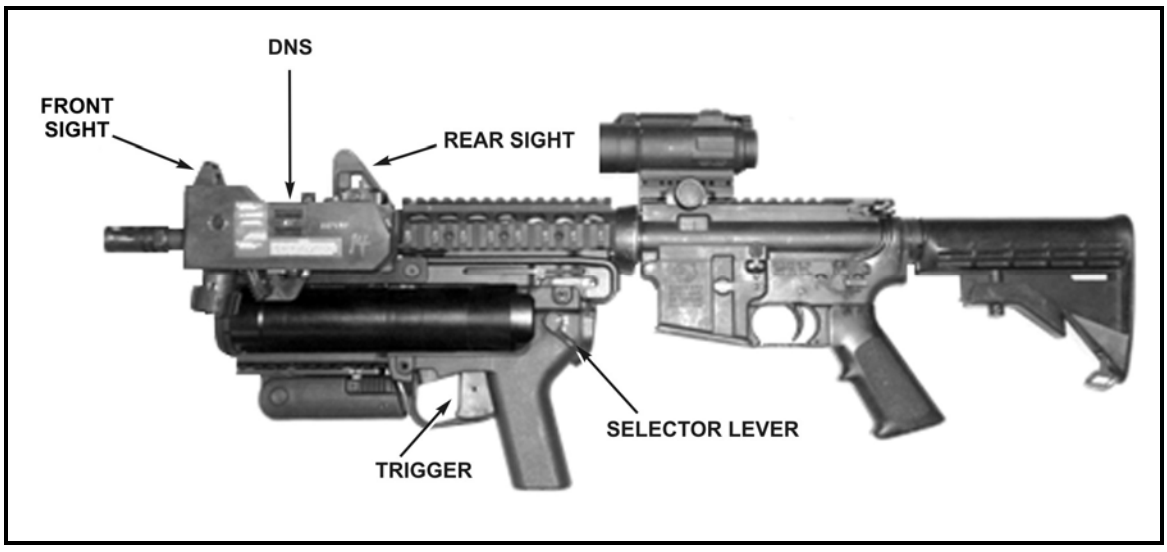


Figure 3-3. Firing the grenade launcher

(5) Place your finger on the trigger, and using an even pace and consistent pressure, pull the trigger rearward until the hammer falls and the weapon fires.
(6) When finished firing, clear the weapon and move the safety selector lever to the SAFE ("S") position.

UNLOAD THE WEAPON

DANGER

BEFORE UNLOADING THE WEAPON, ENSURE THAT THE WEAPON IS POINTED IN A SAFE DIRECTION. FAILURE TO DO SO CAN RESULT IN INJURY OR DEATH TO PERSONNEL.

3-5. To unload the grenade launcher (Figure 3-2)—
(1) Point the weapon in a safe direction.
(2) Move the selector lever to the SAFE (“S”) position.
(3) Press upward on the barrel release lever, and pivot the barrel out from the receiver.
(4) Remove any rounds or cartridge cases by hand. Grasp the rim of the round or cartridge case and pull rearward, removing the round or cartridge case from the rear of the barrel. The weapon is now unloaded.
(5) Pivot the barrel into the receiver until the barrel release lever engages the barrel.
(6) Ensure the selector lever remains in the SAFE (“S”) position.

APPLY THE FUNDAMENTALS OF MARKSMANSHIP

DANGER

DO NOT POINT THE MUZZLE IN THE DIRECTION OF PERSONNEL WHEN LOADING OR FIRING THE GRENADE LAUNCHER AS THIS MAY RESULT IN INJURY OR DEATH TO PERSONNEL.

WARNING

Always wear appropriate eye and ear protection when firing the weapon.

3-6. Before the Soldier approaches the firing line, he must understand and be able to apply the four fundamentals of marksmanship:

- Steady position.
- Aiming.
- Breath control.
- Trigger squeeze.

3-7. Soldiers apply these fundamentals rapidly and consistently to perform the integrated act of firing. These fundamentals should be practiced while the Soldier is wearing all of his equipment, including his helmet and IBA (if available).

STEADY POSITION

3-8. Steady position varies depending on the position, the type of sight used (DNS or leaf sight), and whether the grenade launcher is in the stand-alone or attached configuration. There are three basic firing positions for the grenade launcher, (prone, kneeling, and standing). Once the grenadier has mastered the basic positions he can modify them to support the tactical conditions.

Note. Regardless of firing position being used, ensure that your head is not canted to the left or right; keep it is as straight as possible, in line with the weapon. Failure to keep your head straight may cause the round to cant to the left or right.

WARNING

Keep hands, fingers, and other potential obstructions clear of the barrel. The short barrel length of the grenade launcher increases the risk of a barrel obstruction. Injury to personnel can result if the barrel is obstructed.

Attached Configuration

3-9. When firing using a weapon in the attached configuration, the following firing positions can be used:

- Prone.
- Kneeling.
- Standing.

Prone Firing Position

Note. When firing prone, a supported position is best.

WARNING

Keep hands, fingers, and other potential obstructions clear of the barrel. The short barrel length increases the risk of a barrel obstruction. Injury to personnel can result if the barrel is obstructed.

3-10. To assume a prone firing position (Figure 3-4)—

(1) Face the target.

(2) While laying face down, grasp the pistol grip of the host weapon with your right hand and the pistol grip of the grenade launcher with your left hand, and place the weapon's buttstock into the pocket of your right shoulder so that the sight is level with your eyes.

(3) Lower your right elbow to the ground so that your shoulders are level. This places the weight of your body behind the weapon, which enables you to recover quickly each time you fire.

(4) Straighten your upper body and spread your legs a comfortable distance apart.

(5) Relax and place the weight of your upper body forward into your left arm.

Note. Lean your head to the right and place the front sightpost of the leaf sight on the desired range when using the leaf sight.

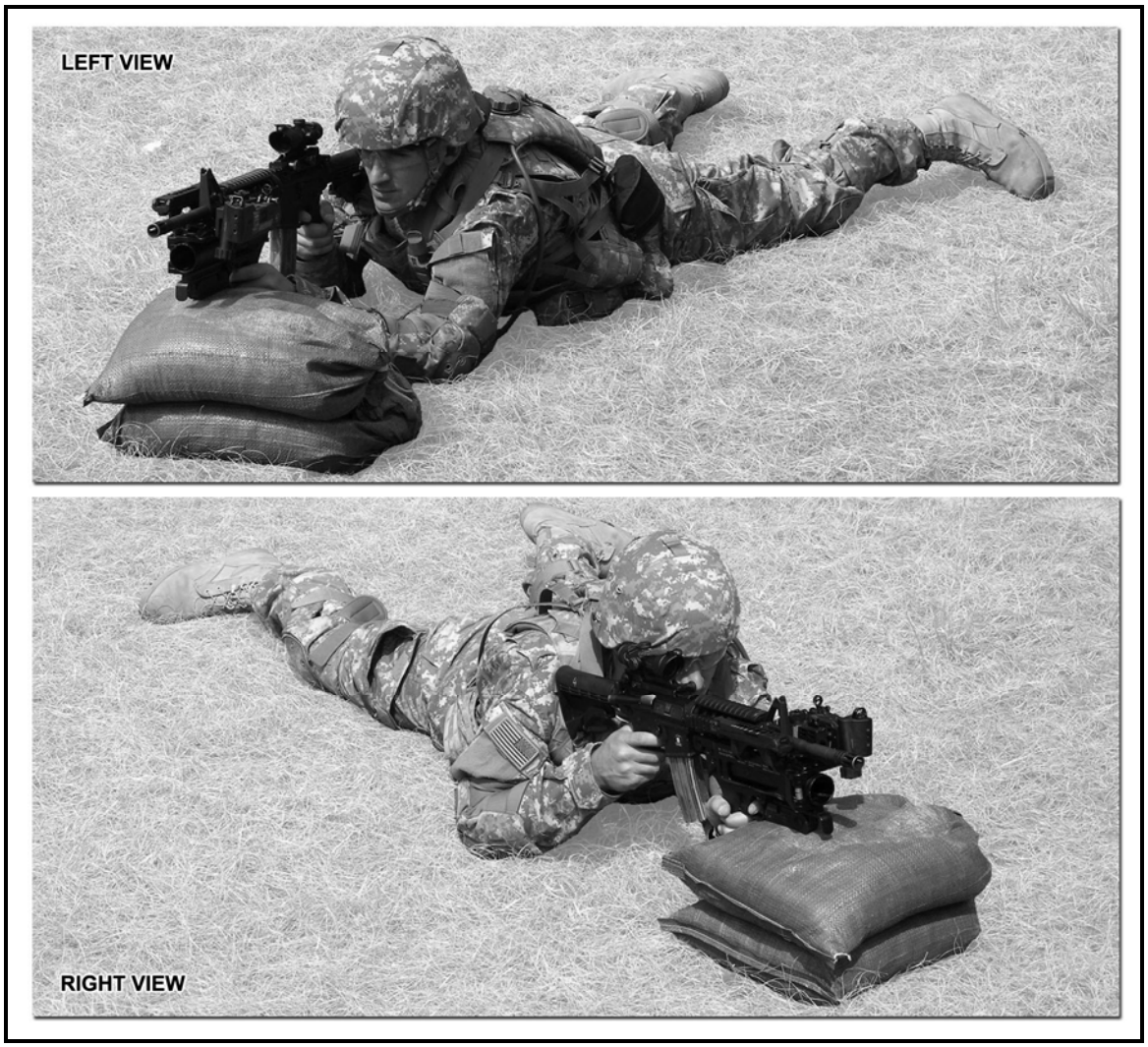


Figure 3-4. Prone firing position

Kneeling Firing Position

3-11. To assume a kneeling firing position (Figure 3-5)—

(1) Face the target.
(2) Place your left foot about 18 inches in front of you and point your toes in the general direction of the target.
(3) Lower your right knee to the ground and sit on your right heel.
(4) Grasp the pistol grip of the host weapon with your right hand and the pistol grip of the grenade launcher with your left hand, and place the weapon's buttstock into the pocket of your right shoulder so that the sight is level with your eyes.
(5) Place your left elbow forward of your left knee, resting the flat portion of your upper arm on your knee.

(6) Pull the weapon firmly into your shoulder.
(7) Pull your right elbow in close to your body to help you apply rearward pressure to the weapon. Ensure that your leg completes a solid, three-point base for your position.

Note. Lean your head to the right and place the front sightpost of the leaf sight on the desired range when using the leaf sight.

Figure 3-5. Kneeling firing position

Standing Firing Position

3-12. To assume the standing firing position (Figure 3-6)—
(1) Stand and face the target, with your feet spread a comfortable distance apart. Point your toes in the general direction of your target. Move your left leg forward and place the majority of your weight on your left foot.
(2) Grasp the pistol grip of the host weapon with your right hand and the pistol grip of the grenade launcher with your left hand, and place the weapon's buttstock into the pocket of your right shoulder so that the sight is level with your eyes.
(3) Hold your right elbow high to form a good pocket for the buttstock and to permit a strong rearward pressure with your right hand.
(4) Hold most of the weapon’s weight with your left hand.
(5) Shift your feet until you achieve a natural aiming stance.

Note. Lean your head to the right and place the front sightpost of the leaf sight on the desired range when using the leaf sight.

Figure 3-6. Standing firing position

Stand-Alone Configuration

3-13. When firing using a weapon in the stand-alone configuration, the following firing positions can be used:

- Prone.
- Kneeling.
- Standing.

***Note*.** When removing the M320 to place it in the stand-alone configuration, the host weapon's zero may shift significantly (± 5 in at 100 yards). If at all possible, re-zero the host weapon prior to going on a mission.

Prone Firing Position

WARNING

Keep hands, fingers, and other potential obstructions clear of the barrel. The short barrel length increases the risk of a barrel obstruction. Injury to personnel can result if the barrel is obstructed.

3-14. To assume the prone firing position (Figure 3-7)—

(1) Face the target.

(2) While laying face down, grasp the pistol grip with your right hand and the fold down grip of the grenade launcher with your left hand, and place the weapon's buttstock into the pocket of your right shoulder so that the sight is level with your eyes.

(3) Lower your right elbow to the ground so that your shoulders are level. This places the weight of your body behind the weapon, which enables you to recover quickly each time you fire.

(4) Straighten your upper body and spread your legs a comfortable distance apart.

(5) Relax and place the weight of your upper body forward into your left arm.

Note. Lean your head to the right and place the front sightpost of the leaf sight on the desired range when using the leaf sight.

Figure 3-7. Prone firing position

Kneeling Firing Position

3-15. To assume the kneeling firing position (Figure 3-8)—

(1) Face the target.

(2) Place your left foot about 18 inches in front of you and point your toes in the general direction of the target.

(3) Lower your right knee to the ground and sit on your right heel.

(4) Grasp the pistol grip with your right hand and the fold down grip of the grenade launcher with your left hand, and place the weapon's buttstock into the pocket of your right shoulder so that the sight is level with your eyes.

(5) Place your left elbow forward of your left knee, resting the flat portion of your upper arm on your knee.

(6) Pull the weapon firmly into your shoulder.

(7) Pull your right elbow in close to your body to help you apply rearward pressure to the weapon. Ensure that your leg completes a solid, three-point base for your position.

Note. Lean your head to the right and place the front sightpost of the leaf sight on the desired range when using the leaf sight.

Figure 3-8. Kneeling firing position

Standing Firing Position

3-16. To assume the standing firing position (Figure 3-9)—

(1) Stand and face the target, with your feet spread a comfortable distance apart. Point your toes in the general direction of your target. Move your left leg forward and place the majority of your weight on your left foot.

(2) Grasp the pistol grip with your right hand and the fold down grip of the grenade launcher with your left hand, and place the weapon's buttstock into the pocket of your right shoulder so that the sight is level with your eyes.

(3) Hold your right elbow high to form a good pocket for the buttstock and to permit a strong rearward pressure with your right hand.

(4) Hold most of the weapon's weight with your left hand.

(5) Shift your feet until you achieve a natural aiming stance.

Note. Lean your head to the right and place the front sightpost of the leaf sight on the desired range when using the leaf sight.

Figure 3-9. Standing firing position

AIMING

3-17. Aiming consists of three steps—

- Sight alignment.
- Focusing.
- Sight picture.

Sight Alignment

3-18. Procedures for proper sight alignment vary according to the type of sight used: leaf sight or DNS.

Leaf Sight

3-19. When using the leaf sight, align the leaf sight with the front sightpost of the grenade launcher's leaf sight.

Day/Night Sight

3-20. When using the DNS, align its rear sight aperture with its front sightpost (Figure 3-10). To do so—

- Picture a horizontal line through the center of the leaf sight or rear sight aperture. The top of the rifle's front sightpost should touch this line.
- Picture a vertical line through the center of the leaf sight or rear sight aperture. This line should vertically bisect the front sightpost.

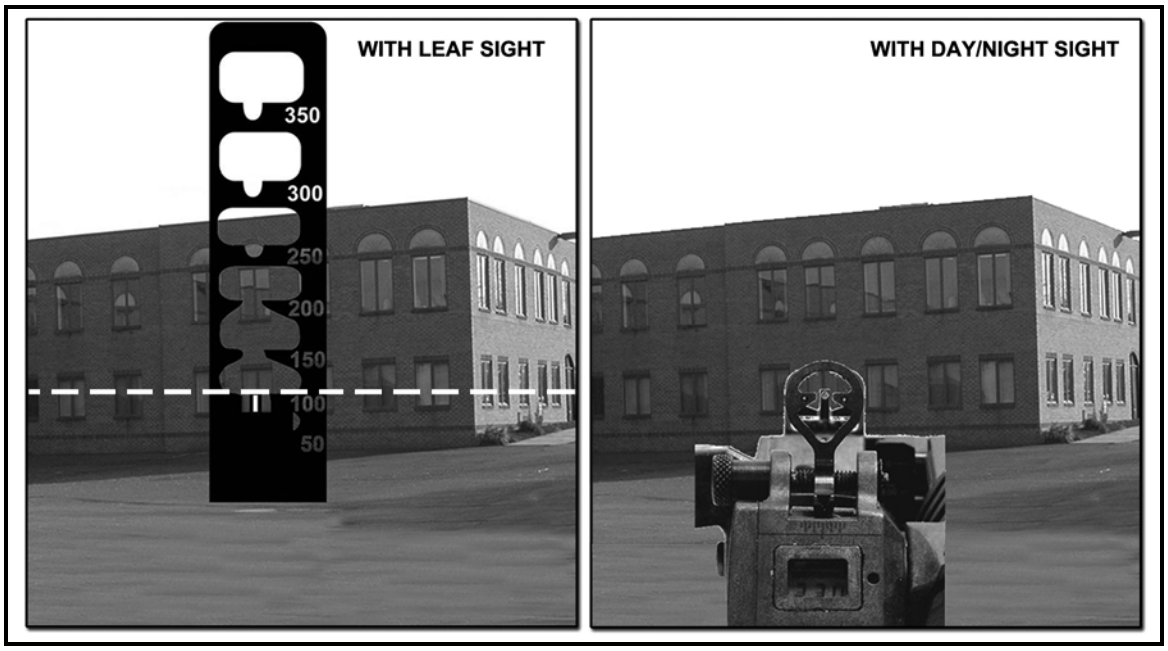


Figure 3-10. Sight alignment

Focusing

3-21. Focus procedures are not impacted by the type of sight used. When using either sight, focus on the front sightpost. A good firing position places your eye directly on line with the center of the leaf sight or rear sight aperture. Your eye's natural ability to center objects in a circle and seek the point of greatest light will help you align the sight correctly.

Sight Picture

3-22. Proper sight picture procedures are not impacted by the type of sight used. To achieve a correct sight picture, align the front sightpost and the leaf sight or rear sight aperture with the target. For area targets, aim where the round's bursting radius will make the round most effective. For point targets, aim at the target's center of mass.

Note. An anti-cant device on the DNS keeps the grenadier from being canted more than 3 degrees. When the weapon is off cant, the indicator light will light up on the DNS along with the flashing bar on the LED display.

BREATHING

3-23. The technique for breathing is the same for every position: breathe naturally, exhale most of your air, hold your breath, and fire before you become uncomfortable. In combat, choke off your breath before firing.

TRIGGER CONTROL

3-24. The technique for trigger control is the same for every position. To perform a proper trigger squeeze—

(1) Place your trigger finger (the index finger of your left hand) so that the trigger is between the first joint and the middle portion of your finger (not at the extreme end of your finger).

(2) Adjust for your hand size, grip, and comfort.

(3) Squeeze your trigger finger steadily to the rear without disturbing the lay of the weapon.

Note. Following through on trigger squeeze is vital due to heavier trigger pull. Continue to squeeze for 1 second after round has fired.

ESTIMATE RANGE

3-25. The grenadier must be able to estimate range. This estimation enables him to hit targets with the first round and to adjust and shift fire, if necessary. He often estimates range visually using one of two methods:

- 100-meter unit of measurement.
- Appearance of objects.

100-METER UNIT OF MEASUREMENT

3-26. To perform the 100-meter unit of measurement method (Figure 3-11)—

(1) Visualize 100 meters on the ground.

(2) Estimate how many 100-meter units lie between you and the target.

APPEARANCE OF OBJECTS

3-27. To perform the appearances of objects method, memorize the sizes and shapes of familiar objects as they appear at different ranges. Consider the factors that affect the appearance of objects, as outlined in Table 3-1.

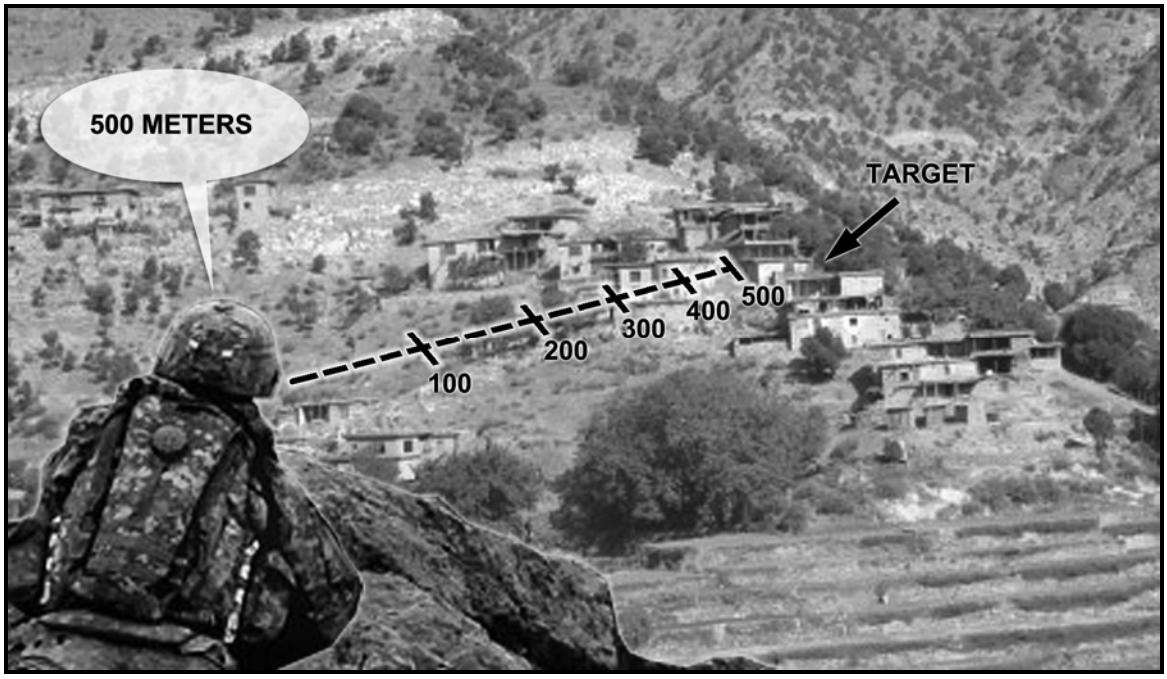


Figure 3-11. Application of the 100-meter unit-of-measurement method

Table 3-1. Factors that affect visual range estimation

FACTORS THAT AFFECT RANGE ESTIMATION	FACTORS THAT CAUSE UNDERESTIMATION OF RANGE	FACTORS THAT CAUSE OVERESTIMATION OF RANGE
Target detail, outline clarity	Target is mostly visible, and its outline is clear.	Target is only somewhat visible or is seen as small relative to its surroundings.
Nature of terrain or position of observer.	Target is located across a depression that is mostly hidden from view.	Target is located across a depression that is visible.
	Target is located at a ground level below that of the observer.	Target is located at a ground level above that of the observer.
	Target is located down a straight, open road or along a railroad.	Target is located where vision is narrowly confined, such as in streets, draws, or forest trails.
		Target is located across uniform surfaces like water, snow, desert, or fields of grain.
Light and atmosphere	Target is brightly lit, or the sun is shining from behind the observer.	Target is poorly lit; as is at dawn or dusk or in rain, snow, or fog; or is obscured because the sun is in the eyes of the observer.
	Target contrasts sharply with the background or is silhouetted due to its size, shape, or color.	Target blends into the background or terrain.
		Target is visible in the clear air of high altitudes.

UNDERSTAND THE CHARACTERISTICS OF FIRE

3-28. The characteristics of fire are as follows:

- Trajectory.
- Line of sight.
- Ordinate.
- Maximum ordinate.
- Danger space.
- Dead space.

TRAJECTORY

3-29. Trajectory is the curve of the fired round as it travels to its target. The trajectory rises as the sights are elevated.

LINE OF SIGHT

3-30. Line of sight is an imaginary line from the weapon to the target, as seen through properly adjusted sights.

ORDINATE

3-31. The ordinate is the vertical distance at any point between the trajectory and the line of sight.

MAXIMUM ORDINATE

3-32. The maximum ordinate is the greatest vertical distance between the trajectory and the line of sight. It occurs at the highest point of the trajectory.

DANGER SPACE

3-33. Danger space is the area where the round impact or shrapnel from the impact injures personnel or destroys the target.

DEAD SPACE

3-34. Dead space is the area(s) where personnel or targets are safe from direct fire weapons. Ditches, depressions, and ravines are examples of dead spaces.

UNDERSTAND THE CLASSES OF FIRE

3-35. Fire distribution is classified three ways:

- With respect to the ground.
- With respect to the target.
- With respect to the weapon.

WITH RESPECT TO THE GROUND

3-36. For the grenade launcher, this class of fire refers only to plunging fire. Plunging fire occurs when firing at long ranges, from high ground to low ground, into abruptly rising ground, or across uneven terrain. For example, 40-mm grenades fired from the top of a hill can follow an arcing trajectory and land in the valley below, instead of hitting the intended target on the next hill (Figure 3-12).

WITH RESPECT TO THE TARGET

3-37. This class of fire includes four ways to distribute fire:

- Frontal.
- Flanking.
- Oblique.
- Enfilade.

3-38. Table 3-2 details the classes of fire.

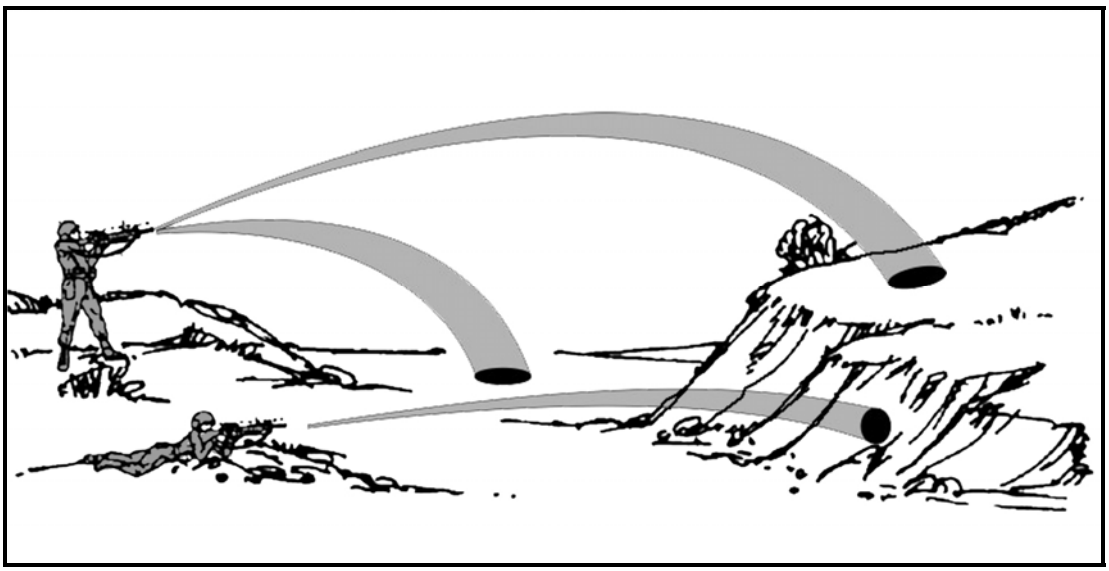
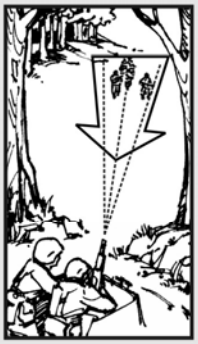
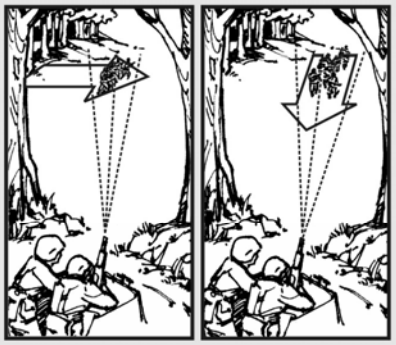


Figure 3-12. Plunging fire

Table 3-2. Classes of fire with respect to the target

CLASSES OF FIRE			
FRONTAL FIRE	FLANKING FIRE	OBLIQUE FIRE	ENFILADE FIRE
			 FLANK FRONTAL
Frontal fire is directed against a target's front, with the target facing or moving toward the firing position.	Flanking fire is directed against the target's flank.	Oblique fire is directed against a target moving or facing at an angle rather than directly toward or perpendicular to the	Enfilade fire is directed along the length of a target and my be frontal or flanking, depending on which way the target is facing.

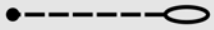
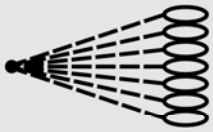
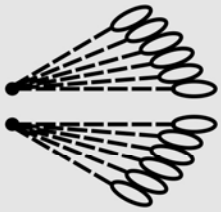
WITH RESPECT TO THE WEAPON

3-39. This class of fire includes four ways to distribute fire:

- Rapid fire point.
- Rapid fire right or left.
- Rapid fire searching.
- Rapid fire right or left and searching.

3-40. Table 3-3 details the classes of fire.

Table 3-3. Classes of fire with respect to the weapon

CLASSES OF FIRE			
RAPID FIRE POINT	RAPID FIRE RIGHT OR LEFT	RAPID FIRE SEARCHING	RAPID FIRE RIGHT OR LEFT AND SEARCHING
			
When executing this type of fire, Soldiers distribute fire against a target with one aim point.	When executing this type of fire, Soldiers distribute fire right to left or left to right without changing range. This type of fire should be used against frontal or flanking targets.	When executing this type of fire, Soldiers distribute fire against a deep target that changes in elevation, but not direction. This type of fire should be used against enfilade targets.	When executing this type of fire, Soldiers distribute fire against a deep and wide target that changes in elevation and direction. This type of fire should be used against an oblique target.

OPERATE THE WEAPON IN UNUSUAL CONDITIONS

3-41. Soldiers must be able to operate this weapon under various operational conditions.

LIMITED VISIBILITY

3-42. Limited visibility degrades the grenadiers' ability to detect and identify targets and the leader's ability to control fire. The leader may instruct grenadiers to fire without command as soon as targets become visible. Grenadiers should engage only targets they can identify, unless ordered to do otherwise. Leaders should fire tracer ammunition to help grenadiers locate and engage targets in limited visibility. The target's center and flanks may not be clearly defined; each grenadier must observe his leader's tracers and those from other squad weapons and cover what he believes to be the entire target.

CHEMICAL, BIOLOGICAL, RADIOLOGICAL, AND NUCLEAR ENVIRONMENTS

3-43. The fundamentals of marksmanship remain valid in the CBRN environment, but some modifications may be needed to accommodate the equipment.

Steady Position

3-44. Many actions are affected by MOPP equipment: handling the weapon, performing operation and function checks, loading and unloading, and cleaning. Consider these modifications:

- Bulky MOPP equipment requires the grenadier to press the stock of the weapon more firmly into his shoulder pocket.
- Stand, crouch, or squat during dry- and live-fire to reduce bodily contact with contaminated ground or foliage.

Aiming

3-45. Wearing a protective mask may force grenadiers to cant the weapon to see through the rear aperture. This ideal aiming procedure should be the initial procedure taught and practiced. If this cannot be achieved, a canted sight picture may be practiced.

