

**SOLDIER'S MANUAL and TRAINER'S GUIDE**

**MOS 11B**

**INFANTRY**

**SKILL LEVEL 1**

**AUGUST 2004**

**HEADQUARTERS  
DEPARTMENT OF THE ARMY**

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## **MOS 11B**

### **Infantry, Skill Level 1**

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\*This publication supersedes STP 7-11BCHM1-SM, 1 March 2000.

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## PREFACE

This publication is for Skill Level 1 soldiers holding the military occupational specialty 11B. It contains standardized training objectives, in the form of task summaries, to train on critical tasks that support unit missions during wartime. All soldiers holding MOS 11B should have access to this publication.

This manual applies to both Active and Reserve Component soldiers.

The proponent of this publication is the United States Army Infantry School. Send comments and recommendations on DA Form 2028 (Recommended Changes to Publications and Blank Forms) directly to--

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*Unless this publication states otherwise, masculine nouns and pronouns do not refer exclusively to men.*

## CHAPTER 1

### Introduction

*This soldier's manual (SM) identifies the individual military occupational specialty training requirements for soldiers in MOS 11B skill level 1. Commanders, trainers, and soldiers should use it to plan, conduct, and evaluate individual training in units. This manual is the primary MOS reference to support the self-development and training of every soldier. It is used with the following manuals to establish effective training plans and programs that integrate soldier, leader, and collective tasks:*

- *STP 7-11B24-SM-TG.*
- *The soldier's manuals of common tasks (STP-21-1-SMCT and STP 21-24-SMCT).*
- *Army Training and Evaluation Programs (ARTEPs).*
- *FM 25-101.*

#### 1-1. TASK SUMMARIES

Task summaries outline the wartime performance requirements of each critical task in the SM. They provide the soldier and the trainer with the information needed to prepare, conduct, and evaluate critical task training. As a minimum, task summaries include information the soldier must know and the skills that he must perform to standards for each task. The format for the task summaries included in this SM is as follows:

- a. **Task Number.** A 10-digit number identifies each task or skill. This task number, along with the task title, must be included in any correspondence pertaining to the task.
- b. **Task Title.** The task title identifies the action to be performed.
- c. **Conditions.** The task condition identifies all the equipment, tools, references, job aids, and supporting personnel that the soldier needs to use to perform the task in wartime. This section identifies any environmental conditions that can alter task performance, such as visibility, temperature, or wind. This section also identifies any specific cues or events that trigger task performance such as a chemical attack or identification of a threat vehicle.
- d. **Standards.** The task standards describe how well and to what level the task must be performed under wartime conditions. Standards are typically described in terms of accuracy, completeness, and speed.
- e. **Training and Evaluation.** The training evaluation section identifies specific actions (known as performance measures) that the soldier must do to successfully complete the task. These actions are in the evaluation guide section of the task summary and are listed in a pass/fail format for easy evaluation. For some tasks, the training and evaluation section may also include detailed training information in a training information outline and an evaluation preparation section. The evaluation preparation section indicates necessary modifications to task performance in order to train and evaluate a task that cannot be trained to the wartime conditions. It may also include special training and evaluation preparation instructions to accommodate these modifications, and any instructions that should be given to the soldier before evaluation.
- f. **References.** This section identifies references that provide more detailed and thorough explanations of task performance requirements than those given in the task summary description.
- g. **Warnings.** Warnings alert users to the possibility of immediate personal injury or damage to equipment.
- h. **Notes.** Notes provide a supportive explanation or hint that relates to the performance standards.

## **1-2. SOLDIER'S RESPONSIBILITIES**

Each soldier is responsible for performing individual tasks that the first-line supervisor identifies based on the unit's mission-essential task list (METL). The soldier must perform each task to the standards listed in the SM. If a soldier has a question about how to do a task or which tasks he must perform, he must ask the first-line supervisor for clarification. The first-line supervisor either knows how to perform each task or can direct the soldier to the appropriate training materials.

## **1-3. TRAINING SUPPORT**

This manual includes the following appendixes and information:

a. **Glossary.** The glossary, which follows the last appendix, is a single comprehensive list of acronyms, abbreviations, definitions, and letter symbols.

b. **References.** This section contains two lists of references that support training of all tasks in this SM. "Needed" references are listed in the conditions statement and are required for the soldier to do the task. "Recommended" references are materials that help a trainer prepare for the task but are not required to perform the task.

**CHAPTER 2**

2-1. General. The MOS Training Plan (MTP) identifies the essential components of a unit training plan for individual training. Units have different training needs and requirements based on differences in environment, location, equipment, dispersion, and similar factors. Therefore, the MTP should be used as a guide for conducting unit training and not a rigid standard. The MTP is designed to assist the commander in preparing a unit training plan which satisfies integration, cross training, training up, and sustainment training requirements for soldiers in this MOS.

This MTP shows the relationship of an MOS skill level between duty position and critical tasks. These critical tasks are grouped by task commonality into subject areas. These subject areas are used to define the training requirements for each duty position within an MOS.

- **Duty Position Column.** This column lists the duty positions of the MOS, by skill level, which have different training requirements.
- **Subject Area Column.** This column lists, by numerical key, the subject areas a soldier must be proficient in to perform in that duty position.
- **Task Number Column.** This column lists the task numbers for all tasks included in the subject area.
- **Title Column.** This column lists the task title for each task in the subject area.
- **Training Location Column.** This column identifies the training location where the task is first trained to soldier training publications standards. If the task is first trained to standard in the unit, the word "Unit" will be in this column. If the task is first trained to standard in the training base, it will identify, by brevity code (ANCOC, BNCOC, etc.), the resident course where the task was taught. Figure 2-1 contains a list of training locations and their corresponding brevity codes.

<b>UNIT</b>	Trained in the Unit
<b>INSTITUT</b>	Institution

Figure 2-1. Training Locations

2-2. Subject Area Codes.

**Skill Level 1**

- 5 COMMUNICATE: GENERAL
- 7 COMMUNICATE: RADIO
- 9 MOVE: BASIC TACTICS
- 16 NAVIGATE: GENERAL/COMPASS/MAP
- 18 RECON-SECURITY: GENERAL
- 19 RECON-SECURITY: NIGHT VISION DEVICES
- 20 RECON-SECURITY: OPSEC AND COMSEC
- 22 SUSTAIN: GENERAL
- 24 SUSTAIN: NBC
- 26 VEHICLES
- 29 VEHICLES: M113-SERIES
- 34 WEAPONS: M9 PISTOL
- 36 WEAPONS: FLASH
- 37 WEAPONS: GENERAL
- 38 WEAPONS: HG/MINES/DEMOLITIONS
- 39 WEAPONS: M136 LAUNCHER (AT4)
- 40 WEAPONS: M16-SERIES RIFLE
- 42 WEAPONS: M220-SERIES TOW
- 43 WEAPONS: M240B MACHINE GUN
- 44 WEAPONS: M240C MACHINE GUN (COAX)
- 45 WEAPONS: M242 (25-MM GUN)
- 49 WEAPONS: MK19 MACHINE GUN
- 53 WEAPONS: SMOKE GRENADE LAUNCHER

2-3. Critical Tasks List.

**MOS TRAINING PLAN  
11B1**

<b>Task Number</b>	<b>Title</b>	<b>Training Location</b>	<b>Sust Tng SL</b>
071-820-0001	Operate Telephone Set, TA-1/PT	UNIT	1
071-820-0003	Install Communication Wire Lines	UNIT	1
071-820-0004	Recover Communication Wire Lines	UNIT	1
113-587-0070	Troubleshoot Secure Single-Channel Ground and Airborne Radio Systems (SINCGARSs) ICOM With or Without the AN/VIC-1 or AN/VIC-3	UNIT	1
113-588-4025	Repair Telephone Cable WD-1/TT or WF16/U	UNIT	1
113-594-2005	Install and Operate an Switchboard, Telephone, Manual SB-993/GT	UNIT	1
113-594-2014	Operate Switchboard, Telephone, Manual SB-22/PT	UNIT	1
113-600-1023	Install Tactical Telephone	UNIT	1
113-600-2007	Operate Telephone Set TA-312/PT	UNIT	1
113-600-3015	Perform Operators PMCS on Tactical Telephone Sets	UNIT	1
113-609-2053	Operate Automated Net Control Device (ANCD) AN/CYZ-10	UNIT	1
113-587-2075	Operate SINCGARS Data Devices	UNIT	1
113-587-2076	Operate Secure SINCGARS Using Control Monitor (CM)	UNIT	1
113-587-2077	Operate SINCGARS Remote Control Unit (SRCU)	UNIT	1
071-810-0003	Construct a Field-Expedient Antenna	UNIT	1
071-810-0004	Maintain Intercommunications Set, AN/VIC-1, on a Tracked Vehicle (Includes FM Radio)	UNIT	1
113-571-1004	Operate in Radio Nets	UNIT	1
113-573-4003	Encode and Decode Messages Using KTC 600(*) Tactical Operations Code	UNIT	1
113-573-4006	Use the KTC 1400(*) Numerical Cipher/Authentication System	UNIT	1
113-573-6001	Recognize Electronic Attack (EA) and Implement Electronic Protection (EP)	UNIT	1
113-573-7017	Prepare/Submit Interference Message Report	UNIT	1
113-587-1064	Prepare SINCGARS (Manpack) for Operation	UNIT	1
113-587-1067	Install Single-Channel Ground and Airborne Radio Systems (SINCGARSs) ICOM With or Without the AN/VIC-1 or AN/VIC-3	UNIT	1
113-587-2059	Operate Radio Set AN/PRC-77 With an TSEC/KY-57	UNIT	1
113-587-2061	Operate Radio Set AN/VRC-64 or AN/GRC-160 with TSEC/KY-57	UNIT	1
113-587-2064	Operate Radio Set AN/VRC-12 or AN/VRC-47 with TSEC/KY-57	UNIT	1
113-587-2070	Operate SINCGARS Single-Channel (SC)	UNIT	1
113-587-2071	Operate SINCGARS Frequency Hopping (FH) (Net Members)	UNIT	1
113-587-2072	Operate SINCGARS Frequency Hopping (FH) Net Control Station (NCS)	UNIT	1
113-587-2082	Operate Secure AN/VRC-92 RETRANS	UNIT	1
061-283-1001	Determine Direction Within the Target Area	UNIT	1
071-326-0501	Move as a Member of a Fire Team	INSTITUT	1
071-326-0512	Estimate Range	INSTITUT	1
071-329-1300	Operate the Driver's Compass Display on an M2A3/M3A3 BFV	UNIT	1
071-329-7017	Navigate Using an AN/PSN-11 Precision Lightweight Global Positioning System Receiver	UNIT	1

Task Number	Title	Training Location	Sust Tng SL
071-329-7018	Prepare the AN/PSN-11 Precision Lightweight Global Positioning System Receiver for Operation	UNIT	1
071-329-7019	Enter Waypoints into an AN/PSN-11 Precision Lightweight Global Positioning System Receiver	UNIT	1
071-331-0001	Perform as a Member of a Patrol	INSTITUT	1
071-706-0001	Operate Night Vision Device, AN/PVS-14	UNIT	1
071-706-0002	Maintain Night Vision Device, AN/PVS-14	UNIT	1
071-315-0003	Operate a Night Vision Sight, AN/PVS-4	UNIT	1
071-315-0030	Operate Night Vision Goggles, AN/PVS-5	UNIT	1
071-315-0090	Maintain a Thermal Viewer, AN/PAS-7	UNIT	1
071-315-0091	Operate a Thermal Viewer, AN/PAS-7	UNIT	1
071-704-0001	Operate a Mini Eyesafe Laser Infrared Observation Set, AN/PVS-6	UNIT	1
071-704-0002	Maintain a Mini Eyesafe Laser Infrared Observation Set, AN/PVS-6	UNIT	1
071-710-0002	Operate the Driver's Night Viewer, AN/VVS-2, on a BFV	UNIT	1
071-710-0003	Maintain the Driver's Night Viewer, AN/VVS-2, on a BFV	UNIT	1
071-710-0008	Operate Night Vision Goggles, AN/PVS-7B	UNIT	1
071-710-0009	Maintain Night Vision Goggles, AN/PVS-7B	UNIT	1
071-331-0801	Challenge Persons Entering Your Area	INSTITUT	1
052-191-1501	Perform Individual Camouflage	INSTITUT	1
071-600-0001	Destroy Supplies and Equipment	UNIT	1
181-906-1505	Conduct Combat Operations According to the Law of War	INSTITUT	1
031-503-1021	MARK NBC CONTAMINATED AREA	UNIT	1
031-503-1030	Prepare the Chemical Agent Monitor for Operation	UNIT	1
031-503-1031	Use the Chemical Agent Monitor	UNIT	1
031-503-1032	Prepare the Chemical Agent Monitor for Movement	UNIT	1
031-506-1052	Protect Yourself and Others From Chemical and Biological Injury/Contamination by Using a Collective Protection Shelter	UNIT	1
071-001-0005	Operate the NBC System on an M2A3/M3A3 BFV	UNIT	1
071-324-6026	Operate the NBC System on an M2A1 or an M3A1 BFV	UNIT	1
071-200-0002	Tow a Tracked Vehicle	UNIT	1
071-216-0007	Maintain the Hull on a BFV	UNIT	1
071-216-0023	Maintain the Hull on an M2A3/M3A3 BFV	UNIT	1
071-216-0024	Maintain the Track and Suspension System on an M2A3/M3A3 BFV	UNIT	1
071-324-2003	Prepare a Range Card for a BFV	UNIT	1
071-324-6001	Drive a BFV	UNIT	1
071-324-6022	Extinguish a Fire on a BFV	INSTITUT	1
071-324-6025	Start a BFV Using Auxiliary Power	UNIT	1
071-212-0020	Start an M113-Series Vehicle Using Auxiliary Power	UNIT	1
071-212-0021	Drive an M113-Series Vehicle	UNIT	1
071-004-0002	Perform a Function Check on an M9 Pistol	INSTITUT	1
071-004-0005	Correct Malfunctions of an M9 Pistol	INSTITUT	1
071-070-0001	Maintain an M202A1 Multishot Rocket Launcher	UNIT	1
071-070-0002	Perform a Function Check on an M202A1 Multishot Rocket Launcher	UNIT	1

Task Number	Title	Training Location	Sust Tng SL
071-070-0003	Load an M202A1 Multishot Rocket Launcher	UNIT	1
071-070-0004	Unload an M202A1 Multishot Rocket Launcher	UNIT	1
071-070-0005	Perform Misfire Procedures on an M202A1 Multishot Rocket Launcher	UNIT	1
071-070-0006	Prepare an M202A1 Multishot Rocket Launcher for Firing	UNIT	1
071-070-0007	Restore an M202A1 Multishot Rocket Launcher to Carrying Configuration	UNIT	1
071-070-0008	Engage Targets with an M202A1 Multishot Rocket Launcher	UNIT	1
071-705-0003	Zero an M68 Sight	INSTITUT	1
071-705-0004	Boresight an M68 Sight	INSTITUT	1
071-000-0004	Maintain a Bayonet	INSTITUT	1
071-317-0000	Prepare an Antiarmor Range Card	UNIT	1
071-326-0100	Engage an Enemy with a Bayonet	INSTITUT	1
071-703-0001	Operate M145 Telescope, Straight	UNIT	1
071-703-0002	Maintain M145 Telescope, Straight	UNIT	1
071-705-0001	Maintain an M68 Sight	UNIT	1
071-705-0002	Operate an M68 Sight	UNIT	1
052-192-1021	Locate Mines by Visual Means	INSTITUT	1
052-192-1117	Install an M21 Antitank (AT) Mine	INSTITUT	1
052-192-1118	Remove an M21 Antitank (AT) Mine	INSTITUT	1
071-440-0031	Employ Hand Grenades During an Urban Operation	INSTITUT	1
071-054-0003	Perform Misfire Procedures on an M136 Launcher	INSTITUT	1
071-008-0001	Mount a Night Vision Sight, AN/PVS-4, on an M16-Series Rifle	UNIT	1
071-008-0002	Dismount a Night Vision Sight, AN/PVS-4, from an M16-Series Rifle	UNIT	1
071-008-0004	Mount an AN/PAS-13 Thermal Weapon Sight on an M16-Series Rifle	UNIT	1
071-008-0005	Dismount an AN/PAS-13 Thermal Weapon Sight from an M16-Series Rifle	UNIT	1
071-008-0006	Zero an AN/PAS-13 Thermal Weapon Sight to an M16-Series Rifle	UNIT	1
071-008-0008	Mount an AN/PAQ-4-Series Aiming Light on an M16-Series Rifle	INSTITUT	1
071-008-0009	Dismount an AN/PAQ-4-Series Aiming Light from an M16-Series Rifle	INSTITUT	1
071-008-0010	Zero an AN/PAQ-4-Series Aiming Light to an M16-Series Rifle	INSTITUT	1
071-008-0011	Engage Targets with an M16-Series Rifle Using an AN/PAQ-4-Series Aiming Light	INSTITUT	1
071-310-0001	Zero an M16A4 Rifle	INSTITUT	1
071-311-2006	Construct Field-Expedient Firing Aids for an M16A1/A2 Rifle	INSTITUT	1
071-315-2307	Zero a Night Vision Sight, AN/PVS-4, to an M16-Series Rifle	INSTITUT	1
071-056-0001	Load the TOW Launcher on a BFV	UNIT	1
071-056-0002	Unload the TOW Launcher on a BFV	UNIT	1
071-056-0004	Maintain an M220 Launcher System	UNIT	1
071-056-0005	Perform a System Self-Test on an M220A1 Launcher System	UNIT	1
071-056-0006	Perform a Preoperational Inspection of an M220 Launcher System and Encased Missile	UNIT	1
071-056-0007	Load an M220 Launcher System	UNIT	1
071-056-0008	Unload an M220 Launcher System	UNIT	1
071-056-0009	Engage Targets with an M220 Launcher System	UNIT	1
071-056-0010	Perform Immediate Action for an M220 Launcher System Misfire	UNIT	1

<b>Task Number</b>	<b>Title</b>	<b>Training Location</b>	<b>Sust Tng SL</b>
071-056-0011	Collimate an AN/TAS-4-Series Nightsight to an M220 Launcher System Optical Sight	UNIT	1
071-056-0013	Perform a System Self-Test on an M220A2 Launcher System	UNIT	1
071-056-0020	Load a Dual Launcher While Mounted on an M901 Vehicle	UNIT	1
071-056-0021	Unload a Dual Launcher While Mounted on an M901 Vehicle	UNIT	1
071-056-0061	Stow M220 Encased Missiles in a Missile Storage Rack	UNIT	1
071-316-3015	Remove a Misfired TOW Missile from the TOW Launcher on a BFV	UNIT	1
071-025-0002	Perform a Function Check on an M240B Machine Gun	INSTITUT	1
171-122-1012	Perform Operator Maintenance on an M240/M240C Machine Gun	UNIT	1
071-024-0001	Load the 25-mm Ammunition Can (HEI-T) on a BFV	UNIT	1
071-024-0002	Load the 25-mm Ammunition Can (APDS-T) on a BFV	UNIT	1
071-024-0003	Unload the 25-mm Ammunition Can (HEI-T) on a BFV	UNIT	1
071-024-0004	Unload the 25-mm Ammunition Can (APDS-T) on a BFV	UNIT	1
071-024-0012	Load the 25-mm Ammunition Can (APDS-T) on an M2A3/M3A3 BFV	UNIT	1
071-024-0013	Load the 25-mm Ammunition Can (HEI-T) on an M2A3/M3A3 BFV	UNIT	1
071-030-0008	Correct Malfunctions of an MK 19 Machine Gun	UNIT	1
071-034-0001	Load an M243 or M259 Smoke Grenade Launcher	UNIT	1
071-034-0002	Unload an M243 or M259 Smoke Grenade Launcher	UNIT	1
071-034-0003	Perform Misfire Procedures on an M243 or M259 Smoke Grenade Launcher	UNIT	1
071-034-0004	Fire an M243 or M259 Smoke Grenade Launcher	UNIT	1
071-034-0005	Load the M257 Smoke Grenade Launcher on a BFV	UNIT	1
071-034-0006	Unload the M257 Smoke Grenade Launcher on a BFV	UNIT	1
071-034-0007	Maintain an M243 or M259 Smoke Grenade Launcher	UNIT	1
071-034-0008	Maintain an M257 Smoke Grenade Launcher on a BFV	UNIT	1
071-324-4003	Fire the M257 Smoke Grenade Launcher on a BFV	UNIT	1

**CHAPTER 3**  
**MOS Skill Level Tasks**

Skill Level 1

Subject Area 5: COMMUNICATE: GENERAL

**Operate Telephone Set, TA-1/PT**  
**071-820-0001**

**Conditions:** In a combat environment, given a field telephone set TA-1/PT and an already installed field wire line with a telephone or switchboard operator at the terminal end.

**Standards:** Sent and received an understandable outgoing and incoming call using proper radio telephone procedures.

**Performance Steps**

1. Reset the visual indicator.
2. Adjust buzzer volume.
3. Make an outgoing call.
4. Receive an incoming call.

NOTE: When the TA-1/PT is connected to a switchboard line, depress the generator lever rapidly several times to signal the end of a call.

**Evaluation Preparation:** SETUP: At the test site provide all material according to the task condition statement.

BRIEF SOLDIER: Tell the soldier to conduct an outgoing and incoming call using proper radio telephone procedures.

**Performance Measures**

1. Reset the visual indicator.
2. Adjusted buzzer volume.
3. Made an outgoing call.

<u>GO</u>	<u>NO GO</u>
—	—
—	—
—	—

**Evaluation Guidance:** Score the soldier GO if all performance measures are passed. Score the soldier NO-GO if any performance measure is failed. If the soldier scores NO-GO, show the soldier what was done wrong and how to do it correctly.

**References**  
**Required**

**Related**  
TM 11-5805-243-13

**Install Communication Wire Lines**  
**071-820-0003**

**Conditions:** In a combat environment, given communications wire (WD-1 on DR-8s or combat wire WD-36), as required; field telephones, as required; a reel unit (RL-39); an assistant, if required; and a requirement to install the communications wire lines.

**Standards:** Installed communication lines as required to meet the tactical situation; connected the wire to a fixed object at the originating and terminating ends of the wire; installed the wire so that it was protected from damage by vehicle traffic and from enemy fire, observation, or destruction.

**Performance Steps**

1. Check the field wire for serviceability by connecting it to the binding post terminals on two separate telephones and transmit and receive.

NOTE 1: Ensure that a "drip loop" is provided at both ends of the wire.

2. Anchor the wire at the start point. Leave enough slack in the wire at the beginning and terminating ends to allow the lead-in wire to reach the telephone or switchboard.

NOTE 2: Field wire must be laid loosely on the ground with plenty of well-distributed slack (approximately 20 percent). Slack allows the wire to lay flat on the ground and simplifies maintenance and rerouting of the wire.

NOTE 3: If laying the wire to an observation post, ensure that the wire parallels the front of at least one defensive position so that the defensive element may detect enemy soldiers who may be attempting to follow the wire into friendly positions.

NOTE 4: When laying surface lines, they should be tied to trees or other fixed objects to prevent passing troops and vehicles from pulling the wire into traffic lanes. All ties should be made at ground level.

3. Move slowly toward the terminating end of the wire. Allow the wire to revolve off the DR-8. DO NOT lay the wire in a straight line.

NOTE 5: Test the wire before and after a new reel is spliced into the line and before connecting the line to a switchboard or telephone.

NOTE 6: Ensure that all splices are taped with electrical tape to prevent moisture from shorting out communications.

4. Anchor the wire at the terminal end and connect it to the telephone or switchboard. Try to talk to someone on the other end of the wire.

NOTE 7: Ensure that the wire is buried at least three feet deep if the wire is to be buried in loose or sandy soil.

NOTE 8: If the situation allows, all lines should be tagged with the using unit's identity code (UIC), which is found in the CEOI.

NOTE 9: Tagging of communication lines is necessary to distinguish one line from another. At a minimum, communication lines must be tagged at the originating point and on each side of the point where the communication line crosses manmade linear terrain features.

NOTE 10: Tags are normally cut, notched, marked, and obtained through the chain of command from the unit communication section. In the event that tags are not available, the unit should improvise substitute tags. Every unit is responsible for ensuring that its lines are adequately marked.

5. When time and the situation permit, bury and camouflage the wire.

**Evaluation Preparation:** SETUP: At the test site, provide all material according to the task condition statement.

**BRIEF SOLDIER:** Tell the soldier to install the wire so that it is protected from damage by vehicle traffic and from enemy fire, observation, and destruction.

<b>Performance Measures</b>	<b><u>GO</u></b>	<b><u>NO GO</u></b>
1. Installed hot loop.	_____	_____
2. Repaired communication wire.	_____	_____

**Evaluation Guidance:** Score the soldier GO if all performance measures are passed. Score the soldier NO-GO if any performance measure is failed. If the soldier scores NO-GO, show the soldier what was done wrong and how to do it correctly.

**References  
Required**

- Related**  
 FM 11-43  
 FM 11-50  
 FM 24-33  
 FM 7-7

**Recover Communication Wire Lines**

**071-820-0004**

**Conditions:** In a combat environment, given empty DR-8s, as required; reel unit, RL-39; a telephone, TA 1/PT; helpers, as needed; and a requirement to recover communications wire lines (WD-1/TT).

**Standards:** Recovered communications wire WD-1/TT. Inspected, repaired (where required), and recoiled the wire onto a DR-8 for future use.

**Performance Steps**

1. Determine and obtain the materials required to recover the communications wire line.
2. Inspect the recovery equipment for serviceability.
3. Run the standing end of the wire around the DR-8 spool, through the small hole in the side of the spool and connect it to the screw type connectors located there (if the DR-8 is empty; if not, splice the standing end of the wire to the wire on the DR-8).
4. Direct a helper, if provided, to follow the wire's route, release the wire from its fixed anchor points, and remove the identification tags.
5. Hang the reel unit, RL-39, around the neck and snap the carrying handles on the DR-8 to the carrying straps. Move slowly in the direction that the wire is running and rotate the reel using the crank and axle, winding the wire onto the DR-8 spool.
6. As the wire coils on the DR-8 spool, visually inspect the wire for breaks and abrasions. If time permits, repair the wire before winding it onto the spool.
7. Continue the process described in step 5 until all wire has been inspected, repaired, and re-coiled on the DR-8 spool.

**Evaluation Preparation: SETUP:** At the test site provide all materials according to the task condition statement.

**BRIEF SOLDIER:** Tell the soldier to recover the wire and coil the wire onto a DR-8 for future use.

<b>Performance Measures</b>	<b><u>GO</u></b>	<b><u>NO GO</u></b>
1. Determined and obtained the materials required to recover the communications wire line.	—	—
2. Inspected the recovery equipment for serviceability.	—	—
3. Ran the standing end of the wire around the DR-8 spool, through the small hole in the side of the spool, and connected it to the screw type connectors located there (if the DR-8 was empty; if not, spliced the standing end of the wire to the wire on the DR-8).	—	—
4. Followed the wire's route, released the wire from its fixed anchor points, and removed the identification tags.	—	—
5. Hung the reel unit, RL-39, around the neck and snapped the carrying handles on the DR-8 to the carrying straps. Moved slowly in the direction the wire was running and rotated the reel using the crank and axle, winding the wire onto the spool DR-8.	—	—
6. As the wire coiled onto the DR-8 spool, visually checked the wire for breaks and abrasions.	—	—

**Performance Measures****GO**    **NO GO**

7. Continued the process described in step 5 until all wire was inspected, repaired, and coiled on the DR-8 spool.

—      —

**Evaluation Guidance:** Score the soldier GO if all performance measures are passed. Score the soldier NO-GO if any performance measure is failed. If the soldier scores NO-GO, show the soldier what was done wrong and how to do it correctly.

**References  
Required**

**Related**  
FM 11-43

**Troubleshoot Secure Single-Channel Ground and Airborne Radio Systems (SINGARSs) ICOM  
With or Without the AN/VIC-1 or AN/VIC-3  
113-587-0070**

**Conditions:** Given an inoperable secure SINGARS with or without intercommunications set AN/VIC-1, with or without frequency-hopping multiplexer (FHMUX) TD-1456/VRC, operating in a net; digital multimeter AN/PSM-45(\*); radio test set AN/PRM-34; tool kit TK-101/G; ANCD AN/CYZ-10 with fill, fill cable; TM 11-5820-890-20-1, TM 11-5820-890-20-2, or TM 11-5820-890-20-3; DA Form 5986-E, and DA Form 5988-E.

**Standards:** Restored the radio set to operation or evacuated the defective LRU to a higher maintenance level.

**Performance Steps**

1. Verify reported malfunctions.
  - a. Review operator's actions.
  - b. Perform visual inspections.
2. Perform systematic troubleshooting procedures.
  - a. Perform self-test.
  - b. Perform off-line measurements.
3. Take corrective actions.
  - a. Fix or replace the defective LRU. (Refer to the MAC.)
  - b. Perform an operational check.
  - c. Evacuate the defective LRU to a higher maintenance level.
    - (1) Process for a higher maintenance level.
    - (2) Prepare maintenance forms.

**Performance Measures**

NOTE: Refer to TM 11-5820-890-20-1, TM 11-5820-890-20-2, or TM 11-5820-890-20-3 for all performance measures.

	<u>GO</u>	<u>NO GO</u>
1. Verified reported malfunctions.	_____	_____
a. Reviewed operator's actions.		
b. Performed visual inspection.		
2. Performed systematic troubleshooting procedures.	_____	_____
a. Performed self-test.		
b. Performed off-line measurements.		
3. Took corrective actions.	_____	_____
a. Fixed or replaced the defective LRU. (Refer to the MAC.)		
b. Performed an operational check.		
c. Evacuated the defective LRU to a higher maintenance level.		
(1) Processed for a higher maintenance level.		
(2) Prepared maintenance forms.		

**Evaluation Guidance:** Score the soldier GO if all steps are passed. Score the soldier NO GO if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly. Have the soldier practice until he can correctly perform the task.

**References**

**Required**

**Related**

DA PAM 738-750

**Repair Telephone Cable WD-1/TT or WF16/U  
113-588-4025**

**Conditions:** Given an telephone cable containing an open and a ground or short, an tool equipment TE-33, an telephone set TA-312/PT (operational) two each, an crimper E9B, an splice connectors UIR, an friction tape and electrical tape, and an TC 24-20.

**Standards:** Standards have been met when the telephone cable has been repaired and tested.

**Performance Steps**

1. Repair an open.
2. Repair short or ground.
3. Test telephone cable.

**Performance Measures**

1. Repaired an open.
2. Repaired short or ground.
3. Tested telephone cable.

<u>GO</u>	<u>NO GO</u>
—	—
—	—
—	—

Note: Refer to TC 24-20 for all performance measures.

**Evaluation Guidance:** Score the soldier GO if all steps are passed. Score the soldier NO-GO if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

**References**

**Required**

- TC 24-20
- TM 11-5805-201-12

**Related**

**Install and Operate an Switchboard, Telephone, Manual SB-993/GT  
113-594-2005**

**Conditions:** Given a switchboard SB-993/GT complete, tool equipment TE-33, field wire lines to telephones, three each, an ACP 134, a TM 11-5805-294-12, with paper and pencil.

**Standards:** Standard is met when SB-993/GT has been installed and operational IAW TM 11-5805-294-12, chapter 2, and ACP 134, chapter 3, within 15 minutes.

**Performance Steps**

1. Perform pre installation procedures. (Refer to TM 11-5805-294-12, para 7)
2. Install the switchboard. (Refer to TM 11-5805-294-12, para 2-6)
3. Process a line-to-line call. (Refer to TM 11-5805-294-12, para 10; ACP 134, table 1, pp 3-3, 3-4, and 3-6)
4. Processes a conference call. (Refer to TM 11-5805-294-12, para 2-7; ACP 134, table1, pp 3-3, 3-4, 3-5, and 3-6)

**Performance Measures**

	<u>GO</u>	<u>NO GO</u>
1. Performed pre installation procedures.	—	—
2. Installed the switchboard.	—	—
3. Processed a line-to-line call.	—	—
4. Processed a conference call.	—	—

**Evaluation Guidance:** Score the soldier GO if all steps are passed. Score the soldier NO-GO if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

**Operate Switchboard, Telephone, Manual SB-22/PT  
113-594-2014**

**Conditions:** This task is performed in a tactical or non-tactical situation, in all weather conditions, and may be performed in an NBC environment. Given a switchboard SB-22/PT, prepared traffic diagram, incoming calls to answer, TM 11-5805-201-12, battery BA-30 (four each), sledgehammer and shovel, ground rod MX-148/G with ground strap, field wire lines (from terminal equipment), tool kit TE-33, cleaning brush, pencil, DA Form 2404 (equipment inspection and maintenance work sheet).

**Standards:** Standard is met when switchboard is installed, local, trunk, and conference calls are processed, and PMCS is performed IAW TM 11-5805-262-12, ACP 134, chapters 2 and 3, and DA Pam 738-750.

**Performance Steps**

1. Install switchboard. (Refer to TM 11-5805-262-12, para 2-3 thru 2-9)
  2. Perform PMCS. (Refer to TM 11-5805-262-12, para 3-3)
- Note: Refer to TM 11-5805-262-12, para 3-5 thru 3-11 for steps 3-9.
3. Perform preliminary operating procedures.
  4. Connect local calls.
  5. Connect outgoing trunk calls.
  6. Connect incoming trunk calls.
  7. Perform recall procedures on local calls.
  8. Perform recall procedures on trunk calls.
  9. Connect conference calls.

**Performance Measures**

	<u>GO</u>	<u>NO GO</u>
1. Installed switchboard.	___	___
2. Performed PMCS.	___	___
3. Performed preliminary operating procedures.	___	___
4. Connected local calls.	___	___
5. Connected outgoing trunk calls.	___	___
6. Connected incoming trunk calls.	___	___
7. Performed recall procedures on local calls.	___	___
8. Performed recall procedures on trunk calls.	___	___
9. Connected conference calls.	___	___

**Evaluation Guidance:** Score the soldier GO if all steps are passed. Score the soldier NO-GO if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

**References**

**Required**  
DA PAM 738-750

**Related**

**Install Tactical Telephone**  
**113-600-1023**

**Conditions:** Given an telephone set TA-312/PT, battery BA-30 (two each), tool kit TE-33, TM 11-5805-201-12, installed wire line. This task is performed in a tactical or non-tactical situation, in all weather conditions, and may be performed in an NBC environment.

**Standards:** Standard is met when telephone is installed, an operation check is made, and PMCS is performed IAW TM 11-5805-201-12, chapter 2, TC 24-20, chapter 12, and DA Pam 738-750 within 10 minutes.

**Performance Steps**

1. Perform PMCS. (Refer to TM 11-5805-201-12, para 4-2)
2. Prepare telephone for operation. (Refer to TM 11-5805-201-12, para 2-3a, and TC 24-20, chapter 12)
3. Install batteries. (Refer to TM 11-5805-201-12, para 2-3f)
4. Install telephone on a pole or tree. (Refer to TM 11-5805-201-12, para 2-3b)
5. Install/remove deicing screen. (Refer to TM 11-5805-201-12, para 2-3g)
6. Perform operational check. (Refer to TM 11-5805-201-12, para 3-2 and 3-3a)

**Performance Measures**

	<u>GO</u>	<u>NO GO</u>
1. Performed PMCS.	_____	_____
2. Prepared telephone for operation.	_____	_____
3. Installed batteries.	_____	_____
4. Installed telephone on a pole or tree.	_____	_____
5. Installed/removed deicing screen.	_____	_____
6. Performed operational check.	_____	_____

**Evaluation Guidance:** Score the soldier GO if all steps are passed. Score the soldier NO-GO if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

**References**

<b>Required</b>	<b>Related</b>
TC 24-20	
TM 11-5805-201-12	

**Operate Telephone Set TA-312/PT  
113-600-2007**

**Conditions:** This task is performed in a tactical or non-tactical situation, under all weather conditions, and it may be performed in an NBC environment. You will be provided with the following: 1. Telephone set TA-312/PT (installed), two each. 2. Headset H-144/U. 3. Screwdriver. 4. TM 11-5805-201-12.

**Standards:** Task standard has been met when a call has been initiated and completed IAW the performance measures.

**Evaluation Preparation:**

<b>Performance Measures</b>	<b><u>GO</u></b>	<b><u>NO GO</u></b>
NOTE: Refer to TM 11-5805-201-12 for performance measures.		
1. Initiate a call in the prescribed mode of operation (paragraph 3-2).	—	—
2. Answer calls in the prescribed mode of operation (paragraph 3-3a). NOTE: Performance measure 3 may be used if the telephone operator must have his hands free during operation.	—	—
3. Answer calls using external headset (paragraph 3-3b). NOTE: Operation under conditions less than ideal may require the operator to make special operating considerations.	—	—
4. Operate telephone set under unusual conditions (paragraph 3-4).	—	—

**Evaluation Guidance:** Score the soldier GO if all steps are passed (P). Score the soldier NO-GO if any step is failed (F). If any step is failed, show the soldier what was done wrong and how to do it correctly.

**References**

**Required**

TM 11-5805-201-12

**Related**

622-113-1886-B

DVC 11-03

SS0410

**Perform Operators PMCS on Tactical Telephone Sets  
113-600-3015**

**Conditions:** Given an telephone set TA-312/PT, batteries BA-30 or BA 3030 (two each), telephone set TA-838/TT, batteries BA-42 or 3042 (four each), telephone set TA-1/PT, lint-free cloth and brush, DA Form 2404, denatured alcohol, TM 11-5805-201-12, TM 11-5805-650-12, TM 11-5805-243-13, DA Pam 738-750.

**Standards:** Standard has been met when the maintenance has been performed and DA Form 2404 is completed.

**Performance Steps**

1. Perform maintenance on TA-312/PT. (Refer to TM 11-5805-201-12)
2. Complete DA Form 2404. (Refer to DA Pam 738-750)
3. Perform maintenance on TA-838/TT. (Refer to TM 11-5805-650-12)
4. Complete DA Form 2404. (Refer to DA Pam 738-750)
5. Perform maintenance on TA-1/PT. (Refer to TM 11-5805-243-13)
6. Complete DA Form 2404. (Refer to DA Pam 738-750)

**Performance Measures**

	<u>GO</u>	<u>NO GO</u>
1. Performed maintenance on TA-312/PT.	___	___
2. Completed DA Form 2404. (TA-312/PT)	___	___
3. Performed maintenance on TA-838/TT.	___	___
4. Completed DA Form 2404. (TA-838/TT)	___	___
5. Performed maintenance on TA-1/PT.	___	___
6. Completed DA Form 2404. (TA-1/PT)	___	___

**Evaluation Guidance:** Score the soldier GO if all steps are passed. Score the soldier NO-GO if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

**References**

<b>Required</b>	<b>Related</b>
DA PAM 738-750	
TM 11-5805-201-12	
TM 11-5805-243-13	
TM 11-5805-650-12	

**Operate Automated Net Control Device (ANCD) AN/CYZ-10  
113-609-2053**

**Conditions:** Given two Automated Net Control Device (ANCD) AN/CYZ-10, SINCGARS Radio Set with secure device, W4 Fill Cable, TB 11-5820-890-12, and TM 11-5820-890-10-8.

**Standards:** Perform in sequence the transfer of COMSEC Keys and SOI information from ANCD to ANCD; Load radio with COMSEC using ANCD; Obtain SOI information from ANCD, correcting all errors within 15 minutes.

**Performance Steps**

1. Transfer COMSEC Keys and SOI information from ANCD to ANCD.
  - a. Turn on both ANCDs.
  - b. Make main menu selection. (ANCD)
  - c. Make source ANCD menu selections.
  - d. Make target ANCD menu selections.
  - e. Transfer data from ANCD to ANCD.
  - f. Turn off/disconnect ANCDs.
  
2. Load radio from ANCD using mode 2 fill.
  - a. Turn on radio and ANCD.
  - b. Make main menu selection. (ANCD)
  - c. Make application menu selection. (ANCD)
  - d. Set controls of radio and connect to ANCD with fill cable.
  - e. Transfer mode 2 fill from ANCD to radio.
  - f. Disconnect ANCD from radio and turn off ANCD.
  
3. Obtain SOI information from ANCD.
  - a. Turn on ANCD.
  - b. Make main menu selection.
  - c. Make SOI menu selection.
  - d. Turn off ANCD.
  
4. Perform PMCS on ANCD.
  - a. Visual inspection.
  - b. Check battery.
  - c. Check fill port/CIK port.

**Performance Measures**

1. Transferred COMSEC keys and SOI information from ANCD to ANCD.
  - a. Turned on both ANCDs.
  - b. Made main menu selection. (ANCD)
  - c. Made source ANCD menu selections.
  - d. Made target ANCD menu selections.
  - e. Transferred data from ANCD to ANCD.
  - f. Turned off/disconnected ANCDs.
  
2. Loaded radio from ANCD using Mode 2 fill.
  - a. Turned on radio and ANCD.
  - b. Made main menu selection. (ANCD)
  - c. Made application menu selection. (ANCD)
  - d. Set controls of radio and connect to ANCD with fill cable.
  - e. Transferred mode 2 fill from ANCD to radio.
  - f. Disconnected ANCD from radio and turned off ANCD.

**GO      NO GO**

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\_\_\_\_\_

**Performance Measures**

- 3. Obtained SOI information from ANCD.
  - a. Turned on ANCD.
  - b. Made main menu selection.
  - c. Made SOI menu selection.
  - d. Turned off ANCD.
  
- 4. Performed PMCS on ANCD.
  - a. Conducted visual inspection.
  - b. Checked battery.
  - c. Checked fill port/CIK port.

**GO**      **NO GO**

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\_\_\_\_\_

**Evaluation Guidance:** Score the soldier GO if all steps are passed. Score the soldier NO-GO if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

**References**

**Required**

- DA PAM 738-750
- TB 11-5820-890-12
- TM 11-5820-890-10-8

**Related**

Subject Area 7: COMMUNICATE: RADIO

**Operate SINCGARS Data Devices  
113-587-2075**

**Conditions:** Given an SINCGARS operating in a digital net, designated operational data device, TM 5820-890-10-1 for ICOM or TM 11-5820-890-10-3 for Non-ICOM, and appropriate data devices technical bulletin (TB).

**Standards:** Standards are met when data is sent and received over the net.

**Performance Steps**

1. Connect data device cable to RT audio/data connector.
2. Set FCTN to SQ ON.
3. Set data rate switch.
4. Send and receive data.

**Performance Measures**

1. Connected data device cable to RT audio/data connector.
2. Set FCTN to SQ ON.
3. Set data rate switch.
4. Send and receive data.

<u>GO</u>	<u>NO GO</u>
_____	_____
_____	_____
_____	_____
_____	_____

Note: Refer to TM 11-5820-890-10-1 or TM 5820-8980-10-3 for performance measures 1 and 2. Refer to appropriate data device TB for performance measures 3 and 4.

**Evaluation Guidance:** Score the soldier GO if all steps are passed. Score the soldier NO-GO if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

**References**

**Required**

- TM 11-5820-890-10-1
- TM 11-5820-890-10-3

**Related**

- FM 24-18

**Operate Secure SINCGARS Using Control Monitor (CM)**  
**113-587-207**

**Conditions:** Given a SINCGARS radio operating in a net, C-11291 CM, TM 11-5820-890-10-1, TM 11-5820-890-10-3, and unit SOI.

**Standards:** The standards are met when radio functions are changed using the CM.

**Performance Steps**

1. Prepare control monitor for operation.
2. Change radio functions using the control monitor.

**Performance Measures**

	<u>GO</u>	<u>NO GO</u>
1. Prepared control monitor for operation.	—	—
2. Changed radio functions using the control monitor.	—	—

**Evaluation Guidance:** Score the soldier GO if all steps are passed. Score the soldier NO-GO if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly. Have the soldier practice until he can correctly perform the task.

**References**

<b>Required</b>	<b>Related</b>
TM 11-5820-890-10-1	
TM 11-5820-890-10-3	

**Operate SINGARS Remote Control Unit (SRCU)**

**113-587-2077**

**Conditions:** Given a SINGARS ICOM operating a net, SRCU C-11561, battery BA-1372, battery BA-5590, battery case CY-8346, flat-tip screwdriver, installed field wire line WF-16, pack frame, cable CX-13298, distant station, TM 11-5820-890-10-1, and TM 11-5820-890-20-1.

**Standards:** The standards are met when an operational message is sent and received from the SRCU.

**Performance Steps**

1. Prepare SRCU for operation.
2. Operate SRCU single channel (SC).
3. Operate SRCU frequency hopping (FH).

**Performance Measures**

	<u>GO</u>	<u>NO GO</u>
1. Prepared SRCU for operation.	—	—
2. Operated SRCU single channel (SC).	—	—
3. Operated SRCU frequency hopping (FH).	—	—

**Evaluation Guidance:** Score the soldier GO if all steps are passed. Score the soldier NO-GO if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly. Have the soldier practice until he can correctly perform the task.

**References**

**Required**

TM 11-5820-890-10-1

**Related**

**Construct a Field-Expedient Antenna**  
**071-810-0003**

**Conditions:** In a combat environment, given field wire, material suitable to use as insulators, a knife, parachute suspension cord or other suitable string material, electrical tape, an operational FM radio, a designated radio frequency and call sign, and a requirement to construct an FM antenna using the materials available.

**Standards:** Established communications with a designated distant radio station.

**Performance Steps**

1. Select type of antenna the mission requires.
  - a. Vertical antennas are omni-directional; that is, they transmit and receive equally well in all directions. Most tactical antennas are vertical; for example, the manpack portable radio uses a vertical whip as do the vehicular radios in tactical vehicles.

**NOTES:**

-- A vertical antenna may be improvised by using a metal pipe or rod of the correct length, held erect by guy lines. The lower end of the antenna should be insulated from the ground by placing it on a large block of wood or other insulating material.

-- A vertical antenna may also be a wire supported by a tree or a wooden pole. For short vertical antennas, the pole may be used without guys (if properly supported at the base). If the length of the vertical mast is not long enough to support the wire upright, it may be necessary to modify the connection at the top of the antenna.

- b. Doublet antennas are directional broadside to their length, which makes the vertical doublet antenna essentially omnidirectional. This is because the radiation pattern is doughnut shaped. The horizontal doublet antenna is bi-directional.
    - c. The vertical half-rombic, long-wire, and "V" antenna are three types of field-expedient directional antennas. These antennas consist of a single wire two or more wave lengths long, supported on poles or tree branches at a height of 3 to 7 meters (10 to 20 feet) above the ground. These antennas will, however, operate satisfactorily as low as 1 meter (approximately 3 feet) above the ground.
2. Construct a field-expedient omnidirectional antenna.
  - a. Analyze the materials available in the area to fabricate the desired antenna.
  - b. Determine the required length of the improvised antenna.
  - c. Determine the method by which the antenna will be supported (if required).
  - d. Attach any required insulators to the antenna wire (if wire is used).
  - e. Stretch and attach the antenna (if wire is used) to a vertical support (tree or pole), and secure it in a taut position.
  - f. Attach the antenna to the radio's antenna well.
  - g. Scrape the paint from a small (1 inch) point on the radio's case at the point where the ground wire will be attached (normally where the battery case connects to the RT).
  - h. Position the antenna until the radio performs to its maximum capability and clear communications have been established with the distant station.
  - i. Attach one end of the ground wire to the sharpened end of the ground stake (if made of wood) and drive it deeply into the ground. If the ground stake is made of metal, attach the ground wire to the top of the stake and drive it into the ground.
  - j. Attach the other end of the ground wire to the radio's case at the point where the paint was removed.
  - k. Attempt to contact a distant radio station.
3. Construct a half-wave doublet antenna.
  - a. Determine the expedient materials required and available to construct a half-wave doublet antenna.

**Performance Steps**

- b. Determine the best location to construct the antenna.
- c. Cut two lengths of wire 1/4 wave length long.
- d. Connect the two wires together with an expedient insulator.
- e. Attach insulators to each end of the antenna wire to insulate the antenna from its supports.
- f. Attach sufficient wire, cord, or rope to the outer two insulators to permit the antenna to be secured to the identified anchor points.
- g. Untwist and spread the two wires apart and remove approximately 3 inches of insulation from the ends of the wire that will be attached to the center of the wire antenna.
- h. Remove a portion (approximately 1 inch) of insulation from the end of each length of antenna wire at a point approximately 3 inches from the center insulator.
- i. Connect the ends of the wire, with the insulation removed and running to the radio, to the anchor points.
- j. Tape the connections.
- k. Remove approximately 1 inch of insulation from the ends of the antenna running to the radio.
- l. Untwist the wire and connect one strand of the wire to the base of the small antenna and screw it into the antenna well.
- m. Release the clamp on one side of the battery box, scrape a small portion of the paint away so that bare metal is exposed, attach the remaining twisted strand of wire to the point from which the paint was removed, close the battery box, and fasten the clamp.
- n. Stretch the wire between two anchor points (ensure that an insulator is between the anchor point and the antenna portion of the wire) and secure the insulator to the anchor points.
- o. Attempt to establish communications with a distant radio station set to the same frequency.
- p. Adjust the antenna, as required, to obtain maximum performance of the antenna.

## 4. Construct a field-expedient directional antenna.

- a. Determine the type of directional antenna required for mission accomplishment.
- b. Identify and locate the expedient materials required to construct the desired type of antenna.
- c. Determine the location where the antenna will be erected.
- d. Construct the required antenna.
  - (1) Construct vertical half-rombic antenna.
    - (a) Determine the direction in which the desired receiving station is located by using a compass.
    - (b) Lay the antenna on the ground so that the long axis of the antenna is aligned on the desired azimuth.
    - (c) Connect the far end (opposite of the radio) to a ground stake.
    - (d) Cut the wire at a point approximately 18 inches from the anchor point in the desired direction of transmission and attach an expedient resistor to the end of it. Secure the other end of the resistor to the wire running to the anchor point and tighten the wire.
    - (e) Cut the wire at a point approximately 3 feet from the anchor point nearest the radio and attach an expedient insulator between the anchor point and the long wire of the antenna. Stretch the antenna wire across the vertical support pole(s) or tree limb(s) so that an angle of approximately 54 degrees is obtained and attach it to a ground stake (near the radio).
    - (f) At a distance of approximately 3 to 4 feet from the ground stake nearest the radio, cut the antenna wire and connect one end of the antenna to an expedient insulator.
    - (g) Connect the portion of wire connected to the ground stake to the opposite end of the insulator.
    - (h) Cut an additional piece of wire approximately 5 feet long, attach it to a point below the insulator at a point where the insulation has been removed, and connect it to the radio.
    - (i) Tape all connections with waterproof tape.
    - (j) Attempt to contact a distant radio station.
  - (2) Construct long-wire antenna.

**CAUTION:** DO NOT use this antenna with the radio transmitter 524 in the high power mode. Damage to the radio could result.

**Performance Steps**

- (a) Stretch the antenna wire (approximately 100 feet long) between two vertical supports at an approximate height of 3 1/2 to 4 1/2 meters above the ground of 3.5 to 4.5 meters. Run the wire (opposite end from the radio) at an angle of approximately 45 degrees and anchor it to the ground using either metal or wooden ground stakes.
- (b) Attach the end of the antenna wire located where the radio will be operated from to a stake and anchor it to the ground.
- (c) Cut the wire at a point approximately 2 feet from the anchor point in the desired direction of transmission and attach an expedient resistor between the anchor point and the antenna.
- (d) Cut the wire at a point approximately 3 feet from the anchor point nearest the radio and attach an expedient insulator between the anchor point and the long wire of the antenna.
- (e) Run a short (approximately 4 feet) piece of wire (single strand WD 1) from the antenna terminal on the radio to a point above the insulator from which the insulation has been removed and secure it.
- (f) Secure a second single strand of wire to the radio at a point on the radio from which the paint has been removed to the other end of the insulator,
- (g) Place the radio into operation and attempt to contact a distant radio station.
- (h) Adjust the antenna's length as required to obtain optimum performance of the radio.
- (3) Construct the "V" antenna so the open end of the V is oriented in the desired direction of transmission.
  - (a) Determine the desired configuration of the antenna.
  - (b) Determine the length of the antenna legs and their angles.
  - (c) Identify the vertical support(s) required.
  - (d) Construct the antenna.
  - (e) Attempt to contact a distant radio station.
  - (f) Adjust the antenna as required to obtain optimum performance (if required).

**Evaluation Preparation: SETUP:** At the test site provide the soldier with all the materials according to the task condition statement.

**BRIEF SOLDIER:** Tell the soldier to construct a field expedient antenna using the materials provided that allows the provided radio to communicate with a distant station.

**Performance Measures**

	<u>GO</u>	<u>NO GO</u>
1. Selected the type of antenna the mission required.	_____	_____
2. Constructed a field-expedient omnidirectional antenna. <ul style="list-style-type: none"> <li>a. Analyzed the materials available in the area to fabricate the desired antenna.</li> <li>b. Determined the required length of the improvised antenna.</li> <li>c. Determined the method by which the antenna would be supported (if required).</li> <li>d. Attached any required insulators to the antenna wire (if wire was used).</li> <li>e. Stretched and attached the antenna (if wire was used) to a vertical support (tree or pole) and secured it in a taut position.</li> <li>f. Attached the antenna to the radio's antenna well.</li> <li>g. Scraped the paint from a small (1 inch) point on the radio's case at the point where the ground wire was be attached (normally where the battery case connects to the RT).</li> <li>h. Adjusted the length and position of the antenna until the radio performed to its optimum capability, and clear communications were established with the distant station.</li> <li>i. Attached one end of the ground wire to the sharpened end of the ground stake (if made of wood) and drove it deeply into the ground. If the ground</li> </ul>	_____	_____

**Performance Measures**

**GO**    **NO GO**

- stake was made of metal, attached the ground wire to the top of the stake and drove it into the ground.
  - j. Attached the other end of the ground wire to the radio's case at the point where the paint was removed.
  - k. Contacted a distant radio station.
  
- 3. Constructed a half-wave doublet antenna.
 

	_____	_____
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  - a. Determined the expedient materials required and available to construct a half-wave doublet antenna.
  - b. Determined the best location to construct the antenna.
  - c. Cut two lengths of wire 1/4 wave length long.
  - d. Connected the two wires together with an expedient insulator.
  - e. Attached insulators to each end of the antenna wire to insulate the antenna from its supports.
  - f. Attached sufficient wire, cord, or rope to the outer two insulators to permit the antenna to be secured to the identified anchor points.
  - g. Untwisted the two wires and removed approximately 3 inches of insulation from the ends of the wire that would be attached to the center of the wire antenna.
  - h. Removed a portion (approximately 1 inch) of insulation from the end of each length of antenna wire at a point approximately 3 inches from the center insulator.
  - i. Connected the ends of the wire from which the insulation was removed, and ran it to the radio.
  - j. Taped the connections to ensure it was water tight.
  - k. Removed approximately 1 inch of insulation from the ends of the antenna and ran it to the radio.
  - l. Untwisted the wire and connected one strand of the wire to the base of small antenna and screwed it into the antenna well.
  - m. Released the clamp on one side of the battery box, scraped a small portion of the paint away so that bare metal was exposed, attached the remaining twisted strand of wire to the point from which the paint was removed, closed the battery box, and fastened the clamp in the closed position.
  - n. Stretched the wire between two anchor points, ensured that an insulator was between the anchor point and the antenna portion of the wire, and secured it in a taut manner to the anchor points.
  - o. Attempted to establish communications with a distant radio station set to the same frequency.
  - p. Adjusted the antenna, as required, to obtain maximum performance of the antenna.
  
- 4. Constructed a field-expedient directional antenna.
 

	_____	_____
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  - a. Determined the type of directional antenna required for mission accomplishment.
  - b. Identified and located the expedient materials required to construct the desired type of antenna.
  - c. Determined the location where the antenna would be erected.
  - d. Constructed the required antenna.
    - (1) Constructed the vertical half-rombic antenna.
      - (a) Determined the direction in which the desired receiving station was located by using a compass.
      - (b) Laid the antenna on the ground so that the long axis of the antenna was aligned on the desired azimuth.
      - (c) Connected the far end (opposite of the radio) to a ground stake.
      - (d) Cut the wire at a point approximately 18 inches from the anchor

**Performance Measures****GO**    **NO GO**

- point in the desired direction of transmission and attached an expedient resistor to the end of it. Secured the other end of the resistor to the wire, ran it to the anchor point, and tightened the wire.
- (e) At a distance of approximately 3 to 4 feet from the ground stake nearest the radio, cut the antenna wire and connected one end of the antenna to an expedient insulator.
  - (f) Connected the portion of wire connected to the ground stake to the opposite end of the insulator.
  - (g) Cut a portion of wire approximately 5 feet in length and attached it to a point above the insulator where the insulation was removed and the insulator attached.
  - (h) Attached the other end of the wire to the radio's antenna well.
  - (i) Cut an additional piece of wire approximately 5 feet long, attached it to a point below the insulator at a point where the insulation was removed, and connected it to the radio.
  - (j) Taped all connections with waterproof tape.
  - (k) Attempted to establish communications with a distant station.
- (2) Constructed long-wire antenna.
- (a) Stretched the antenna wire (approximately 100 feet long) between two vertical supports at an approximate height 3 1/2 to 4 1/2 meters above the ground. Ran the wire (opposite end from the radio) at an angle of approximately 45 degrees and anchored it to the ground using either metal or wooden ground stakes.
  - (b) Attached the end of the antenna wire located where the radio will be operated from to a stake and anchored it to the ground.
  - (c) Cut the wire at a point approximately two feet from the anchor point in the desired direction of transmission and attached an expedient resistor between the anchor point and the antenna.
  - (d) Cut the wire at a point approximately 3 feet from the anchor point nearest the radio and attached an expedient insulator between the anchor point and the long wire of the antenna.
  - (e) Placed the radio into operation and attempted to contact a distant radio station.
  - (f) Adjusted the antenna's length, as required, and obtained optimum performance of the radio.
- (3) Constructed the "V" antenna so the open end of the "V" was oriented in the desired direction of transmission.
- (a) Determined the desired configuration of the antenna.
  - (b) Identified and located the expedient materials required to construct the desired type of antenna.
  - (c) Determined the location where the antenna would be erected.
  - (d) Constructed the antenna.
  - (e) Attempted to contact a distant radio station.
  - (f) Adjusted the antenna's length as required to obtain optimum performance of the radio.

**Evaluation Guidance:** Score the soldier GO if all performance measures are passed. Score the soldier NO-GO if any performance measure is failed. If the soldier scores NO-GO, show the soldier what was done wrong and how to do it correctly.

**References****Required****Related**

FM 24-18

**Maintain Intercommunications Set, AN/VIC-1, on a Tracked Vehicle (Includes FM Radio)  
071-810-0004**

**Conditions:** Given a tracked vehicle with an installed intercommunications set; basic issue items (BII); cleaning equipment and rags, as required; appropriate technical manuals (TM), as applicable; and a requirement to perform operator and or other required maintenance on the vehicle's intercommunications set.

**Standards:** Scheduled and or other required operator's maintenance was performed on the vehicle's intercommunications set. The system was inspected and corrections made where required within the scope of the operator's responsibility. Uncorrected faults were recorded following procedures in DA Pam 738-750 and were reported to the chain of command.

**Performance Steps**

NOTE: As part of the maintenance, check to ensure that all accessories to the system are properly installed.

1. Inspect the vehicle's intercom and all accessories to determine their serviceability, following procedures prescribed in the appropriate TM.
2. Correct identified faults within the scope of the operator's responsibility.
3. Record uncorrected faults following procedure as prescribed in DA Pam 738-750.
4. Report uncorrected faults to the chain of command.

**Evaluation Preparation:** SETUP: At the test site, provide the soldier with all the equipment given in the task condition statement.

BRIEF SOLDIER: Tell the soldier to perform maintenance on the AN/VIC-1 on a tracked vehicle.

<b>Performance Measures</b>	<u><b>GO</b></u>	<u><b>NO GO</b></u>
1. Inspected the vehicle's intercom, checked to ensure that all accessories to the system were properly installed.	—	—
2. Corrected identified faults within the scope of the operator's responsibility.	—	—
3. Recorded uncorrected faults following procedures as prescribed in DA Pam 738-750.	—	—
4. Reported uncorrected faults to the chain of command.	—	—

**Evaluation Guidance:** Score the soldier GO if all performance measures are passed. Score the soldier NO-GO if any performance measure is failed. If the soldier scores NO-GO, show the soldier what was done wrong and how to do it correctly.

