TECHNICAL MANUAL
OPERATOR'S MANUAL
FOR
HOWITZER, MEDIUM, TOWED:
155-MM, M198
(1025-01-026-6648) (EIC:3EL)

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HEADQUARTERS, U.S. MARINE CORPS
JANUARY 1991
REPORTING ERRORS AND RECOMMENDING IMPROVEMENTS

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This manual supersedes TM 9-1025-211-10, dated 1 October 1979, including all changes in their entirety.
# Operating Instructions

- **Description and Use of Operator's Controls and Indicators**
- **Preventive Maintenance Checks and Services (PMCS)**
- **Operation Under Usual Conditions**
- **Operation Under Unusual Conditions**
- **Misfire and Check Firing Procedures**

## Maintenance Instructions

- **Lubrication Instructions**
- **Troubleshooting Procedures**
- **Maintenance Procedures**
- **Cannon Maintenance Procedures**
- **Recoil Mechanism Maintenance Procedures**
- **Carriage Maintenance Procedures**
- **Fire Control Equipment Maintenance Procedures**
- **Maintenance of Auxiliary Equipment**
- **Fire Control Alignment Tests and Measurements**

## Ammunition

- **General**
- **Preparation for Firing**
- **Maintenance**
- **M712 Heat, Cannon-Launched, Guided Projectile and M823 Training Projectile (Copperhead)**
- **Handling**

## Foreign Ammunition (NATO)

## Demolition of Materiel to Prevent Enemy Use

## References

## Components of End Item and Basic Issue Items Lists

## Additional Authorization List

## Expendable/Durable Supplies and Materials List
HOW TO USE THIS MANUAL

GENERAL

a. Whenever the masculine gender (i.e., crewman) is used in this manual, it includes both masculine and feminine genders.

b. The text is key to the illustrations by numbered callouts. When an item is called out in a procedure, a number in parentheses in the text corresponds with a circled number on the illustration.

c. Some illustrations of the howitzer may have equilibrator ballistic shields and the recoil mechanism ballistic shield removed for clarity.

d. The preventive maintenance checks and services table includes equipment serviceability criteria. The information normally found in the For readiness reporting ... column is in the Procedures column.

e. 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. Lists all chapters and their sections, appendixes, and alphabetical index in order and gives page references to where they begin.

c. Chapter Indexes. All chapters contain indexes with page references.

d. Section Indexes. Lists each paragraph contained in the section and a 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 1-2, the items referred to by their common names are listed alphabetically and are followed by their official nomenclature.
CHAPTER 1
INTRODUCTION

Section I. GENERAL INFORMATION

1-1. SCOPE

This manual tells the howitzer crew how to operate and maintain the howitzer in the field. It also includes training procedures.


b. Model Number and Equipment Name. Howitzer, Medium, Towed: 155-mm, M198.

c. Purpose of Equipment. To provide artillery fire in support of ground-gaining troops.

d. Special Inclusions in Manual. This manual includes section drill procedures on page 1-18.

1-2. MAINTENANCE FORMS AND RECORDS

Department of the Army forms and procedures used for equipment maintenance will be those prescribed by DA PAM 738-750, The Army Maintenance Management System (TAMMS). Marine Corps personnel will use TM 4700-15/1, Equipment Record Procedures.
1-3. HAND RECEIPT (HR) MANUALS

This manual has a companion document with a TM number followed by "-HR" (which stands for Hand Receipt). The TM 9-1025-211-10-HR consists of pre-printed hand receipts (DA Form 2062) that list end item related equipment (i.e., COEI, Bl, and AAL) you must account for. As an aid to property accountability, additional -HR manuals may be requisitioned from the following source in accordance with procedures in Chapter 3, AR 25-30:

Commander
US Army Publications Distribution
Center-St. Louis
ATTN: SFIS-APC-S-OC
1655 Woodson Road
St. Louis, MO 63114-6181

1-4. REPORTING EQUIPMENT IMPROVEMENT RECOMMENDATIONS (EIR's)

If your M198 howitzer 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. Put it on an SF 368 (Product Quality Deficiency Report). Mail it to us at: ATTN: AMSTA-AR-QAW-C, TACOM-ARDEC, 1 Rock Island Arsenal, Rock Island, IL 61299-7300 (FAX: Commercial (309) 782-6653, DSN 793-6653) (E-mail: qawqdrs@ria.army.mil). Marine Corps users submit a Product Quality Deficiency Report (SF 368) in accordance with MCO 4855.10, Product Quality Deficiency Report, and TM 4700-15/1, Equipment Record Procedures, to: Commanding General, ATTN: Code (808-1), Marine Corps Logistics Base, 814 Radford Blvd, Albany, GA 31704-1128. We'll send you a reply.