Ideal Aiming Procedure

3-46. To perform the ideal aiming procedure—

(1) Rotate the weapon as little possible to see through and line up the sights.

(2) Place the center tip of the front sightpost on the ideal point of aim.

Canted Sight Picture

3-47. A canted sight picture occurs when the grenadier must cant, or rotate, the weapon.

Breathing

3-48. Wearing the protective mask makes breathing more difficult. Grenadiers must try to breathe normally to avoid hyperventilating while firing.

Trigger Control

3-49. Consider the following modifications:

- Gloves complicate the act of grasping the pistol grip and squeezing the trigger with the index finger. The action of the trigger finger is restricted, and the fit of the glove may require the release of the swing-down trigger guard.
- Because the trigger feels different, control differs from that used in barehanded firing. This difference cannot be accurately predicted.

EXECUTE FIRE COMMANDS

3-50. Leaders give fire commands to place effective fire on a target quickly and without confusion. When the leader decides to engage a target that is not obvious to the grenadier, he must give the grenadier enough information to effectively engage the target. After he alerts the grenadier, the leader must give a target direction, description, and range; a method of fire; and the command to fire. Leaders give initial and subsequent fire commands.

INITIAL FIRE COMMANDS

3-51. Initial fire commands initiate fire on a target. They have six elements:

- Alert.
- Direction.
- Description.
- Range.
- Method of fire.
- Command to open fire.

3-52. The grenadiers repeat each element of the fire command as the leader gives it.

Alert

3-53. This element prepares the grenadiers to receive further instructions. The leader may alert both grenadiers in the squad, but command only one of them to fire.

Alert and Fire Both Grenadiers

3-54. To alert and fire both grenadiers, the leader announces GRENADIER.

Alert Both Grenadiers But Command One of Them to Fire

3-55. To alert both grenadiers but command only one of them to fire, he announces GRENADIER NUMBER ONE (or TWO). The nonfiring grenadier lies on the target to take up the mission in case the primary grenade launcher malfunctions.

Direction

3-56. The leader may use one or more of the following methods to indicate the general direction to the target:

- Speaking.
- Pointing.
- Firing tracers.
- Using reference points.
- Aiming lasers.

Speaking

3-57. The leader can state where the target is relative to the grenadier's position.

Pointing

3-58. The leader can point with his arm or aim with a weapon to give the direction to a small or obscure target.

Note. When the leader points with his arm, someone standing behind him should be able to look over his shoulder, sight along his arm and index finger, and locate the target. A Soldier looking through the sights of a weapon aimed at a target should be able to see the target.

Aiming Lasers/Firing Tracers

3-59. The leader can fire tracer ammunition to direct the grenadier to a target that is not clearly visible. He should first give the general direction to draw the grenadier's attention to the target area. To prevent the loss of surprise caused by the use of tracer ammunition/aiming laser, the leader fires only after he has given all of the elements of the fire command except the command to fire. The leader may then fire his individual weapon, designate the target with laser, or may fire one or more bursts from a machine gun. Because these are the last element of the fire command, it is the grenadier's signal to open fire.

EXAMPLE

GRENADIER (alert)
FRONT (direction)
300
WATCH MY TRACER(S)

Using Reference Points

3-60. The leader may use easily recognized reference points to direct the grenadier to an obscure target. To avoid confusion, the leader uses the word "reference" before he describes the terrain feature used to designate the target. He should also give the general direction to the reference point, since fire may be shifted from a known point.

Note. In accordance with FM 3-25.26, all leaders and grenadiers must know terrain features and the terminology used to describe them.

EXAMPLE

GRENADIER NUMBER ONE
FRONT
REFERENCE: LONE PINE TREE (reference point)

GRENADIER NUMBER ONE
FRONT
REFERENCE: CROSSROADS RIGHT 200 (shift from a known point)

Description

3-61. Unless the target is obvious, the leader may describe the target briefly. This enables the grenadiers to picture the type of target so they can properly apply fire.

Range

3-62. The leader estimates the range to the nearest 100 meters and announces it; however, he omits the word "meters," since the meter is the standard unit of measurement for range.

EXAMPLE

GRENADIER
FRONT
REFERENCE: BARN RIGHT 100
TARGET--TROOPS IN THE OPEN (description)
300 (range in meters)

Method of Fire

3-63. The leader announces the class of fire with respect to the weapon and, unless the fire command requires the grenadier to engage the target with rapid fire, the number of rounds to use.

EXAMPLE

GRENADIER
FRONT
REFERENCE: SHIFT FROM MACHINE GUN BUNKER RIGHT 200
TARGET--TROOPS IN THE OPEN
300
RAPID FIRE RIGHT AND SEARCH (class of fire with respect to weapon)

Command to Open Fire

3-64. The leader may preface the command to commence firing with AT MY COMMAND or AT MY SIGNAL. He withholds fire this way to surprise the enemy or to allow both grenadiers to open fire at the same time. After both grenadiers respond READY, the leader commands FIRE at his discretion. If the leader wants immediate fire, he simply commands FIRE without pausing, and the grenadiers fire as soon as they are ready.

EXAMPLE

GRENADIER
FRONT
TROOPS IN THE OPEN
300
AT MY COMMAND or (Leader pauses until grenadiers are
AT MY SIGNAL ready and fire is desired)
FIRE (or prearranged signal)

SUBSEQUENT FIRE COMMANDS

3-65. The leader issues subsequent fire commands to adjust direction and elevation, to change the number of rounds to fire after a fire mission is in progress, to interrupt fires, or to terminate the alert. If the grenadier engages a target incorrectly, the leader promptly corrects his fire by announcing or signaling desired changes. The grenadier corrects and resumes firing without further command. The leader adjusts direction first—for example, RIGHT 50 or LEFT 100. He adjusts elevation second—for example, ADD FIVE ZERO or DROP FIVE ZERO. Third, he adjusts the number of rounds. He interrupts fire by signaling or announcing CEASE FIRE or terminates the alert by signaling or announcing CEASE FIRE, END OF MISSION.

DOUBTFUL ELEMENTS AND CORRECTIONS

3-66. The grenadier repeats doubtful elements so the leader will repeat the element—for example, if the range to the target was unclear or inaccurate, the grenadier announces SAY AGAIN RANGE, TARGET. The leader then announces THE COMMAND WAS…, repeats the element in question, and continues with the fire command. The leader can also correct fire commands as follows:

- During the initial fire command, he announces CORRECTION and gives the corrected element.

EXAMPLE

GRENADIER
RIGHT FRONT
TROOPS IN THE OPEN
400
CORRECTION
300
RAPID FIRE RIGHT
AT MY COMMAND

- During the subsequent fire command, he corrects an error by announcing CORRECTION and repeating the entire subsequent fire command.

EXAMPLE

LEFT FIVE ZERO, ADD FIVE (subsequent fire command as given)

CORRECTION
LEFT FIVE ZERO, ADD FIVE ZERO (correction)

ABBREVIATED FIRE COMMANDS

3-67. Fire commands need not be complete to be effective. In combat, the leader gives only the elements necessary to place fire on a target quickly and without confusion. During training, he uses all the elements to enable grenadiers to learn how they are used. After grenadiers receive initial training in fire commands, they should learn to react to abbreviated fire commands, which may be given orally or using arm and hand signals.

Oral Method

3-68. Leaders should give clear and concise oral instructions. The example below details the oral instructions a leader would give if he wants to place the fire of one grenade launcher on an enemy machine gun bunker he has located.

EXAMPLE

GRENADIER NUMBER ONE
MACHINE GUN BUNKER
400
FIRE

Arm and Hand Signal Method

3-69. To control fire when battlefield noise or distance to the grenadier is too great, the leader must use arm and hand signals. When he wants a specific grenadier to execute an action or movement, he gives a preliminary signal to that grenadier only. Table 3-4 details the signals commonly used by leaders and grenadiers.

PERFORM DRY-FIRE EXERCISES

3-70. Dry-fire exercises train grenadiers in the techniques of loading, unloading, immediate action, fundamentals of marksmanship, and sight manipulation. These exercises are conducted with dummy rounds. The trainer gives fire commands as appropriate.

LOADING AND UNLOADING EXERCISE

3-71. The loading and unloading exercise trains the grenadier to operate and clear the weapon proficiently. Loading and unloading procedures should be practiced with dummy ammunition.

IMMEDIATE ACTION EXERCISE

3-72. The immediate action exercise is conducted with a dummy round and the basic grenade launcher target. To perform the exercise—

(1) Load the weapon with a dummy round and aim it at one of the targets on the basic grenade launcher range.
(2) Maintain the sight picture while you pull the trigger to simulate firing.
(3) When you are informed that you have a misfire, apply misfire procedures, and then continue to fire.

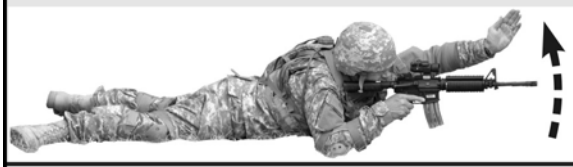
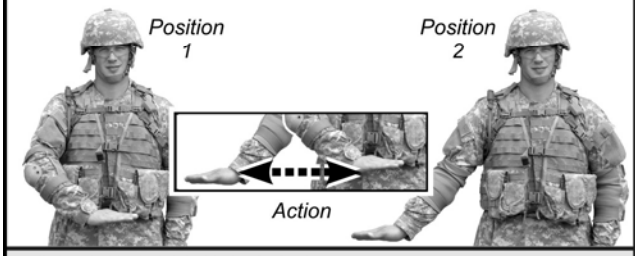
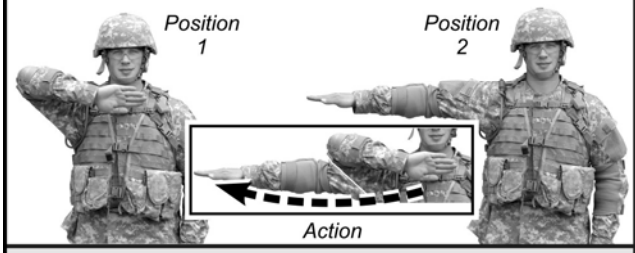
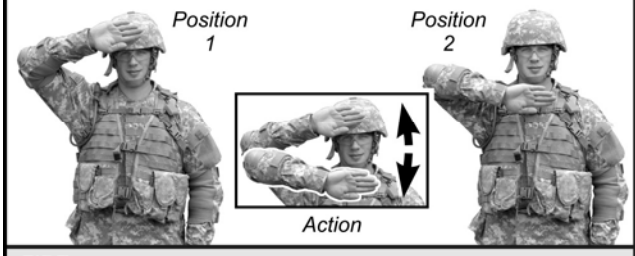
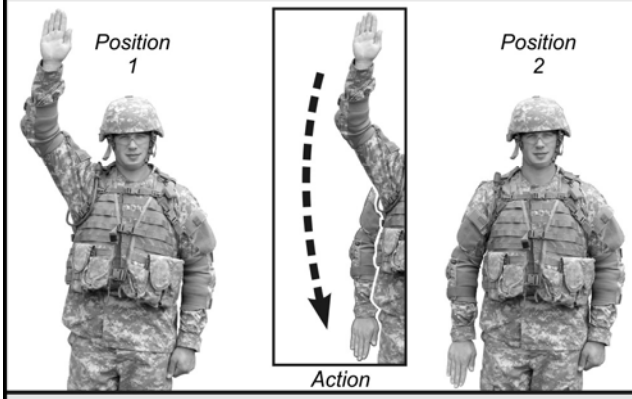
Note. See Chapter 1 for more information about misfire procedures.

AIMING EXERCISE

3-73. The aiming exercise requires the grenadier to simulate firing a dummy round at a target on the basic grenade launcher range. To perform the exercise—

(1) Maintain your sight picture throughout the firing cycle.
(2) If you note that the sight picture has moved after firing the weapon, you were unsteady when you fired.
(3) After each shot, apply immediate action procedures to extract and eject the dummy cartridges. Then, recock the barrel assembly.

Table 3-4. Arm and hand signals and their meanings

SIGNAL	MEANING
READY 	The Soldier gives this signal to indicate that he is ready to fire. He raises his hand or arm above his head toward the leader.
COMMENCE FIRING 	The leader gives this signal by bringing his hand (palm down) to the front of his body (about waist-level) and moving it horizontally in front of his body.
MOVE OVER OR SHIFT FIRE 	The leader gives this signal by raising his hand (on the side toward the new direction) and moving it across his body to the opposite shoulder, palm to the front; then, with his arm and hand extended, he swings his arm in a horizontal arc to point in the new direction. For slight changes in direction, he moves his hand from the latest position to the desired direction of movement.
INTERRUPT OR CEASE FIRING 	The leader gives this signal by raising his arm and hand (palm outward) in front of his forehead and bringing it downward sharply.
FIRE 	The leader gives this signal by dropping his arm sharply from the vertical position to the side of his body. When a single weapon (of a group) is to be fired, point (with the arm extended) to the particular weapon, and then drop the arm sharply to the side.
OTHER SIGNALS	The leader devises other signals to control his weapons. FM 21-60 provides a detailed description of arm and hand signals.

SIGHT SETTING AND SIGHT CHANGING EXERCISES

3-74. Sight setting and sight changing exercises train the grenadier to operate and adjust both the DNS and the leaf sight. There are exercises to practice making range and windage adjustments.

Range

3-75. To practice making range adjustments, manipulate the sights to different range settings (day/night, 50 to 400 meters; leaf sight, 50 to 350 meters). To learn to make fine adjustments for elevation, manipulate the sights from the minimum to the maximum setting.

Windage

3-76. To practice making windage adjustments, depress the rear sight aperture left and right and traverse the windage screw across the entire scale.

40-MM GRENADE LAUNCHER SKILLS TEST

3-77. Grenadiers practice the dry-fire tasks until they become proficient in operating the weapon. Then, they take the dry-fire proficiency exam. This exam emphasizes learning by doing. Before he can progress to live firing, each grenadier must demonstrate skill in every task in the exam.

***Note*.** See Appendix C for more information about the skills test.

REMEDIAL TRAINING

3-78. Soldiers who fail to pass the skills test must attend remedial training, after which they retest. Those who pass can help train those having difficulty.

SENSE AND ADJUST FIRE

3-79. After firing, the grenadier determines, or senses, where the grenade landed relative to the target, and then adjusts elevation and deflection.

SENSING

3-80. As soon as the grenade explodes, the grenadier determines where it exploded with respect to the target. This is called sensing the impact and has two aspects: range and deviation. Because the casualty radius of the HE round is 5 meters (5 and 1/2 yards), the grenadier should determine both range and deviation to the nearest 5 meters.

Range

3-81. The grenadier senses the range as one of the following:

- Short: The grenade bursts between you and the target.
- Over: The grenade bursts beyond the target.
- Target: The grenade hits any part of the target.
- Range Correct: The grenade bursts slightly left or right of the target, but at the correct range.
- Doubtful: The grenade burst left or right of the grenadier, but you cannot sense the range.

Deviation

3-82. The grenadier announces a deviation sensing as—

- Right or left of the target.
- On line with the target.

ADJUSTMENT OF FIRE

3-83. To ensure a second-round hit, the grenadier should adjust his fire by sensing the impact of the round and manipulating the sight:

- If the grenade lands more than 25 meters over or short of the target, adjust the range quadrant to bring the next grenade on target.
- If the grenade explodes less than 25 meters from the target, adjust the point of aim to bring the next grenade on target.

3-84. If the launcher is properly zeroed, the grenadier should adjust the aiming point for deviation errors, which are normally small and easily corrected. A wind strong enough to move the grenade out of its normal trajectory, however, increases the size of the deviation errors. After observing the effect of the wind on the strike of the grenade, he compensates for the wind's effect by aiming into it. This should help bring the next grenade on target. For example, if the grenade bursts to the left and short of the target, the grenadier senses the strike of the round relative to the target and adjusts an equivalent distance to the right and over the target to achieve a target hit.

***Note*.** Grenadiers should watch the flight of the grenade to the target. This helps determine the wind's effect on the grenade as it moves toward the target. To increase the chances of achieving a first-round hit, grenadiers should evaluate and compensate for the wind before firing.

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Chapter 4

Basic Marksmanship Training

Basic marksmanship allows the grenadier to zero and apply the fundamentals of marksmanship during LFXs in day, night, and CBRN conditions. During this phase of instruction, the following tasks are covered:

- Zero the weapon.
- Perform record fire.

ZERO THE WEAPON

4-1. Zeroing is performed on Station 1 of the 40-mm grenade launcher range. When at this station, the grenadier zeroes the weapon (DNS and leaf sight) by firing from a prone supported firing position.

Notes. 1. Firing from a prone supported position reinforces the experience gained during dry firing and allows practice in loading and firing with the most accurate sensing and adjustments obtainable.

2. If the grenadier zeroes in three rounds, he should use the other two rounds to confirm the zero. If the grenadier cannot zero with five rounds, the trainer must remove him from the firing line for remedial training.

4-2. The M320/M320A1 grenade launcher has zeroing procedures for both the DNS and the leaf sight.

ZERO AND BORESIGHT THE DNS

4-3. There are two methods of adjusting the DNS to the grenade launcher—

- Zeroing using the laser borelight.
- Zeroing by firing 40-mm training grenades.

Zeroing Using the Laser Borelight

4-4. This procedure is accomplished using a standard US military laser borelight system (AN/PEM-1), a 40-mm mandrel adapter, a 5.56-mm mandrel, and a full-size boresight target.

4-5. To zero the DNS to the grenade launcher using a laser—

(1) Securely mount the DNS to the grenade launcher and set the DNS range adjustment knob (Figure 4-1) to 0 meters.
(2) Position a target at 10 meters oriented in a vertical position.
(3) Insert the 40-mm mandrel adapter (Figure 4-2) into the barrel of the grenade launcher.
(4) Install the 5.56-mm mandrel (Figure 4-2) to the laser borelight and insert the 5.56-mm mandrel into the 40-mm mandrel adapter.
(5) Position the grenade launcher on a rest. Brace the weapon so that it is aimed in the direction of the laser borelight target and is oriented without cant.
(6) Turn on the laser borelight.

WARNING

The grenade launcher should always be in the attached or complete stand-alone (fitted with the buttstock) configuration before attempting to fire. Failure to do so could result in injury to personnel or damage to equipment.

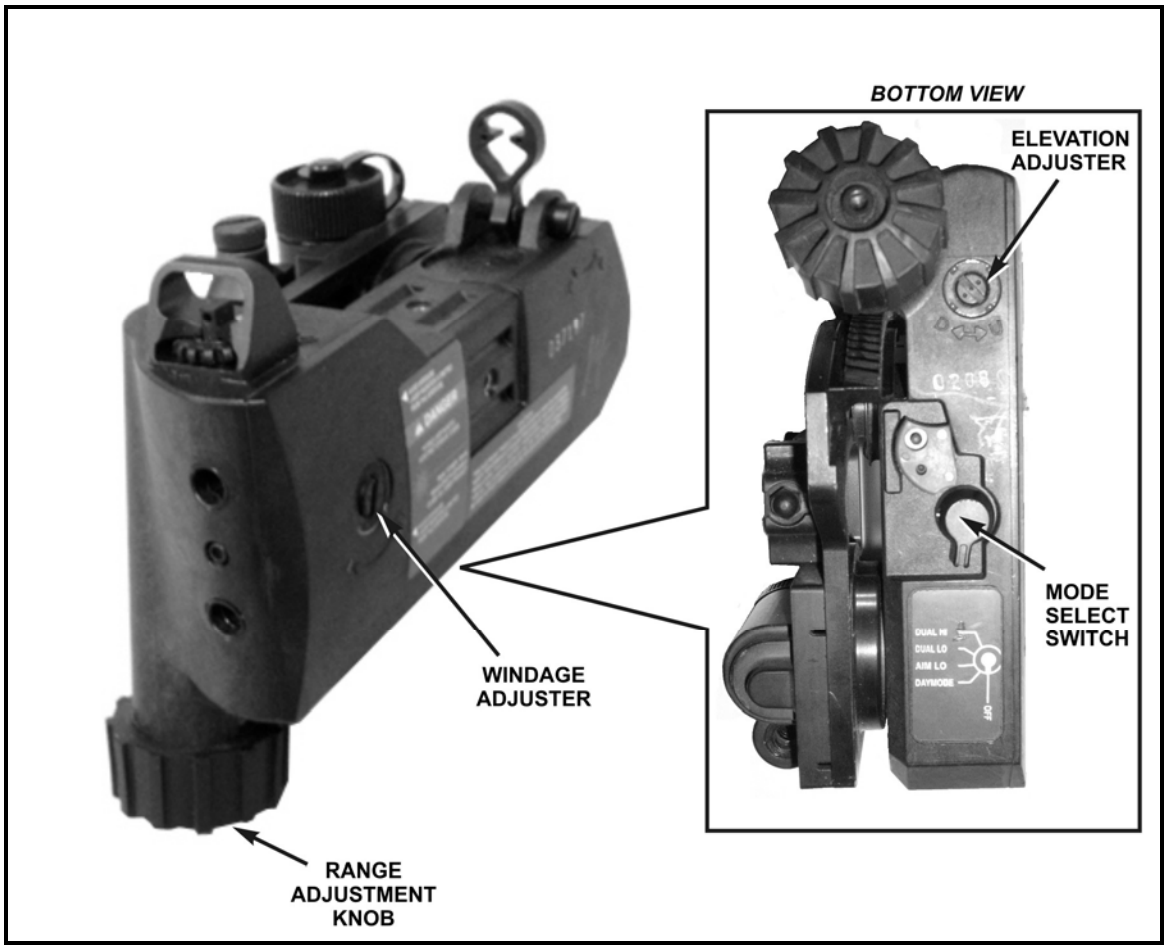


Figure 4-1. Zeroing with the laser borelight

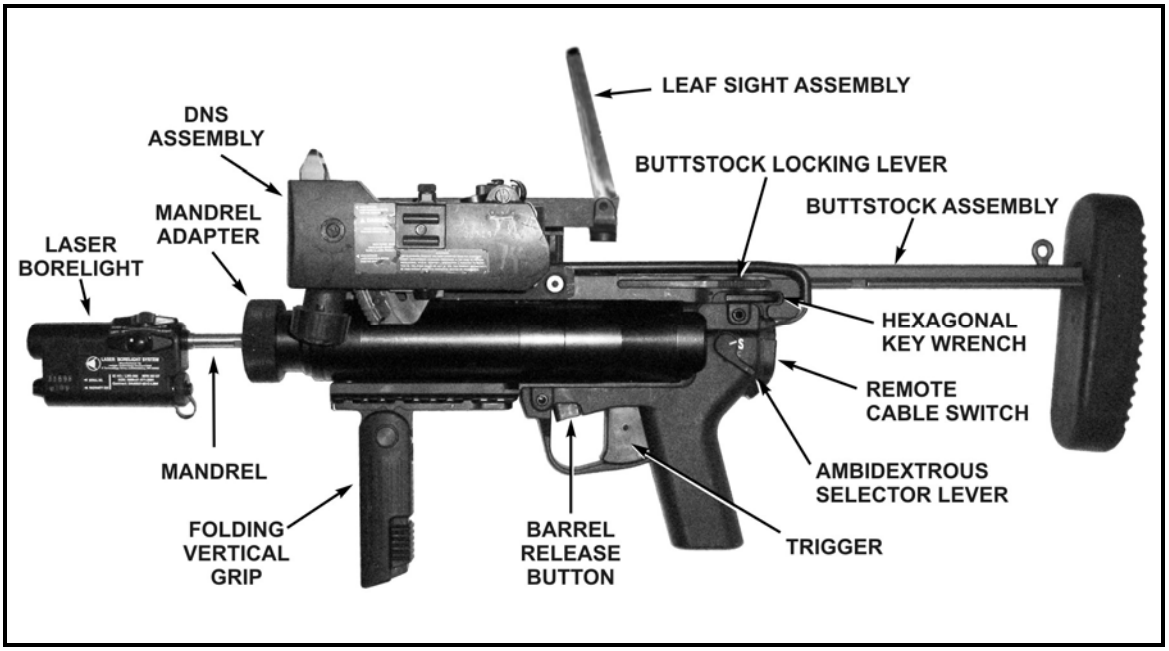


Figure 4-2. Assembly of the mandrels and borelight

(7) Rotate the laser borelight (Figure 4-2), and adjust the borelight's beam adjusters until the borelight beam appears stationary as the laser borelight is rotated.

Note. Refer to TM 9-5860-226-13&P for a detailed description of this procedure.

(8) Aim the grenade launcher in the direction of the laser borelight target. Ensure that the grenade launcher is not canted.

(9) Use night vision devices to observe and verify the IR beam. Adjust the focus and diopter settings for the best image.

(10) Rotate the Mode Select switch on the DNS (Figure 4-1) to the AIM LO position, and activate the laser.

Note. Double tap the Laser Activation button to enable continuous hands-free operation of the laser.

CAUTION

Do not over adjust the borelight adjusters. Failure to comply may result in equipment damage.

(11) Adjust the windage and elevation adjusters (Figure 4-1) on the DNS until the laser dot is centered on the reference point located on the target (Tables 4-1 through 4-4).

(12) Zero the DNS iron sights by centering the sight picture on the target designation named "iron sight." Once complete, double check that the IR laser and borelight have not moved from their locations.

Note. It is vital that the shooter is completely behind the sight.

(13) Turn the DNS Mode Select switch (Figure 4-1) to the OFF position.

(14) Turn the borelight laser to the OFF position.

DANGER

REMOVE THE BORELIGHT AND MANDREL ADAPTER FROM THE WEAPON PRIOR TO FIRING 5.56-MM RIFLE OR 40-MM GRENADE LAUNCHER. FAILURE TO DO SO CAN RESULT IN SERIOUS INJURY OR DEATH.

(15) Remove the laser borelight (Figure 4-2) and the 40-mm mandrel adapter (Figure 4-2) from the barrel of the grenade launcher (Figure 4-2).

Table 4-1. Adjuster rotation and relative beam/shot group movement

ZEROING THE AIMING SPOT	ADJUSTER MOVEMENT	BEAM MOVEMENT	SHOT GROUP MOVEMENT
Bottom Adjuster Elevation	Counterclockwise	Down	Up
	Clockwise	Up	Down
Left Side Adjuster Windage (Azimuth)	Counterclockwise	Left	Right
	Clockwise	Right	Left

Table 4-2. Amount of movement in the beam/shot group per adjuster click

RANGE (M)	DISTANCE CHANGE PER CLICK (CM)
10	0.7
25	1.8
200	14.0

Table 4-3. Comparison of beam movement, range deviation and muzzle velocity change, and range deviation

RANGE (MM)	DEVIATION FROM RANGE (DISTANCE IN M)		
	PER 1 CM OF VERTICAL BEAM MOVEMENT ON 10-M OFFSET	PER 1 CM OF WINDAGE BEAM MOVEMENT ON 10-M OFFSET	PER 1 M-PER-SECOND CHANGE IN MUZZLE VELOCITY
100	0.9	0.1	+/- 2.5
200	0.7	0.2	+/- 4.6
300	0.5	0.3	+/- 6.3
350	0.4	0.4	+/- 7.1

Table 4-4. Elevation and azimuth adjustment

RANGE (M)	FRONT SIGHT ELEVATION MOVEMENT PER TURN OF ADJUSTMENT KNOB (M)	REAR SIGHT AZIMUTH MOVEMENT PER TURN OF ADJUSTMENT SCREW (M)
50	0.3	0.4
100	0.6	0.8
150	1.0	1.2
200	1.3	1.6
250	1.6	2.0
300	1.9	2.4
350	2.2	2.8

Zeroing by Firing the Weapon (Day/Night Sight Iron Sights)

4-6. This method of zeroing can be the most accurate but requires an extended range. For maximum accuracy, the procedure should be conducted with a target 200 meters downrange in atmospheric conditions as close to actual mission conditions as possible.

4-7. To zero the grenade launcher using the DNS iron sights (Figure 4-1)—

(1) Position a target 200 meters downrange from the firing position.

(2) Turn the DNS Mode Select switch to the DAY MODE.

(3) Set the DNS range adjustment knob (1) so that the display indicates 200 meters.
(4) Position the grenade launcher on a rest.

WARNING

Do not attempt to fire the grenade launcher in the stand-alone configuration without the buttstock attached. The grenade launcher should always be in the attached or complete stand-alone (fitted with the buttstock) configuration before attempting to fire.

(5) Fire one M781 training practice (TP) cartridge at the 200-meter target, and observe the point of impact in relation to the target and the point of aim.
(6) Adjust the DNS iron sight windage and the elevation adjusters to correct the point of impact.

Note. See Tables 4-1 through 4-4 for the adjustments.

(7) Fire another M781 TP cartridge and observe the point of impact relative to the target.
(8) Continue to fire and adjust until one round impacts within 5 meters of the point of aim.
(9) Rotate the DNS Mode Select switch to the OFF position.

LEAF SIGHT

4-8. To zero the grenade launcher using the leaf sight assembly, do the following (Figure 4-3)—
(1) Clear the host weapon (attached configuration only).
(2) Clear the grenade launcher.
(3) Position the grenade launcher on a rest.

WARNING

Do not attempt to fire the grenade launcher in the stand-alone configuration without the buttstock attached. The grenade launcher should always be in the attached or complete stand-alone (fitted with the buttstock) configuration before attempting to fire.

(4) Install the buttstock (stand-alone configuration only).
(5) Position a target 200 meters downrange from the firing position.
(6) Raise and extend the front and rear sights. Ensure that the grenade launcher is horizontally positioned so that the sights are not vertically canted.
(7) Align and center the front sightpost in the rear leaf aperture recess.
(8) Fire a round at the target and observe the point of impact in relation to the target and the point of aim.