**References**

**Required**

- TM 11-5820-401-10-2
- TM 11-5820-498-12
- TM 11-5830-340-12

**Related**

- DA PAM 738-750

**Operate in Radio Nets**

**113-571-1004**

**Conditions:** Given a requirement and the following: Radio set; Unit SOI; ANCD; Applicable TM for radio set used; Applicable Army regulations; Applicable allied communications publications (ACPs). Supervision and assistance will be available.

**Standards:** Task standard has been met when you have properly entered the selected radio net and authenticated upon request of the NCS. You have transmitted and received traffic as directed by the NCS, performed duties as NCS, and have left and/or closed the net in accordance with applicable operating procedures and ACP for the radio net in which you are operating according to performance measure 1 through 5.

<b>Performance Measures</b>	<u><b>GO</b></u>	<u><b>NO GO</b></u>
1. Determines operational net to be entered. (Refer to SOI or ANCD.)	—	—
2. Requests permission to enter net. (Refer to ACP 125(E), ACP 124(D), ACP 126(C), FM 24-19, Operating Procedures.)	—	—
3. Passes traffic as directed by the NCS. (Refer to ACP 125(E), ACP 124(D).ACP-126(C)	—	—
4. Requests permission from the NCS to leave the net. (Refer to ACP 125(E), ACP 124(D), ACP 126(C), ACP-131(E), FM 24-19, station leaving net and closing a net.)	—	—
5. Performs functions of an NCS. (Refer to ACP 125(E), ACP 124(D), FM 24-19, precedence prosigns.)	—	—

**Evaluation Guidance:** Score the soldier GO if all steps are passed. Score the soldier NO-GO if any steps are failed. If the soldier scores NO-GO, show what the soldier what was done wrong and how to do it correctly.

**References**

**Required**  
 ACP 125(D)  
 FM 24-19

**Related**  
 TC 24-19

**Encode and Decode Messages Using KTC 600(\*) Tactical Operations Code  
113-573-4003**

**Conditions:** Given a unit SOI with KTC 600(\*) (OPCODE), plain text message to be encoded, and encoded message to be decoded. Supervision and assistance will be available.

**Standards:** Encode and decode a message using KTC 600(\*) within 30 seconds per code group or word/phrase.

**Performance Steps**

SECURITY PRECAUTIONS: Use of code set. Each set of the KTC 600(\*) tactical operations code is effective for 48 hours unless otherwise directed by the signal office. Never mix plain language with encoded messages. Spelling and punctuation must be kept to an absolute minimum. Variant code groups are provided for more commonly used phrases. These should be used impartially and at random. SECURITY PRECAUTIONS: Spare groups are provided to assign additional variants to plain text phrases in the code, or to assign new plain text values as required.

1. Encode a message that has been provided by the supervisor.
  - a. Write the plain text message on a piece of paper, leaving sufficient space above each line to write the code values.
  - b. Turn to the code set to be used for the time period.
  - c. Find the word, phrase, or number to be encoded and write the three-letter code group on the message.

NOTE: The encode section of the operations code is made up of words and phrases commonly used in tactical operations which are arranged in alphabetical order, like a dictionary.

NOTE: The numeral section of the operations code provides two types of code groups for each number.

- (1) The numbers which are not followed by the symbol (+) will be used when the numerals are used singularly or as the first final number of a group of numbers.
- (2) The numbers with the (+) ending will be used with all but the final number of a group of numbers.

2. Decode a message that has been provided.
  - a. After receiving and writing down the encoded message, turn to the code set to be used for the time period.

NOTE: The decode section of the code is made up of the three-letter code groups in alphabetical order, with a word, phrase, or number to the right of each group.

- b. Find the code group and write the word, phrase, or number under that group in the encoded message.

NOTE: Some vocabulary entries include word endings (e.g., -ing, -ed, -ly). These endings should be spelled out if the message content does not clearly indicate which ending is applicable.

**Evaluation Preparation:**

**Performance Measures**

SECURITY PRECAUTIONS: Use of code set. Each set of the KTC 600(\*) tactical operations code is effective for 48 hours unless otherwise directed by the signal office. Never mix plain language with encoded messages. Spelling and punctuation must be kept to an absolute minimum. Variant code groups are provided for more commonly used phrases. These should be used impartially and at random. Spare groups are provided to assign additional variants to plain text phrases in the code, or to assign new plain text values as required.

GO    NO GO

1. Encode a message that has been provided by the supervisor.
  - a. Write the plain text message on a piece of paper, leaving sufficient space above each line to write the code values.

\_\_\_\_\_

**Performance Measures**

**GO**    **NO GO**

- b. Turn to the code set to be used for the time period.
- c. Find the word, phrase, or number to be encoded and write the three-letter code group on the message.

Note: The encode section of the operations code is made up of words and phrases commonly used in tactical operations which are arranged in alphabetical order, like a dictionary.

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- (2) The numbers with the (+) ending will be used with all but the final number of a group of numbers.

2. Decode a message that has been provided.

- a. After receiving and writing down the encoded message, turn to the code set to be used for the time period.

Note: The decode section of the code is made up of the three-letter code groups in alphabetical order, with a word, phrase, or number to the right of each group.

- b. Find the code group and write the word, phrase, or number under that group in the encoded message.

Note: Some vocabulary entries include word endings (e.g., -ing, -ed, -ly). These endings should be spelled out if the message content does not clearly indicate which ending is applicable.

**Evaluation Guidance:** Score the soldier GO if all steps are passed. Score the soldier NO-GO if any step is failed. If the soldier scores NO-GO, show him what was done wrong and how to do it correctly.

**References**

**Required**  
KTC 600(\*)

**Related**  
FA6064  
FA6066  
KTC 600  
KTC 600 CEO

**Use the KTC 1400(\*) Numerical Cipher/Authentication System**  
**113-573-4006**

**Conditions:** Given map coordinates to be encoded, encoded numerical information to be decoded, authentication challenge for reply, pencil, paper, and unit SOI extract with KTC 1400(\*) numeral cipher/authentication system and supplemental instructions.

**Standards:** Use the KTC 1400(\*) numeral cipher/authentication system to encode and decode, and provide a correct reply for a challenge to authenticate.

**Performance Steps**

SECURITY PRECAUTIONS: Use of code sets. Each set of the KTC 1400(\*) is effective for 12 hours unless otherwise directed by the signal office. Encrypt no more than 15 characters with a single SET INDICATOR. If an entire message must be encrypted, use the operation code KTC 600(\*). Use only random letter combinations as SET INDICATORS. Variant letters are provided for each numeral. These should be used impartially and at random. SECURITY PRECAUTIONS: Each table has plain text numbers and letters after the 6th, 12th, and 18th lines. These are to ease operation. Do not use these as cipher values. In challenge and reply authentication, only the station responding is verified. Do not accept a challenge as an authentication. To verify both stations, both stations should be challenged and should reply. Another challenge should be made if an incorrect reply is received, if a "standby" is requested, or if an unusual delay occurs between challenge and reply. Never give the challenge and reply in the same transmission (self authentication).

1. Find the line for encryption.
    - a. Randomly select any two letters for SET INDICATOR (SI), (except Z).
    - b. Find the first letter of the SI in the LINE INDICATOR column.
    - c. Find the second SI letter.
    - d. Find the SET LETTER in the LINE INDICATOR column. This line will be used to encrypt up to 15 characters.
  2. Encrypt grid zone letters provided by the supervisor.
- NOTE: Grid zone letters will be included in messages when they are necessary to the understanding of such messages. No other letters will be encrypted. If necessary to preclude misunderstanding, a statement may be made that grid zone letters are included in the message.
3. Encrypt numbers provided by the supervisor.
  4. Prepare for transmission.
  5. Decrypt grid zone letters and numbers.
  6. Perform challenge and reply authentication.
    - a. Challenge a station using authentication.
    - b. Reply to a station using authentication.
  7. Perform transmission authentication.

**Evaluation Preparation:**

**Performance Measures**

SECURITY PRECAUTIONS: Use of code sets. Each set of the KTC 1400(\*) is effective for 12 hours unless otherwise directed by the signal office. Encrypt no more than 15 characters with a single SET INDICATOR. If an entire message must be encrypted, use the operation code KTC 600(\*). Use only random letter combinations as SET INDICATORS. Variant letters are provided for each numeral. These should be used impartially and at random. Each table has plain text numbers and letters after the 6th, 12th, and 18th lines. These are to ease operation. Do not use these as cipher

**GO    NO GO**

**Performance Measures**

GO      NO GO

values. In challenge and reply authentication, only the station responding is verified. Do not accept a challenge as an authentication. To verify both stations, both stations should be challenged and should reply. Another challenge should be made if an incorrect reply is received, if a "standby" is requested, or if an unusual delay occurs between challenge and reply. Never give the challenge and reply in the same transmission (self authentication).

1. Find the line for encryption.
  - a. Randomly select any two letters for SET INDICATOR (SI), (except Z).
  - b. Find the first letter of the SI in the LINE INDICATOR column.
  - c. Find the second SI letter.
  - d. Find the SET LETTER in the LINE INDICATOR column. This line will be used to encrypt up to 15 characters.

\_\_\_\_\_

2. Encrypt grid zone letters provided by the supervisor.

Note: Grid zone letters will be included in messages when they are necessary to the understanding of such messages. No other letters will be encrypted. If necessary to preclude misunderstanding, a statement may be made that grid zone letters are included in the message.

\_\_\_\_\_

3. Encrypt numbers provided by the supervisor.

\_\_\_\_\_

4. Prepare for transmission.

\_\_\_\_\_

5. Decrypt grid zone letters and numbers.

\_\_\_\_\_

6. Perform challenge and reply authentication.
  - a. Challenge a station using authentication.
  - b. Reply to a station using authentication.

\_\_\_\_\_

7. Perform transmission authentication.

\_\_\_\_\_

**Evaluation Guidance:** Score the soldier GO if all steps are passed. Score the soldier NO-GO if any step is failed. If the soldier scores NO-GO, show him what was done wrong and how to do it correctly.

**References**

**Required**  
KTC 1400 (\*)

**Related**  
CEOI SUPPLEMENTAL INSTRUC  
KTC 1400

## Recognize Electronic Attack (EA) and Implement Electronic Protection (EP)

113-573-6001

**Conditions:** Given a radio set, applicable operator's technical manual, FM 24-1, FM 24-33, and unit SOI extract or Data Transfer Device AN/CYZ-10 loaded with appropriate data.

**Standards:** Standards are met when you have determined that electronic warfare is directed at your station and electronic counter-countermeasures (ECCM) are employed for continued operation.

### Performance Steps

1. Introduction. A close relationship exists between ECCM and COMSEC. Both defensive arts are based on the same principle. An enemy who does not have access to our essential elements of friendly information (EEFI) is a much less effective foe. The major goal of COMSEC is to ensure that friendly use of the electromagnetic spectrum for communications is by the enemy. The major goal of practicing sound ECCM techniques is to ensure the continued use of the electromagnetic spectrum. ECCM techniques are designed to ensure commanders some degree of confidence in the continued use of these techniques. Our objective must be to ensure that all communications equipment can be employed effectively by tactical commanders in spite of the enemy's concerted efforts to degrade such communications to the enemy's tactical advantage. The modification and the development of equipment to make our communications less susceptible to enemy exploitation are expensive processes. Equipment is being developed and fielded which will provide an answer to some of ECCM problems. Commanders, staff, planners, and operators remain responsible for security and continued operation of all communications equipment.
  - a. Operators of communications equipment must be taught what jamming and deception can do to communications. They must be made aware that incorrect operating procedures can jeopardize the unit's mission and ultimately increase unit casualties. Preventive and remedial ECCM techniques must be employed instinctively. Maintenance personnel must be made aware that unauthorized or improperly applied modifications may cause equipment to develop peculiar characteristics which can be readily identified by the enemy.
  - b. ECCM should be preventive in nature. ECCM should be planned and applied to force the enemy to commit more jamming, interception and deception resources to a target than it is worth, or is available. ECCM techniques must also be applied to force the enemy to doubt the effectiveness of the enemy's jamming and deception efforts.
  - c. Before we can begin to prevent electronic countermeasures (ECM), we must first be certain of what we are trying to prevent.
    - (1) Jamming is the deliberate radiation, reradiation, or reflection of electromagnetic energy with the object of impairing the use of electronic devices, equipment, or systems. The enemy conducts jamming operations against us to prevent us from effectively employing our radios, radars, navigational aids (NAVAIDS), satellites, and electro-optics. Obvious jamming is normally very simple to detect. The more commonly used jamming signals of this type are described below. Do not try to memorize them; just be aware that these and others exist. When experiencing a jamming incident, it is much more important to recognize it and take action to overcome it than to identify it formally.
      - (a) Random noise. It is random in amplitude and frequency. It is similar to normal background noise and can be used to degrade all types of signals.
      - (b) Stepped tones. These are tones transmitted in increasing and decreasing pitch. They resemble the sound of bagpipes.
      - (c) Spark. The spark is easily produced and is one of the most effective forms of jamming. Bursts are of short duration and high intensity. Sparks are repeated at a rapid rate and are effective in disrupting all types of communications.
      - (d) Gulls. The gull signal is generated by a quick rise and a slow fall of a variable radio frequency and is similar to the cry of a sea gull.
      - (e) Random pulse. In this type of interference, pulses of varying amplitude, duration, and rate are generated and transmitted. Random pulses are used to disrupt

## Performance Steps

- teletypewriter, radar, and all types of data transmission systems.
- (f) Wobbler. The wobbler is a single frequency which is modulated by a low and slowly varying tone. The result is a howling sound which causes a nuisance on voice radio communications.
  - (g) Recorded sounds. Any audible sound, especially of a variable nature, can be used to distract radio operators and disrupt communications. Examples of sounds include: music, screams, applause whistles, machinery noise, and laughter.
  - (h) Preamble jamming. This type of jamming occurs when the synchronization tone of speech security equipment is broadcast over the operating frequency of secure radio sets. Preamble jamming results in radios being locked in the receive mode. It is especially effective when employed against radio nets using speech security devices.
  - (i) Subtle jamming. This type of jamming is not obvious at all. With subtle jamming, no sound is heard from our receivers. They cannot receive incoming friendly signals, but everybody appears normal to the radio operator.
- (2) Meaconing. This is a system of receiving radio beacon signals from NAVAIDS and rebroadcasting them on the same frequency to confuse navigation. The enemy conducts meaconing operations against us to prevent our ships and aircraft from arriving at their intended targets or destinations.
  - (3) Intrusion. Intentional insertion of electromagnetic energy into transmission paths with the objective of deceiving equipment operators or causing confusion. The enemy conducts intrusion operations against us by inserting false information into our receiver paths. This false information may consist of voice instructions, ghost targets, coordinates for fire missions, or even rebroadcasting of prerecorded data transmissions.
  - (4) Interference. Interference is any electrical disturbance which causes undesirable responses in electronic equipment. As a MIJI term, interference refers to the unintentional disruption of the use of radios, radars, NAVAIDS, satellites, and electro-optics. This interference may be of friendly, enemy, or atmospheric origin. For example, a civilian radio broadcast interrupting military communications is interference.

## 2. Communications Protective Measures.

- a. Considerations. Properly applied ECCM techniques will deny valuable intelligence sources to the enemy and eliminate much of the threat that he poses to our combat operations. The following discussion describes practical ways to protect communications systems.
- b. The siting of the transmitting antenna is critical in the ECCM process. Before making a decision about a proposed site for either a single-channel or multichannel antenna, there are two basic questions to answer:
  - (1) Are communications possible from the proposed site?
  - (2) Are there enough natural obstacles between the site and the enemy to mask transmission?
- c. The final decision on site selection will often be a tradeoff between the answers to these two questions. The communications mission must have first priority in determining the actual antenna sites. There are additional actions that must be taken to limit the enemy's chances of interception and location successes. Transmitters and antennas should be located away from the headquarters. The two locations should be separated by more than 1 kilometer (0.62 mile). Erroneous radio frequency direction (RFD) data used in conjunction with observation data may favor the targeting of a decoy site instead of the actual transmitter site. This ploy depends upon good camouflage at the actual site. Transmitters grouped in one area indicate the relative value of the headquarters. Directional antennas reduce radiation exposure to enemy receivers and enhance the intended signal. (For instruction on directional antennas, refer to TC 24-21.)
- d. Use the lowest possible transmitter power output. Power means less radiated power reaches the enemy and thus increases his difficulty in applying ECM.
- e. Use only approved code systems. Never use unauthorized (homemade) codes. Use of non-NSA generated codes can provide a false COMSEC sense of security that can be exploited by enemy radio intercept operators. Only when absolutely necessary should traffic be passed in the clear.

**Performance Steps**

- f. Rather than assuming equipment is defective, assume that it is operational. Operators must not contact other stations for equipment checks simply because no message has been transmitted in a set time frame.

**Evaluation Preparation:** Setup: A radio set operating in a radio net with interference applied to the system. Brief soldier. Tell the soldier to ensure that he is applying proper tactics to the jamming system.

**Performance Measures**

	<u>GO</u>	<u>NO GO</u>
1. Determine if ECM is being employed.	—	—
a. Check for accidental or unintentional interference. (Refer to FM 24-33.)		
b. Check for intentional interference. (Refer to FM 24-33.)		
2. Initiate operator's procedures. (Refer to FM 24-1 and FM 24-33.)	—	—
a. Check the equipment ground to ensure that the interference is not caused by a buildup of static electricity.		
b. Disconnect the antenna.		
c. Identify the type of sound.		
d. Move the receiver or reorient the antenna, if possible, and listen or look for variations in the strength of the disturbance.		
e. Tune the receiver above or below the normal frequency. If such detuning causes the intensity of the interfering signal to drop sharply, it can be assumed that the interference is the result of spot jamming.		
3. Identify jamming signals. (Refer to FM 24-33.)	—	—
4. Employ antijamming measures. (Refer to FM 24-1.)	—	—

NOTE: Antijamming measures are designed to allow radio operators to work effectively through intentional interference. Regardless of the nature of the interfering signal, radio operators WILL NOT reveal in the clear the possibility or success of enemy jamming.

**Evaluation Guidance:** Score the soldier GO if all steps are passed. Score the soldier NO-GO if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly. Have the soldier practice until the task can be correctly performed.

**References**

**Required**  
 FM 24-1  
 FM 24-33

**Related**  
 FM 24-18  
 TC 24-21

**Prepare/Submit Interference Message Report**  
**113-573-7017**

**Conditions:** This task is performed in any condition or situation. Given FM 24-33, DA Pam 25-7, and unit SOI extract with the KTC 1400(\*). NOTE: Supervision and assistance are available.

Situation I. While performing the duties of an operator in a radio net/system, you encounter an interfering signal of unknown origin, possibly a MIJI incident.

Situation II. One of your duties as a radio operator is to prepare and submit MIJI incident reports.

**Standards:** The standards are met when the MIJIFEEDER voice template message report is prepared and submitted through the NCS by the best available means and the supplemental information assembled for the follow-up MIJI report.

**Performance Steps**

1. Introduction. Meaconing, intrusion, and jamming are deliberate actions intended to deny any enemy the effective use of the electromagnetic spectrum. Interference is unintentional disruption of the effective use of the electromagnetic spectrum by friendly, enemy, or atmospheric sources. Collectively, meaconing, intrusion, jamming, and interference incidents are referred to as MIJI incidents.
2. MIJI reports document all disruptions of the following:
  - a. Radios.
  - b. Radars.
  - c. Navigational aids (NAVAIDS).
  - d. Satellites.
  - e. Electro-optics.
3. Disruptions caused by equipment malfunctions or destruction are exceptions. The MIJI report serves two purposes. First, it provides information to the tactical commander allowing timely decisions to be made to overcome the MIJI problem. Second, it provides a historical record of MIJI incidents from which appropriate ECCM techniques and measures can be developed. This helps us to counter future attempts by the enemy to deny us the effective use of the electromagnetic spectrum.
4. This task gives instructions for completing MIJI reports for communications and non-communications emitters. To fulfill the two purposes stated above, there are two kinds of MIJI reports. The MIJIFEEDER voice template message is a brief report of a MIJI incident. It serves as a decision making tool for the command. The MIJIFEEDER record message is a complete report of a MIJI incident. This provides a historical record from which appropriate ECCM techniques and measures can be developed. To find the definition of meaconing, intrusion, jamming, and interference, see Training Information Outline of Task 113-573-6001, Recognize Electronic Attack (EA) and Implement Electronic Protection (EP).
5. Purpose and Use of the MIJIFEEDER Voice Template. It is only the information needed to adequately inform the tactical commander of the incident in a timely manner. It is used to make evaluation of enemy actions or intentions easier and to provide data to implement appropriate countercountermeasures. It is forwarded through the chain of command to the unit operations center by the equipment operator experiencing the MIJI incident. The report should be forwarded using the most expeditious service communications means available.
6. Report Format and Use of the MIJIFEEDER Voice Template. The voice template was developed for use under the JINTACCS program. It is designed to ensure interoperability on the battlefield during combined, joint, and inter-Army operations. The standardized, simple format permits the expeditious notification of appropriate action elements in time-critical situations. Only the completed and underlined areas (as appropriate) of the format are transmitted. The MIJIFEEDER voice templates

**Performance Steps**

are self-explanatory and contain 10 items of information. When the message is transmitted over nonsecure means, each line number is stated and the completed information is encrypted. When a secure means is used, the title of each line is transmitted along with the completed information.

7. Purpose and use of the MIJIFEEDER Voice Template. The MIJIFEEDER record is a complete report of a MIJI incident. It provides a basis for developing appropriate counteraction measures to be implemented at proper command levels. The Joint Electronic Warfare Center (JEWEC) is the action agency for this report. All MIJIFEEDER record message reports initially evaluated as nonexercise should be forwarded as soon as possible to the JEWEC. The JEWEC uses these reports to develop trends and to evaluate foreign ECM operations. They are also used by the JEWEC to recommend operational methods and equipment changes that will reduce MIJI vulnerability of radios, radars, NAVAIDS, satellites, and electro-optics.
8. Reporting Procedures of the MIJIFEEDER Record Message. The message is forwarded by the Signal officer of the affected unit to the JEWEC, OPM, San Antonio, TX, through operations channels to the corps operation center. All MIJIFEEDER reports are forwarded via secure means within 24 hours of the MIJI incident. Security classification of MIJI incidents or evaluation reports is determined principally by intent and location of the implied or stated source of the problem. Stations in combat areas or having a sensitive military mission ordinarily classify all MIJI reports.
9. Report Format and Contents. In order to complete this report, you must use FM 24-33 and DA Pam 25-7.

**Evaluation Preparation:** Setup: You are provided with FM 24-33 and DA Pam 25-7. Brief Soldier: You must process a MIJIFEEDER Voice Template/MIJIFEEDER Record Message Report in proper format.

<b>Performance Measures</b>	<b><u>GO</u></b>	<b><u>NO GO</u></b>
1. Entered the unit designation.	—	—
2. Entered the type of interference encountered.	—	—
3. Entered the unit location in either of two ways: longitude in minutes and seconds, or in complete grid coordinates down to 10- or 100-meter increments.	—	—
4. Entered two digits each for day, hour, minutes and one letter for the time zone for the start of the MIJI incident.	—	—
5. Entered two digits each for day, hour, minutes, and one letter for the time zone for the end of the MIJI incident.	—	—
6. Entered the nomenclature for the equipment affected.	—	—
7. Entered the channel, frequency or frequency range affected, and the unit of measure.	—	—
8. Entered, in his or her own words, a brief description or other information regarding the MIJI incident.	—	—
9. When required, entered the hours, minutes, and time zone.	—	—
10. Entered the message authentication IAW the joint task form (JTF) requirements.	—	—

**Evaluation Guidance:** Score the soldier GO if all steps are passed. Score the soldier NO-GO if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly. Have the soldier practice until the task is performed correctly.

**References**

**Required**  
FM 24-33

**Related**  
FM 24-35-1

**Prepare SINCGARS (Manpack) for Operation  
113-587-1064**

**Conditions:** Given an operational SINCGARS manpack radio with battery box CY-8346, battery BA-5590, antenna AS-3683, handset H-250, pack frame with straps, TM 11-5820-890-10-1, and TM 11-5820-890-10-3.

**Standards:** Standard is met when battery, fill battery, antenna and handset are installed and attached to pack frame in accordance with TM 11-5820-890-10-1.

<b>Performance Measures</b>	<u><b>GO</b></u>	<u><b>NO GO</b></u>
1. Install batteries.	_____	_____
2. Install antenna.	_____	_____
3. Connect handset H-250.	_____	_____
4. Assemble radio and pack frame.	_____	_____
5. Preset function controls.	_____	_____

**Evaluation Guidance:** Score the soldier GO if all steps are passed. Score the soldier NO-GO if any step is failed. If the soldier scores NO-GO, show him what was done wrong and how to do it correctly.

**References**

**Required**

- TM 11-5820-890-10-1
- TM 11-5820-890-10-3

**Related**

**Install Single-Channel Ground and Airborne Radio Systems (SINGARSs) ICOM With or Without the AN/VIC-1 or AN/VIC-3**

**113-587-1067**

**Conditions:** Given a designated vehicle, designated SINGARS integrated communications (ICOM) with or without intercommunications set AN/VIC-1; installation kit(s) MK-2310 and MK-2314 (if radio set AN/VRC-92 is installed); ANCD AN/CYZ-10 with fill, fill cable; digital multimeter AN/PSM-45(\*); tool kit TK-101/G; drill and drill bits from auto common No. 1; TM 11-5820-890-10-1, TM 11-5820-890-20-1, TM 11-5820-890-20-2, and TM 11-5830-340-12; SB 11-131-2; DA Form 5986-E, and DA Form 5988-E.

**Standards:** Mounted the radio set on its platform and processed test traffic without error.

**Performance Steps**

1. Inventory complete radio system kit. (Refer to SB 11-131-2, TM 11-5820-890-10-1, TM 11-5820-890-20-1, and TM 11-5820-890-20-2.)
2. Install installation kit. (Refer to TM 11-5820-890-20-1, TM 11-5820-890-20-2, and TM 11-5830-340-12.)
3. Mount system components. (Refer to TM 11-5820-890-20-1 and TM 11-5820-890-20-2.)
4. Perform an operational check. (Pass test traffic.) (Refer to TM 11-5820-890-10-1.)
5. Establish maintenance records.

**Performance Measures**

	<u>GO</u>	<u>NO GO</u>
1. Inventoried complete radio system kit. (Refer to SB 11-131-2, TM 11-5820-890-10-1, TM 11-5820-890-20-1, and TM 11-5820-890-20-2.)	—	—
2. Installed installation kit. (Refer to TM 11-5820-890-20-1, TM 11-5820-890-20-2, and TM 11-5830-340-12.)	—	—
3. Mounted system components. (Refer to TM 11-5820-890-20-1 and TM 11-5820-890-20-2.)	—	—
4. Performed an operational check. (Passed test traffic.) (Refer to TM 11-5820-890-10-1.)	—	—
5. Established maintenance records.	—	—

**Evaluation Guidance:** Score the soldier GO if all steps are passed. Score the soldier NO GO if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly. Have the soldier practice until he can correctly perform the task.

**References**

**Required**

TM 11-5820-890-10-1  
TM 11-5830-340-12

**Related**

DA PAM 738-750

**Operate Radio Set AN/PRC-77 With an TSEC/KY-57  
113-587-2059**

**Conditions:** Given a operational AN/PRC-77, COMSEC TSEC/KY-57, battery BA-4386 or BA 5590, fill device TSEC/KYK-13 or TSEC/KOI-18 TM 11-5820-667-12, Equipment Inspection Maintenance Worksheet DA Form 2404 and Unit SOI.

**Standards:** Standard is met when communication is established tactical message can be transmitted and received between a minimum of two radios.

**Performance Steps**

1. Check equipment for completeness.
2. Assemble components of radio set.
  - a. Install battery.
  - b. Assemble for man-pack operation.
  - c. Install the antenna.
3. Install TSEC/KY-57 in pack frame.
4. Load keys into TSEC/KY-57. (KOI-18 or KYK-13)
5. Initiate secure voice procedures.
6. Communicate with distant radio station.
7. Perform stopping procedures.

**Performance Measures**

	<u><b>GO</b></u>	<u><b>NO GO</b></u>
1. Checked equipment for completeness.	___	___
2. Assembled components of radio set. <ol style="list-style-type: none"> <li>a. Installed battery.</li> <li>b. Assembled for man-pack operation.</li> <li>c. Installed the antenna.</li> </ol>	___	___
3. Installed TSEC/KY-57 on pack frame.	___	___
4. Loaded keys into TSEC/KY-57. (KOI-18 or KYK-13)	___	___
5. Initiated secure voice procedures.	___	___
6. Communicated with distant radio station.	___	___
7. Performed stopping procedures.	___	___

**Evaluation Guidance:** Score the soldier GO if all steps are passed. Score the soldier NO-GO if any steps are failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

**References**

**Required**

**Related**

- FM 24-18
- FM 24-33
- TC 24-19
- TM 11-5820-667-12

**Operate Radio Set AN/VRC-64 or AN/GRC-160 with TSEC/KY-57  
113-587-2061**

**Conditions:** Given an operational AN/VRC-64 or AN/GRC-160 with TSEC/KY-57, unit SOI, clean lint free cloth and brush, (O) TM 11-5810-312-12, (O) TM 11-5810-256-OP-2, TM 5820-498-12, distant station, TSEC/KYK-13 or KOI-18 w/keys, DA Form 2404.

**Standards:** Standards are met when the radio is aligned and operating properly and secure radio check successfully completed and stopping procedures correctly initiated.

**Performance Steps**

1. Perform starting procedures.
2. Enter net using correct call signs.
3. Conduct secure commo check.
4. Exit net.
5. Perform stopping procedures.

**Performance Measures**

1. Performed starting procedures.
2. Entered net using correct call signs.
3. Conducted secure commo check.
4. Exited net.
5. Performed stopping procedures.

<u>GO</u>	<u>NO GO</u>
—	—
—	—
—	—
—	—
—	—

**Evaluation Guidance:** Score the soldier GO if all steps are passed. Score the soldier NO-GO if any steps are failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

**References**

**Required**  
FM 24-18  
TC 24-19

**Related**

**Operate Radio Set AN/VRC-12 or AN/VRC-47 with TSEC/KY-57  
113-587-2064**

**Conditions:** Given an operational AN/VRC-12 or AN/VRC-47, distant station, unit SOI, DA Form 2404 (Equipment Inspection and Maintenance Worksheet), TM 11-5820-401-10-1 or TM 11-5820-401-10-2, two TSEC/KY-57s with HYP-57s, KYK-13 or KOI-18, with keys.

**Standards:** Standard is met when equipment is operating and secure message is sent and received.

**Performance Steps**

1. Check equipment for completeness.
2. Prepare equipment for operation.
3. Perform starting procedures.
4. Enter secure radio net.
  - a. Use correct call signs.
  - b. Conduct secure radio check.
5. Leave secure radio net.
  - a. Use correct procedures.
  - b. Use correct call signs.
6. Perform stopping procedures.

**Performance Measures**

	<u>GO</u>	<u>NO GO</u>
1. Checked equipment for completeness.	—	—
2. Prepared equipment for operation.	—	—
3. Performed starting procedures.	—	—
4. Entered secure radio net. <ol style="list-style-type: none"> <li>a. Used correct call signs.</li> <li>b. Conducted secure radio check.</li> </ol>	—	—
5. Left secure radio net. <ol style="list-style-type: none"> <li>a. Used correct procedures.</li> <li>b. Used correct call signs.</li> </ol>	—	—
6. Performed stopping procedures.	—	—

**Evaluation Guidance:** Score the soldier GO if all steps are passed. Score the soldier NO-GO if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

**References**

<b>Required</b>	<b>Related</b>
FM 24-18	
TC 24-19	
TM 11-5820-401-10-1	
TM 11-5820-401-10-2	

**Operate SINCGARS Single-Channel (SC)**

**113-587-2070**

**Conditions:** Given an operational SINCGARS, KYK-13/TSEC with keys or AN/CYZ-10, distant station, TM 11-5820-890-10-8, TM 11-5820-890-10-3, ACP 125 US Suppl-1, DA Pam 738-750, FM 24-19, FM 24-18, and unit SOI or ANCD w/SOI data loaded.

**Standards:** The standards are met when a secure communications check is conducted in SC mode with a distant station.

**Performance Steps**

<b>Performance Measures</b>	<b><u>GO</u></b>	<b><u>NO GO</u></b>
1. Perform starting procedures.	—	—
2. Load traffic encryption key (TEK).	—	—
3. Enter net.	—	—
a. Use correct procedures.		
b. Conduct secure communications check.		
4. Exit net.	—	—
5. Perform stopping procedures.	—	—

**Evaluation Guidance:** Score the soldier GO if all steps are passed. Score the soldier NO-GO if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly. Have the soldier practice until the task can be performed correctly.

**References**

**Required**

DA PAM 738-750  
 FM 24-18  
 TM 11-5820-890-10-1  
 TM 11-5820-890-10-3

**Related**

ACP 125 US SUPP-1  
 FM 24-19

**Operate SINCGARS Frequency Hopping (FH) (Net Members)**  
**113-587-2071**

**Conditions:** Given an operational SINCGARS radio, ECCM fill device with FH data, KYK-13/TSEC with keys, distant net control station (NCS), unit SOI, DA Form 2404, TM 11-5820-890-10-1, TM 11-5820-890-10-3, ACP 125 US Suppl-1, DA Pam 738-750, FM 24-19, and FM 24-18.

**Standards:** The standards are met when FH communications is established using the cold start and CUE late net entry methods and the radio check is successfully completed.

**Performance Steps**

<b>Performance Measures</b>	<u><b>GO</b></u>	<u><b>NO GO</b></u>
1. Perform starting procedures.	—	—
2. Perform net member cold start procedures.	—	—
a. Use correct call signs.		
b. Use correct procedures.		
3. Perform net member CUE late net entry.	—	—
a. Use correct call signs.		
b. Use correct procedures.		
4. Perform stopping procedures.	—	—

**Evaluation Guidance:** Score the soldier GO if all steps are passed. Score the soldier NO-GO if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly. Have the soldier practice until he can correctly perform the task.

**References**

<b>Required</b>	<b>Related</b>
ACP 125 US SUPP-1	
DA FORM 2404	
DA PAM 738-750	
FM 24-18	
FM 24-19	
TM 11-5820-890-10-1	
TM 11-5820-890-10-3	

**Operate SINCGARS Frequency Hopping (FH) Net Control Station (NCS)**  
**113-587-2072**

**Conditions:** Given an operational SINCGARS, ECCM fill device with FH data, KYK-13/TSEC with keys, distant stations, TM 11-5820-890-10-1, TM 11-5820-890-10-3, ACP 125 US Suppl-1, DA Pam 738-750, FM 24-19, FM 24-18, and unit SOI.

**Standards:** The standards are met when an operational message is sent and received in the FH mode using the cold start and CUE late net entry procedures.

<b>Performance Measures</b>	<u><b>GO</b></u>	<u><b>NO GO</b></u>
1. Perform starting procedures.	_____	_____
2. Perform NCS permission checks.	_____	_____
3. Perform NCS cold start net opening.	_____	_____
a. Use correct call signs.		
b. Conduct FH communications.		
4. Perform NCS CUE late net entry.	_____	_____
a. Use correct call signs.		
b. Conduct FH communications.		
5. Perform stopping procedures.	_____	_____

**Evaluation Guidance:** Score the soldier GO if all steps are passed. Score the soldier NO-GO if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly. Have the soldier practice until he can correctly perform the task.

**References**

<b>Required</b>	<b>Related</b>
FM 24-18	
TM 11-5820-890-10-1	
TM 11-5820-890-10-3	

**Operate Secure AN/VRC-92 RETRANS**  
**113-587-2082**

**Conditions:** Given a test message, an operational AN/VRC-92 secure RETRANS system with ground plane antenna systems, fill device MX-18290 with FH data or ANCD AN/CYZ-10 with fill, fill cable, operating net, primary and alternate RETRANS site locations, TM 11-5820-890-10-1, and TM 11-5985-357-13.

**Standards:** Radio station A sent and received test messages to and from radio station B and processed CUE calls as required.

**Performance Steps**

1. Perform operator's PMCS. (Refer to TM 11-5820-890-10-1, operator's PMCS tables.)
2. Complete maintenance form.
3. Prepare radio for operation.
  - a. Perform premission checks.
  - b. Acquire frequencies and call signs/call words from the AN/CYZ-10.
  - c. Load single-channel frequencies.
  - d. Load offset frequencies.
  - e. Load communications security (COMSEC).
  - f. Load frequency-hopping (FH) data.
  - g. Enter the net using cold start, hot start, or cold start late net entry.
  - h. Perform net control station (NCS) operations.
4. Set up secure RETRANS site. (Refer to TM 11-5820-890-10-1 and TM 11-5985-357-13, operator's PMCS tables.)
  - a. Move to RETRANS site.
  - b. Make initial contact with the net.
  - c. Perform operator's PMCS on the ground plane antennas.
  - d. Set up the ground plane antennas.
  - e. Set up RTs C and D for FH operation.
    - (1) Set FCTN switches to SQ ON.
    - (2) Set RT C MODE to FH and COMSEC to CT. Contact RT A with RT C.
    - (3) Set RT D MODE to FH and COMSEC to CT. Contact RT B with RT D.
    - (4) If RT A is the NCS, set RT D MODE to FH-M. If RT B is the NCS, set the RT C MODE to FH-M.

NOTE: If the outstation does not have the new FH data, the RETRANS RT will have to electronically-remote-fill (ERF) the new FH data to the outstation.

  - (5) Connect the retransmit cable.
5. Monitor secure RETRANS. (Refer to TM 11-5820-890-10-1 and TM 11-5985-357-13.)
  - a. Request station A send a given test message to station B. Upon successful completion, request station B send a given test message to station A.
  - b. Set RTs C and D FCTN switches to RXMT.
  - c. Inform that RETRANS is operational.
  - d. Monitor RETRANS for correct operation.

NOTE: No voice or data traffic will be audible. The only indication that traffic is being passed is by observation of the meters.

  - e. Respond to CUE calls as required.
    - (1) Late net entries.
    - (2) Relay FH updates.

<b>Performance Measures</b>	<b><u>GO</u></b>	<b><u>NO GO</u></b>
1. Performed operator's PMCS. (Refer to TM 11-5820-890-10-1, operator's PMCS tables.) <ul style="list-style-type: none"> <li>a. Completed maintenance form.</li> <li>b. Prepared radios for operation.                             <ul style="list-style-type: none"> <li>(1) Performed premission checks.</li> <li>(2) Acquired frequencies and call signs/call words from the AN/CYZ-10.</li> <li>(3) Loaded single-channel frequencies.</li> <li>(4) Loaded offset frequencies.</li> <li>(5) Loaded COMSEC.</li> <li>(6) Loaded FH data.</li> <li>(7) Entered net using cold start, hot start, or cold start late net entry.</li> <li>(8) Performed NCS operations.</li> </ul> </li> </ul>	—	—
2. Set up secure RETRANS site. (Refer to TM 11-5820-890-10-1 and TM 11-5985-357-13, operator's PMCS tables.) <ul style="list-style-type: none"> <li>a. Moved to RETRANS site.</li> <li>b. Made initial contact with the net.</li> <li>c. Performed operator's PMCS on the ground plane antenna systems.</li> <li>d. Set up the ground plane antennas.</li> <li>e. Set up RTs C and D for FH operation.                             <ul style="list-style-type: none"> <li>(1) Set FCTN switches to SQ ON.</li> <li>(2) Set RT C MODE to FH and COMSEC to CT. Contacted RT A with RT C.</li> <li>(3) Set RT D MODE to FH and COMSEC to CT. Contacted RT B with RT D.</li> <li>(4) IF RT A was the NCS, set RT D MODE to FH-M. If RT B was the NCS, set RT C MODE to FH-M.</li> </ul> </li> </ul> NOTE: If the outstation does not have the new FH data, the RETRANS RT will have to ERF the new FH data to the outstation. <ul style="list-style-type: none"> <li>(5) Connected the retransmit cable.</li> </ul>	—	—
3. Monitored secure RETRANS. (Refer to TM 11-5820-890-10-1 and TM 11-5985-357-13.) <ul style="list-style-type: none"> <li>a. Requested station A send a given test message to station B. Upon successful completion, requested station B send a given test message to station A.</li> <li>b. Set RTs C and D FCTN switches to RXMT.</li> <li>c. Informed net that RETRANS was operational.</li> <li>d. Monitored RETRANS for correct operation.</li> </ul> NOTE: No voice or data traffic will be audible. The only indication that traffic is being passed is by observation of the meters. <ul style="list-style-type: none"> <li>e. Responded to CUE calls as required.                             <ul style="list-style-type: none"> <li>(1) Late net entries.</li> <li>(2) Relay FH updates.</li> </ul> </li> </ul>	—	—

**Evaluation Guidance:** Score the soldier GO if all steps are passed. Score the soldier NO GO if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly. Have the soldier practice until he can correctly perform the task.

**References**

**Required**

TM 11-5820-890-10-1  
 TM 11-5985-357-13

**Related**

DA PAM 738-750  
 FM 21-26

## Subject Area 9: MOVE: BASIC TACTICS

**Determine Direction Within the Target Area****061-283-1001**

**Conditions:** Given a object in the target area with a known direction, field artillery binoculars, a compass, and a target in the target area.

**Standards:** Determine the direction to selected points expressed to the nearest 10 mils (+/-60 mils) of the actual direction.

**Performance Steps**

1. Identify five methods of determining direction within the target area.

NOTE: Determining direction is an essential skill for the observer. Direction is an integral part of terrain-map association, adjustment of fire, and target location. There are five methods by which to determine direction.

- a. ESTIMATING. As a minimum, the observer should be able to visualize the eight cardinal directions (N, NE, E, SE, S, SW, W, NW). Because of the accuracy of this method, it is the least preferred method of determine direction.
- b. SCALING FROM A MAP. Using a protractor, the observer can scale direction from a map to an accuracy of 10 mils.
- c. USING A COMPASS. Using a M2 or a lensatic compass, the observer can measure direction to an accuracy of 10 mils.
  - (1) Care must be taken when a compass is used around radios or large concentrations of metal such as vehicles.
  - (2) Observers should move about 50 meters away from vehicles to avoid incorrect readings.
- d. MEASURING FROM A REFERENCE POINT. Using a reference point with a known direction, the observer can measure horizontal angular deviations and apply them to the reference directions.
  - (1) Angular deviations may be measured with the binoculars or with the hand. In measuring with binoculars, angular deviation is determined to the nearest 1 mil.
    - (a) The horizontal scale of the binocular reticle pattern is divided into increments of 10 mils.
    - (b) The vertical scale in the center of the lens is divided into increments of 10 mils and is used in Height Of Burst adjustments.
- e. USING OTHER MEASURING DEVICES. When properly oriented, the G/VLLD provides direction to the nearest mil.

2. Apply the RALS Rule and announce the new direction to the target.

NOTE: Ensure that the students understand how to apply RALS when determining target direction from a point of known direction.

- a. Direction increases to the right and decreases to the left (RIGHT Add/LEFT Subtract).
- b. To determine the direction to the target, apply the number of mils measured left or right of the known direction by applying RALS.

**Evaluation Preparation:** Setup: Ensure that all the equipment is available, serviceable and ready for use. Use the reference and the evaluation guide to score the soldier's performance.

Brief Soldier: Tell the soldier what he is required to do in accordance with (IAW) the task conditions and standard.

**Performance Measures**

1. Did the soldier use the M2 compass and determine direction to two reference points within 60 mils of the actual direction?
2. Did the soldier express direction to the nearest 10 mils?

GO      NO GO

\_\_\_\_\_

\_\_\_\_\_

**Evaluation Guidance:** Score the soldier GO if all steps are passed (P). Score the soldier NO-GO if any steps are failed (F). If the soldier fails any steps, show what was done wrong and how to do it correctly.

**Move as a Member of a Fire Team**  
**071-326-0501**

**Conditions:** In a designated position (other than team leader) in a moving fire team.

**Standards:** Reacted immediately to the fire team leader's example and performed the same actions he did in the designated position within the formation.

**Performance Steps**

1. Fire team formations describe the relationship of the soldiers in the fire team to each other. Standard fire team formations are the wedge (Figure 1), modified wedge (Figure 2), diamond (Figure 3), and file (Figure 4).
  - a. Fire team wedge (Figure 1). This is the basic fire team formation. It has the following characteristics:

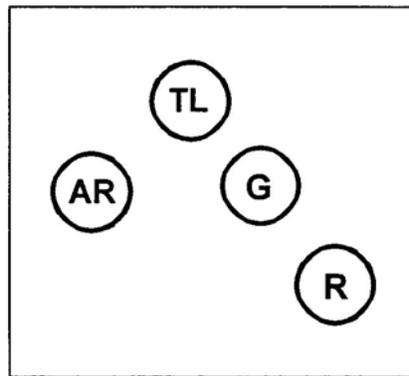


Figure 1. Fire team wedge.

- (1) Is easy to control.
  - (2) Is flexible.
  - (3) Allows immediate fires in all directions.
  - (4) Provides all-round local security.
- b. Modified wedge (Figure 2). When rough terrain, poor visibility, or other factors reduce control of the wedge formation, the sides are closed up to (almost) a single file. When moving in less rugged terrain and control becomes easier, soldiers resume their original positions. The modified wedge can also be used for extended periods when traveling on roads or trails. It has the following characteristics:

**Performance Steps**

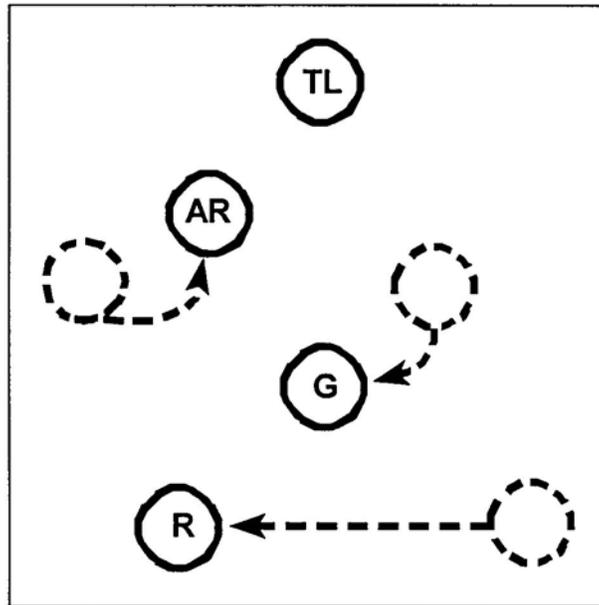


Figure 2. Modified fire team wedge.

- (1) Is easier to control in reduced visibility or rough terrain.
  - (2) Provides less security to flanks than a wedge but more than a file.
  - (3) Masks fires initially to the front and rear for the majority of the team.
- c. Fire team diamond (Figure 3). This formation is a variation of the wedge. It is most often used when the fire team is operating alone or is the lead security element (point) for a column or file. It has the same characteristics as a wedge except there is--

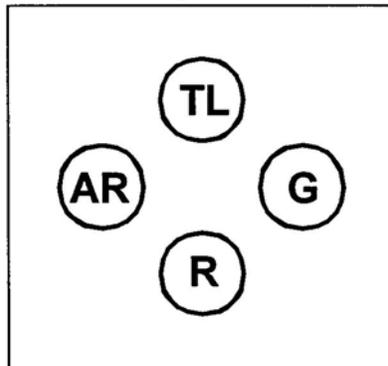


Figure 3. Fire team diamond.

- (1) Reduced frontage.
  - (2) Increased security to the rear.
  - (3) Immediate fires in all directions, but one man's fires are always masked.
- d. Fire team file (Figure 4). When the fire team is not using a wedge or diamond formation, it uses the file. The characteristics of the file are as follows:

## Performance Steps

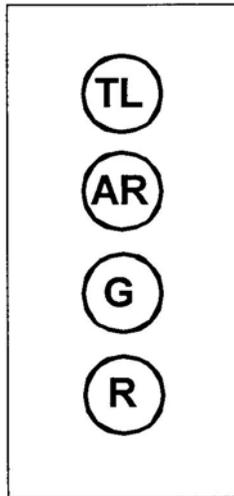


Figure 4. Fire team file.

- (1) Provides maximum control.
  - (2) Provides minimum frontage. It is the easiest formation to use in close terrain or vegetation.
  - (3) Facilitates speed of movement.
  - (4) Is less flexible than the wedge or diamond.
  - (5) Provides immediate fires to flanks, but it masks most soldier's fires to the front and rear.
2. The distances between soldiers in the formation depend on the terrain, visibility, and control factors. The normal interval in daylight is about 10 meters. Formations should not be held rigid, but should vary according to the factors of METT-TC.
- a. The interval is increased in open terrain.
  - b. The interval is decreased when underbrush, terrain, darkness, smoke, or dense fog limits visibility.
  - c. The normal interval is resumed as soon as conditions permit.

**Evaluation Preparation:** SETUP: This task will be tested during a platoon or larger tactical exercise. The fully combat-equipped soldier will move as part of a fire team, operating as part of a platoon conducting a dismounted movement to contact. The soldier may act as any duty position except team leader.

BRIEF SOLDIER: Tell the soldier he is a member of a fire team moving within the fire team formation; must use proper movement techniques within the formation as dictated by terrain and visibility; and must follow the team leader's instructions or signals.

### Performance Measures

	<u>GO</u>	<u>NO GO</u>
1. Kept relative distance within the formation.	—	—
2. Maintained visual contact with the team leader.	—	—
3. Performed the same action as the team leader while maintaining relative position.	—	—
4. Maintained the appropriate interval within the formation based on visibility, terrain, and the team leader's instructions and signals.	—	—
5. Assumed the proper position within the formation as the formation changed.	—	—

**Evaluation Guidance:** Score the soldier GO if all performance measures are passed. Score the soldier NO-GO if any performance measure is failed. If the soldier scores NO-GO, show the soldier what was done wrong and how to do it correctly.

**References  
Required**

**Related**  
FM 7-7  
FM 7-7J  
FM 7-8

## Estimate Range

071-326-0512

**Conditions:** Given personnel, equipment, and vehicles, all stationary and either partially or fully exposed, at ranges from 50 to 3,000 meters, during daylight or night, with good visibility.

**Standards:** Announced the range to each target with no more than a 20-percent error (plus or minus).

### Performance Steps

NOTE: Estimating range is one of the most difficult skills to learn, but is an indispensable one to have when it is needed.

1. Football field method. Even though the length of a football field is 100 yards instead of 100 meters, it is a familiar unit of measure that soldiers can use in estimating ranges.
  - a. Learn what a 100-meter interval (football field) looks like on the ground (Figure 1).

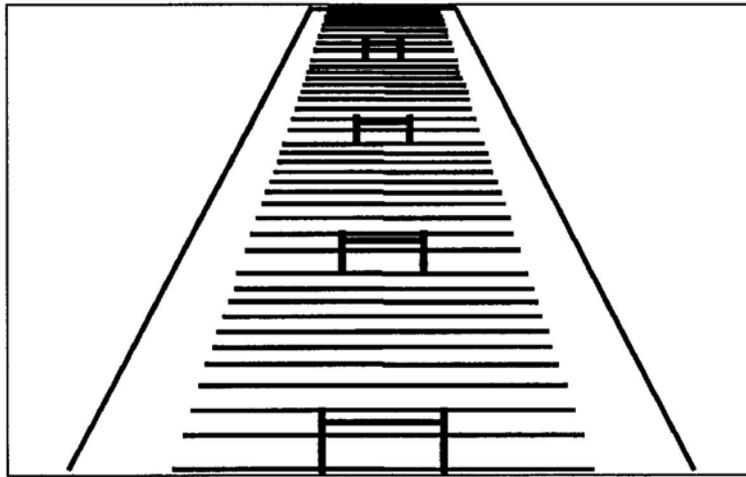


Figure 1. Football field method.

- b. For ranges up to 500 meters, estimate the number of football fields between you and the target.
  - c. For ranges between 500 and 1,000 meters, pick a point halfway between you and the target. Determine the distance to the halfway point as previously described. Double the estimate to find the range to the target (Figure 2).

**Performance Steps**

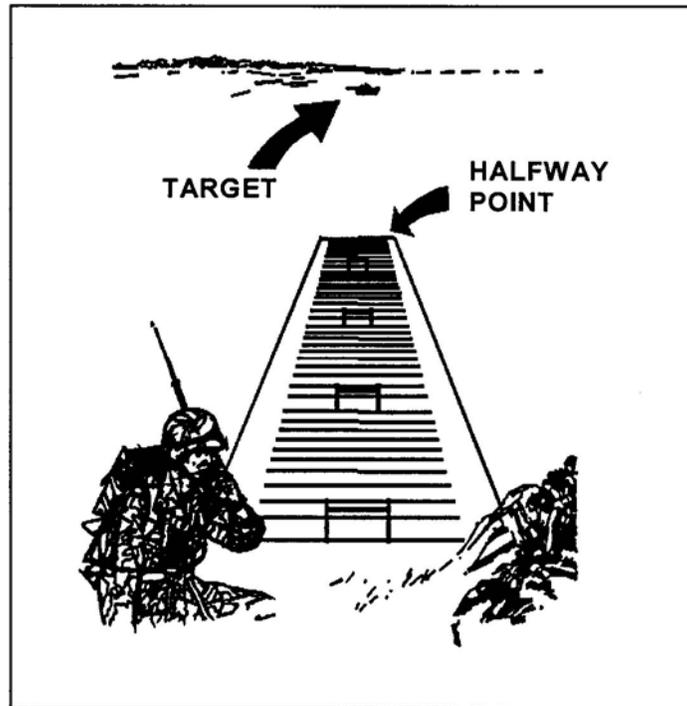


Figure 2. Halfway-point method.

d. Learn the effects of terrain and weather conditions on target appearance (Figure 3).

<b>CONDITIONS IN WHICH TARGETS SEEM CLOSER</b>	<b>CONDITIONS IN WHICH TARGETS SEEM FARTHER AWAY</b>
Bright, clear, daylight conditions	Foggy, rainy, hazy, or twilight conditions
Targets with sun in front of them	Targets with sun behind them
Targets at higher elevations	Targets at lower elevations
Large targets	Small targets
Brightly colored targets (white, red, yellow)	Darkly colored targets
Targets that have contrast	Camouflaged targets
Targets viewed across a ravine, hollow, river, or depression	
Targets at sea	

Figure 3. Effects of terrain and weather on target appearance.

2. Recognition/appearance-of-objects method.

a. Although the target conditions in Figure 4 will have some effect on range estimation, the data in Figure 4 generally hold true.

### Performance Steps

<b>TARGET</b>	<b>DISTANCE TARGET CAN BE RECOGNIZED WITH THE NAKED EYE (in meters)</b>	<b>DISTANCE TARGET CAN BE RECOGNIZED WITH BINOCULARS (in meters)</b>
A tank crew member, soldier, machine gun, mortar, antitank gun, antitank missile launcher	500	2,000
Tank, armored personnel carrier, truck (by model)	1,000	4,000
Tank, howitzer, armored personnel carrier, truck	1,500	5,000
Armored or wheeled vehicle	2,000	6,000

Figure 4. Target recognition method.

- b. If possible, study the appearance of people and objects at various distances until you know how far away they are by how big or clear that seem to be.

EXAMPLE: You should be able to identify armored and wheeled vehicles from 1,500 to 2,000 meters with the naked eye. If you can identify the vehicle as a tank, but you cannot determine the model, the range is between 1,000 and 1,500 meters. Binoculars can greatly increase the range at which you can identify your target.

### 3. Flash-to-bang method.

- a. Using this method, determine range by measuring the time between the flash and the gun report (Figure 5). Sound travels at the speed of 330 meters per second. Light travels much faster.

Performance Steps

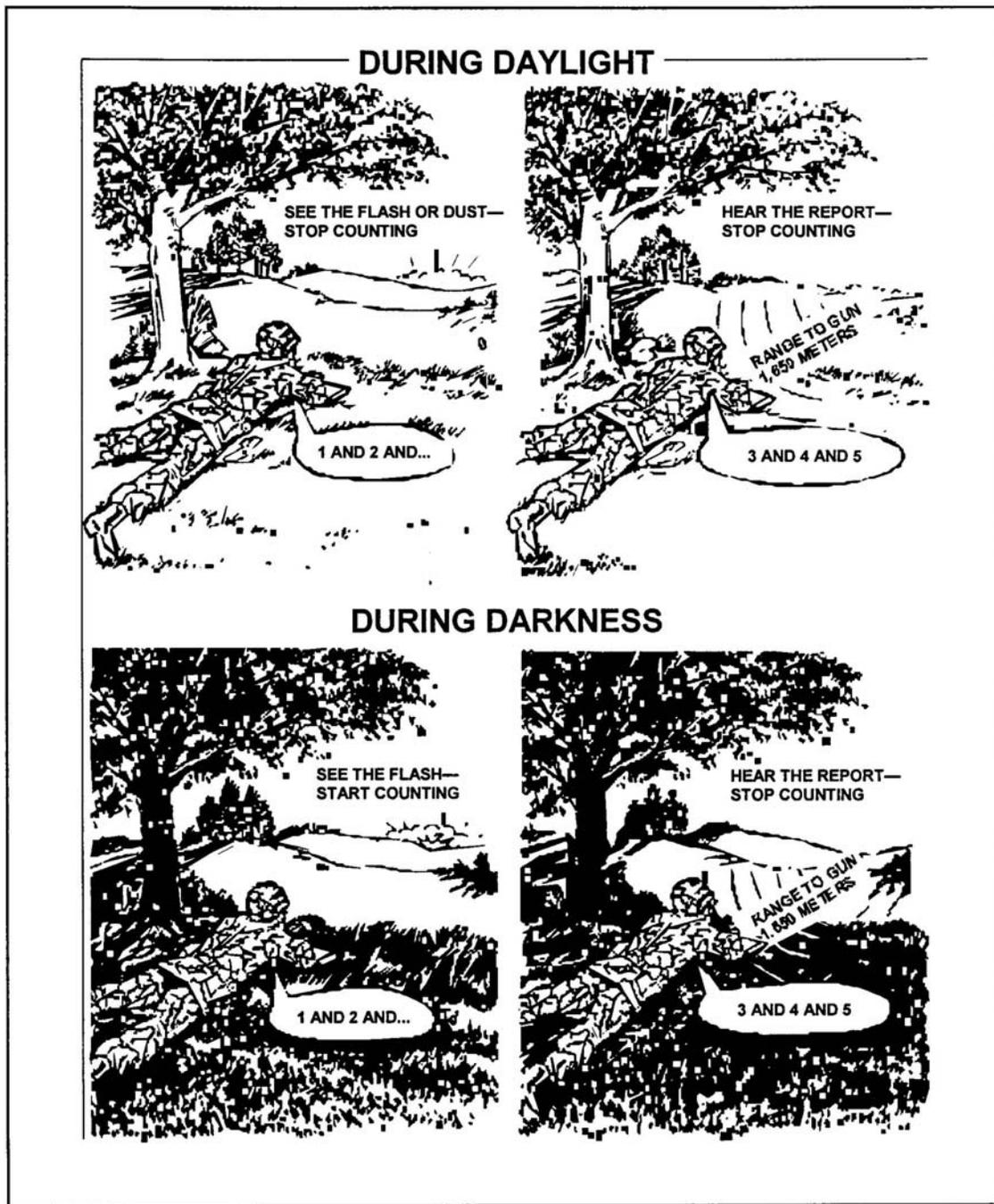


Figure 5. Flash-to-bang method.

- b. Observe the flash of the target or weapon firing.
- c. Count the number of seconds until you hear the weapon fire. You may measure this time interval on a stopwatch, or you may estimate it by counting steadily. For example, a 3-second count would be "one-thousand-one, one-thousand-two, one-thousand-three" or 1 and 2 and 3." If you must count higher than 10, start over at 1.
- d. Multiply the number of seconds by 330 meters (the speed of sound) to estimate the range from your position to the target.

**Performance Steps**

4. Binocular-reticle/mil-relation methods.
  - a. Binocular-reticle method. Fire control equipment requires precise calculations and adjustments, so it is marked in mils. You can use the reticle in a pair of binoculars to determine the width, length, or height of a target in mils (Figure 6).

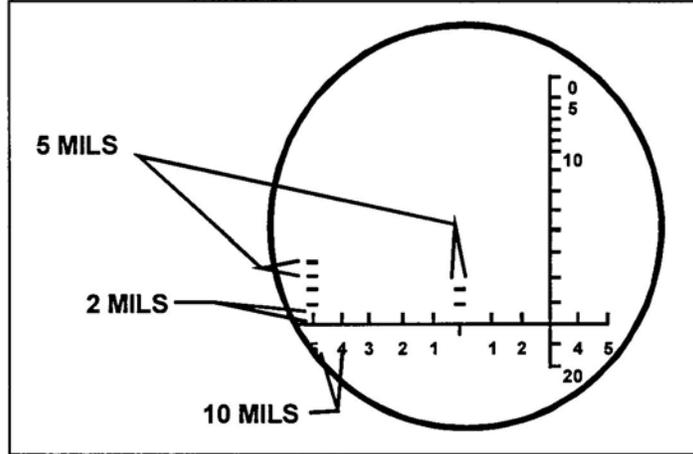


Figure 6. Binocular reticle.