1-5. CORROSION PREVENTION AND CONTROL

a. 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.

b. While corrosion is typically associated with rusting of metals, it can also include deterioration of other materials such as rubber and plastic. Unusual cracking, softening, swelling, or breaking of these materials may be a corrosion problem. 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 assure that the information is identified as a CPC problem. Submit the form to: ATTN: AMSTA-AR-QAW-C, TACOM-ARDEC, 1 Rock Island Arsenal, Rock Island, IL 61299-7300 (FAX: Commercial (309) 782-6653, DSN 793-6653), (E-mail: qawqdrs@ria.army.mil). Marine Corps users submit Product Quality Deficiency Report to: Commanding General, ATTN: Code (808-1), Marine Corps Logistics Base, 814 Radford Blvd, Albany, GA 31704-1128.

1-6. NOMENCLATURE CROSS-REFERENCE LIST

This listing includes the nomenclature cross-reference list, list of abbreviations/acronyms, and explanation of terms (glossary) used in this manual.

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<tr>
<th>COMMON NAME</th>
<th>OFFICIAL NOMENCLATURE</th>
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</thead>
<tbody>
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<td>Dipstick</td>
<td>Liquid gage rod-cap</td>
</tr>
<tr>
<td>Emergency hose assembly</td>
<td>Hose assembly</td>
</tr>
<tr>
<td>Handbrakes</td>
<td>Left and right manual brake assemblies</td>
</tr>
<tr>
<td>Pantel</td>
<td>M137/M137A3 panoramic telescope</td>
</tr>
<tr>
<td>Service hose assembly</td>
<td>Hose assembly</td>
</tr>
<tr>
<td>Spade key</td>
<td>Machine key</td>
</tr>
<tr>
<td>SPEEDSHIFT lever</td>
<td>Selector valve handle</td>
</tr>
<tr>
<td>WHEELS lever</td>
<td>Selector valve handle</td>
</tr>
</tbody>
</table>
1-7. LIST OF ABBREVIATIONS/ACRONYMS

The following alphabetical list gives definitions for the abbreviations and acronyms used in this manual.

ADAM ........................................................................................................ Area denial artillery munition
BCS ........................................................................................................ Base ejection
BE ........................................................................................................... Brake fluid, automotive, silicone
CHG ........................................................................................................ Charge
CLGP .................................................................................................... Cleaner, lubricant and preservative
CP .......................................................................................................... Concrete-piercing
CTA .................................................................................................... Common table of allowances
DF .......................................................................................................... Deflection
ERLS .................................................................................................. Elimination of Radioactive Light Sources
EFC ..................................................................................................... Equivalent full charge
EOD ...................................................................................................... Explosive ordnance disposal
ET .......................................................................................................... Electronic time
FZ .......................................................................................................... Fuze
GB ......................................................................................................... Green bag
GMD .................................................................................................... Grease, molybdenum disulfide
H ............................................................................................................ Mustard gas
HC ........................................................................................................ White chemical smoke mixture
HD ........................................................................................................ Distilled mustard gas
HE ........................................................................................................ High-explosive
HEAT .................................................................................................. High-explosive, anti-tank
HERA .................................................................................................. High-explosive, rocket-assisted
HyPAK ............................................................................................. Hydraulic power assist kit
ICM ...................................................................................................... Improved conventional munitions
JTA ...................................................................................................... Joint table of allowance
LED ..................................................................................................... Light Emitting Diode
MT ........................................................................................................ Mechanical time
MTSQ .................................................................................................. Mechanical time and superquick
N-m ...................................................................................................... Newton meters
OHT ..................................................................................................... Hydraulic fluid, petroleum base
P ............................................................................................................. Requires removal of supplementary if present
PD ........................................................................................................... Point detonating
PL-S .................................................................................................. Lubricating oil, general purpose, special preservative
prox ..................................................................................................... Proximity
QE ......................................................................................................... Quadrant elevation
RAAMS ............................................................................................ Remote anti-armor mine system
RB ........................................................................................................... Red bag
RMK ..................................................................................................... Remarks
RPO ..................................................................................................... Radiological protection officer
SOP ...................................................................................................... Standard operating procedure
SQ .......................................................................................................... Superquick
suppl .................................................................................................. Supplementary
TDA ..................................................................................................... Tables of distribution and allowances
TI .......................................................................................................... Time
TOE ..................................................................................................... Tables of organization and equipment
TWD .................................................................................................. Thermal warning device
VT .......................................................................................................... Variable time
VX ........................................................................................................ Persistent toxic casualty nerve gas
WB ........................................................................................................ White bag
WP ........................................................................................................ White phosphorous
wpn .................................................................................................... Weapon
WTR ..................................................................................................... Grease, aircraft, general purpose, wide temperature range