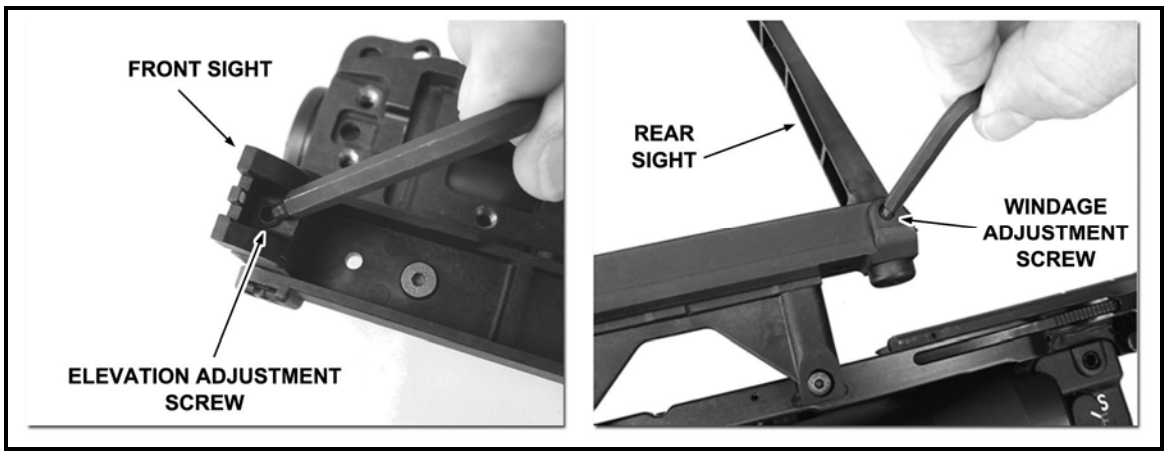


Figure 4-3. Elevation and windage adjustment on the leaf sight assembly

(9) If the round does not impact within 5 meters of the point of aim, make any necessary adjustments to windage and/or elevation using the stowed hex key wrench:

- To adjust the elevation—
  1. Insert the 3-mm end of the stowed hex key wrench into the elevation adjustment screw (Figure 4-3).
  2. Turn the screw. One complete revolution of the elevation adjustment screw moves the point of impact 34 cm (13.4 inches) at 100 meters. If the point of impact is low, turn the elevation adjustment screw counterclockwise. If the point of impact is high, turn the elevation adjustment screw clockwise.
- To adjust the windage—
  1. Insert the 3-mm end of the stowed hex key wrench into the windage adjustment screw (Figure 4-3).
  2. Turn the screw. One complete revolution of the windage adjustment screw moves the point of impact 68 cm (26.8 inches) at 200 meters. If the point of impact is left, turn the windage adjustment screw counterclockwise. If the point of impact is right, turn the windage adjustment screw clockwise.

(10) Continue to shoot/adjust until one round impacts within 5 meters of the point of aim.

(11) When zero has been achieved and confirmed, record the sight settings on *M320/M320A1 40-mm Grenade Launcher Scorecard*, DA Form 7680.

PERFORM RECORD FIRE

4-9. There are two tables associated with record fire:

- Day.
- Night.

4-10. These tables are fired on a range with four prepared stations.

***Note*.** See Appendix A for more information about the grenade launcher range.

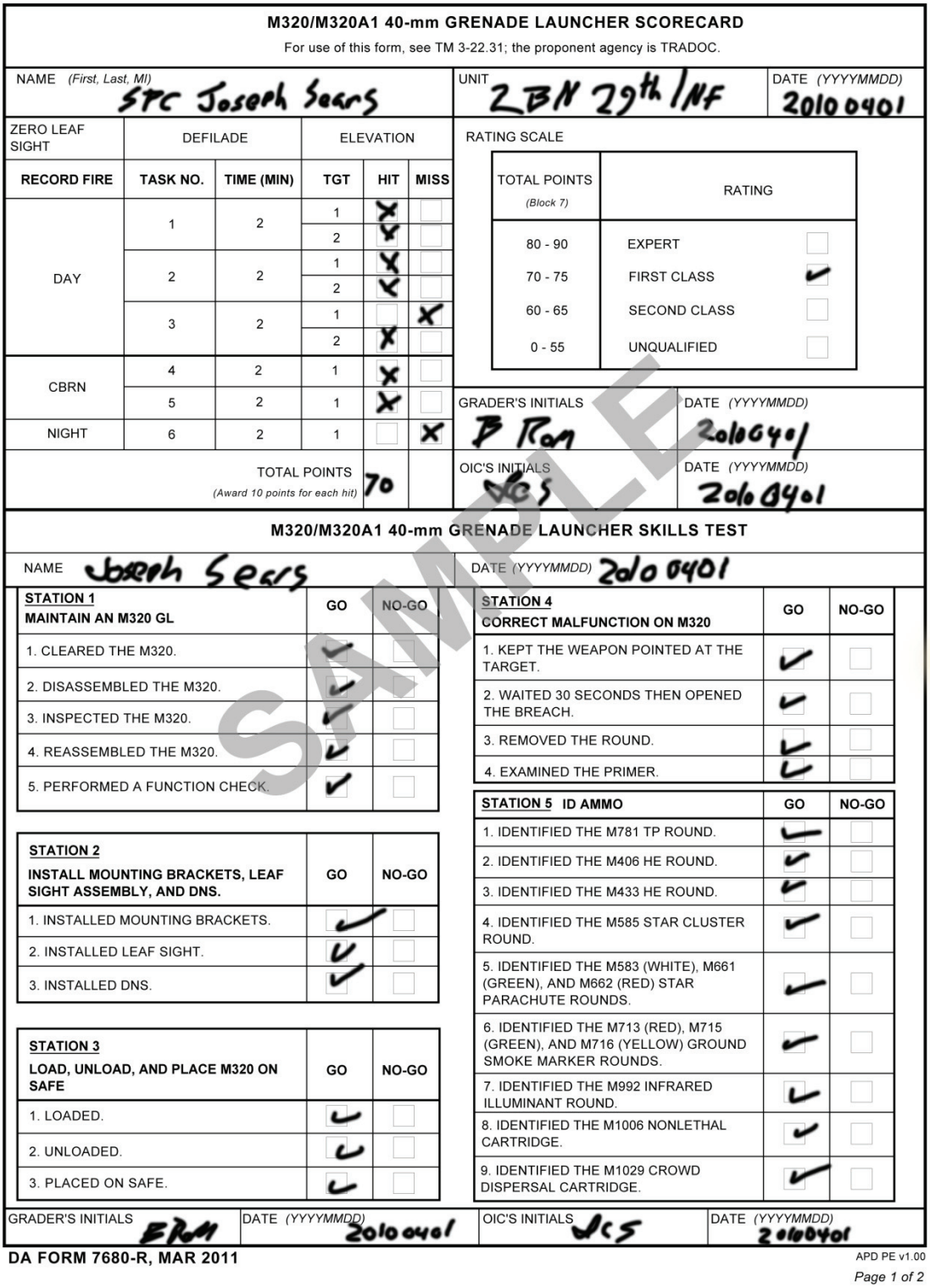
4-11. DA Form 7680 is used to score the qualification firing. To qualify with an M320/M320A1, a grenadier must perform to prescribed standards and must score at least 60 of 90 possible points. Each target hit is worth 10 points. Ratings are awarded based on the point chart shown on the scorecard. Figure 4-4 shows an example of a completed scorecard.

4-12. Before performing LFXs, Soldiers take the 40-mm grenade launcher skills test. This nonfiring exercise is used to determine the grenadier's proficiency on dry-fire tasks associated with the M320 40-mm grenade launcher. Using five stations, Soldiers must demonstrate proficiency on the following tasks:

- Maintain an M320 grenade launcher.
- Install mounting brackets, the leaf sight assembly, and the DNS on the M320 grenade launcher.
- Load, unload, and place the M320 grenade launcher on SAFE.
- Correct malfunctions on an M320 grenade launcher.
- Identify 40-mm ammunition and their purpose.

4-13. As a minimum, the 40-mm grenade launcher skills test must be administered semi-annually for Regular Army units and annually for reserve component (RC) units prior to live-fire qualification with results recorded on DA Form 7680-R.

Note. See Appendix C for conduct of the M320 40-mm grenade launcher skills test.



M320/M320A1 40-mm GRENADE LAUNCHER SCORECARD

For use of this form, see TM 3-22.31; the proponent agency is TRADOC.

NAME (First, Last, MI): SFC Joseph Sears | UNIT: 2BN 29th INF | DATE (YYYYMMDD): 20100401

ZERO LEAF SIGHT	DEFILADE		ELEVATION		
RECORD FIRE	**TASK NO.**	**TIME (MIN)**	**TGT**	**HIT**	**MISS**
DAY	1	2	1	X	
			2	X	
	2	2	1	X	
			2	X	
	3	2	1		X
			2	X	
CBRN	4	2	1	X	
	5	2	1	X	
NIGHT	6	2	1		X
TOTAL POINTS (Award 10 points for each hit)				70	

RATING SCALE

TOTAL POINTS (Block 7)	RATING	
80 - 90	EXPERT	
70 - 75	FIRST CLASS	✓
60 - 65	SECOND CLASS	
0 - 55	UNQUALIFIED	

GRADER'S INITIALS: B Ron | DATE (YYYYMMDD): 20100401

OIC'S INITIALS: JCS | DATE (YYYYMMDD): 20100401

M320/M320A1 40-mm GRENADE LAUNCHER SKILLS TEST

NAME: Joseph Sears | DATE (YYYYMMDD): 20100401

STATION 1 MAINTAIN AN M320 GL	GO	NO-GO
1. CLEARED THE M320.	✓	
2. DISASSEMBLED THE M320.	✓	
3. INSPECTED THE M320.	✓	
4. REASSEMBLED THE M320.	✓	
5. PERFORMED A FUNCTION CHECK.	✓	

STATION 2 INSTALL MOUNTING BRACKETS, LEAF SIGHT ASSEMBLY, AND DNS.	GO	NO-GO
1. INSTALLED MOUNTING BRACKETS.	✓	
2. INSTALLED LEAF SIGHT.	✓	
3. INSTALLED DNS.	✓	

STATION 3 LOAD, UNLOAD, AND PLACE M320 ON SAFE	GO	NO-GO
1. LOADED.	✓	
2. UNLOADED.	✓	
3. PLACED ON SAFE.	✓	

STATION 4 CORRECT MALFUNCTION ON M320	GO	NO-GO
1. KEPT THE WEAPON POINTED AT THE TARGET.	✓	
2. WAITED 30 SECONDS THEN OPENED THE BREACH.	✓	
3. REMOVED THE ROUND.	✓	
4. EXAMINED THE PRIMER.	✓	

STATION 5 ID AMMO	GO	NO-GO
1. IDENTIFIED THE M781 TP ROUND.	✓	
2. IDENTIFIED THE M406 HE ROUND.	✓	
3. IDENTIFIED THE M433 HE ROUND.	✓	
4. IDENTIFIED THE M585 STAR CLUSTER ROUND.	✓	
5. IDENTIFIED THE M583 (WHITE), M661 (GREEN), AND M662 (RED) STAR PARACHUTE ROUNDS.	✓	
6. IDENTIFIED THE M713 (RED), M715 (GREEN), AND M716 (YELLOW) GROUND SMOKE MARKER ROUNDS.	✓	
7. IDENTIFIED THE M992 INFRARED ILLUMINANT ROUND.	✓	
8. IDENTIFIED THE M1006 NONLETHAL CARTRIDGE.	✓	
9. IDENTIFIED THE M1029 CROWD DISPERSAL CARTRIDGE.	✓	

GRADER'S INITIALS: BRM | DATE (YYYYMMDD): 20100401 | OIC'S INITIALS: JCS | DATE (YYYYMMDD): 20100401

DA FORM 7680-R, MAR 2011 APD PE v1.00

Page 1 of 2

SAMPLE

***Figure 4-4. Example completed DA Form 7680-R (M320/M320A1 40-mm Grenade Launcher Scorecard).**

WARNING

Before allowing anyone to move between stations, ensure that—

All weapons are clear.

Bolts are to the rear.

Barrel assemblies are open.

If you see an unsafe act, call out CEASE FIRE, and notify range personnel immediately.

DAY RECORD FIRE

4-14. Day record fire gives the grenadier the confidence and experience he needs to progress from dry-fire exercises to record fire.

4-15. Grenadiers fire this exercise from the following fighting positions: kneeling supported, mid-range supported, and long-range supported. Since all Soldiers must be prepared to accomplish their missions, even in protective clothing, day record fire also includes two CBRN tasks (Tasks 4 and 5). These tasks are performed from the following positions: mid-range supported position (point target) and mid-range supported position (area target). Table 4-5 shows information about day record fire qualification.

Notes. 1. Before they fire for qualification, grenadiers must first zero their weapons and receive instruction on the objectives, range, targets, and qualification standards.

2. The unit is organized in firing orders based on range constraints. Each firing order consists of two grenadiers, one of whom assists.

3. For each of these tasks, the grenadier can designate which target he will engage first. If he scores a hit on the first, the trainer permits him to engage the second. Once he hits both targets, he returns any unexpended rounds to the assistant trainer.

Table 4-5. Day record fire qualification

TASK	STATION	TIME IN MINUTES	ROUNDS	TYPE OF AMMUNITION	TARGET(S) AND RANGE(S)
1	2	2	3	TP	Window facade at 100 m Small bunker at 125 m
2	3	2	3	TP	Two-man bunker at 175 m Automatic weapon position at 200 m
3	4	2	3	TP	Troops in open emplacement at 250m Troops in open at 350 m
4 CBRN	3	2	3	TP	Two-man bunker at 175 m
5 CBRN	3	2	3	TP	Automatic weapons position at 200 m

Task 1, Kneeling Supported Position

***Note*.** Task 1 is performed at Station 2. Only TP rounds may be used at this station.

4-16. Use the following procedures to perform Task 1:

(1) When you receive the command DESIGNATE THE TARGET, identify the target you intend to engage by announcing WINDOW or BUNKER.

(2) When you receive the command DETERMINE THE RANGE, announce the range to the target.

(3) Load one of the three rounds allotted.

***Note*.** Because HE must not be fired at ranges of less than 165 meters on the basic grenade launcher range, use only TP rounds.

(4) When you receive the following fire command, repeat each element as it is given:

GRENADIER
FRONT
3 ROUNDS
100 meters (window) or 125 meters (bunker)
COMMENCE FIRING

(5) Acquire the proper sight picture and announce UP to the grader.

(6) Engage the target given in the fire command until you hit it.

(7) Fire any remaining rounds at the second target.

***Note*.** You need no other fire command.

4-17. For each round you fire, your assistant announces HIT or MISS.

Task 2, Midrange Supported Position

***Note*.** Task 2 is performed at Station 3.

4-18. Use the following procedures to perform Task 2:

(1) When you receive the command DESIGNATE THE TARGET, identify the target you intend to engage by announcing BUNKER or AUTOMATIC WEAPON.

(2) When you receive the command DETERMINE THE RANGE, announce the range to the target.

(3) Load one of the three rounds allotted.

(4) When you receive the following fire command, repeat each element as it is given:

GRENADIER
FRONT
3 ROUNDS
175 METERS (BUNKER) OR 200 METERS (AUTOMATIC WEAPON)
COMMENCE FIRING

(5) Acquire the proper sight picture and announce UP to the grader.

(6) Engage the target given in the fire command until you hit it.

(7) Fire any remaining rounds at the second target.

***Note*.** You need no other fire command.

4-19. For each round you fire, your assistant announces HIT or MISS.

Task 3, Long-Range Supported Position

Note. Task 3 is performed at Station 4.

4-20. Use the following procedures to perform Task 3:

(1) When you receive the command DESIGNATE THE TARGET, identify the target you intend to engage by announcing TROOPS IN THE OPEN EMPLACEMENT or TROOPS IN THE OPEN.

(2) When you receive the command DETERMINE THE RANGE, announce the range to the target.

(3) Load one of the three rounds allotted.

(4) When you receive the following fire command, repeat each element as it is given:

GRENADIER
FRONT
3 ROUNDS
250 METERS (TROOPS IN THE OPEN EMPLACEMENT) or
350 METERS TROOPS IN OPEN
COMMENCE FIRING

(5) Acquire the proper sight picture, and announce UP to the grader.

(6) When the tower operator gives the command FIRE, engage the target given in the fire command until you hit it.

(7) Fire any remaining rounds at the second target.

Note. You need no other fire command.

4-21. For each round you fire, your assistant announces HIT or MISS.

Task 4, Midrange Supported Position (Point Target)

Note. Task 4 is a CBRN task and is performed at Station 3.

4-22. Use the following procedures to perform Task 4:

(1) Put on, clear, and check your mask within nine seconds.

(2) Within the next six seconds, pull the hood over your head and zip the front of it closed.

(3) Load one of the three rounds allotted.

(4) When you receive the following fire command, repeat each element as it is given:

FIRE MISSION
FRONT
3 ROUNDS
175 METERS (BUNKER)
AT MY COMMAND

(5) Acquire the proper sight picture and announce UP to your assistant.

(6) Have your assistant signal the tower operator that you are ready.

(7) When the tower operator gives the command to FIRE, engage the target given in the fire command until you hit it.

4-23. For each round you fire, your assistant announces HIT or MISS.

Task 5, Midrange Supported Position (Area Target)

Note. Task 5 is a CBRN task and is performed at Station 3.

4-24. Use the following procedures to perform Task 5:

(1) Load one of the three rounds allotted.

(2) When you receive the following fire command, repeat each element as it is given:

FIRE MISSION
FRONT
3 ROUNDS
200 METERS (AUTOMATIC WEAPON POSITION)
AT MY COMMAND

(3) Acquire the proper sight picture and announce UP to your assistant.

(4) Have your assistant signal the tower operator that you are ready.

(5) When the tower operator gives the command to FIRE, engage the target given in the fire command until you hit it.

4-25. For each round you fire, your assistant announces HIT or MISS.

Qualification Standards

4-26. Before qualification firing, each grenadier must know the tasks, the time and ammunition required, the procedures to follow if a stoppage occurs, the penalties for failure to stop firing when commanded or signaled to do so, and the method used for scoring targets.

Time and Ammunition

4-27. Each grenadier determines the target and its distance before loading any rounds. When the grenadier receives the command to FIRE, the time allotted for that task begins.

Stoppages

4-28. The grenadier must apply immediate action procedures if a stoppage occurs. The procedures used for stoppages vary according to the circumstances:

- If you reduce the stoppage, continue to fire the course. The trainers allow an extra 15 seconds for each application of immediate action.
- If a stoppage occurs that you cannot reduce by immediate action, raise your hand and announce TIME. When you say TIME, the assistant trainer notes the time, ensures that a real stoppage exists, and tries to clear the stoppage. If he clears it, you can complete firing. If he cannot clear it, the grader will clear it, and you will be allowed 15 seconds for each round remaining to complete firing.
- If you made an error that caused the stoppage, you do not receive extra time, and your score consists only of what you earned before the stoppage occurred.
- If the grenade launcher must be replaced, you are allotted 10 rounds to zero a new one, and then you may repeat the exercise.
- If malfunctions prevent you from finishing the exercise in the time allowed, you can finish it in an alibi run after all other grenadiers complete firing.

Penalties

4-29. Five points are deducted from the score of any grenadier who fails to stop firing when the trainer commands or signals to do so. If a grenadier fires at the wrong target, he loses the rounds allotted for the other target, which leaves him only the remainder of his rounds to expend on both targets.

Target Scoring

4-30. The trainer or assistant trainer records scores on DA Form 7680. They determine whether each grenade fired is a hit or miss and assign 0 points for a miss or 10 points for a hit (Table 4-6). Tasks 1

through 3 each consist of two targets, so the total available for each of these tasks is 20 points. Tasks 4 and 5 each consist of firing one target for a total of 10 points each.

Table 4-6. Determination of a hit or miss

TARGET	DETERMINATION
Window or Door	To score a hit, the grenade must either strike the target or go through the opening in the center of the target.
Bunker	To score a hit, the grenade must strike anywhere on the face of the bunker.
Automatic Weapon	To score a hit, the grenade must strike within 5 meters of the target.
Troops	To score a hit, the grenade must strike within 5 meters of the target.

NIGHT RECORD FIRE

4-31. Night or limited visibility firing trains grenadiers to apply the fundamentals of grenade launcher marksmanship while using the DNS. It trains the grenadier to engage targets between 190 and 200 meters under ideal moonlight conditions. This training increases the grenadiers' confidence. Before night firing, grenadiers receive instruction in its objectives, fundamentals, fire commands, and targets. Night record fire consists of one task: firing from a mid-range supported position (area target). Table 4-7 shows information about night record fire qualification.

Notes. 1. The unit is organized in firing orders, each consisting of a grenadier and assistant, based on the range constraints.

2. The assistant performs his duties in a manner similar to day record fire.

Table 4-7. Night record fire qualification

TASK	STATION	TIME IN MINUTES	ROUNDS	TYPE OF AMMUNITION	TARGET(S) AND RANGE(S)
6	3	2	3	HE	Automatic weapon at 200 m

Task 6, MidRange Supported Position (Area Target)

Note. Task 6 is performed at Station 3.

4-32. Use the following procedures to perform Task 6:

(1) Load one of the three rounds allotted.

(2) When you receive the following fire command, repeat each element as it is given:

GRENADIER
FRONT
3 ROUNDS
200 METERS (AUTOMATIC WEAPON POSITION)
AT MY COMMAND

(3) Acquire the proper sight picture and announce UP to the grader.

(4) When the grader gives the command FIRE, engage the target given in the fire command until you hit it.

(5) Fire any remaining rounds at the second target.

Note. You need no other fire command.

4-33. For each round you fire, your assistant announces HIT or MISS.

Qualification Standards

4-34. Before qualification firing, each grenadier must know the task, the time and ammunition required for each, the procedures to follow if a stoppage occurs, the penalties for failure to stop firing when commanded or signaled to do so, and the method used for scoring targets.

Time and Ammunition

4-35. Table 4-7 provides the night firing task and its time and ammunition requirements.

Stoppages

4-36. The procedure for stoppages is the same as for other qualification firing exercises.

Penalties

4-37. The procedure for penalties is the same as for other qualification firing exercises.

Target Scoring

4-38. The target scoring procedure is the same as for other qualification firing exercises.

Chapter 5

Combat Techniques of Fire

When applying fires, the leader selects and designates targets by indicating their width and depth or, in the case of targets that are hard to identify, by designating the distance from a reference point to the target's center of mass (Figure 5-1). He also designates the midpoint, flanks, or ends of a target unless these locations are obvious to the grenadiers. The grenadiers open fire when ready, adjust and regulate the rate of fire, and shift from one target to another. They cease fire only when the target is neutralized or the leader signals to cease fire.

Grenadiers must be trained in the standard methods of applying fire with a grenade launcher. During this phase of instruction, the following tasks are covered:

- Understand the methods of fire control.
- Identify the types of targets.
- Understand and apply proper predetermined fires.
- Understand proper application of fires.

Figure 5-1. Use of a reference point to identify a target

UNDERSTAND THE METHODS OF FIRE CONTROL

5-1. Fire control includes all leader and Soldier actions in planning, preparing, and applying fire on a target. There are six methods of fire control:

- Oral commands.
- Arm and hand signals.
- Predetermined signals.
- Personal contact.
- SOPs.
- Range cards.

5-2. The noise and confusion of battle may limit the methods of fire control used, so the leader must select the method(s) that will best accomplish the mission.

ORAL COMMANDS

5-3. The primary method of fire control is the oral fire command. This method is effective unless noise or distance prevents the grenadier from hearing the leader.

ARM AND HAND SIGNALS

5-4. This method of fire control is effective only if the grenadiers know the standard arm and hand signals and can see the leader.

5-5. To use this method, the leader gets the grenadier's attention and points to the target. When the grenadier returns the ready signal, the leader commands the grenadier to fire.

PREDETERMINED SIGNALS

5-6. This method of fire control can include visual or sound signals, such as those produced by a whistle, pyrotechnics, aiming lasers, or casualty-producing device. The SOP must define the signals to be used, and all squad members must understand them. If the leader wants to shift fire at a certain time, he gives a predetermined signal, such as smoke or pyrotechnics. When they see this signal, grenadiers shift their fire to a predetermined point.

PERSONAL CONTACT

5-7. This method of fire control is most frequently used by leaders of small units. Many situations require the leader to move to individual Soldiers to issue orders. If so, he must use cover and concealment to avoid disclosing their positions. Once there, he gets the grenadier's attention, points out the new target, and commands FIRE.

STANDING OPERATING PROCEDURE

5-8. This method of fire control refers to actions executed without command. The SOP defines these actions and the events that initiate them. Using an SOP simplifies the leader's job of fire control.

RANGE CARDS

5-9. This method of fire control requires the leader to ensure all range cards are current and accurate. He designates dead spaces, specific targets, no-fire zones, and restricted fire areas. The key to this method is the disciplined grenadier who pays attention to detail and can understand the areas the squad leader wants covered by fire. Figure 5-2 shows an example completed DA Form 5517-R (*Standard Range Card*) for a 40-mm grenade launcher.

IDENTIFY THE TYPES OF TARGETS

5-10. Targets for grenadiers in combat are most likely to be enemy troops. Personnel targets have width and depth; different troop formations require different classes of fire distribution. The fire must thoroughly cover the area where the enemy is known or suspected to be, and the targets may be easy or hard to find. There are two types of targets:

- Point targets.
- Area targets.

5-11. The grenadier may be required to engage multiple targets using various combat techniques of fire for area and point targets.

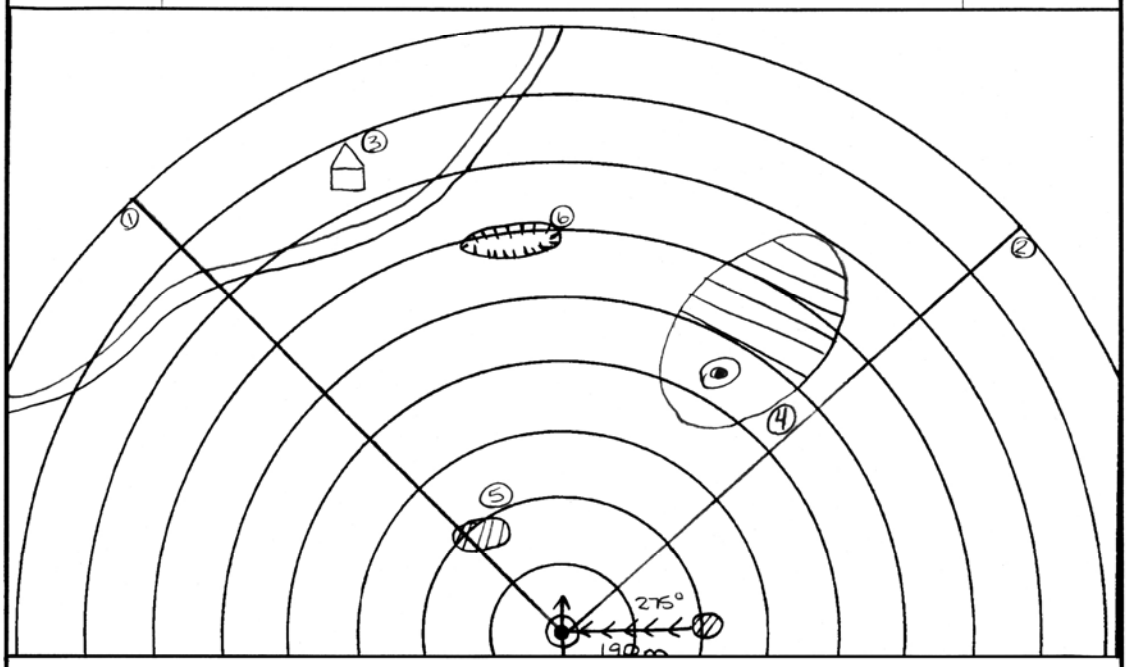
STANDARD RANGE CARD

For use of this form see FM 3-21.71; the proponent agency is TRADOC.

SQD 2nd
PLT 1st
CO B

May be used for all types of direct fire weapons.

MAGNETIC NORTH



DATA SECTION

POSITION IDENTIFICATION: Primary
DATE: 11 Jan 01
WEAPON: M320
EACH CIRCLE EQUALS METERS: 50

NO.	DIRECTION/ DEFLECTION	ELEVATION	RANGE	AMMO	DESCRIPTION
1	300°	—	350m	—	Left Limit
2	15°	—	350m	—	Right Limit
3	330°	—	350m	HE	TRP House
4	0°	—	200m	HE	TRP Hill top
5	305°	—	100m	HE	TRP Berm
6	340°	—	300m	HE	TRP Dry Pond

REMARKS:

DA FORM 5517-R, FEB 1986

Figure 5-2. Example of a grenade launcher range card

POINT TARGETS

5-12. These are targets--such as enemy bunkers, windows, weapons emplacements, light-skinned vehicles, and troops--that have a single aiming point. The maximum effective range for point targets is 150 meters.

5-13. A grenadier engages a point target using point fire (also called rapid point fire). If the target moves after the initial round is fired, the grenadier follows the movement of the target to keep fire on it.

AREA TARGETS

5-14. Area targets may have considerable width and depth and may require extensive right or left and searching fire. A deployed platoon is one example of an area target. The maximum effective range for area targets is 350 meters. Types of area targets are as follows:

- Linear targets.
- Deep targets.
- Linear targets with depth.

5-15. The grenadier must know how to engage area targets regardless of their sizes or shapes. Because an area target is designated by width and depth, the grenadier engages it by aiming and adjusting on its center of mass and then moving left or right, searching to either flank to achieve the fullest effect of the bursting radius. When his fire reaches the target's flank, the grenadier reverses direction. For area targets, the grenadier should aim where the bursting radius will achieve its fullest effect.

Linear Targets

5-16. The grenadier sights on what appears to be the target's center of mass. He fires the grenade launcher left and right across the target on successive aiming points (Figure 5-3). The grenadier engages a designated linear target by moving right or left, searching the weapon to distribute fire evenly on the target. He must engage the entire width of a linear target; its midpoint is the point of aim. The grenadier then moves in the opposite direction to cover the rest of the target.

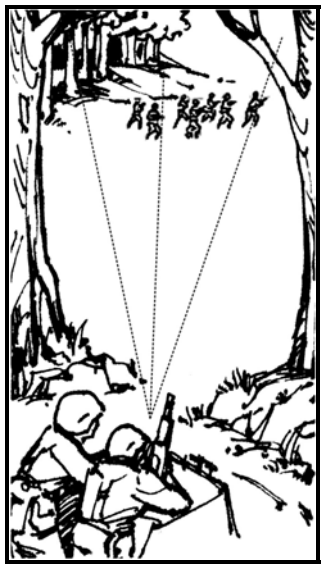


Figure 5-3. Engaging linear targets

Deep Targets

5-17. The grenadier first lays on the target's center of mass. He fires searching fire to the near end and then up to the far end of the target along successive aiming points (Figure 5-4). The leader announces the

range and depth of a deep target in meters, using a reference point to designate its center of mass if the target is hard to identify. The grenadier initially aims on the target's midpoint, unless another part is more critical. He engages a deep target with searching fire. He searches down to an aiming point in front of the near end and back up to an aiming point beyond the far end, always trying to gain the fullest effect of the bursting radius.