- b. Mil-relation method. Use the width, length, or height of the target in mils, represented by the  $R$  in the mil-relation formula,  $R=W-m$ , to determine the range to the target (Figure 7). The mil relation holds true whether the  $W$  is measured horizontally or vertically (Figure 8).

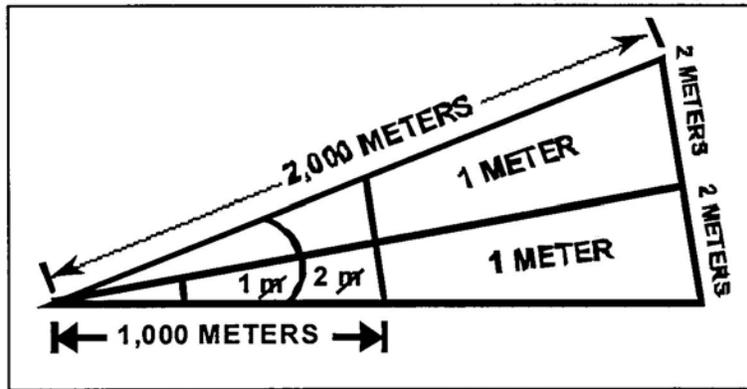


Figure 7. Mil-relation method.

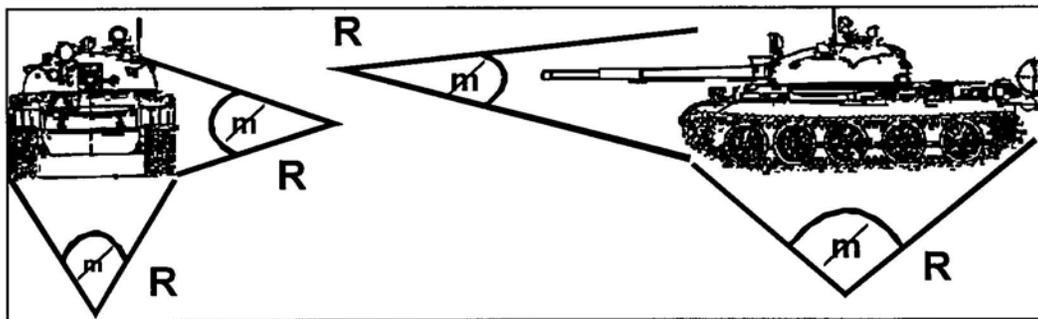


Figure 8. Use of the mil-relation formula.

- (1) If you know any two of these three measurements, you can use this formula to compute the remaining measurement.

**Performance Steps**

- (2) The mil is a unit of angular measurement equal to 1/6400 of a circle. One degree consists of about 18 mils. The symbol for a mil is the letter "m" with a slash through it. Because the relationship represented by this formula is constant, other units of measure, such as yards, feet or inches, can be substituted for meters in expressing width or range.
- (3) Both W (width, length, or height) and R (range) must be expressed in the same unit measure. For example, if you extend the lines that define a 1-mil angle out 1,000 yards, the distance between the end of one line and the other will be 1 yard. At 1,000 meters, a 1-mil angle is 1 meter across (Figure 9).

TARGET			ANGLE MEASUREMENT IN MILS									
			1	2	3	4	5	6	7	8	9	10
TYPE	LENGTH	WIDTH	RANGE (IN METERS)									
MEDIUM TANK	6.5 METERS	3.5 METERS	6,500	3,300	2,200	1,600	1,300	1,100	900	800	700	700
			3,500	1,800	1,200	900	700	600	500	400	400	400
HEAVY TANK	7.5 METERS	3.5 METERS	7,500	3,800	2,500	1,900	1,500	1,300	1,100	900	800	800
			3,500	1,800	1,200	900	700	600	500	400	400	400

Figure 9. Mil angle measurement and range.

- (4) You can use the word "WORM" as a memory aid (Figure 10).

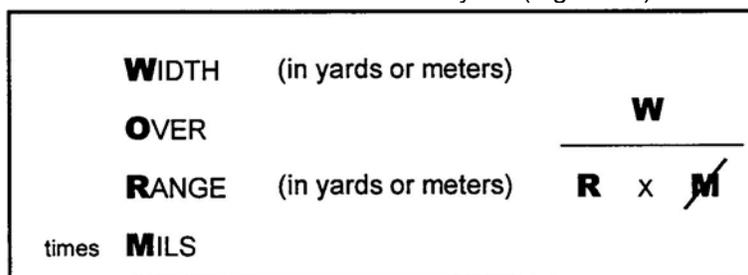


Figure 10. WORM memory aid.

**Evaluation Preparation:** SETUP: Position personnel, equipment, and vehicles (or silhouettes) to serve as five targets at ranges from 50 to 3,000 meters. Ensure the target is fully exposed. Allow binoculars to be available for the soldier to use in estimating the range, using the binocular reticle and the mil-relation methods.

BRIEF SOLDIER: Tell the soldier to announce the distance to at least three of the five targets, with no more than 20-percent error in the distance.

**Performance Measures**

- |   | <u>GO</u> | <u>NO GO</u> |
|---|-----------|--------------|
| 1. Used the football field method.                    | —         | —            |
| 2. Used the recognition/appearance-of-objects method. | —         | —            |
| 3. Used the flash-to-bang method.                     | —         | —            |
| 4. Used the binocular-reticle/mil-relation method.    | —         | —            |

**Evaluation Guidance:** Score the soldier GO if all performance measures are passed. Score the soldier NO-GO if any performance measure is failed. If the soldier scores NO-GO, show the soldier what was done wrong and how to do it correctly.

**References  
Required**

**Related**  
FM 17-12-1-1  
FM 21-75

Subject Area 16: NAVIGATE: GENERAL/COMPASS/MAP

**Operate the Driver's Compass Display on an M2A3/M3A3 BFV**  
**071-329-1300**

**Conditions:** Given a fully operational M2A3/M3A3 BFV, a driver's compass display (DCD), and a requirement to operate the BFV on a predetermined course.

**Standards:** Powered up the M2A3/M3A3 BFV turret, completed the self test, and adjusted the DCD so that the driver could drive the M2A3/M3A3 BFV safely without causing damage to the equipment or injury to personnel.

**Performance Steps**

Perform in sequence.

1. Turn on vehicle master power.
2. Turn on turret power.
3. Ensure the (DCD) initializes correctly (Figure 1).

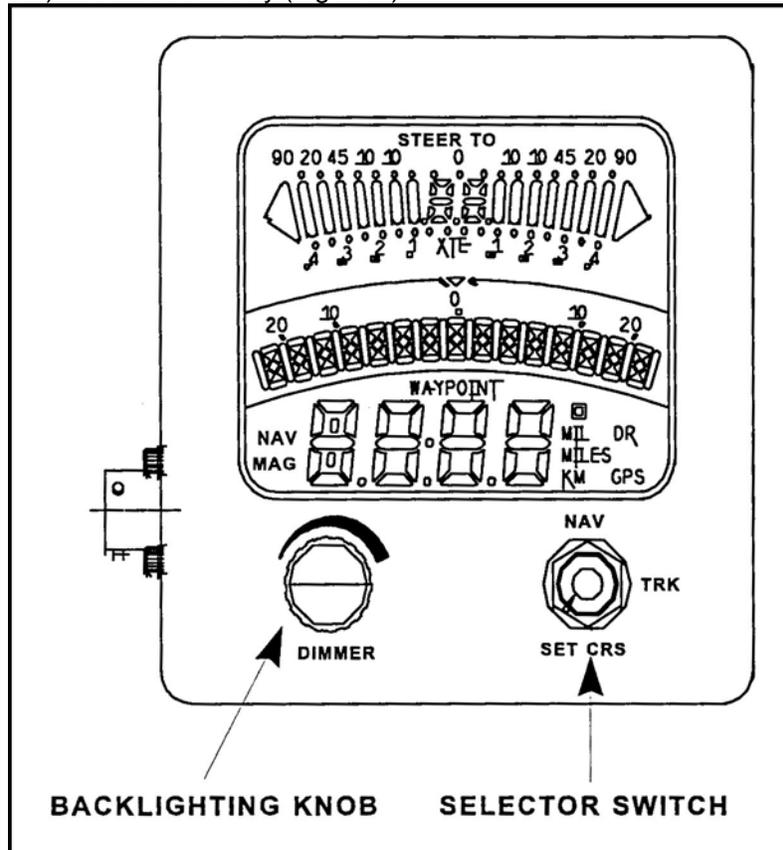


Figure 1. DCD display module assembly.

- a. Observe that the DCD face is back lighted and all icons are being displayed correctly.
- b. Observe the "NO NAV" message on the DCD.
4. Select the desired mode on the DCD.
  - a. Select the navigation mode (NAV) on the DCD (Figure 2).

## Performance Steps

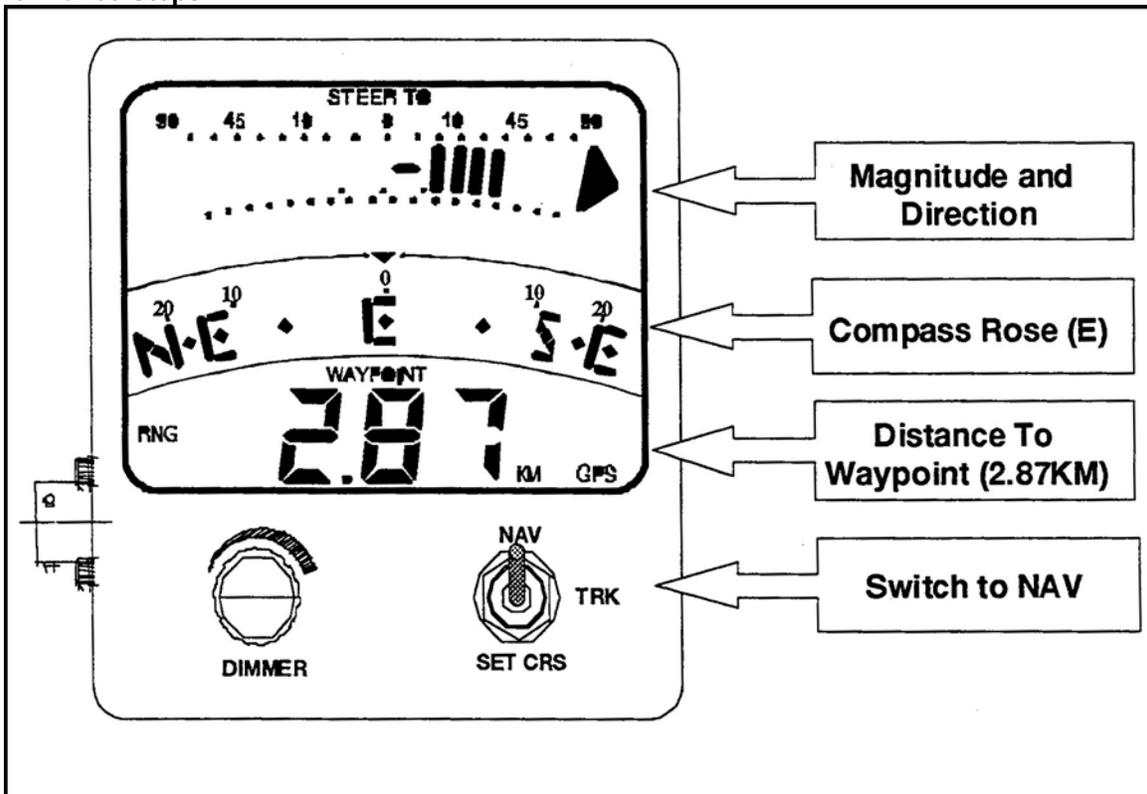


Figure 2. DCD navigation mode.

- (1) Observe that the DCD displays the STEER TO direction of travel, magnitude, the direction of travel on a compass rose, and distance to the next waypoint.
  - (2) Observe that the DCD updates when the commander has acknowledged the advisory message on the commander's tactical display (CTD).
  - (3) Observe that the global positioning system (GPS) indicator is illuminated on the DCD.
  - (4) Observe that the azimuth is indicated in either mils or degrees and that the position distance is indicated.
- b. Select the track (TRK) and set course (SET CRS) mode on the DCD.
- (1) Observe that the cardinal direction and azimuth are displayed on the DCD.
  - (2) Depress the mode switch to the SET CRS position and release and observe that the compass rose has displayed the vehicle azimuth (Figure 3).

Performance Steps

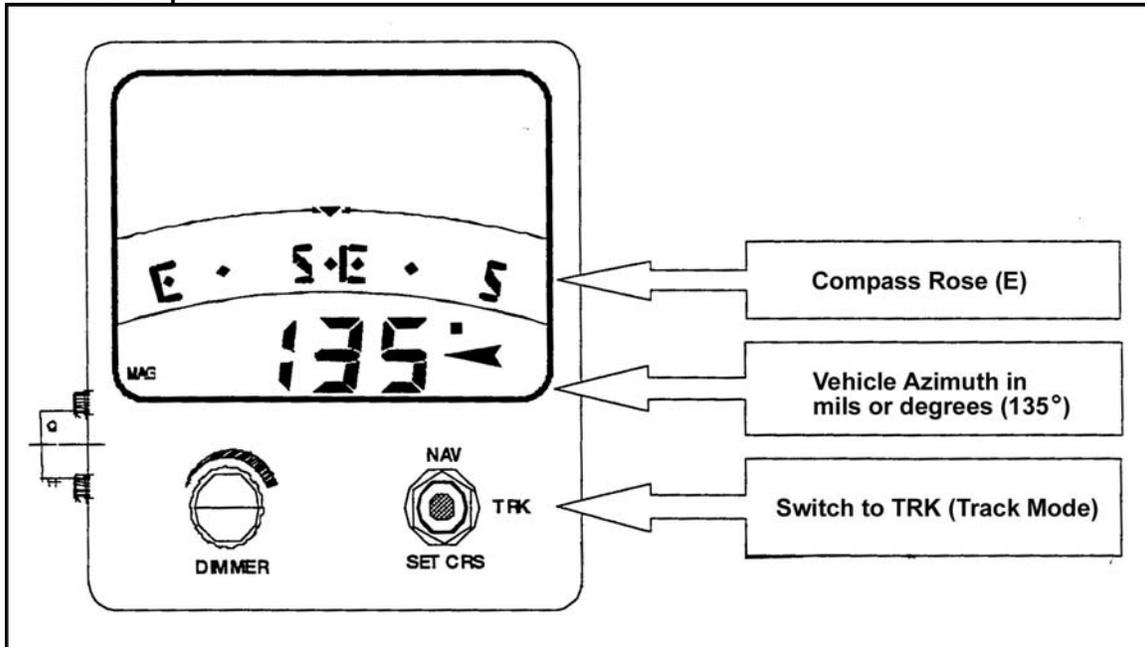


Figure 3. DCD track mode.

- (3) Depress the mode switch to the SET CRS position and release for a second time and observe that the STEER-TO indicator is displayed (Figure 4).

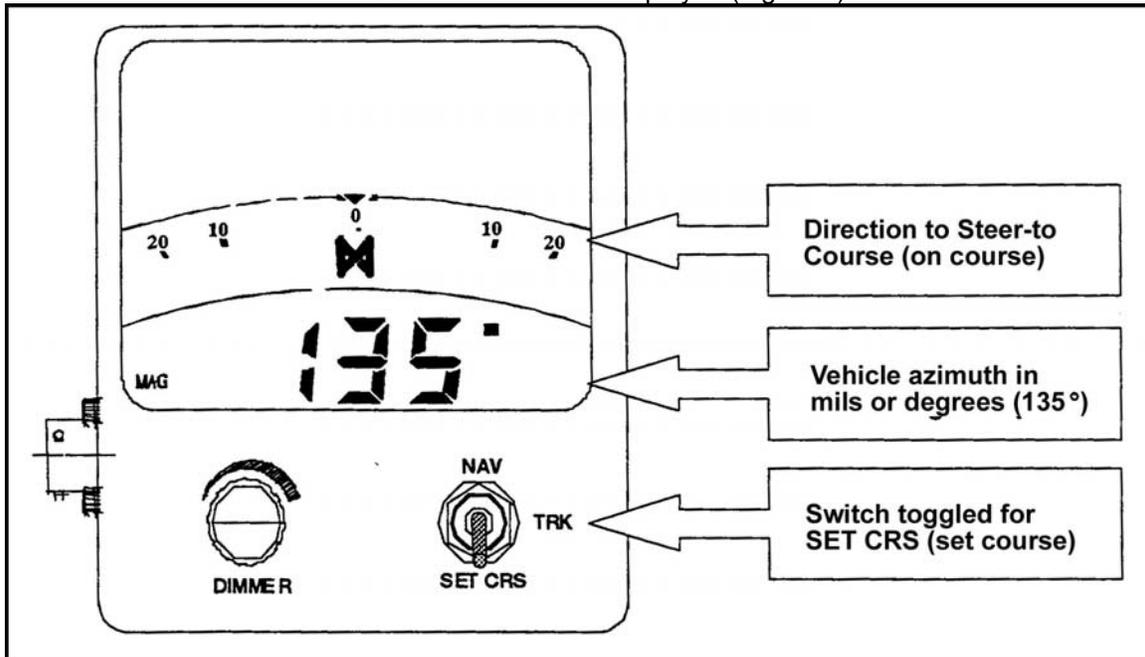


Figure 4. DCD set course mode.

**Evaluation Preparation:** The vehicle must be prepared (PMCS complete) and the turret must be operated in the power mode.

**SETUP:** Provide the soldier with all material and equipment as outlined in the task conditions statement.

**BRIEF SOLDIER:** Tell the soldier to perform operation checks on the DCD in accordance with the procedures described in the TM.

<b>Performance Measures</b>	<b><u>GO</u></b>	<b><u>NO GO</u></b>
1. Turned on vehicle master power.	_____	_____
2. Turned on vehicle turret power.	_____	_____
3. Ensured the DCD initialized correctly.	_____	_____
4. Selected the desired mode on the DCD.	_____	_____
a. Selected the NAV mode on the DCD.		
(1) Observed the NAV mode displayed correctly.		
(2) Observed all updates and corrections made by the vehicle commander.		
b. Selected the TRK and SET CRS mode on the DCD.		
(1) Observed the TRK and SET CRS mode displayed correctly.		
(2) Observed the compass rose and azimuth displayed correctly.		
(3) Observed the STEER TO indicator displayed correctly.		

**Evaluation Guidance:** Score the soldier GO if all performance measures are passed. Score the soldier NO-GO if any performance measure is failed. If the soldier scores NO-GO, show the soldier what was done wrong and how to do it correctly.

**References**  
**Required**

**Related**  
DA PAM 738-750  
LO 9-2350-252-12  
TM 9-2350-294-10-1

**Navigate Using an AN/PSN-11 Precision Lightweight Global Positioning System Receiver  
071-329-7017**

**Conditions:** Given an AN/PVS-11 precision lightweight global positioning system receiver (PLGR) that has been set up for operation and a requirement to move to a new location.

**Standards:** Navigated from one point on the ground to within 100 meters of another point while dismounted using the PLGR.

**Performance Steps**

1. Enter or verify SETUP display.
  - a. Select setup mode.
  - b. Select setup units.
  - c. Select setup magnetic variation type.
  - d. Select elevation hold mode, time reference, and error display format.
  - e. Select setup datum and automatic off timer.
  - f. Select setup data port.
  - g. Select setup automark.
2. Enter crypto keys.
3. Enter and verify initialization displays.
  - a. Initialize position.
  - b. Initialize time and date.
  - c. Initialize track and ground speed.
  - d. Initialize user-defined datum, if necessary.
  - e. Initialize crypto key, if necessary.
4. Enter, edit, or review waypoint information.
  - a. Copy waypoints.
  - b. Determine distance between waypoints.
  - c. Calculate a waypoint.
  - d. Clear waypoints.
  - e. Define a mission route.
5. Check status displays to ensure acquisition of four satellites.
6. Navigate to next point.

**Evaluation Preparation:** SETUP: Provide sufficient setup, initialization, and waypoint information to soldier so that PLGR can be used to navigate. Prepare a navigation course.

**BRIEF SOLDIER:** Tell the soldier to navigate from one point on the ground to another using the PLGR.

**Performance Measures**

**GO      NO GO**

1. Navigated to another point.
  - a. Entered destination.
  - b. Checked status displays.

\_\_\_\_\_

**Evaluation Guidance:** Score the soldier GO if all performance measures are passed. Score the soldier NO-GO if any performance measure is failed. If the soldier scores NO-GO, show the soldier what was done wrong and how to do it correctly.

**References  
Required**

**Related**  
TM 11-5825-291-13

**Prepare the AN/PSN-11 Precision Lightweight Global Positioning System Receiver for Operation  
071-329-7018**

**Conditions:** Given an AN/PSN-11 precision lightweight global positioning system receiver (PLGR) (turned off) with battery (BA-5800/U) not installed.

**Standards:** Prepared the PLGR for operation without damaging equipment.

**Performance Steps**

1. Install battery.
  - a. Remove power battery cover (top of the unit) by twisting counterclockwise.
  - b. Gently insert the battery (contact ends first) into the compartment.
  - c. Screw the power battery cover on snugly.
2. Set up the PLGR for operation.

**NOTE:** An item or field flashing shows the location of the cursor. If no item or field is flashing, use the left or right arrow key to move the cursor. Use the up or down arrow keys to increase or decrease the value of a character, to scroll through a field or selection, or to activate a function.

- a. Turn the PLGR on by pressing the ON/BRT key. (Wait for the PLGR to go through its BIT (built-in test).
- b. Press the MENU key. Move the cursor to SETUP. Activate the SETUP field by pressing the down arrow key.
- c. Move the cursor to the operating mode. Select the CONT (continuous POS) mode by pressing the up or down arrow key.
- d. Move the cursor to the SV-TYPE (satellite vehicle type) and select MIXED.
- e. Press the right arrow key and move the cursor to the right one time to see the up or down arrow symbol preceding the P.
- f. Press the down arrow key one time to display the next screen.
- g. Move the cursor to the coordinate system and select MGRS-NEW.
- h. Move the cursor to the units of measurement and select METRIC.
- i. Move the cursor to ELEV (elevation) and select METER and MSL (mean sea level).
- j. Move the cursor to ANG (angle) and select DEG (degrees) and MAG (magnetic).
- k. Go to the next page by repeating step c and press the down arrow key twice. (Move the cursor to ELEVATION HOLD and select AUTOMATIC.)
- l. Move the cursor to TIME and adjust time to your location.
- m. Move the cursor to ERR (error) and select +\_m (meter).
- n. Go to the next page and move the cursor to DTM (datum) and select the datum for your location.
- o. Move the cursor to AUTOMATIC OFF TIMER and select OFF.
- p. Move two pages down to the AUTOMARK MODE and select OFF.

**Evaluation Preparation:** SETUP: At the test site, provide soldier with an AN/PSN-11 PLGR with battery.

**BRIEF SOLDIER:** Tell the soldier to set up the AN/PSN-11 PLGR for navigating while dismounted.

**Performance Measures**

	<u>GO</u>	<u>NO GO</u>
1. Installed battery. Inserted the battery (contact ends first) into the compartment.	—	—
2. Set up the PLGR for operation.	—	—
a. Turned PLGR on.		
b. Entered or verified SETUP display.		
c. Selected operating mode and satellite vehicle (CONT and MIXED).		
d. Selected units (MGRS-NEW, METRIC, METER, MSL, DEG, and MAG).		
e. Selected EL Hold, TIME, and EER (automatic time = Z hour time zone).		

**Performance Measures**

**GO**    **NO GO**

- f. Selected DATUM and AUTOMATIC OFF TIMER (geographic location and off).

**Evaluation Guidance:** Score the soldier GO if all performance measures are passed. Score the soldier NO-GO if any performance measure is failed. If a soldier scores NO-GO, show the soldier what was done wrong and how to do it correctly.

**References**

**Required**

**Related**

TM 11-5825-291-13

**Enter Waypoints into an AN/PSN-11 Precision Lightweight Global Positioning System Receiver  
071-329-7019**

**Conditions:** Given an AN/PSN-11 PLGR that has been set up for dismounted operation.

**Standards:** Entered waypoints into the AN/PSN-11 PLGR so that it could be used to navigate.

**Performance Steps**

1. Enter a waypoint into the PLGR:
  - a. Press the WP key to display the waypoint menu page. The cursor is on the ENTER field. Activate the ENTER field. (The PLGR will automatically display the next unused waypoint.)
  - b. Press the right arrow key three times. The waypoint label field will be flashing. (This is where you give your waypoint a name, such as Point 1, OBJ Blue, or ORP.) Press the up or down arrow key one time. The cursor will be on the first character of the waypoint label. Use the up or down arrow keys to scroll through and select the first character of the waypoint label. Then press the right arrow key to move the cursor to the next space until you have entered all characters of the waypoint label.
  - c. Move the cursor to the grid zone designator (second line). Select the grid zone designator (located on your map in the grid reference).
  - d. Move the cursor to the grid square identifier and 10-digit grid coordinate. On the third line, select the 100,000 grid square identifier located in the grid reference box on your map and select the 10-digit grid coordinate for your destination.
  - e. Enter the elevation of the waypoint in the same manner (optional). Move to next page.

**NOTE:** The PLGR will confirm the new waypoint by displaying WAYPOINT STORED.

**Evaluation Preparation: SETUP:** At the test site, provide soldiers with an AN/PSN-11 PLGR that has been set up for dismounted operation. Provide a requirement sheet.

**BRIEF SOLDIER:** Tell the soldier to enter a waypoint into the AN/PSN-11 PLGR.

<b>Performance Measures</b>	<u><b>GO</b></u>	<u><b>NO GO</b></u>
1. Entered the waypoint label.	_____	_____
2. Entered the waypoint grid zone designator.	_____	_____
3. Entered the waypoint grid square identifiers and coordinates.	_____	_____
4. Stored the waypoint.	_____	_____

**Evaluation Guidance:** Score the soldier GO if all performance measures are passed. Score the soldier NO-GO if any performance measure is failed. If the soldier scores a NO-GO, show what was done wrong and how to do it correctly.

**References  
Required**

**Related**  
TM 11-5825-291-13

Subject Area 18: RECON-SECURITY: GENERAL

**Perform as a Member of a Patrol**

**071-331-0001**

**Conditions:** In a combat environment, given an individual weapon, loaded carrying equipment, and other mission-specific equipment.

**Standards:** Departed friendly lines, moved to an objective, accomplished the assigned mission, and reentered friendly lines.

**Performance Steps**

1. Prepares self and equipment.
2. Performs at rally points.
3. Performs at danger areas.
4. Maintains alertness.

**Evaluation Preparation:** SETUP: At the test site, provide the material and personnel given in the task condition statement.

BRIEF SOLDIER: Tell the soldier that he is to perform as a member of a patrol.

**Performance Measures**

1. Prepared self and equipment.
2. Performed at rally points.
3. Performed at danger areas.
4. Maintained alertness.

<u>GO</u>	<u>NO GO</u>
—	—
—	—
—	—
—	—

**Evaluation Guidance:** Score the soldier GO if all performance measures are passed. Score the soldier NO-GO if any performance measure is failed. If the soldier scores NO-GO, show the soldier what was done wrong and how to do it correctly.

**References**

**Required**

**Related**

ARTEP 7-8-DRILL  
FM 7-8

Subject Area 19: RECON-SECURITY: NIGHT VISION DEVICES

**Operate Night Vision Device, AN/PVS-14**

**071-706-0001**

**Conditions:** At night, given a night vision device, AN/PVS-14, with components, accessories, and batteries.

**Standards:** Inspected night vision device, AN/PVS-14, for best operational capability. Correctly shut down device. Properly stowed device and all accessories in carrying case. Complied with all warnings and cautions associated with this device.

**Performance Steps**

**WARNING**

To avoid physical and equipment damages carefully read and understand the following safety precautions:

- This equipment requires some night light (moonlight, starlight, and so on) to operate efficiently. The level of performance depends upon the amount and source of light.
- Operating this equipment during cloud cover or while in shaded areas, such as under trees or inside a building, reduces the night light.
- This equipment is less effective when viewing into shadows and other darkened areas.
- This equipment is less effective through rain, fog, sleet, snow, or smoke.
- This equipment is useless when viewing through dense smoke.
- Adjust speed of the vehicle to prevent overdriving the range of view when conditions of possible reduction or loss of vision exist.

1. Prepare the device for operation.

**CAUTION:** Handle all optical components with extreme care and protect against dirt, dust, fingerprints, and excessive moisture.

- a. Inventory carrying case contents to ensure the following accessories are present (Figure 1):

Performance Steps

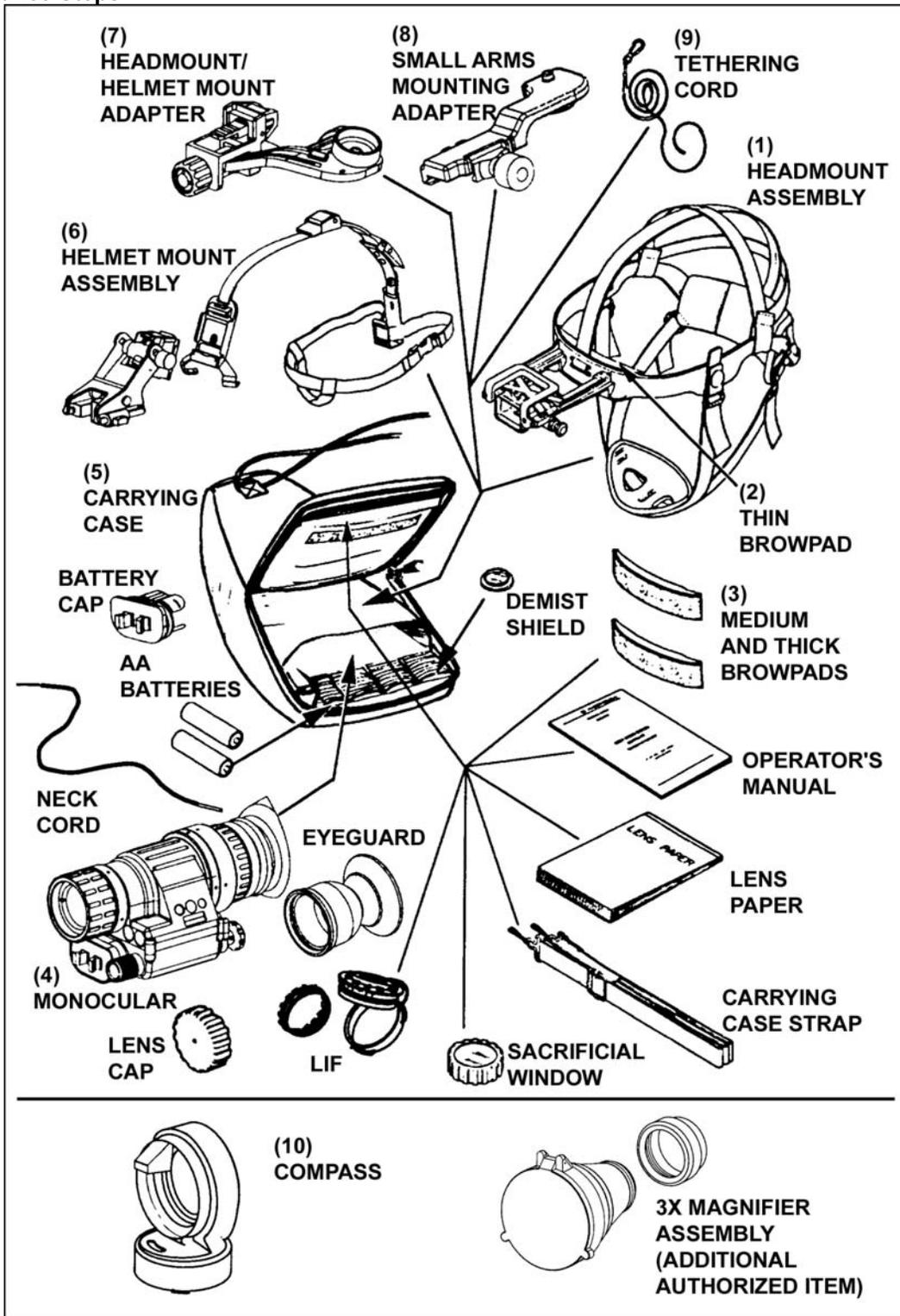


Figure 1. AN/PVS-14 monocular night vision device.

- (1) Headmount assembly.
- (2) Thin browpad.
- (3) Medium and thick browpads. After initial use, browpads will remain on the headmount

**Performance Steps**

- assembly.
- (4) Monocular.
- (5) Carrying case.
- (6) Helmet mount assembly.
- (7) Headmount/helmet mount adapter.
- (8) Small-arms mounting adapter.
- (9) Tethering cord.
- (10) Compass.
- (11) Additional items: demist shield, operator's manual, lens paper, carrying case strap, sacrificial window, light interference filter (LIF), eyeguard, lens cap, neck cord, AA batteries, battery cap.

b. Inspect the monocular assembly and components for serviceability (Figure 2).

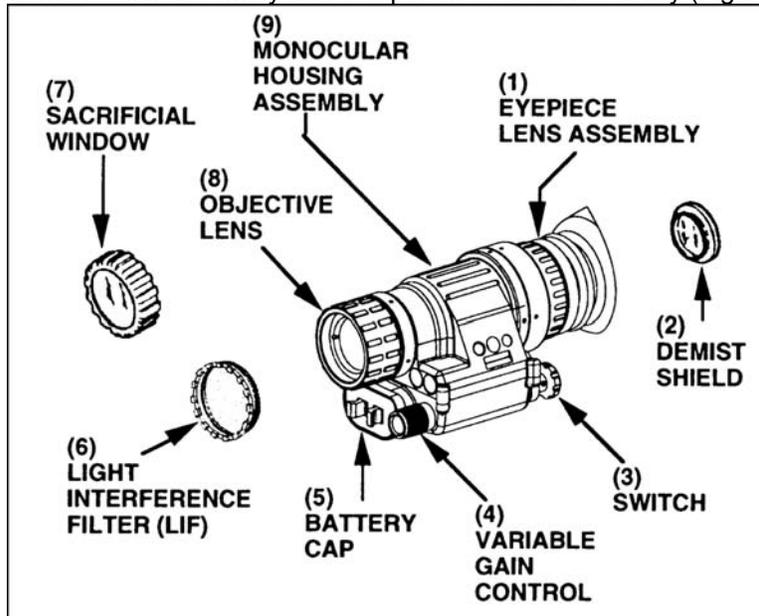
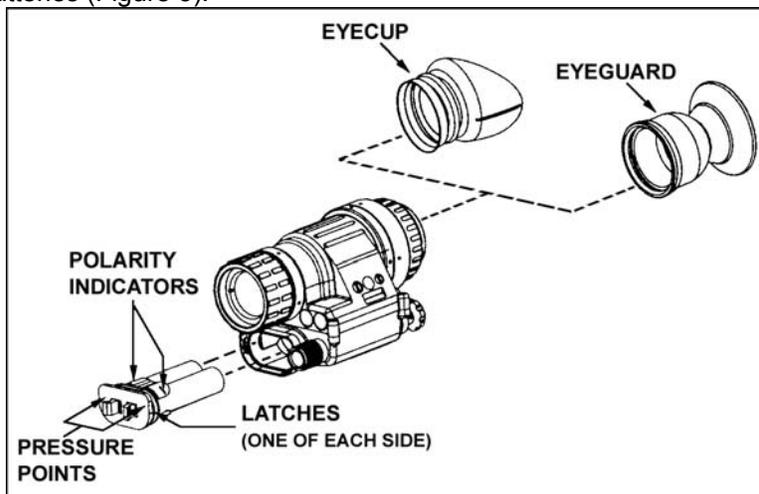


Figure 2. Monocular night vision device and accessory items.

- (1) Inspect device assembly and components for any damage to optical surfaces, body, eyeguard, OFF-ON-PULL/IR switch, and battery cap.
  - (2) Ensure all optical surfaces are clean. Clean with clean water and lens tissue, if needed.
- c. Install batteries (Figure 3).



## Performance Steps

Figure 3. Battery, eyecup and eyeguard installation.

**CAUTION:** To protect the image intensifier, keep the lens cap on the objective lens when the monocular is not in use or when checked out in daylight conditions.

- (1) Check to ensure the switch is in the OFF position before installing the batteries (Figure 4).

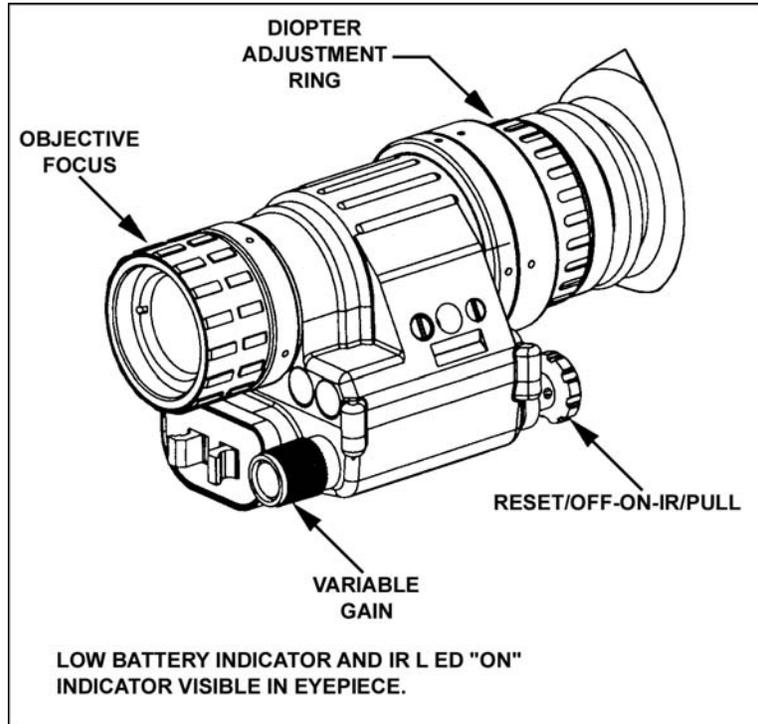


Figure 4. Monocular controls and indicators.

- (2) Open the battery cartridge by squeezing the two tabs together and pulling it out.
- (3) Observe polarity, as indicated on the battery cartridge, and insert the AA 1.5-volt batteries into battery cartridge (Figure 3).

**CAUTION:** At operating temperatures below -20C (-4F), alkaline batteries are not recommended as operating life will be severely reduced. Vdc Lithium 1.5V AA batteries or equivalent should be used below -20C (-4F).

- (4) Replace battery cap and batteries by pushing cartridge at pressure points into the battery compartment making sure both latches on either side are engaged.

2. Perform operational procedures for hand-held operation.
  - a. Ensure the batteries are installed.

**NOTE:** The sharpest image will be observed only when the objective lens and eyepiece are properly focused. The objective focus adjustment is used to focus on objects at varying distances. The diopter adjustment ring is used to focus your eye (with or without glasses) on the image intensifier screen. These adjustments operate independently and must be made separately.

- b. Turn the switch to ON.
- c. Rotate the diopter adjustment ring for the clearest view of the image intensifier screen.
- d. Readjust the objective lens assembly while observing an object until the sharpest image is obtained.

**CAUTION:** Operate the monocular only under darkened conditions or use the lens cap to cover the objective lens for daylight conditions.

3. Perform operational procedures for headmounted operation (Figure 5).

## Performance Steps

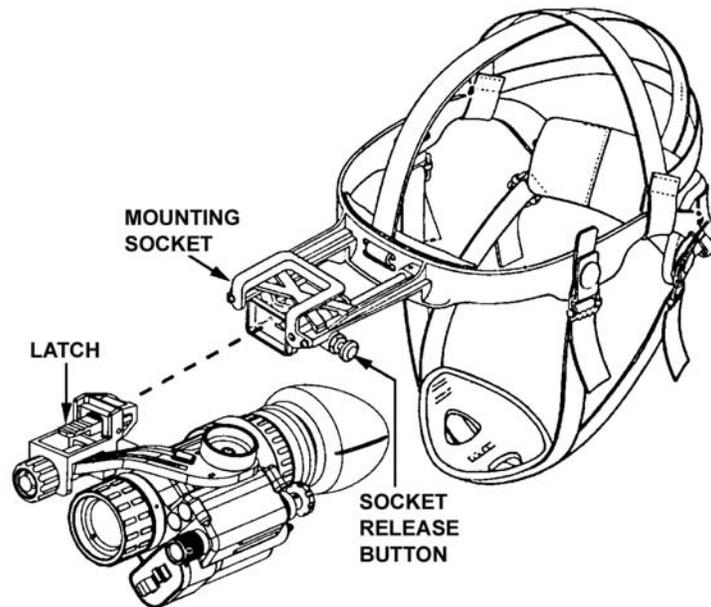


Figure 5. Head/helmet mount adapter operation.

- a. Ensure that batteries are installed.
- b. Don the headmount

NOTE: To make it easier to align the monocular, eyecup, and diopter eyepiece to the eye, depress the socket-release button and slide the mounting socket all the way forward before attaching the monocular.

- c. Align the head/helmet mount adapter's latch to the headmount socket, and focus on the image intensifier screen using the diopter adjustment rings.
  - d. Set your eye relief by depressing the socket release button and move the monocular back toward your eye until the eyecup comfortably seals around the eye.
  - e. Turn the monocular ON.
  - f. Readjust the vertical strap assembly for vertical adjustment of the headmount until the monocular is properly aligned with your eye.
4. Helmet mounted operation.
    - a. Disconnect the helmet mount from the helmet and properly stow it when not needed for immediate use.
    - b. Do not drop or throw the helmet with the helmet mount attached to it.
    - c. The goggle and helmet mount should not be left on the helmet when the helmet is removed.
    - d. With the goggle in the flipped up position, do not flick the goggle down by shaking the helmet. This places significant stress on the helmet mount.
    - e. When not in use, properly stow the helmet mount in the carrying pouch or other protected location.
  5. Perform the following procedures for helmet mounted operation.
    - a. Ensure batteries are installed.
    - b. Don the helmet mount (Figure 6).

## Performance Steps

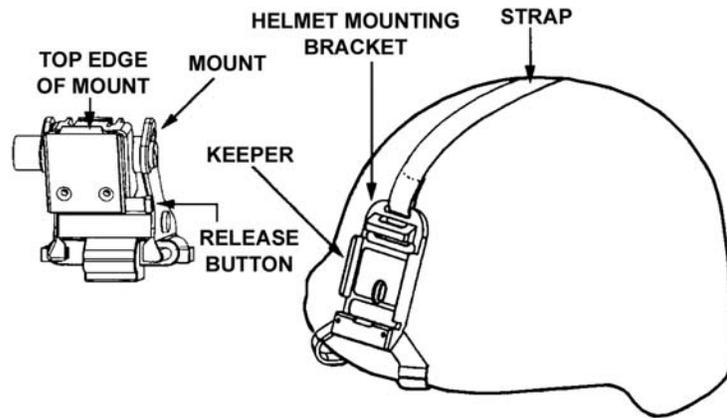


Figure 6. Helmet mount assembly.

- c. Place the monocular in the socket of the helmet mount (Figure 7). Set your eye relief by depressing the side buttons and carefully move the monocular fore and aft until the eyecup comfortably seals around the eye. Readjust the helmet straps as required for vertical adjustment.

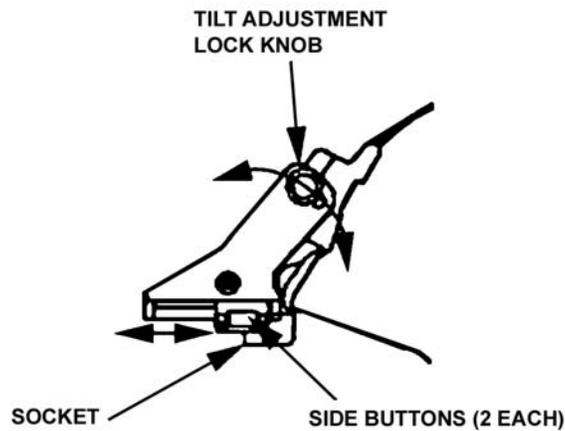


Figure 7. Tilt and flip-up assembly mechanisms.

- d. Turn power switch to ON. Adjust the tilt by using the tilt adjustment lock knob (Figure 7) until you obtain a comfortable viewing angle.

NOTE: The sharpest image will be observed only when the objective lens and eyepiece are properly focused. The objective focus adjustment is used to focus on objects at varying distances. The diopter adjustment ring is used to focus your eye (with or without glasses) on the image intensifier screen. These adjustments operate independently and must be made separately.

- e. Rotate the diopter adjustment ring for the clearest view of the image intensifier screen.

NOTE: Any readjustment of eye relief requires readjustment of the diopter ring.

- f. Adjust the eye relief distance by pressing the socket release button (Figure 5) and sliding monocular fore and aft to obtain a full field of view of the image. Readjust the diopter ring for best image.
- g. Adjust the objective lens focus (Figure 4) while observing an object until the sharpest image is obtained.
- h. To flip up, place an open hand under the monocular, grasp the monocular and rotate upward and rearward until the latch is firmly engaged.

NOTE: The monocular will be turned off automatically when flipped up.

**Performance Steps**

- i. To flip down, grasp the monocular housing and rotate downward and forward until the latch is firmly engaged.
  - j. Turn the switch to the OFF position, then to the ON position to resume viewing.
6. Operate goggles under unusual conditions.
- a. Extreme darkness.
    - (1) Pull the OFF-ON-PULL/IR switch out and rotate it clockwise to the IR position.
    - (2) Ensure the eyecup is positioned to prevent light escaping from the goggle.

**WARNING**

The infrared source is a light that is invisible to the unaided eye for use during conditions of extreme darkness. However, the enemy can detect it with night vision devices. The infrared source is used to see objects within a distance of 3 meters.

- b. Dust and sand. Attach the sacrificial window to protect the objective lens from scratches and other damage.
  - (1) Remove the sacrificial window from the carrying case.
  - (2) Carefully push the sacrificial window over the objective lens until it pops.
  - (3) Turn the sacrificial window clockwise until it snaps in place.
  - (4) Remove the sacrificial window by reversing the installation procedures.
- c. Rainy and humid conditions. Press each eyecup over the diopter retainer ring. Rotate it into correct viewing position.
  - (1) Remove the eyecups by carefully pulling them off the diopter ring.
  - (2) Carefully press a demist shield onto each eyepiece. Do not smudge eyepiece or demist shields.
  - (3) Replace eyecups. Press each eyecup over the diopter retainer ring. Rotate it into correct viewing position.
- d. Laser threat environment. Install the LIF. Using this filter will slightly reduce system gain (Figure 8).

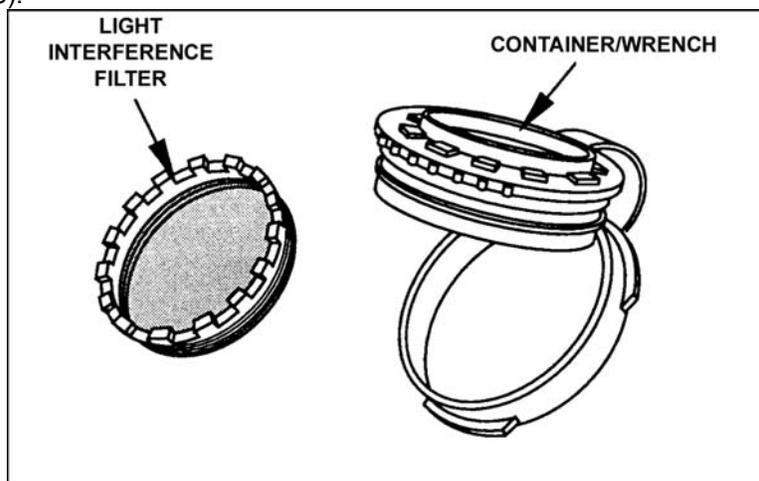


Figure 8. Light interference filter assembly.

- (1) Remove the container/wrench from the carrying case.
- (2) Remove the lens cap or sacrificial window from the objective lens of the goggle.
- (3) Open the container/wrench and remove the LIF.
- (4) Hold the LIF by the notched end. Thread it clockwise into the end of the objective lens.
- (5) Use the ridged side of the container/wrench as a wrench. Engage the ridges on the container with the ridges on the LIF and hand tighten.
- (6) Place the empty container/wrench back into the pouch in the carrying case.

**NOTE:** The lens cap and the sacrificial window will fit onto the end of the objective lens with the LIF in place. However, the lens cap and sacrificial window will not snap into place without the LIF attached.

- (7) Replace the lens cap or the sacrificial window onto the end of the objective lens and over the LIF.

**Performance Steps**

- (8) Remove the LIF by reversing the installation procedures.
- e. NBC environment.
  - (1) Place the protective mask on your head IAW instructions provided with the protective mask.
  - (2) Do not break the seal of the protective mask around your face when installing the headmount assembly over the protective mask.

7. Install and operate the snap-on compass (Figure 9).

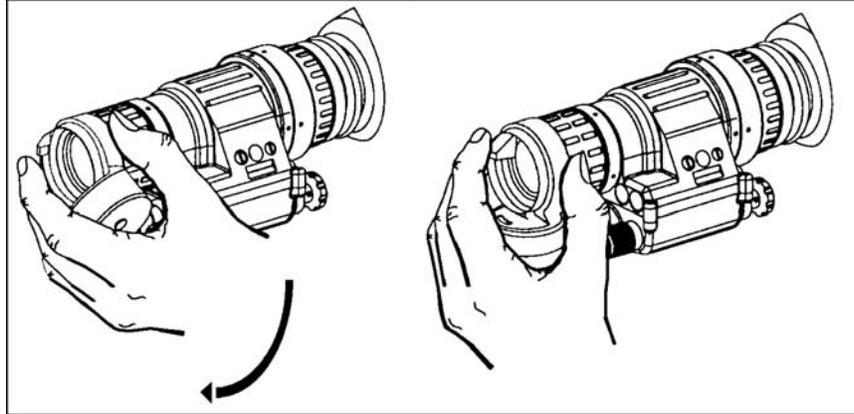


Figure 9. Installation of the snap-on compass.

- a. Remove the objective lens cover from the goggle. Secure the snap-on compass to the lens with the round part of the activation button facing down.
- b. Turn the goggle on. Push up on the activation button to determine azimuth direction.

**Evaluation Preparation:** SETUP: Evaluate this task in a classroom where light can be controlled to simulate nighttime. Provide the soldier with a night vision device, AN/PVS-14, components, and batteries, as described in the task condition statement.

1. Have the soldier prepare the device for operation, operate the device using the headmount assembly, shut down the device, and stow the device.
2. Evaluate the soldier's ability to select and attach the appropriate components by telling him to prepare the device for operation in the following conditions: dust and sand, rain or high humidity, or laser threat environment. If snap-on compass and 3X magnifier are available, evaluate the soldier's ability to attach them to the device.

**BRIEF SOLDIER:** Tell the soldier to prepare the device for operation, operate the device using the headmount assembly, shut down and stow the device, and attach components to operate the device in various conditions as instructed. Tell him to notify you before turning the device ON and after turning it OFF, so you can darken or lighten the room. Tell the soldier not to energize the device when the room lights are on.

**Performance Measures**

	<u>GO</u>	<u>NO GO</u>
1. Prepared the AN/PVS-14 for operation.	—	—
2. Inspected the monocular assembly and components for serviceability.	—	—
3. Installed the batteries.	—	—
4. Performed operational procedures for hand-held operation.	—	—
5. Performed operational procedures for head-mounted operation.	—	—

**Performance Measures**

	<u>GO</u>	<u>NO GO</u>
6. Performed operational procedures for helmet-mounted operation.	—	—
7. Installed the light interference filter (LIF).	—	—
8. Installed and operated snap-on compass (if available).	—	—
9. Attached 3X magnifier telescope assembly (if available).	—	—
10. Stowed the night vision goggles.	—	—

**Evaluation Guidance:** Score the soldier GO if all performance measures are passed. Score the soldier NO-GO if any performance measure is failed. If the soldier scores NO-GO, show the soldier what was done wrong and how to do it correctly.

**References**

**Required**

**Related**

TM 11-5855-306-10

**Maintain Night Vision Device, AN/PVS-14****071-706-0002**

**Conditions:** Given an AN/PVS-14 with proper cleaning equipment.

**Standards:** Maintained AN/PVS-14, inspected parts, cleaned, or replaced IAW TM 11-5855-306-10.

**Performance Steps**

1. Clean the AN/PVS-14. Clean the monocular lens with water (if needed) and dry it thoroughly. Clean the lenses with lens paper (and water, if needed, except for the demist shields).

**CAUTIONS:**

1. The monocular lens is a precision electro-optical instrument. Handle it with care.
2. Do not scratch the external lens surfaces or touch them with your fingers.
3. Do not wipe the demist shields with wet lens paper as this could damage the coating.

## 2. Maintain headmount.

- a. Replace the browpad if cracked, torn, or contaminated:
  - (1) Firmly grasp the headmount and remove the old browpad.
  - (2) Gently press on the browpad. Lightly smooth out any wrinkles in the new browpad.
- b. Remove and reinstall the neckpad. During operation of the monocular lens, the neckpad could separate from its position on the headband.
  - (1) Lift the upper headband strap retention tab. This allows you to insert the neckpad strap underneath (Figure 1).

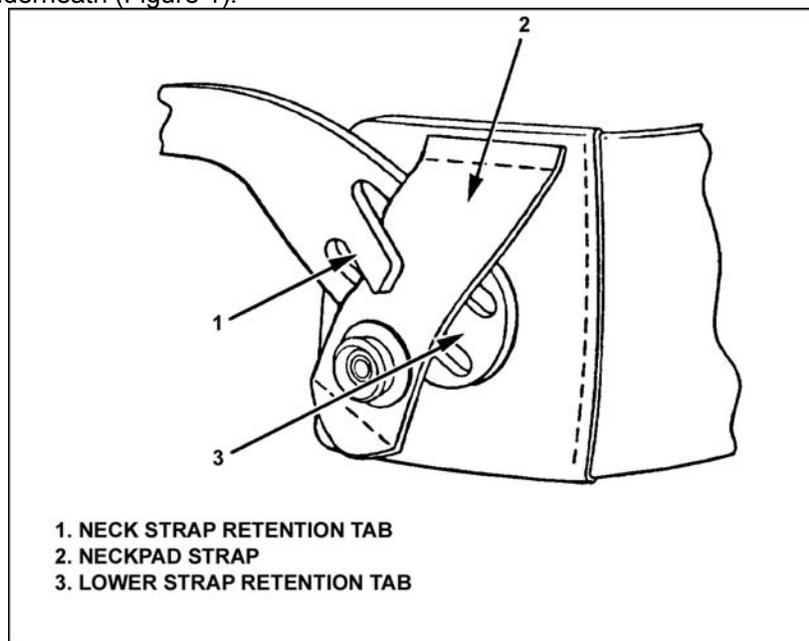


Figure 1. Reinstalling the neckpad.

- (2) Slip the neckpad strap all the way under the upper strap retention tab. Pull the lower part of the neckpad strap under the lower strap retention tab.
- (3) Repeat steps 1 and 2 for the other side of the headband and neckpad, if necessary.
- c. Lace the sliding bar buckle. While donning and adjusting the headmount, the strap could slide out of a slide fastener. To replace the strap and sliding bar buckle:
  - (1) Thread the strap from the inside of the buckle over the moveable sliding bar. Thread the strap back through the buckle, but this time, thread it under the sliding bar and over the serrated part of the buckle (Figure 2).

**Performance Steps**

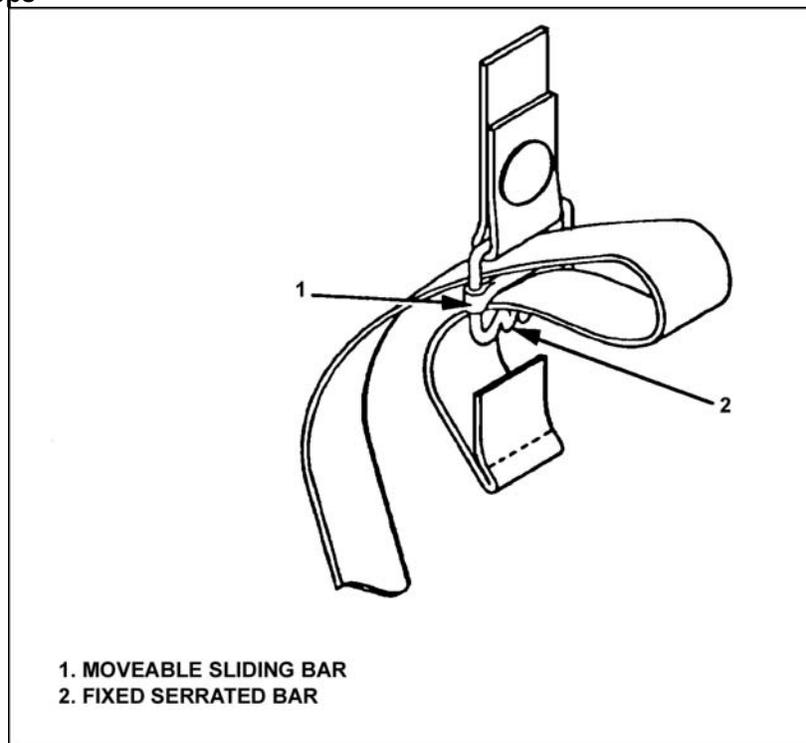


Figure 2. Lacing the sliding bar buckles.

- (2) Pull the strap through the buckle and tighten as necessary.
  - (3) Repeat steps 1 and 2 for any other straps and buckles that may have come undone.
3. Maintain helmet mount.
- a. To replace the helmet mount strap when it becomes frayed or torn:
    - (1) Press the release button. Remove the mount from the helmet mounting bracket.
    - (2) Unlace the strap from the helmet mounting bracket.
    - (3) Unsnap the rear snap and remove the rear bracket.
    - (4) Lace the new helmet mount strap onto the helmet mounting bracket (Figure 3).

**Performance Steps**

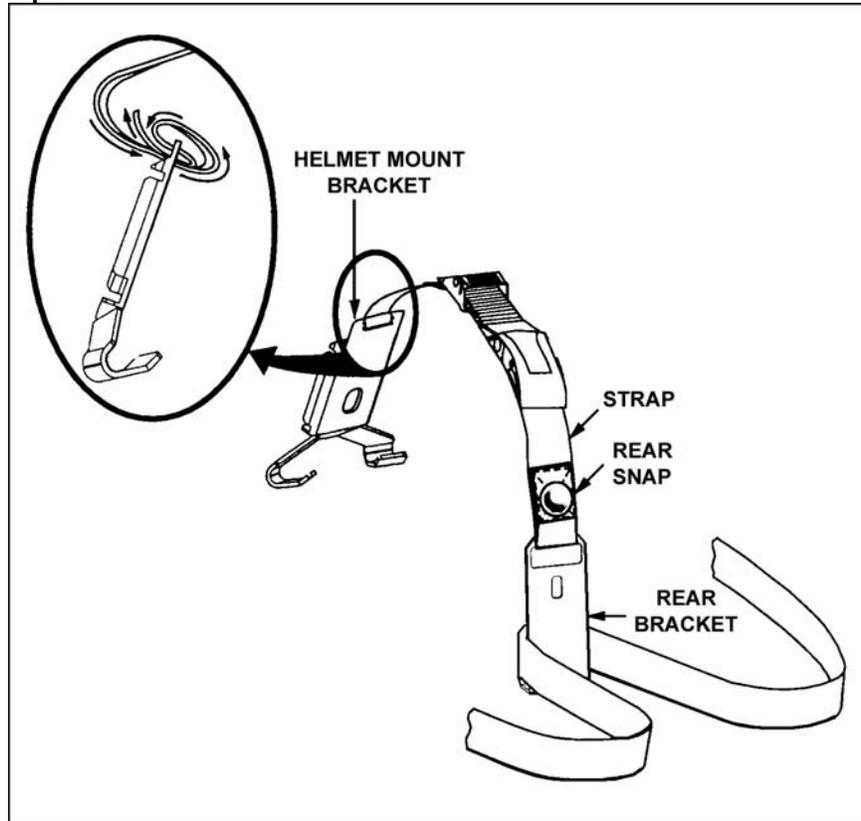


Figure 3. Lacing the helmet mount strap.

