

***ARMY TM 9-1015-249-10
AIR FORCE TO 11W2-5-21-1
MARINE CORPS TM 09922A-10/1**

**OPERATOR'S MANUAL
FOR
MORTAR, 81-MM, M252
NSN 1015-01-164-6651 (EIC:4SK)**

* Supersedes TM 9-1015-249-10, 30 October 1987, including all changes.

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WARNING SUMMARY

This warning summary contains general safety warnings and hazardous materials warnings that must be understood and applied during operation and maintenance of this equipment. Failure to observe these precautions could result in serious injury or death to personnel. Also included are explanations of safety and hazardous materials icons used within the technical manual.

ACCIDENTS AND MALFUNCTION REPORTS (Marine Corps Only)

Accidents involving injury to personnel or damage to the equipment will be reported in accordance with current edition of MCO P5102.1_, Ground Mishaps Report.

FIRST AID

For first aid information, refer to FM 4-25.11, First Aid.

EXPLANATION OF SAFETY WARNING ICONS



EAR PROTECTION - Headphones over ears shows that noise level will harm ears.



EXPLOSION - Rapidly expanding symbol shows that the material may explode if subjected to high temperatures, sources of ignition, or high pressure.



HOT AREA - Hand over object radiating heat shows that part is hot and can burn.

GENERAL SAFETY WARNINGS DESCRIPTION

WARNING



The 81-mm mortar poses a risk of hearing loss. Mortar crew is required to use single hearing protection during firing.

WARNING



If the mortar is hot, avoid serious burns by waiting until the barrel is cool enough to touch with bare hands.

WARNING SUMMARY - Continued

GENERAL SAFETY WARNINGS DESCRIPTION - Continued

WARNING



To prevent premature detonation of cartridge or misdirection of projectile flight, firing site must have sufficient mask clearance and no overhead obstructions.

Dented barrels must be replaced as they are unsafe for firing.

On previous configurations, weapon is not to be fired without blast attenuator device.

Upon releasing cartridge, pass hands downward and, at the same time, turn away from muzzle of mortar cannon to prescribed body and head position, to avoid blast which occurs when cartridge fires.

Double loading of mortar ammunition has resulted in catastrophic accidents. Loading a mortar weapon with two men (alternately) can be very dangerous and could prove fatal. Even with one-man loading, double loading can occur. This is especially true in rapid fire exercises. For this reason, it is imperative that there is absolute certainty that the previous round left the mortar tube before a new round is dropped in.

To avoid injury to crew and supported troops due to collapse of mortar system or errant round, the exterior surface of cannon between upper and lower stop bands must be wiped free of lubrication prior to firing. If portion is not dry, barrel clamp assembly will move on barrel during firing.

Improved BCO series ammunition, M821, M889, M853A1, M819, and M879, develops significantly higher pressures in the weapon than earlier 300 series ammunition. Do not use 800 series ammunition with the M1, M29, and M29A1 Mortars. Serious injury or death may result from tube failure.

Do not stand directly behind cannon when removing a misfire.

Keep head and body away from front of mortar when removing a misfire.

When removing a misfire, loosen but do not open barrel clamp assembly.

Ammunition handler must not put his hand on breech plug when lifting and holding cannon.

WARNING SUMMARY - Continued

GENERAL SAFETY WARNINGS DESCRIPTION - Continued

WARNING



Do not lower breech plug end of cannon below a horizontal position until cartridge has been removed from cannon.

When moving cannon always point in direction of fire and ensure that no crew members stand directly behind or in front of cannon.

To prevent injury or death, follow misfire procedures in WP 0011 to remove cartridge before doing troubleshooting.

Do not fire M821A2 HE cartridge with M1 or M29 Series mortar system. Catastrophic tube failure can be expected if the M821A2 HE cartridge is fired from the M1 or M29 Series mortar system. This failure could result in the death, or serious bodily injury, of mortar crew members and surrounding personnel.

- Do not fire cartridge
 - if eye of upper safety pin breaks off and/or safety pin cannot be removed.
 - if fuze makes a buzzing sound when safety pins are removed.
- Keep cartridge vertical (with fuze end up) if a buzzing sound was heard. Fuze may be armed.
- Notify EOD.

Inspect M751 and M775 Practice Fuzes to ensure that fuze striker is not protruding from nose of fuze so that red stripe is visible. If fuze striker is protruding so that red stripe is visible, fuze may be armed. Force applied to nose of fuze may cause it to function. Remove cartridge to dud pit, taking care not to strike nose of fuze, and notify EOD.

Do not fire ammunition through overhead obstructions or over the heads of unprotected personnel.

The mortar crew must have adequate cover for protection from fragments when firing to ranges of 225 meters (246 yards) or less.

Do not fire ammunition with damaged fins, leaking or missing propellant containers, damaged obturators, or damaged fuzes.

WARNING SUMMARY - Continued

GENERAL SAFETY WARNINGS DESCRIPTION - Continued

WARNING



All cartridges must be inspected prior to firing for dented, cracked, bent, separated, and loose components. Any cartridge with fins bent (even slightly) or propellant increments that have been punctured or torn (leaking propellant) are to be considered unserviceable, since critical short rounds could result if fired.

Unpacked mortar cartridges are known to sustain significant damage when dropped. Packed ammunition dropped from a height of more than 2.1 meters (7 feet) could be similarly damaged. Defects incurred may not be detectable by visual inspection, and firing damaged ammunition could result in weapon or property damage or serious personnel injury or death. All cartridges which have been dropped are to be immediately segregated, tagged or marked for identification, and turned in to the Ammunition Supply Point (ASP) as unserviceable.

Point detonating (PD) and proximity fuzes may prematurely function when fired through extremely heavy rainfall. Short rounds may occur if an excessive amount of oil or water is in barrel during firing. Do not fire ammunition in temperatures above +145 °F (+63 °C) or below -50 °F (-46 °C).

Firing M374A2, M375A1, and M375A2 cartridges in inclement weather (rain/snow) is not advisable. Critical short rounds may occur when propelling charge bags are wet or have previously been exposed to moisture.

Do not hammer on fuze wrench or use an extension on handle. Fuze must be fully seated onto projectile body. Do not stake fuze. Use only authorized fuze combinations.

Propelling charges are not interchangeable. Do not substitute one model for another. Do not mix lots.

To avoid erratic or short rounds, reposition remaining propellant increments towards rear of fin assembly when firing M821 HE (high explosive), M889 HE, M374A3 HE, M375A3 WP (white phosphorus), M819 RP (red phosphorus), M853 Illum (illuminating), or M879 TP (target practice) cartridges with less than full charge (4 increments).

To avoid erratic or short rounds, charge A increment of the M90 and M90A1 propelling charge must be used when firing above charge 0.

WARNING SUMMARY - Continued

GENERAL SAFETY WARNINGS DESCRIPTION - Continued

WARNING



When burning excess increments:

- Burning area must be at least 100 meters (109 yards) from the nearest mortar position, parked vehicles, and ammunition piles.
- Burning area shall be cleared of all dead grass or brush within 30 meters (33 yards).

WARNING



If cartridge fails to fire and mortar is hot, wait until mortar is cool enough to move with bare hands. If mortar is cool enough at time of misfire, wait 1 minute before removing cartridge. This is to avoid an accident from possible delayed action of ignition cartridge. Water or snow applied to barrel can be used for cooling.

WARNING SUMMARY - Continued

EXPLANATION OF HAZARDOUS MATERIALS ICONS



CHEMICAL - Drops of liquid on hand shows that the material will cause burns or irritation to human skin or tissue.



EYE PROTECTION - Person with goggles shows that the material will injure the eyes.



FIRE - Flame shows that a material will ignite and cause burns.



POISON - Skull and crossbones shows that a material is poisonous or is a danger to life.



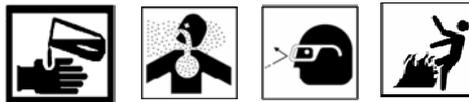
RADIATION - Three circular wedges shows that the material emits radioactive energy and can injure human tissue.



VAPOR - Human figure in a cloud shows that material vapors present danger to life or health.

HAZARDOUS MATERIALS DESCRIPTION

WARNING



CLEANING SOLVENTS

Dry cleaning solvents and paint thinners are flammable. These chemicals evaporate quickly drying the skin; irritation or cracking of the skin may result.

- Do not clean parts near an open flame or in a smoking area.
- Make sure adequate ventilation is available.
- Wear safety goggles or glasses and protective gloves.
- Always know location of nearest eye wash station.

WARNING SUMMARY - Continued

HAZARDOUS MATERIALS DESCRIPTION - Continued

WARNING



RADIATION HAZARD - TRITIUM GAS (H₃)

The M67/M64/M64A1 Sight Units and M58/M59 Aiming Post Lights contain radioactive tritium gas in sealed source form. Exposure to tritium gas is a potential ionizing radiation hazard.

- Eating, drinking, or smoking is NOT allowed in tritium device maintenance areas.
- Arms rooms are not authorized work areas for any radioactive mortar component.
- All personnel who operate and/or maintain fire control equipment must be aware of the special precautions to control exposure to tritium. See "Tritium (H₃) Safety, Care, and Handling" in WP 0001.
- Immediately report any suspected lost or damaged items to your Local Radiation Safety Officer (LRSO). If your LRSO cannot be reached, contact the TACOM-RI Safety Office during regular duty hours at DSN 793-2965/4594, 309-782-2965/4594.

LRSO: _____ Phone: _____

LIST OF EFFECTIVE PAGES/WORK PACKAGES

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Date of issue for the original manual is:

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FOLLOWING:**

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TECHNICAL MANUAL

**OPERATOR'S MANUAL
FOR
MORTAR, 81-MM, M252
NSN 1015-01-164-6651 (EIC:4SK)**

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HOW TO USE THIS MANUAL

The safest, easiest, and best way to operate and maintain the 81-mm mortar is to use this manual. Learning to use this TM is as easy as reading through the next few pages of this section. Knowing what is in this manual and how to use it will save you time and work and will help you to avoid exposing yourself to unnecessary hazards while performing your job.

So where do you start?

Right here, if this is the first time you are using this TM. Be sure to completely read this section on how to use this manual first. There's a lot of information here that you need to know.

Organization

This manual covers the operation of the 81-mm mortar. The manual itself is divided into six chapters. The six chapters, and what they contain, are found in the Table of Contents in the front of this manual. For example, to learn about operating the M252 mortar, you would look in the table of contents and discover that Chapter 2 provides all pertinent information about the operation of the weapon system. Since Chapter 2 covers a great deal of information, you will have to scan the chapter to find the specific information you will need.

In the back of this manual, you will find supporting information. Each work package provides specific information that will assist you in performing the various tasks. The work packages provide such information as additional references (i.e., other TMs or FMs), as in WP 0026, and Basic Issue Items (BII), as in WP 0027. Become familiar with all supporting information work packages before beginning any operational or maintenance task.

Readiness to Use this TM

If you've taken the time necessary to read this section, and are sure of the location and arrangement of the different sections of this TM, you are ready to begin. Remember, this TM has been arranged with you, the user, in mind. Your safety and ability to perform the operational and maintenance tasks in the most efficient manner possible hinge on your ability to perform and understand the information contained in this manual. If you fully understand the arrangement and purpose of this TM, and have taken the time to read through this section, you will have no trouble operating and maintaining this weapon system in the manner for which it was designed.

CHAPTER 1

**GENERAL INFORMATION,
EQUIPMENT DESCRIPTION, AND
THEORY OF OPERATION
FOR
M252 81-MM MORTAR**

OPERATOR
GENERAL INFORMATION

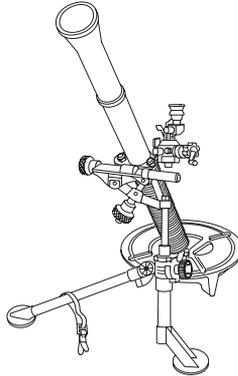
SCOPE

Figure 1. M252 81-mm Mortar.

Type of Manual

Operator's manual.

Model Number and Equipment Name

M252 81-mm Mortar.

Purpose of Equipment

Provides high-angle fire for close range support of ground troops.

MAINTENANCE FORMS, RECORDS, AND REPORTS

1. (A) Department of the Army forms and procedures used for equipment maintenance will be those prescribed by DA PAM 750-8, The Army Maintenance Management System (TAMMS) Users Manual.
2. (MC) Maintenance forms and records used by Marine Corps personnel are prescribed in TM 4700-15/1.
3. (F) Maintenance forms and records used by Air Force personnel are prescribed in AFI 21-101 and the applicable TO 00-20 Series Technical Orders.

REPORTING EQUIPMENT IMPROVEMENT RECOMMENDATIONS (EIR)

If your 81-mm mortar needs improvement, let us know. Send us an EIR. You, the user, are the only one who can tell us what you don't like about your equipment. Let us know why you don't like the design or performance. If you have Internet access, the easiest and fastest way to report problems or suggestions is to go to <https://aeps.ria.army.mil/aepspublic.cfm> (scroll down and choose the "Submit Quality Deficiency Report" bar). The Internet form lets you choose to submit an Equipment Improvement Recommendation (EIR), a Product Quality Deficiency Report (PQDR), or a Warranty Claim Action (WCA). You may also submit your information using an SF 368 (Product Quality Deficiency Report). You can send your SF 368 via e-mail, regular mail, or facsimile using the addresses/facsimile numbers specified in DA PAM 750-8, The Army Maintenance Management System (TAMMS) Users Manual. We will send you a reply.

For Marine Corps users: Quality deficiency reports (QDR) shall be submitted on SF 368 in accordance with MCO 4855.10. A reply will be furnished to you.

HAND RECEIPT (HR) MANUALS

This manual has a companion document with a TM number followed by "-HR" (which stands for Hand Receipt). TM 9-1015-249-10-HR consists of preprinted hand receipts that list end item related equipment (i.e., COEI, BII, and AAL) that must be accounted for. As an aid to property accountability, additional HR manuals may be requisitioned through normal publication channels.

CORROSION PREVENTION AND CONTROL (CPC)

Corrosion Prevention and Control (CPC) of Army materiel is a continuing concern. It is important that any corrosion problems with this item be reported so that the problem can be corrected and improvements can be made to prevent the problem in future items.

Corrosion specifically occurs with metals. It is an electrochemical process that causes degradation of metals. It is commonly caused by exposure to moisture, acids, bases, or salts. An example is the rusting of iron. Corrosion damage in metals can be seen, depending on the metal, as tarnishing, pitting, fogging, surface residue, and/or cracking.

Plastics, composites, and rubbers can also degrade. Degradation is caused by thermal (heat), oxidation (oxygen), solvation (solvents), or photolytic (light, typically UV) processes. The most common exposures are excessive heat or light. Damage from these processes will appear as cracking, softening, swelling, and/or breaking.

If a corrosion problem is identified, it can be reported using SF 368, Product Quality Deficiency Report. Use of key words such as "corrosion", "rust", "deterioration", or "cracking" will ensure that the information is identified as a CPC problem.

The form should be submitted to:

ATTN: AMSRD-AAR-QEP-A
TACOM-ARDEC
1 Rock Island Arsenal
Rock Island, IL 61299-7300

Fax: DSN 793-6653, Commercial (309) 782-6653
E-Mail: qawqdrs@ria.army.mil

DESTRUCTION OF MATERIEL TO PREVENT ENEMY USE

Procedures and materials used for the destruction of the 81-mm mortar in order to prevent enemy use will be found in TM 750-244-7.

PREPARATION FOR STORAGE OR SHIPMENT

See WP 0020.

WARRANTY INFORMATION

Some mortars are under warranty. Contact the ARDEC Warranty Control Office (WARCO) for warranty information.

NOMENCLATURE CROSS-REFERENCE LIST

Common Name

Bipod
Cannon
Cross-Leveling Handwheel
Elevating Handwheel
Sight Unit Adapter
Traversing Handwheel

Official Nomenclature

Mortar Mount
Mortar Barrel
Cross-Leveling Operating Handle
Elevating Leg Operating Handle
Adapter Assembly
Traversing Gear Operating Handle

LIST OF ABBREVIATIONS/ACRONYMS
Abbreviation/Acronym

ANOR	Allowable Number of Rounds
ASP	Ammunition Supply Point
BAD	Blast Attenuator Device
CPC	Corrosion Prevention and Control
D	Delay
DLY	Delay
EIR	Equipment Improvement Recommendation
EOD	Explosive Ordnance Disposal
FDC	Fire Direction Center
HE	High Explosive
Illum	Illuminating
IMP	Impact
IR	Infrared
MO	Multi-Option
MTSQ	Mechanical Time Superquick
NATO	North Atlantic Treaty Organization
NBC	Nuclear, Biological, and Chemical
NSB	Near Surface Burst
PD	Point Detonating
PMCS	Preventive Maintenance Checks and Services
PQDR	Product Quality Deficiency Report
Prox	Proximity
PRX	Proximity
RP	Red Phosphorus
RSO	Radiation Safety Officer
SF	Standard Form
SOP	Standard Operating Procedures
SQ	Superquick
SR	Short Range
T	Time
TAMMS	The Army Maintenance Management System
TP	Target Practice
VT	Variable Time
WCA	Warranty Claim Action
WP	White Phosphorus

TRITIUM (H₃) SAFETY, CARE, AND HANDLING

1. Purpose: These precautions implement mandatory license requirements for use and maintenance of tritium radioluminous fire control devices used on mortars.

-
2. Hazard Description: Radioactive tritium gas is contained in the following mortar components: M67/M64/M64A1 Sight Units and M58/M59 Aiming Post Lights. Provided are some facts about tritium exposure:
- Tritium is a potential ionizing radiation hazard.
 - The tritium gas is hermetically sealed into glass tubes or vials like miniature fluorescent lamps.
 - No external radiation is emitted by the vial itself since the glass effectively stops the beta particles.
 - The beta radiation emitted by tritium is only a hazard if the tritium vial is broken and contaminates personnel or work areas.
 - The tritium gas will quickly disperse into the surrounding air if a vial is broken. It becomes more hazardous when released into a confined space such as an arms room or unventilated room, where the tritium gas converts to tritiated water vapor.
 - Tritiated water is readily absorbed by the body through inhalation, ingestion, or absorption through the skin when contact is made with contaminated surfaces or devices.
3. Identification: Mortar devices containing radioactive self-luminous vials are identified by means of radioactive warning labels. These labels should not be defaced or removed during maintenance and should be replaced immediately when necessary.
4. Control: Control of this radioactive materiel is mandated by Federal Regulation. Immediately report any suspected lost or damaged items to your Radiation Safety Officer (RSO). If your local Radiation Safety Officer cannot be reached, contact the TACOM-RI Safety Office during regular duty hours at DSN 793-2965/4594 or (309) 782-2965/4594.

LOCAL RSO: _____ TELEPHONE: _____

5. Procedures for Handling Damaged Tritium Lamps: The following procedures shall be followed when a tritium lamp contained in a mortar component is broken or does not show illumination.
- a. If the tritium lamp is broken, cracked, or there is no illumination, immediately wrap the device in two clear plastic bags, seal with tape, and mark the bag "Broken Tritium Device – Do Not Open". Personnel handling the tritium device should wear impermeable gloves. If gloves are not available, use the inverted bag method in picking up the device. Place the potentially contaminated gloves between the first and second plastic bag prior to sealing.
 - b. If skin contact is made with any device or area potentially contaminated with tritium, wash immediately (within 3 minutes) with nonabrasive soap and cold water for at least 1 minute.
 - c. Notify your local RSO immediately to report the incident. Contact the base safety office or your NBC officer for the name and telephone number of the local RSO.

TRITIUM (H₃) SAFETY, CARE, AND HANDLING - Continued

- d. Broken tritium sources indoors may result in tritium contamination of the areas, such as work bench table tops, ceilings, floors, etc. Personnel need to inform other persons to vacate the immediate area and secure the immediate area from entry until the RSO has determined the extent of contamination. This can only be determined by the RSO performing a wipe test survey of the potentially contaminated work surfaces/areas.
 - e. Your local RSO will perform a leak test on the damaged device and related work area by performing wipe tests to determine the extent of tritium contamination. If wipe test results are in excess of 1,000 disintegrations per minute (DPM), decontaminate the area per guidance provided by the TACOM-RI license RSO. The local RSO will perform another wipe test after decon to be certain decontamination was successful.
6. Maintenance Precautions: This procedure is applicable to all personnel working with tritium devices, including depot and field maintenance levels.
- a. Do not attempt to repair a known broken device until it has been determined by the RSO that the device is free of tritium contamination. It may or may not be economically feasible to repair mortar components. Due to expired shelf-life, not all non-illuminated devices will have evidence of tritium contamination, but will still be handled as if they were contaminated.
 - b. Check for illumination prior to maintenance in a low light or dark room. Check the luminosity of each lamp in each device to determine the condition. If any lamp is not illuminated, do not repair. Wrap the entire device in plastic bag as outlined above and notify your RSO immediately.
 - c. Wear protective gloves and perform work in a well-ventilated designated area.
 - d. Wash hands immediately (within 3 minutes) with nonabrasive soap and cold water after handling a broken mortar fire control device that contains tritium modules.
 - e. When mortar tritium module components are replaced during maintenance, they must be placed into a clear plastic bag, labeled radioactive tritium component, the NSN, and activity present in millicuries. The maintainer must turn in the fire control component immediately to the unit RSO for proper radioactive waste disposal and security.
 - f. Spare parts to include modules containing tritium lamps must be stored in the shipping container, as received, until installation into the mortar component. Storage of radioactive items is required to be in a secure, well-ventilated area that is designated by the RSO.
 - g. Additional guidance for safe handling and maintenance is located in TM 9-254, General Maintenance Procedures for Fire Control Materiel.

7. Maintenance Levels:

- a. Modules containing tritium lamps can be replaced at the field maintenance level. The module encloses the tritium lamp, e.g., level vials are considered to be modules. Maintenance of mortar components containing tritium fire control involving module replacement ONLY will be performed in a controlled area designated by the installation or mission/unit RSO.
- b. Any repair requiring the removal of the tritium lamp itself from the module is prohibited by TACOM-RI NRC license. Depot level maintenance repair facilities have been established to perform more difficult repairs on fire control devices. All mortar tritium fire control devices requiring replacement of the tritium lamp(s) contained INSIDE the module will be evacuated to the appropriate Tritium Instrument Repair Facility designated by the TACOM LCMC senior health physicist as indicated below. Severely damaged devices (not economically feasible to repair) must be turned in to your installation or local RSO immediately for disposal. The following is an approved list of depot level repair Tritium Instrument Repair Facilities:
 - (1) Anniston Army Depot
 - (2) Fort Drum, NY
 - (3) Fort Stewart, GA
 - (4) Fort Bragg, NC
 - (5) Fort Lewis, WA
 - (6) Schofield Barracks, HI
 - (7) MCLB Albany, GA
 - (8) MCLB Barstow, CA
 - (9) Rock Island Arsenal, Rock Island, IL

TRITIUM (H₃) SAFETY, CARE, AND HANDLING - Continued

8. Posting Requirements: In accordance with Title 10 CFR Section 19.11, the following rules and regulations shall be posted in work areas where mortar tritium fire control devices are repaired. Copies may be requested or further information obtained by contacting the TACOM-RI LCMC RSO/licensee, ATTN: AMSTA-CSC-ZR, Rock Island, IL 61299-7630.

NOTE

Postings e and f (below) may be filed in the installation safety office for review, rather than posting them in the work area.

- a. NRC License (TACOM license BML 12-00722-06).
- b. Standard Operating Procedures specifying maintenance procedures.
- c. NRC Form 3 (May 1999) and Reorganization Act of 1974, Section 206.
- d. Emergency contact information (local RSO and license RSO).
- e. 10 CFR Part 19 - Notices, Instructions, and Reports to Workers.
- f. 10 CFR Part 20 - Standards for Protection against Radiation.

END OF WORK PACKAGE

OPERATOR
EQUIPMENT DESCRIPTION AND DATA

EQUIPMENT CHARACTERISTICS, CAPABILITIES, AND FEATURES**Characteristics**

Provides high-angle fire for close range support of ground troops.

Capabilities and Features

Smooth bore barrel is muzzle loaded and has a removable firing pin.

Mortar breaks down into sections that are portable.

M67 sight unit gives indirect fire capability.

Major Weapon System Components

1. M253 Cannon
2. M177 Mortar Mount (Bipod)
3. M3A1 Baseplate
4. M67 Sight Unit

LOCATION AND DESCRIPTION OF MAJOR COMPONENTS

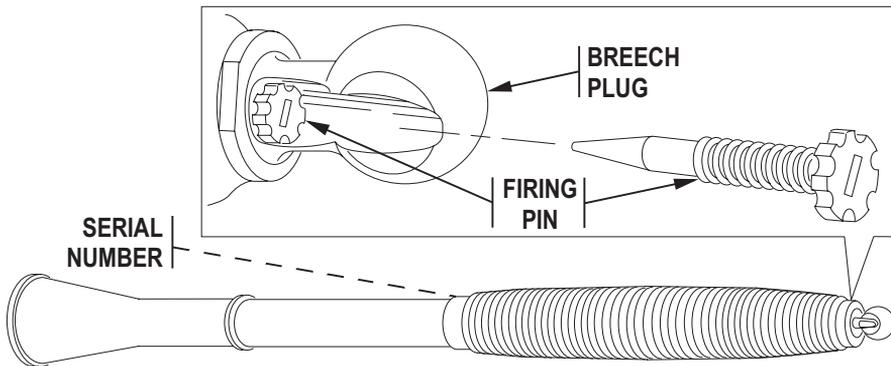


Figure 1. M253 Cannon.

M253 CANNON. The cannon has a removable breech plug and firing pin. The muzzle end has a short tapered lead-in for the cartridge and on previous configurations, a BAD (blast attenuator device). The breech end is finned for better cooling. The mortar serial number is engraved on the cannon directly above the cooling fins.

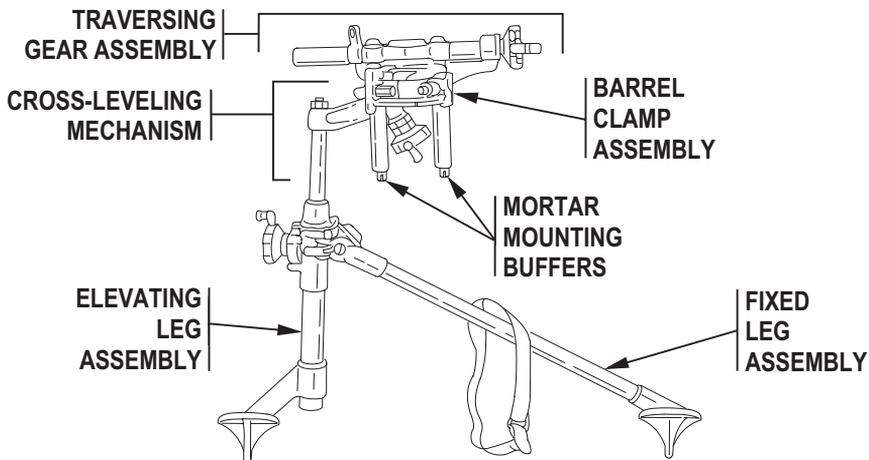


Figure 2. M177 Mortar Mount.

M177 MORTAR MOUNT (BIPOD). The mortar mount is an offset bipod consisting of a barrel clamp assembly which secures the bipod to the cannon, two mortar mounting buffers which reduce the shock of firing on other components, a traversing gear assembly for adjusting the mortar in azimuth, a cross-leveling mechanism for correcting weapon cant, an elevating mechanism to raise and lower the cannon, and two leg assemblies (fixed and elevating) to provide a stable base.

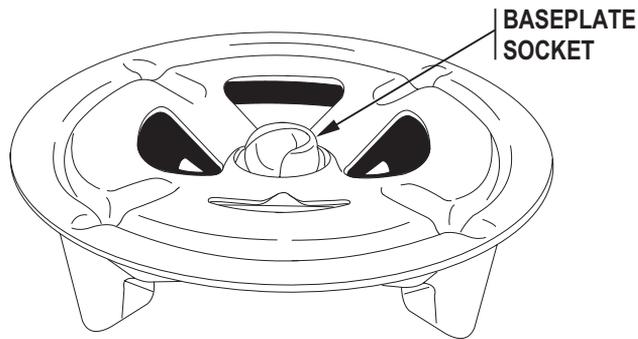


Figure 3. M3A1 Baseplate.

M3A1 BASEPLATE. The baseplate is made of aluminum; the socket provides a mounting point for the cannon.

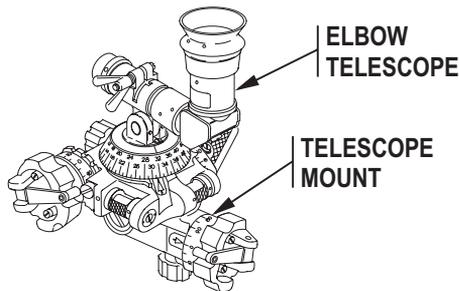


Figure 4. M67 Sight Unit.

NOTE

M67 sight unit is the primary sight unit. The M64/M64A1 sight unit may still be in use but is becoming obsolete.

M67 SIGHT UNIT. The sight unit consists of a 4.0 power hermetically sealed elbow telescope with tritium-illuminated simple cross reticle and a telescope mount with tritium-backlighted level vials, indices, and translucent plastic scales. The telescope mount includes a 6400-mil azimuth mechanism with one set of coarse and fine deflection scales. A similar mechanism is provided for elevation but is limited to travel to readings from 800 mils to 1600 mils on coarse and fine elevation scales. Identifying data are located on a nameplate attached to the telescope mount.

DIFFERENCES BETWEEN MODELS

Some mortars may be initially fielded with the M3/M3A1 Baseplate. The M3A1 Baseplate is the only authorized replacement.

Mortars were fielded with the M177 Mortar Mount. The M177 Mortar Mount is the authorized replacement.

EQUIPMENT DATA

Physical Characteristics

Weight:

M253 Cannon (with BAD, on previous configurations)	35 lb (15.91 kg)
M177 Mortar Mount	27 lb (12.25 kg)
M3A1 Baseplate	29 lb (13.15 kg)
M67 Sight Unit	2.90 lb (1.32 kg)

Dimensions:

Overall length (without BAD, on previous configurations)	4 ft 2 in. (1.27 m)
Overall length (with BAD, on previous configurations)	4 ft 7 in. (1.40 m)
Diameter of baseplate	1 ft 10 in. (0.56 m)

Elevation:

Elevation (approx)	800 to 1515 mils
Per turn of elevation handwheel (approx)	10 mils

Deflection:

Right or left from center (approx)	100 mils
Total deflection by movement of mortar mount without moving baseplate	6400 mils (360 degrees)
Per turn of traversing handwheel (approx)	7 mils

Performance:

Maximum range	5608 m (6133 yd)
Minimum range	83 m (91 yd)

Rate of Fire:

M362 SERIES, M821, M889, M819, AND M853 CARTRIDGES

Sustained	15 rounds/min
Maximum	30 rounds/min for 2 minutes

M374, M374A1, M374A2, M375, M375A1, M375A2, AND M301 SERIES
(EXCEPT M374A3 AND M375A3)

Sustained	8 rounds/min
Maximum	25 rounds/min for 2 minutes

M374A3 AND M375A3 CARTRIDGES

Sustained	15 rounds/min
Maximum	30 rounds/min for 2 minutes

M67 Sight Unit:

Field of view	10 degrees
Height.....	8.5 in. (21.6 cm)
Length	4.38 in. (11.11 cm)
Magnification	4.0 X nominal 3.5 effective
Illumination source.....	self-contained radioactive tritium, 6 to 8 years life

END OF WORK PACKAGE

OPERATOR
THEORY OF OPERATION

THEORY OF OPERATION



Figure 1. Loading of Mortar.

1. Mortar is fired by loading the cartridge into the barrel, fin-end first.

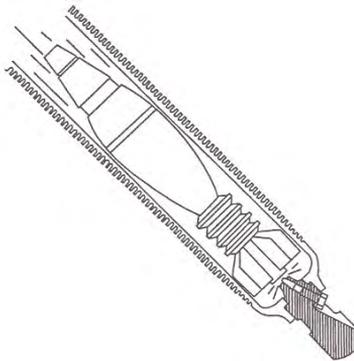


Figure 2. Strike of Firing Pin.