Change 4
1-8. GLOSSARY

The following is an alphabetical listing of terms with definitions used in this manual. These terms need explanation and are not defined within the text.

a. Front of Weapon. The muzzle end of the howitzer.

b. Howitzer Section. Those personnel specified by the current table of organization and equipment that make up a howitzer section.

c. Left Side of Weapon. At a person's left-hand side when standing at the breech end of the weapon, facing toward the cannon muzzle.

d. Rear of Weapon. The breech end of the howitzer.

e. Right Side of Weapon. At a person's right-hand side when standing at the breech end of the weapon, facing toward the cannon muzzle.

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1-9. EQUIPMENT CHARACTERISTICS, CAPABILITIES, AND FEATURES

a. The M198 howitzer provides general support field artillery firing for the light divisions by providing both nuclear and nonnuclear firing.

NOTE
A modified travel lock (to be fabricated by direct support maintenance) will be installed on all howitzers being airlifted by the CH47/CH47D helicopter. The modified travel lock will prevent damage to the helicopter and is to be used for airlift only, and not for towing the howitzer.

b. The M198 is an extended range, split-trail weapon that can be towed by a vehicle or airlifted by a CH47/CH47D or CH53E helicopter. The carriage has retractable wheels and a top carriage which can be rotated 3200 mils to decrease overall length for shipment or storage.

c. The fire control equipment may be used by one or two crewmen for direct or indirect fire. The gunner on the left side controls left and right (traversing) settings and the assistant gunner on the right side controls up and down (elevation) settings. The equipment can also be operated by a gunner on the left side controlling both traversing and elevation settings. All vials, reticles, and counters on the fire control and accessory equipment are radioactively illuminated.

d. The medium weight M198 howitzer has a low profile, may be emplaced rapidly, and has a 6400-mil speed shift assembly.
1-10. LOCATION AND DESCRIPTION OF MAJOR COMPONENTS

a. Howitzer Positions. The firing, stowed, and towed positions for the M198 howitzer are as shown.

FIRING POSITION

STOWED POSITION

NOTE
The muzzle brake is removed to tow the weapon in the stowed position.

TOWED POSITION
b. **Howitzer Components.** Familiarize yourself with the components of the M198 howitzer. Start with item number 1; then go to numbers 2, 3, 4, 5; and continue until you reach number 37. Go to [page 2-1](#) for a detailed description of the controls and indicators.

<table>
<thead>
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<th>Item</th>
<th>Component</th>
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<td>2</td>
<td>Brake precheck</td>
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<td>3</td>
<td>Service and emergency hose assemblies</td>
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<td>4</td>
<td>Cam lock</td>
</tr>
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<td>5</td>
<td>Trail lock handle assembly</td>
</tr>
<tr>
<td>6</td>
<td>Lifting handle</td>
</tr>
<tr>
<td>7</td>
<td>Right trail</td>
</tr>
<tr>
<td>8</td>
<td>Trail retaining pin</td>
</tr>
<tr>
<td>9</td>
<td>BCS gun assembly (GA) bracket</td>
</tr>
<tr>
<td>10</td>
<td>Spade</td>
</tr>
<tr>
<td>11</td>
<td>Drain cock</td>
</tr>
<tr>
<td>12</td>
<td>Lunette</td>
</tr>
<tr>
<td>13</td>
<td>Left trail</td>
</tr>
<tr>
<td>14</td>
<td>Trail lock</td>
</tr>
<tr>
<td>15</td>
<td>Lifting handle</td>
</tr>
<tr>
<td>16</td>
<td>Firing baseplate</td>
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<tr>
<td>16.1</td>
<td>HyPAK</td>
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<td>16.2</td>
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</table>
1-10. LOCATION AND DESCRIPTION OF MAJOR COMPONENTS (cont)

17 M172 telescope and quadrant mount
18 Equilibrator cylinder (both sides)
19 Oil reserve indicator
20 Muzzle brake
21 Cannon tube
22 Wheel (both sides)
23 Elevating handwheel (both sides)
24 Manual control lever (both sides)

25 Travel lock assembly
26 Manifold assembly
27 Ball
28 Lock release lever