- (5) Insert the snap end of the helmet mount strap into the rear bracket and snap the bracket closed.
- 4. Maintain the neck cord.
  - a. The neck cord may be broken, frayed, or loose at one or both ends. If loose, retie the cord. If broken or severely frayed, install a new cord by--
    - (1) Inserting ends through the monocular lens holes from rear.
    - (2) Threading right cord end through hole in lens cap.
    - (3) Tying a knot in each end.

**Evaluation Preparation:** SETUP: At the training site provide the soldier with all the equipment listed in the task condition statement.

BRIEF SOLDIER: Tell the soldier to perform operator maintenance on the night vision device, AN/PVS-14, monocular.

**Performance Measures**

	<u>GO</u>	<u>NO GO</u>
1. Cleaned the AN/PVS-14 monocular.	—	—
2. Maintained the headmount.	—	—
3. Maintained the helmet mount.	—	—
4. Maintained the neck cord.	—	—

**Evaluation Guidance:** Score the soldier GO if all performance measures are passed. Score the soldier NO-GO if any performance measure is failed. If the soldier scores NO-GO, show the soldier what was done wrong and how to do it correctly.

**References**

**Required**

TM 11-5855-306-10

**Related**

**Operate a Night Vision Sight, AN/PVS-4**  
**071-315-0003**

**Conditions:** At night, given an AN/PVS-4 sight in its carrying case and BA-1567/U batteries.

**Standards:** Prepared and correctly placed the AN/PVS-4 sight into operation, then shut it down and stored it.

**Performance Steps**

1. Unpack the sight.

**CAUTION:** Relieve air pressure inside the carrying case by pressing the core of the relief valve, located near the handle, before releasing the latches.

- a. Release the latches securing the top of the carrying case, and remove the top.
- b. Remove the carrying bag from the carrying case. Open the bag and remove the sight.
- c. Inspect the sight for damage (cracks, chips, and abrasions) and ensure that the decals are readable. Report deficiencies.

**CAUTION:** The AN/PVS-4 is a precision electro-optical instrument. They must always be handled carefully. Be sure to turn the ON-OFF/TUBE BRIGHTNESS and ON/OFF/RETICLE BRIGHTNESS switches OFF before installing batteries.

2. Install the batteries (Figure 1).

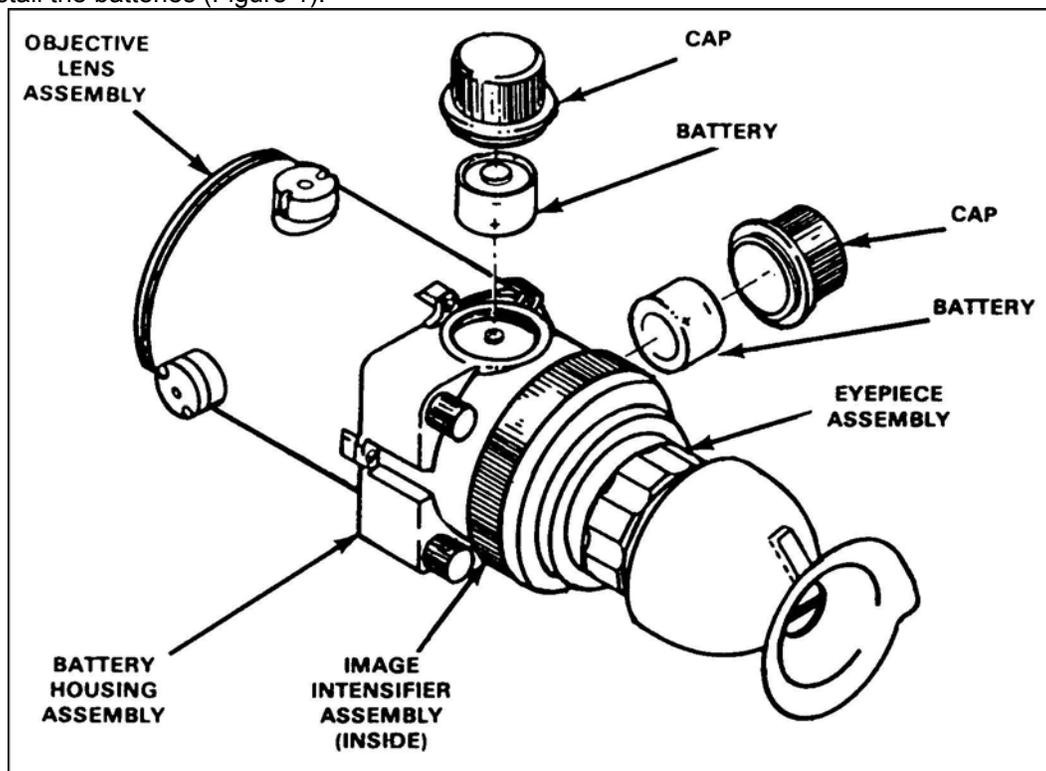


Figure 1. Battery emplacement.

- a. Remove the battery caps by turning them counterclockwise.
- b. Insert a battery in each cap with the negative (-) terminal (raised end) facing into the cap.
- c. Replace the battery caps and tighten them snugly.

3. Operate the device under normal conditions (Figure 2).

## Performance Steps

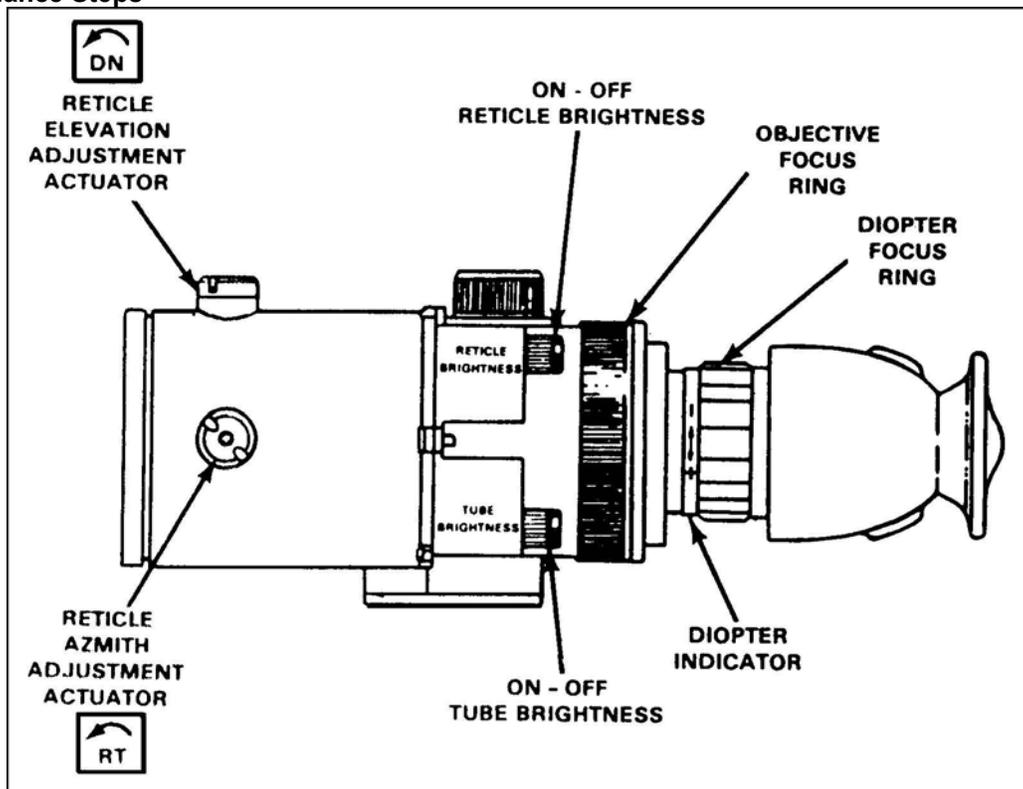


Figure 2. Controls and indicators.

**WARNING**

Using the sight without the eye guard installed may cause detection by the enemy and, when operated on a weapon, can result in physical injury to the operator because of weapon recoil.

**NOTES:**

1. The daylight cover must be installed during the daylight and removed at night.
2. Batteries must be removed when the sight is not in use to prevent accidentally turning on the sight.
  - a. Press the eye against the eye guard to open the rubber leaves that prevent the emission of stray light.
  - b. Turn the ON-OFF/TUBE BRIGHTNESS control clockwise to turn on the sight.

**NOTE:** If the equipment fails to operate, refer to the troubleshooting procedures in TM.

- c. Adjust the ON-OFF/TUBE BRIGHTNESS control to the lowest setting that provides good target-to-background contrast.
- d. Turn the ON-OFF/ RETICLE BRIGHTNESS control clockwise to turn on the light-emitting diode. Adjust the light intensity so that the reticle is just visible against the background.

**CAUTION**

Excessive reticle brightness may damage the image intensifier tube.

- e. Turn the diopter focus ring (Figure 2) to obtain the clearest image of the reticle pattern.
- f. Turn the objective focus ring (Figure 2) until the target in the field of view is sharply defined.

**NOTE:** During surveillance or target engagement, the operator must adjust the objective focus to ensure a sharp image at different ranges.

4. Perform after-operation procedures.
  - a. Turn the reticle and tube brightness controls fully clockwise.
  - b. Remove both batteries.
  - c. Replace the sight in the carrying case.

**Evaluation Preparation:** SETUP: At the test site, provide all the materials and equipment given in the task condition statement.

BRIEF SOLDIER: Tell the soldier to remove the AN/PVS-4 from its storage case and place it into operation. Tell him to take the AN/PVS-4 out of operation and replace it in its storage case.

<b>Performance Measures</b>	<b><u>GO</u></b>	<b><u>NO GO</u></b>
NOTE: Steps 1 and 2 are to be executed in sequence.		
1. Removed sight from the carrying case.	—	—
a. Released the air pressure.		
b. Released the latches.		
c. Inspected the sight for damages.		
2. Installed the batteries.	—	—
a. Placed the ON-OFF/TUBE BRIGHTNESS switch to OFF.		
b. Placed the ON-OFF/RETICLE BRIGHTNESS switch to OFF.		
c. Removed the battery caps (two each).		
d. Inserted the batteries (two each) correctly (negative [-] terminal facing into the cap).		
e. Replaced caps (two each).		
3. Turned the ON-OFF/TUBE BRIGHTNESS control to ON.	—	—
4. Turned the ON-OFF/RETICLE BRIGHTNESS control to OFF.	—	—
5. Performed after-operation procedures.	—	—
a. Turned the ON-OFF/TUBE BRIGHTNESS control to OFF.		
b. Turned the ON-OFF/RETICLE BRIGHTNESS control to OFF.		
c. Removed both batteries.		
d. Replaced the sight in the carrying case.		

**Evaluation Guidance:** Score the soldier GO if all performance measures are passed. Score the soldier NO-GO if any performance measure is failed. If the soldier scores NO-GO, show the soldier what was done wrong and how to do it correctly.

**References**  
**Required**

**Related**  
 TM 11-5855-213-10

**Operate Night Vision Goggles, AN/PVS-5**  
**071-315-0030**

**Conditions:** At night, given serviceable AN/PVS-5 night vision goggles with components, accessories, and batteries.

**Standards:** Used the AN/PVS-5 night vision goggles during performance of assigned mission, complied with all appropriate warnings and cautions. Inspected and operated the goggles to obtain the best possible image. Properly shut down the goggles. Stowed with accessories in the carrying case.

**Performance Steps**

1. Perform preoperational checks.

**CAUTION:** The AN/PVS-5 is a precision electro-optical instrument and must be handled carefully. Keep caps on objective and eyepiece lenses when not in use. Do not expose the unprotected objective lens to bright light with power applied to the goggles. Damage to the image intensifier can result.

- a. Remove the goggles from the carrying case (Figure 1).

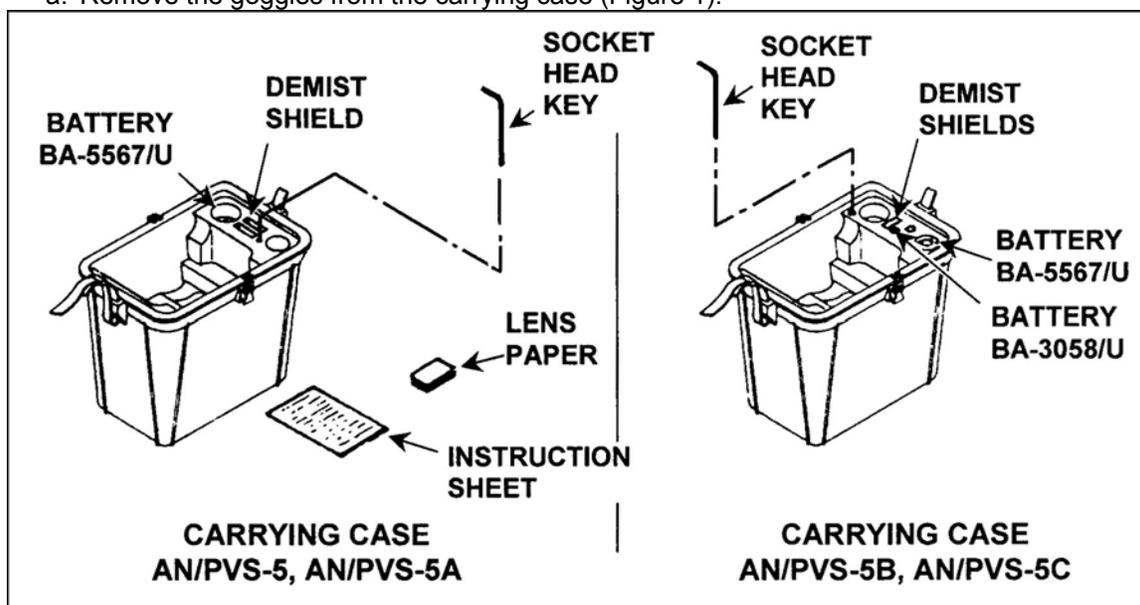


Figure 1. Carrying case items.

**CAUTION:** The neck cord must be placed around the user's neck when the goggles are removed from the carrying case.

- b. Place the neck cord around your neck.
- c. Make sure the rotary switch is in the OFF position.

**CAUTION:** The rotary switch must be in the OFF position when the batteries are installed.

**WARNING:** Do not use mercury or rechargeable NiCad batteries. Using these batteries could result in system failure, which could cause personnel injury.

**WARNING**

Danger of explosion. Do not transport batteries in pockets or other containers containing metal objects such as coins, keys, and so on. Metal objects can short circuit batteries and cause them to become very hot. The BA-5567/U (lithium) batteries could explode.

**WARNING**

The BA-5567/U (lithium) battery contains sulfur dioxide gas under pressure and should be handled in the following manner: (1) The BA-5567/U (lithium) batteries have safety vents to prevent explosion. When they are venting sulfur dioxide gas, you may smell it or hear the sound of gas escaping. When the safety

**Performance Steps**

vents have operated, the batteries are fairly safe from bursting but will be hot and must be handled with care. (2) Do not heat, puncture, disassemble, short circuit, attempt to recharge, or otherwise tamper with the batteries. (3) Turn off the equipment if the battery compartment becomes unduly hot. Do not open the battery compartment, but turn in the goggles to maintenance and report the problem.

d. Install the BA-5567/U (lithium) battery or BA-3058/U (alkaline) battery (Figures 2, 3, and 4).

(1) Remove the BA-5567/U (lithium) battery cap or BA-3058/U (alkaline) battery cap(s).

(2) Insert the BA-5567/U (lithium) battery with the recessed (+) side in first. Insert the BA-3058/U (alkaline) batteries with the flat (-) side in first.

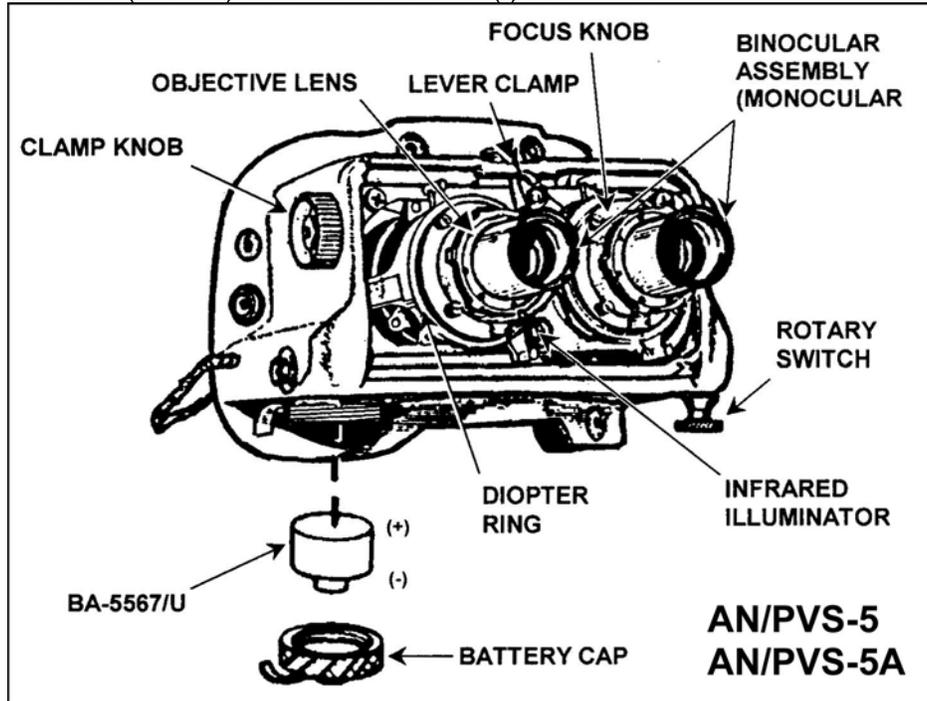


Figure 2. AN/PVS-5 and AN/PVS-5A goggles.

Performance Steps

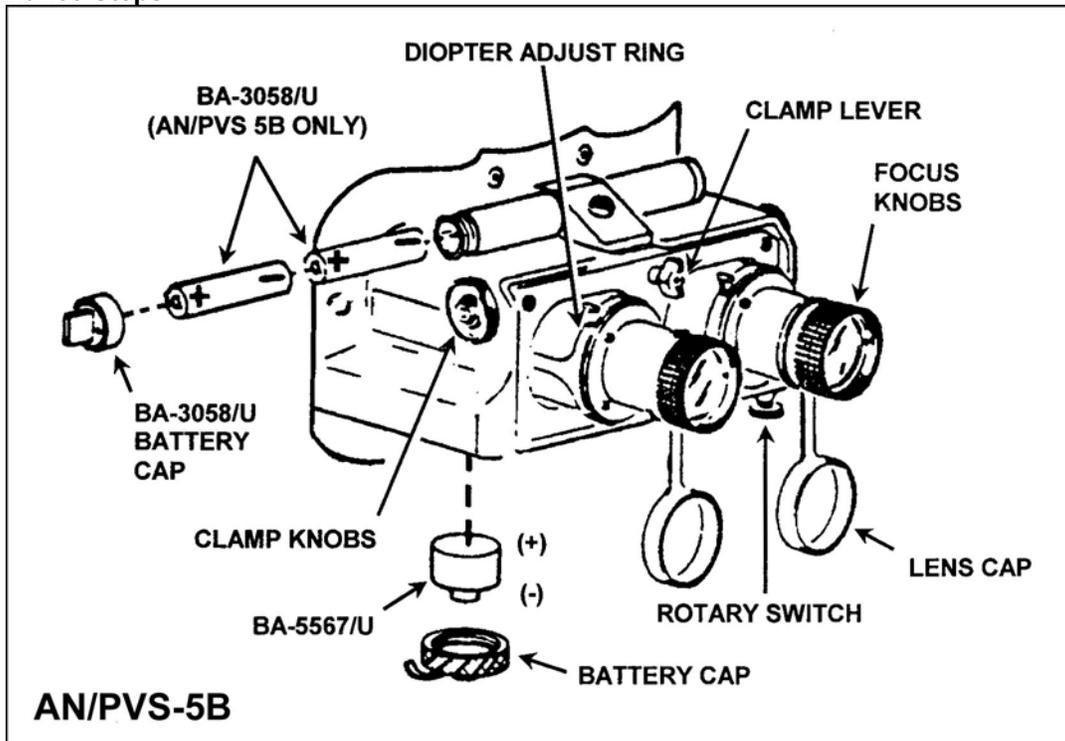


Figure 3. AN/PVS-5B goggles.

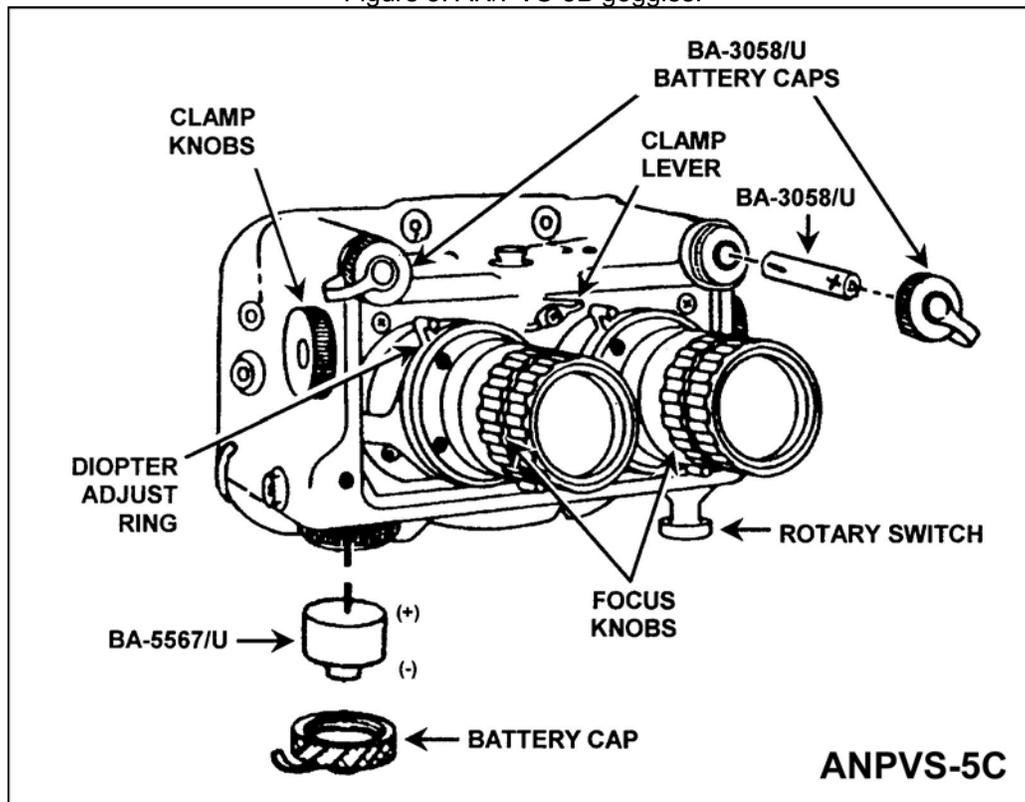


Figure 4. AN/PVS-5C goggles.

WARNING

### Performance Steps

For AN/PVS-5B and AN/PVS-5C: Do not use the goggles with more than one type of battery at a time. Putting both battery types in your goggles at the same time draws off power and will severely reduce battery life of both types.

NOTE: The BA-5567/U (lithium) battery compartment is the same for the AN/PVS-5, AN/PVS-5A, AN/PVS-5B, and AN/PVS-5C. The upper battery compartment for the BA-3058/U (alkaline) batteries is on the top of the face mask for the AN/PVS-5B as shown in Figure 3 and for the AN/PVS-5C as shown in Figure 4.

- (3) Replace the battery cap and tighten it firmly to ensure a watertight seal.
2. Prepare the goggles for operation.
    - a. Snap the headstrap to the face mask, making sure all straps are extended to their maximum lengths.
    - b. Move the objective focus knob and diopter adjustment ring throughout their range to make sure they rotate freely.
    - c. Remove the eyepiece lens caps.
    - d. Place the goggles on your head and adjust the headstraps.
      - (1) Bend your head so that you are facing the ground.
      - (2) With straps loosened, place the goggle headstrap on your head.
      - (3) Grasp the headstrap side (horizontal) band adjustment with both hands and slowly pull band adjustment until face mask cushion just touches your face.
      - (4) Continue pulling straight back on the straps until the goggles feel snug (Figure 5).

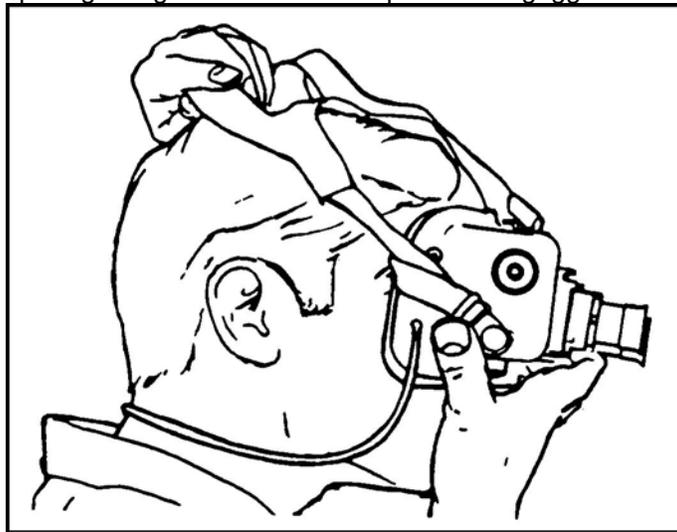


Figure 5. Fitting goggles to face.

- (5) With your head still bent, grasp center (vertical) band adjustment and pull until snug (Figure 6).

**Performance Steps**

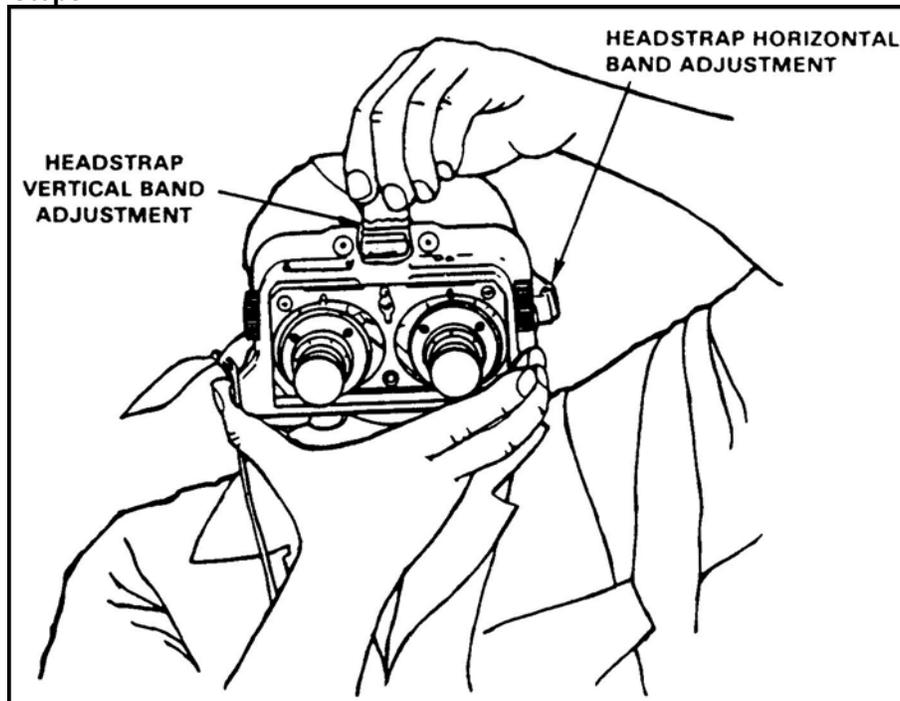


Figure 6. Adjusting headstraps.

- (6) Lift your head to a normal viewing position and make final adjustments on all bands until you have a comfortable, stable fit.
- e. Remove objective lens cap.

3. Operate the goggles.

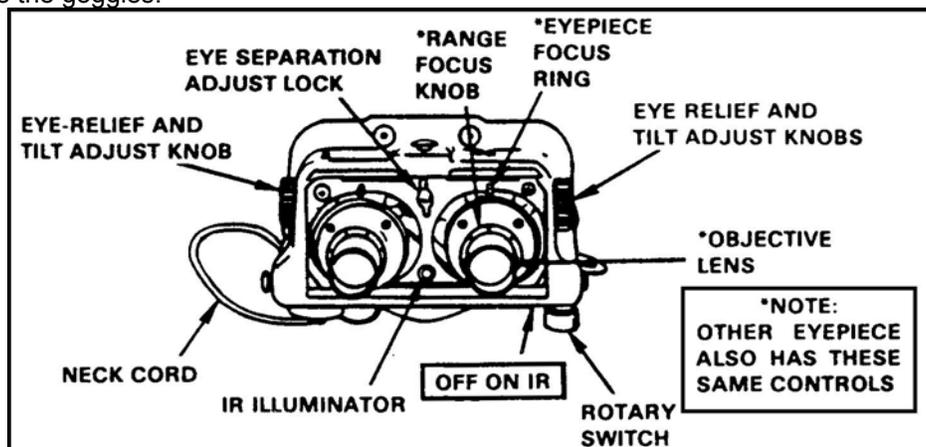


Figure 7. Control locations.

**CAUTION:** Perform the following procedures in the dark.

**NOTE:** Refer to Figure 7 for the location of controls on the AN/PVS-5, AN/PVS-5A, AN/PVS-5B, and AN/PVS-5C.

- a. Set the rotary switch on the ON position. A green glow will appear in each eyepiece after a slight delay.
- b. Adjust the diopter adjustment rings. After the eye relief is set, the diopter adjustment ring adjusts between the eye and the eyepiece. Adjust both eyepieces by turning the diopter adjustment rings counterclockwise.

**Performance Steps**

- c. Adjust the objective focus knobs. Adjust both objective focus knobs to infinity, all the way counterclockwise and back approximately 1/16 turn to infinity. If you are focusing on an object less than 100 to 200 feet away, adjust the focus knobs slightly to the right. Adjustment of the objective focus knobs regulates the target distance that is in focus. The objective focus knobs are located right on the objective lenses.
- d. Loosen the lever clamp (wing nut) counterclockwise and gently pull the monocular apart to their fullest extent. Then, gently push the monocular together to attain a proper sight picture.
  - (1) The proper sight picture has one circular image with a slight overlap.
  - (2) An improper sight picture may be due to the monocular being improperly positioned in front of the eyes.
  - (3) Tighten the lever clamp (wing nut) clockwise finger tight. Do not over tighten the lever clamp (wing nut).
- e. Adjust the clamp knobs.
  - (1) Loosen the clamp knobs counterclockwise and adjust the monocular to attain the desired monocular tilt. The monocular has a tilt range of 25 degrees.
  - (2) The monocular may be adjusted fore and aft in the slot of the face mask assembly within a 0.39 inch (10 millimeter) range. This adjustment changes your field of view. Start by placing the monocular as close to your eyes as possible and then move them outward. The position is a matter of individual preference. Placing the monocular close to the eye allows an excellent view of the monocular image. If the monocular lenses are more than 0.71 inch (18 millimeters) from the eye, your field of view will be less than 40 degrees.

NOTE: If the eyepiece lenses are not properly aligned with the eyes, optimal resolution will not be achieved. Proper alignment of the eyepiece lenses is achieved when the distance between the monocular matches the distance between your pupils and the line of sight is the same as the vertical angle of the binoculars. When all the eyepiece adjustments (eyespan, vertical, and tilt) are properly set, the edges of the images in both monocular will be clear.

- (3) Tighten the clamp knobs clockwise finger tight. Do not over tighten the knobs.

#### 4. Adjust the focus.

NOTE: When setting the diopter adjustment, you can achieve a clear image in each eye (monocular) and yet have a blurred image or develop eyestrain when viewing with both eyes.

NOTE: The following procedure is performed outdoors at night while wearing the goggles.

- a. Preset the objective focus knob and diopter adjustment ring of both monocular fully counterclockwise.
- b. Turn on the goggles.
- c. Look at the edge or some detail of a building or other manmade structure at least 100 feet (33 meters) away.
- d. Cover your left eye, or cup your hand over the left objective lens. Do not close your left eye. Be careful not to touch the lenses.
- e. Turn the right diopter adjustment ring clockwise until you first obtain a clear image, and stop.

NOTE: If you continue to turn the diopter adjustment ring clockwise, the image may seem clear initially, but you could experience eyestrain or headaches after prolonged use.

- f. Refine the focus of the right objective lens by very slowly turning the right objective focus knob until the sharpest image is obtained.
- g. Repeat steps 4c through 4f for the left monocular.
- h. After adjusting both monocular for best focus, cover the objective lens of the left monocular and view the image through the right monocular, checking to see if the image is still clear. Then cover the right monocular with the right hand and view the image through the left monocular. If either monocular is not clear, repeat steps 4c through 4g.
- i. With both eyes open, make final objective focus adjustments, if necessary.
- j. Turn off the goggles.

#### 5. Operate the goggles for reading.

NOTE: Keep both eyes open when focusing.

### Performance Steps

- a. Turn on the goggles to the IR position by pulling the switch down and turning it clockwise. (On the AN/PVS-5, you do not have to pull the switch down to turn it to IR.)
- b. Check that the IR illuminator has been turned on by passing your hand directly in front of the goggles. If the contrast appears extra bright, turn the rotary switch to the ON position from the IR position.
- c. Turn the objective focus knobs fully clockwise to view up close.
- d. Cover your left eye. Keep both eyes open. Adjust the right diopter adjustment ring until the viewing area becomes as clear as possible.
- e. Adjust the right objective focus knob for the clearest image of your reading material.
- f. Cover your right eye. Keep both eyes open. Adjust the left diopter adjustment ring until the viewing area becomes as clear as possible.
- g. Adjust the left objective focus knob for the clearest image of your reading material.
- h. Have an observer wearing night vision goggles check carefully for stray light that may be visible at the edges of your face mask cushion.

### WARNING

The infrared (IR) illuminator is for conditions of extreme darkness. The light from the illuminator can be detected by the enemy using night vision devices, so only use the IR illuminator for emergencies. The purpose of the IR illuminator is for viewing within approximately 6 feet (2 meters).

#### 6. Operate the IR illuminator.

- a. Pull down and turn the rotary switch to the IR position and observe that the area to your immediate front is lighted. (On the AN/PVS-5, you do not have to pull the switch down to turn it to IR.) As the IR illuminator is turned on, the momentary flash that you see is normal.

### WARNING

Two major disadvantages occur when the IR illuminator is used. First, it makes the night vision goggles an active IR system, and when illuminated, the operator is subject to detection by enemy systems. Second, when the illuminator is used, the battery power is consumed six times faster.

- b. Check that the IR illuminator has been turned on by passing your hand directly in front of the goggles. If the contrast appears extra bright on your hand, the IR illuminator is lighted.

#### 7. Install and remove the demist shields.

NOTE: Use the demist shields if the eyepieces become fogged during operation.

CAUTION: Demist shields will be damaged if wiped while wet or with wet lens paper.

- a. Remove the demist shields from the goggles carrying case. Snap the shields over the eyepiece lenses being careful not to smudge the eyepiece lenses or demist shields.
- b. Remove the demist shields by grasping them and pulling them off the eyepiece lenses. Place them back in the carrying case.

#### 8. Operate the goggles in the standby mode.

- a. During extended periods of nonuse, turn the rotary switch to OFF. Observe that the green glow disappears immediately from the goggles.
- b. Remove the goggles from your head.
- c. Let them hang by the neck cord around your neck.

#### 9. Perform shutdown and storage procedures.

- a. Remove goggles.
  - (1) Shut down goggles by turning rotary switch to OFF.
  - (2) Unsnap side straps.
  - (3) Unsnap center strap.

**Performance Steps**

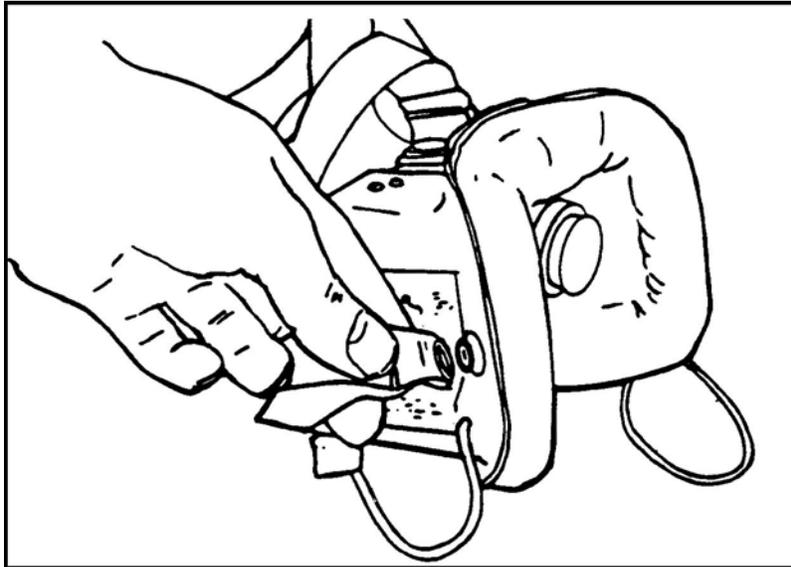


Figure 8. Removing headstrap assembly.

**CAUTION:** When removing the headstrap at the fastener, lift snap only at LIFT DOT (Figure 8) to avoid tearing the strap or breaking through the face mask. The white dot on the strap's button is the only place the button releases on its own. The LIFT DOT is not on the AN/PVS-5B headstrap.

- b. Replace the objective lens caps and eyepiece caps.
- c. Remove batteries.
  - (1) Unscrew the battery caps.
  - (2) Remove the BA-5567/U (lithium) battery or BA-3058/U (alkaline) batteries from the battery compartments.
  - (3) Replace the battery caps.
- d. Loosen the clamp knobs and lever clamp (wing nut).

**CAUTION:** Failure to loosen the clamp knobs and lever clamp (wing nut) before stowing could result in damage to the face mask.

- e. Place the goggles and batteries in the carrying case, and secure the latch.

**Evaluation Preparation: SETUP:** Evaluate this task at night or in a classroom where you can control the light to simulate nighttime conditions. Provide the soldier with a set of AN/PVS-5 night vision goggles, complete with components and fresh batteries.

**BRIEF SOLDIER:** Tell the soldier to prepare the goggles for operation, attach the components, operate the goggles, and shut down and stow the goggles under the following conditions: normal operation, extreme darkness, and rain or high humidity. Tell the soldier that he must notify you before turning the goggles ON and after turning them OFF, so you can darken or lighten the room accordingly. Tell him not to energize the goggles when the room lights are on.

**Performance Measures**

	<u>GO</u>	<u>NO GO</u>
1. Performed preoperational checks.	—	—
a. Removed the goggles from the carrying case.		
b. Placed the neck cord around your neck.		
c. Ensured the rotary switch was in the OFF position.		
d. Installed the battery(ies).		
2. Prepared the goggles for operation.	—	—
a. Installed the headstraps.		
b. Removed the eyepiece lens caps.		

**Performance Measures**

**GO**    **NO GO**

- |   |       |       |
|---|-------|-------|
| c. Put on the goggles and adjusted the headstraps.            |       |       |
| d. Removed objective lens caps.                               |       |       |
| 3. Operated the goggles.                                      | _____ | _____ |
| a. Turned the rotary switch to ON.                            |       |       |
| b. Adjusted all controls to obtain proper sight picture.      |       |       |
| c. Made sure the infrared illuminator was not turned on.      |       |       |
| 4. Performed shutdown and storage.                            | _____ | _____ |
| a. Removed goggles.   |       |       |
| b. Turned the rotary switch to OFF.                           |       |       |
| c. Replaced the lens caps.                                    |       |       |
| d. Removed the battery(ies).                                  |       |       |
| e. Loosened the clamp knobs and lever clamp (wing nut).       |       |       |
| f. Placed the goggles and battery (ies) in the carrying case. |       |       |

**Evaluation Guidance:** Score the soldier GO if all performance measures are passed. Score the soldier NO-GO if any performance measure is failed. If the soldier scores NO-GO, show the soldier what was done wrong and how to do it correctly.

**References**

**Required**

**Related**

TM 11-5855-238-10

**Maintain a Thermal Viewer, AN/PAS-7**  
**071-315-0090**

**Conditions:** Given an AN/PAS-7 with all components; two clean camel's-hair brushes; lens tissue; lens cleaner; three to five clean, lint-free cloths; mild detergent; water; and TM 11-5855-246-10.

**Standards:** Performed preventive maintenance checks and services on the AN/PAS-7 thermal viewer IAW TM.

**Performance Steps**

1. Check viewer.
  - a. Check exterior surfaces for cleanliness and dents.
  - b. Check infrared window and eyepiece lens surface for cleanliness, fractures, scratches, or other damage.
  - c. Check rubber eyeshield for cleanliness and for proper operation of security shutter.
  - d. Check connector for cleanliness and for bent or damaged pins or other damage.
  - e. Check neck and hand sling fabric for cleanliness and for rips, tears, or other damage.

**WARNING**

Lithium organic batteries may be used in the AN/PAS-7A. They are potentially hazardous if misused or tampered with before, during, or after discharge. The following precautions must be strictly observed to prevent possible injury to personnel or equipment damage: Do not heat, incinerate, crush, puncture, disassemble, or otherwise mutilate the batteries. Do not short circuit, recharge, or bypass the internal fuse. Do not store in equipment during long periods of nonuse (in excess of 30 days). Turn off the equipment immediately if you detect the battery compartment becoming unduly hot, hear battery cells venting (hissing sound), or smell irritating sulfur dioxide gas. Remove and dispose of the battery only after it is cool (30 to 60 minutes).

2. Check rechargeable battery with charger or check disposable battery.
  - a. Check exterior surfaces for cleanliness and for dents, scratches, or other damage.
  - b. Check connector for cleanliness and for bent or damaged pins, or other damage.
3. Check interconnecting cables.
  - a. Check connectors and cables for cleanliness.
  - b. Check connectors for bent or damaged pins or other damage.
  - c. Check cables for cracks, breaks, or other damage.
4. Check carrying bag.
  - a. Open bag and shake out any grit or dirt. Wipe interior and exterior with clean, dry, lint-free cloth. If needed, dampen cloth with clean water to remove grease or dirt.
  - b. Check fabric for rips, tears, or other damage.
  - c. Check zipper for proper operation.
5. Check transit case.
  - a. Remove cover and take all units and accessories from case. Turn the case over and shake out any loose dirt or grit. Check interior cushions for rips, tears, or other damage.
  - b. Check exterior surfaces for cleanliness and for dents, scratches, or other damage.
  - c. Check hold-down latches for proper operation and for bent clasps or other damage.

6. Clean lens and window surfaces.

**CAUTION:** Use lens tissue when cleaning lens or window surfaces. Do not use a cloth that will scratch the lens and window surfaces.

**NOTE:** When lens and window surfaces need cleaning, clean exterior surfaces and rubber eyepiece before cleaning lens surfaces.

- a. Remove rubber eyeshield from eyepiece by gently pulling it off.
- b. Remove all dirt, dust, and foreign matter from the lens surface with a clean camel's-hair brush.

**Performance Steps**

- c. For stubborn dirt, use lens tissue folded to form a swab and dampened with lens cleaner.
  - d. Use a gentle circular motion on the lens; start at the center and work out towards the edge.
  - e. Dry the lens with dry lens tissue, using the same circular motion.
7. Clear exterior surfaces.
    - a. Brush the exterior surfaces with a camel's-hair brush. (Do not use same brush you used for cleaning lens and window surfaces.)
    - b. Wipe the surfaces with a clean, lint-free cloth.
    - c. For stubborn dirt, use the cloth dampened with clean, fresh water or with a mild detergent and water.
    - d. Dry thoroughly with a clean, lint-free cloth.
  8. Clean rubber eyeshield.
    - a. Wipe it with a clean, lint-free cloth.
    - b. For stubborn dirt, use the cloth dampened with clean, fresh water.
    - c. Air dry, or dry with a clean, lint-free cloth.
  9. Clean connectors and cables.
    - a. Remove all dirt, dust, and foreign matter with a camel's-hair brush.
    - b. For stubborn dirt, use a lint-free cloth dampened with clean, fresh water.
    - c. Air dry, or dry with a clean, lint-free cloth.

**Evaluation Preparation:** SETUP: At the test site, provide all materials and equipment indicated in the task condition statement.

BRIEF SOLDIER: Tell the soldier to perform operator maintenance on an AN/PAS-7.

**Performance Measures**

	<u>GO</u>	<u>NO GO</u>
1. Checked viewer. <ul style="list-style-type: none"> <li>a. Checked exterior surface for cleanliness and dents.</li> <li>b. Checked infrared window and eyepiece lens surface for cleanliness and for fractures, scratches or other damage.</li> <li>c. Checked rubber eyeshield for cleanliness and for proper operation of security shutter.</li> <li>d. Checked connector for cleanliness and for bent or damaged pins or other damage.</li> <li>e. Checked neck and hand sling fabric for cleanliness and for rips, tears or other damage.</li> </ul>	_____	_____
2. Checked rechargeable battery with charger or checked disposable battery. <ul style="list-style-type: none"> <li>a. Checked exterior surfaces for cleanliness, dents, scratches or other damage.</li> <li>b. Checked connector for cleanliness and for bent or damaged pins or other damage.</li> </ul>	_____	_____
3. Checked interconnecting cable. <ul style="list-style-type: none"> <li>a. Checked connectors and cable for cleanliness.</li> <li>b. Checked connectors for bent or damaged pins or other damage.</li> </ul>	_____	_____
4. Checked carrying bag. <ul style="list-style-type: none"> <li>a. Opened bag and shook out any grit or dirt. Wiped interior and exterior with clean, dry, lint-free cloth. If needed, dampened cloth with clean water to remove grease or dirt.</li> <li>b. Checked fabric for rips, tears, or other damage.</li> <li>c. Checked zipper for proper operation.</li> </ul>	_____	_____
5. Checked transit case.	_____	_____

**Performance Measures**

**GO**    **NO GO**

- |   |                           |                           |
|---|---------------------------|---------------------------|
| <ul style="list-style-type: none"> <li>a. Removed cover and all units and accessories from case. Turned over the case and shook out any loose dirt or grit. Checked interior cushions for rips, tears, or other damage.</li> <li>b. Checked exterior surfaces for cleanliness and for dents, scratches, or other damage.</li> <li>c. Checked hold-down latches for proper operation and for bent clasps or other damage.</li> </ul>   | <p>_____</p> <p>_____</p> | <p>_____</p> <p>_____</p> |
| <p>6. Cleaned lens and window surfaces.</p> <ul style="list-style-type: none"> <li>a. Removed rubber eyeshield from eyepiece by gently pulling it off.</li> <li>b. Removed all dirt, dust, and foreign matter from the lens surface with a clean camel's-hair brush.</li> <li>c. For stubborn dirt, folded the lens tissue to form a swab and dampened it with lens cleaner.</li> <li>d. Used a gentle circular motion on the lens; started at the center and worked out towards the edge.</li> <li>e. Dried the lens with dry lens tissue, used the same circular motion.</li> </ul> | <p>_____</p> <p>_____</p> | <p>_____</p> <p>_____</p> |
| <p>7. Exterior surfaces.</p> <ul style="list-style-type: none"> <li>a. Brushed exterior surfaces with a camel's-hair brush. Used a clean brush. Did not reuse the same brush used to clean lens and window surfaces.</li> <li>b. Wiped the surfaces with a clean, lint-free cloth.</li> <li>c. For stubborn dirt, folded the lens tissue to form a swab. Dampened the tissue with clean, fresh water and, if desired, added a mild detergent.</li> <li>d. Dried thoroughly with a clean, lint-free cloth.</li> </ul>  | <p>_____</p> <p>_____</p> | <p>_____</p> <p>_____</p> |
| <p>8. Cleaned rubber eyeshield.</p> <ul style="list-style-type: none"> <li>a. Wiped with a clean, lint-free cloth.</li> <li>b. For stubborn dirt, used a lint-free cloth dampened with clean fresh water.</li> <li>c. Air dried, or dried with a clean, lint-free cloth.</li> </ul>   | <p>_____</p> <p>_____</p> | <p>_____</p> <p>_____</p> |
| <p>9. Cleaned connectors and cables.</p> <ul style="list-style-type: none"> <li>a. Removed all dirt, dust, and foreign matter with a camel's-hair brush.</li> <li>b. For stubborn dirt, used a lint-free cloth dampened with clean fresh water.</li> <li>c. Air dried, or dried with a clean, lint-free cloth.</li> </ul>   | <p>_____</p> <p>_____</p> | <p>_____</p> <p>_____</p> |

**Evaluation Guidance:** Score the soldier GO if all performance measures are passed. Score the soldier NO-GO if any performance measure is failed. If the soldier scores NO-GO, show the soldier what was done wrong and how to do it correctly.

**References**

**Required**  
 TM 11-5855-246-10

**Related**

## Operate a Thermal Viewer, AN/PAS-7

071-315-0091

**Conditions:** During limited visibility, given an AN/PAS-7 and a sector to scan.

**Standards:** Installed the batteries and focused the goggles. After using the goggles, removed the batteries, covered the lens caps, and properly stowed the goggles in their carrying case.

### Performance Steps

#### WARNINGS

1. Breakage of the cathode-ray (CRT) causes a high-velocity scattering of glass fragments (implosion). To prevent CRT implosion, avoid rough handling or jarring of the instrument. Handling of the CRT will be done only by qualified maintenance personnel using approved safety mask and gloves.

2. The infrared window is coated with thorium fluoride, which contains a radioactive isotope, Thorium-232. The only potential hazard involves ingestion (swallowing or inhaling) of this coated material. This coating is electro-deposited in the silicone base so cleaning with alcohol will not damage it, but it cannot be machined or worked on with abrasives of any sort.

1. Adjust the neck sling.
  - a. Put the neck sling around your neck.
  - b. Adjust it to a comfortable position on your chest.

#### WARNING

Lithium organic batteries may be used in the AN/PAS-7A. They are potentially hazardous if misused or tampered with before, during, or after discharge. The following precautions must be strictly observed to prevent possible injury to personnel or equipment damage:

- Do not heat, incinerate, crush, puncture, disassemble, or otherwise mutilate the batteries.
- Do not short circuit, recharge, or bypass the internal fuse.
- Do not store in equipment during long periods of nonuse (in excess of 30 days).
- Turn off the equipment immediately if you detect the battery compartment becoming unduly hot, hear battery cells venting (hissing sound), or smell irritating sulfur dioxide gas. Remove and dispose of the battery only after it is cool (30 to 60 minutes).

2. Install the rechargeable battery (AN/PAS-7 or AN/PAS-7A) or the disposable battery (AN/PAS-7A only).
  - a. Rechargeable battery.
    - (1) Connect the female end of the interconnecting cable to the viewer.
    - (2) Connect the male end of the interconnecting cable to the rechargeable battery (Figure 1).

## Performance Steps

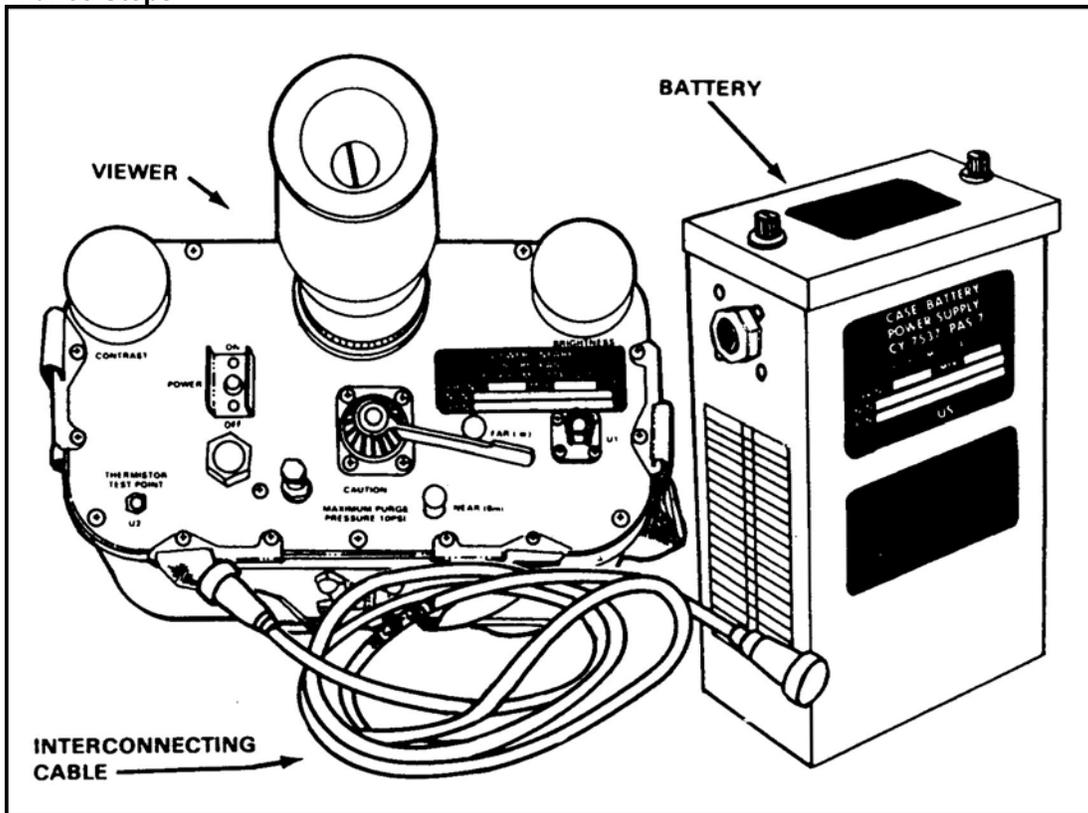


Figure 1. AN/PAS-7 and battery.

- (3) Attach the battery to your belt or place it on a nearby support if the viewer is being operated on a tripod.

## b. Disposable battery.

- (1) Let the viewer hang on your chest by the neck strap with the disposable battery case up.
- (2) Unlatch the two hold-down latches on the disposable battery case (one on each end). Note that the battery cable is stowed under the nylon hinges of the battery case cover.
- (3) Hold the viewer neck strap to one side. Remove the battery cover from the battery case and fold it back until it rests on top of the case. Remove the battery cable from under the nylon cover hinges.
- (4) After making sure the battery removal strip is out, insert the disposable lithium battery (BA-5599/U) into the case with the battery connector to the right (side toward the viewer FOCUS lever).
- (5) Press the battery firmly into the case as far as it will go.
- (6) Fold the battery removal strap over the battery and close the battery case cover. Latch the two hold-down latches.
- (7) Make sure the viewer power switch is in the OFF position. Then connect and lock the battery cable connector to the connector on the viewer front panel.

**CAUTION:** Before turning the power switch to the ON position, be sure that the brightness control is fully counterclockwise.

3. Place the power switch in the ON position. A faint ticking of the oscillating mirror can be heard. Wait about 30 seconds after turn-on for the CRT heater to warm up (Figure 2).

Performance Steps

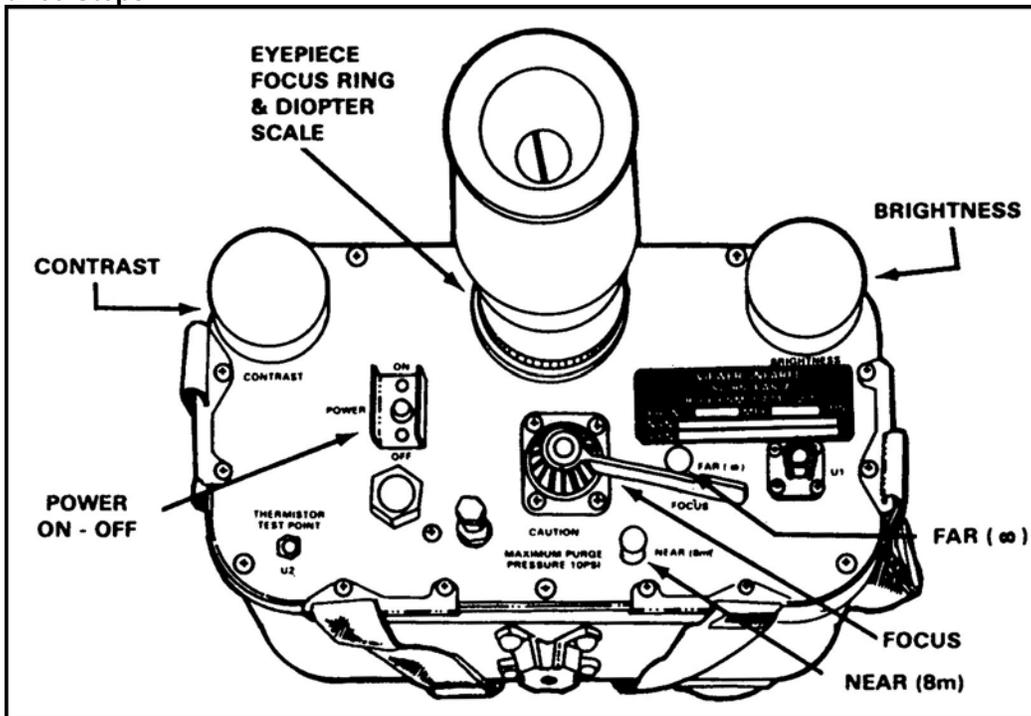


Figure 2. AN/PAS-7 controls.

4. Remove the lens cap from the infrared (IR) window (Figure 3).

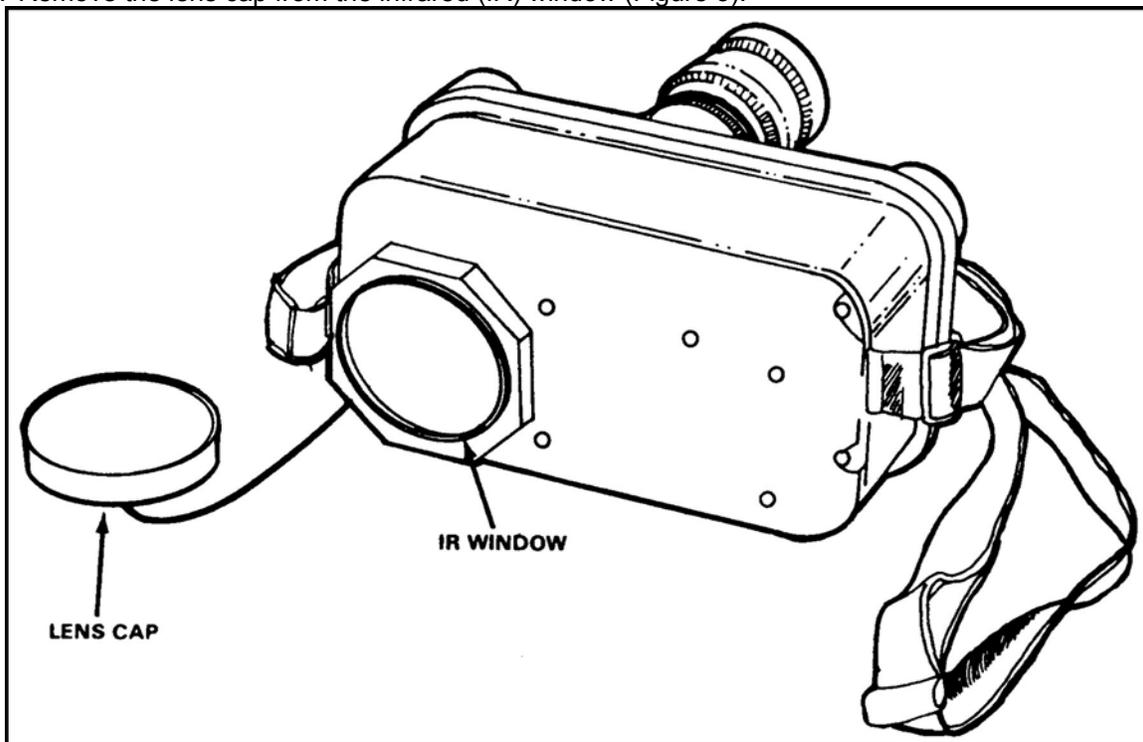


Figure 3. Cap and IR window.