2. Cartridge slides down the barrel under its own weight and strikes the firing pin at the bottom.

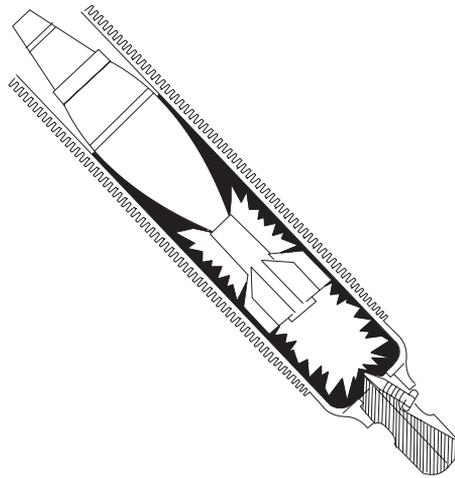
THEORY OF OPERATION - Continued

Figure 3. Function of Propelling Charge.

3. The primer/ignition cartridge functions. The propelling charge is ignited by the ignition cartridge. Expanding gases force the cartridge up and out of the barrel.

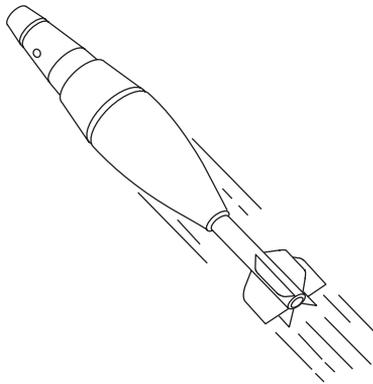


Figure 4. Flight of Cartridge.

4. Cartridge travels down range. Fins provide stability in flight until impact with ground/target.

END OF WORK PACKAGE

CHAPTER 2

OPERATOR INSTRUCTIONS
FOR
M252 81-MM MORTAR

OPERATOR

DESCRIPTION AND USE OF OPERATOR CONTROLS AND INDICATORS

CONTROLS AND INDICATORS

M177 Mortar Mount

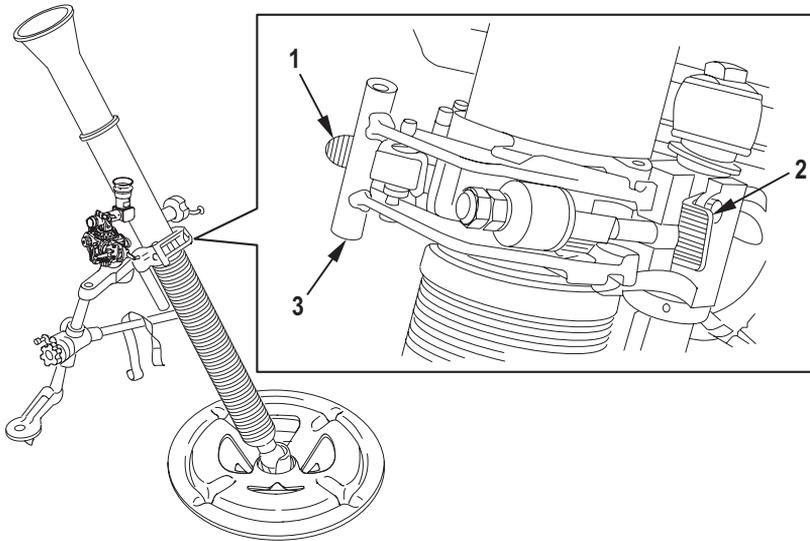


Figure 1. M177 Mortar Mount Barrel Clamp.

BARREL CLAMP LOCKING LEVER (1). Prevents barrel clamp handle (3) from bouncing loose during firing. Press down to release.

BARREL CLAMP LATCH (2). Prevents complete release of barrel clamp assembly if barrel clamp locking lever (1) fails and barrel clamp handle (3) bounces loose. Turn clockwise to release.

BARREL CLAMP HANDLE (3). Barrel clamp handle locks two halves of barrel clamp assembly together.

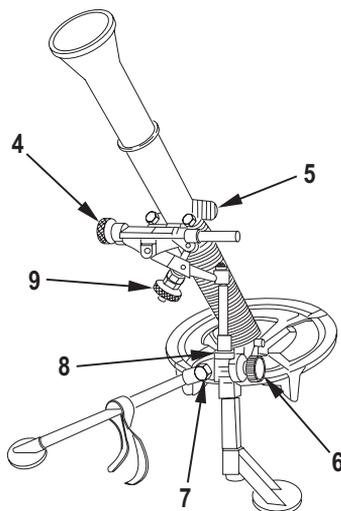
CONTROLS AND INDICATORS - Continued**M177 Mortar Mount - Continued**

Figure 2. M177 Mortar Mount Controls.

TRAVERSING HANDWHEEL (4). Turning traversing handwheel clockwise traverses mortar to the right.

SIGHT UNIT ADAPTER (5). Adapter is attached to sight socket on traversing gear assembly and is used to attach M67 sight unit.

ELEVATING HANDWHEEL (6). Turning elevating leg handwheel clockwise depresses mortar.

LEG LOCKING KNOB (7). Used to lock the fixed leg assembly in any desired position. Turn counterclockwise to release.

LEG LOCKING LEVER (8). Positions fixed leg assembly for emplacement on level ground. Push to release.

CROSS-LEVELING HANDWHEEL (9). Turning clockwise causes the left side of mortar to move downward.

M67 Sight Unit

NOTE

M67 sight unit is the primary sight unit. The M64/M64A1 sight unit may still be in use but is becoming obsolete.

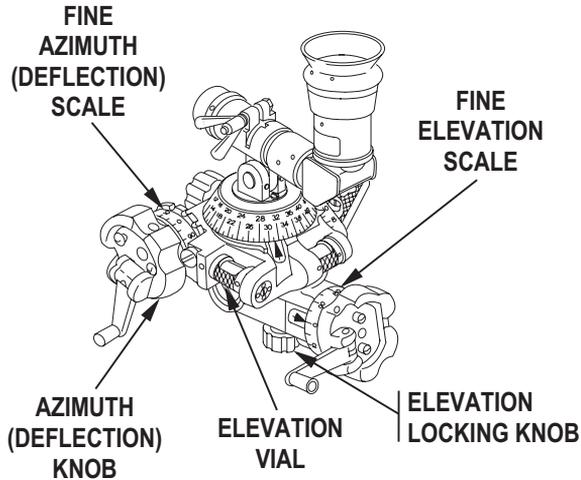


Figure 3. Sight Unit Controls and Indicators (Sheet 1 of 3).

FINE AZIMUTH (DEFLECTION) SCALE. Indicates from 0 to 100 mils in 1 mil increments.

FINE ELEVATION SCALE. Indicates from 0 to 100 mils in 1 mil increments.

ELEVATION LOCKING KNOB. Unlocks or locks elevation mechanism and scales.

ELEVATION VIAL. Indicates level condition of sight unit.

AZIMUTH (DEFLECTION) KNOB. Rotates deflection mechanism and scales.

CONTROLS AND INDICATORS - Continued

M67 Sight Unit - Continued

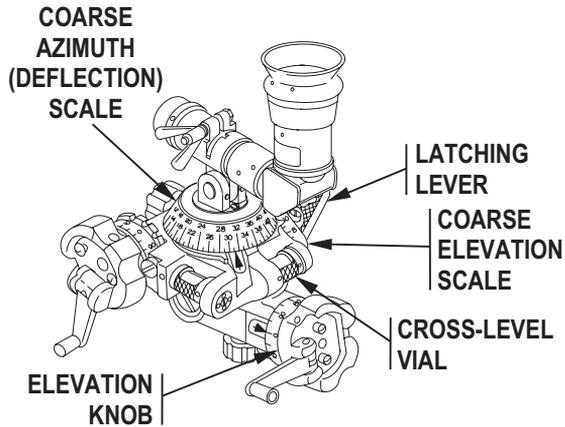


Figure 3. Sight Unit Controls and Indicators (Sheet 2 of 3).

LATCHING LEVER. Locks sight unit to mortar.

COARSE ELEVATION SCALE. Indicates from 700 to 1600 mils in 100 mil increments.

CROSS-LEVEL VIAL. Indicates level condition of sight unit.

ELEVATION KNOB. Rotates elevation mechanism and scale.

COARSE AZIMUTH (DEFLECTION) SCALE. Indicates from 0 to 6400 mils in 100 mil increments.

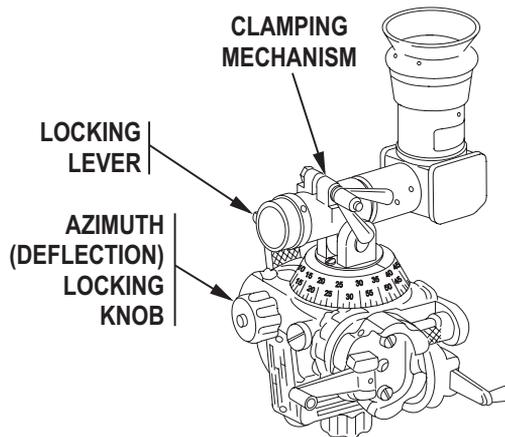


Figure 3. Sight Unit Controls and Indicators (Sheet 3 of 3).

LOCKING LEVER. Locks clamping mechanism in upright position.

CLAMPING MECHANISM. Used to adjust and hold elbow telescope.

AZIMUTH (DEFLECTION) LOCKING KNOB. Unlocks or locks deflection mechanism and scales.

END OF WORK PACKAGE

OPERATOR**OPERATION UNDER USUAL CONDITIONS - EMBLACEMENT OF MORTAR**

INITIAL SETUP:

Not Applicable

MORTAR EMBLACEMENT**WARNING**

To prevent premature detonation of cartridge or misdirection of projectile flight, firing site must have sufficient mask clearance and no overhead obstructions.

1. Select a firm, level site for emplacing mortar.
2. Prepare a horizontal surface upon which to place baseplate and bipod leg assemblies.

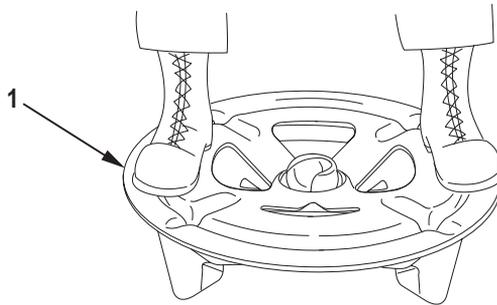


Figure 1. Seating Baseplate.

3. Place baseplate (1) on prepared site.

NOTE

Due to difference in terrain, initial seating of baseplate may include digging out area around legs before jumping on baseplate.

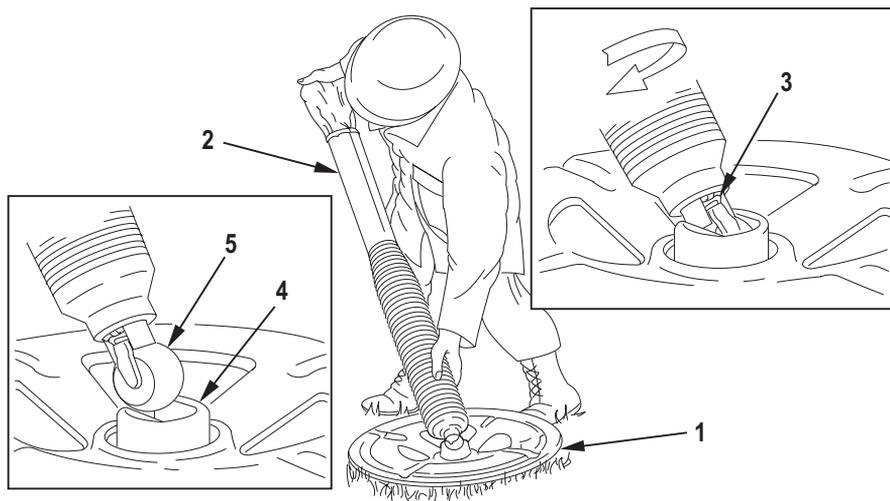
MORTAR EMPLACEMENT - Continued

Figure 2. Placement of Cannon into Baseplate.

4. Set baseplate (1) firmly in place by jumping on it.
5. Lower cannon (2) onto baseplate (1) so that vertical faces of breech plug (5) fit into cutaway portion of baseplate socket (4).
6. Rotate cannon (2) 1/4 turn to lock it into baseplate (1). Firing pin (3) must be up and clearly visible.

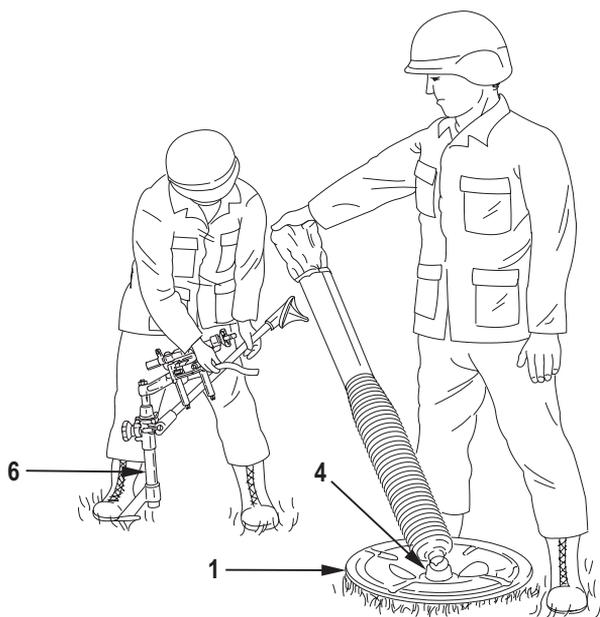


Figure 3. Placement of Elevating Leg Assembly.

7. Standing in front of baseplate (1) with back to line of fire, assistant gunner places foot of elevating leg assembly (6) about 26 in. (0.66 m) in front of baseplate socket (4) and 16 in. (0.41 m) to right of baseplate socket.

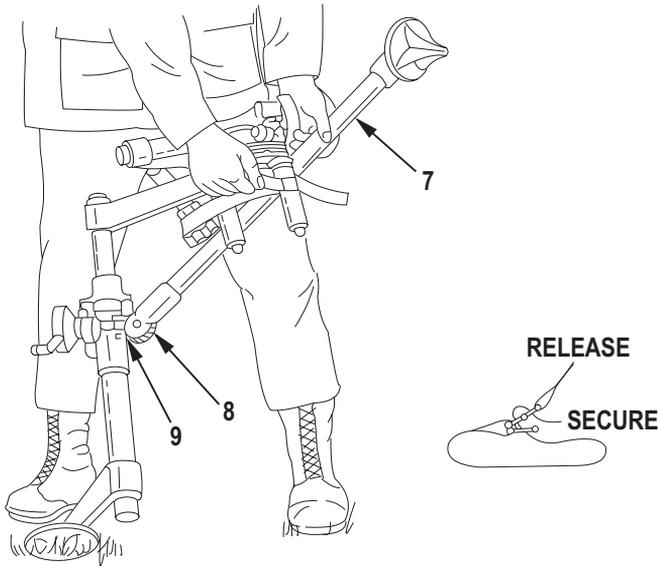
MORTAR EMPLACEMENT - Continued

Figure 4. Placement of Fixed Leg Assembly.

NOTE

On level ground, the correct position for fixed leg assembly is the point of engagement for leg locking lever. On uneven ground, the correct position is reached when elevating leg assembly is leaning about 5 to 10 degrees toward the centerline of mortar.

8. Unstrap fixed leg assembly (7), loosen leg locking knob (8), and lower fixed leg assembly to the ground. Ensure that leg locking lever (9) engages. Leg strap must remain properly laced through buckle to allow utilization of quick release/fasten design.

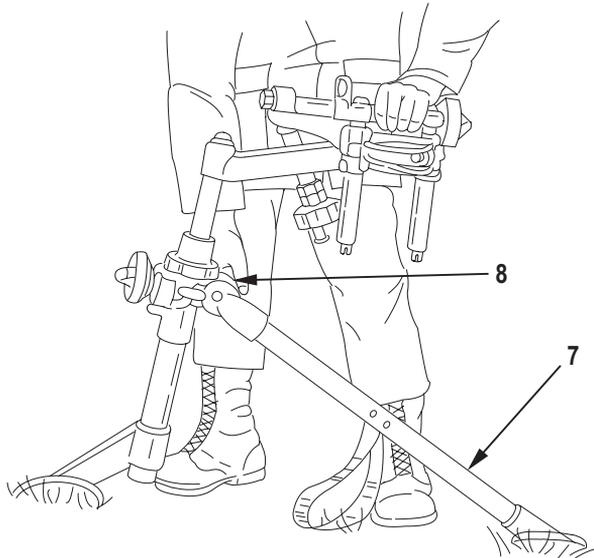


Figure 5. Locking of Fixed Leg Assembly.

9. Lock fixed leg assembly (7) in place by tightening leg locking knob (8).

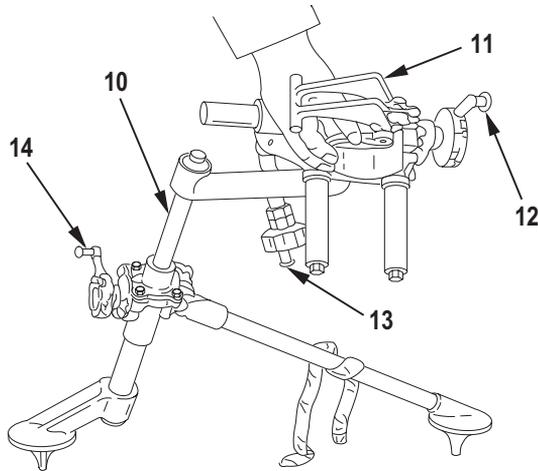


Figure 6. Centering of Barrel Clamp Assembly.

10. Unfold traversing handwheel (12), cross-leveling handwheel (13), and elevating handwheel (14).
11. Turn elevating handwheel (14) until about 8 in. (20.30 cm) of elevating shaft (10) is exposed. Center barrel clamp assembly (11) by using traversing handwheel (12).

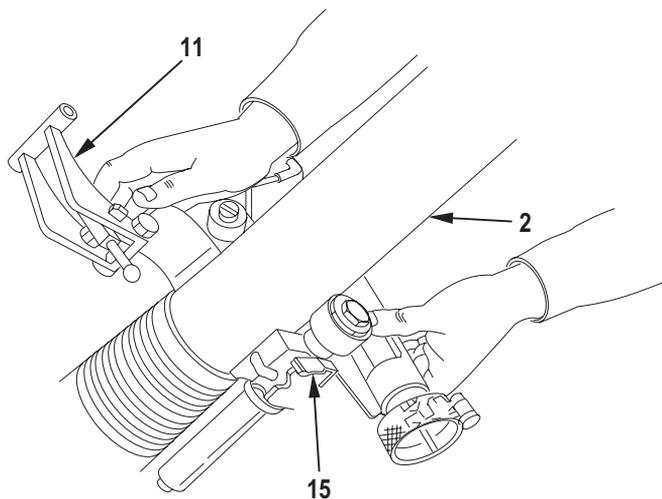
MORTAR EMPLACEMENT - Continued

Figure 7. Installation of Barrel Clamp to Cannon.

12. Release barrel clamp latch (15), open barrel clamp assembly (11), and clamp to cannon (2).

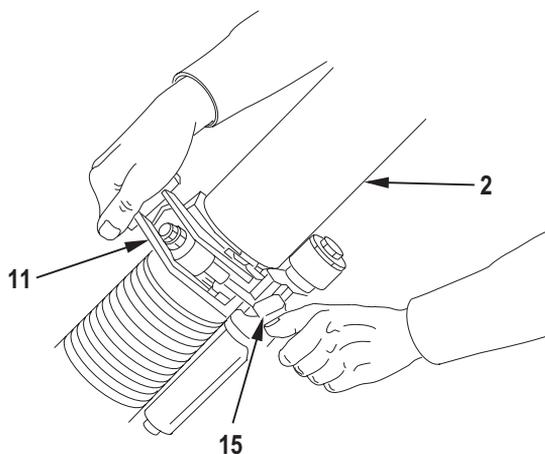


Figure 8. Securing Cannon to Bipod.

13. Adjust bipod until barrel clamp assembly (11) rests against lower stop band of cannon (2). Lock barrel clamp assembly and apply barrel clamp latch (15).

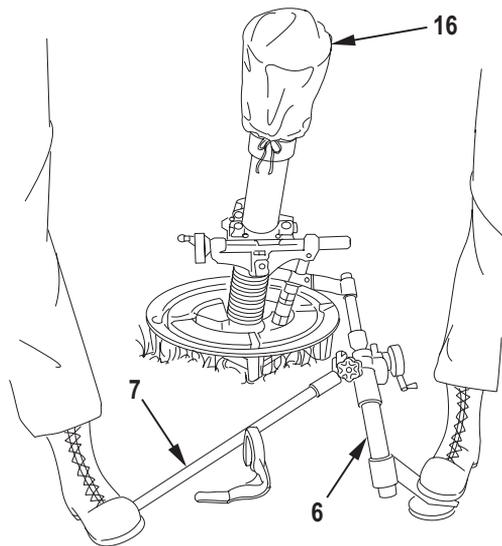


Figure 9. Seating Bipod Legs.

14. Firmly seat legs of fixed leg assembly (7) and elevating leg assembly (6).

NOTE

Do not remove muzzle cover (16) at this time.

END OF TASK

END OF WORK PACKAGE

OPERATOR**OPERATION UNDER USUAL CONDITIONS - INSTALLATION OF M67 SIGHT UNIT**

INITIAL SETUP:

Not Applicable

SIGHT UNIT INSTALLATION**WARNING**

RADIATION HAZARD - TRITIUM GAS (H_3)

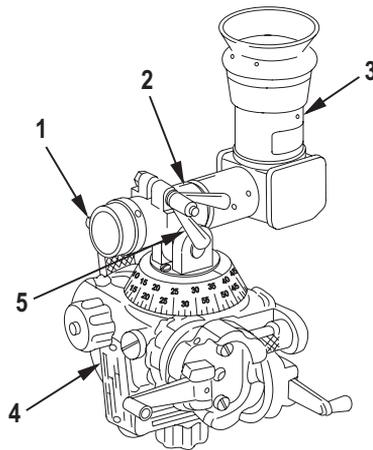


Figure 1. Positioning of Elbow Telescope.

1. Remove sight unit (4) from carrying case.
2. Pull clamping mechanism (1) up and raise elbow telescope (3) to vertical position as shown. Push clamping mechanism down to lock.
3. Loosen wing nut (5) and align top index line (2) with line on the telescope. Tighten wing nut.

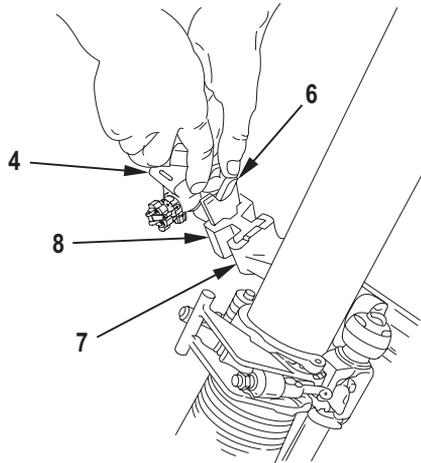
SIGHT UNIT INSTALLATION - Continued

Figure 2. Installation of Sight Unit.

4. Press latching lever (6) while installing sight unit (4) to sight unit adapter (8) on bipod (7). Release latching lever, and check to see that latching lever has firmly locked sight unit to bipod sight unit adapter.

END OF TASK

END OF WORK PACKAGE

OPERATOR**OPERATION UNDER USUAL CONDITIONS - BORESIGHTING WITH M67 SIGHT UNIT**

INITIAL SETUP:

Not Applicable

BORESIGHTING**WARNING**

RADIATION HAZARD - TRITIUM GAS (H₃)

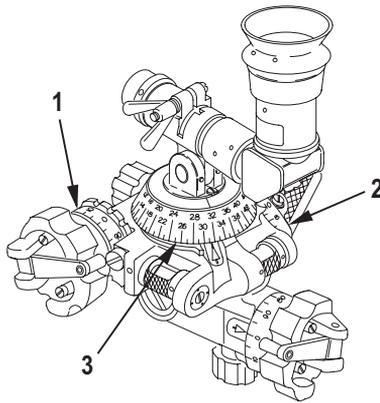


Figure 1. Setting Scales on Sight Unit.

1. Check that elevation and traversing mechanisms are approximately centered.
2. Make a visual check that the elbow telescope is roughly parallel to the ground.
3. If coarse deflection scale (3) is not set at 3200 mils, set it by pushing down around the circumference of the coarse deflection scale, turning it to 32, and releasing it.
4. Set fine deflection scale (1) to 0 mils.
5. Set coarse elevation scale (2) to 0800 mils.

BORESIGHTING - Continued

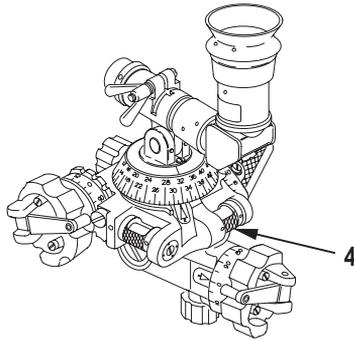


Figure 2. Removal of Cant.

NOTE

Do not use deflection knob on the sight unit to remove cant.

6. Remove cant if present, by turning cross-leveling operating handle until bubble in cross-level vial (4) on sight unit is centered.

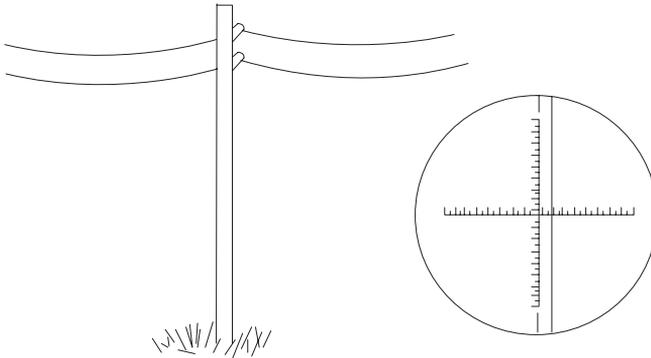


Figure 3. Selection of Aiming Point.

7. Select an aiming point that has a clearly defined vertical line. Aiming point should be as far away as possible and not less than 200 meters (219 yards).

NOTE

Always sight along left edge of aiming point.

8. Look through elbow telescope and pick out distant aiming point. Move mortar if necessary to place cross hairs on distant aiming point. Do not use traversing mechanism, but physically pick up mortar to align it on aiming point.
9. Check both level bubbles and adjust if necessary using mortar controls only. Preparation for boresighting is now complete.

NOTE

It is important to have mortar cannon in center of traverse at this time.

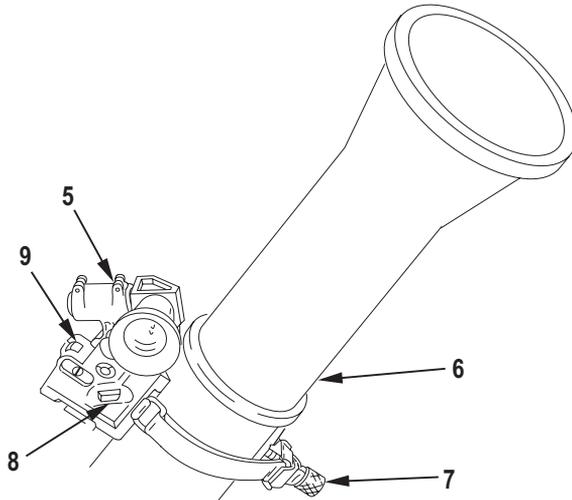


Figure 4. Installation of M45A1 Boresight.

10. Remove M45A1 boresight (5) from carrying case and place on top of cannon (6) just below upper step band.

NOTE

The elbow telescope on the boresight is not used to set the cannon to 800 mils so its orientation is not important.

Slight movements of boresight may be made by loosening clamp screw and lightly tapping boresight body.

11. Center bubble in boresight cross-level vial (9) by rotating boresight (5) slightly around cannon (6) and tightening clamp screw (7).
12. Elevate or depress cannon until bubble in boresight elevation level vial (8) is centered.

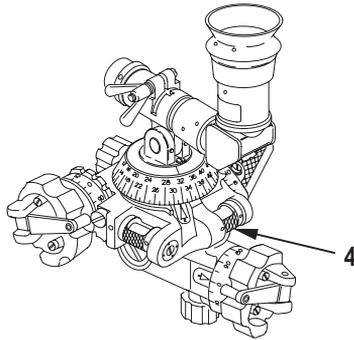
BORESIGHTING - Continued

Figure 5. Centering Bubble in Cross-Level Vial.

13. Check cross-level vial (4) on sight unit. Center bubble if necessary and do not disturb cross-level on boresight. It may be necessary to go back and forth on these two units to get them both centered.
14. Repeat above steps until bubbles in cross-level vial of sight unit, cross-level vial of boresight, and elevation level vial of boresight are centered.
15. The tube is now at 800 mils elevation.

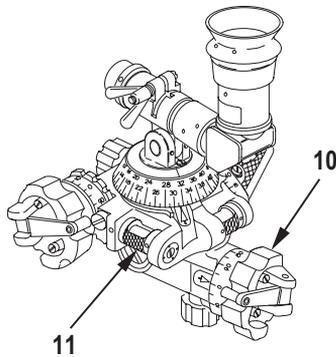


Figure 6. Centering Bubble in Elevation Vial.

16. Check that bubble in elevation vial (11) of sight unit is centered. If it is not, adjust elevation control knob (10) until it is centered.
17. Check cross-level vials on sight unit and boresight to make sure bubbles are still centered. Adjust until bubbles are centered.
18. Check elevation vial on boresight to make sure that bubble is still centered.

19. Repeat previous steps until all four bubbles are centered.

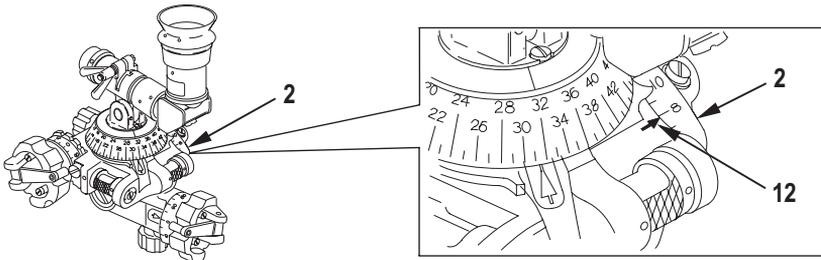


Figure 7. Verification of Reading on Coarse Elevation Scale.

CAUTION

Do not tamper with coarse elevation scale. This could cause damage to scale or sight unit.

20. Verify that reading on coarse elevation scale (2) is 800 mils. (The coarse elevation index arrow (12) should point to 8 on coarse elevation scale.) A mismatch of ± 20 mils is acceptable. If over 20 mils off, remove and turn in sight unit for corrective maintenance.

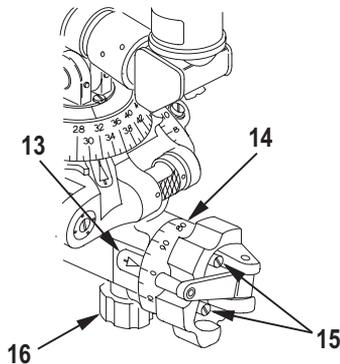


Figure 8. Verification of Reading on Fine Elevation Scale.

21. Verify that reading on fine elevation scale (14) is 0 mils. If it isn't, tighten elevation locking knob (16), loosen two screws (15), and slip scale until arrow (13) points to 0 mils. Tighten screws and loosen elevation locking knob.
22. Recheck all level bubbles and adjust as necessary.
23. The mortar is now boresighted for elevation.

BORESIGHTING - Continued**NOTE**

As an alternate method of boresighting the following procedures may be performed without removing boresight from atop cannon and with both telescopes facing backwards.

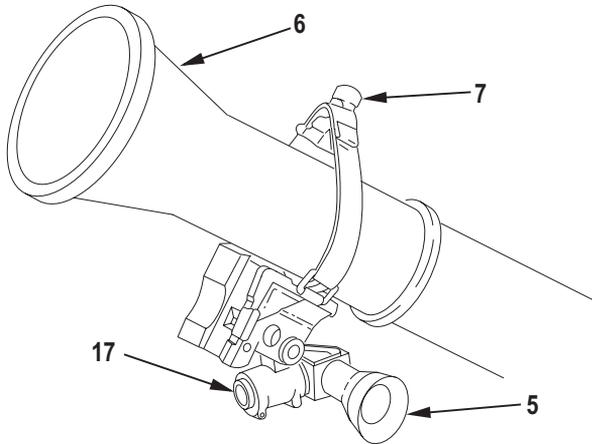


Figure 9. Alternate Position of M45A1 Boresight.