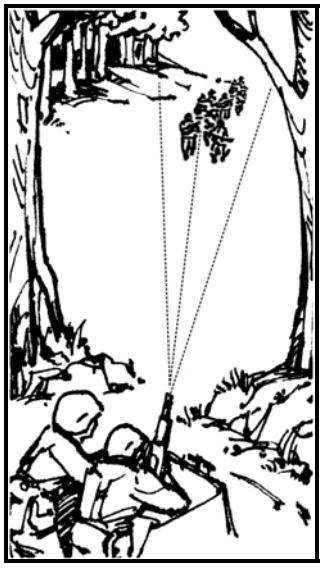


Figure 5-4. Deep targets

Linear Targets with Depth

5-18. The grenadier lays on the target's center of mass. Then, he moves the grenade launcher left and right across the target, selecting successive aiming points at different ranges (Figure 5-5). The leader can fire his rifle to identify a linear target with depth. He should not use the reference point method because showing the angle of this type of target requires at least two reference points. The grenadier initially aims on the target's midpoint, unless another part is more critical. He moves left or right and searches to the near flank, and then back to the far flank.

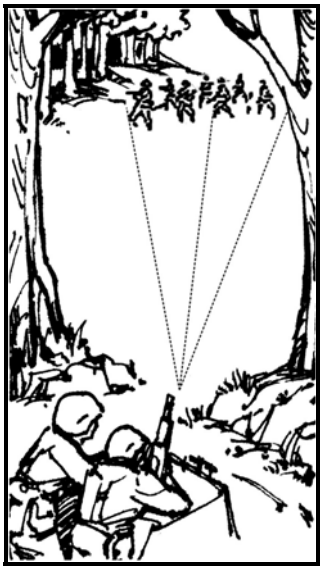


Figure 5-5. Linear targets with depth

UNDERSTAND AND APPLY PROPER PREDETERMINED FIRES

5-19. Predetermined fires are used to cover such target areas as dead spaces and likely enemy avenues of approach and assault positions. Each squad leader prepares a sector sketch to help in planning the defense and controlling fire (Figure 5-6).

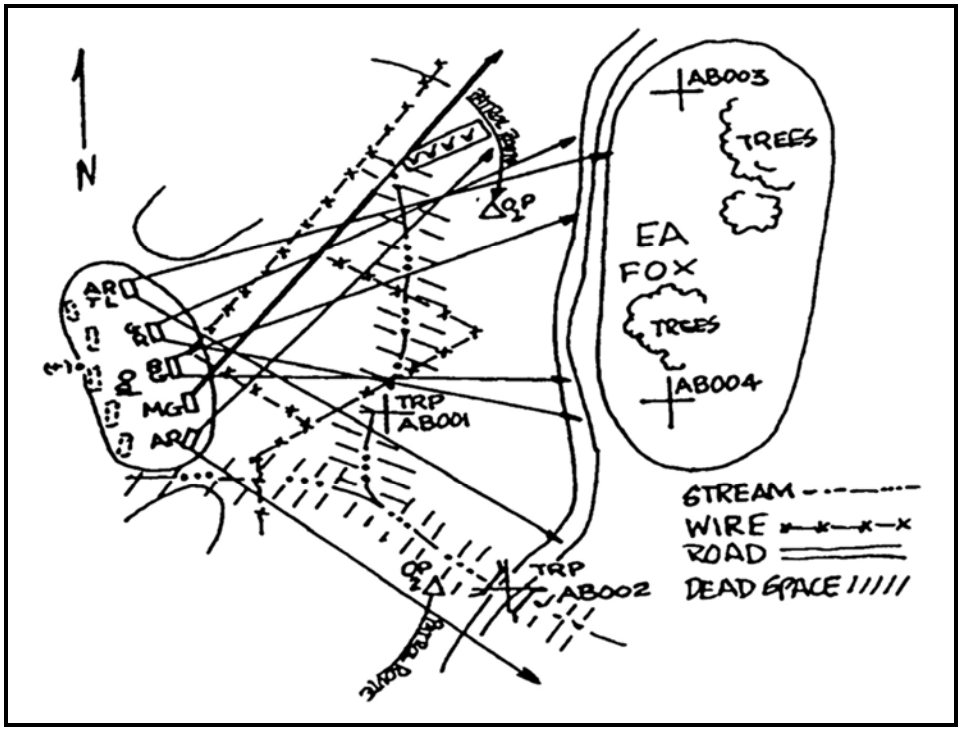


Figure 5-6. Example squad sector sketch

DETERMINING DEAD SPACE

5-20. Dead space is an area within the maximum range of a weapon, which cannot be covered by fire or observation from a particular position because of intervening obstacles, the nature of the ground, or the characteristics of the trajectory, or the limitations of the pointing capabilities of the weapon.

CALLING FOR FIRE

5-21. Predetermined targets, including the final protective line or principal direction of fire, are engaged on order or in accordance with the SOP. The signal used to call for these fires is normally stated in the operation order. Fires on predetermined targets may be controlled by arm and hand signals, voice commands, or pyrotechnic devices.

UNDERSTAND PROPER APPLICATION OF FIRES

5-22. Application of fire refers to the methods grenadiers must use to completely and effectively cover a target area. They can learn these methods only after they know what types of targets they may find in combat and how to properly distribute and concentrate their fire. By using these methods, they can react quickly and properly when they detect or are alerted to various types of targets.

SUPPRESSIVE FIRE

5-23. Suppressive fire is direct or indirect fire aimed near enough to the enemy's position to keep him from placing accurate fire on friendly forces. Grenadiers use suppressive fire to prevent the enemy from seeing, shooting at, or tracking a target.

OVERWATCH FIRE

5-24. Grenadiers use overwatch fire to cover other Soldiers' movements. Grenadiers use overwatch fire to—

- Support the platoon by covering dead space.
- Select likely enemy positions and observe them continuously.
- Determine where to find and how to reach the best grenade launcher position.

OVERHEAD FIRE

5-25. Grenadiers deliver fire over the heads of friendly Soldiers in combat only, and only when the fire command specifies. Terrain and visibility dictate when they can fire overhead safely.

Note. AR 385-63 summarizes training safety requirements.

WARNING

Do not fire overhead fire through trees. Rounds may arm at 14 meters, which is near enough to cause injury by deflecting off nearby trees or structures.

AREA AND POINT FIRE

5-26. Grenadiers deliver point fire and area fire in width, depth, or both. To distribute fire properly, they must know where to aim, how to adjust their fire, and where to move the grenade launcher.

Point of Aim

5-27. The grenadier must initially aim, fire, and adjust on a certain point on the target. He must adjust boldly, rapidly, and continuously. In most cases, the enemy leader and the communications section are in the center of the enemy's formation. Because Soldiers generally tend to bunch up, the enemy troops may also be located near the center of the enemy formation. Unless a greater threat exists elsewhere, the grenadier should use the center of this concentrated target as the initial aiming point. The leader can use binoculars and help the grenadier adjust fire.

Direction

5-28. The direction the leader gives depends on the type of target and on whether he wants one or two grenade launchers to engage the target. When a pair engage an area target (not a point target), they divide the target and interlock and distribute their fire over it. After receiving the fire command, the grenadier (or each grenadier) moves his grenade launcher to aim in the designated direction over the target.

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Appendix A

Training Preparation

A-1. Training preparation involves three steps:

(1) Conduct a training risk assessment.

(2) Conduct an environmental risk assessment.

(3) Make range coordinations.

CONDUCT A TRAINING RISK ASSESSMENT

A-2. The officer in charge (OIC) or noncommissioned officer in charge (NCOIC) conducts a training risk assessment. It is vital to identify unnecessary risks by comparing potential benefit to potential loss.

A-3. Composite risk management (CRM) is a decision-making process used to mitigate risks associated with all hazards that have the potential to injure or kill personnel, damage or destroy equipment, or otherwise impact mission effectiveness. The guiding principles of CRM are as follows:

- Integrate CRM into all phases of the mission and operations.
- Make risk decisions at the appropriate level.
- Accept no unnecessary risk.
- Apply the process cyclically and continuously.
- Do not be risk averse.

A-4. CRM is a five-step process:

(1) Identify hazards.

(2) Assess hazards to determine risk.

(3) Develop controls and make risk decisions.

(4) Implement controls.

(5) Supervise and evaluate.

***Note*.** Steps 1 and 2 are assessment steps; Steps 3 through 5 are management steps.

IDENTIFY HAZARDS

A-5. Hazards may arise from any number of areas. They can be associated with enemy activity, accident potential, weather or environmental conditions, health, sanitation, behavior, and/or materiel or equipment. Mission, enemy, terrain and weather, troops and support available, time available, civil considerations (METT-TC) factors serve as a standard format for identifying hazards, on- or off-duty.

A-6. CRM does not differentiate between the sources of the hazard. The loss of personnel, equipment, or materiel due to any hazard has the same disruptive impact on readiness or mission capabilities, no matter what the source.

ASSESS HAZARDS TO DETERMINE RISK

A-7. During mission analysis, course of action (COA) development, or analysis, rehearsal, and execution steps of the military decision-making process (MDMP), commanders assess hazards and assign risk in terms of probability and severity of adverse impact. During their assessment, they must consider both mission-and non-mission-related aspects that may have an impact. The end result of this assessment is an

initial estimate of risk for each identified hazard as determined from the standardized application of the risk assessment matrix. There are three substeps in this step:

(1) Assess the probability of an event or occurrence.

(2) Estimate the expected result or severity of an event or occurrence.

(3) Determine the level of risk using the standard risk assessment matrix.

Assess the Probability of an Event or Occurrence

A-8. Probability is the likelihood an event will occur based on prior experience. The probability levels estimated for each hazard are based on the mission, COA, or frequency of a similar event. There are five levels of probability, as shown in Table A-1.

Table A-1. Five levels of probability

LEVEL OF PROBABILITY	EXPLANATION
Frequent	Occurs very often, known to happen regularly
Likely	Occurs several times, a common occurrence
Occasional	Occurs sporadically, but is not common
Seldom	Remotely possible, could occur at some time
Unlikely	Can assume will not occur, but not impossible

ESTIMATE THE EXPECTED RESULT OR SEVERITY OF AN EVENT OR OCCURRENCE

A-9. Severity is the degree to which an incident will impact combat power, mission capability, or readiness. The degree of severity estimated for each hazard is based on the results of similar events. Severity is addressed in the four levels used on the risk assessment worksheet (Table A-2):

- Catastrophic.
- Critical.
- Marginal.
- Negligible.

Table A-2. Four levels of severity

LEVEL OF SEVERITY	EXPLANATION
Catastrophic	Complete mission failure or loss of ability to accomplish a mission. Death or permanent total disability. Loss of major or mission-critical systems or equipment. Major property or facility damage. Severe environmental damage. Mission-critical security failure. Unacceptable collateral damage.
Critical	Severely degraded mission capability or unit readiness. Permanent partial disability or temporary total disability exceeding three months time. Extensive major damage to equipment or systems. Significant damage to property or the environment. Security failure. Significant collateral damage.
Marginal	Degraded mission capability or unit readiness. Minor damage to equipment or systems, property, or the environment. Lost days due to injury or illness, not exceeding three months. Minor damage to property or the environment.
Negligible	Little or no adverse impact on mission capability. First aid or minor medical treatment. Slight equipment or system damage, but fully functional or serviceable. Little or no property or environmental damage.

Determine the Level of Risk Using the Standard Risk Assessment Matrix

A-10. Using the standard risk assessment matrix (Table A-3), commanders convert probability and severity for each identified hazard into a specified level of risk. All accepted residual risk must be approved at the appropriate level of command.

Note. This assessment is an estimate, not an absolute. It may or may not be indicative of the relative danger of a given operation, activity, or event.

Table A-3. Risk assessment matrix

RISK ASSESSMENT MATRIX						
Severity		**Probability**				
		Frequent A	Likely B	Occasional C	Seldom D	Unlikely E
Catastrophic	I	E	E	H	H	M
Critical	II	E	H	H	M	L
Marginal	III	H	M	M	L	L
Negligible	IV	M	L	L	L	L
E – Extremely High	H – High	M – Moderate	L – Low			

A-11. Risk is addressed in the four levels listed in the lower left corner of the matrix (Table A-4):

- Extremely high risk.
- High risk.
- Moderate risk.
- Low risk.

Table A-4. Four levels of risk

LEVEL OF RISK	EXPLANATION
Extremely High Risk	Loss of ability to accomplish the mission if hazards occur. In the example noted in Table A-3, a frequent or likely probability of catastrophic loss (IA or IB) or a frequent probability of critical loss (IIA) exists. This implies that the risk associated with this mission, activity, or event may have severe consequences. The decision to continue must be weighed carefully against the potential gain to be achieved by continuing this COA.
High Risk	Significant degradation of mission capabilities (in terms of the required mission standard), inability to accomplish all parts of the mission, or inability to complete the mission to standard will result if hazards occur during the mission. Occasional to seldom probability of catastrophic loss (IC or ID) exists. A likely to occasional probability of a critical loss (IIB or IIC) exists. Frequent probability of marginal losses (IIIA) exists. This implies that if a hazardous event occurs, serious consequences will occur. The decision to continue must be weighed carefully against the potential gain to be achieved by continuing this COA.
Moderate Risk	Expected degraded mission capabilities (in terms of the required mission standard) will result if hazards occur during the mission. An unlikely probability of catastrophic loss (IE) exists. The probability of a critical loss is seldom (IID). Marginal losses occur with a likely or occasional probability (IIIB or IIIC). A frequent probability of negligible (IVA) losses exists.
Low Risk	Expected losses have little or no impact on accomplishing the mission. The probability of critical loss is unlikely (IIE), while that of marginal loss is seldom (IIID) or unlikely (IIIE). The probability of a negligible loss is likely or less (IVB through IVE). Expected losses have little or no impact on accomplishing the mission. Injury, damage, or illness are not expected, or may be minor and have no long-term impact or effect.

DEVELOP CONTROLS AND MAKE RISK DECISIONS

A-12. In this step, commanders develop and apply controls, reassess the hazard to determine a residual risk, and make risk decisions. This process continues until an acceptable level of risk is achieved or until all risks are reduced to a level where benefits outweigh the potential cost. This step is accomplished during the COA development, COA analysis, COA comparison, and COA approval of the MDMP.

IMPLEMENT CONTROLS

A-13. Leaders and staffs ensure that controls are integrated into SOPs, written and verbal orders, mission briefings, and running estimates. The critical check for this step is to ensure that controls are converted into clear and simple execution orders. This step includes coordination and communication with—

- Appropriate superior, adjacent, and subordinate units, organizations, and individuals.
- Logistics Civil Augmentation Program (LOGCAP) organizations and civilian agencies that are part of the force or may be impacted by the activity, hazard, or its control.
- The media and nongovernmental organizations when their presence impacts or is impacted by the force.

SUPERVISE AND EVALUATE

A-14. This step involves implementing risk controls and enforcing them to standard, and validating the adequacy of selected control measures in supporting the objectives and desired outcomes. This continuous process provides the ability to identify weaknesses and to change or adjust controls based on performance, changing situations, conditions, or events.

RESPONSIBILITIES

A-15. CRM responsibilities are spread across three levels:

- Commander.
- Leaders.
- Individual.

Commander

A-16. During implementation of the CRM process, the commander—

- Ensures that warfighting functions (WFF) are performed to standard to minimize human error, materiel failure, and environmental effects.
- Establishes a personnel protection policy and publishes a safety philosophy with realistic safety goals, objectives, and priorities.
- Ensures that his training assessment considers the WFF's ability to protect the force. Selects long-, short-, and near-term control actions and ensures implementation to improve force protection.
- Ensures that his staff integrates risk management into the planning and execution of training and operational missions.
- Makes risk decisions.
- Selects, monitors, and enforces implementation of controls for hazards most likely to result in loss of combat power. After implementing controls, if risk remains above the tolerance level established by higher command, he must elevate the risk decision to the appropriate command level.
- Ensures that the CRM process is evaluated during all AARs.
- Determines if unit performance meets force protection guidance.
- Determines effectiveness of hazard controls and necessary changes to guidance and controls.
- Ensures that these changes are fed back into the training management cycle and guidance for operational missions, including unit SOPs.

Leaders

A-17. During implementation of the CRM process, leaders—

- Enforce METL task performance to standard.
- Adopt the crawl—walk—run approach in planning and executing training.
- Make use of automated on- and off-duty CRM tools and surveys available from the US Army Combat Readiness Center (USACRC).

- Execute risk reduction controls selected by the commander by developing and implementing supporting leader level controls. Apply risk management procedures to each.

Individual

A-18. All Soldiers must understand how to use the CRM process to enhance mission success and to reduce or eliminate loss.

A-19. During implementation of the CRM process, Soldiers—

- Support commanders and leaders in the rapid identification and communication of hazards and associated risks that may impact on the mission.
- Provide immediate feedback to the leader as the mission progresses and hazards are encountered. Use short written messages, hand and arm signals, or radio transmissions to communicate first-hand information to leaders.
- In extreme situations, act alone or make risk decisions within the context of orders.

DA FORM 7566 (COMPOSITE RISK MANAGEMENT WORKSHEET)

A-20. DA Form 7566 (Composite Risk Management Worksheet, Figure A-1) provides a starting point to logically track the CRM process. It can be used to document risk management steps taken during planning, preparation, and execution of training and combat missions.

A-21. See Table A-5 for instructions on completing DA Form 7566.

Table A-5. Worksheet instructions

ITEM	INSTRUCTION
1 through 4	Self-explanatory.
5	Subtask relating to the mission or task in Block 1.
6	Hazards–Identify hazards by reviewing METT-TC factors for the mission or task. Additional factors include historical lessons learned, experience, judgment, equipment characteristics and warnings, and environmental considerations.
7	Initial Risk Level–Factors include historical lessons learned, intuitive analyses, experience, judgment, equipment characteristics and warnings, and environmental considerations. Determine the initial risk for each hazard by applying the risk assessment matrix. Enter the risk level for each hazard.
8	Controls– For each hazard, develop one or more controls that will eliminate the hazard or reduce the risk of a hazardous incident. Specify who, what, where, why, when, and how for each control. Enter controls.
9	Residual Risk Level–Determine the residual risk for each hazard by applying the risk assessment matrix. Enter the residual risk level for each hazard.
10	How to Implement–Decide how each control will be put into effect or communicated to the personnel who will make it happen (written or verbal instruction; tactical, safety, garrison SOPs; rehearsals). Enter controls.
11	How to Supervise (Who)–Plan how each control will be monitored for implementation (continuous supervision, spot-checks) and reassess hazards as the situation changes. Determine if the controls worked and if they can be improved. Pass on lessons learned.
12	Was Control Effective–Indicate “Yes” or “No.” Review during AAR.
13	Overall Risk Level–Select the highest residual risk level and circle it. This becomes the overall mission or task risk level. The commander decides whether the controls are sufficient to accept the level of residual risk. If the risk is too great to continue the mission or task, the commander directs development of additional controls or modifies, changes, or rejects the COA.
14	Risk Decision Authority–Signed by the appropriate level of command.

COMPOSITE RISK MANAGEMENT WORKSHEET

For use of this form, see FM 5-19; the proponent agency is TRADOC.

1. MSN/TASK	2a. DTG BEGIN	2b. DTG END	3. DATE PREPARED *(YYYYMMDD)*

4. PREPARED BY

a. LAST NAME	b. RANK	c. POSITION

5. SUBTASK	6. HAZARDS	7. INITIAL RISK LEVEL	8. CONTROLS	9. RESIDUAL RISK LEVEL	10. HOW TO IMPLEMENT	11. HOW TO SUPERVISE (WHO)	12. WAS CONTROL EFFEC-TIVE?

Additional space for entries in Items 5 through 11 is provided on Page 2.

13. OVERALL RISK LEVEL AFTER CONTROLS ARE IMPLEMENTED *(Check one)*

☐ LOW ☐ MODERATE ☐ HIGH ☐ EXTREMELY HIGH

14. RISK DECISION AUTHORITY

a. LAST NAME	b. RANK	c. DUTY POSITION	d. SIGNATURE

DA FORM 7566, APR 2005

Page 1 of 2

APD V2.00

ITEMS 5 THROUGH 12 CONTINUED:

5. SUBTASK	6. HAZARDS	7. INITIAL RISK LEVEL	8. CONTROLS	9. RESIDUAL RISK LEVEL	10. HOW TO IMPLEMENT	11. HOW TO SUPERVISE (WHO)	12. WAS CONTROL EFFEC-TIVE?

DA FORM 7566, APR 2005

Page 2 of 2

APD V2.00

Figure A-1. Sample DA Form 7566 (*Composite Risk Management Worksheet*)

CONDUCT AN ENVIRONMENTAL RISK ASSESSMENT

A-22. All leaders, trainers, and Soldiers must comply with environmental laws and regulations. The leader must identify the environmental risks associated with training individual and collective tasks, and implement environmental protection measures by integrating them into plans, orders, SOPs, training performance standards, and rehearsals.

A-23. Environmental risk management parallels safety risk management and is based on the same philosophy. Environmental risk management consists of identifying hazards before they happen and assessing hazards caused during training.

Note. See FM 7-0 for more information.

IDENTIFY HAZARDS

A-24. Leaders should identify the potential sources for environmental degradation. An environmental hazard is a condition with the potential for polluting air, soil, or water or destroying cultural or historical artifacts.

ASSESS HAZARDS

A-25. Leaders should analyze the potential severity of environmental degradation by using the environmental risk assessment matrixes in FM 7-0. The risk effect value is defined as an indicator of the severity of environmental degradation. Leaders quantify the environmental risk resulting from the operation as extremely high, medium, or low using the environmental assessment matrixes.

MAKE RANGE COORDINATIONS

A-26. Once the risk assessment is completed, viewed, and command approved, the OIC or NCOIC should check out the range and coordinate for range use.

Note. The OIC or NCOIC should coordinate at least one day ahead of actual use to rehearse range setup and conduct.

RANGE AND TARGETS

A-27. The grenade launcher range is designed for all grenade launchers. Because Soldiers can qualify on this range in all conditions, it prepares grenadiers for combat situations.

A-28. The range has four self-contained stations (Figure A-2). It is 30 meters wide and 500 meters deep, and has a no-HE fire zone out to 165 meters. Targets should be built from durable materials to reduce downrange target maintenance. Those within each station must be grouped and spaced so that the grenadier may fire at close-, mid-, and long-range targets, in that order. The following description of the stations and targets is included to help trainers maintain control during zeroing, practice, and record fire.

WARNING

Before firing HE grenades, move to a protected (covered) position. The minimum safe ranges follow:
Training 165 meters (541 feet)
Combat 31 meters (102 feet)

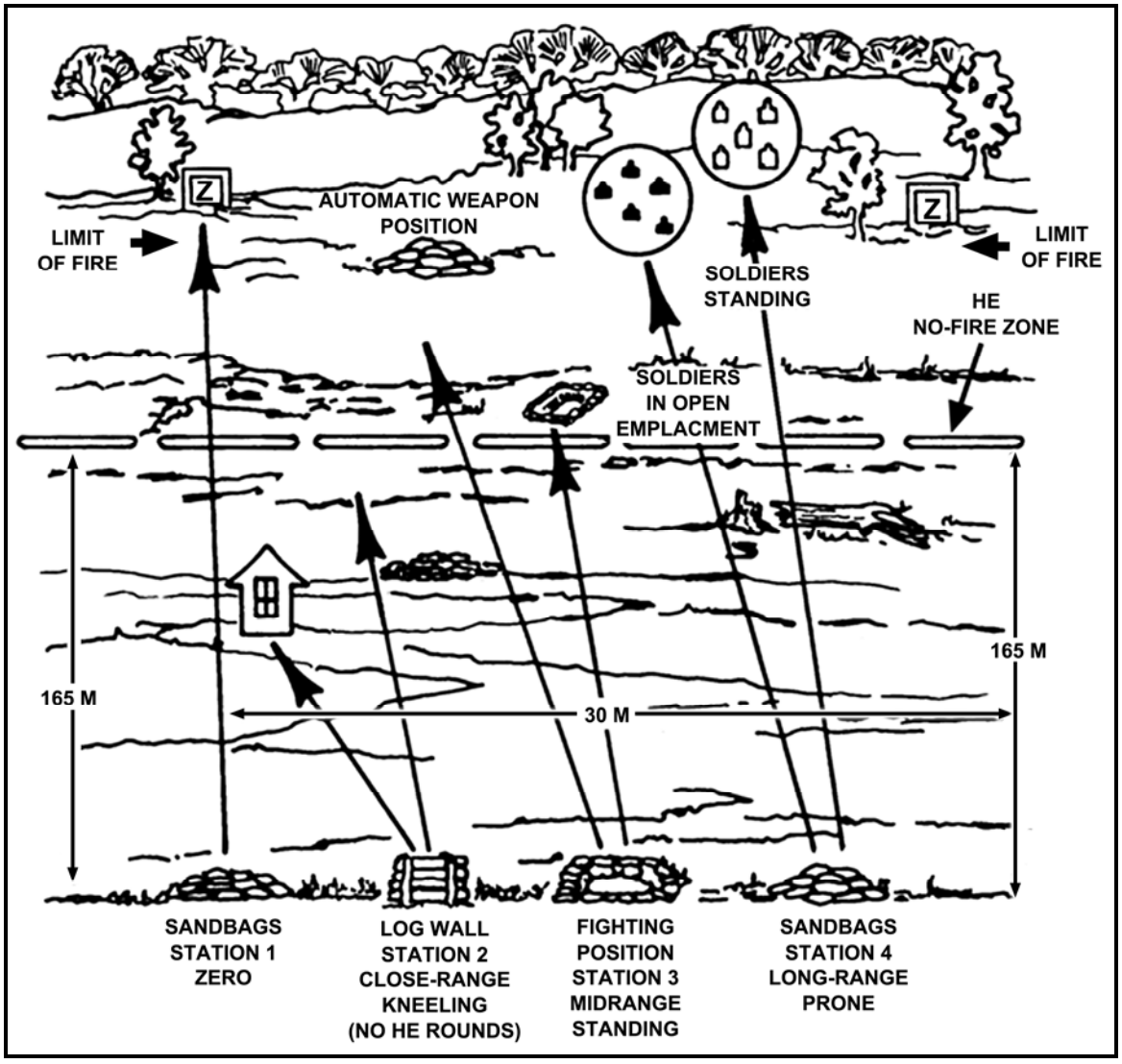

Figure A-2. Grenade launcher range

Station 1

A-29. Station 1 consists of a prone fighting position equipped with sandbags for support and a zeroing target at 200 meters. The target should be constructed of logs or other suitable material. It must have a surface at least two meters high and two meters wide. The target should be clearly marked with a large "Z" painted in a color that contrasts with the surrounding background and that is visible in different sun or glare conditions.

Station 2

A-30. Station 2 consists of an upright log or log wall, a kneeling firing position about 4 feet high, and 2 point-type targets. The targets include a simulated window or door of a building at 100 meters and a small bunker or fighting position with overhead cover at 125 meters. The target may be constructed of logs, sandbags, or other suitable material.

Station 3

A-31. Station 3 consists of a fighting position and two targets. The targets are a two-person bunker at 175 meters and an automatic weapon position at 200 meters. The bunker represents a point target, and the automatic weapon position represents an area target. The targets may be constructed of logs, sandbags, or other suitable material.

Station 4

A-32. Station 4 consists of a prone fighting position with a log or sandbag support and two area targets (with personnel targets in the open) at 250 and 350 meters. The log or sandbags at the firing position are used for support and cover. The targets are E-type and F-type shaped silhouette and are made out of durable materials.

AMMUNITION POSITIONING

A-33. To provide a safe and operational range, the following are recommended procedures for handling ammunition:

- Locate all ammunition for the weapons involved at firing sites outside of the backblast area (when applicable).
- Store ammunition at a position that minimizes the potential for ignition, explosion, or rapid burning.
- Cover all ammunition to protect it from the elements and direct rays of the sun. For proper ventilation, provide air circulation between the ammunition and cover.

EQUIPMENT

A-34. The following equipment is required for range operations:

- Range packet and clearance form.
- Safety fan and diagram (if applicable).
- Other safety equipment (i.e., aiming circle, compass).
- Publications pertaining to the training that will be conducted.
- Lesson plans, status reports, and reporting folder.
- Range flag and light (night firing).
- Radios.
- Field telephone and wire.
- Radio antenna (if necessary).
- Public address set with backup bullhorn(s).
- Concurrent training markers.
- Training aids for concurrent training stations.
- Sandbags.
- Briefing and warm-up tents.
- Space heaters (if needed).
- Colored helmets for control personnel.
- Safety paddles and vehicle flag sets or lights.
- Ambulance or designated vehicle.
- Earplugs.
- Water for drinking and cleaning.
- Scorecards.
- Master scorecard.
- Armorer's tools and cleaning equipment for weapons.

- Brooms, shovels, and other cleaning supplies and equipment.
- Tables and chairs (if needed).
- Target accessories.
- Fire extinguishers.
- Tarp, stakes, and rope to cover the ammunition.
- Toilet paper.
- Spare weapons and repair parts (as needed).
- Tow bar and slave cables for vehicles.
- Fuel and oil for vehicles and target mechanisms.
- Laser boresight.
- 10-meter boresight target.

PERSONNEL

A-35. To provide a safe and efficient range operation and effective instruction, certain duties may be required of personnel. The personnel may include—

- OIC.
- Range safety officer.
- NCOIC.
- Ammunition detail.
- Unit armorer.
- Assistant instructor.
- Medical personnel.
- Control tower operators.
- Maintenance detail.

Officer In Charge

A-36. The OIC is responsible for the overall operation of the range before, during, and after live-firing.

Range Safety Officer

A-37. The range safety officer—

- Is responsible for the safe operation of the range.
- Conducts a safety orientation before each scheduled LFX.
- Ensures that a brass and ammunition check is made before the unit leaves the range.
- Ensures that all personnel comply with the safety regulations and procedures prescribed for the conduct of an LFX.
- Ensures that all left-handed grenadiers use left-handed firing devices.

***Note*.** This officer should not be assigned duties other than those of the safety officer.

Noncommissioned Officer In Charge

A-38. The NCOIC assists the OIC and safety officer by performing duties as required; for example, he might supervise enlisted personnel who are supporting the LFX.

Ammunition Detail

A-39. This detail is composed of one or more ammunition handlers. The ammunition detail—

- Breaks down, issues, receives, accounts for, and safeguards live ammunition.
- Collects expended ammunition casings and other residue.

Unit Armorer

A-40. The unit armorer—

- Repairs rifles.
- Replaces parts.

Assistant Instructor

A-41. One assistant instructor is assigned for each one to ten firing points. Each assistant instructor—

- Ensures that all grenadiers observe safety regulations and procedures.
- Assists grenadiers having problems.

Medical Personnel

A-42. Medical personnel provide medical support, as required by regulations governing LFXs.

Control Tower Operators

A-43. Control tower operators—

- Raise and lower the targets.
- Time the exposures.
- Sound the audible signal.
- Give the fire commands.

***Note*.** If possible, two men should be chosen to perform these functions.

Maintenance Detail

A-44. This detail should be composed of two segments: one to conduct small arms repair and one to perform minor maintenance on the target-holding mechanisms.

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Appendix B

Range Procedures and Range Operations Checklist

This appendix contains the procedures used to conduct live-fire training exercises. These procedures support Army regulations, local range regulations, and established unit training SOPs.

