

**OPERATOR'S MANUAL
FOR
HOWITZER, MEDIUM, TOWED: 155-MM, M777/M777E1
(1025-01-445-0991/AMP-07-00-2000)**

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HOW TO USE THIS MANUAL

GENERAL

- a. Whenever the masculine gender (i.e., crewmen) is used in this manual, it includes both masculine and feminine genders.
- b. The text is keyed to the illustrations by numbered callouts. When an item is called out in a procedure, a number in parentheses in the text corresponds with circled number on the illustration.
- c. The preventative maintenance checks and services table (Para 2-22) includes equipment serviceability criteria. The information normally found in the For readiness reporting ... column is in the Procedures column.
- d. Procedures for unmodified howitzers, where applicable, are provided before procedures for modified howitzers.

INDEXES

- a. **Front Cover Index.** A page reference index of often used portions of the manual.
- b. **Table of Contents.** List all chapters and their sections, appendixes, and alphabetical index in order and give page references to where they begin.
- c. **Chapter Indexes.** All chapters contain indexes with page references.
- d. **Section Indexes.** List each paragraph contained in the section and page reference to the first page of the paragraph.
- e. **Symptom Index.** This quick guide to troubleshooting lists common malfunctions in alphabetical order with a page reference to the test or inspection and corrective action.
- f. **Alphabetical Index.** At the back of the book, tells you where in the manual to find a particular subject.

NOMENCLATURE CROSS-REFERENCE LIST

Throughout this manual, most items are referred to by their official nomenclature. On page 1-3, the items referred to by their common names are listed alphabetically and are followed by their official nomenclature.

WARNING SUMMARY

HAZARDOUS MATERIAL WARNING ICON DEFINITIONS:



FIRE – flame shows that a material may ignite and cause burns.



EXPLOSION – rapidly expanding signal shows that material may explode if subjected to high temperatures, sources of ignition or high pressure.



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



CHEMICAL – drops of liquid on hands show that material will cause burns or irritation

BATTERY WARNINGS



WARNING

Read and follow all warnings in WARNING SUMMARY.
Pay careful attention to those about batteries.



TDC0450

Lithium Batteries

Lithium – Thionyl Chloride (Li-SOCl₂) non-rechargeable batteries present a fire, explosion and vapor hazard. Do not recharge, disassemble, heat above 212° F (100° C), incinerate, puncture, crush, short circuit the terminals, or expose contents to water. If they are abused the high energy level can result in extreme heat or fire.

If battery enclosure shows signs of overheating or becomes hot to the touch, immediately turn off equipment (use on/off switch if supplied, or turn off by unscrewing/removing the battery caps). When removing batteries wear protective equipment.

Li-SOCl₂ batteries contain liquid SOCl₂, which fumes on contact with air. The fumes or vapors are highly toxic, and the liquid is highly corrosive. Therefore, if you smell a sharp suffocating odor or hear a hissing sound, immediately turn off the equipment (use on/off switch supplied, or turn off by unscrewing/removing the battery caps) and leave the area until odor dissipates. NOTE: Personnel can detect the smell of 1 ppm while concentrations of 10 ppm are dangerous. Once the odor has dissipated, always handle leaking batteries with personal protective equipment meeting ANSI or NIOSH/MSHA requirements.

Use only appropriate batteries for each particular item. Consult technical manual for the correct battery. Never mix rechargeable batteries with non-rechargeable batteries to prevent damage and potential injury. Never short-circuit the terminals. Pay careful attention to the polarity diagram on battery enclosure. Do not install batteries backwards or severe equipment damage may result.

Use only class 'D' fire extinguish batteries.

**WARNING SUMMARY
(cont)**

Storage and Shipping

Store batteries in original packaging until ready for use. Examine packages/batteries for bulging, cracking, or signs of leakage before putting the batteries into equipment. Remove any damaged batteries from service and dispose of in accordance with local regulations.

NOTE: When handling batteries that show signs of leaking, bulging, swelling, or deformity, personal protective equipment meeting ANSI or NIOSH/MSHA requirements must be used.

Store in cool, dry, well-ventilated areas separated from other combustibles and hazardous materials. Storage of batteries over 100° F (38° C) will cause rapid loss of power.

Do not accumulate or store waste batteries for disposal for more than 90days.

Do not mix hazardous and non-hazardous waste in the same package.

Do not package any battery if it is hot/warm. Package batteries only when they are cool to the touch.

Batteries for disposal shall be collected, transported and disposed of in a manner that will prevent short-circuit (isolate by taping metal poles/terminals), compacting or mutilation to destroy their physical integrity.

Non-usable batteries shall be disposed of in accordance with local regulations. Contact your local environmental office for instructions. Li-SOCl₂ batteries are classified as hazardous waste.