24. Carefully remove boresight (5) from top of cannon (6). Change strap to other V-block surface and mount to underside of cannon with boresight elbow telescope (17) facing forward.

NOTE

Slight movements of boresight may be made by loosening clamp screw and lightly tapping boresight body.

25. Center cross-level vial by rotating boresight slightly. When bubble centers, tighten clamp screw (7).
26. Recheck all level bubbles and adjust as necessary.

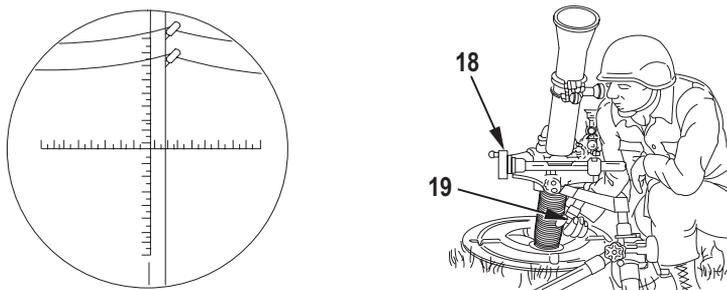


Figure 10. Cross-Leveling on Distant Aiming Point.

27. Look through boresight elbow telescope and find distant aiming point. Move cross hairs to vertical side of distant aiming point by moving traversing handwheel (18) no more than two turns in either direction from center.
28. Re-level cross-level vials on boresight and sight unit by using cross-leveling handwheel (19). This step may have to be repeated several times until both boresight and sight unit are cross-leveled.

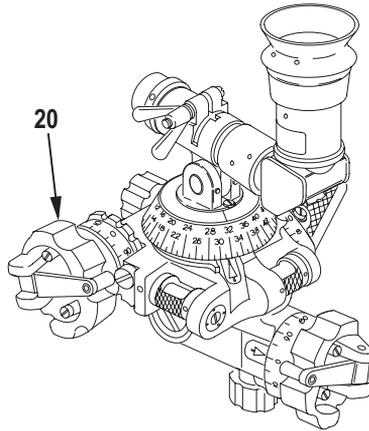
BORESIGHTING - Continued

Figure 11. Adjustment of Azimuth.

29. Look through sight unit and find distant aiming point. Move cross hairs to show exactly the same vertical side of distant aiming point as is shown in the boresight. Do this by turning the azimuth control knob (20) on the sight unit.
30. Recheck all level bubbles and adjust as necessary.
31. When both elbow telescopes show proper target patterns, proceed with next step.

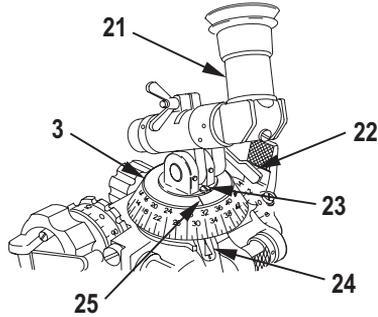


Figure 12. Adjustment of Coarse Deflection Scale.

32. Verify that 32 on coarse deflection scale (3) and arrow (24) are aligned (3200 mils). If not, push down on circumference of scale, turn it to 32, and release it.
33. Verify that line on pointer dial (25) aligns with 32 on coarse deflection scale (3). If it does not, loosen locking lever (22), pivot elbow telescope (21) out of the way, and loosen two screws (23) holding inner pointer dial (25). Turn coarse deflection scale until line is at 32 and then tighten screws.
34. Reposition elbow telescope (21) and tighten locking lever (22).

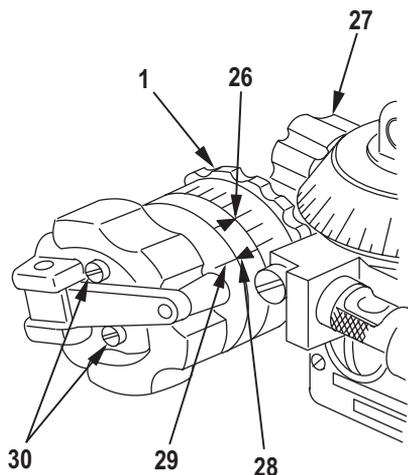
BORESIGHTING - Continued

Figure 13. Adjustment of Fine Deflection Scale.

35. Verify that fine deflection red index arrow (28) is aligned with red index line of control dial (29) and black index arrow (26) is aligned with 0 mils.
36. If arrows are not properly aligned, tighten azimuth locking knob (27). Loosen two screws (30).
37. Turn red index line of control dial (29) to align with red index arrow (28).
38. Disengage fine deflection scale (1) and turn to align 0 mils with black index arrow (26).
39. Tighten two screws (30) and loosen azimuth locking knob (27).
40. Remove boresight from cannon and store in carrying case. Mortar is now boresighted.

END OF TASK

END OF WORK PACKAGE

OPERATOR

OPERATION UNDER USUAL CONDITIONS - ESTABLISHING AIMING LINE

INITIAL SETUP:

Not Applicable

EMPLACING AIMING POSTS FOR INDIRECT FIRE

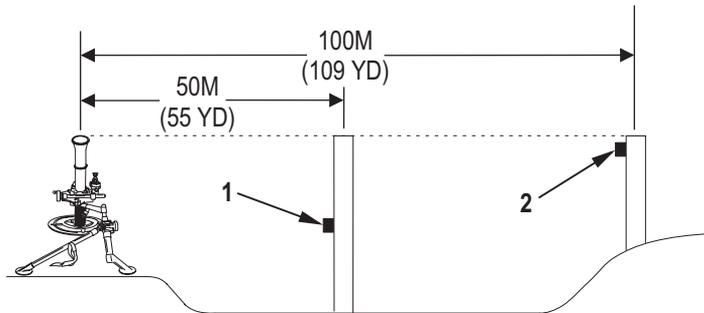


Figure 1. Emplacement of Aiming Posts.

CAUTION

If ground is hard, do not hammer on tail end of aiming posts to emplace. Use entrenching tools or rock to drive in the aiming driving stake. When stake is entrenched firmly, connect aiming post to the point, tail down.

1. Place two sets of assembled aiming posts in ground in a line at a referred deflection from direction of fire. The far post should be emplaced first, 100 meters (109 yards) from weapon if possible. Emplace near post halfway between far post and weapon.
2. If required, place aiming post light on each post. Far post light (2) should be visible above near light (1).

END OF TASK

ESTABLISHING ALTERNATE AIMING LINE**NOTE**

Once aiming line is established using aiming posts, another aiming line should be established, time permitting, in case something happens to aiming posts.

1. Sight upon a clearly defined object as close as possible to aiming line.
2. Record difference in mils between object and aiming line.
3. To use alternate aiming line, add difference in mils to deflection received from fire direction center (FDC).

END OF TASK**END OF WORK PACKAGE**

OPERATOR**OPERATION UNDER USUAL CONDITIONS - OPERATION OF M67 SIGHT UNIT**

INITIAL SETUP:**References**TM 9-1220-243-12&P

OPERATION OF SIGHT UNIT**NOTE**

Plotting board M16 is a portable instrument used to geometrically compute the range and azimuth to target from mortar. Refer to TM 9-1220-243-12&P for more information about the plotting board.

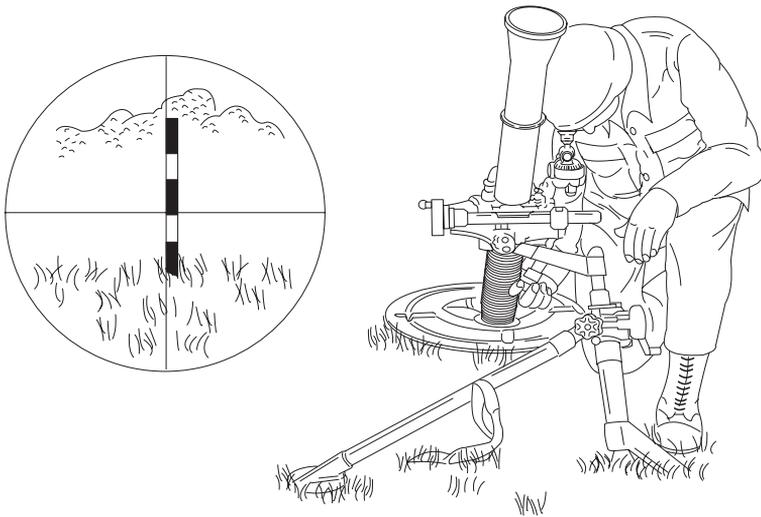


Figure 1. Sighting Mortar on Aiming Posts.

1. Place deflection received from fire direction center (FDC) on sight unit.
2. If deflection shift is greater than 75 mils, center cannon on traversing gear and move bipod. Sight mortar on aiming posts.

OPERATION OF SIGHT UNIT - Continued

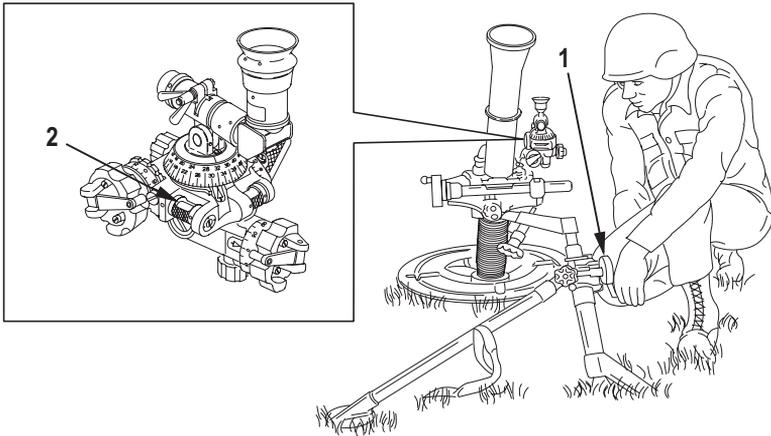
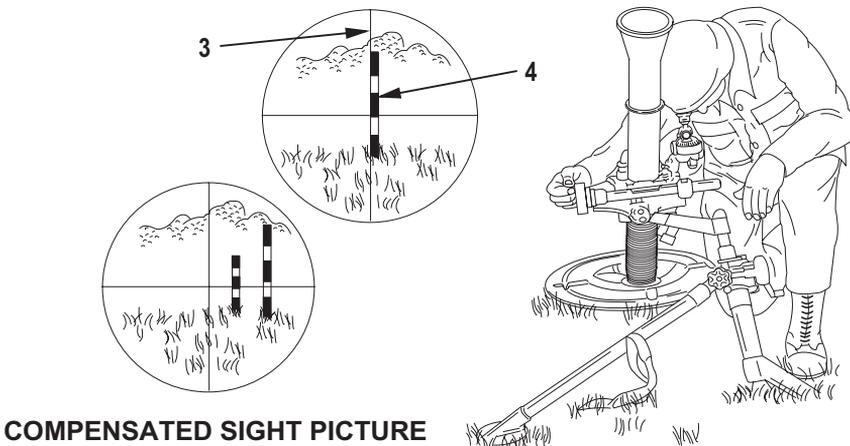


Figure 2. Adjustment of Elevation.

3. Turn elevating handwheel (1) to level bubble in elevation level vial (2).



COMPENSATED SIGHT PICTURE

Figure 3. Adjustment of Deflection.

4. Look through sight unit, and turn traversing handwheel to realign vertical reticle line (3) on aiming posts (4) or to obtain a correct compensated sight picture if deflection shift was large.

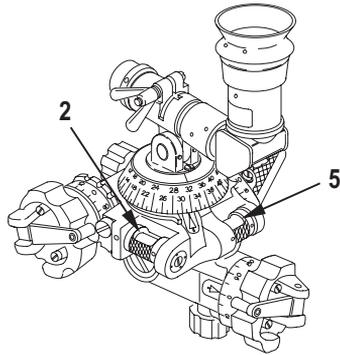


Figure 4. Verification of Sight Picture.

5. Check to ensure that sight picture is correct. If it is not, repeat adjustments until correct sight picture is obtained with bubbles level in both elevation level vial (2) and cross-level vial (5).

END OF TASK

END OF WORK PACKAGE

OPERATOR**OPERATION UNDER USUAL CONDITIONS - LOADING AND FIRING**

INITIAL SETUP:**References**

DA Form 2408-4
NAVMC 10558A
TM 4700-15/1
WP 0006
WP 0012
WP 0022

LOADING AND FIRING**WARNING**

Dented barrels must be replaced as they are unsafe for firing.

On previous configurations, weapon is not to be fired without blast attenuator device.

The following prescribed head positions must be observed during all loading and firing operations:

Gunner's head should be 0.68 meters (27 in.) above the ground and 0.75 meters (30 in.) from the muzzle on a 215 degree radial from the muzzle.

Loader's head should be 0.8 meters (32 in.) above the ground and 0.95 meters (37 in.) from the muzzle on a 155 degree radial from the muzzle. See Figure 1 and Figure 2.

LOADING AND FIRING - Continued

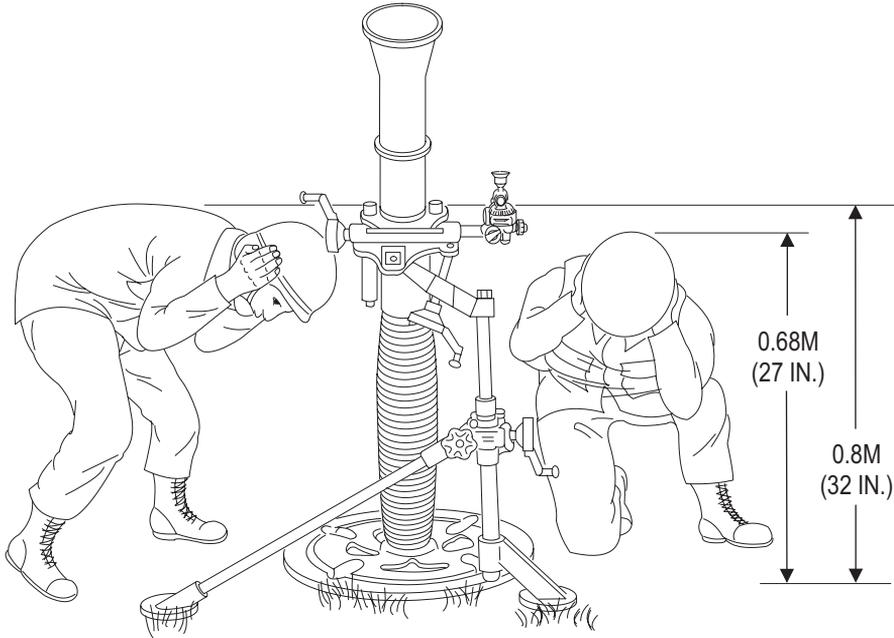


Figure 1. Distance from Ground.

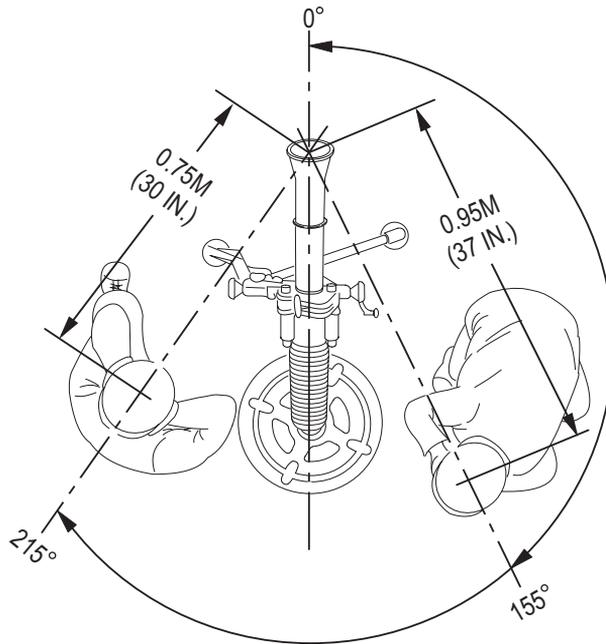


Figure 2. Distance from Muzzle.

WARNING



Do not look into cannon, and do not try to force a cartridge down cannon.

Upon releasing cartridge, pass hands downward and, at the same time, turn away from muzzle of mortar cannon to prescribed body and head position, to avoid blast which occurs when cartridge fires.

Double loading of mortar ammunition has resulted in catastrophic accidents. Loading a mortar weapon with two men (alternately) can be very dangerous and could prove fatal. Even with one-man loading, double loading can occur. This is especially true in rapid fire exercises. For this reason, it is imperative that there is absolute certainty that the previous round left the mortar tube before a new round is dropped in.

LOADING AND FIRING - Continued**WARNING**

Improved BCO series ammunition, M821, M889, M853A1, M819, and M879, develops significantly higher pressures in the weapon than earlier 300 series ammunition. Do not use 800 series ammunition with the M1, M29, and M29A1 Mortars. Serious injury or death may result from tube failure.

**- WARNING -
DO NOT USE IN M1 MORTAR
DO NOT EXCEED CHARGE 3 IN M29 MORTAR**

On early production of M821 and M889 ammunition, the above label was attached to the cartridge behind the fuze. This label may reduce cartridge accuracy, especially when fired at high charge. If possible, remove the label prior to firing. Later production lots contain a stencil in lieu of a label. Always read warnings on cartridge prior to firing. If this warning is not present, check other rounds in ammunition box.

The mortar crew must have adequate cover for protection from fragments when firing to ranges of 400 meters (437 yards) or less.

Unpacked mortar cartridges are known to sustain significant damage when dropped. Packed ammunition dropped from a height of more than 2.1 meters (7 feet) could be similarly damaged. Defects incurred may not be detectable by visual inspection, and firing damaged ammunition could result in weapon or property damage or serious personnel injury or death. All cartridges which have been dropped are to be immediately segregated, tagged or marked for identification, and turned in to the ammunition supply point (ASP) as unserviceable.

All cartridges must be inspected prior to firing for dented, cracked, bent, separated, and loose components. Any cartridge with fins bent (even slightly) or propellant increments that have been punctured or torn (leaking propellant) are to be considered unserviceable, since critical short rounds could result if fired.

WARNING

Sandbag the bipod legs when firing M821 HE (high explosive), M889 HE, M819 RP (red phosphorus), M853 Illum (illumination), and M879 TP (target practice) cartridges above charge 2.

Cannon bore is required to be dry swab cleaned at the end of each fire mission, or 10 rounds fired (approximately). Firing ammunition in a heavily lubricated bore can result in hangfire or failures to fire.

WARNING

Mortar crew is required to use single hearing protection during firing.

CAUTION

To prevent sight unit damage, sight unit must be removed prior to firing mortar seating round(s) (WP 0012).

1. Remove muzzle cover.



Figure 3. Loading Mortar.

LOADING AND FIRING - Continued

2. Hold cartridge body near center.
3. Insert cartridge into barrel (fin end first).

NOTE

In order for baseplate to provide a stable platform for firing, it must be firmly seated. The barrel clamp will slide as long as baseplate is being settled. It then should move only slightly under normal operations.

4. Release cartridge. Cartridge will slide down barrel under its own weight, strike firing pin at bottom, and fire.

CAUTION

To prevent accidental disengagement and possible damage, ensure that sight unit is securely seated.

5. After baseplate seating is complete, install sight unit (WP 0006). Slide buffer to lower stop band and relay mortar system.

NOTE

See WP 0022 for allowable number of rounds per day.

END OF TASK**LOG BOOK ENTRIES AFTER FIRING**

1. After firing has been completed for the day, enter rounds fired on DA Form 2408-4. USMC users shall enter rounds fired in Weapon Record Book, NAVMC 10558A, in accordance with TM 4700-15/1.
2. No entry is necessary in columns e, g, and h of DA Form 2408-4.

END OF TASK**END OF WORK PACKAGE**

OPERATOR**OPERATION UNDER USUAL CONDITIONS - MISFIRE PROCEDURES**

INITIAL SETUP:**Tools and Special Tools**

Firing pin wrench (WP 0027, item 18)

References

WP 0012

MISFIRE PROCEDURES**NOTE**

A misfire is a failure to fire after cartridge is dropped into mortar cannon. Misfires may be caused by defective ammunition, damaged firing pin, or an obstruction in bore that prevents cartridge from sliding down and striking pin.

1. If the weapon misfires, any crew member shouts "Misfire."
2. All personnel, except the gunner, move 50 meters (55 yards) from rear of mortar.

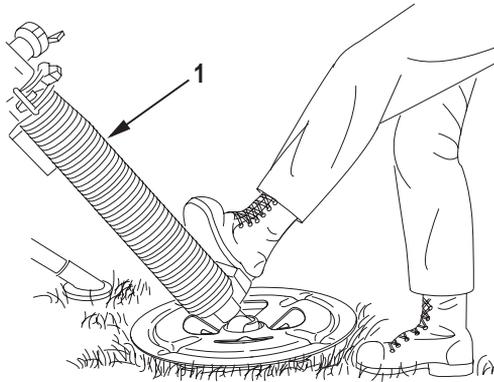


Figure 1. Kicking Cannon.

3. Gunner stands behind mortar and kicks cannon (1) with several sharp blows with heel of his boot.

MISFIRE PROCEDURES - Continued

- If cartridge fires, relay mortar. Continue firing after swabbing bore to remove any debris that may have caused the misfire. If the round fails to fire after cannon is kicked, gunner moves to join rest of crew and waits for one minute. Continue with following steps.

WARNING

If cartridge fails to fire and mortar is hot, wait until mortar is cool enough to move with bare hands. If mortar is cool enough at time of misfire, wait 1 minute before removing cartridge. This is to avoid an accident from possible delayed action of ignition cartridge. Water or snow applied to barrel can be used for cooling.

- Gunner checks cannon for heat with his fingertips and announces when cannon is cool enough to begin cartridge removal procedures.

CAUTION

To prevent damage, sight unit must be removed before continuing (WP 0012).

- Lock sight unit knobs on last deflection, remove sight unit, and place in carrying case.

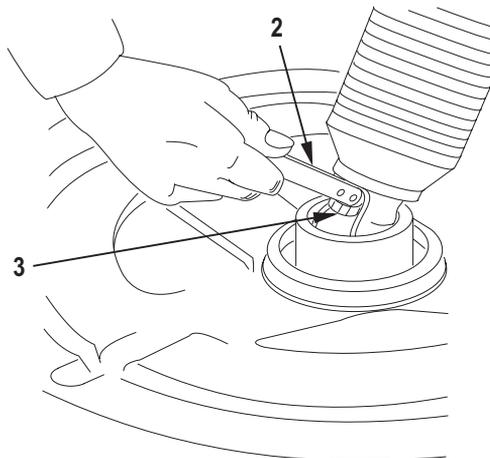


Figure 2. Removal of Firing Pin.

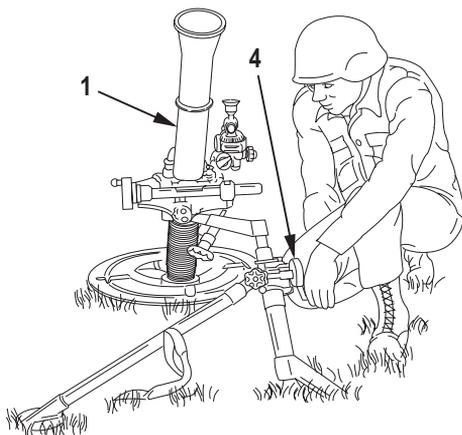


Figure 3. Lowering Elevation of Cannon.

7. Gunner, using firing pin wrench (2) (WP 0027, item 18), removes firing pin (3) completely.
8. If firing pin cannot be removed, gunner depresses cannon (1) to its lowest elevation by turning elevation handwheel (4).

MISFIRE PROCEDURES - Continued**WARNING**

Do not stand directly behind cannon when removing a misfire.

Keep head and body away from front of mortar when removing a misfire.

When removing a misfire, loosen but do not open barrel clamp assembly.

NOTE

Gunner is shown on wrong side of cannon in remaining illustrations to permit reader to view misfire procedure.

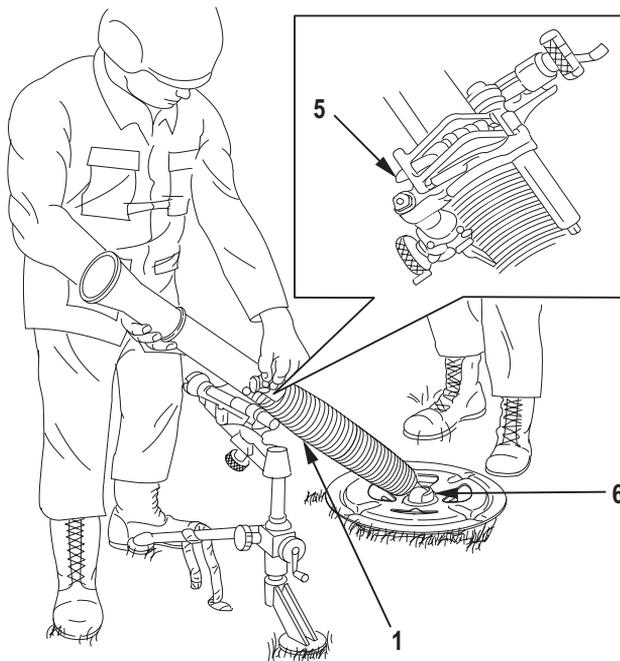


Figure 4. Release of Cannon from Baseplate Socket.



Figure 5. Support of Mortar.

9. Without opening barrel clamp assembly, ammunition handler presses barrel clamp locking lever (5) to release barrel clamp assembly tension and carefully turns cannon (1) 1/4 turn to release it from baseplate socket (6).
10. Gunner grasps both ends of traversing gear assembly (7) to support mortar throughout rest of procedure.
11. Ammunition handler supports cannon (1).

MISFIRE PROCEDURES - Continued

Figure 6. Preparation to Lift Cannon.

12. Keeping both hands away from muzzle, assistant gunner places his right hand, palm up, and on previous configurations, under blast attenuator device (BAD) near muzzle. He then places his left hand, palm down, on top of BAD.

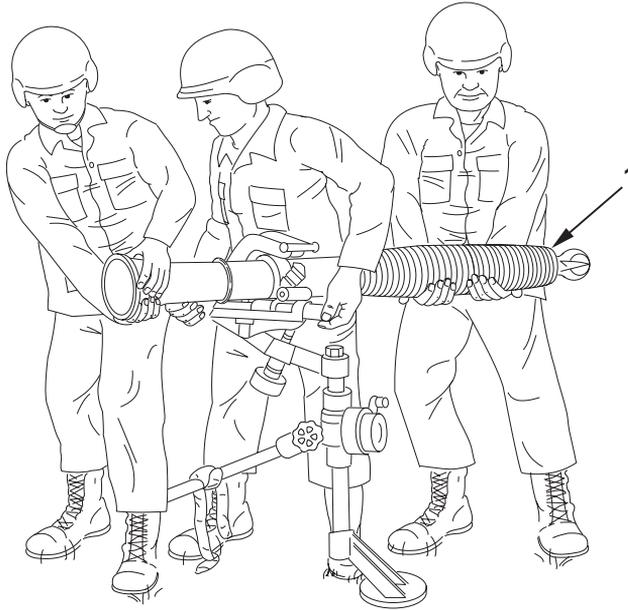


Figure 7. Lifting Cannon to Horizontal Position.

WARNING



Ammunition handler must not put his hand on breech plug when lifting and holding cannon.

13. Ammunition handler places his hands under cannon (1) ahead of breech plug.

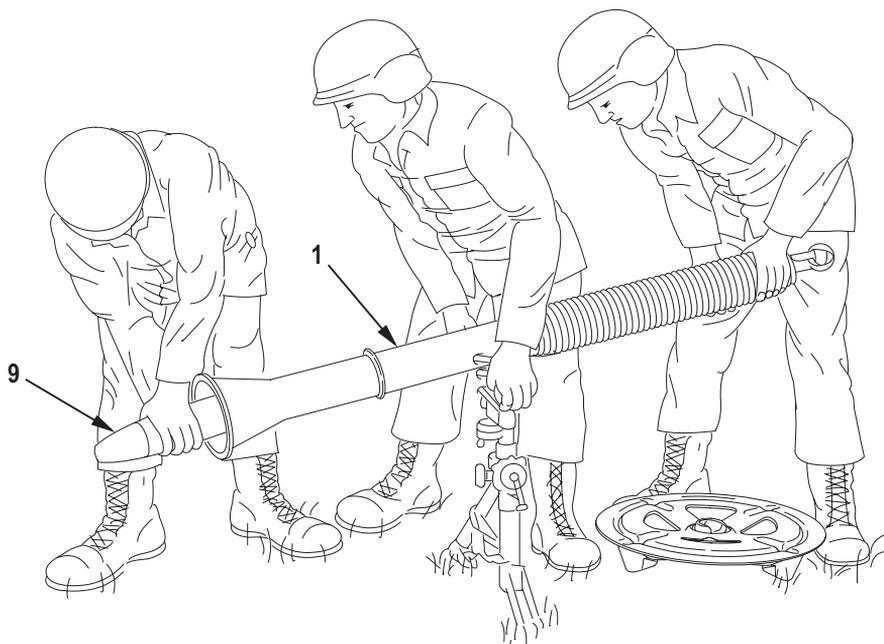
MISFIRE PROCEDURES - Continued

Figure 8. Removal of Cartridge.

WARNING

Do not lower breech plug end of cannon below a horizontal position until cartridge has been removed from cannon.

14. Ammunition handler lifts base of cannon (1) until it is horizontal.
15. After cannon (1) is in horizontal position, assistant gunner places thumb of each hand, and on previous configurations, over BAD.
16. Ammunition handler continues to raise cannon (1).
17. Assistant gunner stops cartridge (9) with his thumbs and, without touching fuze, removes cartridge from cannon (1).

NOTE

If cartridge does not slide from cannon, proceed to step 22. If cartridge is removed, continue with next step.

18. Ammunition handler shakes cannon (1) to dislodge any remnants from last cartridge fire, locks cannon into baseplate, and swabs cannon bore.
19. If primer is dented, ammunition handler replaces safety wire (if applicable). He then places cartridge on ground, tags it, and notifies Explosive Ordnance Disposal (EOD). If primer is not dented, cartridge may be used again.
20. Gunner checks firing pin for damage or fouling before reinstalling it.
21. Mortar is re-laid.

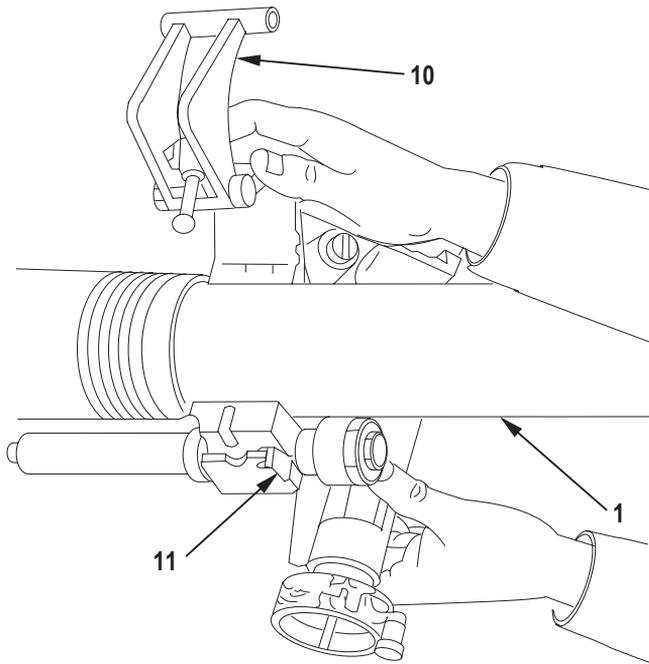


Figure 9. Removal of Cannon from Mortar Mount.

22. Ammunition handler returns cannon (1) to horizontal position.
23. Gunner releases barrel clamp latch (11) and opens barrel clamp assembly (10).

MISFIRE PROCEDURES - Continued**WARNING**

When moving cannon always point in direction of fire and ensure that no crew members stand directly behind or in front of cannon.