RANGE OPERATIONS CHECKLIST

B-1. Conduct of the training exercise should clearly define and establish details and equipment needed to open and operate the range so that these actions do not adversely impact Soldiers' training time. This checklist consists of nine sections, each covering a topic relating to range operations:

- Conduct a mission analysis.
- Double check.
- Become an expert.
- Determine requirements.
- Determine available resources.
- Foolproof.
- Occupy the range and conduct training.
- Close the range.

Notes.

1. The procedures outlined in this checklist should be followed in order to open the range and conduct effective training.

2. The checklist should be modified to include local policy changes to regulations or SOPs.

B-2. The person responsible for the training must answer the questions in each section. To answer these questions, he should use the following procedures:

- Ask each question in order.
- Record each answer as a “Yes” or “No.” Answer “No” to those questions to which you do not know the answer.
- After all of the questions in a section are answered, analyze those that are answered with a “No.”
  - Contact the people who reported them and ask if they have corrected each problem. If so, change the answer to “Yes.”
  - If any “No” remains, analyze it and implement a countermeasure for the shortfall. Afterward, check to ensure that the countermeasures work.
  - Before range operations start, be sure that a workable countermeasure is implemented for each safety hazard presented by a “No” answer.

CONDUCT A MISSION ANALYSIS

B-3. Mission analysis includes identifying—

- Who will be firing on the range (number of personnel and units)?
- What weapons and course will be used?
- Where the training will be conducted (on what range).
- When the range is scheduled for operations (dates and times at which the range opens and closes).

DOUBLE CHECK

B-4. Leaders should verify that all preparations have been made. This includes asking the following questions:

- Has sufficient ammunition been requested for the number of personnel?
- Are the range facilities adequate for the type of training to be conducted?
- Has enough time been scheduled to complete the training?
- Have conflicts that surfaced been resolved?

BECOME AN EXPERT

B-5. To become an expert, a leader should—

- Review technical and field manuals on the weapons to be fired.
- Talk with the armorer and other personnel experienced with the weapons to be fired.
- Review AR 385-63.
- Visit range control and read the installation's range instructions.
- Reconnoiter the range (preferably while it is in use).

DETERMINE REQUIREMENTS

B-6. Determining the requirements involves identifying the equipment and personnel necessary to conduct the training.

Personnel

B-7. The following personnel are required for range operations:

- OIC.
- Safety officer.
- Assistant safety officer.
- NCOIC.
- Ammunition NCO.
- Ammunition personnel (determined by type of range).
- Target detail and target operators.
- Tower operator.
- Concurrent training instructors.
- Assistant instructors.
- Radio-telephone operator (RTO).
- Guards (range requirements).
- Medic(s).
- Air guard.
- Armorer.
- Truck driver (range personnel and equipment).
- Mechanic for vehicles.

B-8. Further, the following must be checked:

- Have you overstaffed your range?

DETERMINE AVAILABLE RESOURCES

B-9. Determining available resources involves the following:

- Fill personnel spaces.
- Keep unit integrity.
- Utilize NCOs.
- Coordinate with supporting organizations:
  - Ammunition.
  - Transportation.
  - Training aids.
  - Medics.
  - Weapons.
  - Other equipment.

FOOLPROOF

B-10. To foolproof range operations—

- Write an overall lesson plan for the range.
- Organize a plan for firing:
  - Determine the range organization.
  - Outline courses of fire to be used.
  - Have fire commands typed for use on the range.
  - Set the rotation of stations.
- Rehearse concurrent training instructors and assistants.
- Brief the RTO on unique range control radio procedures.
- Brief and rehearse the reporting NCO on range operation and all of his duties.
- Collect and concentrate equipment for use on the range in one location.
- Obtain training aids.
- Pick up targets from the range warehouse (if required).
- Report to range control for a safety briefing (if required) and sign for any special items.
- Publish the letter of instruction:
  - Uniform of range and firing personnel (helmets and earplugs).
  - Mode of transportation, departure times, and places.
  - Methods of messing to be used.
  - Any special requirements being placed on units.

OCCUPY THE RANGE AND CONDUCT TRAINING

B-11. Certain actions must be performed to properly occupy the range and conduct training.

Occupy the Range

B-12. When occupying the range, perform the following actions:

- Request permission to occupy the range.
- Establish good communications.
- Have designated areas prepared:

  - Parking.
  - Ammunition point.
  - Medical station.
  - Water point.
  - Concurrent training.
  - Mess.
  - Helipad.
  - Armorer.
- Inspect the range for operational condition.
- Raise the flag when occupying or firing according to the local SOP.
- Check the ammunition to ensure that it is the correct type and quantity.
- Ensure that range personnel are in the proper uniform and the equipment is in position.
- Receive firing units.
- Conduct safety checks on weapons.
- Check for clean, fully operational weapons.
- Conduct a safety briefing (to include administrative personnel on the range).

***Note*.** See the end of this appendix for more information about conducting a safety briefing.

- Organize personnel into firing orders (keep unit integrity, if possible).
- Request permission to commence firing from range control.

Conduct of Firing

B-13. When conducting firing, the following must be checked:

- Are communications to range control satisfactory?
- Are commands from the tower clear and concise?
- Are range areas policed?
- Is ammunition accountability maintained?

***Note*.** See the end of this appendix for more information about issuing ammunition.

- Is the master scorecard updated?
- Is personnel accountability maintained?
- Are vehicles parked in the appropriate areas?
- Is the air guard on duty and alert?
- Are personnel in proper uniform?
- Are earplugs in use?
- Are troops responding properly to commands?
- Are on-the-spot corrections being made when troops use poor techniques or fail to hit the target?
- Is conservation of ammunition being enforced?
- Are weapons cleared before they are taken from the firing line?
- Are personnel checked for brass or ammunition before they leave the range?
- Is anyone standing around not involved in training or support?

CLOSE THE RANGE

B-14. To properly close the range, the following must be performed:

- Close downrange according to the local SOP.
- Remove all equipment and ammunition from the range.
- Police the range.
- Repaste and resurface targets as required by range instructions.
- Perform other maintenance tasks as required by the local SOP.
- Request a range inspector from range control when ready to be cleared.
- Submit an AAR to headquarters.
- Report any noted safety hazards to the proper authorities.

SAFETY BRIEFING

B-15. Before beginning an LFX, all personnel must receive an orientation on range operations. The orientation should outline the procedures for conducting the exercise, to include the duties of the nonfiring orders.

RECOMMENDED BRIEFING

B-16. All personnel training on a rifle range should be briefed on the safety and local requirements for that range. This briefing fulfills the minimum requirements for a rifle range safety briefing. Information may be added to conform to local requirements and safety regulations. AR 385-10 and AR 385-63 should be reviewed by all range personnel before operating any range.

B-17. The safety program should identify—

- Surface danger zones, as described in AR 385-63.
- Location of medical personnel.
- Left and right limits of the range.

Note. Grenadiers never fire outside of these limits.

- Designated smoking area (if applicable).

B-18. Further, the safety program should include the following information:

- Inspect for objects located near the weapon's muzzle before firing, especially during unassisted night fire.
- When not on the firing line, ensure that both weapons' selector levers are in the SAFE position, and the bolt is locked to the rear.
- Ensure that grenadiers enter and exit the firing line at the entry or exit point.
- Before occupying a firing position, inspect it for wildlife or obstructions.
- Always keep the weapon's muzzle pointed downrange when on the firing line, and keep the finger outside of the trigger housing area.
- Never touch a weapon while personnel are downrange or in front of the firing line.
- Load the weapon only on command from the tower or control point.
- Never fire without using hearing protection.
- Ensure that left-handed grenadiers attach left-handed brass deflectors to their weapon before firing.
- When entering or exiting the firing line, clear the weapon with a cleaning rod.
- Consider the rifle loaded at all times, even in break areas. Never point the weapon at anyone.
- If you observe an unsafe act, immediately call CEASE FIRE, move the weapon's selector lever to the SAFE position, place it in the V-notched stake or lay it on the sandbags, and give the verbal and visual command of cease fire.

- Once cleared off of the firing line, report to the ammunition point and turn in all brass and ammunition.
- Do not leave the range until you have been inspected for live ammunition and brass.
- In case of an electrical storm, wait for direction to lock and clear all weapons, ground the equipment (except wet weather gear), and disperse into a predetermined area.
- Do not eat or drink on the firing line unless the tower operator permits drinking from a canteen.

***Note*.** Drink water often to prevent heat injuries.

AMMUNITION ISSUANCE

B-19. To provide a safe and operational range, the following are recommended procedures for handling ammunition:

- Issue ammunition to firing units immediately before scheduled training exercises.
- Distribute small arms ammunition to troops only when they are on the ready line or firing line.
- Limit the unpacking of ammunition at the firing line to the minimum number of rounds needed.
- Retain packaging material until firing is complete.
- Do not burn wooden containers or indiscriminately fire ammunition to preclude return to a storage site.

Appendix C

40-mm Grenade Launcher Skills Test

Before performing LFXs, Soldiers take the 40-mm grenade launcher skills test. This nonfiring exercise is used to determine the grenadier's proficiency on dry-fire tasks associated with the M320 40-mm grenade launcher. Using five stations, Soldiers must demonstrate proficiency on the following tasks:

- Maintain an M320 grenade launcher.
- Install mounting brackets, the leaf sight assembly, and the DNS on the M320 grenade launcher.
- Load, unload, and place the M320 grenade launcher on SAFE.
- Correct malfunctions on an M320 grenade launcher.
- Identify 40-mm ammunition and their purpose.

Notes.

1. Trainers need not conduct this examination on a range; it may be conducted indoors if facilities are available.

2. The skills test is administered using tasks, conditions, standards, administrative guidelines, and performance checklists.

3. Commanders may add to, but not delete from, tasks on the skills test. Once basic proficiency has been attained, commanders can include special conditions, such as CBRN or limited visibility.

As a minimum, the 40-mm grenade launcher skills test must be administered semi-annually for AC units and annually for RC units prior to live-fire qualification.

STATION 1

C-1. At this station, Soldiers clear, disassemble, inspect, reassemble, and perform a function check on the M320 grenade launcher within eight minutes.

SETUP

Note. Prepare one setup for each Soldier to be tested. Place each weapon on a mat to keep its parts free of dirt.

C-2. Each setup should include one M320 grenade launcher with its barrel closed and its selector lever moved to the SAFE position; cleaner, lubricant, preservative (CLP); thong; bore brush; and clean rags.

CONDUCT

C-3. Trainers should read the following statement. Trainers use the performance checklist shown in Figure C-1 to grade individual performance. After each group is tested, trainers assemble the Soldiers that have been graded and critique their performance for about five minutes.

TRAINER:

At this station, you will be required to disassemble and assemble the 40-mm grenade launcher. There will be one grader for every two weapons. You will have eight minutes to complete the disassembly, maintenance inspection, and reassembly of the grenade launcher and perform a function check of the weapon. If you have any trouble, raise your hand and the grader will assist you. When your group is not being tested, remain to the rear of the station with your back toward the working area until your group is called.

ACTION	Maintain an M320 grenade launcher.
CONDITION	Given an M320 grenade launcher with CLP, thong, bore brush, and clean rags.
STANDARD	Cleared, disassembled, inspected, reassembled, and performed a function check on the M320 grenade launcher.

PERFORMANCE MEASURES	**GO**	**NO-GO**
1. Clear the M320 grenade launcher.		
a. Pointed the weapon in a safe direction.	_____	_____
b. Moved the selector lever to the SAFE (“S”) position.	_____	_____
c. Pressed the barrel release allowing the barrel to swing out from the left side of the receiver.	_____	_____
d. Inspected the barrel for the presence of ammunition.	_____	_____
e. Swiveled the barrel into the receiver until the locking lever engaged the barrel.	_____	_____
2. Disassemble the M320 grenade launcher.		
a. Removed the DNS by loosening the knurled screw on the top side.	_____	_____
b. Unscrewed the rail grabber lug counterclockwise.	_____	_____
c. Removed the DNS from the rail and disconnected the remote cable from the DNS.	_____	_____
3. Inspect the M320 grenade launcher before reassembly.		
a. Checked the M320 for cracks, dents, or distortion that would prevent its firm attachment to the host weapon.	_____	_____
b. Checked the DNS for bent or damaged parts and for rust or corrosion.	_____	_____
c. Checked the leaf sight assembly for legibility of markings.	_____	_____
d. Checked the barrel for cracks and general condition.	_____	_____
e. Inspected all parts for excessive wear and damage.	_____	_____
f. Checked for burrs, scratches, nicks, or damage.	_____	_____
4. Reassemble the M320 grenade launcher.		
a. Pressed the barrel stop and slid the barrel into the receiver.	_____	_____
b. Moved the barrel to the rear to lock into position.	_____	_____
c. Installed the handguards and secured the slip ring.	_____	_____
d. Reinstalled the DNS.	_____	_____
5. Perform a function check.		
a. Cleared the grenade launcher.	_____	_____
b. Ensured the selector lever rotates from SAFE ("S") to FIRE ("F") and back to SAFE ("S") with an audible click.	_____	_____
c. Pointed the weapon in a safe direction, ensured the selector lever was in the SAFE (“S”) position and the weapon was unloaded, and attempted to pull the trigger rearward.	_____	_____
***Note*.** The trigger must remain in the forward position with no rearward travel.		
d. Pressed the barrel release, allowing the barrel to pivot outward.	_____	_____
e. Moved the selector lever to the SAFE (“S”) position.	_____	_____
***Note*.** The firing pin located on the hammer must not protrude from the bolt face into the chamber.		
f. Moved the selector lever to the FIRE (“F”) position.	_____	_____
g. Pressed the barrel release while attempting to pull the trigger.	_____	_____
***Note*.** It must not be possible to pull the trigger enough to raise and release the hammer.		
h. Pulled the trigger to detect the firing pin protrusion with light finger pressure on the breech face, with the barrel pivoted outward and the selector lever in the FIRE ("F") position.	_____	_____

Figure C-1. Maintain an M320 grenade launcher

STATION 2

C-4. At this station, Soldiers install the mounting brackets, the leaf sight assembly, and the DNS on the M320 grenade launcher within four minutes.

SETUP

***Note*.** Prepare one setup for each Soldier to be tested. Place each weapon and the equipment on a mat to keep the parts free of dirt.

C-5. Each setup should include one M320 grenade launcher, mounting brackets for M16- and M4-series weapons, a leaf sight assembly, and a DNS.

CONDUCT

C-6. Trainers should read the following statement. Trainers use the performance checklist shown in Figure C-2 to grade individual performance. After each group is tested, trainers assemble the Soldiers that have been graded and critique their performance for about five minutes.

TRAINER:

At this station, you will be required to install the mounting bracket, leaf sight assembly, and the DNS on the grenade launcher. There will be one grader for every two weapons. You will have four minutes to complete this task. If you have any trouble, raise your hand and the grader will assist you. When your group is not being tested, remain to the rear of the station with your back toward the working area until your group is called.

STATION 3

C-7. At this station, Soldiers load, unload, and place the M320 grenade launcher on safe within two minutes.

SETUP

***Note*.** Prepare one setup for each Soldier to be tested. Place each weapon on a mat to keep its parts free of dirt.

C-8. Each setup should include one dummy round and one M320 grenade launcher with its breech closed and its selector lever moved to the FIRE (“F”) position.

CONDUCT

C-9. Trainers should read the following statement. Trainers use the performance checklist shown in Figure C-3 to grade individual performance. After each group is tested, trainers assemble the Soldiers that have been graded and critique their performance for about five minutes.

TRAINER:

At this station, you will be required to load, unload, and place the grenade launcher on SAFE. There will be one grader for every two weapons. You will have two minutes to complete the task. If you have any trouble, raise your hand and the grader will assist you. When your group is not being tested, remain to the rear of the station with your back toward the working area until your group is called.

ACTION	Install mounting brackets, leaf sight assembly, and the DNS on the M320 grenade launcher.
CONDITION	Given an M320 grenade launcher and the M16 and M4 mounting brackets, mounting tools, leaf sight assembly, and DNS.
STANDARD	Properly install the mounting brackets to the M16 or M4 and install both the leaf sight assembly and DNS.

PERFORMANCE MEASURES	**GO**	**NO-GO**
1. Install the mounting brackets.		
a. M16 mounting bracket		
(1) Set the front mounting bracket in the front cutout of the M320 receiver, aligned the holes, and tightened the screws with the 5-mm end of the key wrench.	_____	_____
(2) Pressed the buttstock locking lever and positioned the rear mounting adapter in the slot in the rear of the receiver, aligning the holes.	_____	_____
(3) Installed the shorter head cap screws in front of the rear mounting adapter and the longer one in the rear from underneath the bracket and hand tightened until both were snug, then tightened from the back to the front.	_____	_____
(4) Removed the bottom handguard from the M4/M16.	_____	_____
(5) Attached the mounting bracket to the host weapon using the bayonet adapter lug and ensured the rear bracket fit into the barrel nut groves and pushed down until an audible click was heard.	_____	_____
b. M4 mounting brackets		
(1) Set the front mounting bracket in the rear cutout of the M320 receiver and aligned the holes then tightened the screws with the 5-mm end of the key wrench.	_____	_____
(2) Pressed the buttstock locking lever and positioned the rear mounting adapter in the slot in the rear of receiver, aligning the holes.	_____	_____
(3) Installed the short head cap screw in front of the rear mounting adapter and the long cap screw in the rear from underneath the bracket and hand tightened until both were snug, then tightened from back to front.	_____	_____
(4) Removed the bottom handguard from M4.	_____	_____
(5) Prepared to attach the mounting bracket to the host weapon using the bayonet adapter lug and ensured the rear bracket fits into barrel nut groves and pushed down until an audible click was heard.	_____	_____
2. Install the leaf sight assembly.		
a. Aligned the holes on the sight mount to the holes on the right side of the receiver with the leaf sight secured to mount.	_____	_____
b. Installed two socket head cap screws and tightened with the 3-mm end of the key wrench.	_____	_____
3. Install the DNS.		
A1. Installed the remote cable connector into the remote jack.		
b. Loosened the clamping knob on the DNS until the clamping jaws had sufficient space to fit over the rail of the mount bracket.	_____	_____
c. Positioned the recoil lug in the groove of the rail of the mount bracket. Turned the clamping knob clockwise to tighten. Ensured that the DNS was securely seated and tightened on mounting bracket.	_____	_____

Figure C-2. Install mounting brackets, leaf sight assembly, and the day/night sight on the M320 grenade launcher

ACTION	Load, unload, and place the M320 grenade launcher on safe.
CONDITION	Given an M320 grenade launcher and dummy ammunition.
STANDARD	Insert ammunition into the chamber without damaging the equipment or injuring personnel, unload the grenade launcher, and place the weapon on safe using the safety procedures outlined in TM 9-1010-232-10.

PERFORMANCE MEASURES	**GO**	**NO-GO**
1. Load an M320 grenade launcher.		
a. Moved the selector lever to the SAFE (“S”) position.	_____	_____
b. Depressed the barrel release lever, allowing the barrel to pivot open.	_____	_____
c. Ensured the bore and chamber were clean and dry before loading.	_____	_____
d. Inserted the ammunition into the chamber.	_____	_____
e. Pivoted the barrel until it locked and clicked.	_____	_____
2. Unload the M320 grenade launcher.		
a. Moved the selector lever to the SAFE (“S”) position.	_____	_____
b. Depressed the barrel release.	_____	_____
c. Removed the shell casing or round of ammunition.	_____	_____
d. Secured the round or expended cartridge.	_____	_____
e. Closed the barrel.	_____	_____

Figure C-3. Load, unload, and place the M320 grenade launcher on safe

STATION 4

C-10. At this station, Soldiers correct malfunctions on an M320 grenade launcher within two minutes.

SETUP

***Note*.** Prepare one setup for each Soldier to be tested. Place each weapon on a mat to keep its parts free of dirt.

C-11. Each setup should include one dummy round and one M320 grenade launcher with its breech open and its selector lever in the SAFE ("S") position.

CONDUCT

C-12. Trainers should read the following statement. Trainers use the performance checklist shown in Figure C-4 to grade individual performance. After each group is tested, trainers assemble the Soldiers that have been graded and critique their performance for about five minutes.

TRAINER:

At this station, you will be required to apply immediate action to the grenade launcher. There will be one grader for every two weapons. You will have two minutes to complete the task. If you have any trouble, raise your hand, and the grader will assist you. When your group is not being tested, remain to the rear of the station with your back toward the working area until your group is called.

ACTION	Correct malfunctions on an M320 grenade launcher.
CONDITION	Given an M320 grenade launcher in the attached (mounted on an M16- or M4-series weapon) or stand-alone configuration and dummy ammunition.
STANDARD	Take actions to correct malfunctions on an M320 grenade launcher, following all safety precautions in accordance with TM 9-1010-232-10.

PERFORMANCE MEASURES	**GO**	**NO-GO**
1. The cartridge does not fire.		
a. Moved the selector lever to the SAFE ("S") position.	_____	_____
b. Kept the weapon pointed downrange for at least one minute.	_____	_____
c. Moved the selector lever to the FIRE ("F") position and attempted to fire the cartridge by pulling the trigger a second time.	_____	_____
2. The cartridge failed to fire on the second attempt.		
a. Moved the selector lever to the SAFE ("S") position.	_____	_____
b. Kept the weapon pointed downrange for at least one minute.	_____	_____
c. Pivoted the barrel out from the receiver by pressing upward on the barrel release lever and removed the faulty cartridge.	_____	_____
d. Disposed of the faulty cartridge in accordance with AR 385-10.	_____	_____
3. The malfunction has still not been resolved.		
a. Waited 30 seconds from the time of the failure to fire and then opened the barrel.	_____	_____
b. Removed the round from the barrel and checked for corrosion, gouges, bulging, or misshapen cartridges.	_____	_____
c. Checked for improperly assembled or incomplete parts.	_____	_____
d. Checked to ensure that the firing pin or other component was not broken.	_____	_____
4. Weapon still fails to operate properly.		
a. Cleared the weapon.	_____	_____
b. Performed troubleshooting procedures in accordance with TM 9-1010-232-10.	_____	_____

Figure C-4. Correct malfunctions on an M320 grenade launcher

STATION 5

C-13. At this station, Soldiers identify thirteen 40-mm rounds and their purposes within ten minutes.

SETUP

***Note*.** Prepare one setup for every three Soldiers to be tested.

C-14. Each Soldier's setup should consist of color pictures of 40-mm ammunition, paper, and pencils.

CONDUCT

C-15. Trainers should read the following statement. Trainers use the performance checklist shown in Figure C-5 to grade individual performance. After each group is tested, trainers assemble the Soldiers that have been graded and critique their performance for about five minutes.

TRAINER:

At this station, you will be required to identify the standard types of 40-mm ammunition and their purposes. There will be one grader for every two tables. You will have ten minutes to complete the task. If you have any trouble, raise your hand and the grader will assist you. When you are not being tested, remain to the rear of the station with your back toward the working area until you are called.

ACTION	Identify 40-mm ammunition and their purposes.		
CONDITION	Given color pictures of 40-mm ammunition, paper, and a pencil.		
STANDARD	Identify 40-mm ammunition by nomenclature, type, and purpose.		
PERFORMANCE MEASURES		**GO**	**NO-GO**
1.	Identified the M781 TP round.	_____	_____
2.	Identified the M406 HE round.	_____	_____
3.	Identified the M433 HE round.	_____	_____
4.	Identified the M585 star cluster round.	_____	_____
5.	Identified M583 (white), M661 (green), and M662 (red) star parachute rounds.	_____	_____
6.	Identified M713 (red), M715 (green), and M716 (yellow) ground smoke marker rounds.	_____	_____
7.	Identified the M992 IR illuminant round.	_____	_____
8.	Identified the M1006 nonlethal cartridge.	_____	_____
9.	Identified the M1029 crowd dispersal cartridge.	_____	_____

Figure C-5. Identify 40-mm ammunition and their purposes

EVALUATION

***Note*.** Internal or external evaluators may evaluate the skills test. External evaluation (using evaluators drawn from an organization other than the one being evaluated) is recommended. All evaluators must be skills test qualified within one year prior to testing. Evaluators must have achieved a GO on the task they are evaluating within 30 days prior to testing.

C-16. The Soldier's performance will be recorded using the performance measure checklists, with the overall performance recorded on DA Form 7680 (M320A/M320A1 40-mm Grenade Launcher Scorecard). DA Form 7680 will include—

- Soldier's name.
- Unit.
- Date.
- Zero setting for both leaf sight and DNS.
- Record fire results.
- Qualification rating (expert, first class, second class, or unqualified).
- Performance evaluation score (GO/NO-GO) and date completed.

- Evaluator's name.
- Remarks.

GO

C-17. The Soldier must complete all measures outlined in the performance checklist within the specified time limit to achieve a GO for the task. Soldiers must demonstrate proper procedures on all tasks prior to qualification; to achieve an overall GO on the skills test, the Soldier must receive a GO on all tasks.

NO-GO

C-18. If a Soldier does not achieve the standard indicated on the performance checklist (fails to complete the task, incorrectly performs task steps, or fails to meet the time standard), he receives a NO-GO. When a Soldier receives a NO-GO, he must be critiqued and provided corrective steps for all cited mistakes.

C-19. If a Soldier receives an additional NO-GO on the same task, he must return to be retested on another date. Retests should be conducted as soon as possible after a Soldier has received additional training for a failed task. Soldiers who fail retests should not be allowed to conduct LFXs and should be considered for reassignment.

Note. The Soldier will not be retested until his immediate supervisor initials the scoresheet indicating he has been retrained and is ready to retest.

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Appendix D

M203 40-mm Grenade Launcher

This appendix provides guidance for units to conduct training with the M203 grenade launcher. It discusses the weapon's characteristics, disassembly and assembly procedures, sights, operation and function, marksmanship training, firing positions, indirect fire role, and safety precautions.

SECTION I. CHARACTERISTICS

D-1. The M203-series grenade launchers (Figure D-1) are lightweight, single-shot, breech-loaded, pump-action (sliding barrel), shoulder-fired weapons.

CAPABILITIES AND FEATURES

D-2. There are three M203-series grenade launchers:

- The original model of the M203 was designed for use with M16-series rifles.
- The M203A1 model was designed for use with M4-series carbines.
- The M203A2 model has a quick-release bracket for use with M4- and M4A1-series carbines that have the M4 rail system and with M16A4 rifles that have the M5 adapter rail system.

Note. The unit armorer mounts the M203 on M16-series rifles, and the direct support maintenance company mounts the M203A1/A2 on M4-series carbines. Individual Soldiers should neither mount nor dismount the grenade launcher.

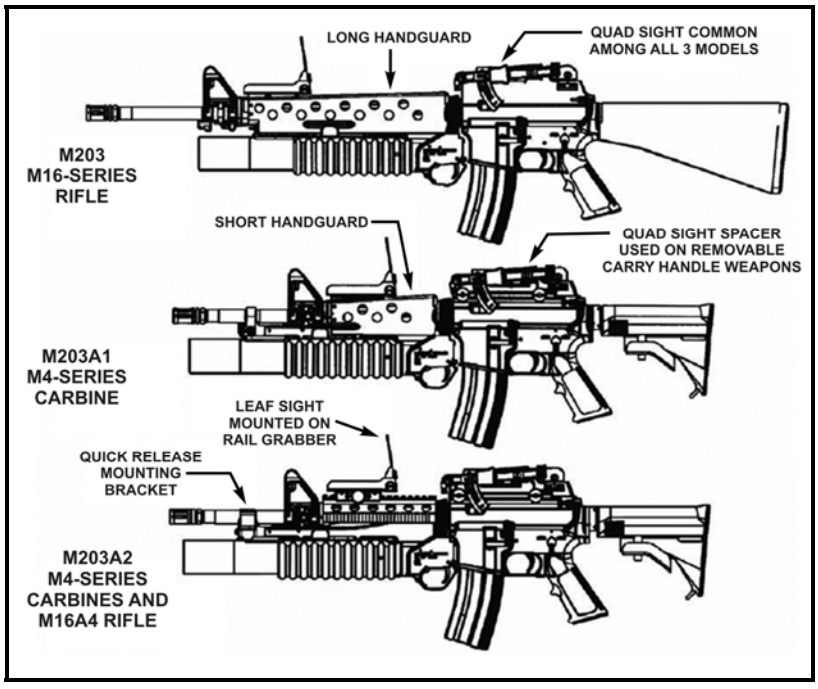


Figure D-1. M203-series grenade launchers

TECHNICAL DATA

D-3. Table D-1 contains the technical data for the M203 grenade launcher.

Table D-1. Technical data for the M203 grenade launcher

PHYSICAL CHARACTERISTICS			
Weapon	Length	Rifle and grenade launcher (overall)	39 inches
		Barrel only	12 inches
		Rifling	10 inches
	Weight	Launcher, unloaded	3.0 pounds
		Launcher, loaded	3.5 pounds
		Rifle and launcher, both fully loaded	11.0 pounds
	Number of lands		6-right hand twist
Ammunition	Caliber		40 mm
	Weight		8 ounces
FIRING CHARACTERISTICS			
Action			Single shot
Sights (Used Together or Separately)		Front leaf sight	Used between 50 and 250 m (beyond 250 m, the M16's barrel hides the target)
		Rear quadrant sight	Use with M16's front sightpost for ranges from 50 to 250 m
		Integrated front sightpost, rear sight aperture	Use for 50 to 400 m
Chamber Pressure			12,000 pounds per square inch
Muzzle Velocity			250 feet per second
Maximum Range			400 m
Maximum Effective Range		Fire team sized area target	350 m
		Vehicle or weapon point target	150 m
Minimum Safe Firing Range (HE)		Training unprotected	165 m
		Protected firing position	less than 165 m
		Combat	31 m
Minimum Arming Range			14 to 38 m
Rate of Fire			5 to 7 rounds per minute
Minimum Combat Load			36 HE rounds

COMPONENTS

D-4. The major components of the M203 grenade launcher are (Figure D-2)—

- Handguard.
- Receiver assembly.
- Barrel assembly.
- Barrel latch.
- Trigger guard.
- Safety.
- Sights.
  - Quadrant sight assembly.
  - Leaf sight assembly.

HANDGUARD

D-5. The handguard assembly (Figure D-2) houses the rifle barrel.

RECEIVER ASSEMBLY

D-6. The receiver assembly (Figure D-2) houses the firing mechanism and ejection system and supports the barrel assembly.