5. Perform system checkout.

### Performance Steps

- a. Select a known, warm target--a person at 10 to 20 feet is best.
- b. Slide each hand under the hand slings on each end of the viewer.
- c. Adjust the hand slings for a comfortable fit.
- d. Hold the viewer in the palms of the hands so that the right thumb can move the tip of the FOCUS lever and the right forefinger can rotate the brightness control. The left forefinger can rotate the contrast control.
- e. Raise the viewer to eye level and press your eye firmly against the rubber eyeshield to open the shutter.
- f. Aim the viewer at the target and adjust the brightness control with the right forefinger until the background scene is just visible.
- g. Adjust the eyepiece focus.
  - (1) Rotate the eyepiece focus ring (Figure 2) until the crosshairs are in the best focus.
  - (2) Once adjusted, no further adjustment should be necessary during the operation.
- h. Rotate the contrast control with the left forefinger until the desired contrast between target image and background is obtained (Figure 2).
- i. Adjust the focus lever with the right thumb (Figure 2) for the best target image (Figure 4).

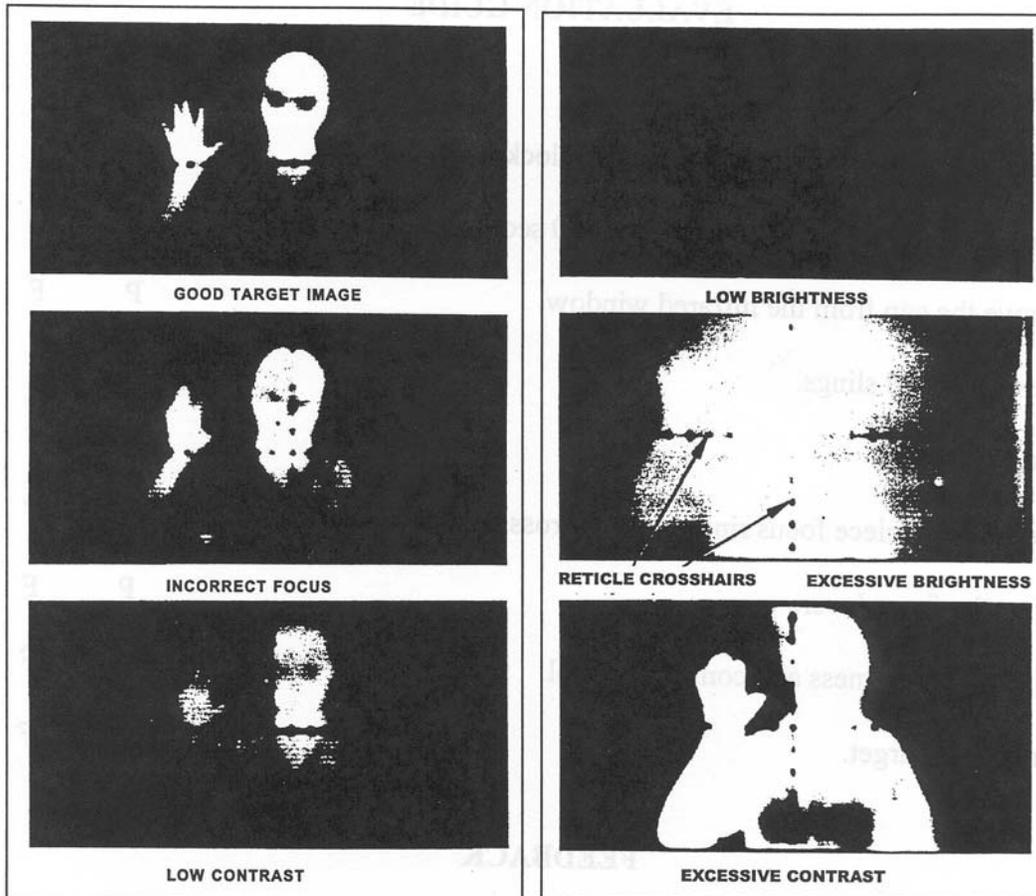


Figure 4. Selection of the best target image.

NOTE: Improper focusing can lead to one or more of the examples shown in Figure 4. If the viewer is focused properly, the target presents a good display.

6. Operate the viewer to search or scan the area of interest.
  - a. Hold the viewer to the eye and search or scan the area of interest while adjusting the focus control between NEAR (8M) and FAR (∞ [infinity]), depending upon the distance to the area

**Performance Steps**

- being scanned.
  - b. Once a target of interest is observed, readjust brightness, contrast, and focus controls as required for a good target image on the display.
  - c. Between search and scan periods, turn down the brightness control and let the viewer hang by the neck sling and rest on your chest. Adjust the neck sling length as required for a comfortable fit. For long periods between search and scan operations, turn the brightness control down and power switch to OFF to conserve the battery.
7. Shut down the viewer.
- a. Set the power switch to OFF.
  - b. Place the protective cap over the IR window.
  - c. Disconnect the interconnecting cable from the viewer (and rechargeable battery, if applicable).
  - d. If you are using a disposable battery, unlatch the two hold-down latches on the disposable battery case and open the cover. Pull the battery removal strap to loosen the battery and remove the battery from the case. Stow the battery interconnecting cable under the nylon cover hinges, close the cover, and latch the hold-down latches.
  - e. Stow the viewer and disposable battery (or interconnecting cable, if applicable) in the carrying bag or stow the system in the transit case as applicable. Install any protective caps removed for operation on the connectors before stowing the equipment in the transit case.

**Evaluation Preparation: SETUP:** At the test site, provide all the equipment given in the task condition statement. If testing more than one soldier, use two sectors with different targets. For safety, ensure the brightness control is fully counterclockwise before testing.

**BRIEF SOLDIER:** Tell the soldier his left and right limits and that testing ends when the target has been correctly identified.

<b>Performance Measures</b>	<b><u>GO</u></b>	<b><u>NO GO</u></b>
1. Adjusted the neck sling.	_____	_____
2. Installed the rechargeable battery (AN/PAS-7 or AN/PAS-7A) or the disposable battery (AN/PAS-7A only).	_____	_____
3. Placed the power switch to ON and waited 30 seconds.	_____	_____
4. Removed the lens cap from the infrared window.	_____	_____
5. Performed system checkout.	_____	_____
6. Operated the viewer.	_____	_____
7. Adjusted the focus lever.	_____	_____
8. Adjusted the brightness and contrast control.	_____	_____
9. Identified the target.	_____	_____
10. Turned viewer off.	_____	_____

**Evaluation Guidance:** Score the soldier GO if all performance measures are passed. Score the soldier NO-GO if any performance measure is failed. If the soldier scores NO-GO, show the soldier what was done wrong and how to do it correctly.

**References  
Required**

**Related**  
TM 11-5855-246-10

**Operate a Mini Eyesafe Laser Infrared Observation Set, AN/PVS-6**  
**071-704-0001**

**Conditions:** Given a mini eyesafe laser infrared observation set (MELIOS), AN/PVS-6; two batteries (BA-6516/U or BB-516/U); and TM 11-5860-202-10.

**Standards:** Placed the MELIOS AN/PVS-6 into operation without damaging equipment.

**Performance Steps**

**WARNING:** A lithium battery BA-6516/U contains gas under pressure. Do not heat, puncture, disassemble, short circuit, try to recharge, or otherwise tamper with the battery. If the battery compartment gets hot, turn off the equipment. Wait until the battery cools off before you remove it. Lithium batteries have safety vents to prevent explosion. Handle the batteries with care. Return the batteries to Defense Reutilization and Marketing Office for disposal IAW DOD Handbook 4160.21-M.

1. Prepare the MELIOS for operation.
  - a. Open the carrying case.
  - b. Remove the MELIOS from the carrying case.
  - c. Ensure the mode switch is in the OFF position (Figure1).

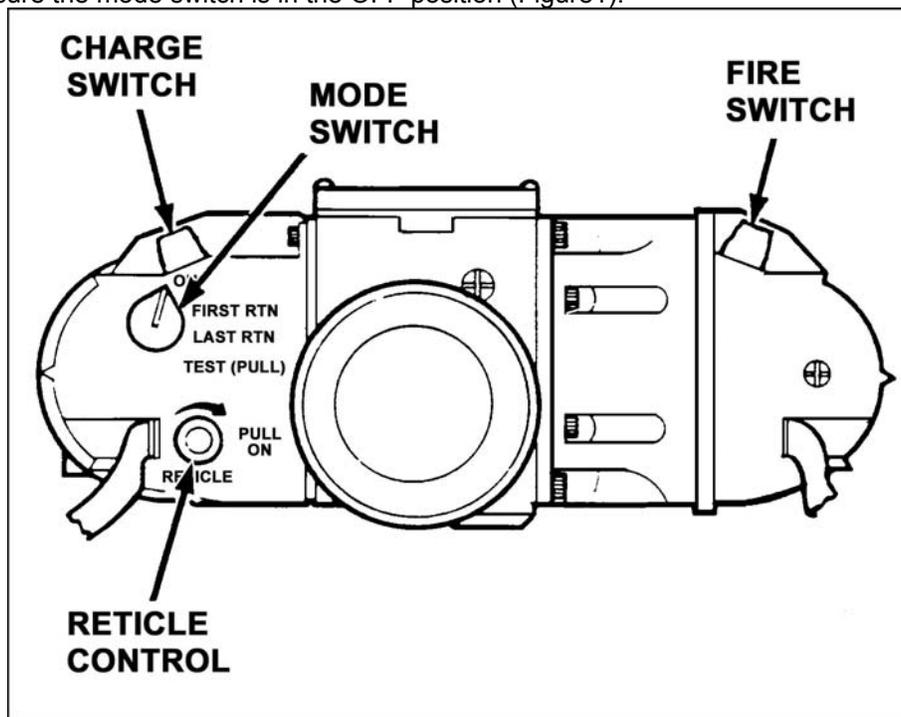


Figure 1. MELIOS controls and indicators.

- d. Install battery (Figure 2).

**Performance Steps**

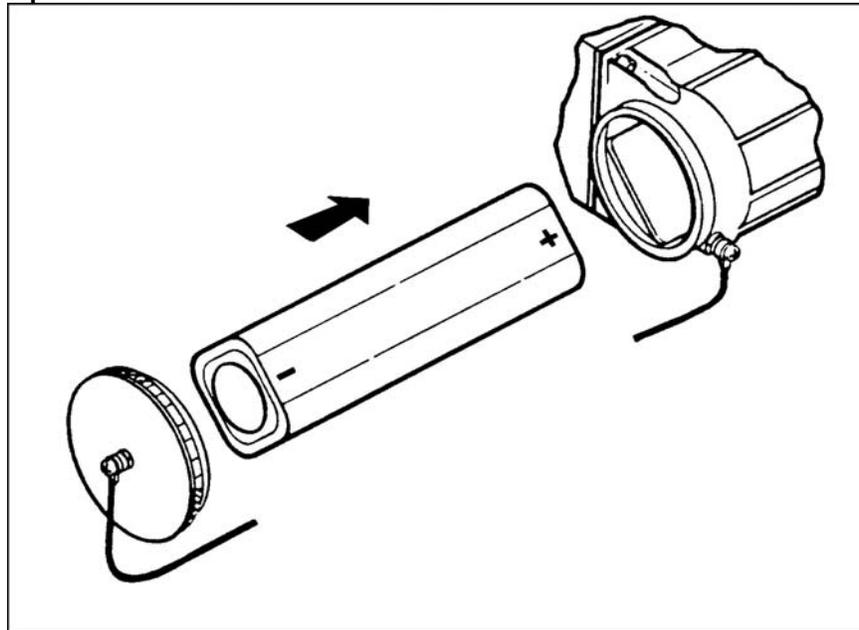


Figure 2. Battery replacement.

- (1) Open battery compartment door by turning screw bail counterclockwise.
  - (2) Insert battery with the small raised contact first.
  - (3) Close and secure battery compartment door.
- e. Rotate the front lens cap away from the objective lens and laser window (Figure 3).

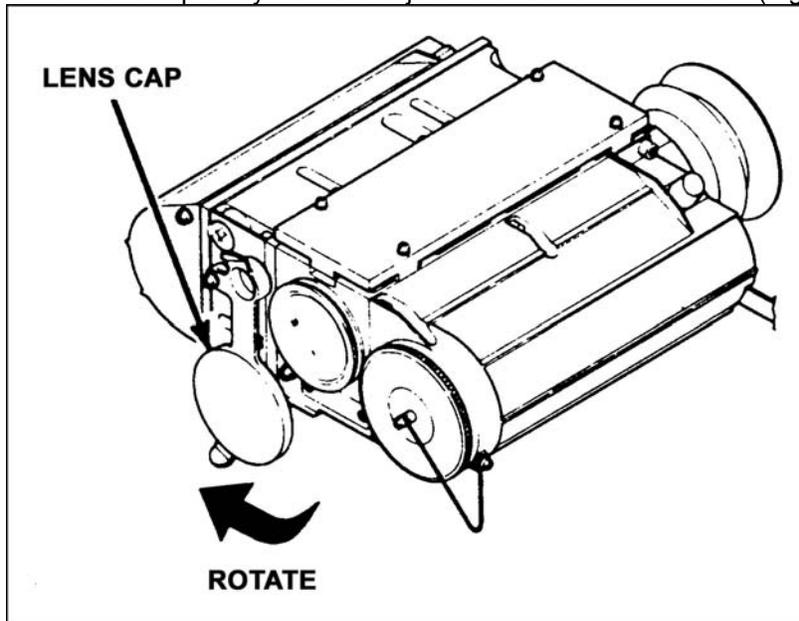


Figure 3. Lens cap.

- f. Pull the eyeshield plug out of eyeshield (Figure 4).

## Performance Steps

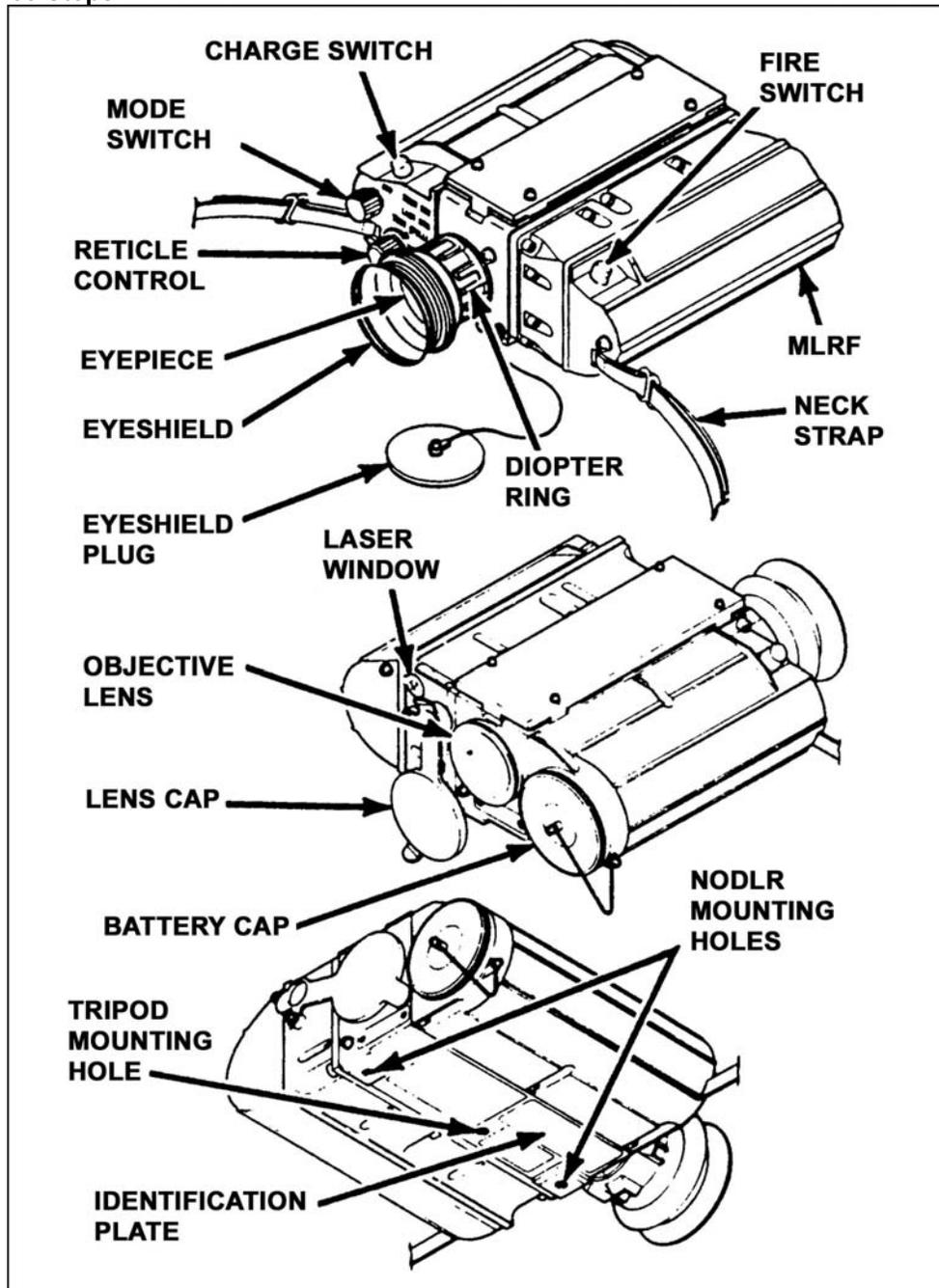


Figure 4. MELIOS laser rangefinder components.

- g. Adjust the diopter setting for clear focus.
- h. Test the mini laser range finder (MLRF).
  - (1) Place the neck strap around your neck.
  - (2) Pull and turn the mode switch to the test position.
  - (3) Press and release the charge switch.
  - (4) Observe the display through the eyepiece lens to ensure all the elements and indicators are lit. Perform troubleshooting procedures for any indicators that are not lit (Figure 5).

Performance Steps

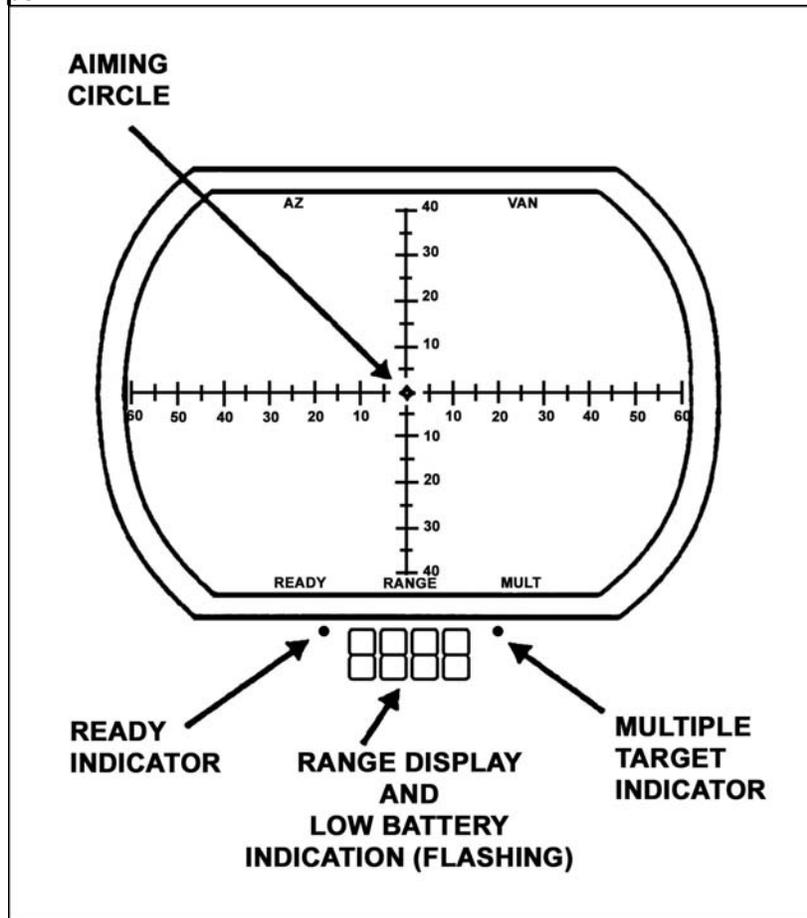


Figure 5. Eyepiece display.

- (5) Press and release fire switch.
  - (6) Pull and turn mode switch to FIRST RTN or LAST RTN.
  - (7) Press and release charge switch.
  - (8) Observe display for ready indicator.
  - (9) View through eyepiece and place aiming circle on a target at a distance greater than 50 meters.
  - (10) Press and hold fire switch after ready indicator is lit.
  - (11) Observe display for range value.
  - (12) Turn mode switch to OFF.
  - (13) Press lens cap over objective lens and laser window.
2. Operate the MELIOS while hand-held.
    - a. Prepare for operation (step 1).
    - b. Remove eyeshield plug from eyeshield.
    - c. Rotate front lens cap away from objective lens and laser window.
    - d. Turn mode switch to FIRST RTN (Figure 1). Go to step f if target is clearly visible.
    - e. If target is partially hidden among trees, smoke, or dust--
      - (1) Turn mode switch to LAST RTN.
      - (2) Look through eyepiece and place reticle aiming circle on target.
      - (3) Press and release charge switch.
- NOTE: If you do not range a target in eight seconds after the charge switch is pressed, the MLRF will shut down and you will have to press the charge switch again.
- f. When the ready indicator lights--

**Performance Steps**

- (1) Hold aiming circle steady on target.
  - (2) Press and hold fire switch.
  - (3) Read "Range" at bottom of display.
  - (4) Release fire switch.
  - g. Follow shutdown procedures if ranging operations are complete.
3. Operate the MELIOS tripod-mounted:
- a. Prepare for operation (step 1).
  - b. Remove tripod from carrying case.
  - c. Open tripod legs and secure tripod at the desired height.
  - d. Place tripod on a stable surface.
  - e. Mount the MELIOS securely on tripod by aligning the mounting hole over the tripod screw and pad.
  - f. Tighten screw until the MELIOS is secure on the tripod pad.
  - g. Remove eyeshield plug from eyeshield.
  - h. Rotate front lens cap away from objective lens and laser window.
  - i. If the target is clearly visible, turn mode switch to FIRST RTN and go to step k.
  - j. If the target is partially hidden among trees, smoke, or dust--
    - (1) Turn mode switch to LAST RTN (Figure 1).
    - (2) Look through the eyepiece and place the reticle aiming circle on the target.
    - (3) Press and release charge switch (Figure 1).
  - k. When the ready indicator lights--
    - (1) Press and hold fire switch (Figure 1).
    - (2) Read "Range" at bottom of display (Figure 5).
    - (3) Release fire switch.
  - l. Follow shutdown procedures if ranging operations are complete.
4. Shutdown the MELIOS using the following procedures:
- a. Press and release the charge switch, then wait three seconds.
  - b. Press and release fire switch.
  - c. Turn mode switch to OFF.
  - d. Rotate lens cap over objective lens and laser window.
  - e. Place eyeshield plug in eyeshield.
  - f. Remove MELIOS from tripod or from around neck.
  - g. Remove battery.
  - h. Return all equipment to the carrying case.
  - i. Close carrying case.

**Evaluation Preparation: SETUP:** At the test site provide the soldier with all the equipment given in the task condition statement.

**BRIEF SOLDIER:** Tell the soldier to operate the MELIOS AN/PVS-6 infrared observation set both hand-held and tripod-mounted.

**Performance Measures**

**GO      NO GO**

- 1. Operated the MELIOS AN/PVS-6.
  - a. Prepared for operation.
  - b. Performed operational test.
  - c. Performed hand-held ranging operation.
  - d. Performed tripod-mounted ranging operation.
  - e. Performed shutdown procedures.

\_\_\_\_\_

**Evaluation Guidance:** Score the soldier a GO if all performance measures are passed. Score the soldier a NO-GO if any performance measure is failed. If the soldier scores a NO-GO, show the soldier what was done wrong and how to do it correctly.

STP 7-11B1-SM-TG

**References**

**Required**

TM 11-5860-202-10

**Related**

TM 11-5860-201-10

**Maintain a Mini Eyesafe Laser Infrared Observation Set, AN/PVS-6  
071-704-0002**

**Conditions:** Given a mini eyesafe infrared observation set (MELIOS), AN/PVS-6, complete with batteries; cleaning compound; lens paper; dry cloth; and TM 11-5860-202-10.

**Standards:** Cleaned and inspected the MELIOS and components for serviceability; reported any deficiencies not corrected to supervisor.

**Performance Steps**

NOTE: Operator maintenance is limited to cleaning, replacing the battery, replacing the shoulder strap for the carrying case, and replacing the neck strap. There are no lubrication requirements for the MELIOS AN/PVS-6.

1. Inspect the MELIOS:
  - a. Inspect carrying case and shoulder strap for damage and serviceability.
  - b. Inspect the objective lens, laser window, and eyepiece lens for dirt, cracks, and scratches.
  - c. Inspect housing, mode switch knob, diopter ring rotation, lens cap, eyeshield plug, lanyard, eyeshield assembly, and neck strap for damage and serviceability.
  - d. Inspect battery charge date.
  - e. Inspect battery compartment for cleanliness, and ensure battery can be installed.
  - f. Inspect battery compartment door gasket for damage.
2. Clean the MELIOS:
  - a. Wipe dust and dirt from all components with a dry cloth.
  - b. Wipe dust and dirt from the carrying case with a dry cloth.
  - c. Dampen a folded lens cleaning tissue with lens cleaning compound. Lightly and slowly wipe the lens. After one stroke, discard tissue. Repeat this procedure until the glass surface is clean.
3. Perform an operational test to ensure the display shows all elements and indicators.

**Evaluation Preparation:** SETUP: At the training site provide the soldier with all the equipment given in the task condition statement.

BRIEF SOLDIER: Tell the soldier to perform operator maintenance on the MELIOS, AN/PVS-6.

<b>Performance Measures</b>	<b><u>GO</u></b>	<b><u>NO GO</u></b>
1. Inspected the MELIOS.	—	—
2. Cleaned the MELIOS.	—	—
3. Performed operational test.	—	—

**Evaluation Guidance:** Score the soldier GO if all performance measures are passed. Score the soldier NO-GO if any performance measure is failed. If the soldier scores NO-GO, show the soldier what was done wrong and how to do it correctly.

**References**

**Required**  
TM 11-5860-202-10

**Related**  
TM 11-5860-201-10

**Operate the Driver's Night Viewer, AN/VVS-2, on a BFV**  
**071-710-0002**

**Conditions:** Given a parked BFV with basic issue items, an AN/VVS-2 night vision viewer, and a requirement to operate the driver's night viewer during limited visibility.

**Standards:** Installed, turned on, and adjusted the night vision viewer in order for the driver to drive the BFV safely without causing damage to the equipment or injury to personnel.

**Performance Steps**

1. Install the AN/VVS-2 on the BFV.
  - a. Remove the front periscope from the driver's hatch cover.
  - b. Unstow the driver's night viewer from stowage.

**NOTE:** The AN/VVS-2 may be operated with either vehicle power or battery power. If battery power is used, dispose of the battery after each night's operation. Normal battery life is six to eight hours.

- c. For battery operation only, install a BA 1567/U 2.7-volt DC battery.
- d. Set two latch handles on the viewer in the open position (Figure 1).

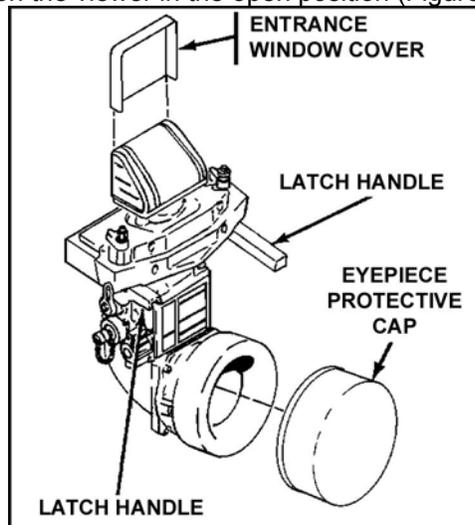


Figure 1. Night viewer.

- e. Install and lock the night viewer.

**CAUTION:** The driver's night viewer is easily damaged. Do not use tools to lock the latch handles.

- f. Remove the entrance window cover and protective cap.

**CAUTION:** Do not install the vehicle power cable before the battery is removed from the driver's night viewer. The battery could explode and damage the driver's night viewer.

- g. For vehicle power operation only, install the vehicle power cable to the viewer.

2. Operate the AN/VVS-2 using battery power.

**CAUTION:** The battery may explode and damage the AN/VVS-2 if the battery overheats. Do not operate the viewer on battery power when the vehicle power cable is attached.

- a. Turn the OFF-BRIGHT rotary switch to maximum bright position.
- b. Adjust the brightness of the viewer.
- c. Position the viewer so that the eye is 6 to 10 inches from the viewing lens.
- d. Install the eyepiece protector cap and entrance window cover.
- e. Install the driver's periscope.
- f. Remove the BA 1567/U from the viewer.

**CAUTION:** The battery may leak and damage the AN/VVS-2. Do not store the battery in the viewer.

3. Operate the driver's night viewer with vehicle power.

**Performance Steps**

- a. Move the master power switch to the ON position.
- b. Turn the OFF-BRIGHT rotary switch to maximum bright position (Figure 2).

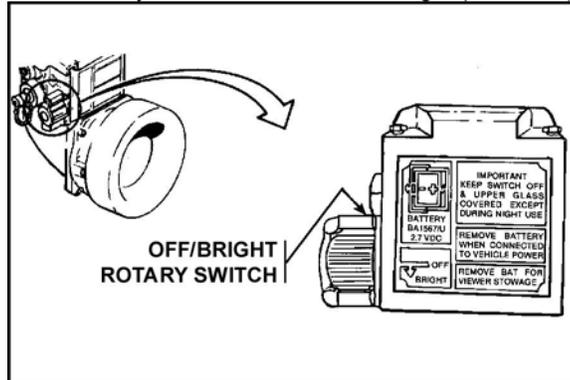


Figure 2. OFF-BRIGHT rotary switch.

- c. Adjust the brightness of the viewer.
- d. Position the viewer so that the eye is 6 to 10 inches from the viewing lens.

4. Stow the driver's night viewer.

**Evaluation Preparation:** SETUP: Provide the soldier with all the equipment as stated in the task condition statement.

**BRIEF SOLDIER:** Tell the soldier to put the AN/VVS-2 into operation so that the BFV can be operated during limited visibility.

**Performance Measures**

- 1. Installed the AN/VVS-2 on the driver's hatch cover.
- 2. Operated the AN/VVS-2 on vehicle power.
- 3. Operated the AN/VVS-2 on battery power.
- 4. Removed and stowed the AN/VVS-2.

<u>GO</u>	<u>NO GO</u>
—	—
—	—
—	—
—	—

**Evaluation Guidance:** Score the soldier GO if all performance measures are passed. Score the soldier NO-GO if any performance measure is failed. If the soldier scores NO-GO, show the soldier what was done wrong and how to do it correctly.

**References**  
Required

**Related**  
TM 9-2350-252-10-1

**Maintain the Driver's Night Viewer, AN/VVS-2, on a BFV  
071-710-0003**

**Conditions:** Given a BFV, an AN/VVS-2 night vision viewer, and a requirement to perform operator's maintenance on the night viewer.

**Standards:** Performed operator maintenance on the driver's night viewer; noted and reported all deficiencies.

**Performance Steps**

NOTE: Preventive maintenance checks and services for the AN/VVS-2 are limited to routine checks that are not done on schedule but are done as required. The operator must be alert to the condition of the equipment and correct any small problems as they occur, rather than wait for a scheduled maintenance time.

Note: There is no lubrication requirement for the AN/VVS-2.

1. Check to ensure that the power cable is not frayed or broken, and the pins in the power connector are not bent.
2. Check the battery compartment and ensure that it is free of corrosion and that the battery cover is present.

CAUTION: Do not remove the protective cover during the day or in a bright area at night. The image tube can be damaged from bright light entering the periscope top even when the AN/VVS-2 is off and without power.

3. Check the exterior of the night viewer for cracks and any other external damage or missing parts.
4. Clean the glass surfaces of the viewer with the lens paper.

NOTE: Stow the AN/VVS-2 when not in use.

5. Within your capabilities, correct shortcomings.
6. Record and report to the chain of command any uncorrected deficiencies IAW unit SOP.

**Evaluation Preparation:** SETUP: Provide the soldier with all the material and equipment given in the task condition statement.

BRIEF SOLDIER: Tell the soldier to perform operator's maintenance on the AN/VVS-2 so that it will pass an inspection and work as designed.

<b>Performance Measures</b>	<b><u>GO</u></b>	<b><u>NO GO</u></b>
1. Inspected the AN/VVS-2 for deficiencies.	—	—
2. Cleaned the night vision viewer.	—	—
3. Corrected shortcomings and deficiencies (within your capabilities).	—	—
4. Recorded and reported to the chain of command any uncorrected deficiencies IAW the unit SOP.	—	—

**Evaluation Guidance:** Score the soldier GO if all performance measures are passed. Score the soldier NO-GO if any performance measure is failed. If the soldier scores NO-GO, show the soldier what was done wrong and how to do it correctly.

**References  
Required**

**Related**

TM 11-5855-249-10  
TM 9-2350-252-10-1  
TM 9-2350-284-10-1

## Operate Night Vision Goggles, AN/PVS-7B

071-710-0008

**Conditions:** At night, given night vision goggles, AN/PVS-7B, with components, accessories, and batteries.

**Standards:** Inspected night vision goggles AN/PVS-7B for best operational capability. Correctly shut down goggles. Properly stowed goggles and all accessories in carrying case. Complied with all warnings and cautions associated with the goggles.

### Performance Steps

#### WARNINGS

To avoid personal injury or damage to the AN/PVS-7B goggles, consider the following limitations and safety precautions while using the goggles:

1. The goggles require some moonlight, starlight, or both to operate.
2. The amount of available light determines the goggles' level of performance.
3. Operating in a shadow from buildings or trees reduces nightlight.
4. The goggles are less effective for viewing into shadowed and other darkened areas than in lighter areas.
5. The goggles are less effective when viewing through rain, fog, sleet, snow, or smoke.
6. When using goggles from a moving vehicle in the fog, rain, sleet, snow, or smoke, vehicle speed must be reduced to avoid over-driving the range of view.
7. Between the last and first quarters of the moon or during operations requiring the use of a protective mask, or both, the assistant driver should use a night vision device.

1. Prepare the goggles for operation.

**CAUTION:** Handle all optical components with extreme care and protect against dirt, dust, fingerprints, and excessive moisture.

- a. Inventory carrying case content to ensure the following accessories are present (Figure 1):
  - (1) Headmount assembly.
  - (2) Demist shields.
  - (3) Brow pads (medium and thick) (thin pad is attached to headmount assembly).
  - (4) Operator's manual.
  - (5) Lens paper.
  - (6) Carrying case strap.
  - (7) Light interference filter (LIF).
  - (8) Sacrificial window.
  - (9) Batteries (2 BA-3058/U or 1 BA-5567/U).
  - (10) Goggles assembly.

Performance Steps

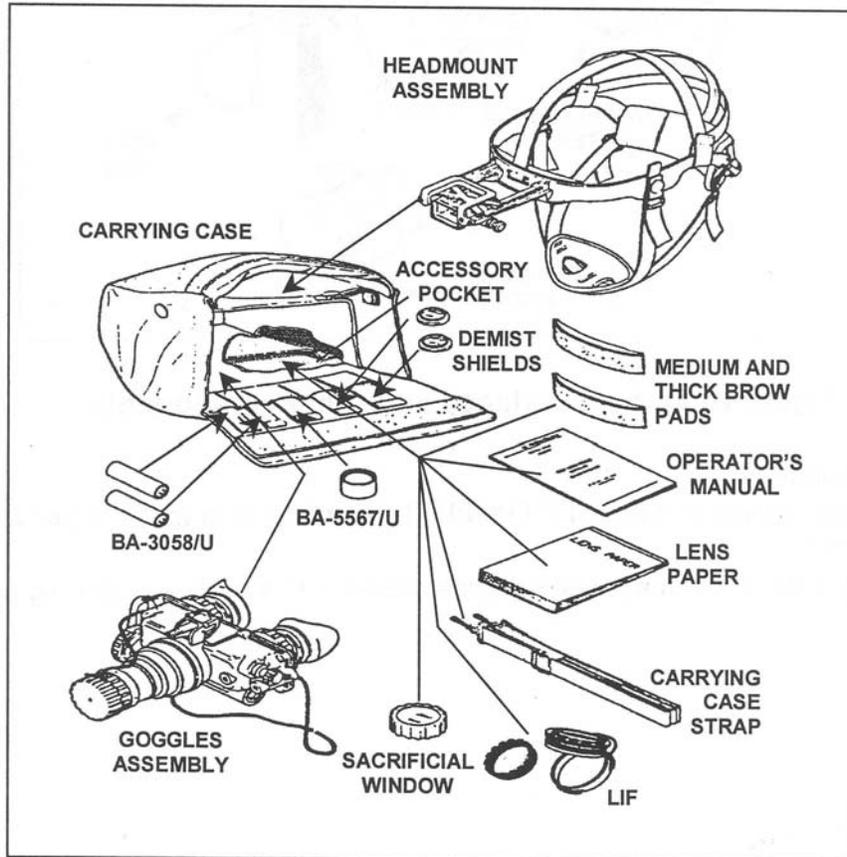


Figure 1. AN/PVS-7B night vision goggles.

- b. Inspect the goggles assembly and components for serviceability (Figure 2).

**Performance Steps**

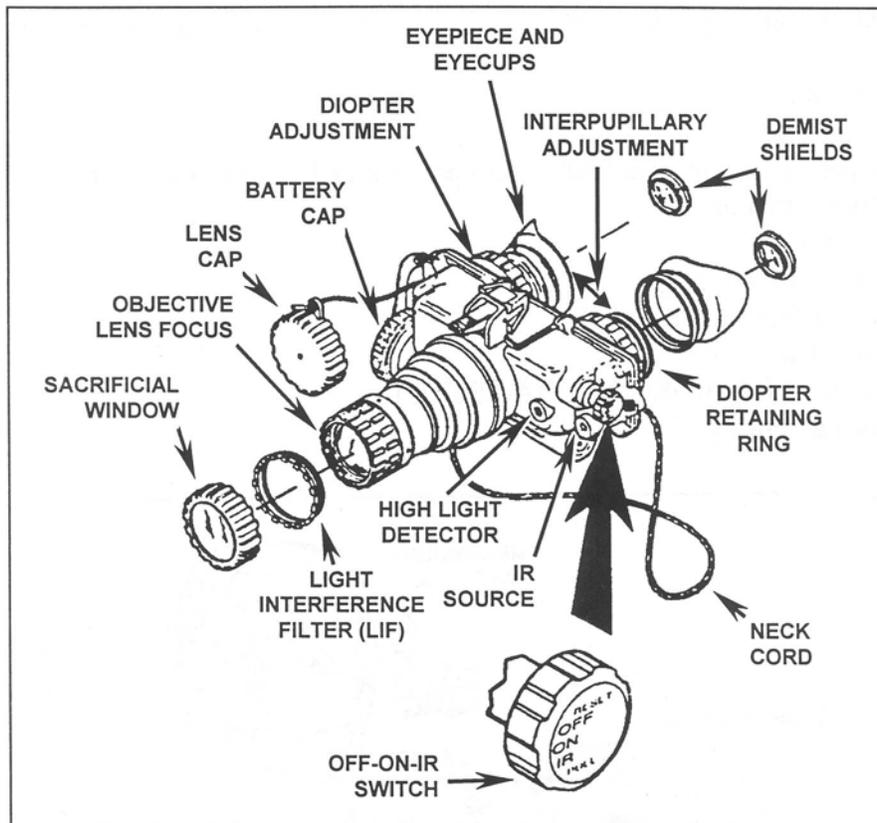


Figure 2. Night vision goggles assembly functional features and accessory items.

- (1) Ensure that the goggles assembly rotary switch is in the OFF position. Inspect goggles assembly and components for any damage to optical surfaces, body, eyecups, OFF-ON-PULL/IR switch, and battery cap.
  - (2) Ensure all optical surfaces are clean. Clean with clean water and lens tissue, if needed.
- c. Install batteries (Figure 3).

## Performance Steps

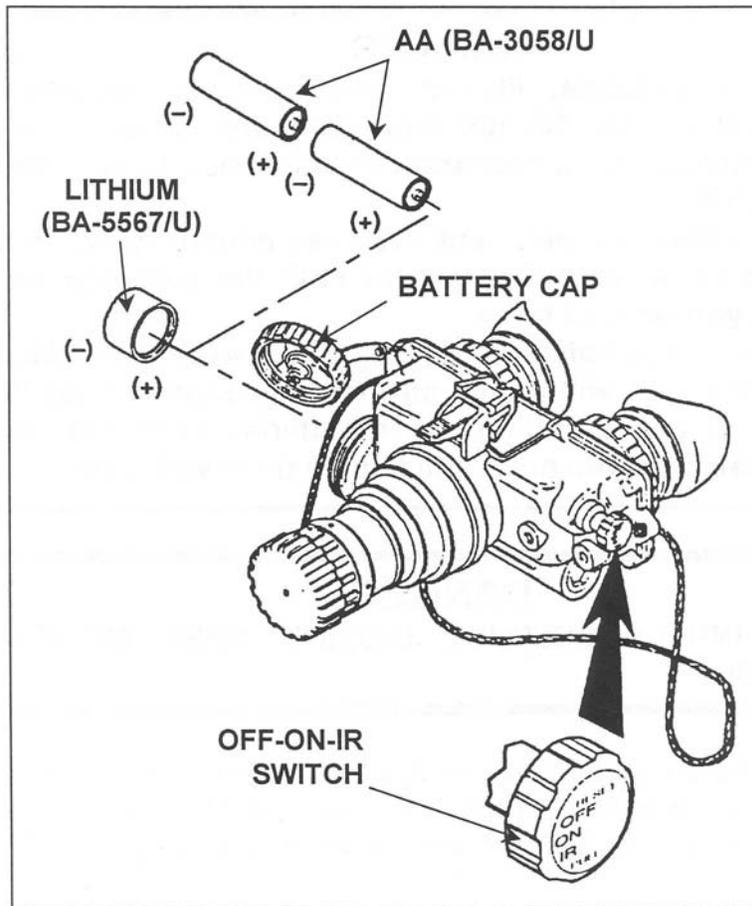


Figure 3. Battery installation.

- (1) Check and ensure that the OFF-ON-PULL/IR switch is in the OFF position before installing batteries.
- (2) Comply with all warnings and danger statements that apply to handling batteries.

### WARNINGS

1. Batteries (alkaline, lithium, and mercury) present a potential hazard. Do not heat, puncture, disassemble, short-circuit, recharge, or otherwise tamper with the batteries.
2. If the batteries compartment becomes unusually hot, turn off the equipment. Try to wait until the batteries cool before you remove them.
3. Batteries have safety vents to prevent explosion. When they vent, you will notice an irritating odor or hear the sound of gas escaping. After batteries vent, they are fairly safe, but you must still handle them with care.

### DANGER

IF YOU INHALE SULFUR DIOXIDE, SEEK MEDICAL ATTENTION.

- (3) Remove the battery cap. Insert two AA batteries (BA-3058/U) or one lithium battery (BA-5567/U) in the battery compartment, positive end (+) first.
  - (4) Replace the battery cap. Tighten it firmly to ensure a watertight seal.
- d. Perform an operational check.
- (1) Position the OFF-ON-PULL/IR switch to ON. Observe that a green glow gradually appears in each eyepiece.
  - (2) Pull the OFF-ON-PULL/IR switch knob and rotate it clockwise to the IR position. Observe that a red light appears in the left eyepiece, which indicates that the IR source is

**Performance Steps**

operating. The IR source is located on the left front of the goggles. Do not block it while operating the goggles.

- (3) Turn the OFF-ON-PULL/IR switch counterclockwise to the OFF position. Observe that the red light and green glow disappear.

2. Operate goggles.

- a. Focusing the goggles. If you normally wear eyeglasses, remove them to operate these goggles. You can focus the goggles, so you will not need your eyeglasses.

- (1) Focus on the image intensifier screen using the diopter adjustment rings.
- (2) Focus on objects at varying distances using the objective focus adjustment.

- b. Handheld operation.

- (1) Position the goggles so that the eyecups seal around your eyes to prevent green glow from escaping.
- (2) Position the OFF-ON-PULL/IR switch to ON.
- (3) Adjust the interpupillary distance by sliding the eyepieces either together or apart so both eyes can observe the entire field of view at the same time.
- (4) To set the diopter adjustment rings, close your left eye and adjust the right diopter ring for the clearest focus on the image intensifier screen. Then, close your right eye and adjust the left diopter ring for the clearest focus on the image intensifier screen.
- (5) Adjust objective lens focus while observing a distant object (at least 4 meters distance) until the sharpest view is obtained.

- c. Head mount operation.

- (1) Adjust the headmount assembly (Figure 4).

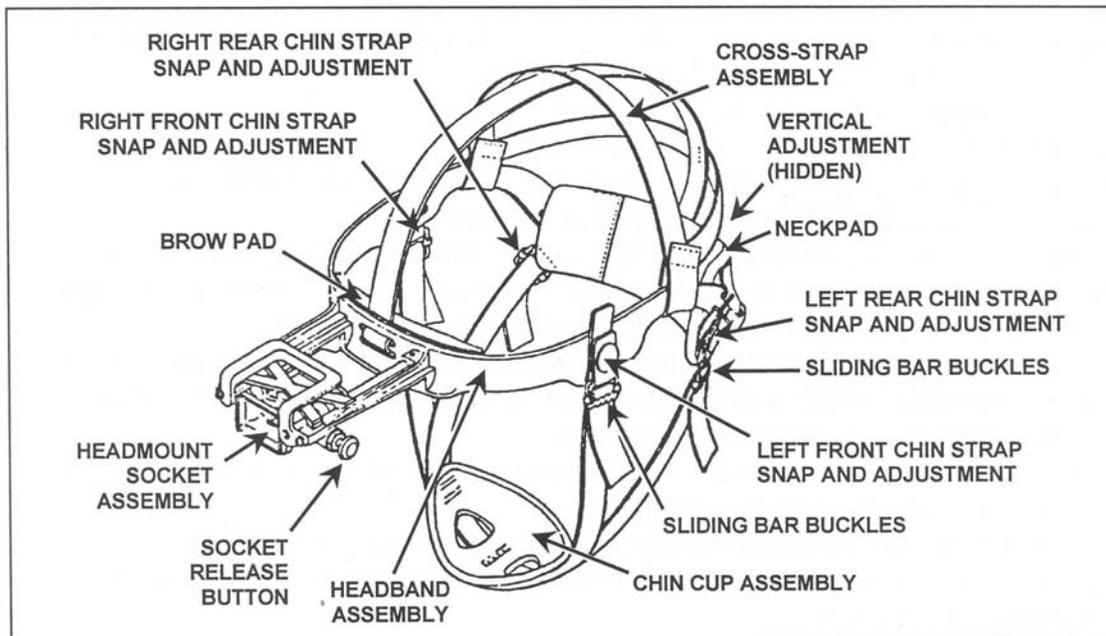


Figure 4. AN/PVS-7B headmount assembly.

- (a) Loosen the four chin straps on the headmount assembly until the end of each strap is about 2 inches from the sliding bar buckles.

NOTE: When installing a headmount assembly over a protective mask, make sure you do not break the seal of the protective mask around your face.

- (b) Grasp the neck pad assembly with both hands. Pull it over your head and down to the back of your neck. If the head mount is too loose, replace the thin pad with the medium or thick pad. The pads are held in place by hook-pile tape.
- (c) Fasten the front and rear snaps in place with your left hand. Hold the chin cup in

## Performance Steps

- position on your chin. Adjust both rear chin assembly straps until you feel light pressure against your chin. Stop. Do not tighten the strap any farther.
- (d) Continue to hold the chin cup in position. At the same time, remove slack from the front and rear chin straps. Once you have done so, stop. Do not tighten them any farther.
  - (e) Make sure cross-strap assembly does not twist. To remove slack from it, adjust the vertical adjustment strap at the neck pad.
  - (f) Adjust the chin straps and the vertical adjustment strap until both chin cup and the headband assembly are in a comfortable but firm position.
  - (g) Depress the socket release button. Position the headmount socket all the way forward.
- (2) Install the goggles on the headmount assembly.
- (a) Align the goggles latch with the headmount socket. Press and hold the goggles latch lever while you place the goggles into the headmount socket. Release the latch when the goggles fully engage the socket.
  - (b) Depress the socket release button. Move the goggles back toward your eyes until the eyecups and eyepieces are comfortably aligned. The eyecups must seal around your eyes and prevent the green glow from escaping.
- (3) Adjust goggles for operation.
- (a) Position the OFF-ON-PULL/IR switch to ON.
  - (b) Adjust the interpupillary distance. Slide the eyepieces either together or apart so you can observe the entire FOV with both eyes at the same time.
  - (c) Set the diopter adjustment rings. Close your left eye and adjusting the right diopter ring for the clearest focus on the image intensifier screen. Close your right eye and adjust the left diopter ring for the clearest focus on the image intensifier screen.
  - (d) Adjust the eye relief distance. Press the socket release button. Move the goggles backward or forward to obtain a full field of view of the image intensifier. If necessary, readjust the diopter rings to obtain the best image.
  - (e) Adjust the objective lens focus while observing a distant object (at least 4 meters away) until you obtain the sharpest possible view.
  - (f) Readjust the vertical strap assembly until the goggles align with your eyes.
  - (g) If necessary, adjust the Kevlar or M1 headband inside the helmet for a proper fit over the headmount assembly.
3. Operate goggles under unusual conditions.
- a. Extreme darkness.
    - (1) Pull the OFF-ON-PULL/IR switch out and rotate it clockwise to the IR position.
    - (2) Ensure the eyecups are positioned to prevent light escaping from the goggles.

### WARNING

The infrared source is a light that is invisible to the unaided eye for use during conditions of extreme darkness. However, the enemy can detect it with night vision devices. The infrared source is used to see objects within a distance of 3 meters.

- b. Dust and sand. Attach the sacrificial window to protect the objective lens from scratches and other damage.
  - (1) Remove the sacrificial window from the carrying case.
  - (2) Carefully push the sacrificial window over the objective lens until it pops.
  - (3) Turn the sacrificial window clockwise until it snaps in place.
  - (4) Remove the sacrificial window by reversing the installation procedures.
- c. Rainy and humid conditions. Press each eyecup over the diopter retainer ring. Rotate it into correct viewing position.
  - (1) Remove the eyecups by carefully pulling them off the diopter ring.
  - (2) Carefully press a Demist shield onto each eyepiece. Do not smudge eyepiece or Demist shields.
  - (3) Replace eyecups. Press each eyecup over the diopter retainer ring. Rotate it into correct viewing position.

**Performance Steps**

- d. Laser threat environment. Install the light interference filter (LIF). Using this filter will slightly reduce system gain.
  - (1) Remove the container/wrench from the carrying case.
  - (2) Remove the lens cap or sacrificial window from the objective lens of the goggles.
  - (3) Open the container/wrench and remove the LIF.
  - (4) Hold the LIF by the notched end. Thread it clockwise into the end of the objective lens.
  - (5) Use the ridged side of the container/wrench as a wrench. Engage the ridges on the container with the ridges on the LIF. Hand tighten the LIF.
  - (6) Place the empty container/wrench back into the pouch in the carrying case.

NOTE: The lens cap and the sacrificial window will fit onto the end of the objective lens with the LIF in place. However, the lens cap and sacrificial window will not snap into place with the LIF attached.

- (7) Replace the lens cap or the sacrificial window onto the end of the objective lens and over the LIF.
- (8) Remove the LIF by reversing the installation procedures.
- e. NBC environment
  - (1) Place the protective mask on your head per instructions provided with the protective mask.
  - (2) Make sure you do not break the seal of the protective mask around your face when you install the headmount assembly over the protective mask.

- 4. Install and operate the snap-on compass.
  - a. Remove the objective lens cover from the goggles. Secure the snap-on compass to the lens with the round part of the activation button facing down.
  - b. Turn the goggles on. Push up on the activation button to determine azimuth direction.
- 5. Attach the 3X magnifier telescope assembly.
  - a. Objective focus cover attached. Push the objective focus cover sleeve onto the goggles' objective focus ring.
  - b. Objective focus cover not attached to goggles. Screw the 3X magnifier directly into the goggles' objective focus ring.
- 6. Stow the night vision goggles (Figure 5).

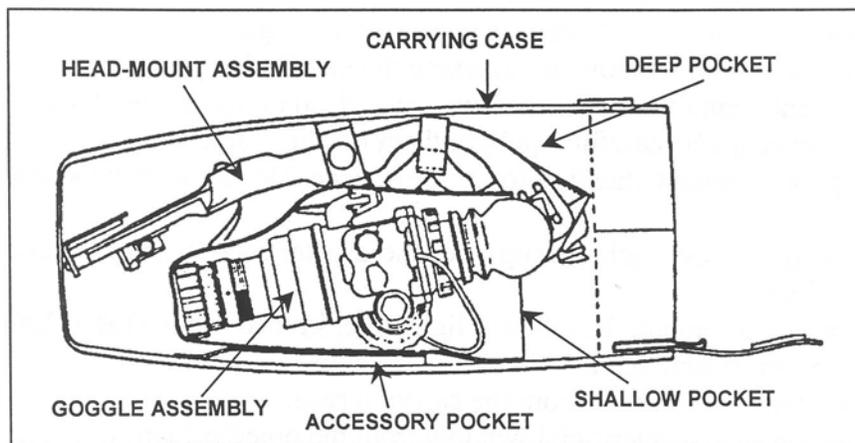


Figure 5. Stow goggles in carrying case.

- a. Shut down the goggles. Move the OFF-ON-PULL/IR switch to OFF.
- b. Remove the goggles from the head mount (if attached). Depress the latch lever and remove the goggles.
- c. Unscrew the battery cap, remove the battery, and replace the battery cap.
- d. Remove the demist shields and sacrificial window, if installed.
- e. Install the lens cap.

**Performance Steps**

- f. Ensure the goggles are free of dirt, dust, and moisture.
- g. Place the demist shields and the battery into their proper carrying case pockets.

**CAUTION:** To prevent damage to window, place the sacrificial window at bottom left or right corner of the carrying case accessory pocket.

- h. Place the lens paper, sacrificial window, and operator's manual in the accessory pocket located under the shallow pocket that contains the goggles.
- i. Place the goggles (objective lens down) into the shallow pocket of the carrying case.
- j. Remove the headmount assembly. Unsnap the front and rear straps. Lift the headmount assembly up and off your head. Stow the assembly in the deep pocket of the carrying case. Close the carrying case.

**Evaluation Preparation: SETUP:** Evaluate this task in a classroom where light can be controlled to simulate nighttime. Provide the soldier with a set of night vision goggles, AN/PVS-7B, components, and batteries, as described in the task condition statement.

1. Have the soldier prepare the goggles for operation, operate the goggles using the headmount assembly, shut down the goggles, and stow the goggles.
2. Evaluate the soldier's ability to select and attach the appropriate components by telling him to prepare the goggles for operation in the following conditions: dust and sand, rain or high humidity, or laser threat environment. If a snap-on compass and 3X magnifier is available, evaluate the soldier's ability to attach them to the goggles.

**BRIEF SOLDIER:** Tell the soldier to prepare the goggles for operation; operate the goggles using the headmount assembly; shut down and stow the goggles; and attach components to operate the goggles in various conditions as instructed. Tell him to notify you before turning the goggles ON and after turning them OFF, so you can darken or lighten the room. Tell the soldier not to energize the goggles when the room lights are on.

**Performance Measures**

	<u>GO</u>	<u>NO GO</u>
1. Prepared goggles for operation.	_____	_____
a. Inventoried contents of the case; ensured all accessories were present.		
b. Inspected the goggles assembly and components for serviceability.		
c. Installed batteries correctly.		
d. Performed an operational check.		
2. Operated goggles in hand-held mode.	_____	_____
3. Operated goggles with head mount.	_____	_____
a. Adjusted the head mount assembly for proper fit.		
b. Installed goggles correctly on the head mount assembly.		
c. Adjusted goggles for operation.		
4. Operated goggles during unusual conditions.	_____	_____
a. Extreme darkness: operated goggles using IR source.		
b. Dust and sand: attached the sacrificial window.		
c. Rainy and humid conditions: installed demist shields to minimize diopter fog.		
d. Laser threat environment: installed the light interference filter (LIF).		
e. NBC environment.		
(1) Placed the protective mask on your head IAW instructions provided with the protective mask.		
(2) Did not break the seal of the protective mask around your face when you installed the head mount assembly over the protective mask.		
5. Installed and operated snap-on compass (if available).	_____	_____

**Performance Measures**

**GO**    **NO GO**

6. Attached 3X magnifier telescope assembly (if available).

\_\_\_\_\_

7. Stowed the night vision goggles.

\_\_\_\_\_

**Evaluation Guidance:** Score the soldier GO if all performance measures are passed. Score the soldier NO-GO if any performance measure is failed. If the soldier scores NO-GO, show the soldier what was done wrong and how to do it correctly.

**References**

**Required**

**Related**

TM 11-5855-262-10-2

## Maintain Night Vision Goggles, AN/PVS-7B

071-710-0009

**Conditions:** Given night vision goggles, AN/PVS-7B, with components, accessories, batteries; clean water; clean, lint-free cloths; and a requirement to perform required operator maintenance on the goggles.

**Standards:** Cleaned and inspected night vision goggles, components, and accessories for serviceability; reported unserviceable items to the supervisor. Properly stowed the goggles and accessories. Complied with all warnings and cautions associated with these goggles.

### Performance Steps

1. Inventory the carrying case for the following items (Figure 1).

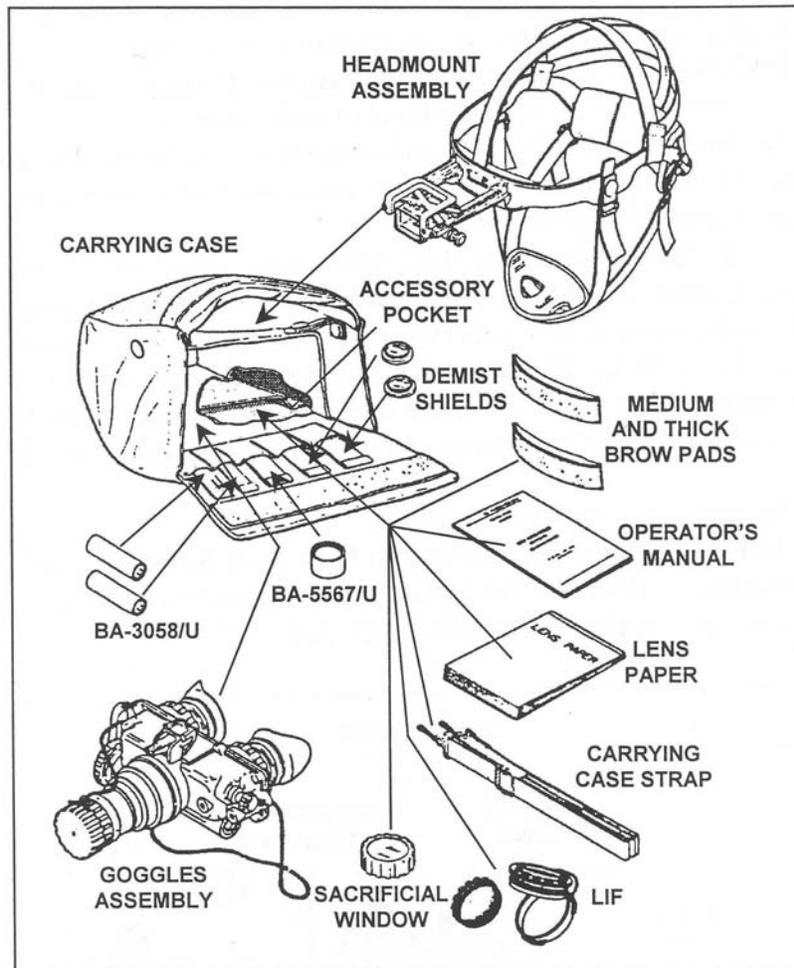


Figure 1. AN/PVS-7B night vision goggles.

- a. Headmount assembly.
- b. Demist shields.
- c. Browpads: medium and thick (the thin pad is attached to the headmount assembly).
- d. Operator's manual.
- e. Lens paper.
- f. Carrying case strap.
- g. Light interference filter (LIF).

**Performance Steps**

- h. Sacrificial window.
- i. Batteries (two BA-3058/U or one BA-5567/U).
- j. Goggles assembly.

2. Clean the AN/PVS-7B.

- a. Clean all optical surfaces with lens paper dampened with clean water (water temperature should be between 70 and 80 degrees Fahrenheit) and wipe clean.
- b. Use a clean, lint-free cloth, dampened with clean water, to remove all dirt and grease from all exterior surfaces.