24. Squad removes cannon (1) from barrel clamp assembly (10), carefully carries cannon to misfire/dud pit 50 meters (55 yards) away from firing line, and places cannon on ground in horizontal position.
25. Notify Explosive Ordnance Disposal (EOD).

END OF TASK**END OF WORK PACKAGE**

OPERATOR

OPERATION UNDER USUAL CONDITIONS - DISPLACEMENT OF MORTAR

INITIAL SETUP:

Tools and Special Tools

Baseplate extractor (WP 0027, item 22)

References

None

DISPLACEMENT

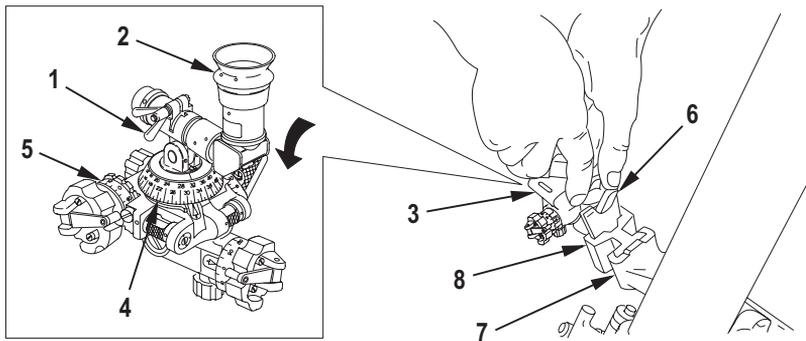


Figure 1. Removal of Sight Unit.

1. Pull clamping mechanism (1) of sight unit (3) up and rotate elbow telescope (2) 90 degrees. Push down on clamping mechanism to lock elbow telescope. Set coarse deflection scale (4) to 3200 mils and set fine deflection scale (5) to 0 mils.
2. Press latching lever (6), remove sight unit (3) from sight unit adapter (8) on bipod (7), and stow sight unit in carrying case.
3. Retrieve aiming posts and lights and stow them in their cases.

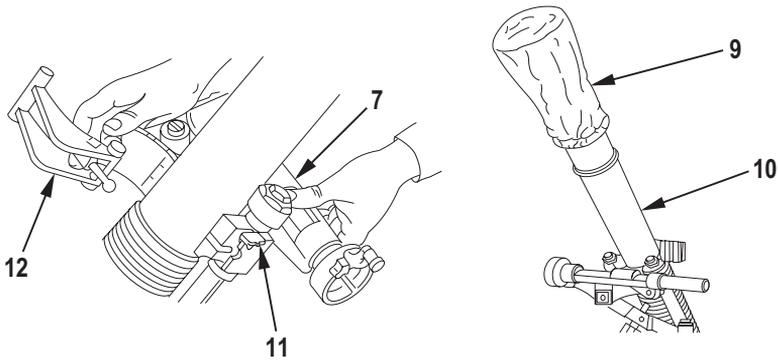
DISPLACEMENT - Continued

Figure 2. Removal of Bipod from Cannon.

4. Install muzzle cover (9) on cannon (10).
5. Release barrel clamp latch (11), open barrel clamp assembly (12), and carefully remove bipod (7) from cannon (10) while keeping cannon supported.

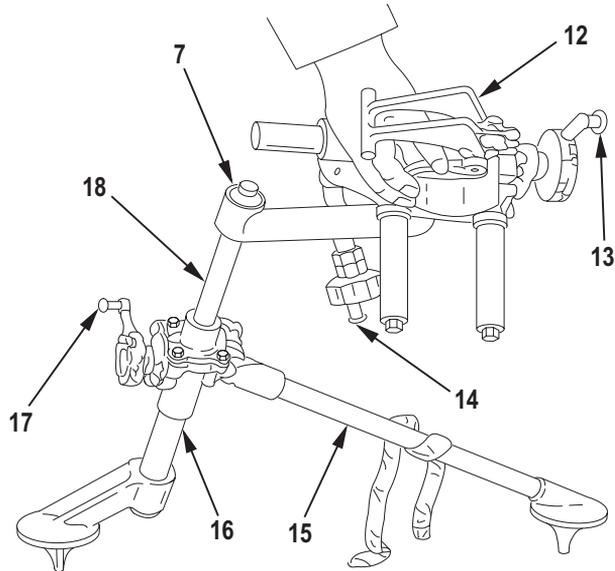


Figure 3. Preparation of Bipod for Movement.

CAUTION

Exercise care in handling bipod with elevating shaft extended; shaft damage could result.

6. Lock barrel clamp assembly (12), traverse bipod (7) fully right, and depress bipod until about 4 in. (10.20 cm) of elevating shaft (18) are visible.
7. Fold up traversing handwheel (13), cross-leveling handwheel (14), and elevating handwheel (17).
8. Lift elevating leg assembly (16) and fixed leg assembly (15) out of ground.

DISPLACEMENT - Continued

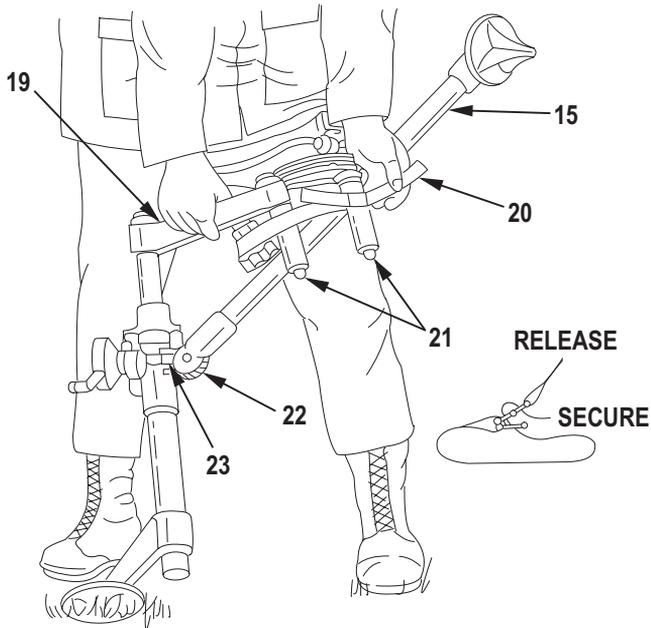


Figure 4. Use of Webbing Strap to Secure Bipod.

9. Unlock fixed leg assembly (15) by loosening leg locking knob (22), and releasing leg locking lever (23) if necessary.
10. Fold up fixed leg assembly (15) as far as possible and tighten leg locking knob (22).
11. Wrap webbing strap (20) around cross-leveling arm (19) and both mortar mounting buffers (21), pull tight, and secure.

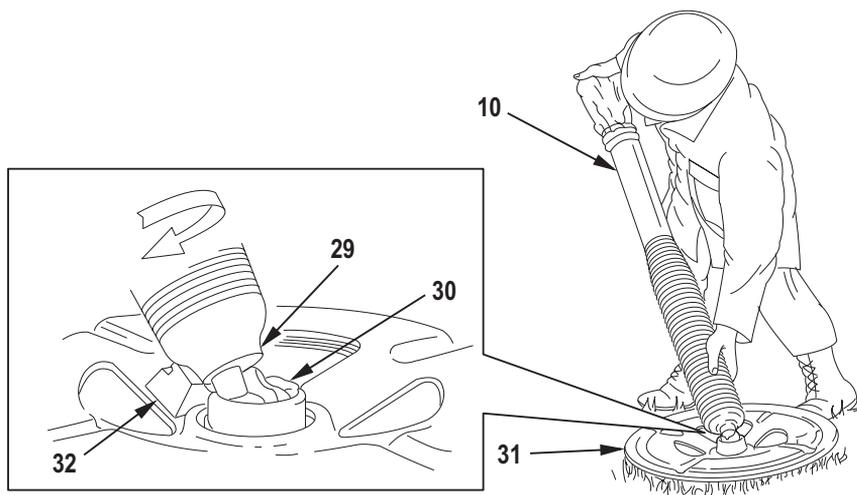


Figure 5. Removal of Cannon and Baseplate.

NOTE

If required, place baseplate extractor (32) (WP 0027, item 22) between cannon's breech cap and baseplate's top surface. Push down on cannon to dislodge baseplate.

12. Turn cannon (10) 1/4 turn so that vertical faces of breech plug (29) align in cutaway portion of baseplate socket (30).
13. Remove cannon (10) from baseplate (31).
14. Remove baseplate (31) from ground.

END OF TASK

END OF WORK PACKAGE

OPERATOR**OPERATION UNDER UNUSUAL CONDITIONS
UNUSUAL ENVIRONMENT/WEATHER,
NUCLEAR, BIOLOGICAL, AND CHEMICAL (NBC) DECONTAMINATION**

INITIAL SETUP:**Materials/Parts**

General purpose lubricating oil (GPL) (WP 0029, item 16)

References

FM 3-11.3
FM 3-11.4
FM 3-11.5
FM 9-207
FM 31-70
FM 31-71
WP 0012

UNUSUAL ENVIRONMENT/WEATHER**Cold**

Keep ammunition, sight unit, and boresight covered when conditions permit. Do not move fire control instruments from cold to warm areas. Use arctic lubricant.

Refer to FM 9-207, FM 31-70, and FM 31-71 for operation in cold climates.

Hot

Lubricate cannon, bipod, and baseplate frequently with general purpose lubricating oil (GPL) (WP 0029, item 16), paying particular attention to all hidden surfaces such as bore, firing pin, and similar places where corrosion might occur. Clean, wipe dry, and restore oil film after handling. Keep equipment covered when conditions permit.

Hot and Dry

Clean and oil the bore of cannon more frequently than usual. Keep equipment covered when conditions permit.

UNUSUAL ENVIRONMENT/WEATHER - Continued

Hot, Damp, and Salty Atmosphere

1. When mortar is being fired, clean and lubricate bore and exposed metal surface more frequently than required for normal service and keep covers in place as often as firing conditions permit.
2. When mortar is not being used, cover unpainted surfaces with a film of general purpose lubricating oil (GPL) (WP 0029, item 16) and keep all covers in place.
3. Check optical instruments for fungus growth.

Sand

1. Clean and lubricate materiel frequently.
2. When beginning an action in sandy areas, remove lubricant from machined surfaces of cannon and other exposed lubricated parts.
3. Clean and lubricate all exposed parts after action is over.

Mud

Firing on very soft ground will require ground preparation (e.g., sandbags). See following illustrations for alternate methods.

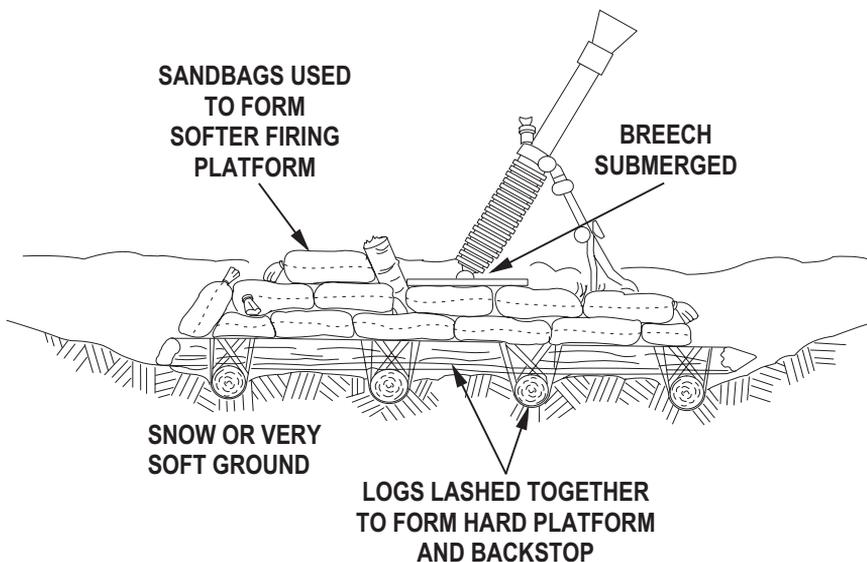


Figure 1. Use of Log Platform and Sandbags.

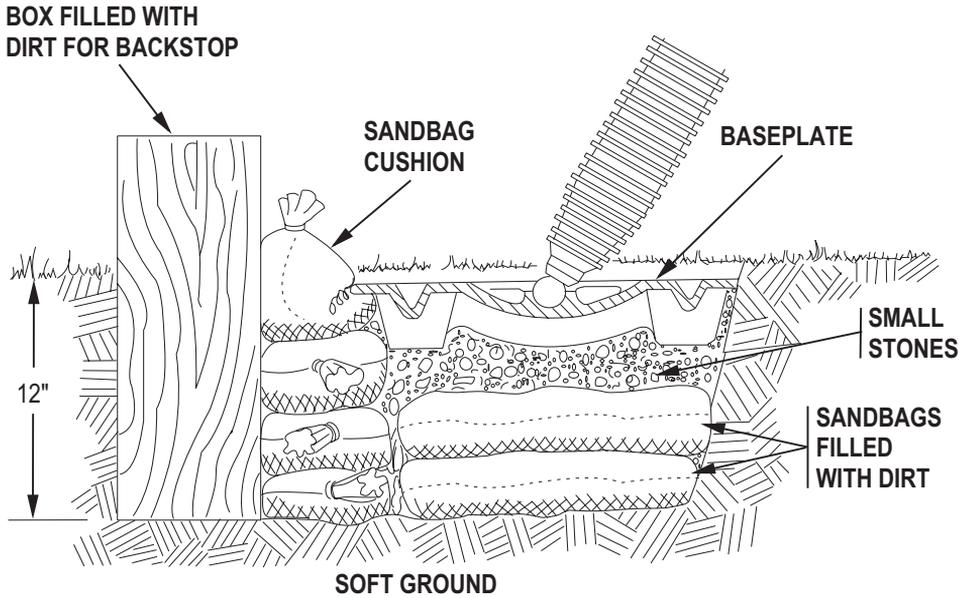


Figure 2. Use of Backstop and Sandbags.

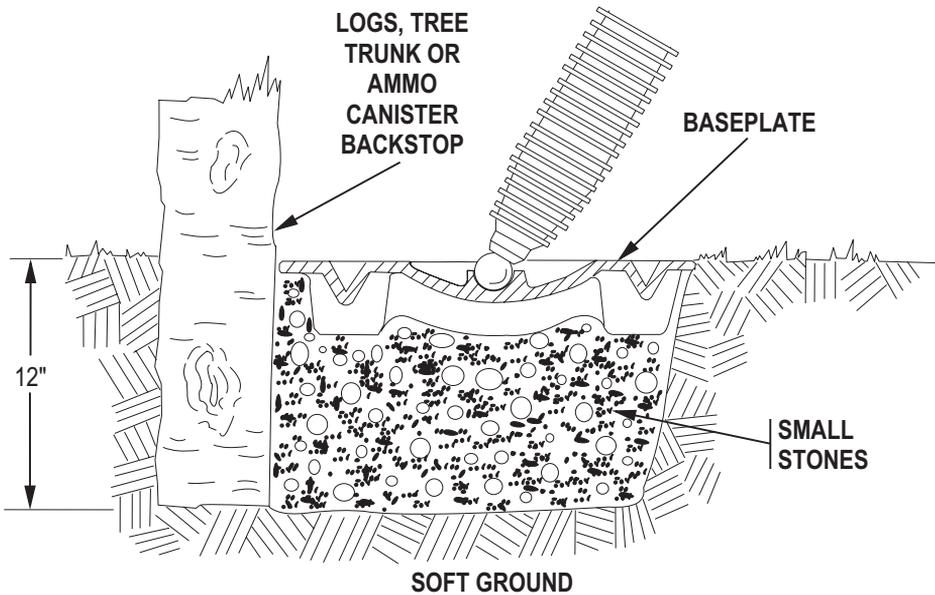


Figure 3. Use of Backstop and Stones.

UNUSUAL ENVIRONMENT/WEATHER - Continued

Frozen, Hard, or Rocky Surfaces

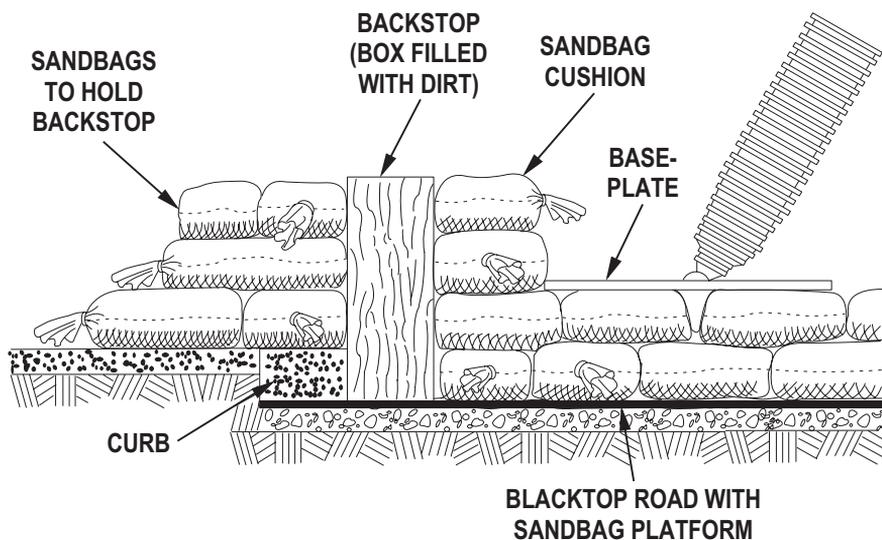


Figure 4. Preparation for Firing from Hard Surfaces.

1. Use sandbags to seat baseplate.
2. Use tripods to support aiming posts.
3. Refer to FM 31-70, FM 31-71, and FM 9-207.

Fording

1. Disassemble weapon into major components (WP 0012) and cover components carefully to protect from water splashes.
2. Watch carefully for water seepage into all parts. This could contaminate the lubricant.
3. If immersion occurs, notify field maintenance to schedule disassembly and lubrication at first opportunity.

END OF TASK

NUCLEAR, BIOLOGICAL, AND CHEMICAL (NBC) DECONTAMINATION

Refer to FM 3-11.3, FM 3-11.4, and FM 3-11.5 for avoidance and decontamination procedures.

END OF TASK

END OF WORK PACKAGE

CHAPTER 3

OPERATOR
TROUBLESHOOTING PROCEDURES
FOR
M252 81-MM MORTAR

**OPERATOR
TROUBLESHOOTING INDEX**

GENERAL

The troubleshooting index lists the common malfunctions which operator may find during the operation or maintenance of the M252 81-mm mortar or its components. Operator should perform the tests/inspections and corrective actions in the order listed.

This manual cannot list all malfunctions that may occur, all the tests and inspections needed to find the fault, or all the corrective actions needed to correct the fault. If the equipment malfunction is not listed or is not corrected by listed corrective actions, notify next line supervisor.

MALFUNCTION/SYMPTOM INDEX

<u>Symptom</u>	<u>Work Package - Page</u>
Baseplate Socket Is Frozen or Difficult to Rotate	WP 0015-3
Excessive Backlash in Traversing, Elevating, or Cross-Leveling Handwheels	WP 0015-3
Mortar Does Not Recoil Properly	WP 0015-2
Mortar Fails to Fire	WP 0015-1
Mortar Is Difficult to Cross-Level	WP 0015-2
Mortar Is Difficult to Elevate or Depress	WP 0015-2
Mortar Is Difficult to Traverse	WP 0015-2
Poor Visibility in Sight Unit Lens	WP 0015-4
Sight Unit Controls Do Not Operate	WP 0015-4
Sight Unit Will Not Seat in Sight Unit Adapter	WP 0015-3

END OF WORK PACKAGE

OPERATOR
OPERATIONAL CHECKOUT AND TROUBLESHOOTING PROCEDURES

INITIAL SETUP:**Tools and Special Tools**

Firing pin wrench (WP 0027, item 18)

References

WP 0011

WP 0018

Materials/Parts

Abrasive cloth (WP 0029, item 9)

Rifle bore cleaning compound (RBC)
(WP 0029, item 7)

TROUBLESHOOTING PROCEDURES

Table 1. Troubleshooting Procedures.

MALFUNCTION
TEST OR INSPECTION**CORRECTIVE ACTION**

1. MORTAR FAILS TO FIRE.**WARNING**

To prevent injury or death, follow misfire procedures in WP 0011 to remove cartridge before doing troubleshooting.

Step 1. Check for defective ammunition.

Follow misfire procedures to dispose of round (WP 0011).

Step 2. Check for dented or bent barrel.

Notify field maintenance.

Step 3. Check for dirt or foreign matter in cannon.

Remove foreign matter and clean thoroughly with RBC (WP 0029, item 7).

TROUBLESHOOTING PROCEDURES - Continued
Table 1. Troubleshooting Procedures - Continued.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

1. MORTAR FAILS TO FIRE - Continued.

Step 4. Check for loose firing pin.

Using firing pin wrench (WP 0027, item 18), remove, clean, and install firing pin (WP 0018).

Step 5. Check for broken firing pin.

Replace firing pin (WP 0018).

2. MORTAR IS DIFFICULT TO TRAVERSE.

Turn traversing handwheel and check for binding or inoperative parts.

Notify field maintenance.

3. MORTAR IS DIFFICULT TO ELEVATE OR DEPRESS.

Turn elevating handwheel and check for binding or inoperative parts.

Notify field maintenance.

4. MORTAR DOES NOT RECOIL PROPERLY.

Check for binding or damaged mortar mounting buffers by pulling down on both buffers at the same time; they should return to original position when released. Check that buffers recoil and counter-recoil without any free play or slacken.

Notify field maintenance.

5. MORTAR IS DIFFICULT TO CROSS-LEVEL.

Turn cross-leveling handwheel and check for binding or inoperative parts.

Notify field maintenance.

Table 1. Troubleshooting Procedures - Continued.

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
6. EXCESSIVE BACKLASH IN TRAVERSING, ELEVATING, OR CROSS-LEVELING HANDWHEELS.	Check if backlash in handwheels exceeds one-eighth of a turn (45 degrees).	Notify field maintenance.
7. BASEPLATE SOCKET IS FROZEN OR DIFFICULT TO ROTATE.	Check for dirt or foreign matter in baseplate socket.	Remove foreign matter or dirt. If socket is still difficult to rotate, notify field maintenance.
8. SIGHT UNIT WILL NOT SEAT IN SIGHT UNIT ADAPTER.	Step 1. Check sight unit dovetail and sight unit adapter for dirt or foreign matter.	Remove foreign matter and clean thoroughly.
	Step 2. Check sight unit dovetail and sight unit adapter for loose paint, nicks, or burrs.	Remove loose paint, nicks, or burrs with abrasive cloth (WP 0029, item 9).
	Step 3. Check for broken or bent sight unit dovetail.	Notify field maintenance.
	Step 4. Check for broken or bent sight unit adapter.	Notify field maintenance.

TROUBLESHOOTING PROCEDURES - Continued
Table 1. Troubleshooting Procedures - Continued.

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
9. SIGHT UNIT CONTROLS DO NOT OPERATE.		
	Step 1. Check to see if locking knobs are tightened.	Release locking knobs.
	Step 2. Check for dirt and grit.	Clean thoroughly. If they are still inoperative, notify field maintenance.
	Step 3. Check coarse azimuth (deflection) scale and fine azimuth scale to ensure there is no movement unless depressed.	Notify field maintenance.
10. POOR VISIBILITY IN M67 SIGHT UNIT LENS.		
	Step 1. Check lens for cracks or breaks.	Notify field maintenance.
CAUTION		
To avoid damage, do not apply heat directly to sight unit lens.		
	Step 2. Check lens for moisture.	Place sight unit in a warm area to see if moisture clears. If moisture does not clear, notify field maintenance.

END OF TASK
END OF WORK PACKAGE

CHAPTER 4

**OPERATOR
MAINTENANCE INSTRUCTIONS
FOR
M252 81-MM MORTAR**

OPERATOR**PREVENTIVE MAINTENANCE CHECKS AND SERVICES INTRODUCTION
GENERAL, EXPLANATION OF COLUMN ENTRIES**

GENERAL

Preventive Maintenance Checks and Services (PMCS) (WP 0017) must be performed by the operator to be sure the mortar is in good operating condition and ready for its primary mission.

To ensure maximum operational readiness, it is necessary that the mortar be inspected at regular intervals so that any defects can be discovered and corrected before serious damage or failure occurs. Any maintenance problems that are beyond operator authorization will be referred to Field Maintenance for correction.

Always observe the WARNINGS and CAUTIONS before and during operation. A WARNING means someone could be hurt. A CAUTION means equipment could be damaged. If the equipment fails to operate, troubleshoot. Report any deficiencies using the proper forms. See DA PAM 750-8.

EXPLANATION OF COLUMN ENTRIES

The INTERVAL column tells you when to do the check or service in the PROCEDURE column. BEFORE checks and services are performed prior to the mortar leaving its containment area or performing its mission. DURING checks begin when the mortar is being used and AFTER checks and services begin when the mortar is taken out of its mission mode or is returned to its containment area.

The ITEM TO BE CHECKED OR SERVICED column tells you the component of the mortar to be checked. The amount of time required is indicated in the MAN-HOUR column.

When recording results of PMCS, entries in the PMCS ITEM NO. column will be used for the TM Item No. column on DA Form 5988-E, Equipment Inspection and Maintenance Worksheet - Electronic, or DA Form 2404, Equipment Inspection and Maintenance Worksheet.

The EQUIPMENT NOT READY/AVAILABLE IF column indicates deficiencies which must be corrected before the mortar can be operated.

END OF WORK PACKAGE

OPERATOR
**PREVENTIVE MAINTENANCE CHECKS AND SERVICES,
INCLUDING LUBRICATION INSTRUCTIONS
PREVENTIVE MAINTENANCE INSPECTION, LUBRICATION INSTRUCTIONS**

INITIAL SETUP:**Tools and Special Tools**

- Cleaning head section (WP 0027, item 27)
- Wire mesh cleaning pad (WP 0027, item 26)

Materials/Parts

- Dry cleaning solvent (WP 0029, item 20)
- General purpose lubricating oil (GPL) (WP 0029, item 16)
- Rifle bore cleaning compound (RBC) (WP 0029, item 7)
- Weapons lubricating oil (LAW) (WP 0029, item 17)
- Wiping rag (WP 0029, item 19)

References

- DA Form 2408-4
 - FM 3-22.90
 - FM 9-207
 - NAVMC 10558A
-

PREVENTIVE MAINTENANCE INSPECTION

**Table 1. Preventive Maintenance Checks and Services
for M252 81-mm Mortar.**

Item No.	Interval	Man-Hour	Item To Be Checked or Serviced	Procedure	Equipment Not Ready/ Available If:
1	Before		DA Form 2408-4	a. Check to see if weapon has been borescoped every 100 rounds when firing subcaliber training rounds (M1 Sabot).	a. Weapon has not been borescoped every 100 rounds when firing subcaliber training rounds (M1 Sabot).

PREVENTIVE MAINTENANCE INSPECTION - Continued

**Table 1. Preventive Maintenance Checks and Services
for M252 81-mm Mortar - Continued.**

Item No.	Interval	Man-Hour	Item To Be Checked or Serviced	Procedure	Equipment Not Ready/ Available If:
1 (Cont)	Before (Cont)		DA Form 2408-4 (Cont)	b. Check to see if weapon has been borescoped and pullover gaged within 180 days prior to firing and within 180 day intervals during firing periods.	b. Weapon has not been borescoped and pullover gaged within 180 days prior to firing and within 180 day intervals during firing period.
2	Before		Cannon	<p style="text-align: center;">WARNING</p> <div style="display: flex; justify-content: center; gap: 20px;">   </div> <p>To avoid injury to crew and supported troops due to collapse of mortar system or errant round, the exterior surface of cannon between upper and lower stop bands must be wiped free of lubrication prior to firing. If portion is not dry, barrel clamp assembly will move on barrel during firing.</p> <p style="text-align: center;">NOTE</p> <p>Dry swab cleaning of cannon bore is required at end of each fire mission or after approximately 10 rounds have been fired.</p>	

Table 1. Preventive Maintenance Checks and Services for M252 81-mm Mortar - Continued.

Item No.	Interval	Man-Hour	Item To Be Checked or Serviced	Procedure	Equipment Not Ready/ Available If:
				<p>a. Check for foreign matter in barrel and wipe interior of barrel dry. Also wipe exterior surface free of all lubrication.</p> <p>b. Check for cracks, broken welds, rust, and loose, missing, dented, or damaged parts on cannon and, on previous configurations, blast attenuator device.</p> <div style="text-align: center;"> </div> <p>c. Verify breech plug (2) is not loose.</p>	<p>b. Cannon (including cooling fins) or blast attenuator device has cracks, broken welds, or loose, missing, dented, or damaged parts.</p> <p>c. Breech plug is loose.</p>

PREVENTIVE MAINTENANCE INSPECTION - Continued

Table 1. Preventive Maintenance Checks and Services for M252 81-mm Mortar - Continued.

Item No.	Interval	Man-Hour	Item To Be Checked or Serviced	Procedure	Equipment Not Ready/ Available If:
2 (Cont)	Before (Cont)		Cannon (Cont)	d. Check for bulges, dents, and visible cracks. Check for evidence of gas leakage around firing pin (1) or breech plug (2) (visible discoloration). e. USMC Only: Check straightness of bore prior to each firing session.	d. Barrel is bulged, dented, or visibly cracked, or shows evidence of gas leakage around firing pin or breech plug (visible discoloration).
3	Before		Mortar Mount (Bipod)	a. Check bipod (including fixed leg assembly) for cracks, broken welds, rust, and loose, missing, or damaged parts.	a. Bipod has cracks, broken welds, or loose, missing, or damaged parts.

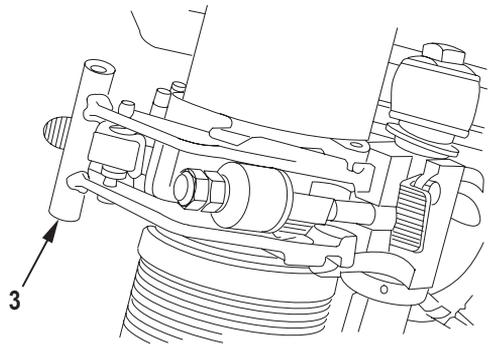
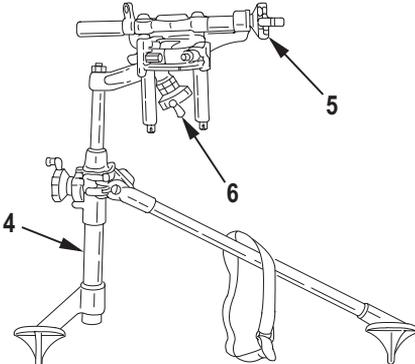


Table 1. Preventive Maintenance Checks and Services for M252 81-mm Mortar - Continued.

Item No.	Interval	Man-Hour	Item To Be Checked or Serviced	Procedure	Equipment Not Ready/ Available If:
				<p>b. Check that barrel clamp assembly (3) operates properly and holds cannon securely.</p>  <p>c. Verify that elevating leg assembly (4), traversing gear assembly (5), and cross leveling mechanism (6) operate smoothly and without binding through entire range of travel. Buffers must allow for full movement in both recoil and counter-recoil travel without any free play/slackness.</p>	<p>b. Barrel clamp assembly is inoperative or does not hold cannon securely.</p> <p>c. Elevating leg assembly, traversing gear assembly, or cross leveling mechanism is binding or inoperative in either recoil or counter-recoil travel, or has free play/slackness.</p>

PREVENTIVE MAINTENANCE INSPECTION - Continued

Table 1. Preventive Maintenance Checks and Services for M252 81-mm Mortar - Continued.