NOTE: A flashing LED light indicates a low battery condition on the M137A2 Pantel (counter box) and the M1A2 collimator. The LED may continue to flash for up to 12 hours. Replace the batteries as soon as possible after encountering this condition.

1.5V alkaline or NiCad batteries may be used in place of 3.6V Lithium – Thionyl Chloride (Li-SOCl₂) batteries for **emergency short-term use only**. Using 1.5V batteries will severely reduce the battery life and they will not work below 32° F (0° C).

ANTENNA

Remain at least 2 feet from radiating antennas of howitzer mounted radios. Antennas can radiate harmful levels of radio frequency.

MERCURY

Thermal warning device contains 0.367 lb (0.166kg) of mercury. Exposure to mercury can cause burns to the skin, eyes and respiratory tract. May be fatal if swallowed or inhaled. Seek emergency assistance immediately. Call HAZMAT personnel for disposal of mercury IAW state/local requirements.



AMMUNITION



Do not chamber ammunition except immediately prior to firing. When possible, fire or unload ammunition within 5 minutes after chambering. Ammunition left too long in a hot or warm weapon can result in cookoffs or in bore explosions, which are hazardous to personnel. Use of ammunition other than that prescribed in this manual is prohibited.

WARNING SUMMARY (cont)

HEARING PROTECTION

The howitzer can generate blast overpressure, which may damage hearing or cause injury to lungs or sinuses if proper protective measures are not followed. Super-vised wearing of earplugs is required at all times, with e-a-r type (plastic roll) prefer-red. The effects of blast can be reduced by moving farther to the rear of the weapon. For this reason, all crew members should move away as far to the rear as practicable. Any crewman who experiences such problems as shortness of breath or bleeding from nose or mouth must be immediately transported to a medical facility for evaluation.

Properly worn foam earplugs provide adequate protection when firing all existing propellant charges, including M203 series and MACS charges, at all quadrant elevations according to the guidelines in the chart on Para 2-35.

HOWITZER

General

The procedures in this technical manual involve the use of a weapon system and live ammunition. All standard safety precautions governing the handling of live ammunition and operation of artillery weapons must be observed.

Make sure personnel are clear of path of recoil. Loss of nitrogen pressure can allow cannon tube assembly to fall out of battery.

To prevent injury from air pressure, never disconnect airline assemblies before closing prime mover cutout cock.

When howitzer is not connected to the prime mover, handbrakes must be applied.

Prior to loading howitzer for actual firing, all personnel must be familiar with prescribed actions in the event of a misfire (Para 2-59 to 2-62) and ensure prefiring checks (Para 2-36) are performed.

When firing howitzer at night, personnel should avoid direct viewing of muzzle flash from their howitzer, or adjacent howitzer, when firing top zones. Temporary flash blindness can be caused by intense muzzle flash, resulting in potential reduction of crew efficiency.

Stickers may occur when firing charge 2, (M3 series propellants). When stickers occur, the projectile lodges in cannon tube and hot gasses under pressure are trapped in the chamber. Removal of the primer is dangerous, as it will be expelled rearward when released. Do not stand behind the breech when removing the primer; the expelled primer may cause injury to personnel standing in its path or ricochet. Do not grasp the firing mechanism block assembly so that your hand is not in the way of the expelling primer.

In case of a MISFIRE/HANGFIRE, follow the misfire procedures prescribed in Para 2-59 thru 2-62. When breech is opened, to remove the charge and primer, if smoke/sparks are coming from the chamber area, do not attempt to remove the charge or close the breech, immediately evacuate the area and notify Explosive Ordnance Disposal (EOD).

Before attempting to speedshift, be sure howitzer is free of all ammunition.

Handbrakes are to remain locked if the howitzer is on any degree of an incline and are not to be released until the lunette is on the prime mover pintle. Release of handbrakes while howitzer is on an incline may allow the howitzer to roll causing injury to personnel and/or damage to equipment.

Personnel should stay clear of area between prime mover and howitzer.

Two crewmen are required to remove or install a wheel assembly. Use care to avoid injury.

WARNING SUMMARY
(cont)

For safety precautions, prior to beginning any painting operations, refer to TM 43-0139. Improper application or removal of CARC paint can be extremely hazardous to your health.

Do not force primer into primer chamber. If primer will not go in, chamber is probably dirty. Forcing primer into primer chamber may cause primer to prematurely ignite powder charge which will cause the howitzer to recoil prematurely and cause serious injury to crew.

Lanyards will not be shortened or injury to personnel may result.

If nitrogen pressure is below 329 psi (23 bar), the recoil mechanism could slide out of battery and cause severe personal injury. Make sure personnel are clear of recoil path.

FIRST AID

For further information on first aid refer to: FM 21-11 (Army), and Battle Skills Training Handbook, Book 2, Pvt. – L/Cpl. (Marine Corps).