**CAUTION**

Handle all optical components with extreme care. Protect against dirt, dust, fingerprints, and excessive moisture.

3. Inspect the accessories and goggles for conditions indicated. Take corrective action as indicated for damaged items.

- a. Night vision goggles assembly (Figure 2).

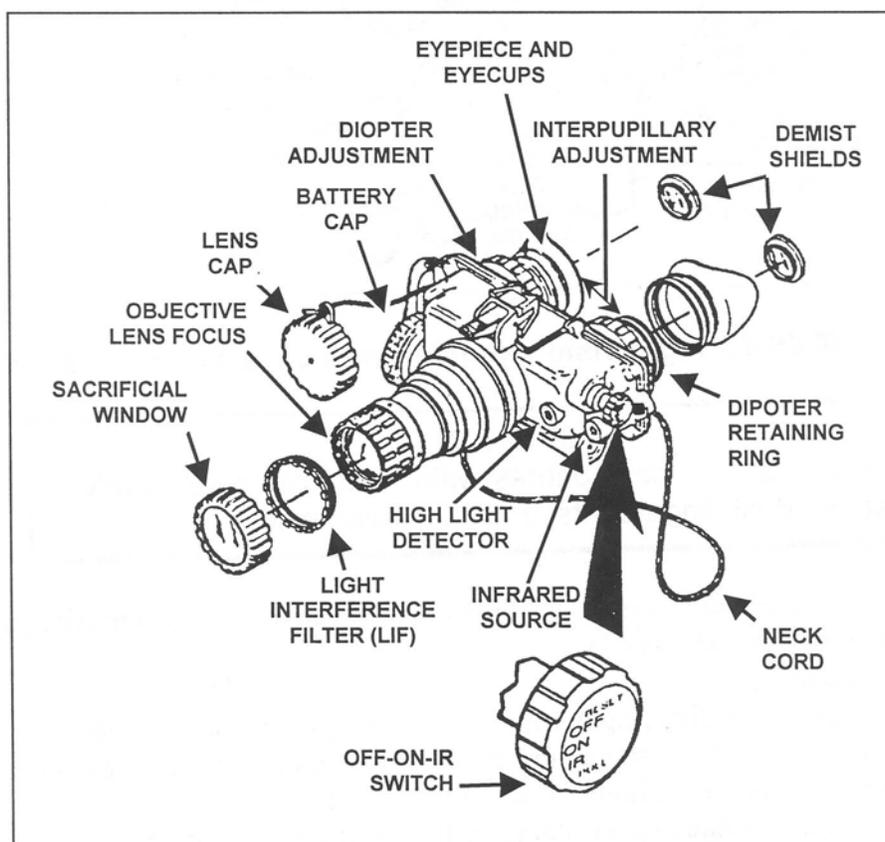


Figure 2. Night vision goggles assembly functional features and accessory items.

- (1) Inspect all lenses for dirt, fingerprints, residue, chips, or cracks. If necessary, use clean water and lens tissues to wash and dry the lens. If you observe chips or cracks in a lens, refer to your supervisor for higher level of maintenance.
- (2) Inspect the goggles housing for damage. If you observe chips or cracks, refer to your supervisor for a higher level of maintenance.
- (3) Inspect the battery compartment for corrosion, defective battery cap spring contact, and preformed packing in the cap. If you find corrosion, or if the battery cap spring is defective, refer to your supervisor for a higher level of maintenance.
- (4) Check the diopter adjustment rings to make sure the eyepieces move freely. If they do

### Performance Steps

- not, refer to your supervisor for a higher level of maintenance.
- (5) Check the interpupillary adjustment on the eyepiece to see if it moves freely. If it does not, refer to your supervisor for a higher level of maintenance.
  - (6) Turn the objective lens focus knob to make sure it moves freely. The knob should turn about 1/3 turn, or 120 degrees. If the knob does not move freely, refer to your supervisor for a higher level of maintenance.
  - (7) Inspect for bent, broken, dried, cracked, torn, dusty, dirty or improperly fitting eye cups. If necessary, clean and dry the eye cups with clean water and a lens tissue. If the eye cups are defective, refer to your supervisor for a higher level of maintenance.
  - (8) Check the OFF-ON-PULL/IR switch. Move the switch from OFF, to ON and to PULL/IR. Each position should have a definite stopping point. If the knob is broken
  - (9) Inspect the AN/PVS-7B headmount assembly (Figure 3).

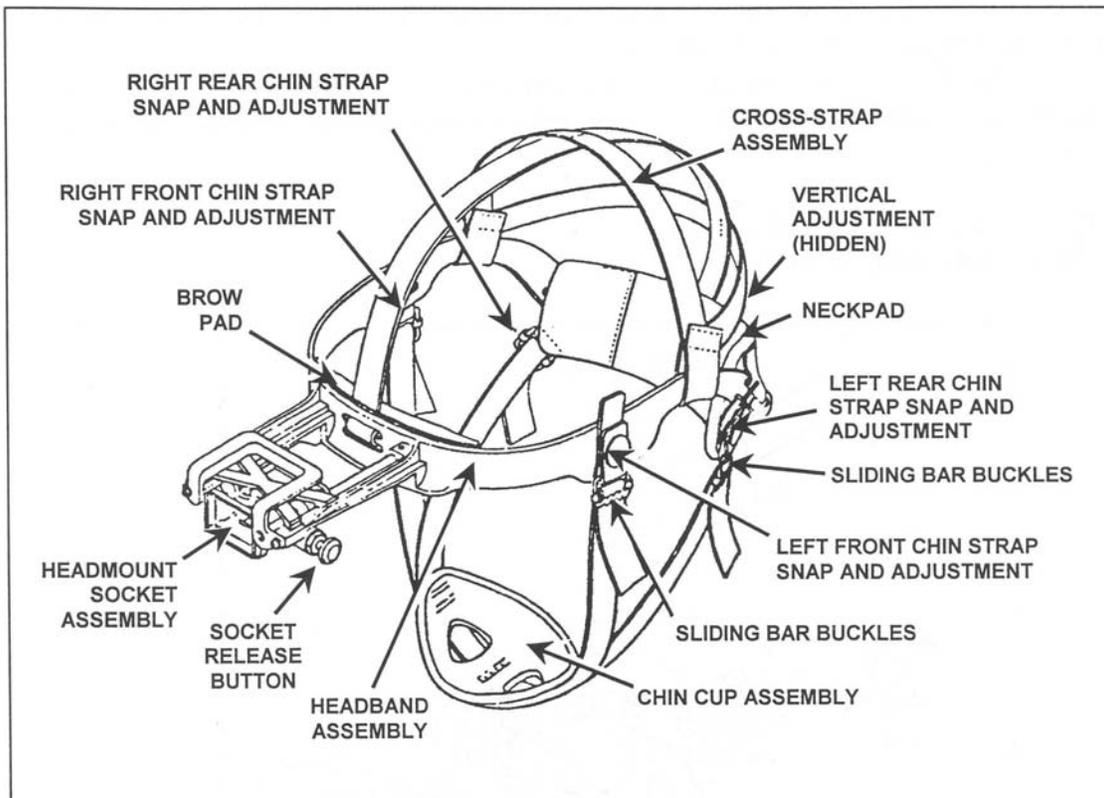


Figure 3. AN/PVS-7B headmount assembly.

- (a) Inspect the headmount strap assemblies and browpads for holes, cracks, defective fasteners, or contamination. Remove and replace the browpad by pulling it out (hook-pile tape holds the brow pads in place). Press in a new pad.
  - (b) Inspect the headmount assembly eye relief. Press the socket release button and check the socket assembly to see if it moves freely. Inspect for dirt and damage. Clean it if needed. If it does not move freely, or if you observe damage, refer to your supervisor for a higher level of maintenance.
  - (c) Inspect the headmount socket and the goggles latch. Inspect and clean the headmount socket. Check to see if the socket and latch work correctly by inserting the goggles latch into the socket. Verify that they link securely. If the socket assembly does not work properly or if you observe damage, refer to your supervisor for a higher level of maintenance.
- (10) Inspect the demist shields for dirt, dust, scratches, or damage. Clean the dry shields only

**Performance Steps**

- with dry lens tissues.
- (11) Inspect the sacrificial window for dirt, dust, scratches, or damage. If necessary, wash it with clean water and dry it with a lens tissue. If you observe damage, refer to your supervisor for a higher level of maintenance.
  - (12) Inspect the neck cord for damaged and frayed ends. Retie, if necessary. If you observe damage, refer to your supervisor for a higher level of maintenance.
  - (13) Inspect the carrying case. Remove all accessories, and shake out all loose dirt or foreign matter. Wipe the interior and exterior with a clean, dry, lint-free cloth. If necessary, use a mild detergent to remove dirt and grease.
  - (14) Inspect the 3X magnifier. Inspect all lenses for dirt, fingerprints, residue, chips or cracks. If necessary, clean and dry the lens with clean water and a lens tissue. Inspect the housing for damage. If you observe any chips or cracks in the housing, refer to your supervisor for a higher level of maintenance.
  - (15) Inspect the snap-on compass for dirt and damage. If necessary, clean it with clean water and a cloth. If you observe damage, refer to your supervisor for a higher level of maintenance.

4. Perform an operational check.
  - a. Install batteries (Figure 4).

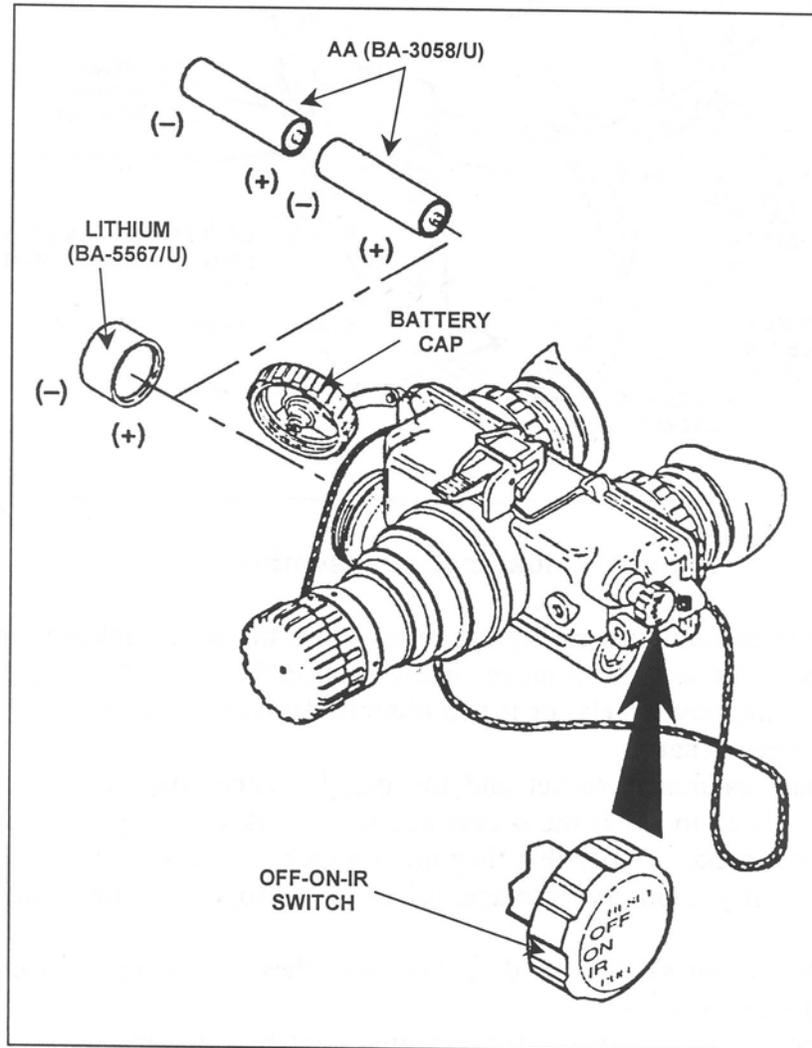


Figure 4. Battery installation.

## Performance Steps

- (1) Check and make certain that the OFF-ON-PULL/IR switch is in the OFF position.
- (2) Comply with all cautions, warning, and danger statements.
- (3) Remove the battery cap. Insert two AA batteries (BA-3058/U) or one lithium battery (BA-5567/U) in the battery compartment, with the positive end (+) first.
- (4) Replace the battery cap and tighten it firmly to ensure a watertight seal.

## WARNINGS

1. Alkaline, lithium, and mercury batteries are potential hazards. Do not heat, puncture, disassemble, short circuit, try to recharge, or otherwise tamper with the batteries.
2. If the battery compartment becomes unusually hot, turn off the equipment. Try to wait until the batteries cool before you remove them.
3. Batteries have safety vents to prevent explosion. When they vent, you will notice an irritating odor or hear the sound of gas escaping. After batteries vent, they are fairly safe, but you must still handle them with care.

## DANGER

IF YOU INHALE SULFUR DIOXIDE, SEEK MEDICAL ATTENTION.

- b. Check goggles for proper operation. Perform the following procedures only in darkened conditions. If you must check the goggles during daylight, use the lens cap to cover the objective lens:
  - (1) Position the OFF-ON-PULL/IR switch to ON. Note the green glow that gradually appears in each eyepiece.
  - (2) Pull the OFF-ON-PULL/IR knob. Rotate it clockwise to the IR position. Note the red light that appears in the left eyepiece, which indicates that the IR source is operating. The IR source is located on the left front of the goggles. Do not block the IR source when operating the goggles.
  - (3) Turn the OFF-ON-PULL/IR switch counterclockwise to the OFF position. Note that the red light and green glow disappear.
  - (4) Shut down the goggles by positioning the OFF-ON-PULL./IR switch to OFF.

5. Stow the goggles (Figure 5).

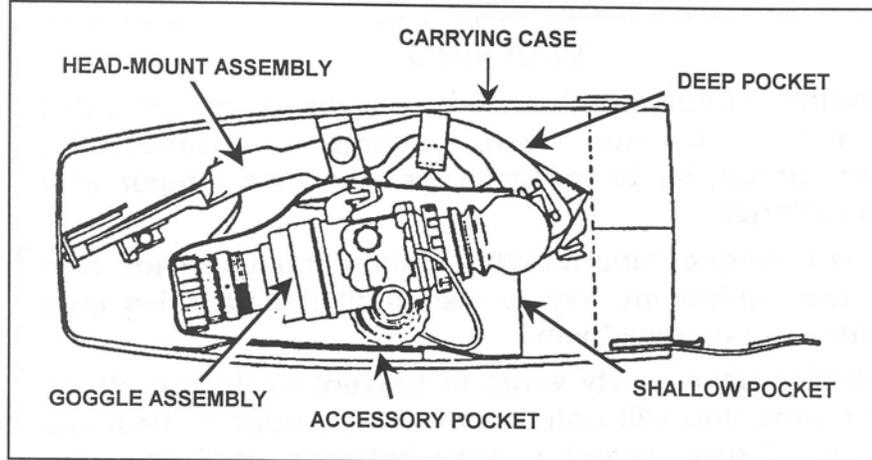


Figure 5. Stow goggles in carrying case.

- a. Unscrew the battery cap, remove battery, and replace the battery cap.
- b. Place demist shields and battery into their proper carrying case pocket.

## CAUTION

Place the sacrificial window at the bottom left or right corner of the carrying case accessory pocket of the carrying case. Close the carrying case.

- c. Place the lens paper, sacrificial window, and operator's manual in the accessory pocket located

**Performance Steps**

- under the shallow pocket that contains the goggles.
- d. Place the goggles (objective lens down) into shallow pocket of carrying case.
- e. Stow the headmount assembly in the deep pocket of the carrying case. Close the carrying case.

**Evaluation Preparation:** SETUP: Provide the soldier with equipment and materials listed in the task condition statement.

**BRIEF SOLDIER:** Tell the soldier to inspect the components, accessories, and goggles for completeness and serviceability and clean them as required; and to perform an operational check, shut down the goggles, and stow them and their accessories.

<b>Performance Measures</b>	<b><u>GO</u></b>	<b><u>NO GO</u></b>
1. Inventoried carrying case for correct content.	_____	_____
2. Cleaned the AN/PVS-7B and accessories using correct cleaning techniques.	_____	_____
3. Inspected accessories and goggles for serviceability.	_____	_____
4. Performed an operational check.	_____	_____
5. Stowed the night vision goggles.	_____	_____
6. Complied with safety precautions and warnings.	_____	_____

**Evaluation Guidance:** Score the soldier GO if all performance measures are passed. Score the soldier NO-GO if any performance measure is failed. If the soldier scores NO-GO, show the soldier what was done wrong and how to do it correctly.

**References**

**Required**

**Related**

TM 11-5855-262-10-2

Subject Area 20: RECON-SECURITY: OPSEC AND COMSEC

**Challenge Persons Entering Your Area**  
**071-331-0801**

**Conditions:** Given the current challenge and password and a defensive position with a designated sector of fire, your individual weapon, and load-carrying equipment (LCE). Enemy and friendly personnel may enter your sector.

**Standards:** Detected and halted all personnel in your sector and challenged them to use the correct challenge. Personnel with correct password were allowed to pass. Personnel with incorrect password were detained or captured (did not allow the enemy to overhear the password).

**Performance Steps**

1. One person desires to pass.
  - a. Upon seeing or hearing someone approach your position, command the person to halt before that person gets close enough to pose a threat. Use a clear voice, just loud enough to be heard.
  - b. Seeing the stranger, halt and cover the soldier without exposing your position and ask, "Who is there?" Again, in a clear voice just loud enough to be heard so the enemy will not overhear if nearby.
  - c. When the stranger identifies himself or herself, such as "Private Willard, messenger" order him or her, "Advance to be recognized."
  - d. Maintain your concealed position and keep the stranger covered with your weapon. When the stranger gets within 2 or 3 meters of you, again order him or her to halt.
  - e. Issue the challenge in a soft voice and wait for the stranger to reply with the correct password. Upon hearing the correct password, give permission to pass if you have no doubt. If a doubt still exists, demand further identification or ask a question only a friendly person would be able to answer.
  
2. A group desires to pass.
  - a. The procedure and precautions for a group are almost the same as for one person. Upon seeing or hearing a group approach, order them to halt before they are close enough to pose a threat.
  - b. The leader of the group should identify the group such as "Friendly patrol." Since you do not want the whole group to advance at once, order, "Advance one person to be recognized."
  - c. When the leader has come forward to be recognized, give him or her the challenge.
  - d. Once you receive the correct password, have the rest of the patrol advance one by one and ensure the leader identifies each person.
  - e. Disarm and detain any person(s) not able to identify themselves to the leader's satisfaction. Then notify your immediate supervisor.

**Evaluation Preparation: SETUP:** Simulate a situation in which soldiers can use the challenge and password. Issue the challenge and password to those who will play the role of friendly troops and the correct and incorrect password to those who will play the role of unidentified troops. The person playing the part of the intruder will vary responses upon being challenged.

**BRIEF SOLDIER:** Tell the soldier to challenge all those who approach the defensive position.

**Performance Measures**

	<u>GO</u>	<u>NO GO</u>
1. Said, "Halt," before the person was close enough to pose a threat. NOTE: Assume the person has halted.	_____	_____
2. Said, "Who is there?" Kept the unknown individual covered.	_____	_____

**Performance Measures**

**GO**    **NO GO**

NOTE: Assume the stranger identifies himself or herself.

- |  |       |       |
|--|-------|-------|
| 3. Said, "Advance to be recognized."   | _____ | _____ |
| 4. Maintained a concealed position, kept the individual covered, and said, "Halt," when he or she was 2 or 3 meters away.  | _____ | _____ |
| 5. Issued the challenge.   | _____ | _____ |
| a. Permitted the person to pass if the password was correct.   |       |       |
| b. Disarmed (if applicable) and detained if the password was not correct.  |       |       |
| c. If still doubtful, asked for further identification or asked a question only a friendly person would be able to answer. |       |       |

**Evaluation Guidance:** Score the soldier GO if all performance measures are passed. Score the soldier NO-GO if any performance measure is failed. If the soldier scores NO-GO, show the soldier what was done wrong and how to do it correctly.

**References  
Required**

**Related**  
FM 21-75  
FM 22-6

## Subject Area 22: SUSTAIN: GENERAL

**Perform Individual Camouflage****052-191-1501**

**Conditions:** Given grass, bushes, trees, shadows, Battle Dress Uniforms (BDU), pieces of Lightweight Camouflage Screen System (LCSS), skin paint, charcoal, and/or mud for camouflage, load carrying equipment (LCE), Kevlar helmet with camouflage cover, an individual weapon, and an individual fighting position placed on a reverse slope.

**Standards:** Camouflage yourself, your individual equipment, and your individual fighting position to prevent detection by visual, near infrared, infrared, ultraviolet, radar, acoustic and radio sensors. There are no changes to the standards if performed in Mission-Oriented Protective Posture (MOPP) 4.

**Performance Steps**

1. Identify critical camouflage considerations, incorporating an analysis of the following considerations:
  - a. Movement.

Note: Movement draws attention. The naked eye and infrared/radar sensors can detect movement.

- (1) Minimize movement, remembering that darkness does not prevent observation.
- (2) Move, slow and smoothly when movement is necessary.

- b. Shape.

- (1) Use artificial materials to break up shapes, outlines and equipment.
- (2) Move, staying in shadows.
- (3) Disguise or distort the shape of your helmet and body with artificial materials when conducting operations close to the enemy.

Note: Gloss or shine caused by light reflecting from smooth or polished surfaces will attract attention. Remember moonlight and starlight can be reflected as easily as sunlight.

- c. Cover or remove the following items eliminating light reflection.

- (1) Mess kits.
- (2) Mirrors.
- (3) Eye glasses.
- (4) Watch crystals.
- (5) Plastic map cases.
- (6) Starched uniforms.
- (7) Clear plastic garbage bags.
- (8) Dust goggles worn on the top of helmets.
- (9) Cigarettes and pipes.
- (10) Red filtered flashlights.

Note: Flashlights - replace all red filters with blue-green filters.

- d. Color. Blend individual camouflage with the surroundings; or at a minimum, objects must not contrast with the background.

Note: When moving from one area to another, change camouflage as required. What works well in one location may draw fire in another.

2. Camouflage your skin.

Note: Exposed skin reflects light.

- a. Cover your skin oils, even if you have very dark skin, using paint sticks. Paint sticks cover these oils and provide blending with the background.

Note: Do not use oils or insect repellent to soften paint sticks. This defeats the purpose of paint sticks by making the skin shiny. Soldiers applying paint should work in pairs because self-application may leave gaps, such as behind the ears.

- b. Use the following table when applying paint on the face:
- c. Paint exposed skin on the back of the neck, arms, and hands with an irregular pattern.

CAUTION

**Performance Steps**

MUD CONTAINS BACTERIA, SOME OF WHICH IS HARMFUL AND MAY CAUSE DISEASE OR INFECTION. MUD SHOULD BE CONSIDERED LAST AS A FIELD EXPEDIENT PAINT.

3. Camouflage your BDUs.
  - a. Roll your sleeves down and button all buttons.
  - b. Attach leaves, grass, small branches, or pieces of LCSS to your uniform and helmet. These items will distort shapes and blend colors with the natural background.

Note: BDUs provide visual and near infrared camouflage.

- c. DO NOT starch BDUs; this counters the infrared properties of the dyes.
- d. Replace excessively faded and worn BDU's because camouflage effectiveness is lost.

4. Camouflage your personal equipment.
  - a. Cover or remove shiny items.
  - b. Secure items that rattle or make noise when moved or worn.

5. Camouflage your individual fighting position.
  - a. Place your position, considering camouflage as the most important factor.
  - b. Place your position out of the direct view of threat forces when possible. Example: Reverse slope defense.
  - c. Place your position at night or under other conditions of limited visibility.
  - d. Collect spoil in carrying devices for careful disposal.

Note: Spoil may be used to fill sandbags and as a parapet for protection.

- e. Avoid disturbing the natural look of the surroundings.
- f. Use LCSS and natural vegetation to distort the outline of the position.

Note: Use decoy positions to draw enemy attention away from actual fighting positions.

- g. Conduct the camouflage process.
  - (1) Camouflage your position as it is built.
  - (2) DO NOT leave shiny or light-colored objects exposed.
  - (3) DO NOT remove shirts while in the open.
  - (4) DO NOT use fires.
  - (5) DO NOT leave tracks or other signs of movement.
  - (6) DO NOT look up when aircraft fly overhead. The most obvious features on aerial photographs is the upturned faces of soldiers.
- h. Inspect the following.
  - (1) Inspect your position from the enemy viewpoint.
  - (2) Inspect the camouflage continuously to see that it stays natural looking and conceals the position.
  - (3) Change or improve materials when they become ineffective.

**Evaluation Preparation: SETUP:** Ensure that all materials required in the conditions statement are available to the soldier. The individual fighting position may be simulated by using sandbags to form a structure that would offer the individual soldier protection. Dimensions of the structure are at the discretion of the evaluator. The buddy system should be used when applying paint to the face.

**BRIEF SOLDIER:** Tell the soldier, in preparation for unit defense, he or she is to identify critical camouflage considerations, camouflage himself or herself or a buddy's exposed skin with paint sticks, camouflage his or her individual equipment, and camouflage his or her individual fighting position.

**Performance Measures**

GO      NO GO

1. Identified critical camouflage considerations.
  - a. Movement.
    - (1) Minimize movement.
    - (2) Move slowly and smoothly.
  - b. Shape.
    - (1) Break up shapes and outlines.

\_\_\_\_\_

**Performance Measures**

**GO    NO GO**

- (2) Distort shapes and outlines.
  - c. Covered or removed the following items, eliminating light reflection:
    - (1) Mess kits.
    - (2) Mirrors.
    - (3) Eye glasses.
    - (4) Watch crystals.
    - (5) Plastic map cases.
    - (6) Starched uniforms.
    - (7) Clear plastic garbage bags.
    - (8) Dust goggles worn on the top of helmets.
    - (9) Cigarettes and pipes.
    - (10) Red filtered flashlights.
  - d. Color.
    - (1) Blend camouflage with the surroundings.
    - (2) Objects should not contrast with the background.
2. Camouflaged your skin. \_\_\_\_\_ \_\_\_\_\_
- a. Used paint sticks to paint your face in accordance with the face camouflage chart.
  - b. Used paint sticks to paint exposed areas of your neck, arms and hands with irregular patterns.
  - c. Explained why mud should be considered last as a field-expedient paint.
3. Camouflaged your BDUs. \_\_\_\_\_ \_\_\_\_\_
- a. Rolled down your sleeves and button all buttons.
  - b. Attached leaves, grass, small branches, or pieces of LCSS to your uniform and helmet.
  - c. Do not wear starched BDU's.
  - d. Do not wear excessively faded or worn BDU's.
4. Camouflaged your personal equipment. \_\_\_\_\_ \_\_\_\_\_
- a. Cover or remove shiny items.
  - b. Secure items that rattle or make noise when moved or worn.
5. Camouflaged your individual fighting position. \_\_\_\_\_ \_\_\_\_\_
- a. Explained the most important camouflage consideration for positions.
  - b. Explained when positions should be placed.
  - c. Collected spoil in carrying devices for careful disposal or use for protection.
  - d. Avoided disturbing the natural look of the surroundings.
  - e. Used LCSS and natural vegetation to distort the outline of the position.
  - f. Explained the use of a decoy position.
  - g. Conducted the camouflage process.
  - h. Inspected your position.
    - (1) From the enemy viewpoint.
    - (2) To ensure camouflage stays natural looking and conceals the position.
    - (3) Change or improve ineffective materials.

**Evaluation Guidance:** Score the soldier GO if all performance measures are passed. Score the soldier NO-GO if any performance measure is failed. If the soldier scores NO-GO, show the soldier what was done wrong and how to do it correctly.

**References**

**Required**  
 FM 20-3  
 FM 21-75

**Related**

**Destroy Supplies and Equipment**  
**071-600-0001**

**Conditions:** In a combat environment, given an order to destroy supplies and equipment.

**Standards:** Rendered the supplies and equipment useless for their intended function.

**Performance Steps**

1. Select destruction methods. You have received the authority and priority of destruction.  
NOTE: Division and higher commanders may delegate their destruction authority when the situation warrants.

- a. Self-destruction devices.
- b. Improper operation.
- c. Fire.
- d. Gunfire.
- e. Demolition.
- f. Mechanical destruction.
- g. Use of natural surroundings.

2. Destroy supplies and equipment.

**Evaluation Preparation:** SETUP: At the test site, provide the soldier with equipment and supplies for which destruction authority and priority has been received.

BRIEF SOLDIER: Tell the soldier to destroy supplies and equipment damaged beyond repair, according to the established priority.

<b>Performance Measures</b>	<b><u>GO</u></b>	<b><u>NO GO</u></b>
1. Selected destruction method.	_____	_____
2. Destroyed supplies and equipment that could not be repaired.	_____	_____

**Evaluation Guidance:** Score the soldier GO if all performance measures are passed. Score the soldier NO-GO if any performance measure is failed. If the soldier scores NO-GO, show the soldier what was done wrong and how to do it correctly.

**References**  
**Required**

**Related**  
TM 750-244-6

**Conduct Combat Operations According to the Law of War**  
**181-906-1505**

**Conditions:** You are in combat. You encounter enemy combatants and civilians, and enemy and civilian property. You may encounter enemy prisoners or wounded enemy soldiers, or you may be taken prisoner or wounded by the enemy.

**Standards:** Follow "The Soldier's Rules" conducting combat operations in accordance with the law of war.

1. Fight only enemy combatants.
2. Safeguard enemies who surrender.
3. Do not kill or torture enemy prisoners.
4. Care for the wounded, whether friend or foe.
5. Do not attack medical personnel, facilities, or equipment.
6. Destroy no more than the mission requires.
7. Treat all civilians humanely.
8. Respect private property and possessions. Do not steal.
9. Identify the rights and duties of prisoners of war (PW).
10. Report all violations of the law of war.

**Performance Steps**

1. Fight only enemy combatants. Do not attack:
  - a. Civilians.
  - b. Enemy soldiers who surrender.
  - c. Enemy soldiers who are sick or wounded, and who are out of combat.
  - d. Medical personnel.
  - e. Aircrew members exiting an aircraft in distress.
2. Safeguard enemies who surrender.
  - a. Allow enemies to surrender.
  - b. Treat all captives as PWs.
  - c. Protect all captives from the dangers of combat.
  - d. Evacuate all moveable captives to the rear as soon after capture as possible.
3. Do not kill or torture enemy prisoners.
  - a. Treat all prisoners humanely.
    - (1) Provide prisoners with food, water, shelter, and medical treatment.
    - (2) Do not take money, personal property, or protective equipment from prisoners unless ordered to do so.
  - b. Protect prisoners from physical or mental abuse.
    - (1) Protect prisoners from acts of violence and intimidation.
    - (2) Do not use prisoners as shields or screens, to clear or plant mines or booby traps, or as hostages.
  - c. Do not use force or coercion in questioning or interrogating prisoners.
4. Care for the wounded, whether friend or foe.
  - a. Collect all wounded personnel.
  - b. Treat all wounded, friend or foe, in accordance with medical priorities.
  - c. Follow the Golden Rule: Treat enemy wounded as you would want friendly wounded to be treated by the enemy.
5. Do not attack medical personnel, facilities, or equipment.
  - a. Do not fire at medical personnel, medical facilities, or medical transport vehicles.
  - b. Respect medical service symbols (Red Cross, Red Crescent, the Red Lion and Sun, and the Red Shield of David).
    - (1) Use medical service symbols only for medical activities.

**Performance Steps**

- (2) Do not hide behind medical service symbols.
6. Destroy no more than the mission requires.
  - a. Follow the Rules of Engagement.
  - b. Attack only combat targets.
  - c. Do not attack protected property such as hospitals, churches, shrines, museums, or undefended places.
  - d. Do not destroy property unless required by the necessities of war.
7. Treat all civilians humanely.
  - a. Move or detain civilians only for proper cause.
  - b. Protect civilians from collective punishment, reprisals, and hostage taking.
  - c. Protect women from forced prostitution, rape, and sexual assault.
8. Respect private property and possessions. Do not:
  - a. Steal civilian property.
  - b. Take war trophies.
  - c. Seize property unless ordered to do so.
9. Identify the rights and duties of PWs.
  - a. PWs have the right to:
    - (1) Receive housing and clothing.
    - (2) Receive enough food to stay in good health.
    - (3) Receive adequate medical care.
    - (4) Maintain proper hygiene.
    - (5) Practice their religious faith.
    - (6) Send and receive mail.
    - (7) Keep personal property except for weapons, military equipment, and military documents.
    - (8) Receive packages containing foodstuffs, clothing, and educational, religious, or recreational material.
    - (9) Have a prisoners' representative to the PW camp commander.
    - (10) Receive humane treatment from their captors.
  - b. PWs have the duty to:
    - (1) Tell their captors only their name, rank, service number, and date of birth.
    - (2) Obey all lawful camp rules.
    - (3) Obey the lawful orders of senior prisoners.
    - (4) Perform nonmilitary labor which is not humiliating, dangerous, or unhealthy. Officers and NCOs can be required to perform only supervisory work.
10. Report all violations of the law of war.
  - a. Do your utmost to prevent criminal acts.
  - b. Request clarification of unclear orders.
  - c. Refuse to obey an order that is clearly illegal.
  - d. Report violations of the law of war to one of the following:
    - (1) Chain of command.
    - (2) Military police.
    - (3) Inspector General.
    - (4) A judge advocate.
    - (5) A chaplain.

**Evaluation Preparation:** Setup: Test each soldier individually during an Army Training and Evaluation Program (ARTEP) exercise or a field training exercise (FTX). Whenever possible, the best way to test soldiers is to integrate realistic law of war issues into exercise play. At a minimum, orally present the soldier with simulated combat situations and have the soldier either recall or apply "The Soldier's Rules." Brief Soldier: Either: Tell the soldier he or she will have to respond to situations involving the law of war

(The Soldier's Rules). Or: As a minimum, tell the soldier you will describe a situation involving the law of war and he or she must apply the Soldier's Rules orally.

<b>Performance Measures</b>	<b><u>GO</u></b>	<b><u>NO GO</u></b>
1. Situation A: On a patrol, you encounter a group of enemy soldiers walking toward you with their hands raised. <ul style="list-style-type: none"> <li>a. Allow enemies to surrender.</li> <li>b. Treat all captives as PWs.</li> <li>c. Protect all captives from the dangers of combat.</li> <li>d. Evacuate all moveable captives to the rear as soon after capture as possible.</li> </ul>	—	—
2. Situation B: You take an enemy soldier prisoner. <ul style="list-style-type: none"> <li>a. Treat all prisoners humanely.</li> <li>b. Protect prisoners from physical or mental abuse.</li> <li>c. Do not use force or coercion in questioning or interrogating prisoners.</li> </ul>	—	—
3. Situation C: On patrol, you encounter a group of enemy soldiers who are sick or wounded and are out of combat. <ul style="list-style-type: none"> <li>a. Collect all wounded personnel.</li> <li>b. Treat all wounded, friend or foe, in accordance with medical priorities.</li> <li>c. Follow the Golden Rule: Treat enemy wounded as you would want friendly wounded to be treated by the enemy.</li> </ul>	—	—
4. Situation D: You see an enemy field ambulance, marked with a Red Crescent. <ul style="list-style-type: none"> <li>a. Do not fire at medical personnel, medical facilities, or medical transport vehicles.</li> <li>b. Respect medical service symbols (Red Cross, Red Crescent, the Red Lion and Sun, and the Red Shield of David).</li> </ul>	—	—
5. Situation E: Your patrol encounters sniper fire from a window in a large building within a city. You can neutralize the sniper by direct fire at the window or by destroying the entire building. <ul style="list-style-type: none"> <li>a. Attack only combat targets.</li> <li>b. Do not attack protected property such as hospitals, churches, shrines, museums, or undefended places.</li> <li>c. Do not destroy property unless required by the necessities of war.</li> </ul>	—	—
6. Situation F: Your unit has been attacked by enemy civilians in hit and run raids. <ul style="list-style-type: none"> <li>a. Move or detain civilians only for proper cause.</li> <li>b. Protect civilians from collective punishment, reprisals, and hostage taking.</li> <li>c. Protect women from forced prostitution, rape, and sexual assault.</li> </ul>	—	—
7. Situation G: You find abandoned property on the battlefield. <ul style="list-style-type: none"> <li>a. Do not steal civilian property.</li> <li>b. Do not take war trophies.</li> <li>c. Do not seize property unless ordered to do so.</li> </ul>	—	—
8. Situation H: You are taken prisoner. You are asked questions. <ul style="list-style-type: none"> <li>a. Tell only name, rank, service number, and date of birth.</li> </ul>	—	—
9. Situation I: You observe a violation of the law of war. <ul style="list-style-type: none"> <li>a. Do your utmost to prevent criminal acts.</li> <li>b. Report violations of the law of war to one of the following: Chain or command, military police, Inspector General, a judge advocate, or a chaplain.</li> </ul>	—	—

**Evaluation Guidance:** Score the soldier a GO if all responses are correct. Score the soldier a NO-GO if any response is incorrect. If a response is incorrect, refer the soldier to the appropriate Soldier's Rule for further study.

**References**

**Required**  
AR 350-41  
FM 27-10

**Related**

Subject Area 24: SUSTAIN: NBC

**MARK NBC CONTAMINATED AREA**

**031-503-1021**

**Conditions:** Given an area where NBC weapons have been used. You are in the appropriate MOPP level. You have NBC markers (radiological, biological, and chemical), grease pencil, information necessary to fill out a marker for each type of contamination, the means to hold the markers in place, and a designated location for the sign.

**Standards:** 1. Selected the appropriate marker based upon information provided. 2. Recorded the required information on the marker. 3. Emplaced the marker properly.

**Performance Steps**

1. Once contamination has been located and identified in an area, the area must be marked to warn friendly troops. Markers must be placed where they can be easily seen.
  - a. Radiological contamination. Prepare a marker labeled ATOM.
    - (1) Print all information on the front side of the marker so that the word ATOM is facing toward you in an upright position.
    - (2) Print the dose rate, in centigray per hour (cGyph).
    - (3) Print the date and time (local or ZULU, state which).
    - (4) Print the date and time (local or ZULU, state which) of the detonation, if known. (If the date and time is not known, print UNKNOWN.)
  - b. Biological contamination. Prepare a marker labeled BIO.
    - (1) Print all information on the front side of the marker so that the BIO is facing toward you in an upright position.
    - (2) Print the type of agent detected. (If unknown, print the word UNKNOWN.)
    - (3) Print the date of detection beneath the type of agent.
    - (4) Print the time (local or ZULU, state which) of detection beneath the date of detection.
  - c. Chemical contamination. Prepare a marker labeled GAS.
    - (1) Print all information on the front side of the marker so that the word GAS is facing toward you in an upright position.
    - (2) Print the type of agent detected. (If unknown, print the word UNKNOWN.)
    - (3) Print the date and time (local or ZULU, state which) of detection beneath the type of agent detected.
2. Position the marker so that the recorded information faces away from the area of contamination and the marker can be easily seen.
  - a. Attach the markers to objects such as trees or poles, so that they will be easily visible from all probable routes through the contaminated area.
  - b. Place each marker so that the next one can be seen from the one just emplaced.
  - c. For radiological contamination, place the markers at the location where the dose rate is measured at 1 cGyph or more.

**Evaluation Preparation:** Setup: Use simulants to produce a contaminated environment for CB agents. When requiring a marker for radiological contamination, tell the soldier the amount of radiation present.

**Performance Measures**

	<u>GO</u>	<u>NO GO</u>
1. Selected appropriate marker.	_____	_____
2. Recorded required information on the marker.	_____	_____
3. Emplaced the marker.	_____	_____

**Evaluation Guidance:** Score the soldier GO if all steps are passed (P). Score the soldier NO-GO if any steps are failed (F). If the soldier fails any steps, show what was done wrong and how to do it correctly.

**References**

**Required**

FM 3-3

TM 3-9905-001-10

**Related**

## Prepare the Chemical Agent Monitor for Operation

**031-503-1030**

**Conditions:** Given a protective overgarment ensemble, protective mask with hood attached, a chemical agent monitor (CAM), TM 3-6665-331-10, DA Form 2404 (Equipment Inspection and Maintenance Worksheet), a pencil, and a directive to prepare the CAM for operation in an area where chemical contamination may occur.

**Standards:** Identify the components, controls, and indicators of the CAM. Perform before operations preventive maintenance checks and services (PMCS). Perform required troubleshooting procedures so that the CAM passes the self-test and the confidence test in both G and H modes.

### Performance Steps

1. Identify components (TM 3-6665-331-10, paragraph 1-9) and controls and indicators (TM 3-6665-331-10, Chapter 2, Section I).
2. Perform before-operations PMCS in accordance with TM 3-6665-331-10, paragraph 2-2.
3. Perform self-test.

- a. Ensure nozzle protective cap is in position on monitor case assembly.
- b. Press ON/OFF push-button switch.

NOTE: If CAM display does not come on, disappears, or flashes on and off, refer to troubleshooting symptoms 3 and 4 in TM 3-6665-331-10, paragraph 3-3.

- c. Check that H mode shows.
  - (1) If G mode shows, press G/H mode push-button switch. Turn CAM off, then on again. Verify H mode shows.
  - (2) If H mode still does not show, refer to troubleshooting symptom 5 in TM 3-6665-331-10, paragraph 3-3.
- d. Check that markers A and B show.
- e. Check that all eight bars show.
- f. Check that three vertical dots show.
- g. Check that BL shows.
- h. Check that WAIT shows.

NOTE: If any display is not shown, refer to troubleshooting symptom 9 in TM 3-6665-331-10, paragraph 3-3.

- i. Check that display clears from self-test after 30 seconds.

NOTE: If display does not clear after 30 seconds, refer to troubleshooting symptom 10 in TM 3-331-10, paragraph 3-3. H mode, WAIT, A and B markers remain.

- j. Check that WAIT clears from display within two minutes.

NOTE: In very cold conditions, the battery may not immediately reach operating level (BL may not go out). If BL is still displayed after five minutes, repeat step 3.

NOTE: An extended warm up period may be necessary if CAMs have been in storage 30 days or longer. Allow CAM to run until it passes confidence test, but not more than 24 hours.

NOTE: If WAIT does not clear within two minutes (only H mode and A and B markers remain), refer to troubleshooting symptom 11 in TM 3-6665-331-10, paragraph 3-3.

4. Perform confidence test.

NOTE: This test is performed after completing a self-test or when changing modes.

CAUTION: Nozzle protective cap assembly must be stored on environmental cap when not on the front of the CAM. Do not touch the nozzle assembly or the new filtered nozzle standoff; touching could contaminate them. Attach filtered nozzle standoff quickly to prevent dust and contamination from entering the CAM.

- a. Twist counterclockwise and remove nozzle protective cap from front of CAM; place nozzle protective cap onto CAM environmental cap and twist clockwise.
- b. Place a filtered nozzle standoff into CAM nozzle assembly.

**Performance Steps**

- (1) Pull one filtered nozzle package assembly from pocket of carrying harness.
- (2) Peel back covering from top of filtered nozzle package assembly until one filtered nozzle standoff is exposed.
- (3) Quickly press CAM nozzle assembly into exposed filtered nozzle standoff and remove.
- (4) Lay covering back in place across top of filtered nozzle package assembly. Slide package assembly back into pocket of carrying harness.

NOTE: Make sure CAM display indicates H mode.

c. Perform H confidence test as follows:

- (1) Remove confidence sample from carrying harness.
- (2) Grasp confidence sample with H end exposed.

CAUTION: Do not allow CAM to sample the confidence sample for more than one second. Longer than one second will saturate the CAM with vapor. It is only necessary that at least three bars show for test verification (do not attempt to have all bars show).

- (3) Press CAM nozzle assembly firmly into H end of confidence sample for one second. Confidence sample should touch filtered nozzle standoff.
- (4) Remove confidence sample.
- (5) Verify that at least three bars are displayed after a few seconds.

NOTE: Three dots may appear momentarily; ignore them. If fewer than three dots appear, refer to troubleshooting symptom 8 in TM 3-6665-331-10, paragraph 3-3.

- (6) Check that display clears to zero or one bar within two minutes.

NOTE: If CAM does not clear within 2 minutes, refer to troubleshooting symptom 6 in TM 3-6665-331-10, paragraph 3-3.

d. Press G/H mode push-button switch; verify mode changes from H to G.

- (1) When WAIT disappears, proceed.

NOTE: If three dots appear following the mode change, ignore them.

- (2) If display flashes on and off, go to troubleshooting symptom 4 in TM 3-6665-331-10, paragraph 3-3.

e. Perform G confidence test the same as the H confidence test, using the G end of the confidence sample.

f. Place confidence sample into pocket of carrying harness.

5. If CAM passes self-test and confidence test, it is ready for operation.

6. If CAM fails to respond after you followed troubleshooting procedures, annotate deficiencies on DA Form 2404 and turn CAM in to maintenance.

**Evaluation Preparation:** Setup: Give the soldier an operational CAM with TM 3-6665-331-10, accessories (carrying case and components) and training devices/equipment necessary to perform the task. Use the M58A1 and for all training situations.

Brief Soldier: Tell the soldier to assume MOPP4 and perform the steps necessary to prepare the CAM for operation. Evaluation will be based on individual performance and adherence to safety precautions.

**Performance Measures**

1. Identified components.

GO      NO GO

\_\_\_\_\_

2. Identified controls.

\_\_\_\_\_

3. Identified indicators.

\_\_\_\_\_

4. Performed before-operations PMCS.

\_\_\_\_\_

5. Performed self-test.

\_\_\_\_\_

6. Performed confidence test.

\_\_\_\_\_

**Performance Measures****GO**    **NO GO**

7. Performed troubleshooting procedures, if required.

\_\_\_\_\_

**Evaluation Guidance:** Score the slider GO if all steps are passed. Score the slider NO-GO if step is failed. If the slider scores NO-GO, show him what was done wrong and how to do it correctly.

**References****Required**

TM 3-6665-331-10

**Related**

TM 3-4230-216-10

TM 3-4240-279-10

TM 3-6665-307-10

**Use the Chemical Agent Monitor**  
**031-503-1031**

**Conditions:** Given a chemical agent monitor (CAM) that has been prepared for operation and TM 3-6665-331-10. You are in the appropriate mission-oriented protective posture (MOPP) level. The order has been given to perform monitoring procedures for personnel and equipment.

**Standards:** Perform monitoring procedures for personnel and equipment in accordance with TM 3-6665-331-10, paragraph 2-6.

**Performance Steps**

1. Ensure the CAM has been prepared for operation as outlined in task 031-503-1030, Prepare the Chemical Agent Monitor for Operation.
2. Perform operating procedures for changing modes.
  - a. To change from G mode to H mode, proceed with the following steps:
    - (1) Press the G/H mode push-button switch.
    - (2) verify that the display indicates H mode.

NOTE: Wait may be displayed for several seconds.

- (3) When wait has disappeared, proceed.
- (4) If three dots also appear following the mode change, ignore them.
- (5) If the display flashes on and off, refer to troubleshooting symptom 4 in TM 3-6665-331-10, paragraph.
- (6) Perform the confidence test for the H mode.

- b. To change from H mode to G mode, proceed with the following steps:

- (1) Press G/H mode push-button switch.
- (2) Verify that the display indicates G mode.

NOTE: Wait may be displayed for several seconds.

- (3) When wait has disappeared, proceed.
- (4) If three dots also appear following the mode change, ignore them.
- (5) If the display flashes on and off, refer to troubleshooting symptom 4 in TM 3-6665-331-10, paragraph.
- (6) Perform the confidence test for the H mode.

3. Monitor.

**CAUTION:** Do not contaminate the filtered nozzle standoff by allowing it to come in contact with liquid agent. **NOTE:** Get to know your operating environment (know local interferences). Do not obstruct the filtered nozzle standoff.

- a. Approach the object to be monitored (land vehicle, terrain, personnel, or casualty) from an upwind position if possible.

Note: It is probable that any contamination will cause a relatively high reading quite quickly. This has the advantage of quickly defining the upwind boundary of the area of contamination. From a downwind position the response will be low initially and will rise as the source of contamination is approached.

- b. Hold the CAM 1/2 inch from the object being monitored.
- c. If the operation of the CAM is in doubt at any time, remove the filtered nozzle standoff and replace the nozzle protective cap assembly on the nozzle assembly.
  - (1) When the display has cleared down to one or zero bars, remove the nozzle protective cap assembly and install a new filtered nozzle standoff.
  - (2) Perform a confidence test.

NOTE: Monitoring can then continue. The CAM is a vapor monitor and can report only conditions at the front of the nozzle assembly. It is a point monitor only and cannot give a realistic assessment of the vapor hazard over an area from one position.

- d. Move the CAM around the area and carry out a complete reconnaissance to properly assess the vapor hazard in the area.

NOTE: Complete assessment will probably be made in conjunction with other detection methods. If there

**Performance Steps**

is a source of vibration in the area, WAIT may display momentarily when searching for the agent.

NOTE: When a constant number of bars is continually shown on the display, it usually indicates that contamination is present in the surrounding area or on the nozzle.

e. Establish what general vapor hazards exists around the contaminated person or equipment.

NOTE: If the reading obtained is higher than the background level, then the person or equipment is contaminated. If the reading is the same as the background, then the person or equipment may be contaminated or the CAM may be merely recording the background vapor hazard.

f. Take care when assessing the contamination of an object from the information indicated on the CAM display.

CAUTION: Do not switch the CAM off for end of mission storage if more than one bar is displayed.

NOTE: Switch the CAM off when it is not in use to extend battery life.

NOTE: In cold weather, liquid contaminants may not release sufficient vapor to produce a reading on the CAM.

NOTE: A few vapors present in the atmosphere (interferents can, in some cases, give false response on the CAM.

NOTE the situations most likely to give false reading are in enclosed spaces on when sampling near strong vapor sources, such as dense smoke. For example, there may be responses in the galley, the sick bay, or the hanger. Some of the types of vapors that have been found to give false readings are - Aromatic vapors. Included in this group of materials are perfumes and food flavorings. Some brands of after-shave and perfume can give responses in the G mode when the CAM is held close to the skin, for example in casualty handling procedures. Some sweets, such as peppermints and cough lozengers, as well as menthol cigarettes can cause a response in G mode if the breath is exhaled directly into the CAM nozzle. Cleaning compounds. Some cleaning compounds and disinfectants contain additives that give them a pleasant smell. Some of the additives, such as menthol and methyl salicylate, can give false responses in the H or G mode. Cleaning materiaqls are by their very nature spread over large surface areas and, therefore, providea considerable vapor source, particularly in enclosed spaces. Smoke and fumes. The exhuaust from some rocket motors and the fumes from some munitions can give responses. Since from some rocket motors and the fumes from some munitions can give responses. Since monitoring with the CAM in these situations is unrealistic, few problems should arise.

g. If you suspect your CAM is giving a false reading, do the following:

- (1) Stay masked.
- (2) Check for obvious vapor sources, such as smoke and known interferents.
- (3) Remove and discard the filtered nozzle standoff. Place the nozzle protective cap assembly onto the front of the CAM case, and reestablish a clear air background.
- (4) Remove the nozzle protective cap assembly.
  - (a) If a false response occurs again, the CAM may not be operable in the immediate area.
  - (b) Remove the source of interferant if possible or replace the nozzle protective cap assembly and remove the CAM from the area.
  - (c) If any malfunctions occur, refer to the operator troubleshooting symptom in TM 3-6665-331-10, Table 3-1.

4. Follow all the safety rules outlined in TM 3-6665-327-13&P.

**Evaluation Preparation:** Setup: Evaluate this task during a field exercise or during a normal training session. Gather all necessary equipment and materials. Provide an area large enough to properly set up the CAM and perform monitoring of personnel and equipment. Develop several sets of conditions for testing purposes. Utilize approved simulants for the CAM to simulate contamination.

Brief Soldier: Tell the soldier to assume MOPP4 and perform the steps necessary to put the CAM into operation.

**Performance Measures**

	<u>GO</u>	<u>NO GO</u>
1. Ensured the CAM has been prepared for operation.	—	—
2. Performed operating procedures for changing modes.	—	—

**Performance Measures**

GO    NO GO

3. Monitored.

—      —

4. Followed all safety rules in TM 3-6665-331-10

—      —

**Evaluation Guidance:** Score the soldier GO if all steps are passed (P). Score the soldier NO-GO if any step is failed (F). If any step is failed, show the soldier what was done wrong and how to do it correctly.

**References**

**Required**  
TM 3-6665-331-10

**Related**

**Prepare the Chemical Agent Monitor for Movement**  
**031-503-1032**

**Conditions:** Given mission-oriented protective posture(MOPP) Level 4 protective gear, assigned protective mask with hood attached, M8 or M9 detector paper, an M258A1decontaminating kit, an M256 detector kit, a chemical agent monitor (CAM), TM 3-6665-331-10, and the directive to perform monitoring procedures for movement.

**Standards:** Perform the procedures to decontaminate th CAM in accordance with TM 3-6665-331-10, paragraph 2-17, and FM 3-5. Perform the procedures for removing the CAM from operation in accordance with TM 3-6665-331-10, paragraph 2-6f. Perform shutdown procedures in accordance with TM 6665-331-10, paragraph 2-6g. Perform after-operation preventative maintenance checks and services (PMCS) in accordance with TM 3-6665-331-10, paragraph 2-2.

**Performance Steps**

1. Decontaminate a contaminated CAM before shutdown.
  - a. Nuclear. For radiological contamination, brush, wipe, or vacuum the contamination from the equipment. The contamination is not destroyed, it is just moved from one place to another. Therefore, take control of the runoff.

CAUTION:Do not decontaminate the CAM or its accessories with M258A1 or M280 decontamination Kits. These kits may cause false positives and temporarily render the CAM inoperative.

CAUTION Decontaminate the nuclear, biological, chemical NBC gloves with hot soapy water or M291 skin decontamination kit.

- b. Biological or chemical. If the CAM or its accessories appear to be contaminated, decontaminate them. Wipe chemical contamination from the metal electronics cases with DS2. After 30 minutes wipe thoroughly with a damp cloth, dry, and wipe with oil. If DS2 is not available or the case is of a material other than metal, wipe with a cloth and hot, soapy water or use a nonstandard decontaminant. For either biological or chemical contamination, use the following procedures:

- (1) Press the ON/OFF push-button switch to turn the CAM off.
      - (2) Remove the filtered nozzle standoff and discard it as contaminated waste.

CAUTION: The CAM nozzle assembly must be decontaminated using water only.

- (3) Lightly dampen a cloth with water and wipe the CAM nozzle assembly thoroughly. Discard cloth as contaminated waste.
        - (4) Decontaminate the NBC gloves.

CAUTION: Handle the nozzle protective cap assembly carefully to avoid cross-contamination.

- (5) Remove the nozzle protective cap assembly from the environmental cap. Twist and install the nozzle protective cap assembly over the nozzle assembly.
          - (6) Press the ON/OFF push-button switch to turn the CAM on.
          - (7) Check for contamination with another CAM known to be free from contamination.
          - (8) If this check confirms that the first CAM is contaminated, disconnect the carrying harness by unsnapping both ends. Remove the carrying harness and handle straps. If the carrying harness assembly is contaminated, proceed as follows:
            - (a) Open the carrying harness battery packet and confidence sample packet.
            - (b) Decontaminate NBC gloves.
            - (c) Remove the confidence sample, the spare battery, and the filtered nozzle package assemblies, and check for contamination using another CAM. If contaminated, discard all items except the confidence sample as contaminated waste.
            - (d) Decontaminate the confidence sample using a cloth and hot, soapy water. Wipe dry with clean cloth or let air dry.
            - (e) Decontaminate the NBC gloves.
            - (f) Attach the spare replacement carrying harness from the sealed plastic bag in the carrying case to the CAM.
            - (g) Place the decontaminated confidence sample in the spare carrying harness

## Performance Steps

- assembly.
- (h) Place the spare battery and the filtered nozzle package assemblies, if not contaminated, in the spare carrying harness assembly.
- (9) Wait until the CAM display clears to one or zero bars in both modes. This may take 10 to 15 minutes. If the CAM does not clear, the nozzle protective cap assembly may be contaminated and may require replacement with the spare from the carrying case assembly. Replace the nozzle protective cap assembly and repeat the previous procedures.
- (10) Press the ON/OFF push-button switch to turn the CAM off. Decontaminate the CAM using the procedures and guidelines for electronic equipment in FM 3-5, Chapter 8. Decontaminate the NBC gloves, and check the completeness of decon with another CAM.
  - (a) Decontaminate the NBC gloves.
  - (b) Attach the spare replacement carrying harness from the sealed plastic bag in the carrying case to the CAM.
- (11) If the carrying case assembly is contaminated, open the carrying case assembly, decontaminate the NBC gloves, remove and decontaminate the sealed accessories as required, discard the carrying case assembly as contaminated waste, and replace the nozzle protective cap assembly if the CAM failed to clear down in previous steps.

NOTE: In conditions below 40°F (4C) take the CAM to a warm area to carry out the shutdown procedures.

2. Remove the CAM from operation.
  - a. Remove and discard the filtered nozzle standoff from the nozzle assembly.
  - b. When operating in wet conditions try to avoid trapping moisture on the nozzle assembly or inside the nozzle protective cap assembly. Trapped water may result in increased start-up time or reduced sensitivity. Inspect the nozzle assembly for indication of moisture; if droplets of water are present, attempt to shake the moisture off.
  - c. Twist and remove the nozzle protective cap assembly from the environmental cap.
  - d. Twist and install the nozzle protective cap assembly to the CAM case front end.

NOTE: The CAM normally clears down to one or zero bars within two minutes. If the CAM is contaminated, it may take at least an hour to clear down to zero bars.

- e. Observe the display. If the display shows zero or one bar, press the G/H push-button switch to change modes of operation and observe the display again. If the display shows zero or one bar in both modes, the CAM is ready for shutdown procedures. In conditions below 40degF (4degC) allow the CAM to run an additional five minutes after the display has cleared to zero or one bar. If more than one bar shows, let the CAM run until the display shows zero or one bar.
  - f. If the CAM fails to clear down in either mode within an hour, refer to the troubleshooting symptom 7 in TM 3-6665-331-10, Paragraph 3-3. When the display shows zero or one bar in both modes, press the ON/OFF push-button switch to shut the CAM off.
3. Prepare the CAM for movement.
    - a. Do the following to prepare the CAM for movement to a new location and to return the CAM to operation at the new location:
      - (1) Remove the CAM from operation.
      - (2) Shut down the CAM.
    - b. If the carrying case is available, proceed with the following steps:
      - (1) Inspect the two filtered nozzle package assemblies in the carrying harness. If either package is empty, replace it with a new one from the lid of the carrying case assembly.
      - (2) Inspect the nozzle protective cap assembly. If cap is damaged, replace it with the spare nozzle protective cap assembly stored in the carrying case assembly.
      - (3) Place the CAM into the carrying case assembly.
      - (4) Flip the pocket with the replacement carrying harness into the carrying case.
      - (5) Close the lid on the carrying case. Slide one hand along the hook-and-loop fastener to secure the carrying case.
      - (6) Place the CAM back into operation by performing the self-test and the confidence test

**Performance Steps**

explained in task 031-503-1030, Prepare the Chemical Agent Monitor for Operation.

**Evaluation Preparation:** Setup: Evaluate this task during a field exercise or during a normal training session. Gather all necessary equipment and materials. Provide an area large enough to properly set up the CAM and perform monitoring of personnel and equipment. Develop several sets of conditions for testing of personnel and equipment. Use approved simulants for the CAM to simulate contamination.

**Brief Soldier:** Tell the soldier to assume MOPP4 and perform the steps necessary to put the CAM into operation.

<b>Performance Measures</b>	<b><u>GO</u></b>	<b><u>NO GO</u></b>
1. Performed the procedures to decontaminate the CAM in accordance with TM 3-6665-331-10, paragraph 2-17, and FM 3-5.	—	—
2. Performed the procedures for removing the CAM from operation in accordance with TM 3-6665-331-10, paragraph 2-6f.	—	—
3. Performed shutdown procedures in accordance with TM 3-6665-331-10, paragraph 2-6g..	—	—
4. Performed after-operation PMCS in accordance with TM 3-6665-331-10, paragraph 2-2.	—	—

**Evaluation Guidance:** Score the soldier GO if all steps are passed (P). Score the soldier NO-GO if any step is failed (F). If any step is failed, show the soldier what was done wrong and how to do it correctly.