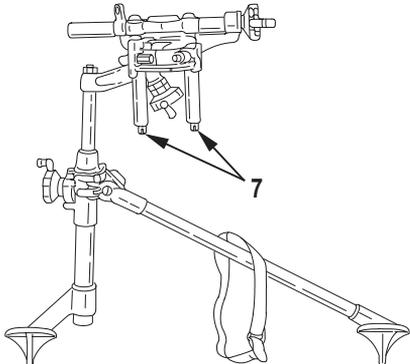
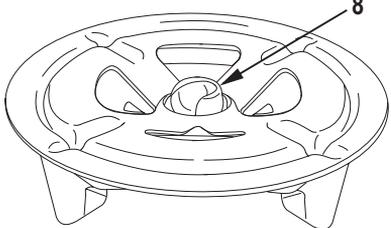
Item No.	Interval	Man-Hour	Item To Be Checked or Serviced	Procedure	Equipment Not Ready/ Available If:
3 (Cont)	Before (Cont)		Mortar Mount (Bipod) (Cont)	 <p>d. Test function of mortar mounting buffers (7) by pulling down on both of them at the same time; they should return to the original position when released.</p>	<p>d. Mortar mounting buffers are binding or inoperative.</p>
4	Before		Mortar Baseplate, M3A1	 <p>a. Check that U-shaped socket (8) can be rotated 360 degrees.</p>	<p>a. Socket does not rotate 360 degrees.</p>

Table 1. Preventive Maintenance Checks and Services for M252 81-mm Mortar - Continued.

Item No.	Interval	Man-Hour	Item To Be Checked or Serviced	Procedure	Equipment Not Ready/ Available If:
5	Before		M67 Sight Unit	<p>b. Check mortar baseplate for cracks, broken welds, and loose, missing, or damaged parts.</p> <p style="text-align: center;">WARNING</p> <p style="text-align: center;"></p> <p style="text-align: center;">RADIATION HAZARD - TRITIUM GAS (H₃).</p> <p style="text-align: center;">NOTE</p> <p>M67 sight unit is the primary sight unit. M64/M64A1 sight unit may still be in use but is becoming obsolete. PMCS procedures are similar.</p> <p>a. Check for proper illumination of tritium-lit sources listed below in a darkened area. If any source is not illuminated, notify the local Radiation Safety Officer (RSO). See warning summary for procedures.</p>	<p>b. Mortar baseplate has cracks, broken welds, or missing or damaged parts.</p> <p>a. Items are damaged or not illuminated.</p>

PREVENTIVE MAINTENANCE INSPECTION - Continued

Table 1. Preventive Maintenance Checks and Services for M252 81-mm Mortar - Continued.

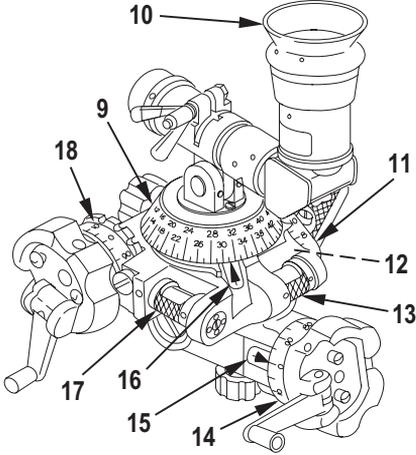
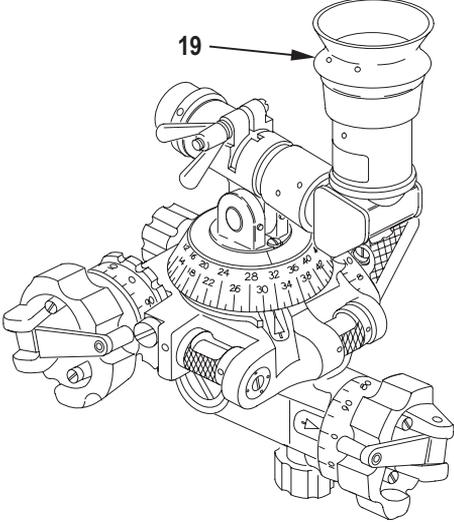
Item No.	Interval	Man-Hour	Item To Be Checked or Serviced	Procedure	Equipment Not Ready/ Available If:
5 (Cont)	Before (Cont)		M67 Sight Unit (Cont)	 <p>9. Coarse deflection scale 10. Telescope 11. Coarse elevation scale 12. Coarse elevation index arrow 13. Cross-level vial 14. Fine elevation scale 15. Fine elevation index arrow 16. Coarse deflection index arrow 17. Elevation vial 18. Fine deflection scale</p>	

Table 1. Preventive Maintenance Checks and Services for M252 81-mm Mortar - Continued.

Item No.	Interval	Man-Hour	Item To Be Checked or Serviced	Procedure	Equipment Not Ready/ Available If:
				 <p>b. Check eyeshield (19) for damage. Check lenses and windows for smears, scratches, cracks, or other obstructions.</p>	<p>b. Image is totally obstructed.</p>

PREVENTIVE MAINTENANCE INSPECTION - Continued

Table 1. Preventive Maintenance Checks and Services for M252 81-mm Mortar - Continued.

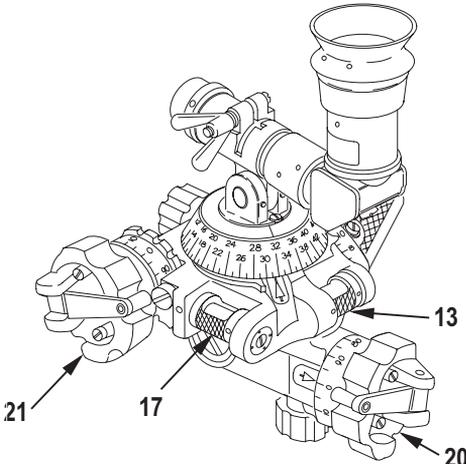
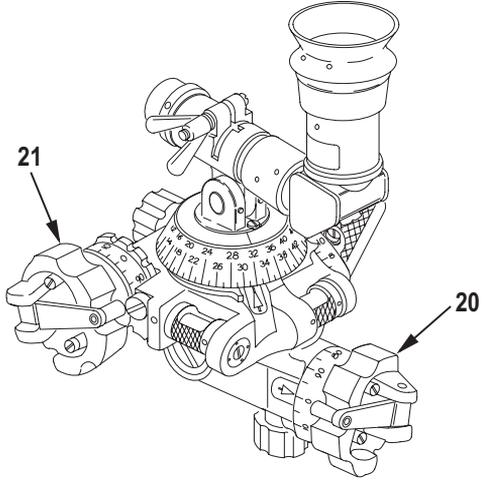
Item No.	Interval	Man-Hour	Item To Be Checked or Serviced	Procedure	Equipment Not Ready/ Available If:
5 (Cont)	Before (Cont)		M67 Sight Unit (Cont)	 <p> c. Verify that cross-level vial (13) and elevation vial (17) are not cracked, broken, or loose. d. Check elevation control knob (20) and deflection (azimuth) control knob (21) for free and easy operation through entire range. </p>	<p> c. Level vials are cracked, broken, or loose. d. Knobs do not turn. </p>

Table 1. Preventive Maintenance Checks and Services for M252 81-mm Mortar - Continued.

Item No.	Interval	Man-Hour	Item To Be Checked or Serviced	Procedure	Equipment Not Ready/ Available If:	
				 <p>The diagram shows a perspective view of the mortar's control mechanism. Callout 20 points to the elevation control knob, and callout 21 points to the deflection (azimuth) control knob. The mechanism includes a circular scale with numerical markings and a central index line.</p>	<p>e. Check backlash of elevation control knob (20) and deflection (azimuth) control knob (21). It must not exceed 0.5 mils.</p> <p>f. Check scales and index lines. They must be clear and distinct.</p>	<p>e. Backlash exceeds 0.5 mils.</p> <p>f. Scales and index lines cannot be read.</p>

PREVENTIVE MAINTENANCE INSPECTION - Continued

Table 1. Preventive Maintenance Checks and Services for M252 81-mm Mortar - Continued.

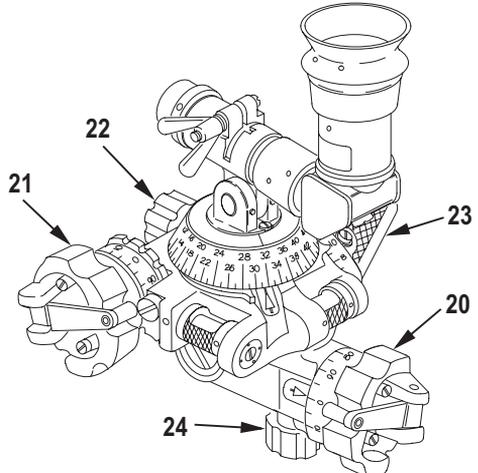
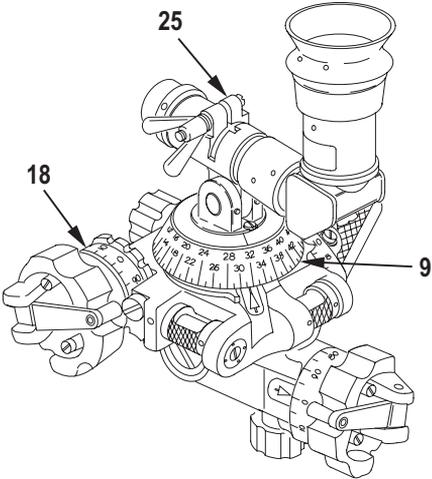
Item No.	Interval	Man-Hour	Item To Be Checked or Serviced	Procedure	Equipment Not Ready/ Available If:
5 (Cont)	Before (Cont)		M67 Sight Unit (Cont)	 <p> g. Check dovetail latching lever (23) for cracks. Also check that latching lever secures sight unit to adapter and that mounting surface is free from nicks and burrs. h. Check that elevation control knob (20) and deflection (azimuth) control knob (21) stay in position when locking knobs (22 and 24) are tightened. </p>	<p> g. Latching lever is broken or does not secure sight unit; nicks and burrs prevent proper seating of sight unit. h. Deflection (azimuth) or elevation control knob slips when locking knobs are tightened. </p>

Table 1. Preventive Maintenance Checks and Services for M252 81-mm Mortar - Continued.

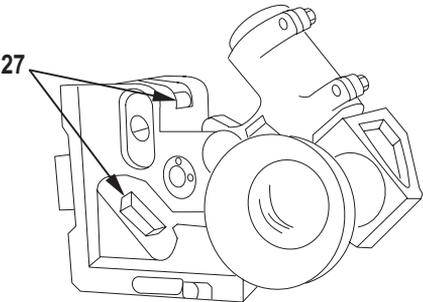
Item No.	Interval	Man-Hour	Item To Be Checked or Serviced	Procedure	Equipment Not Ready/ Available If:
				 <p> i. Check that coarse deflection scale (9) and fine deflection scale (18) rotate freely when depressed and return to position when spring tension is released. j. Check that clamping mechanism (25) secures elbow telescope to telescope mount. </p>	<p> i. Scales do not return to position under spring tension or scales move freely when not depressed. j. Clamping mechanism does not secure elbow telescope. </p>

PREVENTIVE MAINTENANCE INSPECTION - Continued

Table 1. Preventive Maintenance Checks and Services for M252 81-mm Mortar - Continued.

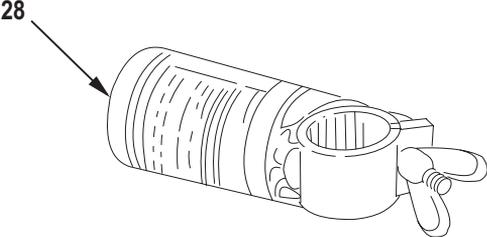
Item No.	Interval	Man-Hour	Item To Be Checked or Serviced	Procedure	Equipment Not Ready/ Available If:
5 (Cont)	Before (Cont)		M67 Sight Unit (Cont)	k. Check M67 sight unit for missing or damaged radiation warning, data plate, or other parts.	k. Radiation warning or data plate is missing, or radiation warning, data plate, or other parts is/are damaged.
6	Before		M14 Aiming Posts and Cover	 <p>a. Check for index completeness and that mating surfaces are clean, free of paint, and fit properly.</p> <p>b. Check that posts (26) are not bent or broken.</p>	<p>a. Mating surfaces do not fit properly.</p> <p>b. Posts are bent or broken.</p>

Table 1. Preventive Maintenance Checks and Services for M252 81-mm Mortar - Continued.

Item No.	Interval	Man-Hour	Item To Be Checked or Serviced	Procedure	Equipment Not Ready/ Available If:
7	Before		M45A1 Boresight	<p style="text-align: center;">NOTE</p> <p style="text-align: center;">Refer to FM 3-22.90, Mortars, for alternate method of boresighting.</p> <div style="text-align: center;">  </div> <p>a. Check eyeshield for damage. Check lenses and windows for smears, scratches, cracks, or other obstructions.</p> <p>b. Check that level vials (27) are not cracked, broken, or loose in mounting.</p>	<p>a. Target image is obstructed.</p> <p>b. Level vials are cracked or broken.</p>

PREVENTIVE MAINTENANCE INSPECTION - Continued

Table 1. Preventive Maintenance Checks and Services for M252 81-mm Mortar - Continued.

Item No.	Interval	Man-Hour	Item To Be Checked or Serviced	Procedure	Equipment Not Ready/ Available If:
8	Before		M58 and M59 Aiming Post Lights	<p style="text-align: center;">WARNING</p> <div style="text-align: center;">  <p>RADIATION HAZARD - TRITIUM GAS (H₃).</p> </div> <div style="text-align: center;">  </div> <p>a. Check aiming post lights (28) for proper illumination in a darkened area. If they are damaged or not illuminated, notify the local RSO. See warning summary for procedures.</p>	<p>a. Aiming post lights are damaged or not illuminated.</p>

**Table 1. Preventive Maintenance Checks and Services
for M252 81-mm Mortar - Continued.**

Item No.	Interval	Man-Hour	Item To Be Checked or Serviced	Procedure	Equipment Not Ready/ Available If:
				b. Check M58/M59 aiming post lights for missing or damaged radiation warning, data plate, or other parts. c. Check for evidence of tampering (aiming post lights are factory sealed and no disassembly is authorized or required).	b. Radiation warning or data plate is missing, or radiation warning, data plate, or other parts is/are damaged. c. Evidence of tampering is present.

PREVENTIVE MAINTENANCE INSPECTION - Continued

Table 1. Preventive Maintenance Checks and Services for M252 81-mm Mortar - Continued.

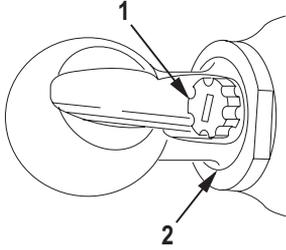
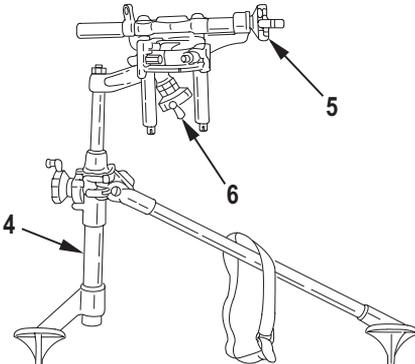
Item No.	Interval	Man-Hour	Item To Be Checked or Serviced	Procedure	Equipment Not Ready/ Available If:
9	During		Cannon	 <p>a. Verify breech plug (2) is not loose.</p> <p>b. Check for bulges, dents, and visible cracks. Check for evidence of gas leakage around firing pin (1) or breech plug (2) (visible discoloration).</p>	<p>a. Breech plug is loose.</p> <p>b. Barrel is bulged, dented, or visibly cracked, or shows evidence of gas leakage around firing pin or breech plug (visible discoloration).</p>

Table 1. Preventive Maintenance Checks and Services for M252 81-mm Mortar - Continued.

Item No.	Interval	Man-Hour	Item To Be Checked or Serviced	Procedure	Equipment Not Ready/ Available If:
10	During		Mortar Mount (Bipod)	 <p>Verify that elevating leg assembly (4), traversing gear assembly (5), and cross leveling mechanism (6) operate smoothly and without binding through entire range of travel. Buffers must allow for full movement in both recoil and counter-recoil travel without any free play/slackness.</p>	<p>Elevating leg assembly, traversing gear assembly, or cross leveling mechanism is binding or inoperative in either recoil or counter-recoil travel, or has free play/slackness.</p>

PREVENTIVE MAINTENANCE INSPECTION - Continued

Table 1. Preventive Maintenance Checks and Services for M252 81-mm Mortar - Continued.

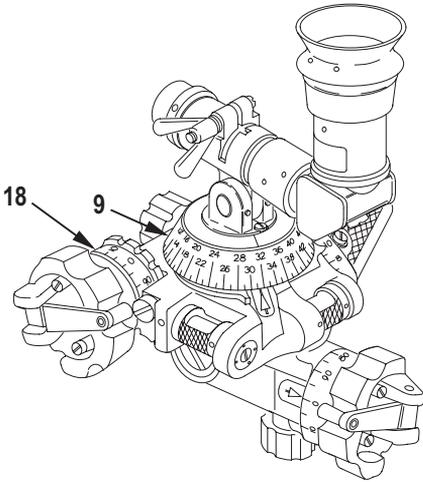
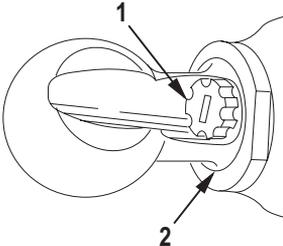
Item No.	Interval	Man-Hour	Item To Be Checked or Serviced	Procedure	Equipment Not Ready/ Available If:
11	During		M67 Sight Unit	 <p>a. Check coarse deflection scale (9) to ensure that scale rotates freely when depressed and provides resistance under spring tension when released.</p> <p>b. Check fine deflection scale (18) to ensure that scale rotates freely when depressed and provides resistance under spring tension when released.</p>	<p>a. Dial scale slips during firing.</p> <p>b. Dial scale slips during firing.</p>

Table 1. Preventive Maintenance Checks and Services for M252 81-mm Mortar - Continued.

Item No.	Interval	Man-Hour	Item To Be Checked or Serviced	Procedure	Equipment Not Ready/ Available If:
12	After		DA Form 2408-4	Update DA Form 2408-4 to reflect day's firing. After 5,000 rounds fired, have weapon borescoped every 500 additional rounds. USMC users shall update NAVMC 10558A.	After 5,000 rounds fired, weapon has not been borescoped every 500 additional rounds.
13	After		Cannon	 <p>a. Verify breech plug (2) is not loose.</p> <p>b. Check for bulges, dents, and visible cracks. Check for evidence of gas leakage around firing pin (1) or breech plug (2) (visible discoloration).</p>	<p>a. Breech plug is loose.</p> <p>b. Barrel is bulged, dented, or visibly cracked, or shows evidence of gas leakage around firing pin or breech plug (visible discoloration).</p>

PREVENTIVE MAINTENANCE INSPECTION - Continued

Table 1. Preventive Maintenance Checks and Services
for M252 81-mm Mortar - Continued.

Item No.	Interval	Man-Hour	Item To Be Checked or Serviced	Procedure	Equipment Not Ready/ Available If:
13 (Cont)	After (Cont)		Cannon (Cont)	c. Use rifle bore cleaning compound (RBC) (WP 0029, item 7) to thoroughly clean barrel bore after firing and two consecutive days thereafter. See lubrication instructions in this work package.	
14	After		Mortar Mount (Bipod)	Fully extend bipod assemblies to clean and lubricate exposed bearing surfaces with general purpose lubricating oil (GPL) (WP 0029, item 16).	

**Table 1. Preventive Maintenance Checks and Services
for M252 81-mm Mortar - Continued.**

Item No.	Interval	Man-Hour	Item To Be Checked or Serviced	Procedure	Equipment Not Ready/ Available If:
15	After		M67 Sight Unit	<p style="text-align: center;">WARNING</p> <div style="text-align: center;">  </div> <p style="text-align: center;">RADIATION HAZARD - TRITIUM GAS (H₃).</p> <p>a. Check for proper illumination of tritium-lit sources listed below in a darkened area. If any source is not illuminated, notify the local RSO. See warning summary for procedures.</p>	<p>a. Items are damaged or not illuminated.</p>

PREVENTIVE MAINTENANCE INSPECTION - Continued

Table 1. Preventive Maintenance Checks and Services for M252 81-mm Mortar - Continued.

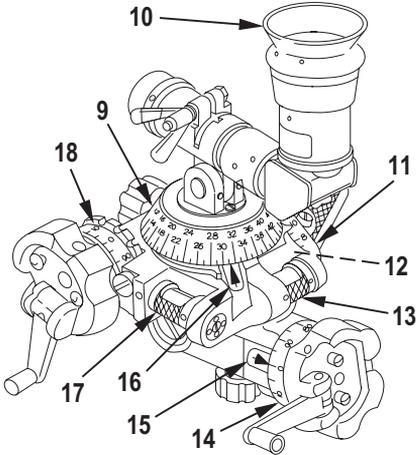
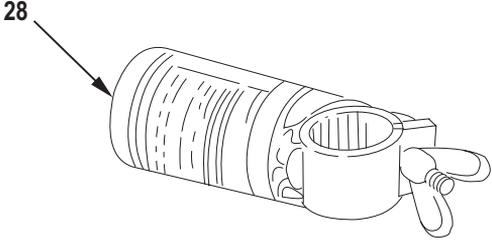
Item No.	Interval	Man-Hour	Item To Be Checked or Serviced	Procedure	Equipment Not Ready/ Available If:
15 (Cont)	After (Cont)		M67 Sight Unit (Cont)		<ul style="list-style-type: none"> 9. Coarse deflection scale 10. Telescope 11. Coarse elevation scale 12. Coarse elevation index arrow 13. Cross-level vial 14. Fine elevation scale 15. Fine elevation index arrow 16. Coarse deflection index arrow 17. Elevation vial 18. Fine deflection scale

Table 1. Preventive Maintenance Checks and Services for M252 81-mm Mortar - Continued.

Item No.	Interval	Man-Hour	Item To Be Checked or Serviced	Procedure	Equipment Not Ready/ Available If:
15 (Cont)	After (Cont)		M67 Sight Unit (Cont)	b. Wipe sight unit with wiping rag (WP 0029, item 19) before storing in carrying case.	
16	After		M58 and M59 Aiming Post Lights	<p>WARNING</p>  <p>RADIATION HAZARD - TRITIUM GAS (H₃).</p>  <p>a. Check aiming post lights (28) for proper illumination in a darkened area. If they are damaged or not illuminated, notify the local RSO. See warning summary for procedures.</p>	<p>a. Aiming post lights are damaged or not illuminated.</p>

PREVENTIVE MAINTENANCE INSPECTION - Continued

Table 1. Preventive Maintenance Checks and Services for M252 81-mm Mortar - Continued.

Item No.	Interval	Man-Hour	Item To Be Checked or Serviced	Procedure	Equipment Not Ready/ Available If:
16 (Cont)	After (Cont)		M58 and M59 Aiming Post Lights (Cont)	b. Wipe aiming post lights with wiping rag (WP 0029, item 19) before storing.	

END OF TASK

LUBRICATION INSTRUCTIONS

Lubrication Procedures

WARNING



CLEANING SOLVENTS

NOTE

These lubrication instructions are mandatory. Intervals are based on usual operating conditions. For unusual operating conditions, perform the lubricating procedures more often. When the weapon is not in use, intervals may be extended if proper lubrication procedures have been followed.

General purpose lubricating oil (GPL) (WP 0029, item 16) is the prime lubricant. Weapons lubricating oil (LAW) (WP 0029, item 17) may be used for continuous sub-zero environments. Cleaner, Lubricant, Preservative (CLP) is authorized for use on mortar systems, but for short-term application. Prolonged storage of weapon systems coated with CLP will result in damage to equipment. GPL/RBC are preferred over CLP.

1. Clean parts with dry cleaning solvent (WP 0029, item 20). Dry before lubricating.

-
2. Immediately after firing, and for two consecutive days thereafter, clean the cannon bore with RBC (WP 0029, item 7), using wire mesh pad (WP 0027, item 26) attached to cleaning head section (WP 0027, item 27). After the third cleaning, wipe dry and lightly coat with GPL (WP 0029, item 16). When mortar is not being fired, clean weekly with RBC, wipe dry, and lubricate with GPL.
 3. Weekly, clean and wipe entire outside surface of cannon, bipod, and baseplate with GPL (WP 0029, item 16).
 4. Weekly, or as needed, fully extend the traversing, elevating, and cross-leveling assemblies to wipe clean and lubricate exposed surfaces with GPL (WP 0029, item 16).
 5. Weekly, or as needed, carefully clean cooling fins at breech end of cannon to ensure maximum heat transfer. Do not allow dirt or foreign matter to build up on the cooling fins.
 6. Mortar mount must be sent to field maintenance for complete service and lubrication semiannually.
 7. Refer to FM 9-207 for arctic lubrication.

LUBRICATION INSTRUCTIONS - Continued

Lubricating Points

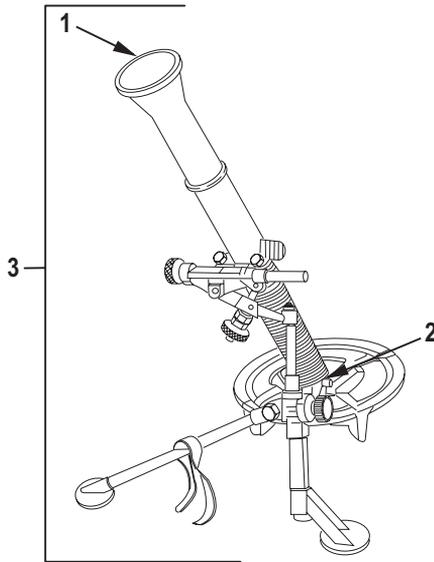


Figure 1. Lubricating Points.

<u>ITEM NO.</u>	<u>AREA OF MORTAR</u>	<u>LUBRICANT</u>	<u>INTERVAL</u>
1	Cannon Bore	GPL Oil	Weekly
2	Firing Pin	GPL Oil	Weekly
3	Outside Surfaces	GPL Oil	Weekly

END OF TASK

END OF WORK PACKAGE

OPERATOR**M252 81-MM MORTAR MAINTENANCE
PAINTING, REPAIR OR REPLACEMENT**

INITIAL SETUP:**Tools and Special Tools**

Firing pin wrench (WP 0027, item 18)

Materials/Parts

Dry cleaning solvent (WP 0029, item 20)

Lacquer (WP 0029, item 15)

Paint brush (WP 0029, item 5)

Polyurethane coating (WP 0029, item 10)

Synthetic thinner (WP 0029, item 23)

PAINTING

1. Inspect surfaces of baseplate, bipod, and sight unit adapter for loose or missing paint.

WARNING**CLEANING SOLVENTS**

2. Clean damaged areas with dry cleaning solvent (WP 0029, item 20).
3. Touch up paint on M3A1 baseplate and sight unit adapter using polyurethane coating (WP 0029, item 10), paint brush (WP 0029, item 5), and synthetic thinner (WP 0029, item 23). Touch up bipod using lacquer (WP 0029, item 15).

END OF TASK

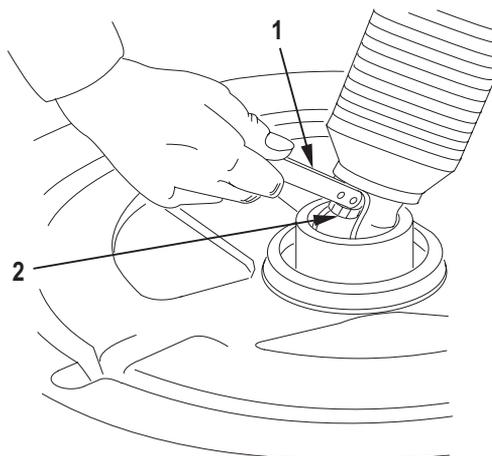
REPAIR OR REPLACEMENT

Figure 1. Replacement of Firing Pin.

1. Using firing pin wrench (1) (WP 0027, item 18), remove firing pin (2).

WARNING**CLEANING SOLVENTS**

2. Clean parts using dry cleaning solvent (WP 0029, item 20).
3. Inspect firing pin (2). Replace as necessary.
4. Install firing pin (2) until properly seated.

END OF TASK**END OF WORK PACKAGE**

OPERATOR**OPTICAL PARTS MAINTENANCE
OPTICAL PARTS CARE AND HANDLING**

INITIAL SETUP:**Materials/Parts**

Alcohol (WP 0029, item 1)

Lens paper (WP 0029, item 18)

OPTICAL PARTS CARE AND HANDLING**Wiping**

1. To wipe optical parts, use only lens paper (WP 0029, item 18) especially intended for cleaning optical glass.
2. Do not use cleaning cloths on optical surfaces.

Cleaning

1. Keep optical parts free from oil and grease.
2. Do not touch lenses or windows with bare fingers.
3. Apply alcohol (WP 0029, item 1) with lens paper (WP 0029, item 18) and wipe gently with clean lens paper to remove oil or grease from optical surfaces.
4. If alcohol is not available and temperature is above freezing, breathe heavily on glass and wipe off with clean lens paper. Repeat this operation until clean.

Cold Weather Cleaning

1. Clean optical surfaces with lens paper (WP 0029, item 18) moistened with alcohol (WP 0029, item 1).
2. If alcohol is not available, use dry lens paper (WP 0029, item 18).
3. Wipe gently to avoid scratching or removing coated surface of optics.

OPTICAL PARTS CARE AND HANDLING - Continued**Moisture****CAUTION**

Do not apply heat directly from concentrated sources. This could cause unequal expansion of parts, leading to damage and inaccurate functioning of optical parts.

NOTE

Condensation may cause moisture to collect on optical parts of instrument when temperature of parts is lower than that of surrounding air.

1. If moisture from condensation is not excessive, remove moisture by placing instruments in a warm place.
2. If moisture from condensation is excessive, notify field maintenance.

END OF TASK**END OF WORK PACKAGE**

OPERATOR
PREPARATION FOR STORAGE OR SHIPMENT

INITIAL SETUP:**Materials/Parts**

- Barrier material (WP 0029, item 3)
- Cushioning material (WP 0029, item 11)
- Dry cleaning solvent (WP 0029, item 20)
- General purpose lubricating oil (GPL) (WP 0029, item 16)
- Grease, Aircraft (GA) (WP 0029, item 14)
- Tape, pressure sensitive adhesive, paperback, water resistant (WP 0029, item 22)
- Tape, pressure sensitive adhesive, Type 4, CL1 (WP 0029, item 21)
- Wiping rag (WP 0029, item 19)

References

- DA Form 2408-4
 - DA Form 2408-9
 - TB 9-1000-247-34
-

PREPARATION FOR STORAGE OR SHIPMENT**Intermediate Storage**

Store the weapon under cover, in open sheds, or warehouses, whenever possible, and prepare it for storage as follows:

1. Preparation. Remove components and disassemble weapon prior to cleaning and packaging.

WARNING**CLEANING SOLVENTS**

2. Cleaning and Drying. Clean the weapon, including the bore, with dry cleaning solvent (WP 0029, item 20). Wipe dry using wiping rags (WP 0029, item 19).
3. Preservation. Coat the cannon bore liberally with GPL lubricating oil (WP 0029, item 16). Coat the other painted and unpainted surfaces of the cannon and mount assembly with GA grease (WP 0029, item 14).