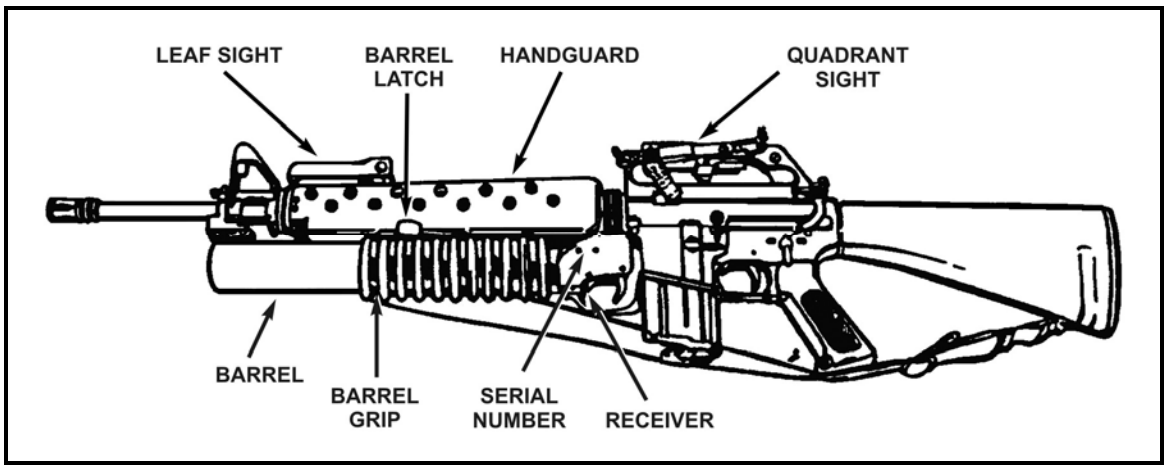


Figure D-2. Components of the M203 grenade launcher

BARREL ASSEMBLY

D-7. The barrel assembly (Figure D-2) holds the cartridges ready for firing and directs the projectile.

BARREL LATCH

D-8. The barrel latch (Figure D-2) is located on the left side of the barrel. It locks the barrel and receiver together. To open the barrel, the grenadier depresses the barrel latch and slides the barrel forward.

TRIGGER GUARD

D-9. The trigger guard (A, Figure D-3) protects the trigger. The grenadier depresses the rear portion of the trigger guard to rotate it down and away from the rifle's magazine well (B, Figure D-3). This enables the grenadier to wear gloves or mittens while firing.

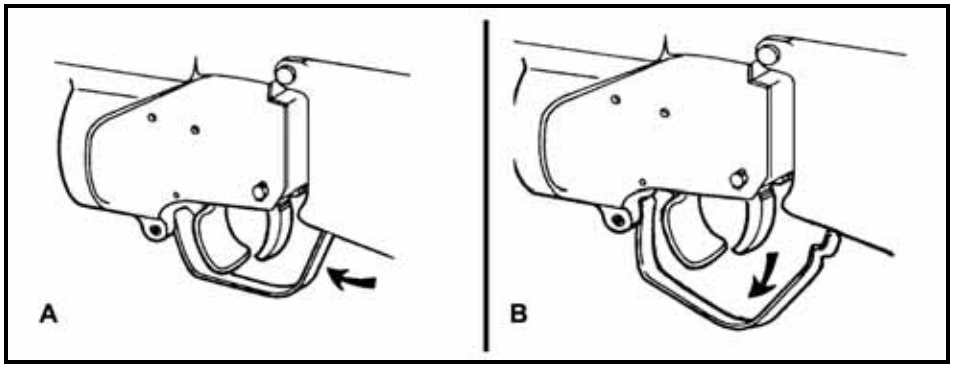


Figure D-3. Trigger guard

SAFETY

D-10. The safety is inside the trigger guard, just in front of the trigger. For the launcher to fire, the safety must be forward (in the FIRE position; Figure D-4, left). When the safety is rearward, the launcher is in the SAFE position (Figure D-4, right). The grenadier adjusts the safety manually.

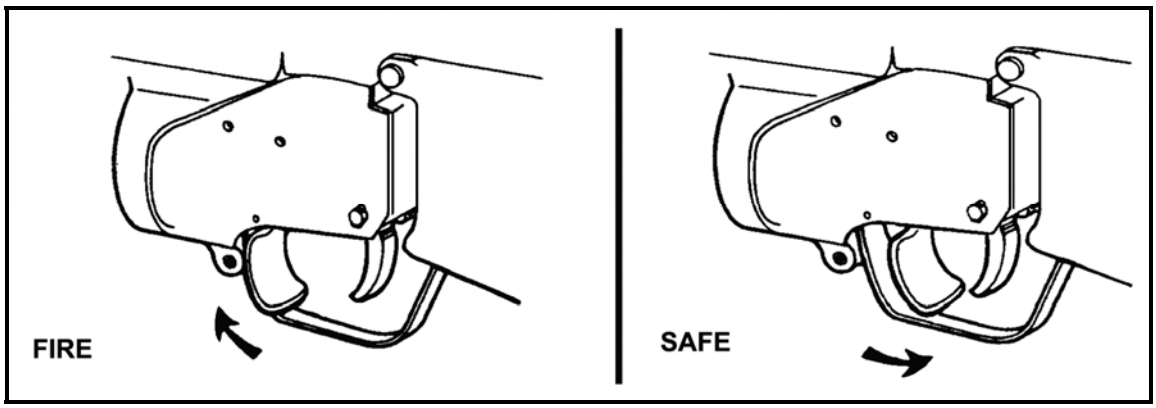


Figure D-4. Safety

QUADRANT SIGHT ASSEMBLY

D-11. The quadrant sight assembly (Figure D-5) attaches to the left side of the rifle's carrying handle. It enables the grenadier to adjust for elevation and windage. This assembly consists of—

- Clamp, bracket assembly, and mounting screw.
- Sight arm and range quadrant.
- Front sightpost.
- Rear sight aperture.

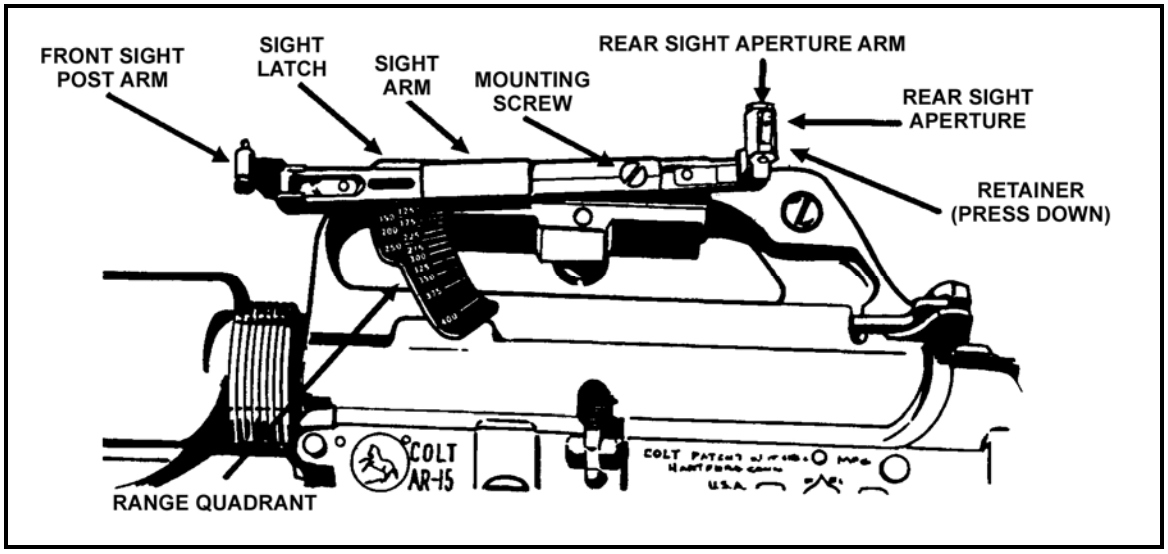


Figure D-5. Quadrant sight assembly

Clamp, Bracket Assembly, and Mounting Screw

D-12. The clamp and the bracket assembly hold the quadrant sight on the rifle's carrying handle. The mounting screw inserts through the right side of the clamp and into the bracket assembly.

Sight Arm and Range Quadrant

D-13. The sight arm mounts both the sight aperture arm (which holds the rear sight aperture) and the sightpost arm (which holds the front sightpost). This procedure allows the sight to pivot on the range quadrant to the desired range setting. The range quadrant is graduated in 25-meter increments from 50 to 400 meters.

D-14. To select a range—

(1) Apply rearward pressure on the sight latch to release the quadrant sight arm so it can move along the range quadrant.

(2) Center the number in the rear sight aperture to select the desired range.

(3) Release the sight latch to lock the sight into position.

Front Sightpost

D-15. The front sightpost mounts on the sightpost arm by means of a pivot bracket.

CAUTION

To prevent damage to the sights, keep the bracket closed when the sights are not in use.

D-16. To make minor adjustments in elevation when zeroing the launcher—

- To decrease elevation, turn the elevation adjustment screw on the sightpost clockwise.
- To increase elevation, turn it counterclockwise.

EXAMPLES

To move the impact of the projectile 5 meters at a range of 200 meters, turn the elevation adjustment screw one full turn (360 degrees).

To move the impact of the projectile 2.5 meters at a range of 200 meters, turn the elevation adjustment screw one-half turn (180 degrees).

Rear Sight Aperture

D-17. The rear sight aperture is on the sight aperture arm, which is attached to the rear portion of the quadrant sight arm.

D-18. To make minor adjustments in deflection (windage) when zeroing the launcher—

- To move the impact to the left, press the rear sight aperture retainer down and move the rear sight aperture away from the barrel.
- To move to the right, move it toward the barrel.

EXAMPLES

To move the impact of the projectile 1.5 meters at a range of 200 meters, move the rear sight aperture one notch.

LEAF SIGHT ASSEMBLY

D-19. The leaf sight assembly (Figure D-6) is attached to the top of the handguard. The leaf sight assembly consists of—

- Sight base.
- Sight mount and sight.

- Elevation adjustment screw and elevation scale.
- Windage screw and windage scale.

D-20. Elevation and windage scales are marked on the mount. The folding, adjustable, open ladder design of the sight permits rapid firing without sight manipulation.

Note. The front sightpost of the M16-series rifle serves as the front aiming post for the M203 leaf sight.

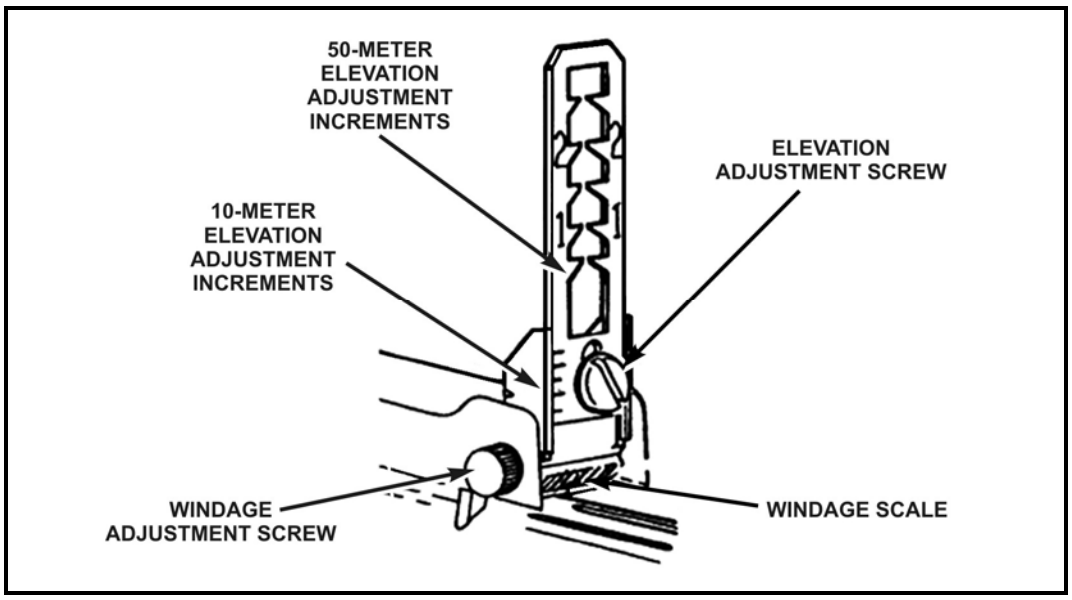


Figure D-6. Leaf sight assembly

Sight Base

D-21. Two mounting screws permanently attach the sight base to the rifle handguard. When the sight is down, the base protects it from damage.

Sight Mount and Sight

D-22. The grenadier uses the sight mount attached to the sight base to raise or lower the sight. Though the range is not marked on the sight in meters, the sight is graduated in 50-meter increments from 50 to 250 meters, which are marked with a "1" at 100 meters and a "2" at 200 meters.

Elevation Adjustment Screw and Elevation Scale

D-23. The screw attaches the sight to its mount. When the screw is loosened, the sight can be moved up or down to make minor adjustments in elevation during the zeroing procedure:

Note. The rim of a 40-mm cartridge case is useful for turning the screw.

- Raise the sight to increase the range.
- Lower the sight to decrease the range.

D-24. The elevation scale consists of five lines spaced equally on the sight. The index line is to the left of the sight.

EXAMPLE

To move the impact of the projectile 10 meters in elevation at a range of 200 meters, move the sight one increment.

Windage Screw and Windage Scale

D-25. The grenadier uses the knob on the left end of the windage screw to make minor deflection adjustments during the zeroing. The scale has a zero line in the center. Two vertical lines are located on either side of and are of equal distance from the zero line.

EXAMPLE

At a range of 200 meters, turning the knob on the windage scale one increment to the *left* moves the impact of the projectile 1.5 meters in the opposite direction, that is, to the *right*.

AMMUNITION

D-26. The M203 grenade launcher uses standard 40-mm grenade launcher ammunition. A complete list and description of each type can be found in TM 9-1010-221-10.

SECTION II. MARKSMANSHIP TRAINING

D-27. Marksmanship training teaches the grenadier to fire the grenade launcher and prepares him to employ it in combat. Except for the subjects discussed in the remainder of this appendix, marksmanship training, range construction, and range firing are the same for the M203 as they are for the M320/M320A1 grenade launcher.

***Note*.** See Chapters 2, 3, 4, and 5 for more information about M320/M320A1 grenade launcher marksmanship training.

PRELIMINARY MARKSMANSHIP TRAINING

D-28. During this phase of instruction, the following tasks are covered:

- Clear the weapon.
- Disassemble the weapon.
- Clean and lubricate the weapon.
- Assemble the weapon.
- Load the weapon.
- Fire the weapon.
- Aim the weapon and achieve correct sight picture.
- Sense and adjust fire.

CLEAR THE WEAPON

***Note*.** The Soldier must clear the weapon before performing maintenance on it. FM 3-22.9 provides instructions for clearing M16- and M4- series weapons.

D-29. To clear the grenade launcher—

(1) Push in the release button, and pull the barrel forward.

(2) Watch to see if a round extracts.

(3) Move the safety to the SAFE ("S") position.
(4) Inspect the breech to ensure a round is not present.
(5) Pull the barrel to the rear until it clicks. This cocks the weapon.

DISASSEMBLE THE WEAPON

Notes. 1. As he disassembles the weapon, the Soldier places each part on a clean, flat surface, such as a table, shelter half, or disassembly mat. This aids in reassembly and simplifies the task of keeping up with the parts. The Soldier will later reassemble the grenade launcher in the reverse order that he disassembled it.

2. Only ordnance personnel may disassemble the grenade launcher beyond the steps described here.

D-30. To disassemble the weapon (Figure D-7)—
(1) Loosen the mounting screw, and remove the quadrant sight assembly from the carrying handle of the weapon.
(2) Remove the barrel assembly and handguard assembly, in either order.

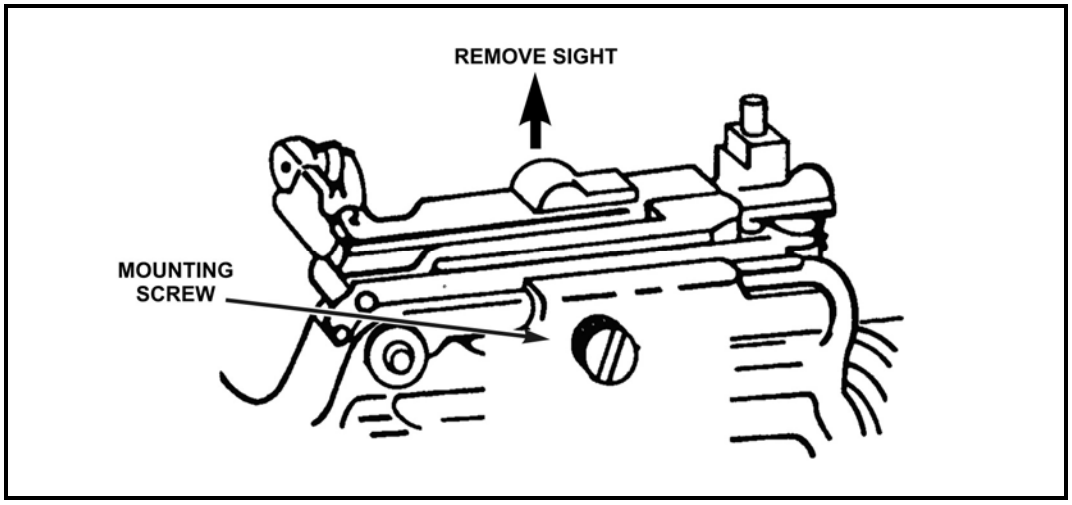


Figure D-7. Removing the quadrant sight assembly

- To remove the barrel assembly first (Figure D-8)—
  1. Push the barrel latch, and move the barrel forward until it hits the barrel stop.
  2. On the left side of the handguard, insert a cleaning rod into the fourth hole back from the muzzle.
  3. Depress the barrel stop, and slide the barrel forward and off.

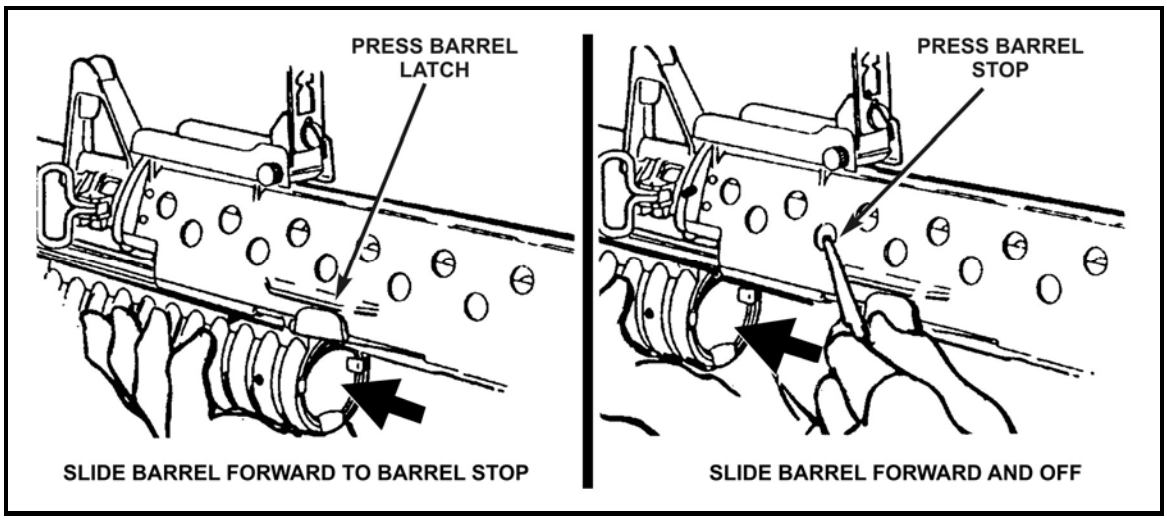


Figure D-8. Removing the barrel assembly before the handguard assembly

- To remove the handguard assembly first (Figure D-9)—
  1. Pull back on the rifle's slip ring, and remove the handguard by pulling it up and back.
  2. Push the barrel latch, and move the barrel forward until it hits the barrel stop.
  3. Use a cleaning rod to depress the barrel stop, and slide the barrel forward and off.

CAUTION

Never use a screwdriver or any other tool when removing the handguard assembly. Doing so could damage the handguard assembly or slip ring.

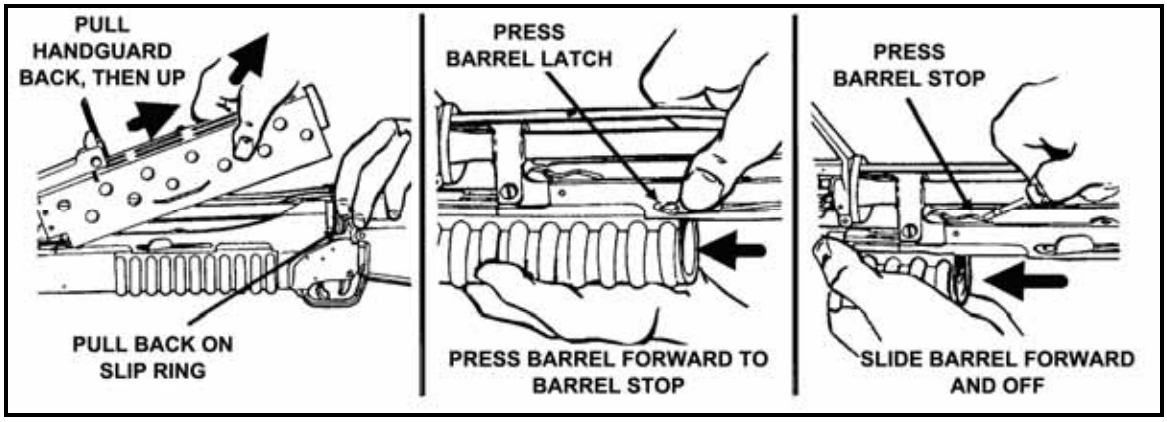


Figure D-9. Removing the handguard assembly before the barrel assembly

CLEAN AND LUBRICATE THE WEAPON

D-31. Proper maintenance of the M203 grenade launcher is vital and must be part of all gunnery training programs. Good maintenance contributes to weapon effectiveness as well as to unit readiness. Maintaining the weapon requires actions that must be taken before, during, and after firing to properly maintain the grenade launcher. The grenadier cleans and lubricates the M203 grenade launcher the same as he would the M320/M320A1 grenade launcher.

***Note*.** See TM 9-1010-221-10 for complete maintenance and inspection procedures.

ASSEMBLE THE WEAPON

D-32. To assemble the grenade launcher, perform disassembly procedures in reverse. To assemble the grenade launcher—

(1) Install the barrel by pressing the barrel stop and sliding the barrel into the receiver (Figure D-10).

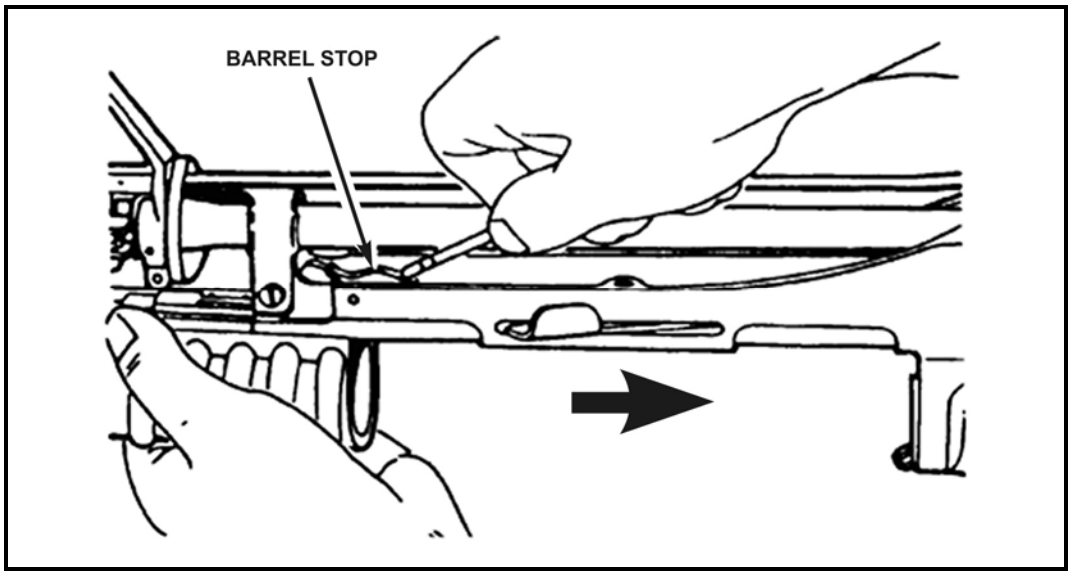


Figure D-10. Installing the barrel

(2) Lock the barrel by moving it rearward until it closes with a click (Figure D-11).

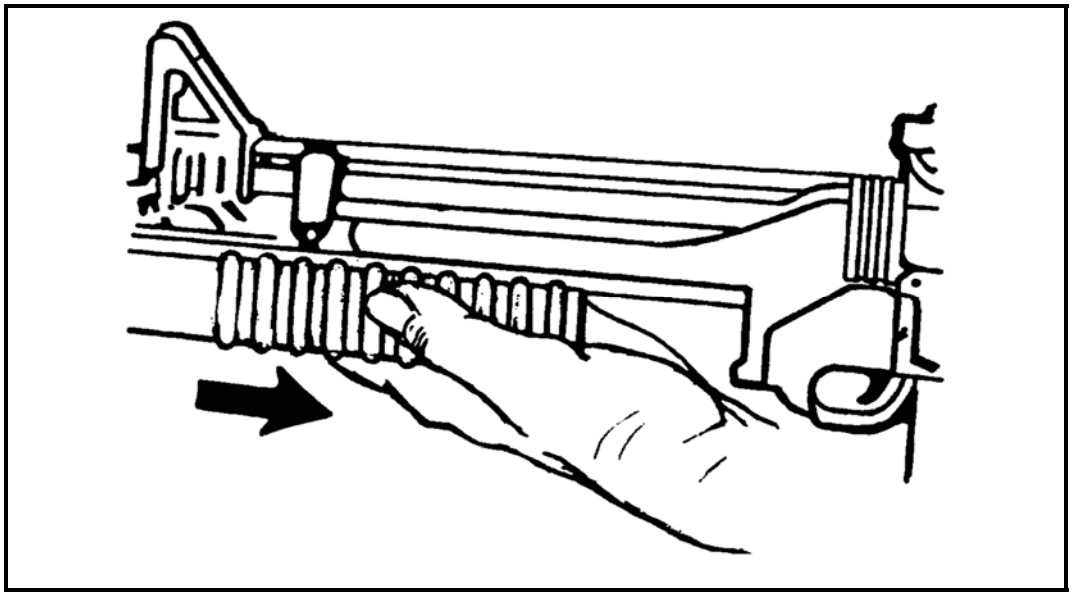


Figure D-11. Locking the barrel

(3) Install the handguard, and secure it with the slip ring (Figure D-12).

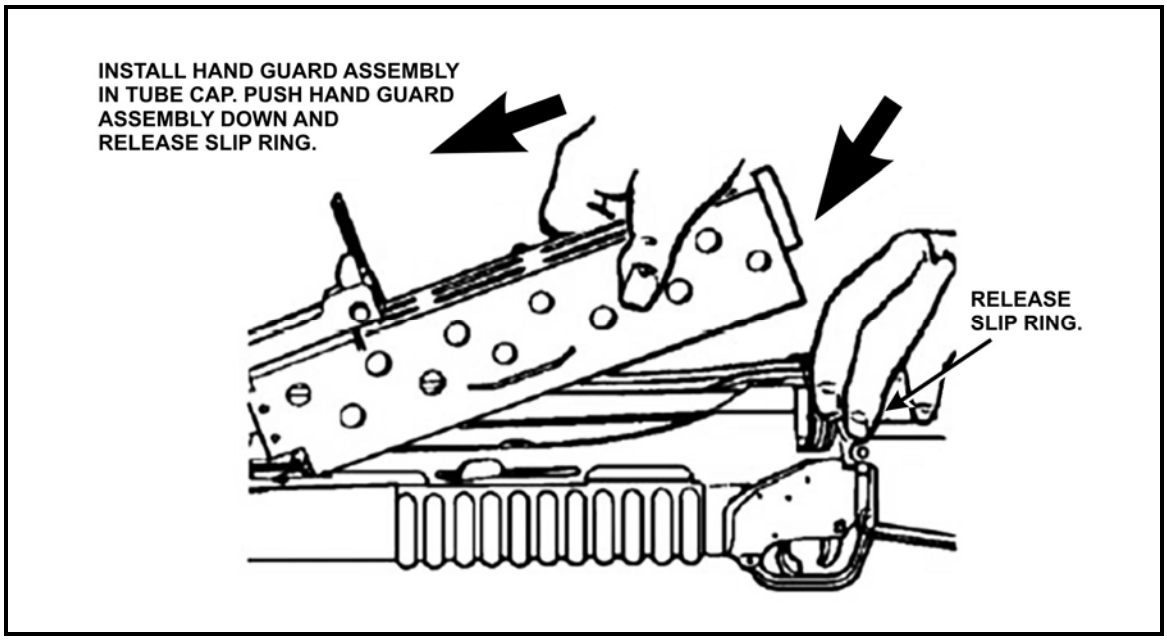


Figure D-12. Installing and securing the handguard

(4) Install the quadrant sight assembly (Figure D-13).

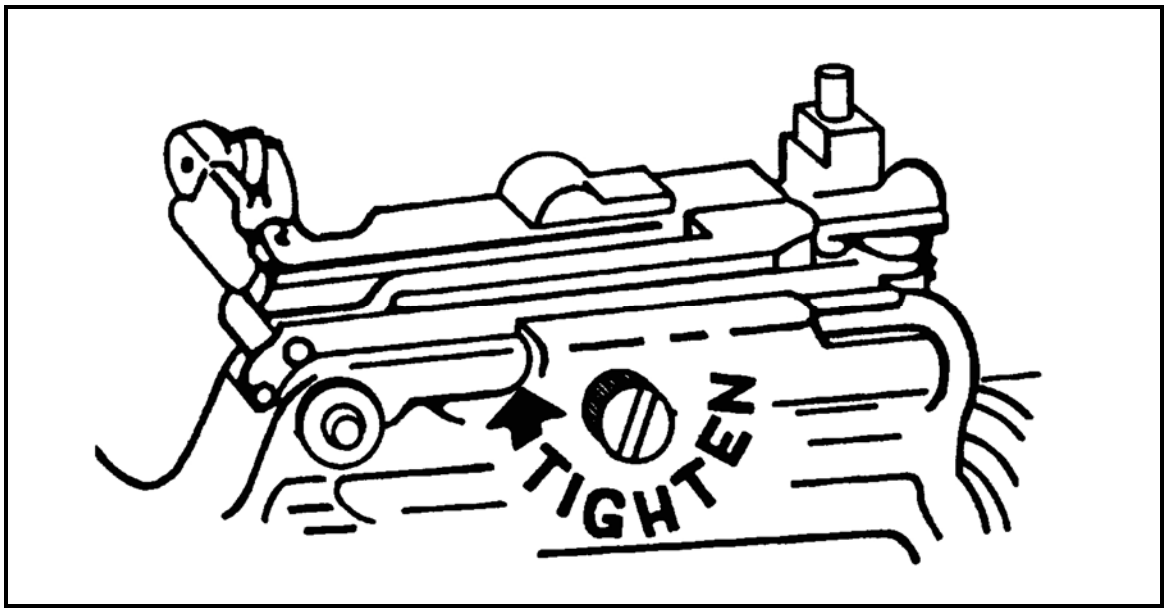


Figure D-13. Installing the quadrant sight assembly

PERFORM A FUNCTION CHECK

D-33. Once the weapon has been assembled, the Soldier should perform a function check to ensure that the grenade launcher has been assembled correctly.