**References**

**Required**  
TM 3-6665-331-10

**Related**

## **Protect Yourself and Others From Chemical and Biological Injury/Contamination by Using a Collective Protection Shelter**

**031-506-1052**

**Conditions:** You are in a chemically contaminated area, and at Mission-Oriented Protective Posture (MOPP) level 4. You need to take shelter in a collective protection shelter. You have load carrying equipment (LCE), an M1 or M1A1 waterproof bag, assigned decontamination kit(s) (M258A1, or M291 and M295), M8 detector paper, and replacement MOPP gear. Soldiers in armor units wear the Suit, Contamination Avoidance and Liquid Protection over their MOPP gear; decontaminating apparatus (M11 or M13 DAP); water; and a brush.

**Standards:** Enter and exit a collective protection shelter without becoming a casualty, endangering other shelter occupants, or transferring the hazard to yourself or the shelter interior.

### **Performance Steps**

NOTE: The procedures are the same regardless of which type of MOPP ensemble you may have. The only difference comes from masks that have canister filters attached by a flexible hose to the mask; for this arrangement, be sure to bend over so as to not contaminate the flexible hose.

1. Prepare to enter a collective shelter.
  - a. Remove LCE, mask carrier, weapon, and helmet; place on an uncontaminated surface (such as a poncho).
  - b. Keep your decontamination kit(s) and waterproof bag with you at all times.
  - c. Loosen your protective gear.
    - (1) Trousers
      - (a) Untie ankle cords.
      - (b) Open velcro and zippers of both legs.
    - (2) Jacket
      - (a) Unsnap rear snaps.
      - (b) Unsnap two bottom front snaps (leave top snap closed).
      - (c) Untie waist cord, but leave zipped.
    - (3) Mask with hood
      - (a) Unfasten shoulder straps, remove from beneath your arms, and reattach.
      - (b) Loosen neck cord.
  - d. Decontaminate the mask and hood.
  - e. Decontaminate your gloves.

NOTE: Remember that you are in a contaminated area. Do not lean against anything after you have begun to remove your individual protective equipment.

- f. Roll your hood.
- g. Remove your protective jacket.
- h. Remove your protective trousers.
- i. Remove your protective overboots.
  - (1) Stand next to the hot line (the line that separates the contaminated area from the noncontaminated area).
  - (2) Unfasten or cut the fasteners on your overboots.

NOTE: At no time should you step on the ground on the contaminated side of the hot line once you have removed your overboots.

- (3) Remove the overboot closest to the hot line. Once the overboot is off, place your exposed combat boot on the clean side of the hot line. Repeat the procedure for the other overboot.

2. Enter a collective protective shelter with an air lock while in MOPP gear.
  - a. Enter the air lock.
    - (1) Ensure the door is closed.
    - (2) Set the purge timer.

NOTE: Discard the used decontamination kit(s) in the receptacle provided.

**Performance Steps**

- (3) Decon your gloves again.
- (4) Decon the exposed portion of your rolled hood.
- (5) Wait for completion of the purge cycle.
- b. When timer bell sounds, loosen but don't remove your gloves.
- c. Remove mask.
  - (1) Stop breathing.
  - (2) Keep eyes open.
  - (3) Remove mask and hood and place both in the waterproof bag.
  - (4) Seal the bag shut.
  - (5) Remove gloves and drop them to the floor.
- d. Enter the shelter from the airlock carrying the bag containing your mask and hood.

## 3. Enter a tank (without an airlock).

- a. Mount the tank over the left front road wheel.

NOTE: The following step (3b) is done by only the loader.

- b. Decon an area about four feet in diameter around the loader's hatch if contamination is present. Flush the decontaminant away with water.
- c. Remove your Suit, Contamination Avoidance and Liquid Protective (SCALP).

- (1) Stand just outside the decontaminated area.

NOTE: Discard the used items and removed SCALP over the side of the tank.

- (2) Remove the SCALP jacket.
- (3) Remove the SCALP trousers.
- (4) Remove the SCALP overboot closest to the cleaned area. Once the overboot is off, place your exposed combat boot in the clean area. Repeat the procedure for the other overboot.
- d. Decon your protective gloves.
- e. Decon your protective gloves.
- f. Resume operations as if in a contaminated environment.
- g. Remain in MOPP 4 until further decontamination is performed or until testing indicates no hazard is present.

NOTE: If tests reveal no hazard is present, and you are in a buttoned-up overpressure system equipped vehicle, initiate unmasking procedures.

## 4. Exit a collective shelter or van with an airlock while wearing MOPP gear.

- a. Put on clean MOPP gear inside the shelter.
- b. Ensure the airlock is unoccupied.
- c. Exit the shelter.
  - (1) Stop breathing.
  - (2) Step into airlock carrying the bag with your mask and hood.
  - (3) Don the protective mask.
- d. Exit the air lock.

## 5. Exit a tank without an airlock.

- a. Traverse the turret until the main gun is centered over the front slope.
- b. Put on mask and protective gloves.

NOTE: The loader must be the first one to exit.

- c. Put on the SCALP at the loader's station.
- d. Exit the tank through the loader's hatch carrying your decontaminating kit(s).
- e. Carry the decontaminating apparatus.
- f. If you are the last one to exit, close the loader's hatch.

## 6. Field expedient shelters may be found or constructed. Use tape and other material to seal cracks around doors and windows to provide a location for temporary rest and relief. The procedures for entering and exiting a structure without an airlock can be adapted to the structure being used.

- f. Carefully remove your contamination-avoidance cover (CAC) or the rain suit while standing just outside the decontaminated area to avoid inner garment contact.

**Performance Steps**

- g. Discard the CAC or the rain suit over the side of the tank onto the ground.
    - (1) Discard the jacket.
    - (2) Discard the trousers.
  - h. Remove the boot covers.
    - (1) Take off the boot covers one at a time.
    - (2) Place the clean boot inside the decontaminated area each time.
    - (3) Discard the boot covers over the side of the tank.
  - i. Decontaminate the gloves with your personal decontaminating kit, discarding the used wipes over the side of the tank.
  - j. Lower yourself into the tank through the loader's hatch.
  - k. Resume operations as if in a contaminated environment.
  - l. Monitor the interior with detection equipment if you are the loader or are directed to do so.
  - m. Remain in MOPP4 until further decontamination is performed or until further tests indicate no hazard if the readings are positive.
  - n. Initiate unmasking procedures if readings are negative and the tank is in the buttoned-up overpressure mode.
8. Exit a tank without an air lock.
- a. Traverse the turret until the main gun is centered over the front slope (any crew member).
  - b. Put on the mask and protective gloves (crew members).
  - c. Put on the CAC or rain suit and the boot covers at the loader's station.
  - d. Exit through the loader's hatch, carrying your personal decontaminating kit.

Note: The loader must be the first to exit.

- e. Carry the decontaminating apparatus.
- f. Close the hatch if you are the last crew member to exit.
- g. Use detection equipment to determine the presence or absence of contamination on the tank and surrounding area if you are the loader.
- h. Initiate unmasking procedures if no contamination is present.
- i. Decontaminate the loader's hatch and an area approximately 4 feet in diameter around it if contamination is present and you are the loader.

**Evaluation Preparation:** Setup: Evaluate this task during a field exercise or during a normal training session. For training and evaluation purposes, use the M58A1 decontamination kit instead of the M258A1. Test the soldier on the type of collective protection shelter appropriate for his mission.

**Brief Soldier:** Tell the soldier that he or she is to enter and exit the appropriate type of collective protection shelter in a chemically contaminated environment while in MOPP level 4 without becoming a casualty, endangering other shelter occupants, or transferring the hazard to yourself or the shelter interior. Test the soldier on the type of shelter he must be familiar with in the field.

**Performance Measures**

	<u>GO</u>	<u>NO GO</u>
1. Prepared to enter the shelter.	—	—
a. Removed personal equipment.		
b. Retained decontaminating kit(s) and waterproof bag.		
c. Decontaminated mask and hood.		
d. Properly removed protective clothing.		
2. Entered a collective protection shelter or van while in MOPP gear without contaminating himself or the shelter.	—	—
a. Ran purge cycle.		
b. Decontaminated gloves and hood.		
c. Placed mask with hood in waterproof bag and sealed it.		
d. Removed gloves.		

<b>Performance Measures</b>	<b><u>GO</u></b>	<b><u>NO GO</u></b>
3. Entered a tank without an air lock without contaminating himself or the tank.	—	—
a. Mounted tank over left front road wheel.		
b. Decontaminated area around loader's hatch.		
c. Removed SCALP.		
d. Decontaminated gloves.		
e. Lowered himself into tank through the loader's hatch.		
f. Continued operations in MOPP4.		
4. Exited a collective protection shelter or van while in MOPP gear without contaminating himself or the shelter.	—	—
a. Put on clean MOPP gear inside shelter.		
b. Ensured air lock was not occupied.		
c. Stopped breathing.		
d. Entered airlock carrying bag that contains mask with hood.		
e. Don mask.		
f. Exited airlock.		
5. Exited a tank without an air lock without contaminating himself or the tank.	—	—
a. Traversed the turret.		
b. Put on mask and protective gloves.		
b. Remove the hood (from back to front) from the helmet, detaching it from around the eye lenses and then from the filter hose.		
NOTE: The loader must be the first one to exit.		
c. Put on the SCALP at the loader's station.		
c. Remove the overgarment jacket and trousers with the mask and helmet (if applicable) still using steps 3 through 8 EXCEPT when removing overgarments, bending at the waist to prevent the filter canister and hose from touching the body as the overgarment is removed.		
d. Exited the tank through the loader's hatch carrying decontaminating kit(s).		
d. Proceed to the air lock or hot line.		
e. Carried the decontaminating apparatus.		
e. Remove the overboots one at a time, placing the exposed boots on the clean side of hot line each time.		
f. Remove the mask, helmet, and gloves before entering the enclosure.		
f. If the soldier was the last one to exit, closed the loader's hatch.		
g. Seal the mask in the M1 or M1A1 bag.		
h. Carry the mask into the shelter.		
6. Exit a shelter or van with an air lock while wearing a special-purpose ensemble without contaminating yourself or the shelter.	—	—
a. Put on clean MOPP gear inside the shelter.		
b. Make sure the air lock is unoccupied.		
c. Stop breathing.		
d. Step into the air lock, carrying the M1 or M1A1 bag.		
e. Don the protective mask.		
f. Exit the air lock.		
7. Enter a tank without an air lock without contaminating yourself or the tank.	—	—
a. Mount the tank over the left front road wheel.		
b. Use detection equipment to determine the presence or absence of contamination on the tank and the surrounding area if you are the loader.		
c. Decontaminate the loader's hatch and an area approximately 4 feet in diameter around it if contamination is present and you are the loader. (Ensure a 30-minute contact time.)		
d. Acquire a water can from the left bustle rack only if you are the loader.		

**Performance Measures**

**GO**    **NO GO**

- e. Flush decontaminant from the loader's hatch and the surrounding area only if you are the loader.
  - f. Carefully remove the CAC or the rain suit while standing just outside the decontaminated area to avoid inner garment contact.
  - g. Discard the suit over the side of the tank onto the ground, removing the jacket first and then the trousers.
  - h. Remove the boot covers.
  - i. Decontaminate the gloves with your personal decontaminating kit, discarding the used wipes over the side of the tank.
  - j. Lower yourself into the tank through the loader's hatch.
  - k. Resume operations as if in a contaminated environment.
  - l. Monitor the interior with detection equipment if you are the loader or are directed to do so.
  - m. Remain in MOPP 4 until further decontamination is performed or until further tests indicate no hazard if the readings are positive.
  - n. Initiate unmasking procedures if readings are negative and the tank is in the buttoned-up overpressure mode.
8. Exit a tank without an air lock without contaminating yourself or the tank.
- a. Traverse the turret until the main gun is centered over the front slope.
  - b. Put on the mask and protective gloves.
  - c. Put on the CAC or the rain suit and the boot covers at the loader's station.
  - d. Exit through the loader's hatch, carrying your personal decontaminating kit.
  - e. Carry the decontaminating apparatus.
  - f. Close the hatch if you are the last crew member to exit.
  - g. Use detection equipment to determine the presence or absence of contamination on the tank and the surrounding area if you are the loader.
  - h. Initiate unmasking procedures if no contamination is present.
  - i. Decontaminate the loader's hatch and an area approximately 4 feet in diameter around it if contamination is present and you are the loader.

**Evaluation Guidance:** Score the soldier GO if all performance measures are passed. Score the soldier NO-GO if any performance measure is failed. If the soldier scores NO-GO, show the soldier what was done wrong and how to do it correctly. Allow the soldier time to retrain and retest.

**References**

**Required**  
FM 3-4

**Related**

**Operate the NBC System on an M2A3/M3A3 BFV  
071-001-0005**

**Conditions:** Given an M2A3/M3A3 BFV with basic issue items and the vehicle master power ON, an operational NBC system, an M42A1 protective mask, and a requirement to operate the NBC system.

**Standards:** Operated the NBC system on an M2A3/M3A3 BFV without causing damage to equipment or injury to personnel.

**Performance Steps**

1. Activate the nuclear biological chemical (NBC) system.
  - a. Remove the combat vehicle crewman (CVC) helmet (Figure 1).

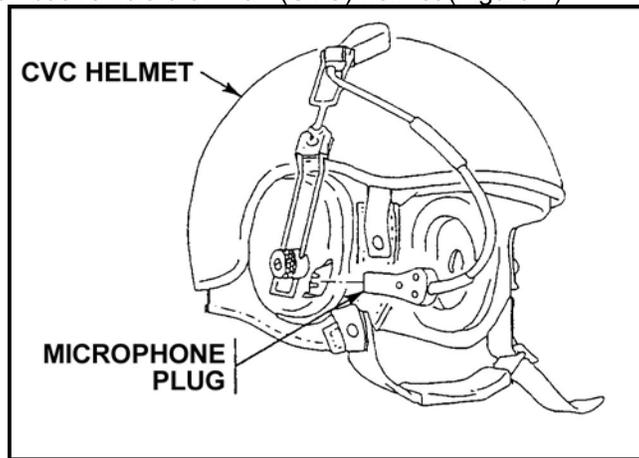


Figure 1. CVC helmet.

- (1) Remove CVC helmet.
  - (2) Remove the microphone plug from the CVC helmet.
- b. Put on protective mask.
  - (1) Put microphone plug from the protective mask into the plug hole on the CVC helmet (Figure 2).

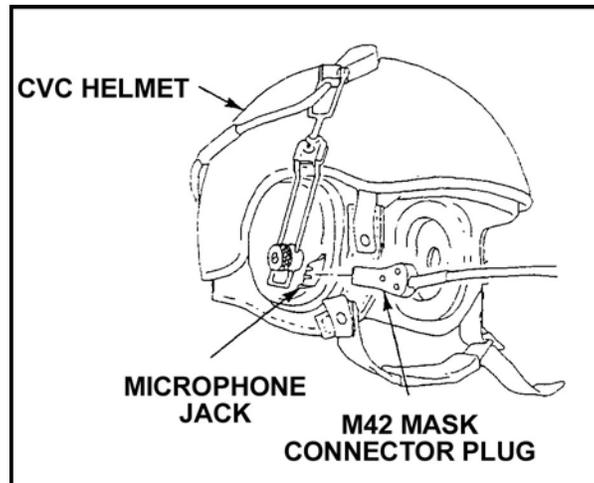


Figure 2. M42 connector.

- (2) Put on CVC helmet.

**Performance Steps**

c. Move master power switch to ON (Figure 3).

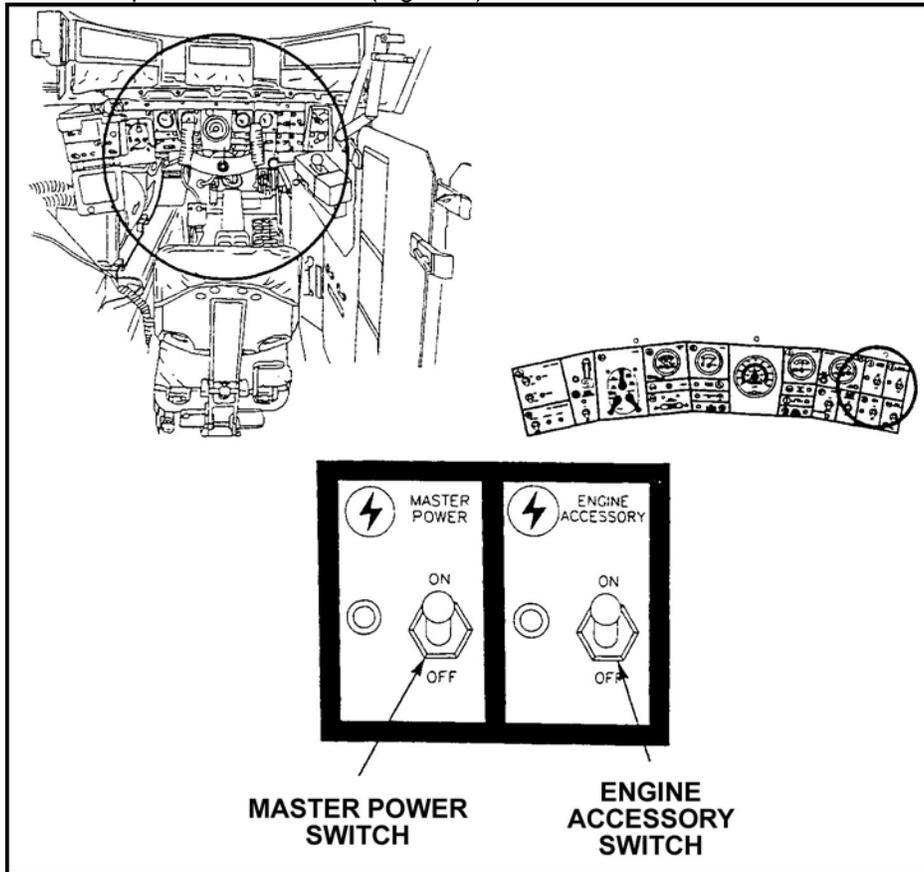


Figure 3. Master power and engine accessory switch.

d. Move engine accessory switch to ON.

e. Move NBC systems switch to ON (Figure 4).

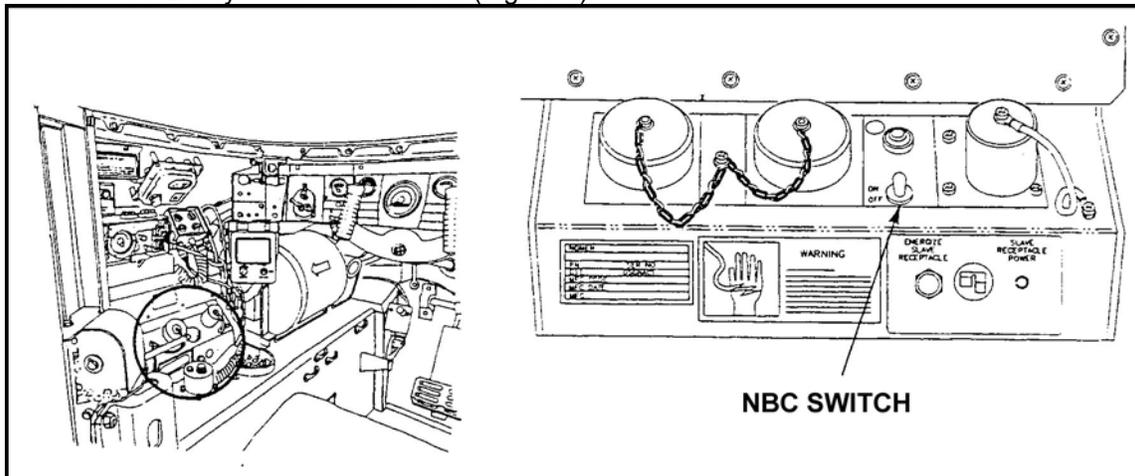


Figure 4. NBC system switch.

**WARNING**

You can get frostbite on your face when you inhale subfreezing air. During cold weather, do not connect air outlet hose to protective mask until air is warm. Hold your hand over air outlet hose and feel if air is warm.

## Performance Steps

NOTE: In an M2A3/M3A3, there are eight outlet hoses in the hull (driver and seven crew members).

- f. Feel air coming out of the air outlet hose (Figure 5).

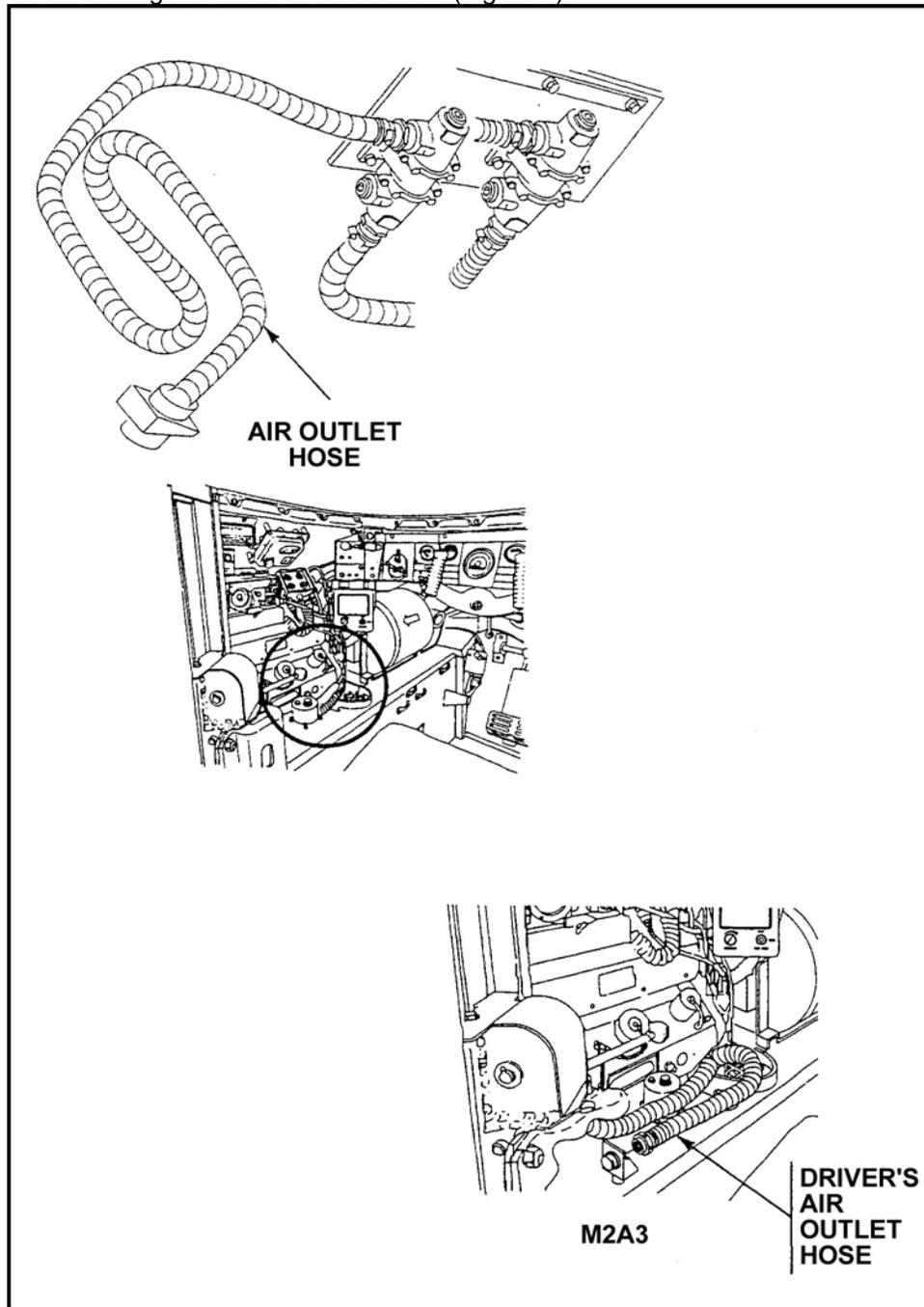


Figure 5. Air outlet hose.

- (1) If the air is too cold to be breathed safely, do step g.
  - (2) If the air coming from the air outlet hose can be breathed safely, go to step h.
- g. Operate the NBC heater system (Figure 6).

**Performance Steps**

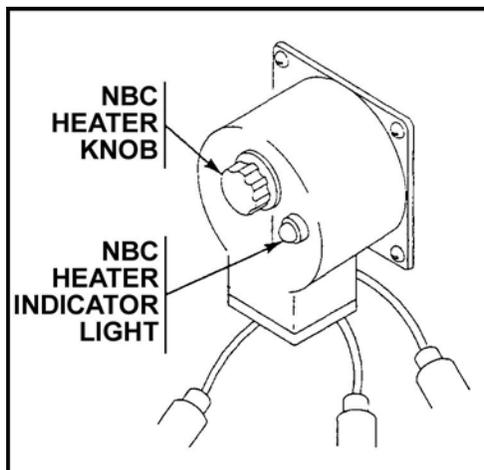


Figure 6. NBC heater switch.

- (1) Turn NBC heater knob to the right until the green NBC heater indicator light comes on.
  - (2) Turn the knob to the right to increase air temperature.
  - (3) Turn off the NBC heater by turning the knob to the left until it stops and the green light goes off.
- h. Install air outlet hose on protective mask (Figure 7).

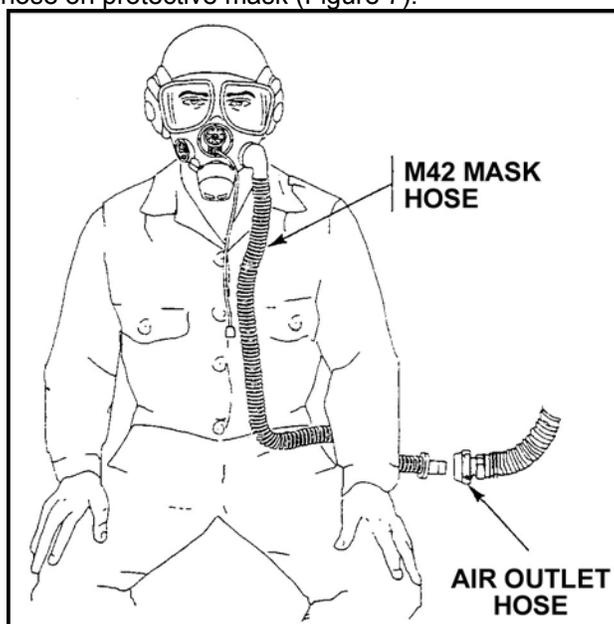


Figure 7. Air outlet hose quick disconnect.

- (1) Remove air outlet hose at quick disconnects on the hull by pulling down on the air outlet hoses.
  - (2) Place the air outlet hose on the connector of the protective mask.
2. Deactivate the NBC system.
- a. Move NBC switch to OFF.
  - b. Move engine accessory switch to OFF.
  - c. Move master power switch to OFF.
  - d. Remove air outlet hose from protective mask.
    - (1) Remove air outlet hose at the connector on the protective mask by pulling out on the air

**Performance Steps**

- outlet hose.
- (2) Place the air outlet hose on the quick disconnect on the hull.
- e. Remove the CVC helmet.
- f. Remove the microphone plug that is connected to the protective mask from the CVC helmet.
- g. Remove the protective mask.
- h. Stow protective mask in carrier.
- i. Put on CVC helmet.
  - (1) Install microphone plug on CVC helmet.
  - (2) Put on CVC helmet.

**Evaluation Preparation:** SETUP: Provide the soldier with an M2A3/M3A3 BFV and an M42A1 protective mask. The vehicle master power is ON.

BRIEF SOLDIER: Tell the soldier that he will be tested on his ability to operate the NBC system without causing damage to the equipment or injury to personnel.

**Performance Measures**

	<u>GO</u>	<u>NO GO</u>
1. Activated the NBC system.	—	—
2. Deactivated the NBC system.	—	—

**Evaluation Guidance:** Score the soldier GO if all performance measures are passed. Score the soldier NO-GO if any performance measure is failed. If the soldier scores NO-GO, show the soldier what was done wrong and how to do it correctly.

**References  
Required**

**Related**  
TM 9-2350-294-10-1

## Operate the NBC System on an M2A1 or an M3A1 BFV

071-324-6026

**Conditions:** Given an M2A1/A2 or M3A1/A2/A3 BFV with an NBC system installed, an M25A1 protective mask, a CVC helmet, and an order to mask and activate the NBC system.

**Standards:** 1. Donned the mask and made the NBC system operational without causing damage to the system components or injury to personnel.

2. Upon the "ALL CLEAR" signal, restored the NBC system to a non-operational status and the protective mask to its original storage configuration.

### Performance Steps

NOTE: When operating the NBC system, the only difference in task requirement between the driver and other crew members is that only the driver can turn the system on and off.

1. Upon receiving the signal "GAS," put on the M25A1 protective mask.
  - a. Remove the CVC helmet.
  - b. Put on the mask and secure the hood.
  - c. Disconnect the microphone plug from the CVC and connect the mask microphone to the microphone jack on the CVC (Figure 1).

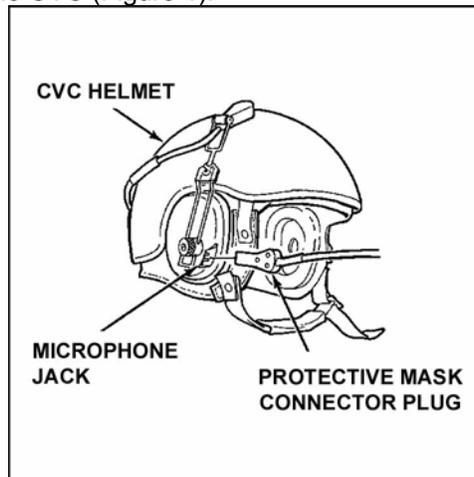


Figure 1. Attach mask microphone plug.

2. The driver activates the NBC system (Figure 2).

NOTE: The NBC system will not work until the spring clip is removed from the air intake holes.

- a. Uncover the air intake holes on the precleaner by sliding the spring clip to either side.

**Performance Steps**

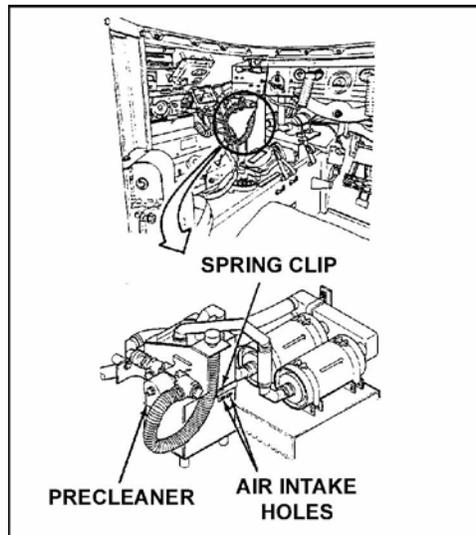


Figure 2. NBC system.

- b. Ensure the master power and engine accessory switches are in the ON position.
- c. Move the NBC system switch to the ON position (Figure 3).

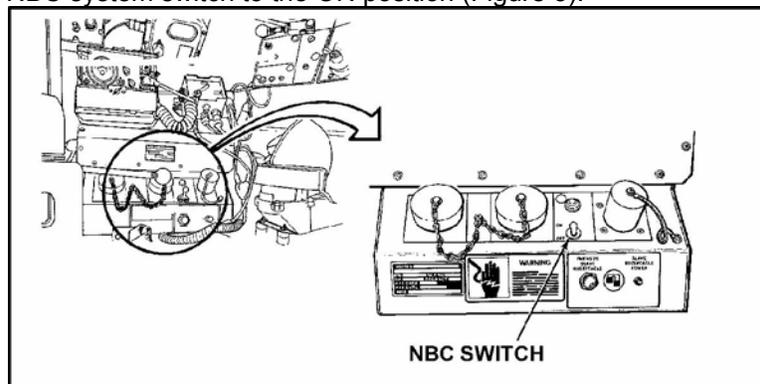


Figure 3. NBC system switch.

- 3. Check the air outlet and NBC heater (Figure 4).

**Performance Steps**

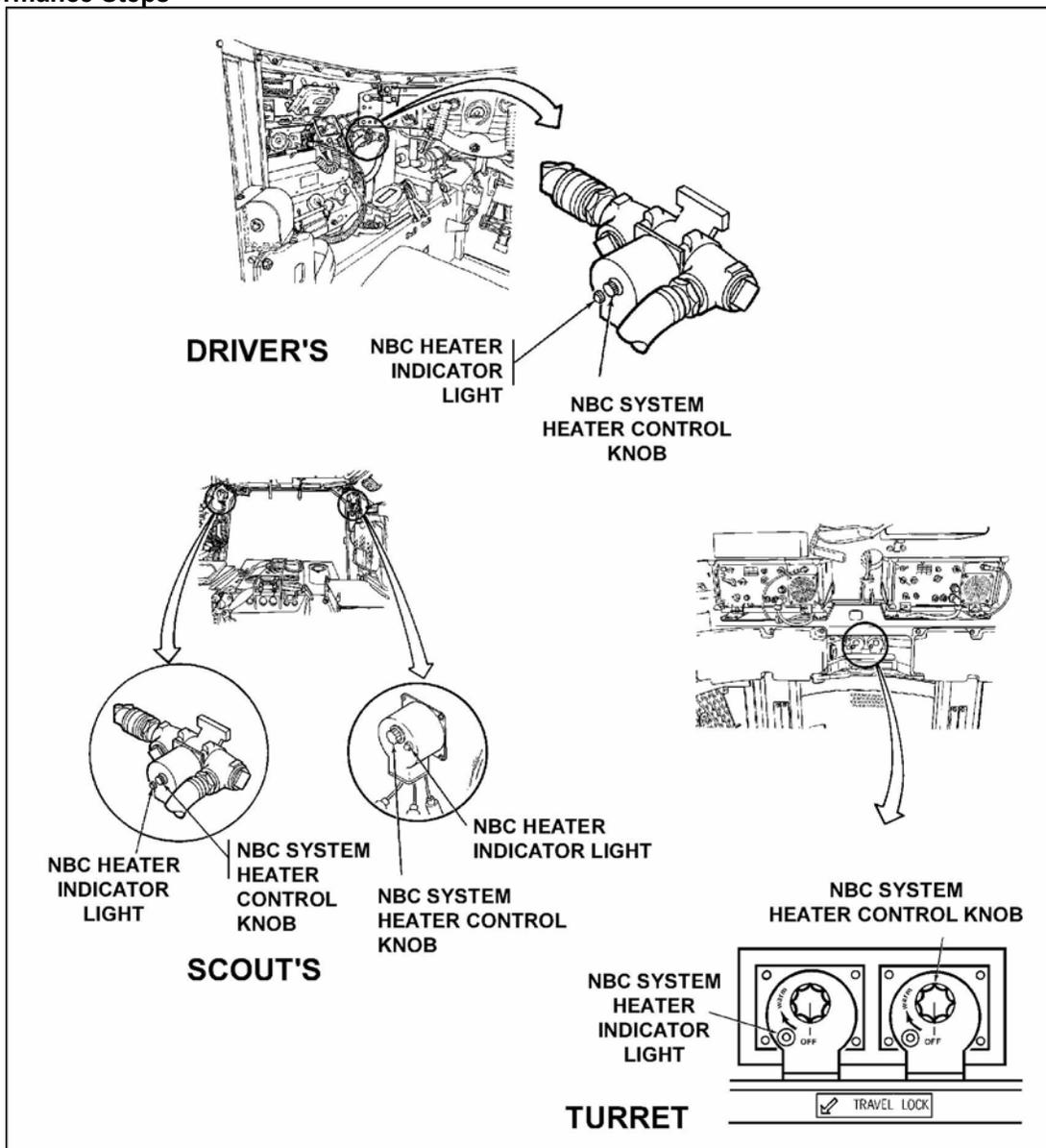


Figure 4. NBC heater.

NOTE: The M2A1 has only one NBC heater in the hull (driver's). The M3A1 has three NBC heaters in the hull (driver's and two scouts'). Both types of vehicles have two NBC heaters in the turret (gunner's and Bradley commander's).

- a. Remove the air outlet hose from the quick disconnect. Check the temperature of the air by holding a hand over the air outlet hose.

**WARNING**

During cold weather, do not connect the air outlet hose to the mask until the air is warm; otherwise, the face can be frostbitten.

- b. If the air is too cold to breathe safely, turn the NBC heater on by turning the heater knob to the right (clockwise) until the green NBC heater indicator light comes on.
- c. To increase the air temperature, turn the NBC heater knob to the right (clockwise). Connect the air outlet hose to the mask carrier.
- d. When the NBC heater is no longer needed, turn the control knob to the left (counterclockwise) to the OFF position.

**Performance Steps**

4. The driver deactivates the NBC system on the command signal "ALL CLEAR."
  - a. Move the NBC system switch to the OFF position.
  - b. Move the master power and engine accessory switches to the OFF position (if required).
  - c. Slide the spring clip over the air intake holes on the NBC system precleaner.
5. Unmask and turn the NBC heater off.
  - a. Remove air outlet hose from the mask carrier and return it to the quick disconnect. Turn the NBC heater off.
  - b. Remove and store the M25A1 protective mask.
  - c. Restore communications and inform the chain of command of the equipment status.

**Evaluation Preparation:** SETUP: Provide the soldier with all the equipment as outlined in the task condition statement. If the soldiers are tested individually in a position other than driver, a driver must be provided to activate the NBC system.

BRIEF SOLDIER: Tell the soldier he will be given the signals "GAS" and "ALL CLEAR." At these signals, each soldier will perform the appropriate actions.

**Performance Measures**

	<u>GO</u>	<u>NO GO</u>
1. Masked and connected the mask microphone to the CVC.	_____	_____
2. Driver activated NBC system.	_____	_____
3. Turned on and adjusted the NBC heater and attached the air outlet hose to the mask.	_____	_____
4. Driver deactivated NBC system.	_____	_____
5. Unmasked and turned off the NBC heater.	_____	_____

**Evaluation Guidance:** Score the soldier GO if all performance measures are passed. Score the soldier NO-GO if any performance measure is failed. If the soldier scores NO-GO, show the soldier what was done wrong and how to do it correctly.

**References**

**Required**

**Related**

- TM 9-2350-252-10-1
- TM 9-2350-252-10-2

Subject Area 26: VEHICLES

**Tow a Tracked Vehicle**

**071-200-0002**

**Conditions:** In a field or garrison environment given two tracked vehicles with basic issue items (BII)(one operational vehicle with driver and vehicle commander, and one non-operational vehicle with vehicle commander), tow bar, helper as required, and a requirement to tow the vehicle.

**Standards:** A non-operational tracked vehicle was connected to an operational vehicle and towed to a designated point without causing damage to equipment or injury to personnel.

**Performance Steps**

**WARNING**

Always use a tow bar when the universal joints on a disabled vehicle are disconnected for the purpose of towing.

**CAUTION**

The transmission and/or differential on an M113-series vehicle may be damaged if the vehicle is towed faster than 10 miles per hour or for a distance of more than 30 miles.

**WARNING**

A tow bar must be used if the M113-series vehicle is to be towed more than 30 miles because the towed vehicle will not have brakes when the drive shafts are disconnected.

**WARNING**

Block the vehicle to be towed to prevent it from rolling.

1. Prepare a vehicle for towing with a tow bar.
  - a. Confirm through discussion with the supervisor the method by which the disabled vehicle will be towed and the equipment required.
  - b. Align the rear of the towing vehicle with the front or rear of the disabled vehicle.
  - c. Remove the pins and shackles from two towing eyes on disabled vehicle.
  - d. Install the tow bar on front of the disabled vehicle.
  - e. Install the tow bar on the towing pintle of the towing vehicle.

**WARNING**

When towing an M113-series vehicle with tow cables, do not disconnect the disabled vehicle's drive shafts between the differential and the final drives. Also, do not use tow cables to tow an M113-series vehicle more than 30 miles or faster than 10 miles per hour.

2. Prepare a vehicle for towing with tow cables.
  - a. Identify the equipment required for towing a vehicle with tow cables.
  - b. Align the rear of towing vehicle with front or rear of the disabled vehicle.
  - c. Cross cables in an X to prevent them from entangling and to maintain alignment between vehicles.
  - d. Connect the towing cables to the front towing hooks on the disabled vehicle.
  - e. Connect the towing cables to the rear tow hook/eyes on the towing vehicle.

**NOTE:** For towing vehicles backward, attach cables to the rear towing eye hooks of the disabled vehicle. Except in an emergency, do not exceed 5 miles per hour while towing a vehicle backward.

**WARNING**

Ensure that all hatches are closed before attempting to tow the disabled vehicle.

**WARNING**

All personnel outside the vehicle should stand well away from tow cables when a tracked vehicle is being

**Performance Steps**

towed. If a cable breaks, soldiers could be injured or killed.

3. Tow the disabled vehicle to a designated location.

NOTE: Towing speed for a BFV should not exceed 15 miles per hour (25 kilometers per hour). Reverse towing should not exceed 5 miles per hour (8 kilometers per hour). When towing an M113-series vehicle in excess of 10 miles per hour or farther than 30 miles, the left and right drive shafts between the differential and the final drive must be disconnected (normally done by organizational maintenance personnel).

- a. Ensure that the towed vehicle's hand brake is in the OFF position and the range selector on the BFV in the TOW position.
- b. If the vehicle to be towed is an M113-series vehicle, ensure that the range selector is in the N (neutral) position.
- c. Position gun tubes and or barrels on the side opposite tow cables or tow bar before moving the vehicles.

**CAUTION**

When towing downhill, do so slowly; brakes could overheat and become damaged.

- d. When using tow cables, tighten the slack in tow cables by moving the vehicles apart slowly before starting the towing operation.
- e. After moving the vehicle a short distance, stop the vehicle's movement if the situation permits, and do the following:
  - (1) Check the rigging to ensure that all locking pins are properly installed on the towing shackles, tow hooks, tow bar, cables, and the towing pintle.
  - (2) Check the cables to ensure that they are not kinked or in danger of breaking.
- f. Tow the disabled vehicle to a predesignated point following the guidance of the vehicle commander and in accordance with established towing speed limits and SOPs.
- g. When accelerating, do so gradually.
- h. Make slow, wide turns when turning.

4. Upon reaching the designated location, bring both vehicles slowly to a halt and remove the tow bar or cables from both vehicles.

5. Return all equipment to its original configuration.

**Evaluation Preparation:** SETUP: At the test site provide all material and equipment according to task conditions statement.

BRIEF SOLDIER: Tell the soldier to connect a non-operational vehicle to an operational vehicle and tow it to a designated point without causing damage to equipment or injury to personnel.

**Performance Measures**

	<u>GO</u>	<u>NO GO</u>
1. Prepared a vehicle for towing with a tow bar.	___	___
2. Prepared a vehicle for towing with tow cables.	___	___
3. Towed the disabled vehicle to a designated location.	___	___
4. Upon reaching the designated location, brought both vehicles slowly to a halt and removed the tow bar or cables from both vehicles.	___	___
5. Returned all equipment to its original configuration.	___	___

**Evaluation Guidance:** Score the soldier GO if all performance measures are passed. Score the soldier NO-GO if any performance measure is failed. If the soldier scores NO-GO, show the soldier what was done wrong and how to do it correctly.

STP 7-11B1-SM-TG

**References  
Required**

**Related**  
FM 9-43-2  
TM 9-2350-252-10-1  
TM 9-2350-261-10

**Maintain the Hull on a BFV**  
**071-216-0007**

**Conditions:** Given a parked BFV with the master power OFF, basic issue items, DA Form 2404, TM 9-2350-252-10-1, LO 9-2350-252-12, lubricants, and helpers as required.

**Standards:** Performed the required maintenance on the hull of the BFV using the procedures described in TM 9-2350-252-10-1. Lubricated the hull in accordance with procedures described in LO 9-2350-252-12. Recorded all uncorrected deficiencies on DA Form 2404 in accordance with DA Pam 738-750, and reported them to the chain of command.

**Performance Steps**

1. Inspect the hull of the BFV IAW procedures described in the TM.
  - a. Check for loose, broken, bent, or missing bolts, nuts, screws, and parts.
  - b. Be alert for loose or chipped paint, rust, cracks, or gaps where parts are welded together.
  - c. Check electrical wires and connectors for cracked or broken insulation and bare wires.
  - d. Check hoses and fluid lines for wear, damage, and leaks. Ensure that the clamps and fittings are tight. The various classes of fluid leaks are:
    - (1) Class 1. Seepage of fluid is not great enough to form drops, but is shown by wetness or color changes.
    - (2) Class 2. Leakage of fluids is great enough to form drops, but drops do not drip from the item being checked.
    - (3) Class 3. Leakage of fluid is great enough to form drops that fall from the item being checked.

NOTE: The BFV can be operated with minor leaks (class 1 or 2). Constantly check how much fluid each item or system can hold.

2. Apply maintenance procedures on the hull as described in the TM and LO.
3. Correct operator-level shortcomings and deficiencies within the scope of the operator's capabilities.
4. Record all uncorrected shortcomings and deficiencies on DA Form 2404 in accordance with the procedures described in DA Pam 738-750.
5. Report all uncorrected shortcomings and deficiencies to the chain of command.
  - a. Maintain the fire suppression system:
    - (1) Inspect all components on the fire suppression system for serviceability and cleanliness in accordance with procedures prescribed in the TM.
    - (2) Correct all faults within the scope of the operator's realm of responsibility and authority.
    - (3) Record any uncorrected faults on DA Form 2404.
    - (4) Report uncorrected faults to the chain of command.
  - b. Maintain the NBC system:

NOTE: If the NBC system has been immersed in water, the filters must be replaced and the chain of command notified.

- (1) Inspect the NBC system following the schedules and procedures prescribed in the TM.
- (2) Correct identified faults within the scope of the operator's capabilities.
- (3) Record uncorrected faults on DA Form 2404.
- (4) Report uncorrected faults to the chain of command.
- c. Maintain the exhaust system:
  - (1) Inspect the vehicle's exhaust system (including the heater's exhaust system) following procedures prescribed in the TM.
  - (2) Correct identified faults determined to be within the operator's realm of responsibility following procedures prescribed in the TM.
  - (3) Record all uncorrected faults DA Form 2404.
  - (4) Report all uncorrected faults to the chain of command.
- d. Maintain the fuel system:

### Performance Steps

- (1) Inspect the fuel system following procedures prescribed in the TM.
  - (2) Correct identified faults in accordance with the operator's responsibility following procedures prescribed in the TM.
  - (3) Record all uncorrected faults on DA Form 2404.
  - (4) Report uncorrected faults to the chain of command.
- e. Maintain the cooling system:
- (1) Inspect the coolant system following procedures prescribed the TM.
  - (2) Correct identified faults within the operator's area of responsibility.
  - (3) Record any uncorrected faults on DA Form 2404.
  - (4) Report any uncorrected faults to the chain of command.
- f. Maintain the personnel heater:
- (1) Inspect the heater system following procedures prescribed in the TM.
  - (2) Correct identified faults within the scope of the operator's responsibility and authority.
  - (3) Record all uncorrected faults on DA Form 2404.
  - (4) Report all uncorrected faults to the chain of command.
- g. Maintain the hydraulic system:
- (1) Inspect the hydraulic system following procedures prescribed in the TM.
  - (2) Correct identified faults found on the hydraulic system within the scope of the operator's responsibility and authority.
  - (3) Record uncorrected faults on DA Form 2404.
  - (4) Report all uncorrected faults to the chain of command.
- h. Maintain the engine:
- (1) Inspect the engine for faults using the criteria prescribed in the TM.
  - (2) Correct faults in the engine within the area of responsibility of the operator.
  - (3) Record any uncorrected faults on DA Form 2404.
  - (4) Report any uncorrected faults to the chain of command.
- i. Maintain the bilge system:
- (1) Inspect the bilge system for serviceability and cleanliness in accordance with procedures prescribed in the TM.
  - (2) Correct faults within the scope of the operator's responsibility and authority.
  - (3) Record any uncorrected faults on DA Form 2404.
  - (4) Report any uncorrected faults to the chain of command.
- j. Extinguish a fire on a BFV:

NOTE: The fire extinguisher system on the BFV consists of fixed and portable fire extinguishers.

### WARNING

These fire extinguishers are filled with Halon gas, which is heavy, odorless, and becomes toxic when exposed to flames. After the fire extinguishers are discharged, get all personnel out of the vehicle as soon as possible. If the squad cannot get out of the vehicle, get as much fresh air into the vehicle as possible.

- (1) Fixed fire extinguishers:
  - (a) Outfit with independent discharge nozzles.
  - (b) One in the engine compartment.
  - (c) Two in the troop compartment.
  - (d) Fire extinguisher in the engine compartment will only operate in the manual mode.
  - (e) Fire extinguisher in the troop compartment will operate in the manual or automatic mode.
  - (f) Automatic mode causes the sensors in the troop compartment to react to heat and light, which will automatically activate the fire extinguishers when fire is present.

NOTE: For training purposes, the mode switch is placed in the manual position when soldiers are in the vehicle. When the BFV is unoccupied or in combat, the switch is placed in the automatic position.

- (g) Manual mode prevents the sensors in the troop compartment from reacting to heat and light.
  - (h) Fire extinguishers are discharged by pulling the "T" type handles--one inside the vehicle and the other outside the cargo hatch to the rear of the fuel filler cap.
- (2) Portable fire extinguisher:

**Performance Steps**

- (a) The portable fire extinguisher is used as a backup for the fixed system when an inside fire is not completely extinguished or for a fire outside the BFV.
- (b) To operate the fire extinguisher, remove it from the bracket, pull the safety pin from the top of the squeeze handle, point the discharge nozzle at the base of the flame, squeeze the handle, and evacuate the crew.
- (3) Extinguish a fire in the engine compartment.
  - (a) The Bradley commander alerts the soldiers of an engine compartment fire by the intercommunications system or by voice command. If the intercommunications system does not work, he shouts "Fire! Engine Compartment" and rotates the turret to 6400 mils.

**WARNING**

Failure to place the turret at 6400 mils may prevent the cargo hatch from fully opening. If the ramp or ramp access door fails, soldier(s) could be trapped inside the troop compartment.

- (b) Turn the turret power switch to OFF. Evacuate the vehicle through the BC's hatch.
- (c) The driver stops the vehicle, shuts down the engine by pulling out the fuel control handle, discharges the Halon bottle by rotating the release valve inside the driver's compartment (if it has not been automatically discharged), lowers the ramp, turns the master power switch OFF, disconnects the CVC helmet and unfastens the seat belt, secures his weapon, and evacuates the vehicle through the driver's hatch, if possible. (He uses the ramp if driver's hatch cannot be used for evacuation).
- (d) The fire team members disconnect seat belts; the squad leader of fire team leader pulls and quickly disconnects to release the CVC helmets or headsets; the fire team members secure their weapons; the fire team members in Nos. 5 and 9 seats secure the rear portable fire extinguishers; and the fire team evacuates the vehicle through the ramp.
- (e) The gunner evacuates the vehicle through the gunner's hatch.

NOTE: If fire is not extinguished, the portable fire extinguishers must be used.

k. Maintain the smoke generating system:

- (1) Turn the turret drive system OFF, and engage the turret travel lock.
- (2) Inspect and clean the smoke grenade stowage bins and launcher tubes in accordance with the TM.

l. Maintain the electrical system:

- (1) Inspect the BFV's electrical system using criteria prescribed in the TM.
- (2) Correct all identified faults within the operator's area of responsibility.
- (3) Record any uncorrected faults on DA Form 2404.
- (4) Report any uncorrected faults to the chain of command.

m. Maintain the track and suspension system:

- (1) Inspect the track and suspension system following the procedures described in the TM.
- (2) Correct all operator deficiencies.
- (3) Lubricate the track and suspension system as outlined the in LO.

**WARNING**

Be aware of safety precautions when moving in or around the vehicle.

- (4) Record all uncorrected deficiencies on DA Form 2404.
- (5) Report all uncorrected deficiencies and the vehicle status to the chain of command.

**Evaluation Preparation:** SETUP: Provide the soldier with all the material and equipment needed as outlined in the task condition statement.

BRIEF SOLDIER: Tell the soldier to perform before-, during-, and after-operation checks on the hull in accordance with the procedures described in TM 9-2350-252-10-1, and annotate all uncorrectable faults on DA Form 2404 in accordance with DA Pam 738-750.

**Performance Measures**

- 1. Performed before-operation checks.

<u>GO</u>	<u>NO GO</u>
—	—

**Performance Measures**

**GO**      **NO GO**

- |                                       |   |   |
|---------------------------------------|---|---|
| 2. Performed during-operation checks. | — | — |
| 3. Performed after-operation checks.  | — | — |
- a. Maintained the fire suppression system:
    - (1) Inspected all components.
    - (2) Recorded any uncorrected faults on DA Form 2404.
  - b. Maintained the NBC system:
    - (1) Inspected the NBC system
    - (2) Recorded all uncorrected faults on DA Form 2404.
  - c. Maintained the exhaust system:
    - (1) Inspected the vehicle exhaust system.
    - (2) Recorded all uncorrected faults on DA Form 2404 and reported to the chain of command.
  - d. Maintained the fuel system:
    - (1) Inspected the fuel system.
    - (2) Recorded all uncorrected faults on DA Form 2404 and reported to the chain of command.
  - e. Maintained the cooling system:
    - (1) Inspected the cooling system.
    - (2) Reported any uncorrected faults on DA Form 2404 and reported to the chain of command.
  - f. Maintained the personnel heater:
    - (1) Inspected the heater system.
    - (2) Recorded all uncorrected faults on DA Form 2404 and reported to the chain of command.
  - g. Maintained the hydraulic system:
    - (1) Inspected the hydraulic system.
    - (2) Recorded uncorrected faults on DA Form 2404.
  - h. Maintained the engine:
    - (1) Inspected the engine for faults.
    - (2) Recorded any uncorrected faults on DA Form 2404 and reported to the chain of command.
  - i. Maintained the bilge system:
    - (1) Inspected the bilge system for faults.
    - (2) Recorded any uncorrected faults on DA Form 2404 and reported to the chain of command.
  - j. Extinguished a fire on a BFV:
    - (1) Alerted other squad members.
    - (2) Stopped the vehicle and turned engine OFF.
    - (3) Activated the fire extinguishers.
    - (4) Evacuated the vehicle immediately.
    - (5) (BC) Accounted for all soldiers and individual weapons, and medically treated individuals, as required.
    - (6) (BC) Checked the vehicle, ensured the fire was extinguished. Used the portable fire extinguishers, as required.
    - (7) Notified the chain of command (by any means available) of the situation and the status of the vehicle.
  - k. Maintained the smoke generating system:
    - (1) Located and operated the smoke generating system switch on the BFV.
    - (2) Operated the driver's controls on the BFV.
    - (3) Started and shut down the engine on a BFV.
    - (4) Turned on the smoke generator switch.
    - (5) Turned off smoke generator and shut down vehicle.
  - l. Maintained the electrical system:

**Performance Measures****GO**    **NO GO**

- (1) Inspected the BFV's electrical system using TM 9-2350-252-10-1.
- (2) Corrected all identified faults within the operator's area of responsibility.
- (3) Recorded any uncorrected faults on DA Form 2404.
- m. Maintained the track and suspension system:
  - (1) Inspected the track suspension system IAW TM 9-2350-252-10-1.
  - (2) Corrected all operator deficiencies.
  - (3) Lubricated the track and suspension system IAW LO 9-2350-252-12.
  - (4) Recorded and reported all uncorrected deficiencies.

**Evaluation Guidance:** Score the soldier GO if all performance measures are passed. Score the soldier NO-GO if any performance measure is failed. If the soldier scores NO-GO, show the soldier what was done wrong and how to do it correctly.

**References****Required**

DA FORM 2404  
 LO 9-2350-252-12  
 TM 9-2350-252-10-1

**Related**

DA PAM 738-750

**Maintain the Hull on an M2A3/M3A3 BFV**  
**071-216-0023**

**Conditions:** Given a parked M2A3/M3A3 BFV with the master power OFF, basic issue items, DA Form 2404, TM 9-2350-294-10-1, LO 9-2350-252-12, lubricants, and helpers as required.

**Standards:** Performed the required maintenance on the hull of the M2A3/M3A3 BFV using the procedures described in TM 9-2350-294-10-1. Lubricated the hull in accordance with procedures described in LO 9-2350-252-12. Recorded all uncorrected deficiencies on DA Form 2404 in accordance with DA Pam 738-750, and reported them to the chain of command.

**Performance Steps**

1. Inspect the hull of the M2A3/M3A3 BFV IAW procedures described in TM 9-2350-294-10-1.
  - a. Check for loose, broken, bent, or missing bolts, nuts, screws, and parts.
  - b. Be alert for loose or chipped paint, rust, cracks, or gaps where parts are welded together.
  - c. Check electrical wires and connectors for cracked or broken insulation and bare wires.
  - d. Check hoses and fluid lines for wear, damage, and leaks. Ensure that the clamps and fittings are tight. The various classes of fluid leaks are:
    - (1) Class 1. Seepage of fluid is not great enough to form drops, but is shown by wetness or color changes.
    - (2) Class 2. Leakage of fluids is great enough to form drops, but drops do not drip from the item being checked.
    - (3) Class 3. Leakage of fluid is great enough to form drops that fall from the item being checked.

NOTE: The BFV can be operated with minor leaks (class 1 or 2). How much fluid each item or system being checked can hold must be considered and checked continuously.

2. Apply maintenance procedures on the hull as described in TM 9-2350-294-10-1 and LO 9-2350-252-12.
3. Correct operator-level shortcomings and deficiencies within the scope of the operator's capabilities.
4. Record all uncorrected shortcomings and deficiencies on DA Form 2404 in accordance with the procedures described in DA Pam 738-750.
5. Report all uncorrected shortcomings and deficiencies to the chain of command.

**Evaluation Preparation:** SETUP: Provide the soldier with all the material and equipment needed as outlined in the task condition statement.

BRIEF SOLDIER: Tell the soldier to perform before-, during-, and after-operation checks on the hull in accordance with the procedures described in TM 9-2350-294-10-1, and annotate all uncorrectable faults on DA Form 2404 in accordance with DA Pam 738-750.

<b>Performance Measures</b>	<b><u>GO</u></b>	<b><u>NO GO</u></b>
1. Inspected the hull of the M2A3 BFV IAW TM 9-2350-294-10-1.	—	—
2. Applied maintenance procedures on the hull as described in TM 9-2350-294-10-1 and LO 9-2350-252-12.	—	—
3. Corrected operator-level shortcomings and deficiencies within the scope of the operator's capabilities.	—	—
4. Recorded all uncorrected shortcomings and deficiencies on DA Form 2404 IAW the procedures described in DA Pam 738-750.	—	—

**Performance Measures****GO**    **NO GO**

5. Reported all uncorrected shortcomings and deficiencies to the chain of command.    \_\_\_\_\_

**Evaluation Guidance:** Score the soldier GO if all performance measures are passed. Score the soldier NO-GO if any performance measure is failed. If the soldier scores NO-GO, show the soldier what was done wrong and how to do it correctly.

**References****Required**

DA FORM 2404

LO 9-2350-252-12

TM 9-2350-294-10-1

**Related**

DA PAM 738-750

**Maintain the Track and Suspension System on an M2A3/M3A3 BFV  
071-216-0024**

**Conditions:** Given a parked M2A3/M3A3 BFV with basic issue items, DA Form 2404, TM 9-2350-294-10-1, LO 9-2350-252-12, lubricants as prescribed in the LO, spare track shoes or pads, and helpers as required.

**Standards:** Performed the required maintenance and replaced track shoes or pads IAW with the procedures described in TM 9-2350-294-10-1 and LO 9-2350-252-12 without causing damage to equipment or injury to personnel. Recorded and reported all uncorrectable faults.

**Performance Steps**

**NOTE:** In a combat environment, several squad members are involved in the maintenance process. However, one squad member with a helper can perform this task.

1. Inspect track and suspension system following the procedures described in TM 9-2350-294-10-1.
2. Correct all operator-level deficiencies.
3. Lubricate the track and suspension system as outlined in LO 9-2350-252-12.

**WARNING**

Be aware of safety precautions when moving in or around the vehicle.

4. Record all uncorrected deficiencies on DA Form 2404 IAW the procedures described in DA Pam 738-750.
5. Report all uncorrected deficiencies and the vehicle status to the chain of command.

**Evaluation Preparation:** SETUP: Provide the soldier with all the material and equipment as outlined in the task condition statement.

**BRIEF SOLDIER:** Tell the soldier to perform scheduled or other required maintenance on the track and suspension system on the BFV in accordance with TM 9-2350-294-10-1 and LO 9-2350-252-12.