CHAPTER 5

AMMUNITION
MAINTENANCE INSTRUCTIONS
FOR
M252 81-MM MORTAR

OPERATOR

AMMUNITION MARKING INFORMATION

INITIAL SETUP:**References**

FT 81-AB-2
 FT 81-AI-3
 FT 81-AO-1
 FT-81-AQ-1
 FT-81-AR-1
 FT 81-M5
 TM 9-1315-249-12&P
 TM 9-1315-252-12&P

AUTHORIZED CARTRIDGES

The following cartridges are authorized to be fired in the M252 Mortar when appropriate firing tables are used:

<u>Cartridges</u>	<u>Firing Tables</u>
Cartridge, 81-mm: HE (high explosive), M821	FT 81-AR-1
Cartridge, 81-mm: HE, M821A1	FT 81-AR-1, C-3
Cartridge, 81-mm: HE, M821A2	FT 81-AR-1, C-3
Cartridge, 81-mm: HE, M889	FT 81-AR-1
Cartridge, 81-mm: HE, M889A1	FT 81-AR-1, C-3
Cartridge, 81-mm: HE, M889A2	FT 81-AR-1, C-3
Cartridge, 81-mm: HE, M374A3	FT 81-AQ-1
Cartridge, 81-mm: HE, M374A2, M374A1, and M374	FT 81-AI-3
Cartridge, 81-mm: HE, M362A1 and M362	FT 81-AQ-1, C-1
Cartridge, 81-mm: Smoke, RP (red phosphorus), M819	FT 81-AR-1
Cartridge, 81-mm: Smoke, WP (white phosphorus), M375A3	FT 81-AQ-1, C-1
Cartridge, 81-mm: Smoke, WP, M375A2, M375A1, and M375	FT 81-AI-3
Cartridge, 81-mm: Illum (illuminating), M853A1	FT 81-AR-1, C-1
Cartridge, 81-mm: Illum, M301A3	FT 81-AI-3
Cartridge, 81-mm: Illum, M301A2 and M301A1	FT 81-AB-2
Cartridge, 81-mm: Illum, M816	FT 81-AR-1, C-1
Cartridge, 81-mm: Practice, M879	FT 81-AR-1, C-1
Cartridge, 81-mm: Practice, SR (short range), M880	FT 81-M5
Cartridge, 81-mm: Training, M68	FT 81-AI-3
81-mm Mortar Training Device (SABOT)	FT 81-AO-1

AUTHORIZED CARTRIDGES - Continued

M821 HE Cartridge

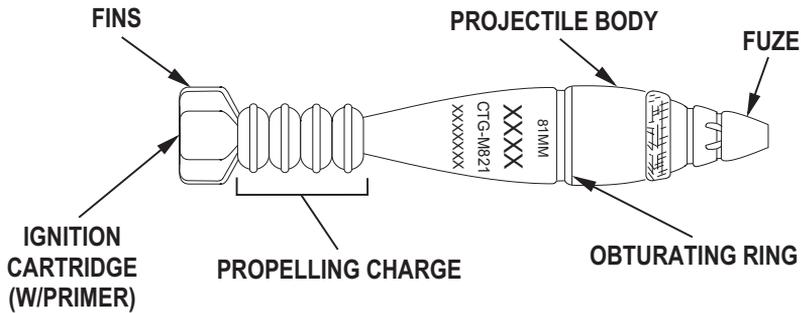


Figure 1. M821 HE Cartridge.

Type/Use: High explosive/fragmentation and blast

Identification: Olive drab w/yellow markings

Components: Fuze, Multi-Option, M734
 Propelling Charge, M223

Maximum Range: 5608 meters (6133 yards)

M821A1 HE Cartridge

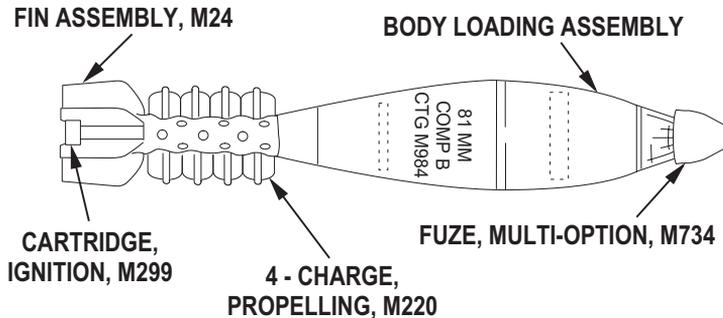


Figure 2. M821A1 HE Cartridge.

Type/Use: High explosive/fragmentation and blast

Identification: Olive drab w/yellow markings

Components: Fuze, Multi-Option, M734
 Propelling Charge, M220

Maximum Range: 5935 meters (6491 yards)

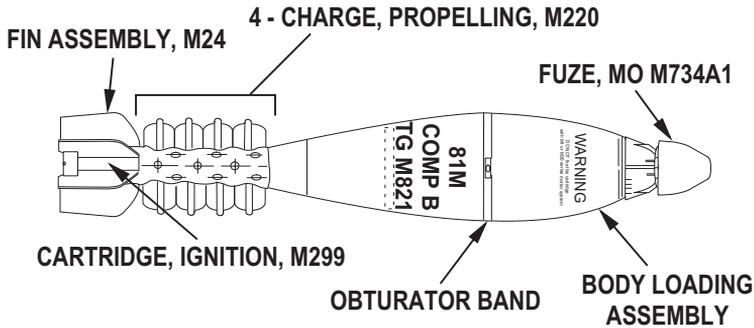
M821A2 HE Cartridge

Figure 3. M821A2 HE Cartridge.

Type/Use: High explosive/fragmentation and blast

Identification: Olive drab w/yellow markings

Components: Fuze, Multi-Option, M734A1
Propelling Charge, M220

Maximum Range: 5792 meters (6334 yards)

WARNING

DO NOT fire this cartridge with M1 or M29 Series mortar system. Catastrophic tube failure can be expected if the M821A2 HE cartridge is fired from the M1 or M29 Series mortar system. This failure could result in the death, or serious bodily injury, of mortar crew members and surrounding personnel.

AUTHORIZED CARTRIDGES - Continued

M889 HE Cartridge

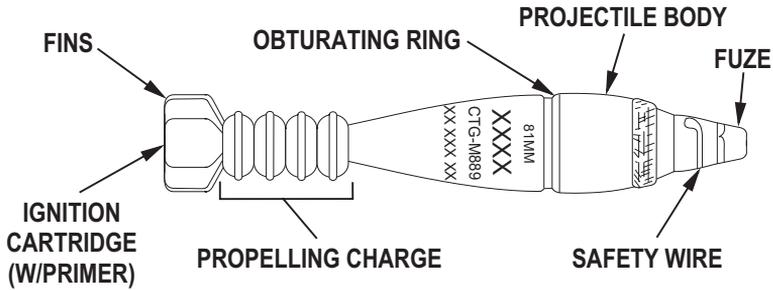


Figure 4. M889 HE Cartridge.

Type/Use: High explosive/fragmentation and blast

Identification: Olive drab w/yellow markings

Components: Fuze, Point Detonating, M935
Propelling Charge, M223

Maximum Range: 5608 meters (6133 yards)

M889A1 HE Cartridge

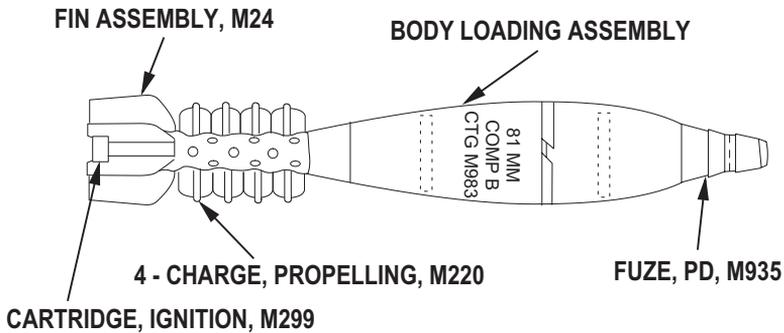


Figure 5. M889A1 HE Cartridge.

Type/Use: High explosive/fragmentation and blast

Identification: Olive drab w/yellow markings

Components: Fuze, Point Detonating, M935
Propelling Charge, M220

Maximum Range: 5935 meters (6491 yards)

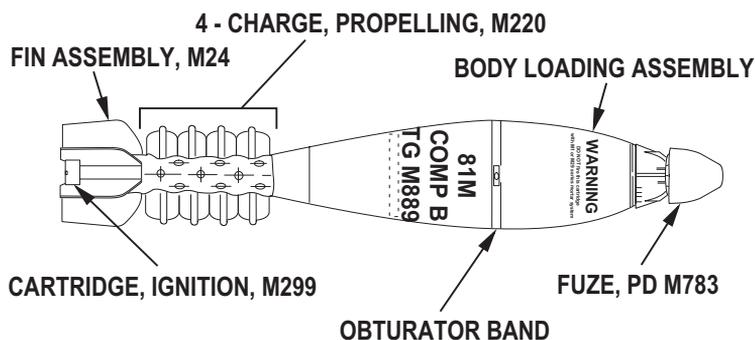
M889A2 HE Cartridge

Figure 6. M889A2 HE Cartridge.

Type/Use: High explosive/fragmentation and blast

Identification: Olive drab w/yellow markings

Components: Fuze, Point Detonating/Delay, M783
Propelling Charge, M220

Maximum Range: 5792 meters (6334 yards)

WARNING

DO NOT fire this cartridge with M1 or M29 Series mortar system. Catastrophic tube failure can be expected if the M889A2 HE cartridge is fired from the M1 or M29 Series mortar system. This failure could result in the death, or serious bodily injury, of mortar crew members and surrounding personnel.

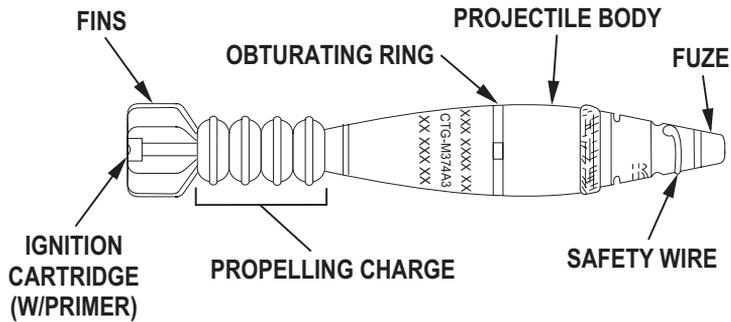
AUTHORIZED CARTRIDGES - Continued
M374A3 HE Cartridge

Figure 7. M374A3 HE Cartridge.

Type/Use: High explosive/fragmentation and blast**Identification:** Olive drab w/yellow markings**Components:** Fuze, Point Detonating, M567 or M524 (series)
Propelling Charge, M205**Maximum Range:** 4800 meters (5249 yards)

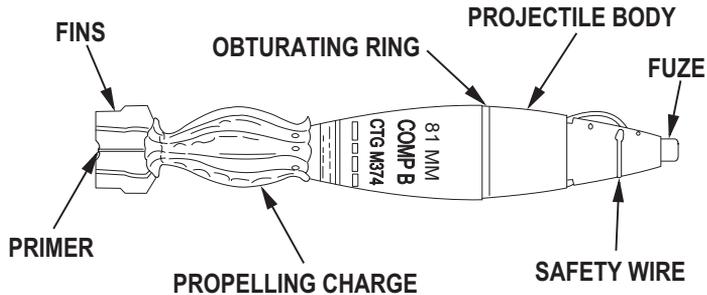
M374A2, M374A1, and M374 HE Cartridge

Figure 8. M374A2, M374A1, and M374 HE Cartridge.

Type/Use: High explosive/fragmentation and blast

Identification: Olive drab w/yellow markings

Components: Fuze - Point Detonating, M524 (series),
Point Detonating, M526 (series),
Point Detonating, M567, or
Proximity, M532

Propelling Charge, M90 (M374 cartridge) or
M90A1 (M374A1 and M374A2 cartridges)

Maximum Range: 4500 meters (4921 yards)

Limitations:

1. Cartridges assembled with Fuze, PD, M524 (A1, A2, A3, or A4) are for USMC/USN use only.
2. Cartridges assembled with Fuze, Proximity, M532, must be fired above charge 0.
3. Short rounds may be expected when firing below charge 4.

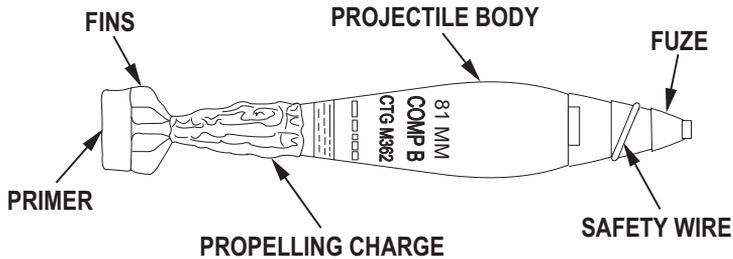
AUTHORIZED CARTRIDGES - Continued
M362A1 and M362 HE Cartridge

Figure 9. M362A1 and M362 HE Cartridge.

Type/Use: High explosive/fragmentation and blast**Identification:** Olive drab w/yellow markings

Components: Fuze - Point Detonating, M524 (series),
 Point Detonating, M526 (series), or
 Proximity, M532
 Propelling Charge, M5

Maximum Range: 3600 meters (3937 yards)**Limitations:**

1. Cartridges assembled with Fuze, PD, M524 (A1, A2, A3, or A4) are for USMC/USN use only.
2. Cartridges assembled with Fuze, Proximity, M532, must be fired above charge 0.

M819 Smoke Cartridge

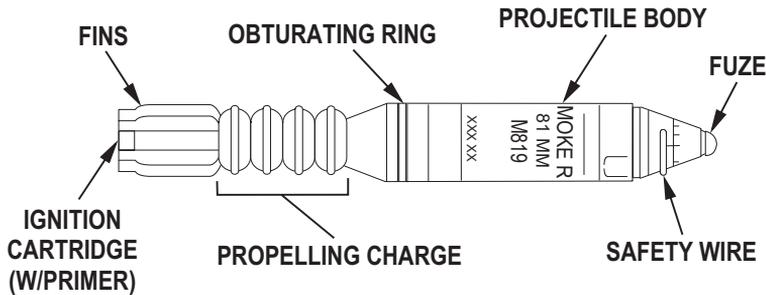


Figure 10. M819 Smoke Cartridge.

Type/Use: Smoke (red phosphorous pellets)/screening. To be fired in 3 round volleys (after registration) for initial screen deployment and approximately 1 round/min thereafter for screen sustainment, depending upon weather conditions.

Identification: Light green w/black markings and one brown band

Components: Fuze, Mechanical Time Superquick, M772
 Propelling Charge, M218

Maximum Range: 4875 meters (5331 yards) (impact)

M375A3 Smoke Cartridge

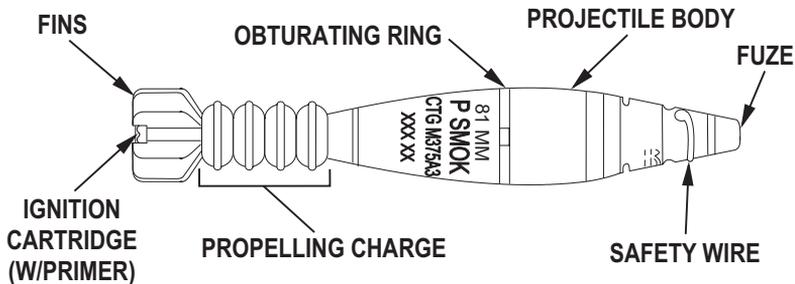


Figure 11. M375A3 Smoke Cartridge.

Type/Use: Smoke (white phosphorous)/spotting and incendiary

Identification: Light green w/light red markings and one yellow band

Components: Fuze, Point Detonating, M567 or M524 (series)
 Propelling Charge, M205

Maximum Range: 4800 meters (5249 yards)

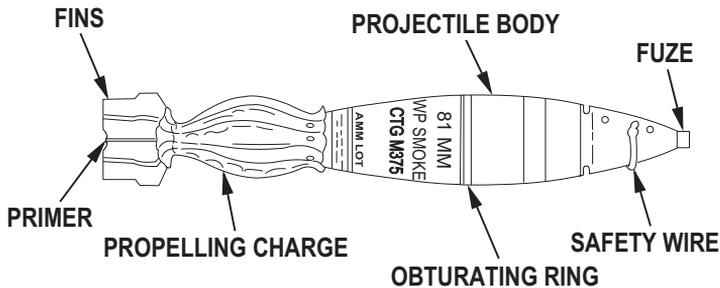
AUTHORIZED CARTRIDGES - Continued
M375A2, M375A1, and M375 Smoke Cartridge

Figure 12. M375A2, M375A1, and M375 Smoke Cartridge.

Type/Use: Smoke (white phosphorus)/spotting and incendiary

Identification: Light green w/light red markings and one yellow band

Components: Fuze - Point Detonating, M524 (series),
Point Detonating, M526 (series), or
Point Detonating, M567
Propelling Charge, M90 (M375 cartridge) or
M90A1 (M375A1 and M375A2 cartridges)

Maximum Range: 4500 meters (4921 yards)

Limitations:

1. Cartridges assembled with Fuze, PD, M524 (A1, A2, A3, or A4) are for USMC/USN use only.
2. Short rounds may be expected when firing below charge 4.

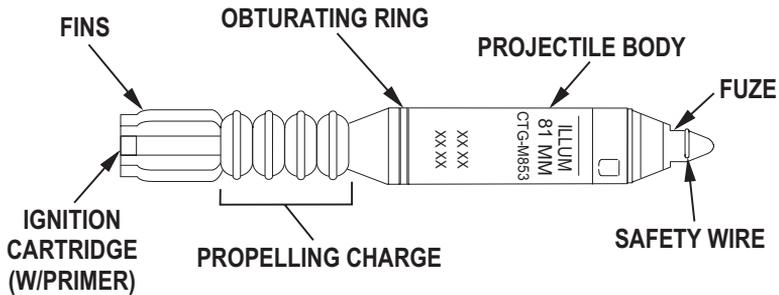
M853 Illuminating Cartridge

Figure 13. M853 Illuminating Cartridge.

Type/Use: Illumination**Identification:** White w/black markings**Components:** Fuze - Mechanical Time Superquick, M772, or Time, M768
Propelling Charge, M219**Maximum Range:** 5100 meters (5577 yards) (burst)**Remarks:**

1. Cartridge contains an illuminating candle/parachute assembly.
2. Candle provides a minimum of 600,000 candlepower illumination for at least 60 seconds.

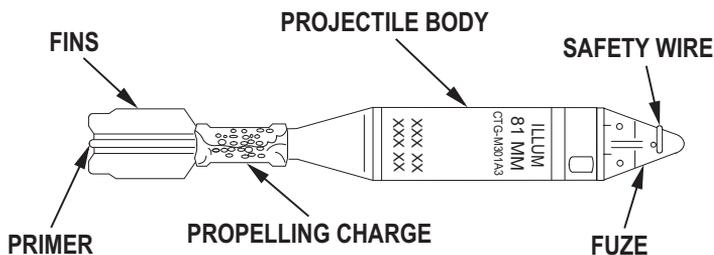
AUTHORIZED CARTRIDGES - Continued
M301A3 Illuminating Cartridge

Figure 14. M301A3 Illuminating Cartridge.

Type/Use: Illumination**Identification:** White w/black markings**Components:** Fuze, Time, M84A1

Propelling Charge, M185

Maximum Range: 3150 meters (3445 yards) (burst)**Limitation:** Cartridge cannot be fired below charge 3.**Remarks:**

1. Cartridge contains an illuminating candle/parachute assembly.
2. Candle provides a minimum of 500,000 candlepower illumination for at least 60 seconds.

M301A2 and M301A1 Illuminating Cartridge

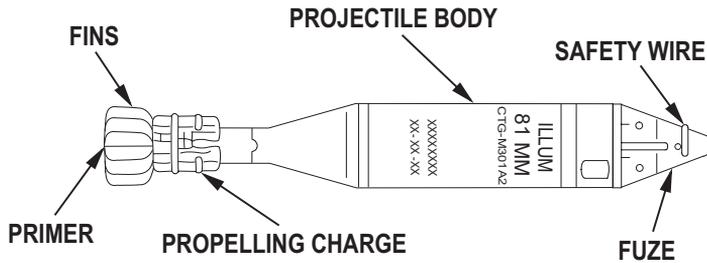


Figure 15. M301A2 and M301A1 Illuminating Cartridge.

Type/Use: Illumination

Identification: White w/black markings

Components: Fuze, Time, M84

Propelling Charge, M2A1

Maximum Range: 2150 meters (2351 yards) (burst)

Limitation: Cartridge cannot be fired below charge 2.

Remarks:

1. Cartridge contains an illuminating candle/parachute assembly.
2. Candle provides a minimum of 500,000 candlepower illumination for at least 60 seconds.

AUTHORIZED CARTRIDGES - Continued

M816 Infrared (IR) Illuminating Cartridge

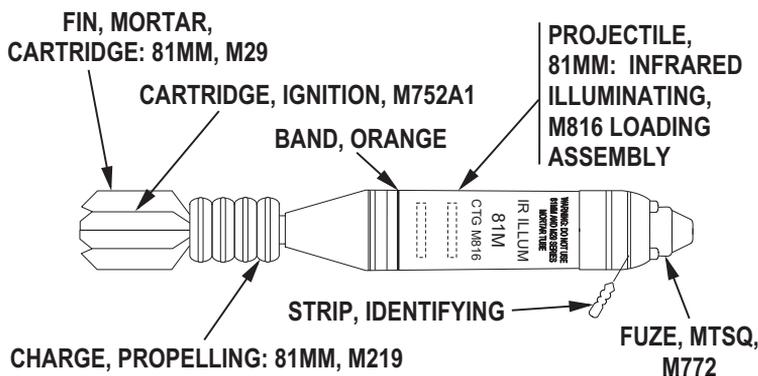


Figure 16. M816 Infrared Illuminating Cartridge.

Type/Use: Illumination, infrared (IR)

Identification: White w/black markings and one orange band

Components: Fuze, Mechanical Time Superquick, M772
Propelling Charge, M219

Maximum Range: 5100 meters (5577 yards) (air burst)

Remarks:

1. Cartridge contains an illuminating infrared charge and parachute assembly.
2. Cartridge is marked with an orange band to identify it as an infrared (IR) cartridge.
3. User must use night vision device to expose enemy forces in darkness.
4. Charge provides a minimum infrared illumination for at least 60 seconds.

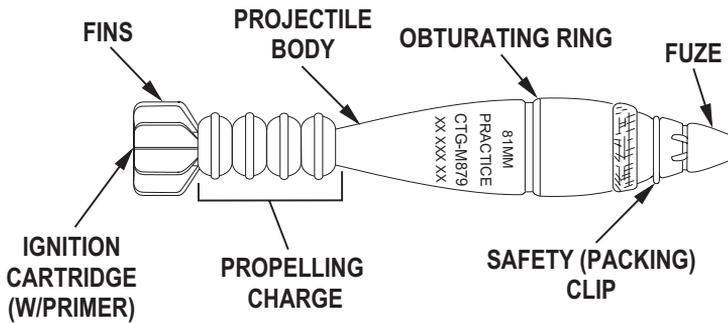
M879 Practice Cartridge

Figure 17. M879 Practice Cartridge.

Type/Use: Target practice (full range)/training

Identification: Blue w/white markings and one brown band

Components: Fuze, Point Detonating (Practice), M751 (Type I or Type II)
Propelling Charge, M220

Maximum Range: 5600 meters (6124 yards)

Remarks:

1. Cartridges with Type I, M751 Fuzes resemble M821 HE cartridges.
2. Cartridges with Type II, M751 Fuzes resemble M889 HE cartridges.
3. Projectile body contains an inert fill.
4. A pyrotechnic smoke charge in the fuze produces a flash, an audible sound, and a smoke cloud on impact.
5. A high dud rate may be encountered when firing the M879 at charge 0.

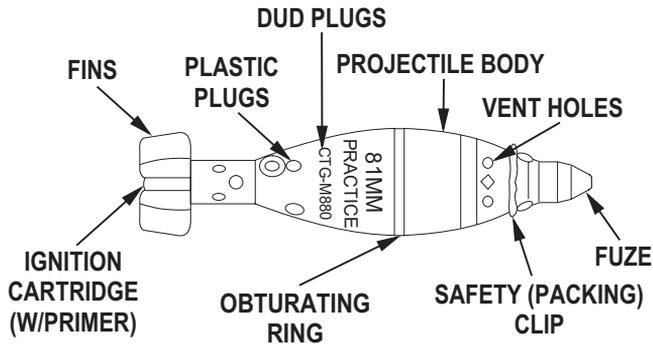
AUTHORIZED CARTRIDGES - Continued
M880 Practice Cartridge

Figure 18. M880 Practice Cartridge.

Type/Use: Target practice (short range)/training**Identification:** Blue w/white markings and one brown band**Components:** Fuze, Point Detonating (Practice), M775 (Type I or Type II)
Propelling Charge, ignition cartridge only**Maximum Range:** 458 meters (501 yards)**Remarks:**

1. Projectile body is hollow.
2. Range of cartridge is reduced by removing plastic plugs from projectile body. Removal of plugs allows gases to escape (from the mortar barrel) through the body and out the vent holes.
3. A pyrotechnic smoke charge in the fuze produces a flash, an audible sound, and a smoke cloud on impact.
4. The spent (fired) projectiles can be recovered for rebuilding and reuse. Refer to TM 9-1315-252-12&P for instructions and limitations.

M68 Training Cartridge

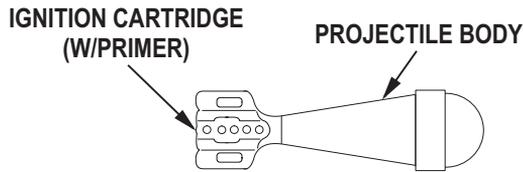


Figure 19. M68 Training Cartridge.

Type/Use: Training

Identification: Blue w/white markings

Components: Fuze, none

Propelling Charge, M6 or M3 ignition cartridge only

Maximum Range: 280 meters (306 yards)

Remarks:

1. Cartridge is fired with ignition cartridge only.
2. Cartridge can be re-used. Ignition cartridge and/or primer must be replaced.

81-mm Mortar Training Device

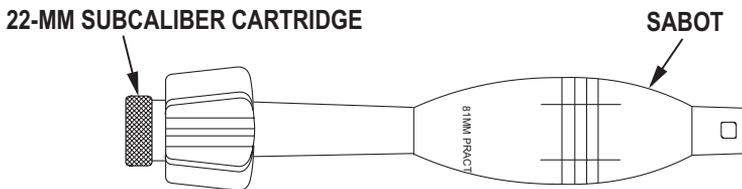


Figure 20. 81-mm Mortar Training Device.

Type/Use: Training

Components: Sabot M1

22-mm subcaliber cartridges (M744, M745, M746, and M747)

Remarks:

1. Refer to TM 9-1315-249-12&P for additional information and instructions on its use.
2. The M1 SABOT, with any 22-mm subcaliber cartridge, WILL NOT be fired unless equipped with Type IV Range Nut Assembly, NSN 1315-01-163-5428. Rapid and condemning tube erosion WILL occur with non-compliance.

END OF WORK PACKAGE

OPERATOR**CARE AND HANDLING OF AMMUNITION
PREPARATION FOR FIRING, LOADING AND FIRING, FIRING SAFETY
PRECAUTIONS, UNFIRED CARTRIDGES, CARE AND HANDLING OF CARTRIDGES**

INITIAL SETUP:**References**

AR 385-10
AR 385-63
FM 4-30.13
TB 43-0250
TM 9-1300-200
WP 0010
WP 0023
WP 0024

PREPARATION FOR FIRING

1. Unpack cartridge.
 - a. Remove U-shaped packing stop/clip (if any) from fuze (except for M879 TP (target practice) and M880 TP (SR) (short range) cartridges).

NOTE

Inspect M751 and M775 Practice Fuzes for the presence of fuze packing clip. Clip should remain in place until just prior to firing. If the packing clip is not present, remove cartridge to dud pit and notify Explosive Ordnance Disposal (EOD).

- b. Remove protective bag and desiccant bags (if any) secured to or covering fin assembly.
 - c. Remove plastic shell/insert assembly (if any) covering propelling charge.
2. Assemble fuze to cartridge if cartridge was shipped unfuzed (see Installation of Fuzes in WP 0023).
3. Set fuze for required time or desired type of burst (see Fuze Setting in WP 0023).
4. Adjust propelling charge for desired range (see Adjustment in WP 0024).

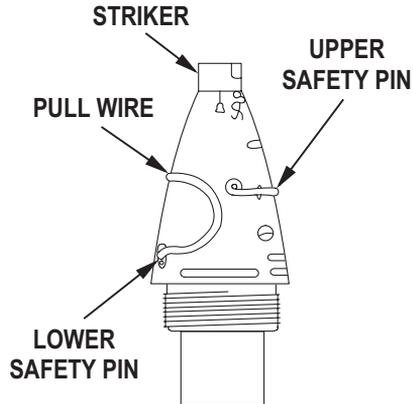
PREPARATION FOR FIRING - Continued

Figure 1. M524 PD (Point Detonating) Fuze.

WARNING

- Do not fire cartridge
 - if eye of upper safety pin breaks off and/or safety pin cannot be removed.
 - if fuze makes a buzzing sound when safety pins are removed.
- Keep cartridge vertical (with fuze end up) if a buzzing sound was heard. Fuze may be armed.
- Notify EOD.

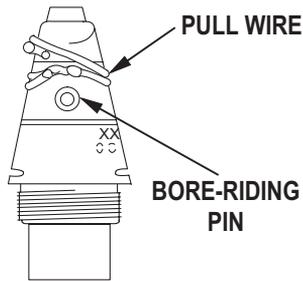


Figure 2. M526 PD Fuze.

WARNING

- Do not fire cartridge
 - if fuze makes a buzzing sound when safety pins are removed.
 - if bore-riding pin is missing.
- Always check for presence of bore-riding pin after removing safety pins.
- Notify EOD.

WARNING

Inspect M751 and M775 Practice Fuzes to ensure that fuze striker is not protruding from nose of fuze so that red stripe is visible. If fuze striker is protruding so that red stripe is visible, fuze may be armed. Force applied to nose of fuze may cause it to function. Remove cartridge to dud pit, taking care not to strike nose of fuze, and notify EOD.

5. Remove safety pin/pull wire (if any) just prior to loading cartridge. Remove packing clip from M751 or M775 Practice Fuze prior to firing.

END OF TASK

LOADING AND FIRING**WARNING**

Do not fire ammunition through overhead obstructions or over the heads of unprotected personnel.

The mortar crew must have adequate cover for protection from fragments when firing to ranges of 225 meters (246 yards) or less.

Do not fire ammunition with damaged fins, leaking or missing propellant containers, damaged obturators, or damaged fuzes.

All cartridges must be inspected prior to firing for dented, cracked, bent, separated, and loose components. Any cartridge with fins bent (even slightly) or propellant increments that have been punctured or torn (leaking propellant) are to be considered unserviceable, since critical short rounds could result if fired.

Unpacked mortar cartridges are known to sustain significant damage when dropped. Packed ammunition dropped from a height of more than 2.1 meters (7 feet) could be similarly damaged. Defects incurred may not be detectable by visual inspection, and firing damaged ammunition could result in weapon or property damage or serious personnel injury or death. All cartridges which have been dropped are to be immediately segregated, tagged or marked for identification, and turned in to the Ammunition Supply Point (ASP) as unserviceable.

Point detonating (PD) and proximity fuzes may prematurely function when fired through extremely heavy rainfall. Short rounds may occur if an excessive amount of oil or water is in barrel during firing. Do not fire ammunition in temperatures above +145 °F (+63 °C) or below -50 °F (-46 °C).

Firing M374A2, M375A1, and M375A2 cartridges in inclement weather (rain/snow) is not advisable. Critical short rounds may occur when propelling charge bags are wet or have previously been exposed to moisture.

CAUTION

Before loading cartridge, ensure that barrel and cartridge are free of sand, mud, moisture, snow, wax, or other foreign matter.

Ensure that all packing materials (packing stops, supports, and plastic bags) were removed from cartridge.

NOTE

Ensure that cartridge has proper amount of charge.

Remove safety wire/clip (if any) before loading.

See WP 0010 for loading and firing instructions.

END OF TASK

FIRING SAFETY PRECAUTIONS

General safety precautions to be observed during training are prescribed in AR 385-63 and TM 9-1300-200.

Allowable Number of Rounds (ANOR) Per Day

WARNING



Before loading cartridge, ensure that barrel and cartridge are free of sand, mud, moisture, snow, wax, or other foreign matter.

Ensure that all packing materials (packing stops, supports, and plastic bags) were removed from cartridge.

Hearing can be permanently damaged if exposed to constant high noise. All personnel within 100 meters (109 yards) are required to wear hearing protection during firing. Limit exposure of the crew to the maximum Allowable Number of Rounds (ANOR) per day.

NOTE

ANOR is for TRAINING ONLY; it DOES NOT apply in COMBAT.

Using the proper head position and single hearing protection, the ANOR that can be safely fired each day is limited. See WP 0010 for proper crew positions.

FIRING SAFETY PRECAUTIONS - Continued**Table 1. 800 Series Ammunition.**

Charge	Elevation	ANOR	Points per Round
4	800	61	16.0
4	1511	611	1.6
3	800	180	5.5
3	1511	1000+	0.0
2	800	666	1.5
2	1511	856	1.2
1	800	1000+	0.0
1	1511	1000+	0.0

Point values are used to compute exposure limits (1000 pts per day maximum) when a mixture of charges is fired in one 24 hour period.

Table 2. 300 Series Ammunition.

Type	Charge	ANOR	Points per Round
M301A1/A2	4	50	*
M301A3	8	143	*
M374/A1/A2	9	125	*
M374A3	4	106	*
M375/A1/A2	9	125	*
M375A3	4	106	*

* No reduced charge data or point values are provided for the 300 series ammunition.