***Note*.** Notify the unit armorer at once if the launcher fails to function.

D-34. To conduct a function check—

(1) Check the proper operation of the sear. Cock the launcher, pull the trigger, and continue to hold the trigger. When you pull the trigger, you release the firing pin and should hear a metallic click. Hold the trigger to the rear and cock the launcher again. Release the trigger, then pull. The firing pin should again release.

WARNING

If the sear malfunctions, the launcher could fire without your pulling the trigger.

(2) Check the safety by pulling the trigger in both the SAFE ("S") and FIRE ("F") positions. You must cock the launcher before you can place the safety in the SAFE ("S") position.

(3) Check the windage adjustment screw on the leaf sight assembly for proper operation.

(4) Only if the weapon has been zeroed: Move the elevation adjustment screw.

(5) Move the barrel forward and back to be sure the barrel stop and barrel latch function.

LOAD THE WEAPON

D-35. To load the weapon—

DANGER

KEEP THE WEAPON'S MUZZLE POINTED DOWNRANGE.

KEEP THE SAFETY IN THE SAFE ("S") POSITION UNTIL READY TO FIRE.

(1) Depress the barrel latch to unlock the barrel assembly, and slide the barrel assembly forward.

(2) Move the barrel assembly forward and then backward to cock the weapon.

(3) Press the barrel latch and slide the barrel forward.

CAUTION

Before loading make sure the bore and chamber are clean and dry.

(4) Insert a round of ammunition into the chamber.

(5) Slide the barrel closed until it locks.

***Note*.** When the barrel locks, you will hear a click.

FIRE THE WEAPON

DANGER

TO AVOID PERSONNEL INJURY OR DEATH, ENSURE THERE ARE NO OBSTACLES (SLING, BRANCHES, ETC.) IN THE LINE OF FIRE.

KEEP THE WEAPON'S MUZZLE POINTED DOWNRANGE.

KEEP THE SAFETY IN THE SAFE ("S") POSITION UNTIL READY TO FIRE.

WARNING

Hearing protection is required for the grenadier and all personnel on the firing range, when using the M585 cartridge.

D-36. To fire the weapon—

(1) Determine the distance to the target, and select the range.
(2) Move the safety to the FIRE ("F") position.
(3) Aim and squeeze the trigger to fire.

UNLOAD THE WEAPON

DANGER

KEEP THE WEAPON'S MUZZLE POINTED DOWNRANGE.

KEEP THE SAFETY IN THE SAFE ("S") POSITION UNTIL READY TO FIRE.

D-37. To unload the grenade launcher—

(1) Press the barrel latch.
(2) Slide the barrel forward.

D-38. The round automatically extracts and ejects.

AIM THE WEAPON AND ACHIEVE CORRECT SIGHT PICTURE

D-39. Aiming consists of three steps—

- Sight alignment.
- Focusing.
- Sight picture.

Sight Alignment

D-40. Procedures for proper sight alignment vary according to the type of sight used: leaf sight or quadrant sight.

Leaf Sight

D-41. When using the leaf sight, align it with the front sightpost of the rifle.

Quadrant Sight

D-42. When using the DNS, align its rear sight aperture with its front sightpost (Figure D-14). To do so—

- Picture a horizontal line through the center of the leaf sight or rear sight aperture. The top of the rifle's front sightpost should touch this line.
- Picture a vertical line through the center of the leaf sight or rear sight aperture. This line should vertically bisect the front sightpost.

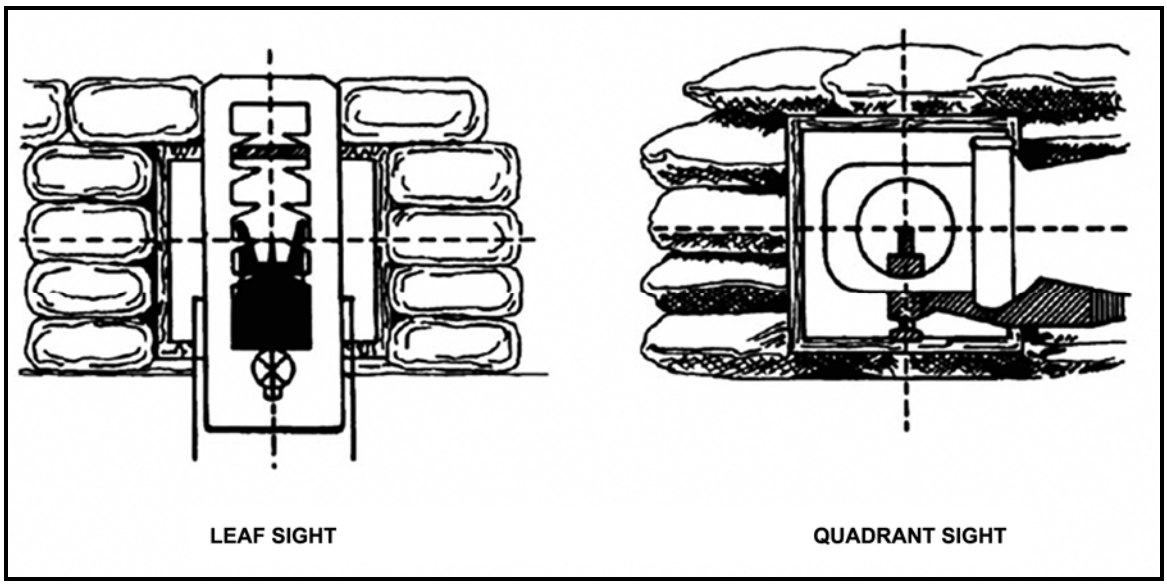


Figure D-14. Sight alignment

Focusing

D-43. Focus procedures are not impacted by the type of sight used. For either sight, focus on the front sightpost. A good firing position places your eye directly on line with the center of the leaf sight or rear sight aperture. Your eye's natural ability to center objects in a circle and seek the point of greatest light will help you align the sight correctly.

Sight Picture

D-44. Proper sight picture procedures are not impacted by the type of sight used. To achieve a correct sight picture, align the front sightpost and the leaf sight or rear sight aperture with the target. For area targets, aim where the round's bursting radius will make the round most effective. For point targets, aim at the target's center of mass.

OPERATE THE WEAPON IN LIMITED VISIBILITY CONDITIONS

D-45. The AN/PVS-7 is issued for use with the M203, whereas the AN/PVS-4 is normally issued for use with crew-served weapons. M203 gunners may qualify with either device. In a defensive position, the gunner identifies targets during daylight and constructs aiming or elevation stakes. Because the AN/PVS-7 rear sight must be set to the far setting to sense rounds, the gunner cannot see both the M203 sights and the target at the same time. Therefore, stakes are more important with the AN/PVS-4 than with the AN/PVS-4.

SENSE AND ADJUST FIRE

D-46. After firing, the grenadier determines, or senses, where the grenade landed relative to the target, and then adjusts elevation and deflection.

Sensing

D-47. As soon as the grenade explodes, the grenadier determines where it exploded with respect to the target. This is called sensing the impact and has two aspects: range and deviation. Because the casualty radius of the HE round is 5 meters (5 and 1/2 yards), the grenadier should determine both range and deviation to the nearest 5 meters.

Range

D-48. The grenadier senses the range as one of the following:

- Short: The grenade bursts between you and the target.
- Over: The grenade bursts beyond the target.
- Target: The grenade hits any part of the target.
- Range Correct: The grenade bursts slightly left or right of the target, but at the correct range.
- Doubtful: The grenade burst left or right of the grenadier, but you cannot sense the range.

Deviation

D-49. The grenadier announces a deviation sensing as—

- Right or left of the target.
- On line with the target.

Adjustment of Fire

D-50. To ensure a second-round hit, the grenadier should adjust his fire by sensing the impact of the round and manipulating the sight:

- If the grenade lands more than 25 meters over or short of the target, adjust the range quadrant to bring the next grenade on target.
- If the grenade explodes less than 25 meters from the target, adjust the point of aim to bring the next grenade on target.

D-51. If the launcher is properly zeroed, the grenadier should adjust the aiming point for deviation errors, which are normally small and easily corrected. A wind strong enough to move the grenade out of its normal trajectory, however, increases the size of the deviation errors. After observing the effect of the wind on the strike of the grenade, he compensates for the wind's effect by aiming into it. This should help bring the next grenade on target. For example, if the grenade bursts to the left and short of the target, the grenadier senses the strike of the round relative to the target and adjusts an equivalent distance to the right and over the target to achieve a target hit.

***Note*.** Grenadiers should watch the flight of the grenade to the target. This helps determine the wind's effect on the grenade as it moves toward the target. To increase the chances of achieving a first-round hit, grenadiers should evaluate and compensate for the wind before firing.

MOUNT AND ZERO THE AN/PVS-4 (WITHOUT THE RAIL SYSTEM)

D-52. The grenadier must mount the AN/PVS-4 to the weapon before he zeroes it, and he must do both before he can qualify with the M203 grenade launcher. To mount the scope—

(1) Remove the quadrant sight.

(2) Position the mounting bracket assembly on the left side of the rifle so that the two clamps project through the opening under the handle. Loosen the wing nuts completely (Figure D-15).

(3) Turn the clamp plates so that the pointed ends are in the UP position and are seated against the handle.

(4) Tighten the wing nuts clockwise until the mounting bracket is secure against the weapon.

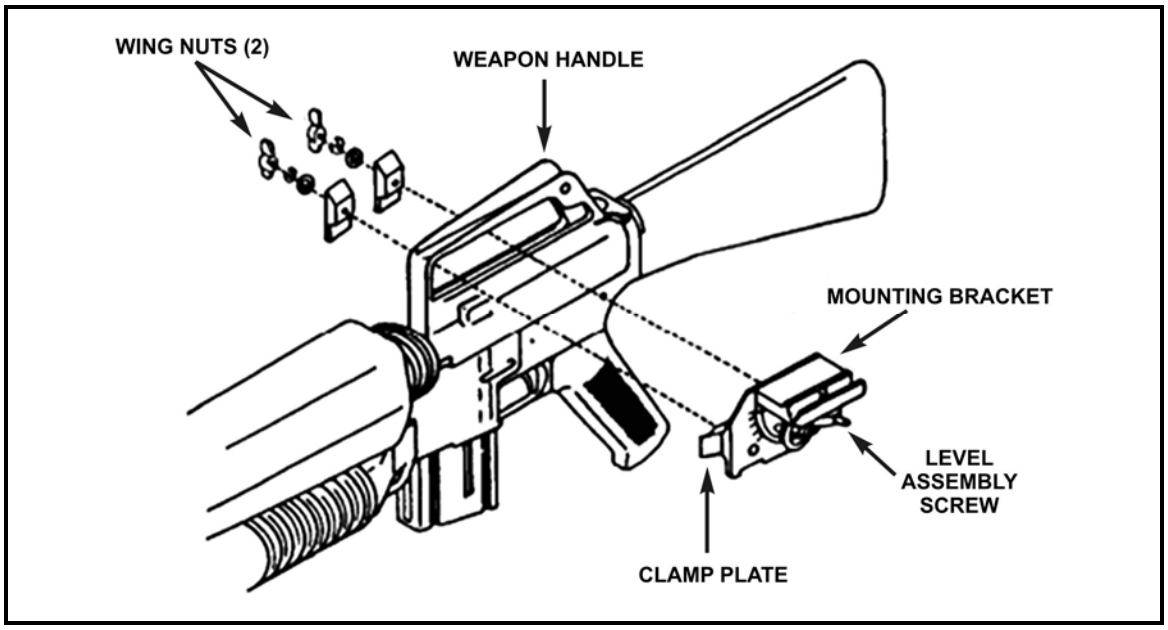


Figure D-15. Installing the mounting bracket

(5) Position the sight in the groove on top of the bracket, and align the threaded hole in the base of the sight mounting adapter with the lever screw assembly.

(6) Tighten the screw clockwise to firmly secure the sight to the bracket.

D-53. After mounting the nightsight on the M203, the grenadier zeroes the nightsight to the rifle. To zero the nightsight to the weapon—

***Note*.** FM 3-22.9 provides instructions for zeroing the nightsight to the rifle.

(1) Using the aiming points on the nightsight reticle (Figure D-16) and the range settings on the mounting bracket, center the nightsight's reticle pattern within the field of view.

(2) To ensure that the nightsight is centered, rotate the azimuth control knob either way until it stops. Then, rotate it back the opposite way, counting the number of clicks until it stops again (this may be any number of clicks between 200 and 600).

(3) Divide the number of clicks in half and rotate the knob in the original direction by that number of clicks.

EXAMPLE

The total number of clicks is 500. Rotate the knob back 250 clicks in the original direction.

(4) Center the elevation using the same procedure with the elevation control knob. The total amount of elevation clicks also varies between 200 and 600.

***Note*.** Before adjusting the reticle pattern, the grenadier should fire three 5.56-mm rounds and then retighten the mount wing nuts to securely seat the sight. Once this is done, the grenadier fires at a 10-meter target because hitting and spotting this target is easier than hitting a 25-meter target. This procedure may be performed in daylight using the daylight cover.

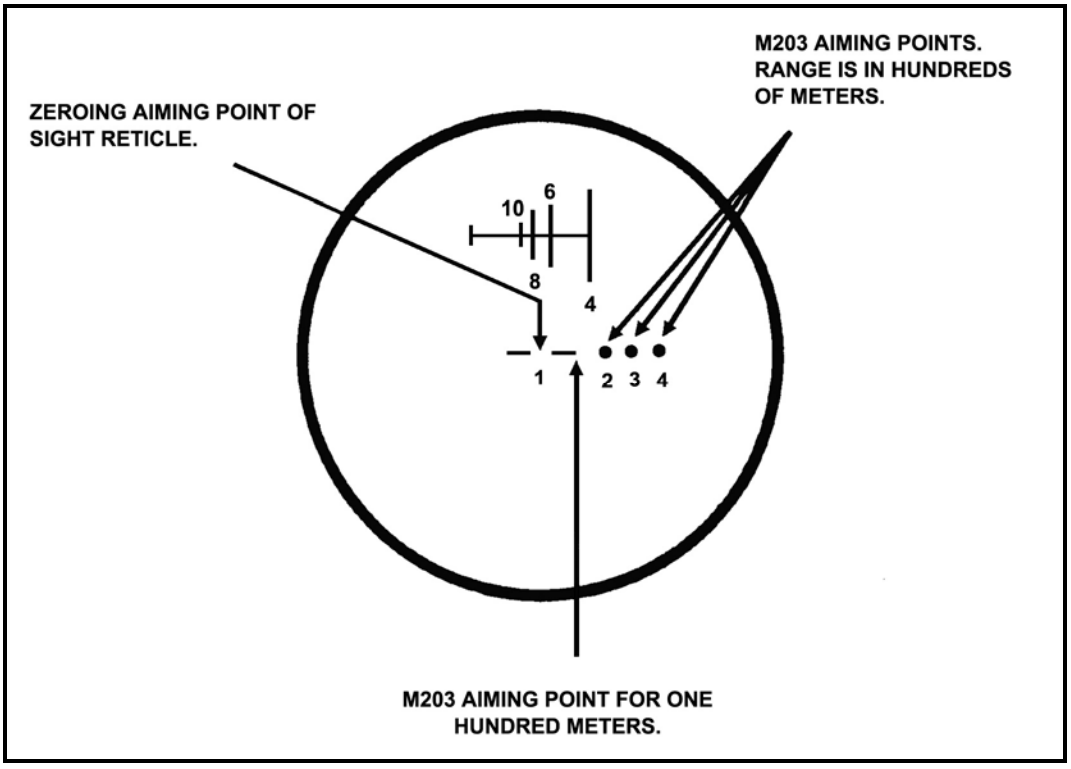


Figure D-16. Aiming points

(5) Adjust the reticle pattern. To do so—

(a) Turn the sight on, and adjust the reticle intensity to the desired level of illumination.

(b) Place an M16 25-meter target at 10 meters, and stabilize the weapon.

(c) Fire a 5.56-mm round at the center of the target, and mark the hole the round makes.

- If the round misses the entire target, reseat the sight exactly as previously described.
- If the round hits the target but not within 20 cm (8 inches) of the center, adjust the azimuth and elevation controls to bring the impact point toward the center of the target. Then, fire a second round. Continue to fire single rounds and adjust the controls until the rounds strike within the desired distance from the center.

D-54. Once the reticle is adjusted, the grenadier moves the 25-meter target out to 25 meters and uses the rifle to zero the nightsight to the M203. To obtain a 25-meter zero—

***Notes*.**

1. Do not remove the nightsight from the weapon until you have obtained a zero.
2. This zero is not recorded.
3. If the nightsight is dismounted and remounted on the weapon, the grenadier must re-zero; some changes in its zeroing will occur.

(1) Stabilize the weapon.
(2) Center the reticle's zeroing range aiming point on the center of the target (Figure D-16).
(3) Fire until you obtain a good three-round shot group.
(4) Triangulate and locate the center of the shot group.
(5) Turn the azimuth and elevation control knobs to adjust the sight reticle. Move the center of the shot group 9.8 cm (3 7/8 inches) below and 4.2 cm (1 5/8 inches) to the right of the target aiming point (Figure D-17).
   - One click of the azimuth or elevation adjustment moves the strike of the round .63 cm (1/4 inch) at a range of 25 meters.
   - Two clicks move the reticle about one square on the target.
(6) Assume a stable position.
(7) Place the reticle aiming point on the target aiming point, and fire three more rounds.
(8) Repeat Steps 5, 6, and 7 until the rounds strike within a 3.2 cm (1 1/4 inch) circle in the desired location 9.8 cm (3 7/8 inches) below and 4.2 cm (1 5/8 inches) to the right of the aiming point or until you have fired 12 rounds.

Note. If you are unable to zero the AN/PVS-4 after 12 rounds, the trainer must send you to remedial training.

D-55. Next, the grenadier confirms the zero on the grenade launcher range using a 200-meter target. To do so—

(1) Place the nightsight into operation and use its reticle, which has two parts. Use the vertical line in the upper part of the reticle to estimate range and the lower part to aim the weapon.
(2) Set the range as estimated on the range indicator of the mounting bracket (Figure D-16).
(3) Engage the target, placing the aiming point of the sight reticle on the target's center of mass (Figure D-17).
(4) Fire the weapon using all your marksmanship skills.

D-56. Zero is confirmed if two of three rounds strike within 5 meters of the target.

BASIC MARKSMANSHIP TRAINING

D-57. Basic marksmanship allows the grenadier to zero and apply the fundamentals of marksmanship during LFXs in day, night, and CBRN conditions. During this phase of instruction, the following tasks are covered:

- Zero the weapon.
- Perform record fire.

D-58. DA Form 2946-R (*40-mm Grenade Launcher Scorecard*) is used to score the qualification firing. Figure D-18 shows an example of a completed scorecard.

Notes.
1. Zeroing is not included on the scorecard, because the weapon must be zeroed before qualification firing. However, the zero data should already have been entered on the scorecard when the weapon was zeroed.
2. HE familiarization may be included in qualification firing but is not scored.
3. A blank scorecard is provided in back of this field manual and must be locally reproduced on 8 1/2- by 11-inch paper.

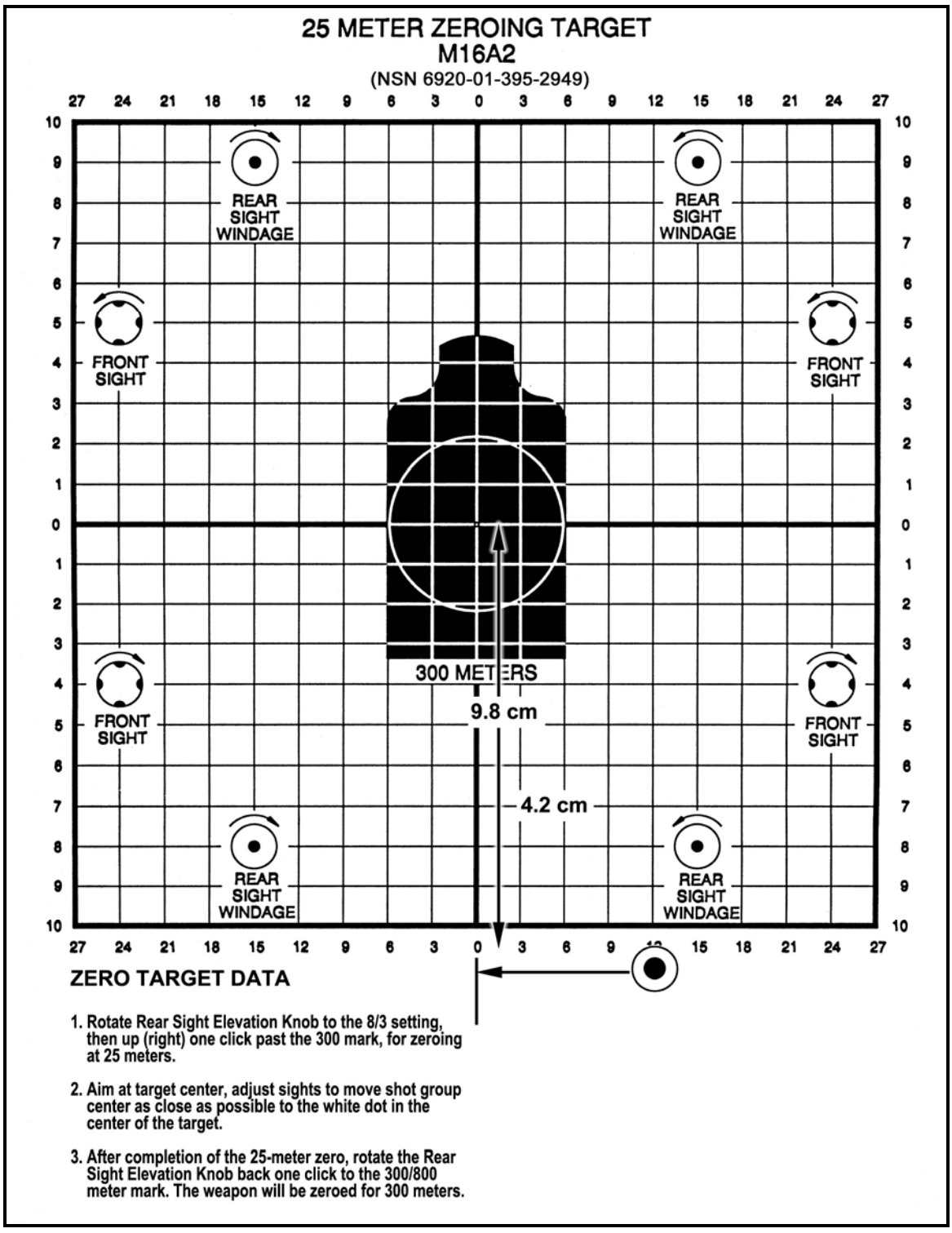
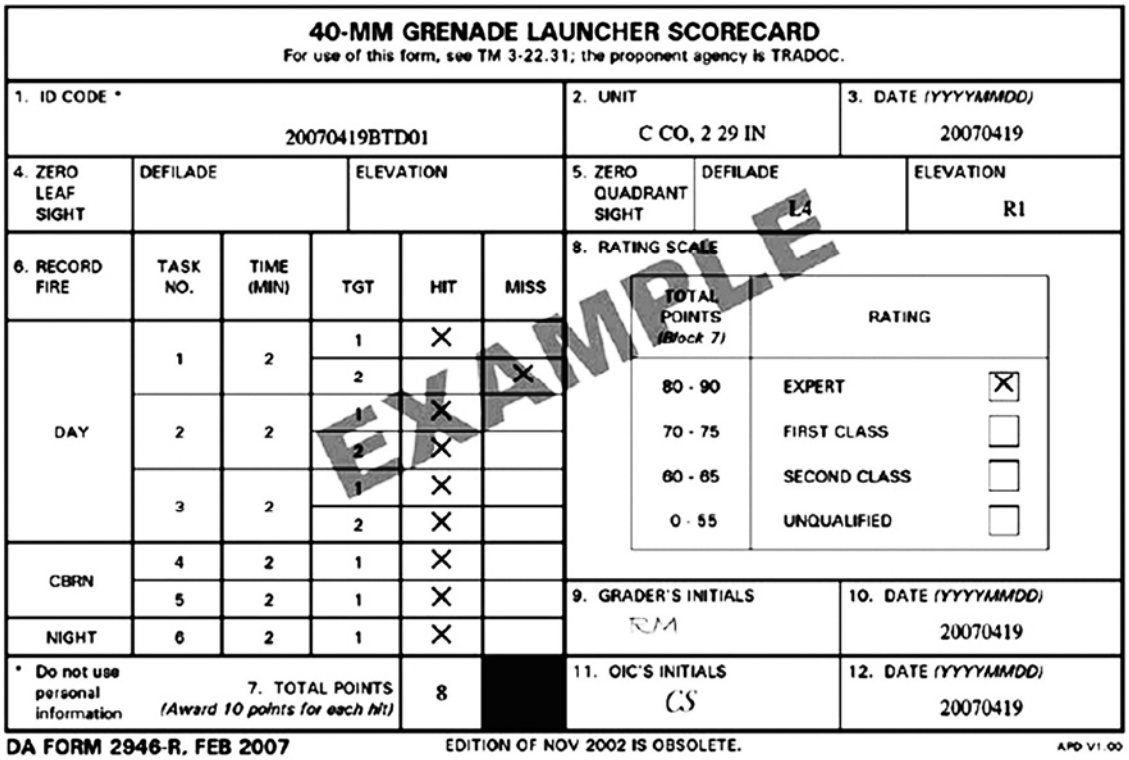


Figure D-17. Adjustment of rounds



40-MM GRENADE LAUNCHER SCORECARD
For use of this form, see TM 3-22.31; the proponent agency is TRADOC.

1. ID CODE *						2. UNIT		3. DATE (YYYYMMDD)
20070419BTD01						C CO, 2 29 IN		20070419
4. ZERO LEAF SIGHT	DEFILADE		ELEVATION			5. ZERO QUADRANT SIGHT	DEFILADE	ELEVATION
							L4	R1

6. RECORD FIRE	TASK NO.	TIME (MIN)	TGT	HIT	MISS
DAY	1	2	1	X	
			2		X
	2	2	1	X	
			2	X	
	3	2	1	X	
			2	X	
CBRN	4	2	1	X	
	5	2	1	X	
NIGHT	6	2	1	X	
* Do not use personal information	7. TOTAL POINTS (Award 10 points for each hit)			8	

8. RATING SCALE

TOTAL POINTS (Block 7)	RATING	
80 - 90	EXPERT	X
70 - 75	FIRST CLASS	
60 - 65	SECOND CLASS	
0 - 55	UNQUALIFIED	

EXAMPLE

9. GRADER'S INITIALS	10. DATE (YYYYMMDD)
RM	20070419
11. OIC'S INITIALS	12. DATE (YYYYMMDD)
CS	20070419

DA FORM 2946-R, FEB 2007 EDITION OF NOV 2002 IS OBSOLETE. APD V1.00

Figure D-18. Example completed DA Form 2946-R (40-mm Grenade Launcher Scorecard)

ZERO THE WEAPON

D-59. Zero data should be entered on DA Form 2946-R. Zeroing is performed on Station 1 of the 40-mm grenade launcher range. When at this station, the grenadier zeroes the weapon (quadrant and leaf sight) by firing from a prone supported firing position.

Notes.

1. The M203 is normally zeroed using only the quadrant sight, but may be zeroed with both sights or with only the leaf sight.

2. Firing from a prone supported position reinforces the experience gained during dry firing and allows practice in loading and firing with the most accurate sensing and adjustments obtainable.

3. If the grenadier zeroes in three rounds, he should use the other two rounds to confirm the zero. If the grenadier cannot zero with five rounds, the trainer must remove him from the firing line for remedial training.

Leaf Sight

D-60. To zero the weapon using the leaf sight—

Note. A red mark at 50 meters on the leaf sight reminds the grenadier not to zero at this range.

(1) Select a target at 200 meters.
(2) Place the sight in the upright position.
(3) Place the center mark of the windage scale on the index line on the rear of the sight base.
(4) Loosen the elevation adjustment screw on the leaf sight.
(5) Place the leaf sight's index line on the sight mount's center elevation mark.
(6) Tighten the elevation adjustment screw.
(7) Assume a prone supported firing position.
(8) When you receive the following fire command, repeat each element as it is given:
GRENADIER
FRONT
200 (ZERO PANEL)
ONE ROUND
COMMENCE FIRING
(9) Load one round of 40-mm HE or TP ammunition, obtain the proper sight picture, and announce UP to your assistant.
(10) Use correct sighting and aiming procedures to align the target with the front leaf sight.
(11) When the tower operator gives the command to commence firing, fire one round at the panel marked "Z."
(12) Sense the impact of the round. If the round did not land within 5 meters of the zero panel, adjust the sights for windage and elevation.
(13) Fire two more cartridges, readjusting the sight after each. Once a round impacts within 5 meters of the target, the weapon is zeroed.
(14) After you have zeroed the weapon, record the zero data on your scorecard. As soon as you can, transfer the information to a small piece of paper and tape this inside the rifle pistol grip.

Quadrant Sight

D-61. To zero the weapon using the quadrant sight—

(1) Select a target at 200 meters.
(2) Ensure that the quadrant sight is correctly mounted on the rifle's carrying handle.
(3) Open the front sightpost and rear sight aperture.
- Move the front sightpost to its highest position and then back 2 1/2 turns.
- Depress the rear sight retainer. Slide the rear sight aperture to the left until its white index line aligns with the edge of the sight aperture arm.

(4) Move the sight latch rearward, and reposition the quadrant sight arm to 200 meters.
(5) Assume a prone supported firing position.
(6) Use correct sighting and aiming procedures to align the target with the front sightpost and rear sight aperture.
(7) Load one round of 40-mm HE or TP ammunition.
(8) Fire a round, sense the impact, and adjust the sights for windage and elevation.
(9) Fire two more cartridges, readjusting the sights after each. Once a round impacts within 5 meters of the target, the weapon is zeroed.
(10) After you have zeroed the weapon, record the zero data on your scorecard. As soon as you can, transfer this information to a small piece of paper and tape this inside the rifle pistol grip.