END OF TASK**UNFIRED CARTRIDGES**

1. Replace safety wire/clip if removed from fuze.

NOTE

Install upper safety pin first on M524 and M526 PD Fuzes.

If safety pins cannot be fully re-inserted into fuze, do not force it. Notify EOD.

2. Reset fuze (see Resetting Fuzes in WP 0023).

NOTE

Do not attempt to reset M532 VT (variable time) fuzes. Fuzes set for PD action cannot be returned to proximity mode.

3. Remove fuze, if cartridge was shipped unfuzed. Re-install closing plug.

NOTE

Do not mix propelling models or lots. Use original increments.

4. Re-install propellant increments so that cartridge has a full charge.

CAUTION

When repacking M821/M899 HE (high explosive) ammunition, tighten monopack cap until a definite stop is felt. This will occur when the sealing wire hole on the cap is between 0.95 to 1.27 cm (3/8 to 1/2 in.) to the right of the container sealing wire lug (see illustration). Do not tighten further. This may cause cracks in the cap.

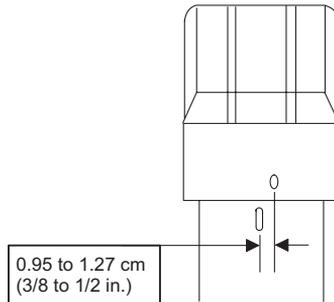


Figure 3. Repacking of M821/M899 HE Ammunition.

NOTE

Replace packing clip on M751 and M775 Practice Fuzes. If packing clip cannot be fully inserted, notify EOD.

5. Install packing stop. Install packing clip on M751 and M775 Practice Fuzes. Repack cartridge.

END OF TASK

CARE AND HANDLING OF CARTRIDGES

1. Do not throw or drop live ammunition.
2. Use proper tools to open ammo boxes and ammo containers.
3. Do not break moisture resistant seal (or jungle-wrap) of ammunition containers until cartridges are to be fired.
4. Protect cartridges when removed from ammo container. Protect ammunition from rain and snow. Do not remove plastic shell/insert assembly around propelling charge, until propelling charge is to be adjusted. If protective bags were packed with cartridge, cover fin assembly and propelling charge to prevent moisture contamination. Stack cartridges on top of empty ammo boxes. Cover cartridges with plastic sheets provided.
5. Do not expose cartridges to direct sunlight, extreme temperatures, flame, or other sources of heat.
6. Store WP-loaded cartridges at temperatures below 111 °F (44 °C) to prevent melting of WP (white phosphorus) filler. If this is not possible, WP-loaded cartridges must be stored fuze-end up so that WP will resolidify with void space in nose end of cartridge (when temperature returns below 111 °F (44 °C)). Failure to observe this precaution could result in rounds with erratic flight.
7. Store WP-loaded ammunition separate from other types of ammunition.
8. Notify EOD of leaking WP cartridges. Avoid contact with any leakers.
9. Protect primer of cartridge during handling.
10. Do not handle duds.
11. Do not transport ammunition which is not properly secured to vehicle.
12. For further instructions, refer to AR 385-10, TM 9-1300-200, FM 4-30.13, and TB 43-0250.

END OF TASK

END OF WORK PACKAGE

OPERATOR
FUZES
IDENTIFICATION, INSTALLATION OF FUZES, FUZE SETTING,
RESETTING FUZES, FUZE WRENCH/SETTERS

INITIAL SETUP:**Tools and Special Tools**

M18 Fuse wrench (WP 0027, item 20)

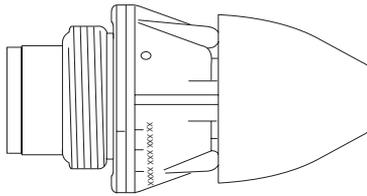
IDENTIFICATION**Multi-Option, M734 Fuze**

Figure 1. M734 Multi-Option Fuze.

Functions: Prox (proximity)/impact

Settings: Prox, near surface burst, impact, or 0.05 second delay action

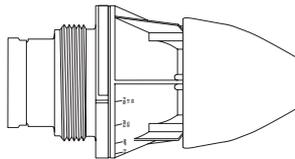
Multi-Option, M734A1 Fuze

Figure 2. M734A1 Multi-Option Fuze.

Functions: PRX (proximity)/impact/delay

Settings: 120 PRX, 60/81 PRX, IMP (Impact), or DLY (0.05 second delay) action

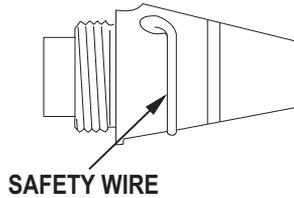
IDENTIFICATION - Continued**Point Detonating, M935 Fuze**

Figure 3. M935 Point Detonating Fuze.

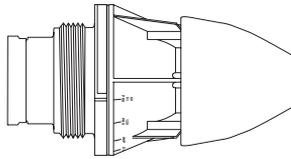
Functions: Impact**Settings:** Superquick or 0.05 second delay action**Remarks:** Fuze has a safety wire.**Point Detonating/Delay, M783 Fuze**

Figure 4. M783 Point Detonating/Delay Fuze.

Functions: Impact/delay**Settings:** 120 PRX, 60/81 PRX, IMP (Impact), or DLY (0.05 second delay) action**NOTE**

M783 fuze looks the same as the M734A1 fuze. If M783 is set on 120 PRX or 60/81 PRX, it will function only on Impact mode.

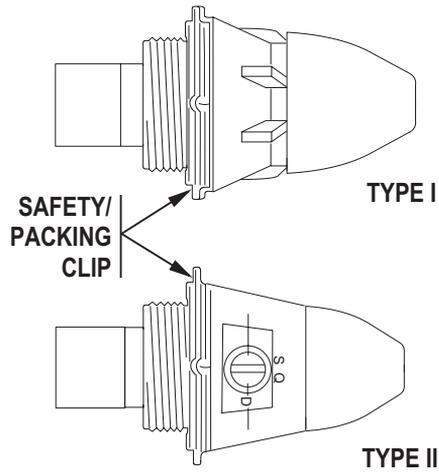
Point Detonating, M751 and M775 Fuze


Figure 5. M751 and M775 Point Detonating Fuze.

Functions: Impact

Settings: Dummy multi-option, PRX (proximity)/NSB (near surface burst)/IMP (impact)/DLY (delay) (Type I Ogive)

Dummy point detonating, SQ (superquick)/D (delay) (Type II Ogive)

Remarks: Fuze has a smoke charge and safety/packing clip.

IDENTIFICATION - Continued

Point Detonating, M524 (Series) Fuze

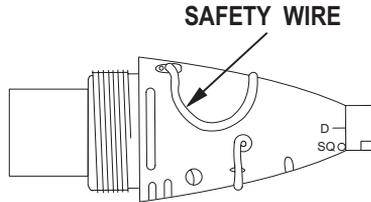


Figure 6. M524 Series Point Detonating Fuze.

Functions: Impact

Settings: Superquick or 0.05 second delay action

Remarks: Fuze has a safety wire.

Point Detonating, M526 (Series) Fuze

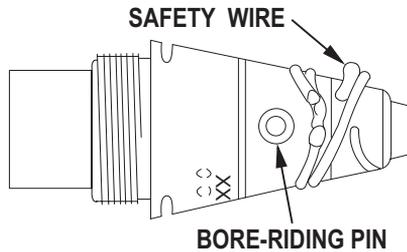


Figure 7. M526 Series Point Detonating Fuze.

Functions: Impact

Settings: Superquick action only

Remarks: Fuze has a safety wire and bore-riding pin.

Point Detonating, M587 Fuze

Figure 8. M587 Point Detonating Fuze.

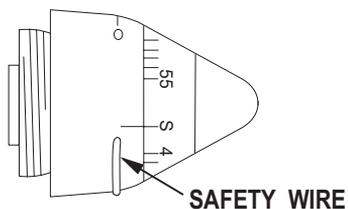
Functions: Impact**Settings:** Superquick or 0.05 second delay action**Remarks:** Fuze has a safety wire.**Mechanical Time Superquick, M772 Fuze**

Figure 9. M772 Mechanical Time Superquick Fuze.

Functions: Airburst/impact**Settings:** 4 to 55 seconds (1/2 second intervals)**Remarks:** Fuze has an expelling charge and safety wire.

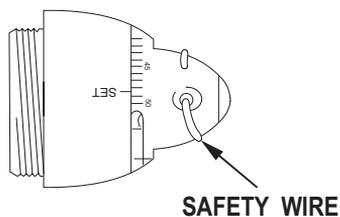
IDENTIFICATION - Continued**Time, M768 Fuze**

Figure 10. M768 Time Fuze.

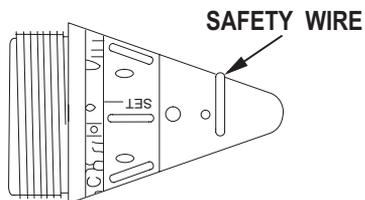
Functions: Airburst**Settings:** 3 to 55 seconds (one second intervals)**Remarks:** Fuze has an expelling charge and safety wire.**Time, M84 Series Fuze**

Figure 11. M84 Series Time Fuze.

Functions: Airburst**Settings:** 0 to 25 seconds (M84)

0 to 50 seconds (M84A1)

Remarks: Fuze has an expelling charge and safety wire.

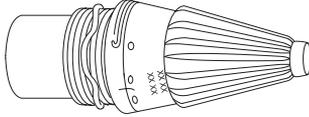
Proximity (VT) (Variable Time), M532 Fuze

Figure 12. M532 Proximity (VT) Fuze.

Functions: Prox/impact**Settings:** Proximity or superquick action**END OF TASK****INSTALLATION OF FUZES****WARNING**

Do not hammer on fuze wrench or use an extension on handle. Fuze must be fully seated onto projectile body. Do not stake fuze. Use only authorized fuze combinations.

1. Place cartridge on its side.
2. Remove closing plug from cartridge. Use a M18 fuze wrench (WP 0027, item 20) to loosen closing plug. Turn handle of wrench in counterclockwise direction.
3. Inspect fuze threads and fuzewell threads for damage. Do not use fuze if thread is damaged. Do not use projectile if fuzewell thread is damaged or if explosive is visible on thread.
4. Screw fuze into projectile body. Seat fuze and secure it with an M18 fuze wrench (WP 0027, item 20). There must be no visible gap between fuze and projectile body.

NOTE

If binding occurs, unscrew fuze and recheck threads.

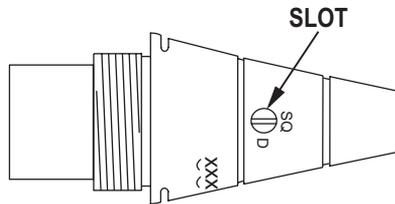
FUZE SETTING

The following chart identifies the proper procedure and required tools/wrenches for setting the fuze.

Table 1. Fuze Setting Procedure.

Fuze									Fuze Setter (Wrench)	Proce- dure
PD			MTSQ	T		MO	VT			
M935 M567 M783	M524 Series	M526 Series	M751 M775	M772	M768	M84	M734 M734A1	M532		
•									M18	1
	•								M18	2
		•	•						NONE	3
				•	•				1-3/4 in. open end wrench	4
						•			M25	5
							•		NONE	6
								•	NONE	7

Procedure No. 1



SUPERQUICK SETTING

Figure 13. Fuze Setting Procedure 1 - Superquick.

1. Superquick setting.
 - a. These fuzes are shipped preset to function superquick on impact.
 - b. Verify setting prior to firing. Selector slot should be aligned with SQ-marking on ogive.

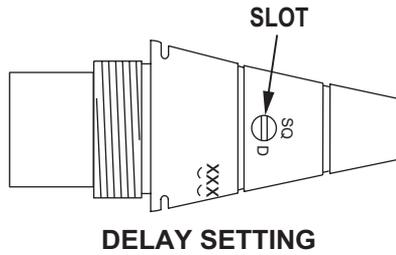


Figure 14. Fuze Setting Procedure 1 - Delay.

2. Delay setting.
 - a. Turn selector slot in clockwise direction until slot is aligned with D-marking on ogive.
 - b. Use bladed end of M18 fuze wrench (WP 0027, item 20) to change settings.

Procedure No. 2

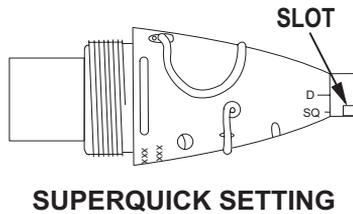


Figure 15. Fuze Setting Procedure 2 - Superquick.

1. Superquick setting.
 - a. These fuzes are shipped preset to function superquick on impact.
 - b. Verify setting prior to firing. Slot in striker should be aligned with SQ-marking and notch on ogive.

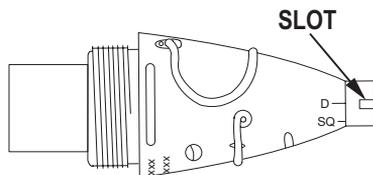
FUZE SETTING - Continued**Procedure No. 2 - Continued****DELAY SETTING**

Figure 16. Fuze Setting Procedure 2 - Delay.

2. Delay setting.
 - a. Turn striker slot in clockwise direction until slot is aligned with D-marking and line on ogive.
 - b. Use bladed end of M18 fuze wrench to change settings.

Procedure No. 3

1. These fuzes function on impact with superquick action only.
2. Remove safety wire from M526 PD Fuze just before firing.
3. Remove safety/packing clip from M751 and M775 PD Fuzes just before firing.
4. No other action is required.
5. M751 and M775 PD Fuzes have dummy multi-option PRX/NSB/IMP/DLY, or dummy PD SQ/D settings (for practice only).

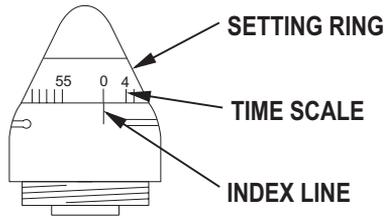
Procedure No. 4
**M772 MTSQ FUZE**

Figure 17. Setting of M772 MTSQ Fuze.

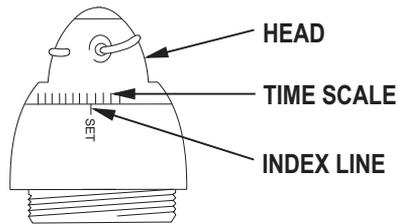
**M768 TIME FUZE**

Figure 18. Setting of M768 Time Fuze.

1. Rotate setting ring or head of fuze in clockwise direction until correct line and number of seconds on time scale is aligned with index line.
2. Use wrench, NSN 5120-00-203-4801, or a 1-3/4 inch open-end wrench to turn setting ring or head of fuze.
3. See firing tables for correct time settings.

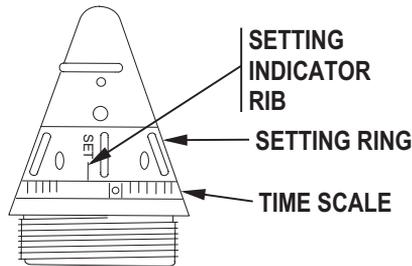
FUZE SETTING - Continued**Procedure No. 5****M84 SERIES FUZE**

Figure 19. Setting of M84 Series Fuze.

1. Rotate setting ring in counterclockwise direction until setting indicator rib (marked set) is aligned with correct line (boss) and number of seconds of time scale.
2. Use M25 fuze setter to turn the setting ring.
3. See firing tables for correct time setting.

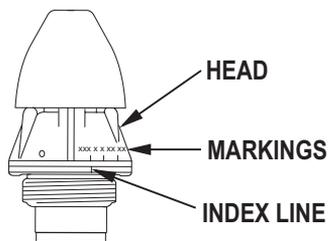
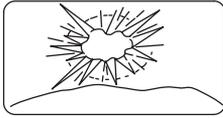
Procedure No. 6**M734 FUZE**

Figure 20. Setting of M734 Fuze by Hand.

1. Fuzes can be set by hand.
2. Set fuze by rotating fuze head (in clockwise direction) until correct marking (PRX, NSB, IMP, or DLY) is over index line.

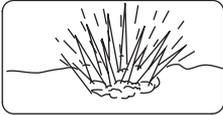
3. Next illustration depicts burst types.



PRX – Proximity. The fuze comes set to PRX (burst height is 3 to 13 ft (0.9 to 4.0 m)).



NSB – Near Surface (non-jamming) (burst height is 0 to 3 ft (0 to 0.9 m)).



IMP – Impact (SQ)

DLY – Delay (0.05 second)

Figure 21. Burst Types.

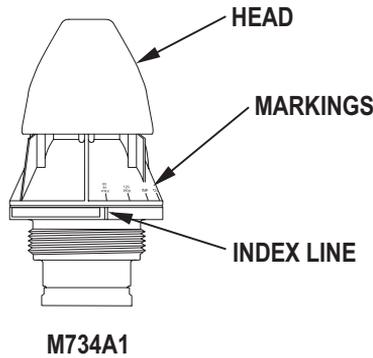


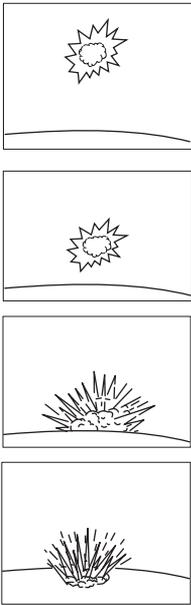
Figure 22. Setting of M734A1 Fuze by Hand.

1. M734A1 fuze can be set by hand.
2. Set fuze by rotating fuze head (in clockwise direction) until correct marking (60/81 PRX, 120 PRX, IMP, or DLY) is over index line.

FUZE SETTING - Continued

Procedure No. 6 - Continued

3. Next illustration depicts burst types.



120 PRX – Proximity. (burst height is 3 to 13 ft (0.9 to 4.0 m)).

60/81 PRX – Proximity. The fuze comes set to 60/81 PRX (burst height is 3 ft (0.9 m)).

IMP – Impact

DLY – Delay (0.05 second)

Figure 23. Burst Types.

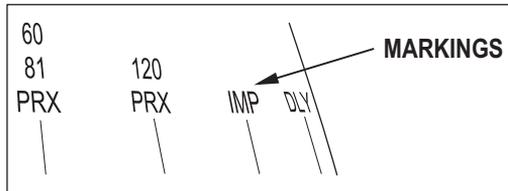


Figure 24. Fuze Markings.

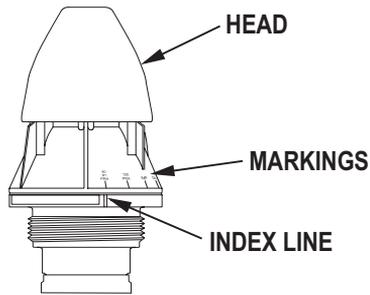
**M783**

Figure 25. Setting of M783 Fuze by Hand.

1. M783 fuze can be set by hand.
2. Set fuze by rotating fuze head (in clockwise direction) until correct marking (IMP or DLY) is over index line.

NOTE

M783 fuze looks the same as M734A1 fuze. However, if the M783 fuze is set on 120 PRX or 60/81 PRX, it will only function in Impact mode.

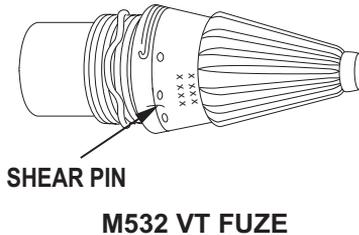
FUZE SETTING - Continued**Procedure No. 7**

Figure 26. Setting of M532 VT Fuze.

1. Proximity setting – Use fuze as shipped.

NOTE

Examine shear pin of fuze to determine if it may once have been set for PD action. Fuzes set for PD action cannot be returned to PROX mode. Fuzes with broken shear pins may function PD instead of PROX.

2. PD Setting – Rotate nose of fuze (by hand) at least 1/3 turn (120 degrees) in either direction.

END OF TASK**RESETTING FUZES**

M935 and M567 PD Fuzes – Align selector slot with SQ-marking on ogive.

M524 (series) PD Fuzes – Align slot in striker with SQ-marking and notch in ogive.

M526, M751, and M775 PD Fuzes – None.

M772 MTSQ and M768 Time Fuzes – Rotate setting ring or head of fuze until S-line of time scale is aligned with index ring.

M84 (series) Time Fuzes – Rotate setting ring in counterclockwise direction (only) until setting indicator rib is aligned with S-marking of time scale.

M734 Multi-option Fuze – Rotate head of fuze in counterclockwise direction until PRX marking is over index line.

M532 VT Fuze – Do not reset this fuze.

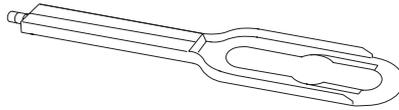
FUZE WRENCH/SETTERS**M18 Fuze Wrench**

Figure 27. M18 Fuze Wrench.

1. Wrench for assembling fuze to cartridge.
2. Bladed tip on end for setting PD type fuzes.

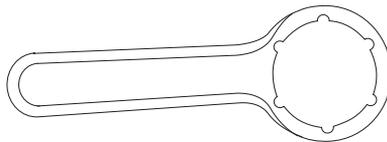
M25 Fuze Setter

Figure 28. M25 Fuze Setter.

1. Sets M84 series time fuzes.
2. Notches in setter engage ribs in setting ring of fuze.

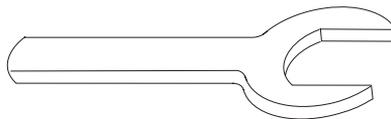
Fuze Setting Wrench (NSN 5120-00-203-4801)

Figure 29. Fuze Setting Wrench.

1. Sets M772 MTSQ and M768 time fuzes.
2. Engage 1-3/4 in. flats on setting ring or head of fuze.

END OF TASK**END OF WORK PACKAGE**

OPERATOR
PROPELLING CHARGES
IDENTIFICATION, ADJUSTMENT, UNUSED INCREMENTS

INITIAL SETUP:

Not Applicable

IDENTIFICATION

Table 1. Propelling Charges.

Model No.	No. of Increments	Type of Container
M2A1	4	Cellophane bags
M5 and M185	8	Water-repellant cotton (cloth) bags
M90	1-Charge A 8-Charge B	Water-repellant cotton (cloth) bags
M90A1	1-Charge A 8-Charge B	Silk or acrylic (acetate laminated) cloth bags
M205, M218, M219, M220, and M223	4	Nitrocellulose/fiber containers (horseshoe-shaped)

END OF TASK

ADJUSTMENT**WARNING**

Propelling charges are not interchangeable. Do not substitute one model for another. Do not mix lots.

To avoid erratic or short rounds, reposition remaining propellant increments towards rear of fin assembly when firing M821 HE (high explosive), M889 HE, M374A3 HE, M375A3 WP (white phosphorus), M819 RP (red phosphorus), M853 Illum (illuminating), or M879 TP (target practice) cartridges with less than full charge (4 increments).

To avoid erratic or short rounds, charge A increment of the M90 and M90A1 propelling charge must be used when firing above charge 0.

1. Cartridges are shipped with a complete propelling charge and ignition cartridge/primer.
2. Use firing table to determine proper charge for firing.
3. With exception of M880 TP cartridge, M68 training cartridge, and sabot training device, reduce range of cartridge by removing appropriate number of increments from fin assembly. The following figure shows number of increments that should be remaining.

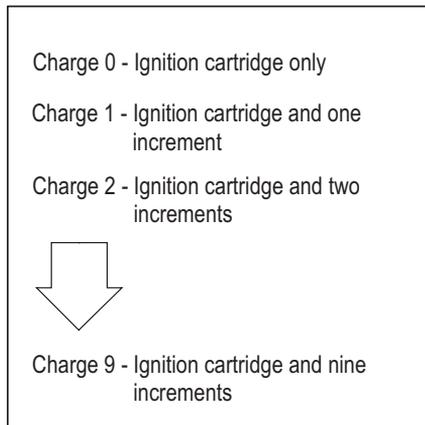


Figure 1. Propelling Charge Increments.

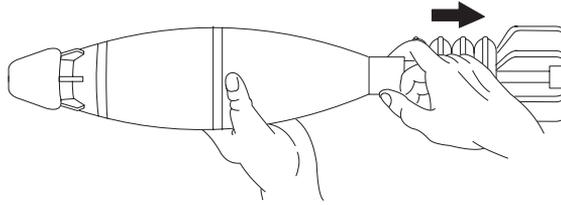


Figure 2. Placement of Increments.

4. Slide remaining increments toward rear, until charge is against fins (M821 HE, M889 HE, M374A3 HE, M375A3 WP, M819 RP, M853 Illum, and M879 TP cartridges only). Failure to reposition increments could result in improper ignition and a short round.
5. Reduce range of M880 TP cartridge by removing plastic plugs from projectile body. The following table shows number of plugs that should be remaining.

Table 2. Use of Plugs.

Charge	Number of Plugs
Charge 0	Ignition cartridge only
Charge 1	Ignition cartridge and one plug
Charge 2	Ignition cartridge and two plugs
Charge 3	Ignition cartridge and three plugs

6. Place excess increments in an empty ammunition box for protection. Close lid of box during firing to prevent accidental ignition from burning debris/residue.

END OF TASK

UNUSED INCREMENTS**WARNING**

When burning excess increments:

- Burning area must be at least 100 meters (109 yards) from the nearest mortar position, parked vehicles, and ammunition piles.
 - Burning area shall be cleared of all dead grass or brush within 30 meters (33 yards).
1. Excess increments should be destroyed daily.
 2. Destroy increments by burning.
 3. Place increments on the ground. Form a row 4 to 6 in. (10.20 to 15.20 cm) wide and as long as necessary. Do not pile increments more than 1 to 2 in. (2.50 to 5.10 cm) high.
 4. End train of increments with a row of single increments, followed by at least a meter of dry grass or dead leaves.
 5. Ignite dry grass or leaves.
 6. Allow ensuing fire to self-extinguish.

END OF TASK**END OF WORK PACKAGE**

OPERATOR**FOREIGN AMMUNITION (NATO)
GENERAL, AUTHORIZED CARTRIDGES, FUZE SETTING,
ADJUSTMENT OF PROPELLING CHARGE**

INITIAL SETUP:

Not Applicable

GENERAL

As a result of recent agreements, the United States (US) and a number of its NATO (North Atlantic Treaty Organization) allies intend to establish the interoperability of many weapons systems and ammunition of the various countries. The goal is to enable the safe and effective firing of major types of ammunition of the same size from the same compatible size and type weapon of the NATO armies. Interoperability criteria are now required for many weapons and ammunition items in current development. Determinations are now being made to establish which ammunition items will be authorized for use in US weapons by changes to the applicable ammunition and weapons manuals. NATO nations will provide similar authorization in their manuals. Only authorized NATO ammunition will be used. Those items covered in the manual have been authorized. If a munitions item has not been authorized, it is because (1) it has not yet been determined to be safe to fire from a US weapon or (2) it has been determined that the munitions item cannot be safely fired from the US weapon system.

AUTHORIZED CARTRIDGES

1. The following NATO ammunition can be fired in the 81-mm mortar cannon:

NATIONITEM

United Kingdom (UK) Cartridge 81-mm HE, L15A4

2. Cartridge, 81-mm HE (high explosive), L15A4 is assembled with Fuze, PD (point detonating) L35A1 and Propelling Charge, MK2.

FUZE SETTING

1. Fuze, PD L35A1 functions on impact with superquick (SQ) or delay (D) action.
2. Align selector slot with SQ-marking or D-marking for desired action.
3. Remove safety pin just prior to firing.

ADJUSTMENT OF PROPELLING CHARGE

1. The MK2 (UK) Propelling Charge System is comprised of the following:
 - a. Three L32A1 Augmenting Cartridges (increments) placed next to the fins.
 - b. Three L34A2 Augmenting Cartridges (increments) placed next to the projectile body.
 - c. An L33A1 Primary Ignition Cartridge.
2. Adjust range of cartridge by removing appropriate number and type of increments (see following table).

Table 1. MK2 Propelling Charge System.

Charge	Increments
Charge 6	All augmenting cartridges (increments) in place.
Charge 5	One L34A2 augmenting cartridge (increment) removed.
Charge 4	Two L34A2 augmenting cartridges (increments) removed.
Charge 3	Three L34A2 augmenting cartridges (increments) removed.
Charge 2	Three L34A2 augmenting cartridges (increments) and one L32A1 augmenting cartridge (increment) removed.
Charge 1	Three L34A2 augmenting cartridges (increments) and two L33A1 augmenting cartridges (increments) removed.
Primary Charge (Charge 0) only	All augmenting cartridges (increments) removed.

END OF WORK PACKAGE

CHAPTER 6
SUPPORTING INFORMATION
FOR
M252 81-MM MORTAR

OPERATOR
REFERENCES

SCOPE

The work package lists all field manuals, firing tables, forms, miscellaneous publications, technical manuals, Air Force publications, and USMC publications and forms referenced in this manual.

FIELD MANUALS

FM 3-11.3	Multiservice Tactics, Techniques, and Procedures for Chemical, Biological, Radiological, and Nuclear Contamination Avoidance
FM 3-11.4	Multiservice Tactics, Techniques, and Procedures for Nuclear, Biological, and Chemical (NBC) Protection
FM 3-11.5	Multiservice Tactics, Techniques, and Procedures for Chemical, Biological, Radiological, and Nuclear Decontamination
FM 3-22.90	Mortars
FM 4-25.11	First Aid
FM 4-30.13	Ammunition Handbook: Tactics, Techniques, and Procedures for Munitions Handlers
FM 9-207	Operation and Maintenance of Ordnance Materiel in Cold Weather
FM 31-70	Basic Cold Weather Manual
FM 31-71	Northern Operations

FIRING TABLES

FT 81-AB-2	Firing Tables: Mortar, 81-mm, M29 and M1
FT 81-AI-3	Mortar, 81-mm: M29A1 and M29; Mortar, 81-mm, Self-Propelled: M125A1 and M125; Carrier, 81-mm Mortar, Tracked: XM755; Firing Cartridge, HE, M374A2 and M374; Cartridge, WP, M375A2 and M375; Cartridge, Illuminating: M301A3; Cartridge, Training: M68 and Training Device, M1
FT 81-AO-1	Firing Tables: 81-mm Mortar Training Device (SABOT)
FT 81-AQ-1	Mortar, 81-mm: M29A1 and M29; Mortar, 81-mm, Self-Propelled: M125A1 and M125; Carrier, 81-mm Mortar, Tracked: M755; and Firing Cartridge, HE, M374A3

FIRING TABLES - Continued

FT 81-AR-1	Firing Tables for Mortar, 81-mm: M252 Firing Cartridge, HE, M821; Cartridge, HE, M889; Cartridge, RP, M819; Cartridge, TP, M879; Cartridge, Illum, M853A1; Cartridge, HE, M984; Cartridge, HE, M983; and Cartridge, TP (SR), M880
FT 81-M5	Firing Tables for Cartridge, 81-mm: Practice, SR, M880

FORMS

DA Form 2028	Recommended Changes to Equipment Publications and Blank Forms
DA Form 2404	Equipment Inspection and Maintenance Worksheet
DA Form 2408-4	Weapon Record Data
DA Form 2408-9	Equipment Control Record
DA Form 5988-E	Equipment Inspection and Maintenance Worksheet - Electronic
SF 368	Product Quality Deficiency Report

MISCELLANEOUS PUBLICATIONS

AR 385-10	The Army Safety Program
AR 385-63	Range Safety
CTA 8-100	Army Medical Department Expendable/Durable Items
CTA 50-909	Field and Garrison Furnishings and Equipment
CTA 50-970	Expendable/Durable Items (Except Medical, Class V Repair Parts, and Heraldic Items)
DOD Directive 5230.25	Withholding of Unclassified Technical Data from Public Disclosure
DA PAM 385-24	The Army Radiation Safety Program
DA PAM 750-8	The Army Maintenance Management System (TAMMS) Users Manual
10 CFR Part 19	Notices, Instructions, and Reports to Workers; Inspections
10 CFR Part 20	Standards for Protection against Radiation

TECHNICAL BULLETINS

TB 9-1000-247-34	Standards for Overseas Shipment of Small Arms, Aircraft Armament, Towed Howitzers, Mortars, Recoilless Rifles, Rocket Launchers, and Associated Fire Control Equipment
TB 43-0250	Ammunition Handling, Storage, and Safety

TECHNICAL MANUALS

TM 9-254	General Maintenance Procedures for Fire Control Materiel
TM 9-1015-249-10-HR	Hand Receipt Covering Components of End Item (COEI), Basic Issue Items (BII), and Additional Authorization List (AAL) for 81-mm Mortar M252 (NSN 1015-01-164-6651)
TM 9-1220-243-12&P	Operator's and Organizational Maintenance Manual Including Repair Parts and Special Tools List for Plotting Board, Indirect Fire, M16 W/E (1220-00-602-7941) and Plotting Board, Indirect Fire, M19 W/E (1220-01-059-7989)
TM 9-1300-200	Ammunition, General
TM 9-1315-249-12&P	Operator's and Unit Maintenance Manual (Including Repair Parts and Special Tools List) for 81-mm Mortar Training Device, 81-mm Sabot (Inert) M1, and 22-mm Subcaliber Practice Cartridges M744, M745, M746, and M747
TM 9-1315-252-12&P	Operator's and Unit Maintenance Manual (Including Repair Parts and Special Tools List) for Cartridge, 81-mm: Target Practice (Short Range), M880 (NSN 1315-01-216-7071)
TM 43-0001-28-3	Data Sheets for Guns, Howitzers, and Mortars Interoperable Ammunition
TM 750-244-7	Procedures for Destruction of Equipment in Federal Supply Classifications 1000, 1005, 1010, 1015, 1020, 1025, 1030, 1055, 1090, and 1095 To Prevent Enemy Use

AIR FORCE PUBLICATIONS AND FORMS

AFI 21-101	Management and Maintenance of Non-Nuclear Munitions
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USMC PUBLICATIONS AND FORMS

MCO P5102.1	Ground Mishaps Report
MCO 4855.10	Quality Deficiency Report Manual
NAVMC Form 10558A	Weapon Record Book
NAVMC Form 10772	Recommended Changes to Technical Publications
TM 4700-15/1	Equipment Record Procedures

END OF WORK PACKAGE

OPERATOR**COMPONENTS OF END ITEM (COEI) AND BASIC ISSUE ITEMS (BII) LISTS**

INTRODUCTION**Scope**

This work package lists COEI and BII for the 81-mm mortar to help you inventory items for safe and efficient operation of the equipment.