PERFORM RECORD FIRE

D-62. There are two tables associated with record fire:

- Day.
- Night.

D-63. These tables are fired on a range with four stations prepared.

Note. See Appendix A for more information about the grenade launcher range.

D-64. DA Form 2946-R is used to score the qualification firing. To qualify with an M203, a grenadier must perform to prescribed standards and must score at least 60 of 90 possible points. Each target hit is worth 10 points. Ratings are awarded based on the point chart shown on the scorecard. Figure D-18 shows an example of a completed scorecard.

WARNING

Before allowing anyone to move between stations, ensure that—

- **All weapons are clear.**
- **Bolts are to the rear.**
- **Barrel assemblies are open.**

If you see an unsafe act, call out CEASE FIRE, and notify range personnel immediately.

Day Record Fire

D-65. Day record fire gives the grenadier the confidence and experience he needs to progress from dry-fire exercises to record fire.

D-66. Grenadiers fire this exercise from the following fighting positions: kneeling supported, mid-range supported, and long-range supported. Since all Soldiers must be prepared to accomplish their missions, even in protective clothing, day record fire also includes two CBRN tasks (Tasks 4 and 5). These tasks are performed from the following positions: mid-range supported position (point target) and mid-range supported position (area target). Table D-2 shows information about day record fire qualification.

Notes.

1. Before they fire for qualification, grenadiers must first zero their weapons and receive instruction on the objectives, range, targets, and qualification standards.
2. The unit is organized in firing orders based on range constraints. Each firing order consists of two grenadiers, one of whom assists.
3. For each of these tasks, the grenadier can designate which target he will engage first. If he scores a hit on the first, the trainer permits him to engage the second. Once he hits both targets, he returns any unexpended rounds to the assistant trainer.

Table D-2. Day record fire qualification

TASK	STATION	TIME IN MINUTES	ROUNDS	TYPE OF AMMUNITION	TARGET(S) AND RANGE(S)
1	2	2	3	TP	Window at 100 m Bunker at 125 m
2	3	2	3	TP	Bunker at 175 m Automatic weapon at 200 m
3	4	2	3	TP	Troops in open emplacement at 250 m Troops in open at 350 m
4 CBRN	3	2	3	TP	Bunker at 175 m
5 CBRN	3	2	3	TP	Automatic weapons at 200 m

Task 1, Kneeling Supported Position

Note. Task 1 is performed at Station 2. Only TP rounds may be used at this station.

D-67. Use the following procedures to perform Task 1:

(1) When you receive the command DESIGNATE THE TARGET, identify the target you intend to engage by announcing WINDOW or BUNKER.

(2) When you receive the command DETERMINE THE RANGE, announce the range to the target.

(3) Load one of the three rounds allotted.

(4) When you receive the following fire command, repeat each element as it is given:

GRENADIER
FRONT
3 ROUNDS
100 METERS (WINDOW) OR 125 METERS (BUNKER)
COMMENCE FIRING

(5) Acquire the proper sight picture and announce UP to the grader.

(6) Engage the target given in the fire command until you hit it.

(7) Fire any remaining rounds at the second target.

Note. You need no other fire command.

D-68. For each round you fire, your assistant announces HIT or MISS.

Task 2, Midrange Supported Position

Note. Task 2 is performed at Station 3.

D-69. Use the following procedures to perform Task 2:

(1) When you receive the command DESIGNATE THE TARGET, identify the target you intend to engage by announcing BUNKER or AUTOMATIC WEAPON.

(2) When you receive the command DETERMINE THE RANGE, announce the range to the target.

(3) Load one of the three rounds allotted.

(4) When you receive the following fire command, repeat each element as it is given:

GRENADIER
FRONT
3 ROUNDS
175 METERS (BUNKER) OR 200 METERS (AUTOMATIC WEAPON)
COMMENCE FIRING

(5) Acquire the proper sight picture and announce UP to the grader.
(6) Engage the target given in the fire command until you hit it.
(7) Fire any remaining rounds at the second target.

Note. You need no other fire command.

D-70. For each round you fire, your assistant announces HIT or MISS.

Task 3, Long-Range Supported Position

Note. Task 3 is performed at Station 4.

D-71. Use the following procedures to perform Task 3:
(1) When you receive the command DESIGNATE THE TARGET, identify the target you intend to engage by announcing TROOPS IN THE OPEN EMPLACEMENT or TROOPS IN THE OPEN.
(2) When you receive the command DETERMINE THE RANGE, announce the range to the target.
(3) Load one of the three rounds allotted.
(4) When you receive the following fire command, repeat each element as it is given:
GRENADIER
FRONT
3 ROUNDS
250 METERS (TROOPS IN THE OPEN EMPLACEMENT) or 350 METERS TROOPS IN OPEN
COMMENCE FIRING
(5) Acquire the proper sight picture and announce UP to the grader.
(6) Engage the target given in the fire command until you hit it.
(7) Fire any remaining rounds at the second target.

Note. You need no other fire command.

D-72. For each round you fire, your assistant announces HIT or MISS.

Task 4, Midrange Supported Position (Point Target)

Note. Task 4 is a CBRN task and is performed at Station 3.

D-73. Use the following procedures to perform Task 4:
(1) Put on, clear, and check your mask within nine seconds. Within the next six seconds, pull the hood over your head and zip the front of it closed.
(2) Load one of the three rounds allotted.
(3) When you receive the following fire command, repeat each element as it is given:
FIRE MISSION
FRONT
3 ROUNDS
175 METERS (BUNKER)
AT MY COMMAND
(4) Acquire the proper sight picture and announce UP to the grader.
(5) Engage the target given in the fire command until you hit it.
(6) Fire any remaining rounds at the second target.

Note. You need no other fire command.

D-74. For each round you fire, your assistant announces HIT or MISS.

Task 5, Midrange Supported Position (Area Target)

Note. Task 5 is a CBRN task and is performed at Station 3.

D-75. Use the following procedures to perform Task 5:

(1) Load one of the three rounds allotted.

(2) When you receive the following fire command, repeat each element as it is given:
FIRE MISSION
FRONT
3 ROUNDS
200 METERS (AUTOMATIC WEAPON POSITION)
AT MY COMMAND

(3) Acquire the proper sight picture and announce UP to the grader.

(4) Engage the target given in the fire command until you hit it.

(5) Fire any remaining rounds at the second target.

Note. You need no other fire command.

D-76. For each round you fire, your assistant announces HIT or MISS.

Qualification Standards

D-77. Before qualification firing, each grenadier must know the tasks, the time and ammunition required, the procedures to follow if a stoppage occurs, the penalties for failure to stop firing when commanded or signaled to do so, and the method used for scoring targets.

Time and Ammunition

D-78. Each grenadier determines the target and its distance before loading any rounds. When the grenadier receives the command to FIRE, the time allotted for that task begins.

Stoppages

D-79. The grenadier must apply immediate action procedures if a stoppage occurs. The procedures used for stoppages vary according to the circumstances:

- If you reduce the stoppage, continue to fire the course. The trainers allow an extra 15 seconds for each application of immediate action.
- If a stoppage occurs that you cannot reduce by immediate action, raise your hand and announce TIME. When you say TIME, the assistant trainer notes the time, ensures that a real stoppage exists, and tries to clear the stoppage. If he clears it, you can complete firing. If he cannot clear it, the grader will clear it, and you will be allowed 15 seconds for each round remaining to complete firing.
- If you made an error that caused the stoppage, you do not receive extra time, and your score consists only of what you earned before the stoppage occurred.
- If the grenade launcher must be replaced, you are allotted 10 rounds to zero a new one, and then you may repeat the exercise.
- If malfunctions prevent you from finishing the exercise in the time allowed, you can finish it in an alibi run after all other grenadiers complete firing.

Penalties

D-80. Five points are deducted from the score of any grenadier who fails to stop firing when the trainer commands or signals to do so. If a grenadier fires at the wrong target, he loses the rounds allotted for the other target, which leaves him only the remainder of his rounds to expend on both targets.

Target Scoring

D-81. The trainer or assistant trainer records scores on DA Form 2946-R. They determine whether each grenade fired is a hit or miss and assign 0 points for a miss or 10 points for a hit (Table D-3). Tasks 1 through 3 each consist of two targets, so the total available for each of these tasks is 20 points. Tasks 4 and 5 each consist of firing one target for a total of 10 points each.

Table D-3. Determination of a hit or miss

TARGET	DETERMINATION
Window or Door	To score a hit, the grenade must either strike the target or go through the opening in the center of the target.
Bunker	To score a hit, the grenade must strike anywhere on the face of the bunker.
Automatic Weapon	To score a hit, the grenade must strike within 5 m of the target.
Troops	To score a hit, the grenade must strike within 5 m of the target.

Night Record Fire

D-82. Night or limited visibility firing trains grenadiers to apply the fundamentals of grenade launcher marksmanship while using the DNS. It trains the grenadier to engage targets out to 200 meters under ideal moonlight conditions. This training increases the grenadiers' confidence. Before night firing, grenadiers receive instruction in its objectives, fundamentals, fire commands, and targets. Night record fire consists of one task: firing from a mid-range supported position (area target). Table D-4 shows information about night record fire qualification.

Notes. 1. The unit is organized in firing orders, each consisting of a grenadier and assistant, based on the range constraints.

2. The assistant performs his duties in a manner similar to day record fire.

Table D-4. Night record fire qualification

TASK	STATION	TIME IN MINUTES	ROUNDS	TYPE OF AMMUNITION	TARGET(S) AND RANGE(S)
6	3	2	3	HE	Automatic weapon at 200 m

Task 6, Midrange Supported Position (Area Target)

Note. Task 6 is performed at Station 3.

D-83. Use the following procedures to perform Task 6:

(1) Load one of the three rounds allotted.

(2) When you receive the following fire command, repeat each element as it is given:

GRENADIER
FRONT
3 ROUNDS
200 METERS (AUTOMATIC WEAPON POSITION)
AT MY COMMAND

(3) Acquire the proper sight picture and announce UP to the grader.

(4) When the grader gives the command FIRE, engage the target given in the fire command until you hit it.
(5) Fire any remaining rounds at the second target.

Note. You need no other fire command.

D-84. For each round you fire, your assistant announces HIT or MISS.

Qualification Standards

D-85. Before qualification firing, each grenadier must know the task, the time and ammunition required for each, the procedures to follow if a stoppage occurs, the penalties for failure to stop firing when commanded or signaled to do so, and the method used for scoring targets.

Time and Ammunition

D-86. Table D-4 provides the night firing task and its time and ammunition requirements.

Stoppages

D-87. The procedure for stoppages is the same as for other qualification firing exercises.

Penalties

D-88. The procedure for penalties is the same as for other qualification firing exercises.

Target Scoring

D-89. The target scoring procedure is the same as for other qualification firing exercises.

SECTION III. PROFICIENCY (PERFORMANCE) EXAMINATION

D-90. This appendix provides the examination used to test Soldiers' proficiency with the M203 grenade launcher in dry-fire tasks.

DESCRIPTION

D-91. The examination is a practical non-firing exercise given during the last period of M203 training before range firing. Trainers need not conduct this examination on a range and may conduct it indoors if facilities are available. Soldiers must demonstrate proper techniques for the following tasks:
(1) Perform general disassembly and assembly.
(2) Set the sights.
(3) Identify five standard types of 40-mm ammunition and their purposes.
(4) Load, unload, and place the M203 grenade launcher on SAFE.
(5) Apply immediate action.

CONDUCT OF EXAMINATION

D-92. This paragraph explains how to conduct the examination. The suggested times may help the commander plan the examination.

EQUIPMENT

D-93. The following equipment is required to conduct the proficiency examination:

Tables

D-94. At Station 3, set up one table for every three Soldiers being tested. At each of the other stations, set up only one table. Ensure every table has an ample supply of paper and pencils.

Setups

D-95. At each station, prepare one "setup" for each Soldier to be tested. A setup consists of everything one Soldier needs to complete the task for that station.

Weapons

D-96. Except at Station 3, include one M203 grenade launcher in each setup.

Dummy Ammunition

D-97. Provide twelve rounds of dummy ammunition for each setup at Stations 1 and 2 and one round of dummy ammunition for each setup at Stations 4 and 5. Station 3 does not require dummy ammunition.

TIME ALLOCATION

D-98. Time required for the examination should not exceed 3 1/2 hours if allocated as follows:

- 15 minutes total for the orientation, instructions, breakdown, and movement.
- 30 minutes at each of the five stations (total of 2 l/2 hours).
- Two 10-minute breaks (20 minutes).
- Five 5-minute movement periods (25 minutes).

STATIONS

D-99. Five subjects and stations are recommended for this proficiency examination. This paragraph describes each station and its requirements. Figures containing the score sheets follow at the end of this appendix.

STATION 1--PERFORM GENERAL DISASSEMBLY AND ASSEMBLY.

(1) Prepare one setup for each Soldier to be tested. Each setup should include one M203 grenade launcher with its breech closed and its safety on SAFE. Place each weapon on a mat to keep its parts free of dirt.

(2) Trainers should read the following statement:

TRAINER:

During this period, you will be organized into three groups and required to disassemble and assemble the M203 grenade launcher. There will be one grader for every two weapons. You will have 8 minutes to complete the general disassembly and assembly. If you have any trouble, raise your hand and the grader will assist you. When your group is not being tested, remain to the rear of the station with your back toward the working area until your group is called.

(3) Trainers use the checklist shown in Figure D-19 to grade individual performance.

(4) After each group is tested, trainers assemble the Soldiers they graded and critique them thoroughly (for about 5 minutes).

STATION 2--SET THE SIGHTS.

(1) Prepare one setup for each Soldier to be tested. Each setup should include one M203 grenade launcher with its breech open and its safety on SAFE. Place each weapon on a mat to keep its parts free of dirt.

(2) Trainers read the following statement:

> **TRAINER:**
> During this period, you will be organized into three groups and required to set the quadrant and sight leaf for range and windage. There will be one grader for every two weapons. You will have 4 minutes to set each sight. If you have any trouble, raise your hand and the grader will assist you. When your group is not being tested, remain to the rear of the station with your back toward the working area until your group is called.

(3) Trainers use the checklist shown in Figure D-20 to grade individual performance.

(4) After each group is tested, trainers assemble the Soldiers they graded and critique them thoroughly (for about 5 minutes).

STATION 3--IDENTIFY FIVE STANDARD TYPES OF 40-MM AMMUNITION AND THEIR PURPOSES.

(1) Prepare one table for every three Soldiers. Each Soldier's setup should consist of ample paper and pencils.

(2) Trainers read the following statement:

> **TRAINER:**
> During this period, you will be organized into three groups and required to identify five standard types of 40-mm ammunition and their purposes. There will be one grader for every two tables. You will have 10 minutes to complete the task. If you have any trouble, raise your hand and the grader will assist you. When you are not being tested, remain to the rear of the station with your back toward the working area until you are called.

(3) Trainers use the checklist shown in Figure D-21 to grade individual performance.

(4) After testing each group, trainers assemble the Soldiers they graded and critique them thoroughly (for about 5 minutes).

STATION 4--LOAD, UNLOAD, AND PLACE THE M203 GRENADE LAUNCHER ON SAFE.

(1) Prepare one setup for each Soldier to be tested. Each setup should include one dummy round and one M203 grenade launcher with its breech closed and its safety on FIRE. Place each weapon on a mat to keep its parts free of dirt.

(2) Trainers read the following statement:

TRAINER:

During this period, you will be organized into three groups and required to load, unload, and place the M203 grenade launcher on SAFE. There will be one grader. You will have 2 minutes to complete the task. If you have any trouble, raise your hand and the grader will assist you. When your group is not being tested, remain to the rear of the station with your back toward the working area until your group is called.

(3) Trainers use the checklist shown in Figure D-22 to grade individual performance.

(4) After testing each group, trainers assemble the Soldiers they graded and critique them thoroughly (for about 5 minutes).

STATION 5--APPLY IMMEDIATE ACTION.

(1) Prepare one setup for each Soldier to be tested. Each setup should include one dummy round and one M203 grenade launcher with its breech open and its safety on SAFE. Place each weapon on a mat to keep its parts free of dirt.

(2) Trainers read the following statement:

TRAINER:

During this period, you will be organized into three groups and required to apply immediate action. There will be one grader. You will have 2 minutes to complete the task. If you have any trouble, raise your hand, and the grader will assist you. When your group is not being tested, remain to the rear of the station with your back toward the working area until your group is called.

(3) Trainers use the checklist shown in Figure D-23 to grade individual performance.

(4) After testing each group, trainers assemble the Soldiers they graded and critique them thoroughly (for about 5 minutes).

STATION 1

CHECKLIST

Clear the M203 grenade launcher:

☐ 1. Cock the weapon, observe for extraction, place the safety in the safe position, inspect the breech, and return the barrel to the FIRE position.

Disassemble the M203 grenade launcher:

☐ 2. Remove the quadrant sight.

☐ 3. Pull back the slip ring. Lift up on the handguard and pull it to the rear to remove it.

☐ 4. Press the barrel latch and move the barrel forward to the barrel stop.

☐ 5. Unlock the opening of the M203 grenade launcher barrel.

☐ 6. Press the barrel stop to release the barrel from the receiver and remove the barrel.

Assemble the M203 grenade launcher:

☐ 7. Replace the barrel, press the barrel stop, and slide the barrel into the receiver.

☐ 8. Move the barrel rearward to close it.

☐ 9. Replace the handguard and secure it with the slip ring.

☐ 10. Replace the quadrant sight.

Perform a function check on the M203 grenade launcher:

☐ 11. Cock the launcher and pull the trigger. Hold the trigger to the rear and cock the launcher again. Release the trigger and then pull it. Check the safety in both SAFE and FIRE positions. Check the leaf sight windage adjustment screw and the function of the barrel latch.

Figure D-19. Station 1—Perform general disassembly and assembly

STATION 2

CHECKLIST

Set first sight:

☐ 1. Place the sight in an upright position.
☐ 2. Index the windage scale.
☐ 3. Index the elevation adjustment screw.
☐ 4. Tighten the elevation adjustment screw.
☐ 5. Assume a prone supported position.
☐ 6. Set the sight for the range given and align the sight with the target.

Set second sight:

☐ 1. Ensure the sight is correctly mounted.
☐ 2. Open the front sight post and rear sight aperture.
☐ 3. Align the rear sight aperture with the index line.
☐ 4. Move the front sight post to its highest position; then move it back 2 1/2 turns.
☐ 5. Assume a supported prone position.
☐ 6. Set the sight for the range given and align the sight with the target.

Figure D-20. Station 2—Set the sights

STATION 3

CHECKLIST

☐ 1. Identify an M433 high-explosive dual-purpose round and state its purpose.
☐ 2. Identify an M406 high-explosive round and state its purpose.
☐ 3. Identify an M781 training practice round and state its purpose.
☐ 4. Identify an M583A1 star parachute round and state its purpose.
☐ 5. Identify an M713 ground marker round and state its purpose.

Figure D-21. Station 3—Identify five standard types of 40-mm ammunition and their purposes

STATION 4

CHECKLIST

Load the M203 grenade launcher:

☐ 1. Open the breech and place the weapon on safe.
☐ 2. Insert a 40-mm round into the chamber.
☐ 3. Close the breech and ensure it locks.

Unload the M203 grenade launcher:

☐ 4. Depress the barrel latch and open the breech.
☐ 5. Hold one hand under the barrel to catch the extracted round.
☐ 6. Place the weapon on safe.
☐ 7. Slide the barrel to the rear to close the breech.

Figure D-22. Station 4—Load, unload, and place the M203 grenade launcher on SAFE

STATION 5

CHECKLIST

☐ 1. Load the M203 grenade launcher and try to fire.
☐ 2. Announce a misfire and keep the weapon pointed at the target.
☐ 3. Wait 30 seconds and clear the area before trying to unload the weapon.
☐ 4. Use extreme caution during unloading.
☐ 5. Determine whether the primer is dented (round is at fault) or not (firing mechanism is at fault).

Figure D-23. Station 5—Apply immediate action

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Glossary

AAR	after-action review
ARNG	Army National Guard
ARNGUS	Army National Guard of the United States
BOLC	Basic Officer Leaders Course
CATS	Combined Arms Training Strategy
CBRN	chemical, biological, radiological, nuclear
CLP	cleaner, lubricant, preservative
COA	course of action
CRM	composite risk management
DNS	day/night sight
HE	high-explosive
IET	initial entry training
IR	infrared
LCD	liquid crystal display
LED	light-emitting diode
LFX	live-fire exercise
LOGCAP	Logistics Civil Augmentation Program
LRF	laser rangefinder
MDMP	military decision-making process
METL	mission-essential task list
METT-TC	mission, enemy, terrain and weather, troops and support available, time available, civil considerations
MILES	multiple integrated laser engagement system
MOPP	mission-oriented protective posture
NCO	noncommissioned officer
NCOES	Noncommissioned Officers Education System
NCOIC	noncommissioned officer in charge
OIC	officer in charge
POI	program of instruction
RC	reserve component
RTO	radio-telephone operator
SOP	standing operating procedure
STRAC	Standards in Training Commission
STX	situational training exercise
TADSS	training aids, devices, simulators, and simulations
TP	training practice
TRADOC	Training and Doctrine Command
USACRC	US Army Combat Readiness Center
USAR	US Army Reserve
WFF	warfighting functions

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References

DOCUMENTS NEEDED

These documents must be available to the intended users of this publication.

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TM 9-5860-226-13&P, *Operator and Field Maintenance Manual including Repair Parts and Special Tools List for the AN/PEM-1 Laser Borelight System (LBS-300-A2) (NSN 5860-01-471-2091) (EIC: N/A) and Laser Borelight System (LBS-050) (NSN 5860-01-466-2087) (EIC: N/A)*, 31 August 2007.

FORMS NEEDED

DA Form 2028, Recommended Changes to Publications and Blank Forms.
DA Form 5517-R, Standard Range Card.
DA Form 7566, Composite Risk Management Worksheet.

FORMS PRESCRIBED

DA Form 2946-R, 40-mm Grenade Launcher Scorecard.
DA Form 7680, M320/M320A1 40-mm Grenade Launcher Scorecard.

INTERNET WEBSITES

US Army Publishing Directorate, http://www.apd.army.mil
Reimer Doctrine and Training Digital Library, http://www.train.army.mil

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Index

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40-MM GRENADE LAUNCHER SCORECARD

For use of this form, see TM 3-22.31; the proponent agency is TRADOC.

1. ID CODE *			2. UNIT	3. DATE *(YYYYMMDD)*

4. ZERO LEAF SIGHT	DEFILADE	ELEVATION	5. ZERO QUADRANT SIGHT	DEFILADE	ELEVATION

6. RECORD FIRE	TASK NO.	TIME (MIN)	TGT	HIT	MISS
DAY	1	2	1	☐	☐
			2	☐	☐
	2	2	1	☐	☐
			2	☐	☐
	3	2	1	☐	☐
			2	☐	☐
CBRN	4	2	1	☐	☐
	5	2	1	☐	☐
NIGHT	6	2	1	☐	☐
* Do not use personal information		7. TOTAL POINTS *(Award 10 points for each hit)*			

8. RATING SCALE

TOTAL POINTS *(Block 7)*	RATING	
80 - 90	EXPERT	☐
70 - 75	FIRST CLASS	☐
60 - 65	SECOND CLASS	☐
0 - 55	UNQUALIFIED	☐

9. GRADER'S INITIALS	10. DATE *(YYYYMMDD)*
11. OIC'S INITIALS	12. DATE *(YYYYMMDD)*

DA FORM 2946-R, FEB 2007 EDITION OF NOV 2002 IS OBSOLETE. APD PE v1.00

M320/M320A1 40-mm GRENADE LAUNCHER SCORECARD

For use of this form, see TM 3-22.31; the proponent agency is TRADOC.

NAME *(First, Last, MI)*	UNIT	DATE *(YYYYMMDD)*

ZERO LEAF SIGHT	DEFILADE		ELEVATION		
RECORD FIRE	**TASK NO.**	**TIME (MIN)**	**TGT**	**HIT**	**MISS**
DAY	1	2	1	☐	☐
			2	☐	☐
	2	2	1	☐	☐
			2	☐	☐
	3	2	1	☐	☐
			2	☐	☐
CBRN	4	2	1	☐	☐
	5	2	1	☐	☐
NIGHT	6	2	1	☐	☐
TOTAL POINTS *(Award 10 points for each hit)*					

RATING SCALE

TOTAL POINTS *(Block 7)*	RATING	
80 - 90	EXPERT	☐
70 - 75	FIRST CLASS	☐
60 - 65	SECOND CLASS	☐
0 - 55	UNQUALIFIED	☐

GRADER'S INITIALS	DATE *(YYYYMMDD)*
OIC'S INITIALS	**DATE *(YYYYMMDD)***

M320/M320A1 40-mm GRENADE LAUNCHER SKILLS TEST

NAME	DATE *(YYYYMMDD)*

STATION 1 **MAINTAIN AN M320 GL**	**GO**	**NO-GO**
1. CLEARED THE M320.	☐	☐
2. DISASSEMBLED THE M320.	☐	☐
3. INSPECTED THE M320.	☐	☐
4. REASSEMBLED THE M320.	☐	☐
5. PERFORMED A FUNCTION CHECK.	☐	☐

STATION 2 **INSTALL MOUNTING BRACKETS, LEAF SIGHT ASSEMBLY, AND DNS.**	**GO**	**NO-GO**
1. INSTALLED MOUNTING BRACKETS.	☐	☐
2. INSTALLED LEAF SIGHT.	☐	☐
3. INSTALLED DNS.	☐	☐

STATION 3 **LOAD, UNLOAD, AND PLACE M320 ON SAFE**	**GO**	**NO-GO**
1. LOADED.	☐	☐
2. UNLOADED.	☐	☐
3. PLACED ON SAFE.	☐	☐

STATION 4 **CORRECT MALFUNCTION ON M320**	**GO**	**NO-GO**
1. KEPT THE WEAPON POINTED AT THE TARGET.	☐	☐
2. WAITED 30 SECONDS THEN OPENED THE BREACH.	☐	☐
3. REMOVED THE ROUND.	☐	☐
4. EXAMINED THE PRIMER.	☐	☐

STATION 5 **ID AMMO**	**GO**	**NO-GO**
1. IDENTIFIED THE M781 TP ROUND.	☐	☐
2. IDENTIFIED THE M406 HE ROUND.	☐	☐
3. IDENTIFIED THE M433 HE ROUND.	☐	☐
4. IDENTIFIED THE M585 STAR CLUSTER ROUND.	☐	☐
5. IDENTIFIED THE M583 (WHITE), M661 (GREEN), AND M662 (RED) STAR PARACHUTE ROUNDS.	☐	☐
6. IDENTIFIED THE M713 (RED), M715 (GREEN), AND M716 (YELLOW) GROUND SMOKE MARKER ROUNDS.	☐	☐
7. IDENTIFIED THE M992 INFRARED ILLUMINANT ROUND.	☐	☐
8. IDENTIFIED THE M1006 NONLETHAL CARTRIDGE.	☐	☐
9. IDENTIFIED THE M1029 CROWD DISPERSAL CARTRIDGE.	☐	☐

GRADER'S INITIALS	DATE *(YYYYMMDD)*	OIC'S INITIALS	DATE *(YYYYMMDD)*

CONDUCT OF A RECORD FIRE

ZEROING IS PERFORMED ON STATION 1 OF THE 40-mm GRENADE LAUNCHER RANGE. WHEN AT THIS STATION, THE GRENADIER ZEROES THE WEAPON (DNS AND LEAF SIGHT) BY FIRING FROM A PRONE SUPPORTED FIRING POSITION. AFTER THE GRENADIER HAS ZEROED THE WEAPON, HE RECORDS THE ZERO DATA FOR FUTURE REFERENCE.

DAY RECORD FIRE

TASK	STATION	TIME IN MINUTES	ROUNDS	TYPE OF AMMUNITON	TARGET(S) AND RANGE(S)
1	2	2	3	TP	Window facade at 100m
					Small bunker at 125m
2	3	2	3	TP	Two-man bunker at 175m
					Automatic weapon position at 200m
3	4	2	3	TP	Troops in open emplacement at 250m
					Troops in open 350m
4	3	2	3	TP	Two-man bunker at 175m
5	3	2	3	TP	Automatic weapons position at 200m (CBRN)

NIGHT RECORD FIRE

TASK	STATION	TIME IN MINUTES	ROUNDS	TYPE OF AMMUNITION	TARGET(S) AND RANGE(S)
6	3	2	3	HE	Automatic weapons position at 200m

CONDUCT OF A 40-mm GRENADE LAUNCHER SKILLS TEST

BEFORE PERFORMING LIVE FIRE, SOLDIERS TAKE THE 40-mm GRENADE LAUNCHER SKILLS TEST. THIS EXERCISE IS USED TO DETERMINE THE GRENADIER'S PROFICIENCY ON DRY-FIRE TASKS ASSOCIATED WITH THE M320 40-mm GRENADE LAUNCHER. USING FIVE STATIONS, SOLDIERS MUST DEMONSTRATE PROFICIENCY ON THE FOLLOWING TABLE:

- MAINTAIN AN M320 GRENADE LAUNCHER.
- INSTALL MOUNTING BRACKETS, THE LEAF SIGHT ASSEMBLY, AND THE DNS ON THE M320 GRENADE LAUNCHER.
- LOAD, UNLOAD, AND PLACE THE M320 GRENADE LAUNCHER ON SAFE.
- CORRECT MALFUNCTIONS ON AN M320 GRENADE LAUNCHER.
- IDENTIFY 40-mm AMMUNITION AND THEIR PURPOSE.

NOTES:

1. TRAINERS NEED NOT CONDUCT THIS EXAMINATION ON A RANGE; IT MAY BE CONDUCTED INDOORS IF FACILITIES ARE AVAILABLE.
2. THE SKILLS TEST IS ADMINISTERED USING TASKS, CONDITIONS, STANDARDS, ADMINISTRATIVE GUIDELINES, AND PERFORMANCE CHECKLISTS.
3. COMMANDERS MAY ADD TO, BUT NOT DELETE FROM, TASKS ON THE SKILLS TEST. ONCE BASIC PROFICIENCY HAS BEEN ATTAINED, COMMANDERS CAN INCLUDE SPECIAL CONDITIONS, SUCH AS CBRN OR LIMITED VISIBILITY.
4. SEE APPENDIX C OF TM 3-22.31 FOR MORE INFORMATION.

TM 3-22.31 (FM 3-22.31)
17 November 2010

By Order of the Secretary of the Army:

GEORGE W. CASEY, JR.
General, United States Army
Chief of Staff

Official:

JOYCE E. MORROW
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Secretary of the Army
1030001

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