General

The COEI and BII information is divided into the following lists:

Components of End Item (COEI). This list is for information purposes only and is not authority to requisition replacements. These items are part of the 81-mm mortar. As part of the end item, these items must be with the end item whenever it is issued or transferred between property accounts. Items of COEI are removed and separately packaged for transportation or shipment only when necessary. Illustrations are furnished to help you find and identify the items.

Basic Issue Items (BII). These essential items are required to place the 81-mm mortar in operation, to operate it, and to do emergency repairs. Although shipped separately packaged, BII must be with the 81-mm mortar during operation and when it is transferred between property accounts. Listing these items is your authority to request/requisition them for replacement based on authorization of the end item by the TOE/MTOE. Illustrations are furnished to help you find and identify the items.

Explanation of Columns in the COEI List and BII List

Column (1) Illus Number. Gives you the number of the item illustrated.

Column (2) National Stock Number (NSN). Identifies the stock number of the item to be used for requisitioning purposes.

Column (3) Description, Part Number/(CAGEC). Identifies the Federal item name (in all capital letters) followed by a minimum description when needed. The stowage location of COEI and BII is also included in this column. The last line below the description is the part number and the Commercial and Government Entity Code (CAGEC) (in parentheses).

Column (4) Usable On Code. When applicable, gives you a code if the item you need is not the same for different models of equipment. These codes are identified below:

Code
M96

Used on
M252

INTRODUCTION - Continued**Explanation of Columns in the COEI List and BII List - Continued**

Column (5) U/I. Unit of Issue (U/I) indicates the physical measurement or count of the item as issued per the National Stock Number shown in column (2).

Column (6) Qty Rqr. Indicates the quantity required.

COMPONENTS OF END ITEM

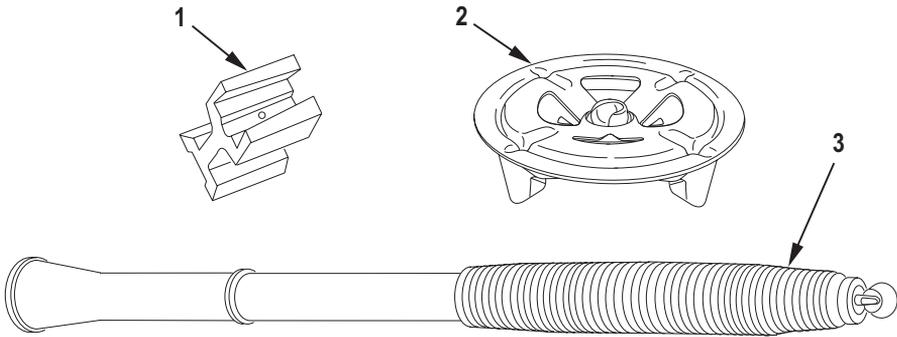


Figure 1. Components of End Item (Sheet 1 of 2).

Table 1. Components of End Item (COEI) List.

(1) Illus Number	(2) National Stock Number (NSN)	(3) Description, Part Number/(CAGEC)	(4) Usable On Code	(5) U/I	(6) Qty Rqr
1	1015-01-211-4045	ADAPTER ASSEMBLY 9362653 (19200)	M96	EA	1
2	1015-01-236-0389	BASEPLATE, M3A1 11579870 (19206)	M96	EA	1
3	1015-01-528-2773	CANNON, MORTAR, 81-MM, M253 12901300 (1NUW7)	M96	EA	1

COMPONENTS OF END ITEM - Continued

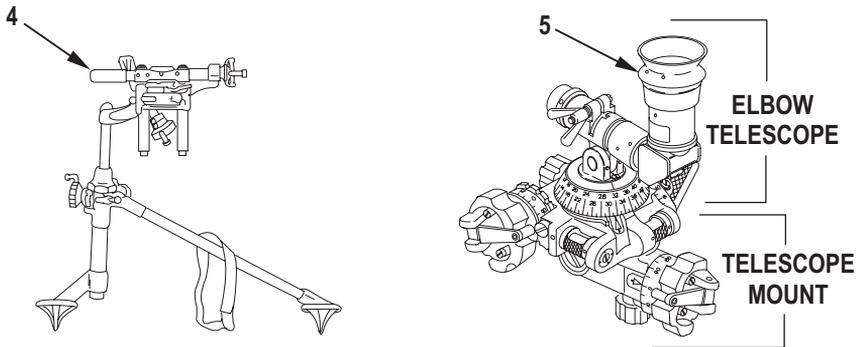


Figure 1. Components of End Item (Sheet 2 of 2).

Table 1. Components of End Item (COEI) List - Continued.

(1) Illus Number	(2) National Stock Number (NSN)	(3) Description, Part Number/(CAGEC)	(4) Usable On Code	(5) U/I	(6) Qty Rqr
4	1015-01-521-1612	MOUNT, MORTAR, M177 11580035 (19206)	M96	EA	1
NOTE					
The M67 Sight Unit telescope mount and elbow telescope must be ordered separately.					
5		SIGHT UNIT, M67 9356182 (19200) Consists of:	M96	EA	1
	6650-01-340-6082	MOUNT, TELESCOPE 9356166 (19200)			
	6650-01-341-5195	TELESCOPE, ELBOW 9356181 (19206)			

BASIC ISSUE ITEMS

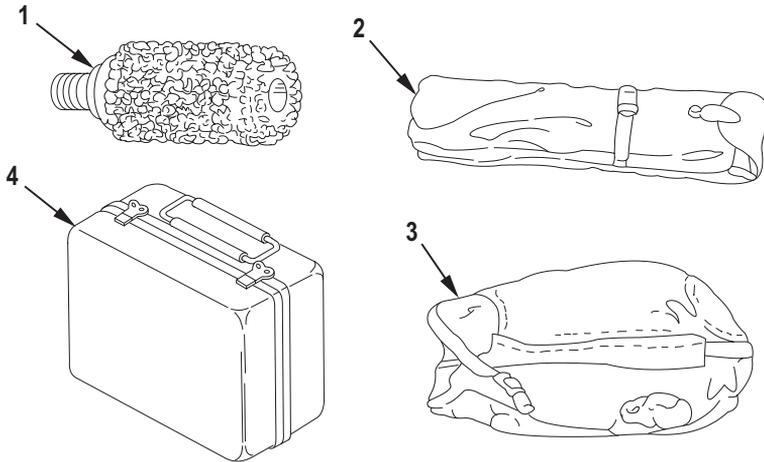


Figure 2. Basic Issue Items (Sheet 1 of 7).

Table 2. Basic Issue Items (BII) List.

(1) Illus Number	(2) National Stock Number (NSN)	(3) Description, Part Number/(CAGEC)	(4) Usable On Code	(5) U/I	(6) Qty Rqr
1	1015-01-441-4161	BRUSH SECTION 11580239 (19206)	M96	EA	1
2	1290-01-043-8288	CASE, AIMING POST 11733755 (19206)	M96	EA	2
3	1240-01-043-7502	COVER, FIRE CONTROL 11733753 (19200)	M96	EA	1
4	6650-01-521-9875	CASE, SIGHT UNIT PRF13005489 (19200)	M96	EA	1

BASIC ISSUE ITEMS - Continued

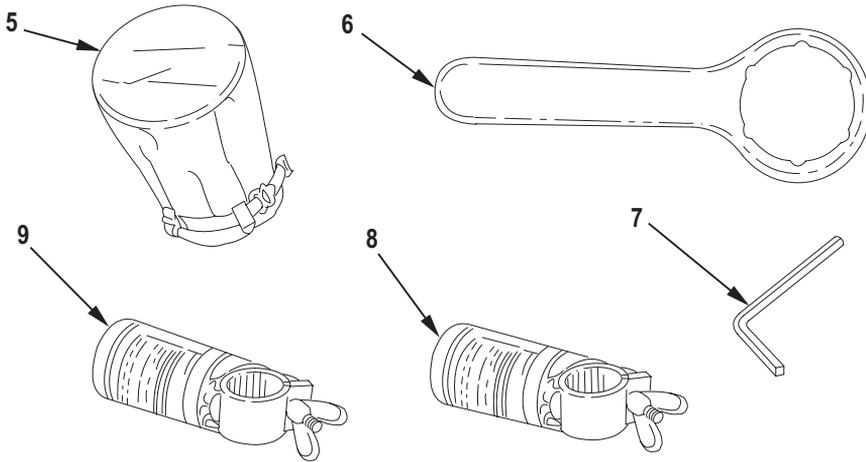


Figure 2. Basic Issue Items (Sheet 2 of 7).

Table 2. Basic Issue Items (BII) List - Continued.

(1) Illus Number	(2) National Stock Number (NSN)	(3) Description, Part Number/(CAGEC)	(4) Usable On Code	(5) U/I	(6) Qty Rqr
5	1015-01-441-4159	COVER, MUZZLE 11580230 (19206)	M96	EA	1
6	1290-00-767-6038	FUZE SETTER, M25 7676038 (19200)	M96	EA	1
7	5120-00-198-5400	KEY, SOCKET HEAD (0.035) B18.3 (05047)	M96	EA	1
8	1290-00-169-1934	LIGHT, AIMING POST: M58 (Green) 11730975 (19200)	M96	EA	2
9	1290-00-169-1935	LIGHT, AIMING POST: M59 (Orange) 11730976 (19200)	M96	EA	1

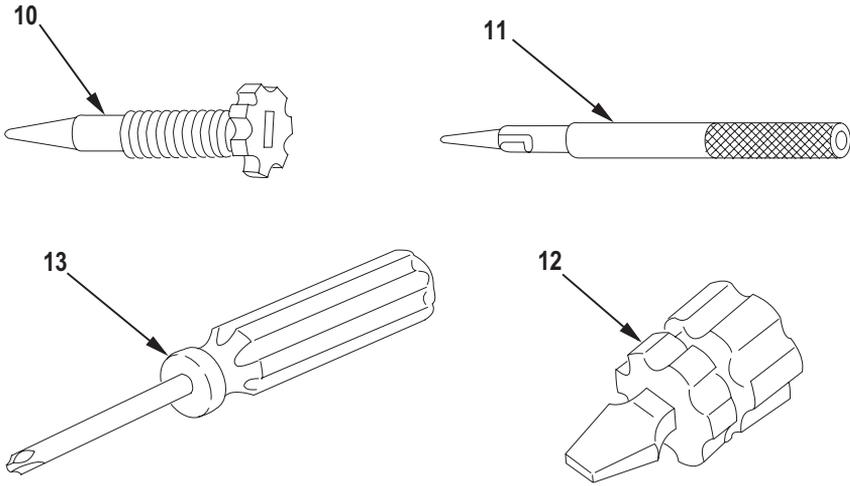


Figure 2. Basic Issue Items (Sheet 3 of 7).

Table 2. Basic Issue Items (BII) List - Continued.

(1) Illus Number	(2) National Stock Number (NSN)	(3) Description, Part Number/(CAGEC)	(4) Usable On Code	(5) U/I	(6) Qty Rqr
10	1015-01-441-4160	PIN, FIRING 11580037 (19206)	M96	EA	2
11	1290-01-046-8320	POST, AIMING, M14 11736201 (19200)	M96	EA	16
12	5120-00-278-1279	SCREWDRIVER, FLAT TIP B107.15 (05047)	M96	EA	1
13	5120-00-820-2995	SCREWDRIVER, CROSS TIP B107.30 (05047)	M96	EA	1

BASIC ISSUE ITEMS - Continued

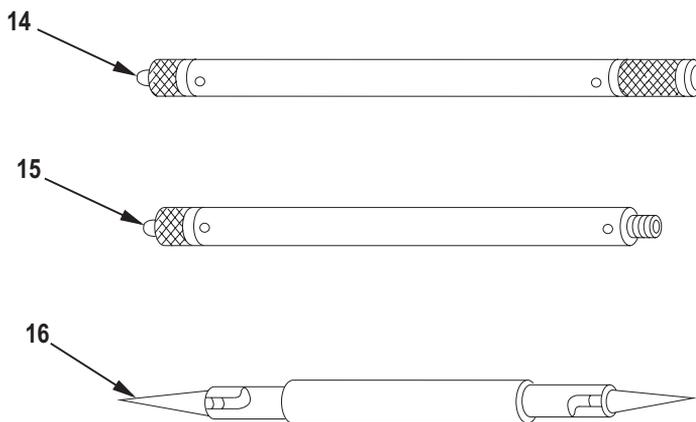


Figure 2. Basic Issue Items (Sheet 4 of 7).

Table 2. Basic Issue Items (BII) List - Continued.

(1) Illus Number	(2) National Stock Number (NSN)	(3) Description, Part Number/(CAGEC)	(4) Usable On Code	(5) U/I	(6) Qty Rqr
14	1015-01-441-3112	STAVE SECTION, END 11580242 (19206)	M96	EA	1
15	1015-01-441-3113	STAVE SECTION, INTERMEDIATE 11580241 (19206)	M96	EA	3
16	1010-01-043-8195	STAKE, DRIVING, AIMING POST 11741788 (19200)	M96	EA	2

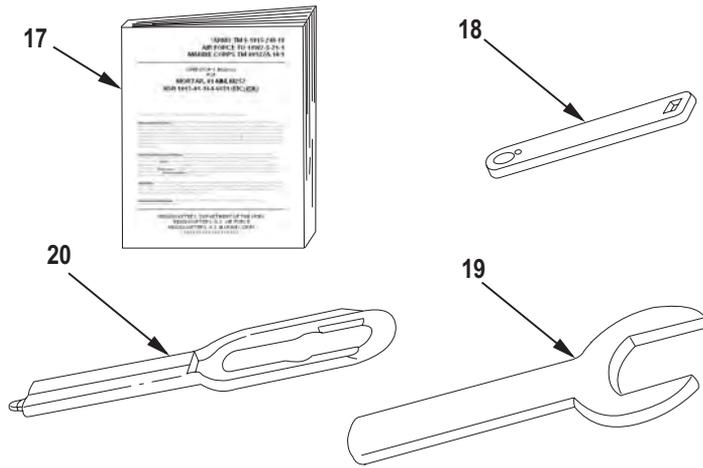


Figure 2. Basic Issue Items (Sheet 5 of 7).

Table 2. Basic Issue Items (BII) List - Continued.

(1) Illus Number	(2) National Stock Number (NSN)	(3) Description, Part Number/(CAGEC)	(4) Usable On Code	(5) U/I	(6) Qty Rqr
17		TM 9-1015-249-10	M96	EA	1
18	5120-01-442-2311	WRENCH, FIRING PIN 11580236 (19206)	M96	EA	1
19	5120-00-203-4801	WRENCH, FUZE SETTING 1-3/4 inch A-A-1353 (58536)	M96	EA	1
20	4933-00-723-1161	WRENCH, FUZE, M18 7231161 (19206)	M96	EA	1

BASIC ISSUE ITEMS - Continued

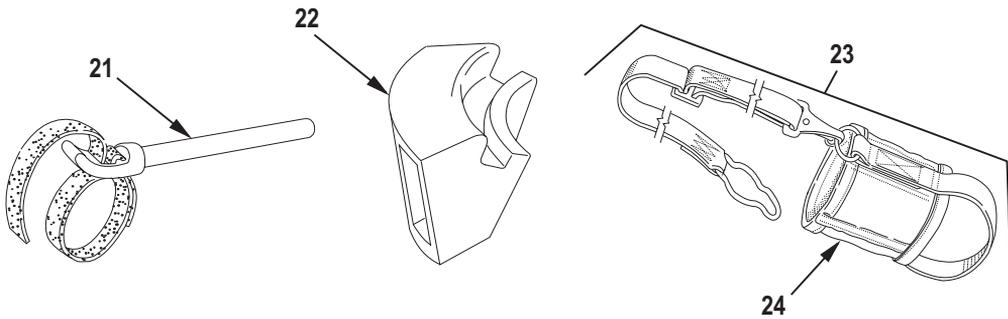


Figure 2. Basic Issue Items (Sheet 6 of 7).

Table 2. Basic Issue Items (BII) List - Continued.

(1) Illus Number	(2) National Stock Number (NSN)	(3) Description, Part Number/(CAGEC)	(4) Usable On Code	(5) U/I	(6) Qty Rqr
21	5120-00-262-8491	WRENCH, PIPE, STRAP 5576345 (19207)	M96	EA	1
22	4933-01-441-5496	EXTRACTOR, BASEPLATE 11580238 (19206)	M96	EA	1
23	1015-01-288-6771	SLING ASSEMBLY 11580120 (19206)	M96	EA	1
24	1015-01-305-3143	COVER, MUZZLE 11580206 (19206)	M96	EA	1

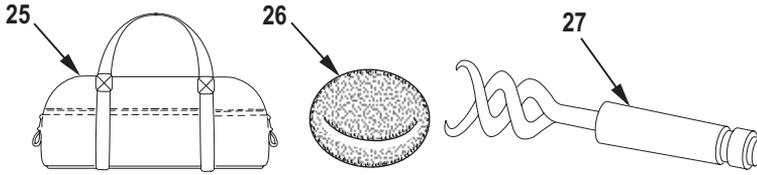


Figure 2. Basic Issue Items (Sheet 7 of 7).

Table 2. Basic Issue Items (BII) List - Continued.

(1) Illus Number	(2) National Stock Number (NSN)	(3) Description, Part Number/(CAGEC)	(4) Usable On Code	(5) U/I	(6) Qty Rqr
25	5140-00-473-6256	BAG, TOOL (SACHEL) 11655979 (19206)	M96	EA	1
26	1015-01-535-0333	CLEANING PAD, WIRE MESH 11580976 (1NUW7)	M96	EA	1
27	5350-01-535-0336	HEAD SECTION, CLEANING 11580087 (1NUW7)	M96	EA	1

END OF WORK PACKAGE

OPERATOR
ADDITIONAL AUTHORIZATION LIST (AAL)

INTRODUCTION**Scope**

This work package lists additional items you are authorized for the support of the 81-mm mortar.

General

This list identifies items that do not have to accompany the 81-mm mortar and that do not have to be turned in with it. These items are all authorized to you by CTA, MTOE, TDA, or JTA.

Explanation of Columns in the AAL

Column (1) National Stock Number (NSN). Identifies the stock number of the item to be used for requisitioning purposes.

Column (2) Description, Part Number/(CAGEC). Identifies the Federal item name (in all capital letters) followed by a minimum description when needed. The last line below the description is the part number and the Commercial and Government Entity Code (CAGEC) (in parentheses).

Column (3) Usable On Code. When applicable, gives you a code if the item you need is not the same for different models of equipment. These codes are identified below:

<u>Code</u>	<u>Used on</u>
M96	M252

Column (4) U/I. Unit of Issue (U/I) indicates the physical measurement or count of the item as issued per the National Stock Number shown in column (1).

Column (5) Qty Recm. Indicates the quantity recommended.

ADDITIONAL AUTHORIZATION LIST ITEMS

Table 1. Additional Authorization List.

(1) National Stock Number (NSN)	(2) Description, Part Number /(CAGEC)	(3) Usable On Code	(4) U/I	(5) Qty Recm
8105-00-285-4744	BAG, SAND A-A-52141 (58536)	M96	EA	1
7510-00-889-3494	BINDER, LOOSELEAF 11677003 (19207)	M96	EA	1
1220-01-548-9063	BOARD, PLOTTING: M16 13014357 (19200)	M96	EA	1
1240-00-152-3512	BORESIGHT: M45A1 10549221 (19200)	M96	EA	1
1290-01-067-0687	CIRCLE, AIMING, M2A2 11785090 (19200)	M96	EA	1
1290-00-930-4260	COMPASS, MAGNETIC, M2 10547166 (19200)	M96	EA	1
4240-01-538-7970	HEARING, PROTECTION, HEADSET 97011 (1QQ93)	M96	EA	AR
4930-00-537-8977	OILER, HAND MS15766-1 (96906)	M96	EA	1
1220-01-215-9410	SCALE, CIRCULAR FIRING (for M821 HE rounds) 9395870 (19200)	M96	EA	1
1220-01-242-2427	SCALE, CIRCULAR FIRING (for M853A1 IL) 12962954 (19200)	M96	EA	1
1220-01-392-3551	SCALE, CIRCULAR FIRING (for M819 SMKRP round) 12912955 (19200)	M96	EA	1
1220-01-413-9150	SCALE, CIRCULAR FIRING (for M879 round) 12912958 (19200)	M96	EA	1
1220-01-519-8007	SCALE, GRAPHICAL FIRING (for M821A1/A2 HE) 12960762 (19200)	M96	EA	1

Table 1. Additional Authorization List - Continued.

(1) National Stock Number (NSN)	(2) Description, Part Number //(CAGEC)	(3) Usable On Code	(4) U/I	(5) Qty Recm
1220-01-519-8008	SCALE, GRAPHICAL FIRING (for M889A1 HE) 12972524 (19200)	M96	EA	1
1220-01-519-8009	SCALE, GRAPHICAL FIRING (for M816 ILL IR) 12972522 (19200)	M96	EA	1
5120-00-278-1269	SCREWDRIVER, FLAT TIP GGG-S-121 (81348)	M96	EA	1
5120-00-180-0728	SCREWDRIVER, JEWELER'S SWIVEL KNOB A-A-52049 (58536)	M96	EA	1
6675-00-240-1881	TRIPOD, SURVEYING (for arctic use only) A-A-52049 (58536)	M96	EA	2

END OF WORK PACKAGE

OPERATOR

EXPENDABLE AND DURABLE ITEMS LIST

INTRODUCTION

Scope

This work package lists expendable and durable items that you will need to operate and maintain the 81-mm mortar. This list is for information only and is not authority to requisition the listed items. These items are authorized to you by CTA 50-970, Expendable/Durable Items (Except Medical, Class V Repair Parts, and Heraldic Items); CTA 50-909, Field and Garrison Furnishings and Equipment; or CTA 8-100, Army Medical Department Expendable/Durable Items.

Explanation of Columns in the Expendable/Durable Items List

Column (1) Item No. This number is assigned to the entry in the list and is referenced in the narrative instructions to identify the item (e.g., Use abrasive cloth (WP 0029, item 9)).

Column (2) Level. This column identifies the lowest level of maintenance that requires the listed item (C = Crew).

Column (3) National Stock Number (NSN). This is the NSN assigned to the item which you can use to requisition it.

Column (4) Item Name, Description, Part Number/(CAGEC). This column provides the other information you need to identify the item. The last line below the description is the part number and the Commercial and Government Entity Code (CAGEC) (in parentheses).

Column (5) U/I. Unit of Issue (U/I) code shows the physical measurement or count of an item, such as gallon, dozen, gross, etc.

EXPENDABLE AND DURABLE ITEMS LIST

Table 1. Expendable and Durable Items List.

(1) Item No.	(2) Level	(3) National Stock Number (NSN)	(4) Item Name, Description, Part Number/(CAGEC)	(5) U/I
1	C	6810-00-201-0906	ALCOHOL, DENATURED 837015 (19203)	PT
2	C	8150-00-269-4662	BAG, PLASTIC Pkg. of 100 MIL-B-117 (81349)	EA
3	C	8135-00-292-9719	BARRIER MATERIAL: Grease-proofed, waterproofed, flexible 36 in. x 100 yd roll MIL-B-121 (81348)	RO
4	C	7920-00-205-2401	BRUSH, CLEANING TOOL AND PARTS Chinese bristle, rd MIL-B-43871 (81349)	EA
5	C	8020-00-242-7266	BRUSH, PAINT 3 in. size MS16866 (96906)	EA
6	C	6850-00-227-1887	CLEANING COMPOUND, OPTICAL LENS: Liquid 1 qt bottle	QT
	C	6850-00-392-9751	2 oz bottle MIL-C-43454 (81349)	OZ
7	C	6850-00-224-6657	CLEANING COMPOUND, RIFLE BORE (RBC) Solution type 8 oz can	OZ
	C	6850-00-224-6663	1 gal can MIL-C-372 (81349)	GL
8	C	9150-01-193-6376	CLEANER, LUBRICANT, PRESERVATIVE CLP-9 (27412)	CN
9	C	5350-00-221-0872	CLOTH, ABRASIVE: Crocus 50 sheet package A-A-1206 (58536)	EA

Table 1. Expendable and Durable Items List - Continued.

(1) Item No.	(2) Level	(3) National Stock Number (NSN)	(4) Item Name, Description, Part Number/(CAGEC)	(5) U/I
10	C	8010-01-229-7546	COATING, POLYURETHANE, GREEN 1 qt can MIL-C-53039 (81349)	QT
11	C	8135-00-989-9889	CUSHIONING MATERIAL: Cellulose 20 in. x 50 ft roll PPP-C-843 (81348)	RO
12	C	9905-00-257-2746	DECAL, INSTRUCTION 11731011 (19200)	EA
13	C	8415-00-266-8675	GLOVES, CHEMICAL AND SOLVENT RESISTANT ZZ-G-381 (81348)	PR
14	C	9150-01-228-3389	GREASE, AIRCRAFT (GA) 11581022 (1NUW7)	LB
15	C	8010-00-582-5382	LACQUER, BLACK 1602 (87187)	PT
16	C	9150-00-231-2361	LUBRICATING OIL, GENERAL PURPOSE (GPL) MIL-L-3150 (81349)	QT
17	C	9150-00-292-9689	LUBRICATING OIL, WEAPONS (LAW) 1 qt can MIL-L-14107 (81349)	QT
18	C	6640-00-663-0832	PAPER, LENS Tissue sheet form NNN-P-40 (81348)	EA
19	C	7920-00-205-1711	RAG, WIPING 50 lb bale A-A-531 (81348)	LB
20	C	6850-00-281-1985	SOLVENT, DRY CLEANING (SD) 1 gal can A-A-711 (58536)	GL

Table 1. Expendable and Durable Items List - Continued.

(1) Item No.	(2) Level	(3) National Stock Number (NSN)	(4) Item Name, Description, Part Number/(CAGEC)	(5) U/I
21	C	7510-00-266-6712	TAPE, PRESSURE SENSITIVE ADHESIVE, Type 4, CL1 2 in. x 60 yd roll PPP-T-60 (81348)	RO
22	C	7510-00-297-6655	TAPE, PRESSURE SENSITIVE ADHESIVE Paperback, water resistant PPP-T-76 (81349)	RO
23	C	8010-00-181-8080	THINNER, SYNTHETIC 1 pt can 020X304 (85570)	PT

END OF WORK PACKAGE

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ITEM NO.	PAGE NO.	PARA-GRAPH	LINE NO.*	FIGURE NO.	TABLE NO.	RECOMMENDED CHANGES AND REASON <i>(Provide exact wording of recommended changes, if applicable)</i>	
1	0005-4				1	The illustration on this page is showing the wrong mortar mount. 	
<i>*Reference to line numbers within the paragraph or subparagraph.</i>							
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PUBLICATION NUMBER TM 9-1015-249-10	DATE 25 January 2010	TITLE Operator's Manual for 81-mm Mortar, M252
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PAGE NO.	COLM NO.	LINE NO.	NATIONAL STOCK NUMBER	REFERENCE NO.	FIGURE NO.	ITEM NO.	TOTAL NO. OF MAJOR ITEMS SUPPORTED	RECOMMENDED ACTION

PART III – REMARKS

(Any general remarks or recommendations, or suggestions for improvement of publications and blank forms. Additional blank sheets may be used if more space is needed.)

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ITEM NO.	PAGE NO.	PARA-GRAPH	LINE NO.*	FIGURE NO.	TABLE NO.	RECOMMENDED CHANGES AND REASON <i>(Provide exact wording of recommended changes, if applicable)</i>	
*Reference to line numbers within the paragraph or subparagraph.							
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PART III – REMARKS <i>(Any general remarks or recommendations, or suggestions for improvement of publications and blank forms. Additional blank sheets may be used if more space is needed.)</i>									
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ITEM NO.	PAGE NO.	PARA-GRAPH	LINE NO.*	FIGURE NO.	TABLE NO.	RECOMMENDED CHANGES AND REASON <i>(Provide exact wording of recommended changes, if applicable)</i>	
*Reference to line numbers within the paragraph or subparagraph.							
TYPED NAME, GRADE OR TITLE					TELEPHONE EXCHANGE/AUTOVON, PLUS EXTENSION		SIGNATURE

TO: <i>(Forward direct to addressee listed in publication)</i> AMSTA-LCL-MPP / TECH PUBS, TACOM-RI 1 Rock Island Arsenal Rock Island, IL 61299-7630					FROM: <i>(Activity and location) (Include ZIP Code)</i>			DATE	
PART II – REPAIR PARTS AND SPECIAL TOOL LISTS AND SUPPLY CATALOGS/SUPPLY MANUALS									
PUBLICATION NUMBER TM 9-1015-249-10					DATE 25 January 2010			TITLE Operator's Manual for 81-mm Mortar, M252	
PAGE NO.	COLM NO.	LINE NO.	NATIONAL STOCK NUMBER	REFERENCE NO.	FIGURE NO.	ITEM NO.	TOTAL NO. OF MAJOR ITEMS SUPPORTED	RECOMMENDED ACTION	
PART III – REMARKS <i>(Any general remarks or recommendations, or suggestions for improvement of publications and blank forms. Additional blank sheets may be used if more space is needed.)</i>									
TYPED NAME, GRADE OR TITLE				TELEPHONE EXCHANGE/AUTOVON, PLUS EXTENSION			SIGNATURE		

RECOMMENDED CHANGES TO PUBLICATIONS AND BLANK FORMS						Use Part II (<i>reverse</i>) for Repair Parts and Special Tools Lists (RPSTL) and Supply Catalogs/Supply Manuals (SC/SM).	DATE Date you filled out this form
For use of this form, see AR 25-30; the proponent agency is ODISC4.							
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PART I - ALL PUBLICATIONS (EXCEPT RPSTL AND SC/SM) AND BLANK FORMS							
PUBLICATION/FORM NUMBER TM 9-1015-249-10						DATE 25 January 2010	TITLE Operator's Manual for 81-mm Mortar, M252
ITEM NO.	PAGE NO.	PARA-GRAPH	LINE NO.*	FIGURE NO.	TABLE NO.	RECOMMENDED CHANGES AND REASON <i>(Provide exact wording of recommended changes, if applicable)</i>	
*Reference to line numbers within the paragraph or subparagraph.							
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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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Marine Corps Systems Command

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