**Performance Measures**

	<u>GO</u>	<u>NO GO</u>
1. Inspected the track and suspension system IAW TM 9-2350-294-10-1.	—	—
2. Corrected all operator-level deficiencies.	—	—
3. Lubricated the track and suspension system IAW LO 9-2350-294-12.	—	—
4. Recorded all uncorrected deficiencies on a DA Form 2404.	—	—
5. Reported all uncorrected deficiencies to the chain of command.	—	—

**Evaluation Guidance:** Score the soldier GO if all performance measures are passed. Score the soldier NO-GO if any performance measure is failed. If the soldier scores NO-GO, show the soldier what was done wrong and how to do it correctly.

**References**

**Required**

DA FORM 2404  
LO 9-2350-252-12  
TM 9-2350-294-10-1

**Related**

DA PAM 738-750

**Prepare a Range Card for a BFV**

**071-324-2003**

**Conditions:** Given a BFV during daylight hours, a stationary firing position, a sector of fire, a pencil or pen, DA Form 5517-R (Standard Range Card), a lensatic compass, and binoculars.

**Standards:** Prepared a range card that included a sketch section, a data section, sectors of fire, and military symbols.

**Performance Steps**

1. Prepare a range card for each primary, alternate, and supplementary position designated in the defense as described in FM 7-7J and FM 23-1 (Figure 1).

Performance Steps

### STANDARD RANGE CARD

For use of this form see FM 7-8. The proponent agency is TRADOC.

SQD / ST PLT <u>3<sup>RD</sup></u> CO <u>B</u>		 MAGNETIC NORTH
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DATA SECTION				
POSITION IDENTIFICATION <b>PRIMARY</b>		DATE <b>1 JULY 85 / 0835</b>		
WEAPON <b>BRADLEY B-31</b>		EACH CIRCLE EQUALS <b>500</b> METERS		
NO.	DIRECTION/ DEFLECTION	ELEVATION	RANGE/AMMO	DESCRIPTION
1	5970m/5420m			LEFT LIMIT/WINDMILL
2	1610m/0920m			RIGHT LIMIT/ORCHARD
3	5440m	-10	AP	TRP/ 1/WELCH ROAD
4	5830m	+5	HE	TRP/ 2/RJ 501
5	0220m	-3	AP	TRP/ 3/NELSON ROAD
6	0240m	+2	HE	TRP/ 4/RJ 478
REMARKS: <b>WPNS REF POINT-FROM RJ 460; MAZ 298° 500M</b>				

DA FORM 5517-R, FEB 86

Figure 1. Preparing a range card.

2. Indicate the firing position by weapon symbol.
3. Indicate the location by distance and azimuth from a known point (eight-digit grid).

**Performance Steps**

4. Indicate the sector of fire.
  - a. Left and right limits.
  - b. Maximum engagement lines.
  - c. Ranges and azimuth to target engagement areas and target reference points.
  - d. Dead space.
5. Indicate magnetic north.
6. Complete the identification data.
  - a. Unit designation.
  - b. Date and time of preparation.
  - c. Firing position designation (primary, alternate, or supplementary).
  - d. Weapon number.
  - e. Distance between circles.
7. Stake the position.

**Evaluation Preparation:** SETUP: Provide the soldier all the equipment needed to prepare a range card (DA Form 5517-R): pencil, paper, a stationary firing position, sector of fire, and target reference points designated by the Bradley commander.

BRIEF SOLDIER: Tell the soldier to prepare a range card that includes, as a minimum, the following information:

1. The symbol for the BFV covering the sector.
2. The azimuth (degrees) and distance (meters) of the firing position from an easily recognizable terrain feature or an eight-digit grid.
3. The left and right limits of the area assigned to be covered by observation and fire.
4. Areas where targets are likely to appear (engagement areas) and the range, azimuth, and elevation to them from the firing position.
5. Dead space (areas that cannot be observed or covered by fire).
6. The direction of magnetic north when the range card is oriented.
7. Identification data.
  - Unit designation (no higher than company/troop).
  - Date and time of preparation.
  - Firing position (primary, alternate, or supplementary).
  - Weapon number.
  - Distance between circles.
8. Stake the BFV position.

**Performance Measures**

	<u>GO</u>	<u>NO GO</u>
1. Indicated firing position by weapon symbol.	—	—
2. Indicated location by distance and azimuth from a known point (eight-digit grid).	—	—
3. Indicated sector of fire. <ol style="list-style-type: none"> <li>a. Left and right limits.</li> <li>b. Maximum engagement lines.</li> <li>c. Ranges and azimuth to target engagement areas and target reference points.</li> <li>d. Dead space.</li> </ol>	—	—
4. Indicated magnetic north.	—	—
5. Completed identification data. <ol style="list-style-type: none"> <li>a. Unit designation.</li> <li>b. Date and time of preparation.</li> </ol>	—	—

**Performance Measures**

**GO**    **NO GO**

- c. Firing position designation (primary, alternate, or supplementary).
- d. Weapon number.
- e. Distance between circles.

6. Staked the position.

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**Evaluation Guidance:** Score the soldier GO if all performance measures are passed. Score the soldier NO-GO if any performance measure is failed. If the soldier scores NO-GO, show the soldier what was done wrong and how to do it correctly.

**References**

**Required**  
DA FORM 5517-R

**Related**  
FM 23-1  
FM 7-7J

**Drive a BFV**  
**071-324-6001**

**Conditions:** Given an operational, swimmable BFV with BII, the master power switch ON, water barrier erect, drain plugs installed, and an assistant to act as a Bradley commander; and a water obstacle.

**Standards:** Started the BFV; drove safely; negotiated varying terrain and obstacles under all environmental conditions and during periods of limited visibility; used driving aids (if required) and drove without damage to the vehicle or equipment, or injury to personnel.

**Performance Steps**

**WARNING:** Sudden vehicle movement can throw soldiers out of their seats. Wear the lap safety belt while the vehicle is in motion. Do not use any seat with missing lock pin or inoperative lap safety belt.

1. Start the BFV.
  - a. Ensure the master power switch is ON.
  - b. Move the engine accessory switch to ON.
  - c. Check the instrument panel to ensure all gauges and warning lights are operational and within normal ranges as designed.
  - d. Turn on the fuel control.

**NOTE:** If the tactical situation permits, the horn should be sounded to warn the soldiers that the engine is about to be started.

**CAUTION:** Holding gear selector in start for more than 30 seconds can damage the starter. If the engine does not start on the first try, wait one minute and try again.

- e. Move the gear selector to start and hold it until the engine starts, but do not hold it longer than 30 seconds.
- f. Check the driver's instrument panel.
- g. Warm up the engine by allowing it to idle for about 1 minute.

**NOTE:** To start the BFV below +40F, see the procedures in the appropriate TMs.

2. Drive the BFV.
  - a. Release the hand brake.
  - b. Adjust the brake pedal height.

**CAUTION:** Removal of lockouts during normal vehicle operation can cause transmission damage.

- c. Set the gear selector from neutral (N) to the desired position.

**NOTE:** If the tactical situation permits, sound the horn to warn the soldiers that the vehicle is about to move.

**WARNING:** Vehicle noise can cause permanent hearing damage. Double hearing protection must be worn.

**WARNING:** Vehicle movement can throw you from your seat and injure you. Use of seat belts is mandatory.

- d. Move the vehicle and control its speed by taking the foot off the brake pedal and slowly pressing down on the accelerator until the vehicle is moving at the desired speed.

3. Operate the BFV over rough terrain.

**WARNING:** The BFV can roll over and kill or injure soldiers. Avoid high speeds and sudden turns when driving on hills or rough terrain. Wear seat belts.

**CAUTION:** The BFV can get stuck in trenches wider than 8 feet (2.5 meters). The transmission can be damaged if the gear selector is pulled past the LOW position into the TOW START position while the BFV is moving.

- a. Drive the BFV over trenches.
  - (1) Drive to the trench straight on.
  - (2) Move the gear selector to LOW.
  - (3) Center the steering yoke and drive slowly over the trench. Accelerate as soon as the vehicle clears the trench.

**CAUTION:** Obstacles higher than 36 inches (91 centimeters) can damage the BFV's drive sprockets.

### Performance Steps

- b. Drive the vehicle over an obstacle (for example, fallen trees, rocks, and shallow streams).
  - (1) Drive to the obstacle straight on.
  - (2) Move the gear selector to LOW.
  - (3) Center the steering yoke and drive slowly over the obstacle. Accelerate as soon as the vehicle clears the obstacle.

**WARNING:** Do not drive on side slopes steeper than 40 percent (22 degrees).

- c. Drive the vehicle on side slopes.
  - (1) Move the gear selector to LOW before driving on a steep side slope.
  - (2) Slowly turn the vehicle uphill if the rear of the vehicle is sliding downhill.
  - (3) Slowly turn the vehicle downhill if the front of the vehicle is sliding downhill.

**CAUTION:** Sharp turns on snow, ice, or mud can cause the BFV to throw a track. Make a series of small, wide turns instead of one sharp turn.

- d. Drive the vehicle on snow, ice, or mud.
  - (1) Control the vehicle speed and drive it as smoothly as possible.
  - (2) Slow the vehicle smoothly before making turns.
  - (3) If the vehicle breaks through the crust of deep snow or soft soil, steer the vehicle straight to get back on the crust.
  - (4) Remove the track shoe pads, if directed by the BC.

#### 4. Swim a water obstacle.

- a. Activate the forward and rear bilge pumps.
- b. Enter the water.

**WARNING:** Do not exceed 5 miles per hour (8 kilometers per hour) when entering the water with the BFV. Serious damage to the trim vane and water barrier could result. The BFV could swamp or sink.

- (1) The BC will direct you to the entry point.
- (2) Center the steering yoke.
- (3) Use the DRIVE gear to enter the water.
- (4) Do not enter water faster than 5 miles per hour (8 kilometers per hour).

- c. Drive the BFV in water.

**CAUTION:** The transmission can be damaged if you shift into REVERSE or PIVOT STEER before the speedometer is at zero. The vehicle response is slower than normal while driving in the water.

- (1) To turn the vehicle in water--
  - (a) Turn the steering yoke in the direction you are directed (by the BC) to go.
  - (b) Release the steering yoke before completing the turn to avoid overshooting the turn.
- (2) To turn the vehicle quickly in water--
  - (a) Take the foot off the accelerator pedal and allow the speedometer to go to zero.
  - (b) Move the gear selector to PIVOT STEER, step down on the accelerator pedal, and turn the steering yoke in the direction you are directed (by the BC) to go.
- (3) To drive forward in water after turning quickly--
  - (a) Take the foot off the accelerator pedal and allow the speedometer to go to zero.
  - (b) Move the gear selector to DRIVE and step down on the accelerator pedal.

**WARNING:** Braking in water could cause the engine to stall. You can lose control of the BFV with a stalled engine. Soldiers could drown.

- (4) To stop the vehicle quickly in water--
    - (a) Take the foot off the accelerator pedal and allow the speedometer to go to zero.
    - (b) Move the gear selector to REVERSE and step down on the accelerator pedal to stop.
  - (5) To back up the vehicle in water--
    - (a) Take the foot off the accelerator pedal and allow the speedometer to go to zero.
    - (b) Move the gear selector to REVERSE and step down on the accelerator pedal to stop.
  - (6) To drive forward in water after backing up--
    - (a) Take the foot off the accelerator pedal and allow the speedometer to go to zero.
    - (b) Move the gear selector to DRIVE and step down on the accelerator pedal.
- d. Exit the water.
    - (1) Make sure that both tracks make contact with solid ground at the same time.
    - (2) Ease on the accelerator so that the exit speed is not faster than 5 miles per hour (8

**Performance Steps**

- kilometers per hour).
- (3) Drive the BFV smoothly straight up the bank.
- e. Perform post-swimming operations.

**Evaluation Preparation:** SETUP: Provide the soldier with the equipment and assistance as described in the task condition statement.

BRIEF SOLDIER: Tell the soldier to correctly perform one or more of the prescribed steps with a BFV. The soldier needs assistance for this task.

**Performance Measures**

	<u>GO</u>	<u>NO GO</u>
1. Started the BFV.	—	—
2. Drove the vehicle.	—	—
3. Operated the vehicle over rough terrain.	—	—
4. Swam a water obstacle.	—	—
a. Activated the forward and rear bilge pumps.		
b. Entered the water.		
c. Drove the BFV in water.		
d. Exited the water.		

**Evaluation Guidance:** Score the soldier GO if all performance measures are passed. Score the soldier NO-GO if any performance measure is failed. If the soldier scores NO-GO, show the soldier what was done wrong and how to do it correctly.

**References**

**Required**

**Related**

- TM 9-2350-252-10-1
- TM 9-2350-284-10-1

## Extinguish a Fire on a BFV

071-324-6022

**Conditions:** Given a BFV with an operational fire suppression system, portable fire extinguishers, a squad or crew, a fire anywhere in the vehicle, and a requirement to extinguish the fire.

**Standards:** A fire has been discovered onboard the BFV, an alert given, location of the fire identified, and troops evacuated. The fire has been extinguished by use of the vehicle's onboard, fixed, fire suppression system and the vehicle's portable fire extinguishers without causing further injury to soldiers.

### Performance Steps

1. Operate troop compartment fixed fire extinguisher.

**WARNING:** These fire extinguishers are filled with Halon gas, which is heavy, odorless, and becomes toxic when exposed to flames. After the fire extinguishers are discharged, get all personnel out of the vehicle as soon as possible. If the squad cannot get out of the vehicle, get as much fresh air into the vehicle as possible.

- a. Pull the "T" handle inside the vehicle or outside the cargo hatch, behind the fuel filler cap.
- b. Point the discharge nozzle at the base of flames.
- c. Squeeze handle.
- d. Evacuate crew.

2. Operate engine compartment fixed fire extinguisher.

- a. Pull the "T" handle inside the vehicle or outside the cargo hatch, behind the fuel filler cap.
- b. Point discharge nozzle at the base of flames.
- c. Squeeze handle.
- d. Evacuate crew.

**NOTE:** If fire is not extinguished, the portable fire extinguishers must be used.

3. Operate portable fire extinguisher.

- a. Remove from bracket.
- b. Remove safety pin from top of squeeze handle.
- c. Point discharge nozzle at the base of flames.
- d. Squeeze handle.
- e. Evacuate crew.

4. Extinguish a fire in the engine compartment.

- a. Bradley commander (BC)--
  - (1) Alerts the soldiers to an engine compartment fire over the intercommunications system or by voice command. If the intercommunications system does not work, he shouts, "Fire, Engine Compartment!" Rotates turret to 6400 mils.
  - (2) Turns the turret power switch to Off.
  - (3) Evacuates the vehicle through the BC's hatch.
- b. Driver--
  - (1) Stops the vehicle.
  - (2) Shuts down the engine by pulling out the fuel control handle.
  - (3) Discharges the Halon bottle by rotating the release valve inside the driver's compartment if it has not been automatically discharged.
  - (4) Lowers the ramp.
  - (5) Turns the master power switch OFF.
  - (6) Disconnects the CVC helmet and unfastens the seat belt.
  - (7) Secures the weapon.
  - (8) Evacuates the vehicle through the driver's hatch, if possible. Otherwise, uses the ramp.
- c. Fire team members disconnect seat belts.
- d. Squad leader or fire team leader pulls the quick disconnect to release the CVC helmets or headsets.

**Performance Steps**

- e. Fire team members--
    - (1) Secure their weapons.
    - (2) In the Number 5 and Number 9 seats, secure the rear portable fire extinguishers.
    - (3) Evacuate the vehicle via the ramp.
  - f. Gunner evacuates the vehicle through the gunner's hatch.
5. Extinguish a fire in the troop compartment.
- a. Squad leader or fire team leader alerts the BC of a troop compartment fire by intercommunications system or by voice command. If the intercommunications system does not work, he shouts "Fire, troop compartment!"
  - b. The BC turns the turret power to OFF and evacuates the vehicle through the BC's hatch.
  - c. Gunner evacuates through the gunner's hatch.
  - d. Driver--
    - (1) Stops the vehicle.
    - (2) Shuts down the engine by pulling out the fuel control handle.
    - (3) Lowers the ramp.
    - (4) Turns the master power switch OFF.
    - (5) Pulls the quick disconnects to release the CVC helmet and seat belt.
    - (6) Unfastens his seat belt.
    - (7) Secures his weapon.
    - (8) Evacuates the vehicle through the driver's hatch.
  - e. Fire team members disconnect seat belts.
  - f. Squad leader or fire team leader pulls the quick disconnect to release the CVC helmets or headsets.
  - g. Fire team members--
    - (1) Secure their weapons.
    - (2) In the Number 5 and Number 9 seats secure the rear portable fire extinguishers.
    - (3) Evacuate the vehicle through the ramp.
    - (4) In the Number 9 seat pull the handle to activate the troop-area fire extinguishers from the outside.

**Evaluation Preparation:** SETUP: Provide the soldier with the equipment, situation, and assistance needed to perform this task.

**BRIEF SOLDIER:** Tell the soldier to extinguish a fire anywhere in the vehicle by use of the vehicle's fire extinguishers and to assist in the evacuation of soldiers to safety away from the burning BFV.

**Performance Measures**

	<u>GO</u>	<u>NO GO</u>
1. Alerted other squad members.	—	—
2. Stopped the vehicle, and turned engine OFF.	—	—
3. Activated the fixed fire extinguishers.	—	—
4. Evacuated the vehicle immediately.	—	—
5. The BC accounted for all soldiers and individual weapons, and medically treated individuals, as required.	—	—
6. The BC checked the vehicle to ensure the fire had been extinguished. Used the portable fire extinguishers, as required.	—	—
7. Notified the chain of command (by any means available) of the situation and the status of the vehicle.	—	—

**Evaluation Guidance:** Score the soldier GO if all performance measures are passed. Score the soldier NO-GO if any performance measure is failed. If the soldier scores NO-GO, show the soldier what was done wrong and how to do it correctly.

**References  
Required**

**Related**  
TM 9-2350-252-10-1  
TM 9-2350-284-10-1

## Start a BFV Using Auxiliary Power

071-324-6025

**Conditions:** Given an M2/M3 BFV with discharged batteries and a slave cable and another vehicle with 24-volt system with all electrical switches, except the fire suppression switch, turned OFF in both vehicles.

**Standards:** Started the BFV engine with discharged batteries using a slave cable and another vehicle, and did not damage equipment or injure personnel.

### Performance Steps

1. Install slave cable.
  - a. Remove cap from slave receptacle of disabled vehicle.
  - b. Plug slave cable into slave receptacle of disabled vehicle.
  - c. When using operational vehicle as power source, repeat a and b in the operational vehicle.
  - d. When using 24-volt power source, install slave cables on power source and turn on power source.

2. Move master power switch to ON in operational vehicle.

**WARNING:** Batteries can explode if you start engine with outside power source when slave receptacle power light is red. Soldiers could be killed or injured. If slave receptacle power light is red, stop task immediately.

**CAUTION:** Battery and or electrical system can be damaged if slave receptacle power light is red. Both slave receptacle power lights must be green before you try to start disabled vehicle with operational vehicle. The slave receptacle power light in disabled vehicle must be green when using 24-volt power source.

3. Check slave receptacle power light in operational vehicle and disabled vehicle.
  - a. Press energize slave receptacle button in operational vehicle only.
  - b. If both slave receptacle power lights are green, go to Step 4.
  - c. If either slave receptacle power light is red, immediately go to Step 9, and stop task. Do not attempt to start vehicle. Notify organizational maintenance.
4. Start engine of operational vehicle.
5. Move engine accessory switch to ON in disabled vehicle.
6. Turn on fuel control in disabled vehicle.
  - a. Press and hold fuel push-to-release button.
  - b. Push fuel control handle toward instrument panel to ON.
  - c. Release fuel push-to-release button.

**CAUTION:** Holding gear selector in START for more than 30 seconds can damage starter. Do not hold gear selector in START for more than 30 seconds at a time. If engine does not start on first try, wait one minute and try again.

7. Move gear selector to START on disabled vehicle and hold until engine starts, but not for more than 30 seconds.
  - a. If vehicle does not start, wait one minute and try again.
  - b. If engine does not start after three tries, notify organizational maintenance.

**CAUTION:** If slave receptacle is not de-energized before slave cable is removed, the slave cable and slave receptacle could be damaged.

8. In operational vehicle, move master power switch to OFF, then back to ON.
9. Remove slave cable.
  - a. Unplug slave cable from slave receptacle on disabled vehicle.
  - b. Install cap on slave receptacle.
  - c. When using operational vehicle as power source, repeat a and b in operational vehicle.

**Performance Steps**

10. Move master power switch to ON in disabled vehicle.  
 CAUTION: Power unit can be damaged. Stop engine if warning lights do not go off in 30 seconds.

- 11. Check driver's instrument panel.
  - a. Check that TRANS OIL PRESS warning light goes OFF.
  - b. Check that ENGINE OIL LOW PRESSURE warning light goes OFF.
  - c. Check that warning tone stops sounding.
  - d. If warning lights and warning tone do not go off within 30 seconds after engine is running, stop engine and notify organizational maintenance.
  - e. Check that volts gauge pointer is in green zone.

**Evaluation Preparation:** SETUP: Provide soldier with an M2/M3 BFV with discharged batteries, a slave cable, and another vehicle.

BRIEF SOLDIER: Tell the soldier to start the disabled BFV using an outside 24-volt power source.

NOTE: In most instances, a disabled vehicle will be started with another vehicle that has a 24-volt system; therefore, the performance measures have been written with this in mind.

<b>Performance Measures</b>	<u>GO</u>	<u>NO GO</u>
1. Ensured all electrical switches in disabled vehicle and operational vehicle were in the OFF position.	—	—
2. Plugged slave cable into slave receptacles of disabled vehicle and operational vehicle.	—	—
3. Started engine of operational vehicle.	—	—
4. Moved engine accessory switch in disabled vehicle to the ON position.	—	—
5. Ensured the slave receptacle power lights in the disabled and operational vehicles were green.	—	—
6. Turned on fuel control in disabled vehicle.	—	—
7. Moved gear selector to START and started engine.	—	—
NOTE: Did not hold gear selector in start for more than 30 seconds.		
8. Removed slave cable from disabled vehicle and operational vehicle.	—	—
9. Moved master power switch on disabled vehicle to the ON position.	—	—
10. Checked driver's instrument panel; ensured all warning lights and gauges operated in the proper position.	—	—

**Evaluation Guidance:** Score the soldier GO if all performance measures are passed. Score the soldier NO-GO if any performance measure is failed. If the soldier scores NO-GO, show the soldier what was done wrong and how to do it correctly.

**References  
 Required**

**Related**  
 TM 9-2350-252-10-1  
 TM 9-2350-284-10-1

## Subject Area 29: VEHICLES: M113-SERIES

**Start an M113-Series Vehicle Using Auxiliary Power**  
**071-212-0020**

**Conditions:** In a field or garrison environment, given an M113-series vehicle with a dead battery, an operational vehicle equipped with 24-volt power system and receptacle for auxiliary power cable, an auxiliary power cable (slave cable), and a requirement to start the M113-series vehicle using auxiliary power. Engine cranks slowly, and voltmeter indicates LOW on battery charge level.

**Standards:** The engine of the M113-series vehicle with dead battery was started without damage to either vehicle.

**Performance Steps****WARNING**

1. Exhaust gases can kill. Brain damage can result from heavy exposure. Do not allow personnel between vehicles during slave starting.
2. When starting, carriers can move suddenly and crush personnel. Personnel should stay clear of area between carriers.

1. Position operable (source) vehicle to facilitate proper cable hookup.
2. Ensure master switch is OFF on both vehicles.
3. If vehicle is equipped with an M14 alarm system, disconnect the M182 mount cable.
4. Turn all switches to OFF position in M113-series vehicle that is to be started.
5. Remove protective covers from slave receptacles of both vehicles.

**WARNING**

Electrical slave cable can be improperly connected causing electrical spark or fire. Personnel can be killed or injured. Equipment can be damaged. Match connection-guide lug and cable prongs with receptacle hole.

6. Connect slave cable to auxiliary power receptacle of M113-series vehicle to be started, then to the auxiliary power receptacle on the source vehicle.
7. Start engine of source vehicle.
8. Turn master switch of M113-series vehicle to be started to ON position and apply engine start procedure to start engine.
9. Turn master switch to OFF on both vehicles.

**WARNING**

Electric sparking can burn personnel and damage equipment. Disconnect slave cable carefully to avoid sparks.

10. Disconnect slave cables from both vehicles.
11. Install protective covers on auxiliary power receptacles of both vehicles and stow slave cable.
12. Perform all steps without injuring personnel or damaging equipment.

**Evaluation Preparation:** SETUP: At the test site, provide all materials and equipment according to the task condition statement.

**BRIEF SOLDIER:** Tell the soldier to use a 24-volt power system and receptacle for an auxiliary power cable (slave cable) to start the vehicle using auxiliary power.

<b>Performance Measures</b>	<b><u>GO</u></b>	<b><u>NO GO</u></b>
1. Positioned operable (source) vehicle to facilitate proper cable hookup.	—	—
2. Ensured master switch was set to OFF on both vehicles.	—	—
3. Disconnected the M182 mount cable, if M113-series vehicle to be started was equipped with an M14 alarm system.	—	—
4. Turned all switches to the OFF position in M113-series vehicle that was to be started.	—	—
5. Removed protective covers from slave receptacle of both vehicles.	—	—
6. Connected slave cable to auxiliary power receptacle of M113-series vehicle to be started, then to auxiliary power receptacle on the source vehicle.	—	—
7. Started engine of source vehicle.	—	—
8. Turned master switch of M113-series vehicle to be started to the ON position, and applied the engine start procedures to start engine.	—	—
9. Turned master switch to OFF on both vehicles.	—	—
10. Disconnected slave cables from both vehicles.	—	—
11. Installed protective covers on auxiliary power receptacles of both vehicles and stowed slave cable.	—	—
12. Performed all steps without injuring personnel or damaging equipment.	—	—

**Evaluation Guidance:** Score the soldier GO if all performance measures are passed. Score the soldier NO-GO if any performance measure is failed. If the soldier scores NO-GO, show the soldier what was done wrong and how to do it correctly.

**References  
Required**

- Related**  
 TM 9-2350-259-10  
 TM 9-2350-261-10  
 TM 9-2350-277-10-1

**Drive an M113-Series Vehicle**  
**071-212-0021**

**Conditions:** In a field or garrison environment, given an M113-series vehicle, basic issue items, and a requirement to drive the vehicle across varying terrain in all weather conditions.

**Standards:** Driving techniques for operating the vehicle across varying terrain and in all weather conditions are applied. The vehicle is driven safely without damage to the vehicle or injury to personnel.

**Performance Steps**

**WARNINGS**

1. An unlatched hatch cover could swing and injure personnel. Make sure hatches are secured.
2. Carrier movement can throw you from your seat and injure you. Use of seat belts is mandatory.
3. Rapid starts, sudden stops and sharp turns can throw riders off carrier. Riders thrown from carrier can be killed or injured. Riders must sit inside carrier on seats that are provided. Riders must secure seat belts and wear CVC or regular helmet.
4. Heater and engine exhaust fumes contain deadly poisonous gases. Severe exposure can cause death or permanent brain damage. Exhaust gases are more dangerous in places with poor air flow.
5. To protect yourself and your partners, always obey the following:
  - a. Do not run heater or engine indoors unless there is very good air flow.
  - b. Do not idle engine for long time unless there is very good air flow.
  - c. Do not drive carrier with any power plant access covers open or removed.
  - d. Be alert at all times.
  - e. Check for the smell of exhaust fumes. If you notice any fumes, open hatch covers, ramp access door, or ramp right away.
6. Noises from carrier or weapons firing from carrier can damage hearing of personnel. All personnel in carrier must wear double hearing protection when carrier or weapon is operated.
7. Loss of control can cause carrier to crash. Avoid oversteering at high speeds to prevent skidding or carrier upset. Use caution when turning on hills or side slopes.
8. When driving the M113A3 model, always observe the following warning: Carrier can pivot steer when transmission controller is in SL position and steering lock pin is not engaged. Personnel can be killed or injured. Make sure transmission is in SL and steering lock pin is engaged (steering locked indicator light should be on) unless carrier is to be steered.
9. Brake pedal is very sensitive. Applying brake hard can cause a sudden stop, causing injury. Apply brakes lightly, and with caution.

1. Perform operational checks.
2. Apply required safety measures such as wearing seat belt and hearing protection, using ground guides, and giving warnings prior to moving the vehicle and lowering or raising the ramp.
3. Apply vehicle starting procedures.

**WARNINGS**

1. When driving the M113A1 and M113A2 models, observe the following:
  - a. Do not press or touch brake lock button while the vehicle is moving.
  - b. Never use the pivot steer brakes when driving faster than 15 miles per hour, or with shift lever in a driving range higher than 1-2 except in emergency situations.
  - c. Never use pivot steer brakes and differential brakes at the same time.
  - d. When steering and braking occurs at 1st notch or after 4th notch on the quadrant, vehicle can skid and crash; personnel can be injured or killed. If steering and braking is not between 2d notch and 3rd notch, do not operate vehicle; notify organizational maintenance through the chain of command.
2. Exhaust gas poisoning causes dizziness, headache, loss of muscle control, sleepiness, coma, and death. If anyone shows signs of exhaust gas poisoning, get all personnel out of the carrier. Make sure they have lots of fresh air. Keep them warm, calm, and inactive. Get medical help. If anyone stops breathing, give artificial respiration.

**Performance Steps**

4. Set gear selector, as required, and drive the vehicle at appropriate speeds based on specific conditions and instructions from supervisor.

**WARNING**

Do not attempt to change carrier forward or reverse movement by shifting until carrier comes to a complete stop. Above 4 miles per hour if you attempt to shift into reverse (or forward), the carrier will continue in the direction you were moving when you attempted to make the change. Failure to follow the above instructions could result in injury or death to personnel and destruction of equipment or property.

5. Monitor driver controls and gages for normal vehicle operation.

**WARNING**

Failure to heed the following warnings will result in damage to the vehicle and injury to personnel:

1. Do not climb obstacles higher than 2 feet.
2. Do not drive on grades that exceed 60 percent.
3. Do not drive on side slopes steeper than 30 percent.
4. Do not cross trenches that exceed 5 1/2 feet.
5. Do not ford water that exceeds 40 inches when driving A1 and A2 models, 48 inches when driving the A3 model.
6. Drive the vehicle over trenches, obstacles, shallow streams (3 1/2 feet or less), slopes, hills, and on snow, ice, or mud by applying the appropriate driving technique for the specific condition.
7. During water operations, ensure vehicle is properly prepared. Exercise extreme caution during entry and exit and apply water driving techniques.
8. During reduced visibility, use night vision devices or aids. Vehicle driving techniques remain the same for specific conditions.
9. Apply engine shutdown procedures after completion of mission.

**Evaluation Preparation:** SETUP: At the test site provide all material and equipment according to task condition statement.

BRIEF SOLDIER: Tell the soldier to operate the vehicle across varying terrain and weather conditions. The vehicle must be driven safely without damage to the vehicle or injury to personnel.

**Performance Measures**

	<u>GO</u>	<u>NO GO</u>
1. Performed operational checks.	—	—
2. Applied required safety measures, such as wearing seat belt and hearing protection, used ground guides, and gave warning prior to moving the vehicle and lowering or raising the ramp.	—	—
3. Applied vehicle starting procedures.	—	—
4. Set gear selector, as required, and drove the vehicle at appropriate speeds based on specific conditions and instructions from supervisor.	—	—
5. Monitored driver controls and gauges for normal vehicle operation.	—	—
6. Drove the vehicle over trenches, obstacles, shallow streams (40 inches or less when driving A1 and A2 model, 48 inches or less when driving the A3), slopes, hills, snow, ice, or mud; applied the appropriate driving technique for the specific condition.	—	—
7. Ensured the vehicle was properly prepared for water operations. Exercised extreme caution during entry and exit, and applied water driving techniques.	—	—

**Performance Measures**

- 8. Used night vision devices or aids during reduced visibility. Vehicle driving techniques remained the same for specific conditions.
- 9. Applied engine shutdown procedures after completion of mission.

**GO**    **NO GO**

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 \_\_\_\_    \_\_\_\_

**Evaluation Guidance:** Score the soldier GO if all performance measures are passed. Score the soldier NO-GO if any performance measure is failed. If the soldier scores NO-GO, show the soldier what was done wrong and how to do it correctly.

**References**

**Required**

**Related**

- TM 9-2350-259-10
- TM 9-2350-261-10
- TM 9-2350-277-10-1

Subject Area 34: WEAPONS: M9 PISTOL

**Perform a Function Check on an M9 Pistol**  
**071-004-0002**

**Conditions:** Given an M9 pistol with a magazine.

**Standards:** Performed operational checks in correct sequence and determined whether the M9 pistol would function correctly or not.

**Performance Steps**

**WARNING**

Ensure the pistol is clear before you perform a function check.

1. Place the safety lever in SAFE position.
2. Insert the empty magazine into the magazine well.
3. Retract the slide fully and release it. The slide should lock to the rear.
4. Depress the slide stop and allow the slide to return fully forward. At the same time, the hammer should fall to the full forward position.
5. Squeeze and release the trigger. The firing pin block should move up and down. The hammer should not move.
6. Place the safety lever in the FIRE position.
7. To check the double action, squeeze the trigger. The hammer should cock and fall.
8. Squeeze the trigger again, and hold it to the rear. While holding the trigger to the rear, manually retract and release the slide. Release the trigger. You should hear a click, but the hammer should not fall.
9. To check the single action, squeeze the trigger. The hammer should fall.
10. If the pistol functions as indicated during the checks, it is operational.

**Evaluation Preparation:** SETUP: At the test site, provide the equipment listed in the task condition statement.

BRIEF SOLDIER: Tell the soldier to perform a function check based on the steps in this task and determine whether or not the M9 pistol functions correctly.

**Performance Measures**

	<u>GO</u>	<u>NO GO</u>
1. Placed the safety lever in the SAFE position.	___	___
2. Inserted the empty magazine into the magazine well.	___	___
3. Retracted the slide fully then released it.	___	___
4. Depressed the slide stop and allowed the slide to return fully forward.	___	___
5. Squeezed and released the trigger.	___	___
6. Placed the safety lever in FIRE position.	___	___
7. Checked the double action by squeezing the trigger.	___	___

**Performance Measures**

	<u>GO</u>	<u>NO GO</u>
8. Squeezed the trigger again and held it to the rear, at the same time manually retracting and releasing the slide. Released the trigger. A click should have been heard. The hammer should not have fallen.	—	—
9. Checked the single action by squeezing the trigger. The hammer should have fallen.	—	—

**Evaluation Guidance:** Score the soldier GO if all performance measures are passed. Score the soldier NO-GO if any performance measure is failed. If the soldier scores NO-GO, show the soldier what was done wrong and how to do it correctly.

**References**

**Required**

**Related**

TM 9-1005-317-10

## Correct Malfunctions of an M9 Pistol

071-004-0005

**Conditions:** Given an M9 pistol; a loaded magazine with 9-mm ammunition; cleaner, lubricant, and preservative (CLP); lubricating oil, Arctic weather (LAW); lubricating oil, semifluid, automatic weapon (LSA); bore brush; wiping rags; M4 cleaning rod (handle with one section and a swab holder); and small-arms cleaning swabs.

**Standards:** Without damage to the pistol, eliminated malfunctions caused by faulty action of either the pistol or the ammunition while in an environment that required engagement of targets.

### Performance Steps

WARNING:

Always keep the pistol pointed in a safe direction during the following procedures.

1. Perform immediate action.
  - a. When the slide is fully forward and the pistol fails to fire, apply immediate action as follows:
    - (1) Ensure the safety lever is in FIRE position.
    - (2) Squeeze the trigger again.
    - (3) If the pistol does not fire, ensure that the magazine is fully seated, retract the slide to the rear, and release.
    - (4) Squeeze the trigger.
    - (5) If the pistol still does not fire, remove the magazine and retract the slide to eject the chambered cartridge. Insert a new magazine, retract the slide, and release to chamber another cartridge.
    - (6) Squeeze the trigger.
    - (7) If the pistol does not fire, replace the ammunition.
    - (8) If the pistol fails to fire again, clear the pistol and perform remedial action IAW step 2.
  - b. When the slide is not fully seated forward, remove finger from the trigger. With the other hand, try to push the slide fully forward. If the slide will not move forward, proceed as follows:
    - (1) Place safety lever in SAFE position.
    - (2) Remove the magazine.
    - (3) Grasp the slide and retract it to the rear, locking it with the slide stop.
    - (4) Inspect the chamber and remove any obstructions.
    - (5) Insert another loaded magazine into the pistol.
    - (6) Release the slide.
    - (7) Place the safety lever in the FIRE position, aim, and squeeze the trigger.
    - (8) If the pistol does not fire, clear the pistol and perform remedial action IAW step 2.
2. Perform remedial action.
  - a. Ensure the pistol is clear.
  - b. Disassemble the pistol and inspect for dirty, corroded, missing, or damaged parts.
  - c. Clean dirty or corroded parts. Replace missing or damaged parts.
  - d. Lubricate and assemble the pistol.
  - e. Inspect magazine for damaged parts. Replace magazine if necessary.
  - f. Check for dirty or damaged ammunition. Clean or replace ammunition.
  - g. Perform a function check.
  - h. Load the pistol and try to fire.
  - i. If the pistol does not fire, clear the pistol and notify your supervisor.

**Evaluation Preparation:** SETUP: Provide equipment and materials listed in the condition statement. Use performance steps in the training outline to evaluate performance of the task.

BRIEF SOLDIER: Tell the soldier the pistol stopped firing and to perform immediate and remedial action on the pistol.

**Performance Measures**

1. Performed immediate action.
2. Performed remedial action.

<u>GO</u>	<u>NO GO</u>
—	—
—	—

**Evaluation Guidance:** Score the soldier GO if all performance measures are passed. Score the soldier NO-GO if any performance measure is failed. If the soldier scores NO-GO, show the soldier what was done wrong and how to do it correctly.

**References**

**Required**

**Related**

TM 9-1005-317-10

Subject Area 36: WEAPONS: FLASH

**Maintain an M202A1 Multishot Rocket Launcher**  
**071-070-0001**

**Conditions:** Given an M202A1 multishot rocket launcher, an M74 rocket clip, a clean dry rag, and a requirement to maintain the launcher.

**Standards:** The launcher and rocket clip have been cleaned and inspected for serviceability. Any defects have been reported to the supervisor.

**Performance Steps**

1. Clean the launcher by removing any dirt, sand, mud, or moisture and clean rocket with a clean dry cloth.
2. Inspect for serviceability:
  - a. Launcher.
    - (1) Inspect exterior for damaged, loose, or missing parts, dents, cracks, separations, and loose fiberglass.
    - (2) Inspect interior of launch tubes for dents or cracks, raveled, frayed, or loose fiberglass, or visible signs of burns.
    - (3) Inspect sights for loose, damaged, or missing parts. Check for correct operation of the sight lock. Sight through the lens and check for incorrect alignment of the reticle, obscured vision, or a broken reticle.
    - (4) Report any defects to supervisor.
  - b. Rocket clip. If the rocket clip has any of the following defects, it is unserviceable and must be turned in.

**WARNING:** A defective rocket clip can cause injury or death to personnel.

    - (1) Loose warheads.
    - (2) Leaking rockets.
    - (3) Dented rocket canister.
    - (4) Bail not under spring tension.
    - (5) Rust or corrosion.
3. Protect the launcher and rocket clip from ice, snow, sand, and dust.
4. Observe the operating temperature limits of -32 Celsius to +60 degrees Celsius (-25 degrees Fahrenheit to +140 degrees Fahrenheit).
5. When temperature and humidity are excessive, or when salt air is present, inspect and clean the launcher and rocket clip daily.

**Evaluation Preparation:** SETUP: At the test site, provide the soldier with all the equipment given in the task condition statement.

BRIEF SOLDIER: Tell the soldier to maintain the M202A1 multishot rocket launcher.

**Performance Measures**

	<b><u>GO</u></b>	<b><u>NO GO</u></b>
1. Removed dirt, sand, mud, or moisture with a clean dry cloth.	—	—
2. Inspected launcher and rocket clip.	—	—
3. Protected launcher and rocket clip from ice, snow, sand, and dust.	—	—
4. Observed operating temperature limits.	—	—

**Performance Measures****GO**    **NO GO**

5. Inspected and cleaned the launcher and rocket clip daily during excessive weather conditions.

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**Evaluation Guidance:** Score the soldier GO if all performance measures are passed. Score the soldier NO-GO if any performance measure is failed. If the soldier scores NO-GO, show the soldier what was done wrong and how to do it correctly.

**References  
Required**

**Related  
TC 23-2**

**Perform a Function Check on an M202A1 Multishot Rocket Launcher  
071-070-0002**

**Conditions:** Given an M202A1 multishot rocket launcher and a requirement to perform a function check.

**Standards:** Completed operational checks and verified the operational status of the launcher.

**Performance Steps**

1. Unfasten the latch on the rear dust cover and rotate the cover down. Ensure that the latch, hinge, and cover are serviceable.
2. Check the front cover trigger handle interlock system:
  - a. Unfasten the latch on the front cover, rotate the front cover handle outward until it stops, then rotate the front cover down below the launcher tubes applying sufficient pressure to lock it in the down position and allowing the trigger handle to be released from its retracted position.
  - b. Pull the trigger handle assembly down and lock it in position.
3. Check the firing pin mechanism assembly and trigger safety:
  - a. Grasp the firing pin mechanism housing; hold it firmly and fully extend it from the launcher. Do not allow the firing pin housing to rotate.
  - b. Move the trigger safety button to the FIRE position and pull the trigger. The firing pin should protrude from the housing.
  - c. Move the trigger safety button to the SAFE position and pull the trigger. The trigger should not operate.
  - d. Retract the firing pin housing back into the launcher
4. Restore the rear dust cover and fasten the latch.

**Evaluation Preparation:** SETUP: At the test site, provide the soldier with all the equipment given in the task condition statement.

BRIEF SOLDIER: Tell the soldier to perform a function check on the M202A1 multishot rocket launcher.

<b>Performance Measures</b>	<u><b>GO</b></u>	<u><b>NO GO</b></u>
1. Unfastened the latch on the rear cover and rotated the cover down.	—	—
2. Checked the front cover trigger handle interlock system.	—	—
3. Checked the firing pin mechanism assembly and trigger safety.	—	—
4. Restored the rear dust cover and fastened the latch.	—	—

**Evaluation Guidance:** Score the soldier GO if all performance measures are passed. Score the soldier NO-GO if any performance measure is failed. If the soldier scores NO-GO, show the soldier what was done wrong and how to do it correctly.

**References  
Required**

**Related  
TC 23-2**

**Load an M202A1 Multishot Rocket Launcher  
071-070-0003**

**Conditions:** Given an M202A1 multishot rocket launcher and an M74 rocket clip.

**Standards:** Inserted and secured the M74 rocket clip in the launcher, ensured safety mechanisms were in place, and closed and secured the rear cover.

**Performance Steps**

1. Place the trigger safety button in the SAFE position.
2. Position the launcher on the ground resting on its (closed) front cover with the front cover handle in the stowed position.
3. Open the rear cover and rotate it down and beneath the launcher.
4. Supporting the launcher with the left hand on the sight, partially insert the rocket clip into the rear end of the launcher tubes with bail handle down using rocket warheads as guides.
5. Grasp the end of the rocket clip support strap nearest the two black straps and pull it outward to remove the strap and spacers.
6. Depress the launcher clip lock button and fully insert the rocket clip into the launcher (a "click" will indicate the rocket clip is locked onto the firing pin assembly).
7. Ensure that the rocket clip latch is seated in the clip attachment slot of the firing pin mechanism assembly.
8. Close and secure the rear cover.

**Evaluation Preparation:** SETUP: At the test site, provide the soldier with all the equipment given in the task condition statement.

BRIEF SOLDIER: Tell the soldier to load the M202A1 launcher.

<b>Performance Measures</b>	<b><u>GO</u></b>	<b><u>NO GO</u></b>
1. Placed the trigger safety button in the SAFE position.	—	—
2. Positioned the launcher on the ground resting on the closed front cover with the front cover handle in the stowed position.	—	—
3. Opened the rear cover and rotated it down and beneath the launcher.	—	—
4. Supported the launcher with the left hand on the sight and partially inserted the rocket clip into the rear end of the launcher tubes with the bail handle down. Used rocket warheads as guides.	—	—
5. Grasped the end of the rocket clip support strap nearest the two black straps and pulled it outward and removed the strap and spacers.	—	—
6. Depressed the launcher clip lock button and inserted the rocket clip into the launcher until a click was heard.	—	—
7. Checked the rocket clip latch to ensure it was seated in the clip attachment of the firing pin mechanism assembly.	—	—
8. Closed and secured the rear cover.	—	—

**Evaluation Guidance:** Score the soldier GO if all performance measures are passed. Score the soldier NO-GO if any performance measure is failed. If the soldier scores NO-GO, show the soldier what was done wrong and how to do it correctly.

**References  
Required**

**Related  
TC 23-2**

**Unload an M202A1 Multishot Rocket Launcher  
071-070-0004**

**Conditions:** Given a loaded M202A1 multishot rocket launcher in a carrying configuration with combination tool.

**Standards:** Removed M74 rocket clip from the launcher and closed and secured the rear cover.

**Performance Steps**

1. Open the rear cover and place the launcher on the ground so that it is resting on the rear cover. Ensure the rear cover folds down against the rocket clip for stabilization.
2. Remove the rocket clip latch using the combination tool.
3. Depress the rocket clip lock button, grasp the bail handle, and remove the rocket clip by pulling rearward.
4. Reinsert the firing pin mechanism assembly.
5. Close and secure the rear cover.

**Evaluation Preparation:**

SETUP: At the test site, provide the soldier with all the equipment given in the task condition statement.

BRIEF SOLDIER: Tell the soldier to unload the M202A1 rocket launcher.

<b>Performance Measures</b>	<b><u>GO</u></b>	<b><u>NO GO</u></b>
1. Opened the rear cover and placed the launcher on the ground so that it was resting on the rear cover.	_____	_____
2. Removed the rocket clip latch using the combination tool.	_____	_____
3. Depressed the rocket clip lock button, grasped the bail handle and removed the rocket clip by pulling rearward.	_____	_____
4. Reinserted the firing pin mechanism assembly.	_____	_____
5. Closed and secured the rear cover.	_____	_____

**Evaluation Guidance:** Score the soldier GO if all performance measures are passed. Score the soldier NO-GO if any performance measure is failed. If the soldier scores NO-GO, show the soldier what was done wrong and how to do it correctly.

**References  
Required**

**Related  
TC 23-2**

**Perform Misfire Procedures on an M202A1 Multishot Rocket Launcher  
071-070-0005**

**Conditions:** Given a loaded M202A1 multishot rocket launcher that has misfired, and a small knife with at least a 1-inch blade.

**Standards:** Applied misfire procedures so that the misfired rocket(s) could be fired, or safety mechanisms put in place, rocket clip removed from the launcher, and the supervisor notified.

**Performance Steps**

**CAUTION:** Do not assume that an initial failure of rocket to fire is a complete misfire. It could be a hangfire or a mechanical delay. However, the misfire procedures outlined below are appropriate for either a complete misfire or a hangfire.

**WARNING:** Do not stand behind or in front of a misfired rocket clip. Death or injury could occur from delayed ignition.

1. Keep the launcher oriented on the target area.
2. Squeeze the trigger four times after the last misfired rocket to clear the launcher of rockets including the one that has misfired. If this clears the launcher, remove the empty clip and inspect the launcher for defects before firing again.
3. Grasp the side of one rocket clip tube and remove the clip latch to separate the firing pin mechanism from the rocket clip. If separation does not occur, carefully insert a blade between the firing pin mechanism and the rocket clip manifold and apply pressure to obtain at least a 1-inch separation between the two.
4. Grasp the side of one rocket clip tube and remove the rocket clip; do not use the bail handle.
5. Place the rocket clip on the ground as far away from the fighting position and friendly troops as practical. Notify supervisor.
6. Inspect the launcher for defects before firing again.

**Evaluation Preparation:** SETUP: At the test site, provide an expended M202A1 launcher in the ready to fire configuration.

**BRIEF SOLDIER:** Tell the soldier to assume a correct ready-to-fire position and to go through firing procedures. Tell him to go through misfire procedures.

**Performance Measures**

	<u>GO</u>	<u>NO GO</u>
1. Kept the launcher oriented on the target area.	_____	_____
2. Squeezed the trigger four times after the last misfired rocket to clear the launcher of rockets including the one that misfired. If this cleared the launcher, removed the empty clip and inspected the launcher for defects before firing again.	_____	_____
3. Grasped the side of one rocket clip tube and removed the clip latch to separate the firing pin mechanism from the rocket clip. If separation did not occur, carefully inserted a blade between the firing pin mechanism and the rocket clip manifold and applied pressure to obtain at least a 1-inch separation between the two.	_____	_____
4. Grasped the side of one rocket clip tube and removed the rocket clip.	_____	_____
5. Placed the rocket clip on the ground as far away from the fighting position and friendly troops as practical.	_____	_____
6. Notified supervisor.	_____	_____

**Evaluation Guidance:** Score the soldier GO if all performance measures are passed. Score the soldier NO-GO if any performance measure is failed. If the soldier scores NO-GO, show the soldier what was done wrong and how to do it correctly.

**References**  
**Required**

**Related**  
TC 23-2

**Prepare an M202A1 Multishot Rocket Launcher for Firing**  
**071-070-0006**

**Conditions:** Given a loaded M202A1 multishot rocket launcher in a carrying configuration and a requirement to prepare it for firing.

**Standards:** Prepared the M202A1 multishot rocket launcher for firing without damage to the launcher or injury to soldiers.

**Performance Steps**

1. Open the rear cover, grasp the bail handle, and pull the rocket clip out until it is fully extended and locked into position (a click will indicate the rocket clip is locked).
2. Release the bail handle ensuring that it folds against the rear edge of the rocket clip in the downward position.
3. Position the launcher on the right shoulder so that the rear cover acts as a shoulder rest in front of the right shoulder.
4. Place the right hand under the launcher to support it, while using the left hand to unlatch the front cover and rotate the handle outward until it stops. Then rotate the front cover down until it locks into position. (This action releases the trigger handle assembly).
5. Extend the trigger handle assembly until it is fully seated in the firing position ensuring the trigger safety button is in the SAFE position.

**WARNING:** The danger zone extends 15 meters to the rear of the launcher with a base of 15 meters. All personnel, material, and obstructions must be clear of this area.

The caution zone extends an additional 25 meters with a base of 38 meters. Personnel in this area could be injured by debris from launcher backblast.

In a tactical situation the launcher may be fired without injury to the firer as long as any rear vertical obstructions are at least 5 meters away. Friendly troops in the caution zone must be protected in a fighting position, behind a solid object, or lying prone with helmets on and facing firing position.

6. Check the backblast area to ensure it is safe to fire the launcher.
7. Extend the sight.
8. Raise the protective lens cover. The launcher is ready to fire.

**Evaluation Preparation:** SETUP: At the test site, provide the soldier with all the equipment given in the task condition statement.

**BRIEF SOLDIER:** Tell the soldier to assume a correct carrying position with the launcher. Once he has assumed the carrying position, tell him to prepare the M202A1 multishot rocket launcher for firing.

**Performance Measures**

	<u>GO</u>	<u>NO GO</u>
1. Opened the rear cover, grasped the bail handle, and pulled the rocket clip outward until locked into position.	—	—
2. Released the bail handle.	—	—
3. Positioned the launcher on the right shoulder.	—	—
4. Moved the right hand under the launcher, used the left hand to unlatch the front cover and rotated handle.	—	—

<b>Performance Measures</b>	<b><u>GO</u></b>	<b><u>NO GO</u></b>
5. Rotated cover into lock position.	—	—
6. Extended the trigger handle assembly until it was fully seated in the firing position and ensured the trigger safety button was in the SAFE position.	—	—
7. Checked the backblast area.	—	—
8. Extended the sight.	—	—
9. Raised the protective lens cover.	—	—

**Evaluation Guidance:** Score the soldier GO if all performance measures are passed. Score the soldier NO-GO if any performance measure is failed. If the soldier scores NO-GO, show the soldier what was done wrong and how to do it correctly.

**References**  
**Required**

**Related**  
 TC 23-2

**Restore an M202A1 Multishot Rocket Launcher to Carrying Configuration  
071-070-0007**

**Conditions:** Given an M202A1 multishot rocket launcher prepared for firing and the requirement to restore the launcher to carrying configuration.

**Standards:** Prepared the launcher in such a manner that it was not damaged and was returned to a safe carrying configuration.

**Performance Steps**

1. Position trigger safety button on SAFE.
2. Close the sight cover, position the sight in the forward detent, and fold the sight assembly in against the launcher.
3. Press the trigger release button, which unlocks the handle, and rotate it upward, engaging the interlock and releasing the front cover.
4. Close and latch the front cover.
5. Position the launcher on the ground so that it is resting on the front cover.
6. Depress the rocket clip lock button and push on the rear of the rocket clip, retracting it into the launcher.
7. Check the rocket clip latch to ensure it is engaged in the rocket clip attachment slot of the firing pin mechanism assembly.
8. Close and latch the rear cover.

**Evaluation Preparation:** SETUP: At the test site, provide the soldier with all the equipment given in the task condition statement.

BRIEF SOLDIER: Tell the soldier to assume a correct firing position with the launcher. Once he has assumed the firing position, tell him to restore the M202A1 multishot rocket launcher to the carrying configuration.

<b>Performance Measures</b>	<b><u>GO</u></b>	<b><u>NO GO</u></b>
1. Positioned trigger safety button on SAFE.	—	—
2. Closed the sight cover.	—	—
3. Pressed the trigger release button, unlocked the handle and rotated it upward, engaged the interlock, and released the front cover.	—	—
4. Closed and latched the front cover.	—	—
5. Positioned the launcher on the ground so that it rested on the front cover.	—	—
6. Depressed the rocket clip lock button and pushed the rear of the rocket clip, retracting it into the launcher.	—	—
7. Checked the rocket clip latch to ensure it was engaged in the rocket clip attachment slot of the firing pin mechanism assembly.	—	—
8. Closed and latched the rear cover.	—	—

**Evaluation Guidance:** Score the soldier GO if all performance measures are passed. Score the soldier NO-GO if any performance measure is failed. If the soldier scores NO-GO, show the soldier what was done wrong and how to do it correctly.

**References**  
**Required**

**Related**  
TC 23-2

**Engage Targets with an M202A1 Multishot Rocket Launcher**  
**071-070-0008**

**Conditions:** Given a loaded M202A1 multishot rocket launcher that has been prepared for firing at threat targets and a requirement to engage such targets.

**Standards:** Threat targets have been acquired and a determination made that the launcher should be employed against such targets. Fire has been placed on threat targets by application of correct launcher sighting, aiming, and fire adjustment techniques.

**Performance Steps**

1. Acquire the target.
2. Determine if the target is engageable based on the following considerations:
  - a. Minimum range to target is at least 20 meters.
  - b. Maximum range to target does not exceed 750 meters.
  - c. Type of target is suitable for launcher engagement (disabled armored vehicles, dismounted troops, fortified positions, wooded areas, built-up areas, crew-served or individual weapons positions, and vehicles carrying troops, ammunition, or combustible supplies).
  - d. Instructions received from supervisor.
3. If the target is to be engaged:
  - a. Assume the best possible firing position.
  - b. Obtain a correct sight picture and place the appropriate aiming point on the target.
  - c. Apply proper marksmanship techniques to place fire on the target.

**Evaluation Preparation:** SETUP: At the test site, provide the soldier with all the equipment given in the task condition statement.

BRIEF SOLDIER: Tell the soldier to assume a good supported firing position and engage target with the M202A1 multishot rocket launcher.

<b>Performance Measures</b>	<b><u>GO</u></b>	<b><u>NO GO</u></b>
1. Acquired the target.	_____	_____
2. Determined if the target was engageable.	_____	_____
3. Engaged the target.	_____	_____

**Evaluation Guidance:** Score the soldier GO if all performance measures are passed. Score the soldier NO-GO if any performance measure is failed. If the soldier scores NO-GO, show the soldier what was done wrong and how to do it correctly.

**References**  
**Required**

**Related**  
 TC 23-2

## Subject Area 37: WEAPONS: GENERAL

**Zero an M68 Sight****071-705-0003**

**Conditions:** Given an M68 sight, a zeroed M16-series rifle, a zeroed M4 carbine, a zeroed M4 modular weapon system, components, battery (0E890) DL1/3N, 25-meter range, and the appropriate ammunition.

**Standards:** Zeroed an M68 sight by firing accurately at a zeroed target, and impacted the center mass with a three-round shot group upon zero confirmation.

**Performance Steps**

1. Place an M68 sight into operation.
2. Zero the M68 sight:
  - a. Open front and rear lens covers (Figure 1).

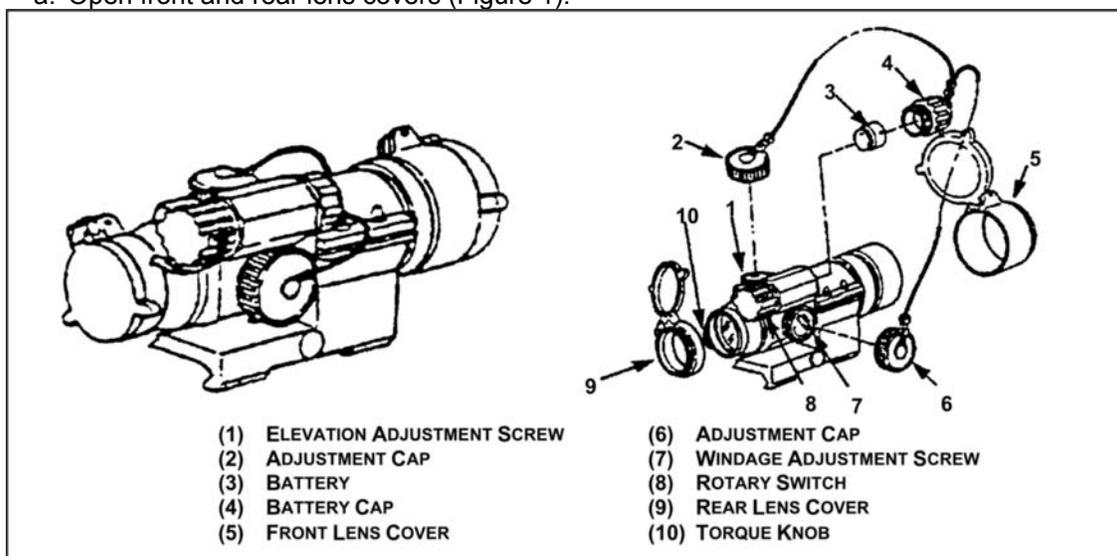


Figure 1. M68, close combat optic.

- b. Turn rotary switch clockwise until red dot intensity contrasts suitably with target background.
- c. Look through sight to get a rough estimate of zeroing adjustment required. When looking through iron sights, the red dot should appear on top of the front sight post.
- d. If adjustment is required, remove adjustment screw caps from adjustment screws by turning them counterclockwise (Figure 1).

**NOTE:** Each click of the adjustment screw makes a 4-millimeter movement of the point of impact at 25 meters (1/2 minute of adjustment).

- e. Insert an adjustment tool (coin, screwdriver, or knife) in adjustment screw slot. Turn adjustment screw as follows:
  - (1) To move the point of impact to the right, turn the windage adjustment screw counterclockwise.
  - (2) To move the point of impact to the left, turn the windage adjustment screw clockwise.
  - (3) To move point of impact up, turn the elevation adjustment screw counterclockwise.
  - (4) To move the point of impact down, turn the elevation adjustment screw clockwise.
- f. Repeat steps (c) through (e) until sight is roughly zeroed.
- g. Confirm zeroing by firing at least three shots at a zeroing target. Check the impact points on the zeroing target to confirm accuracy.

**NOTE:** After initial firing, check to ensure that the mount and sight (M16-series or M4-series) are secure.

**Performance Steps**

On M16-series, hand tighten the mounting bolt on the mount, then hand tighten the torque knob on the sight until it snaps twice. On the M4-series, hand tighten the torque knob on the sight until it snaps twice.

- h. If zeroing is accurate, fire three more shots to confirm. If zero is not accurate, repeat steps (e) through (g) until zeroing is complete.
- i. Install adjustment cap by rotating clockwise and hand tighten.

NOTE: Sight picture - place the red dot on center mass of the target and engage.

**Evaluation Preparation:** SETUP: When the borelight is not available, use the iron sights on a zeroed weapon to zero the M68 sight. On an M4-series carbine, reconfirm zero if the M68 sight is moved to a different slot on the rail.

BRIEF SOLDIER: Tell the soldier that each click of the adjustment screw makes a 4-millimeter movement of the point of impact at 25 meters (1/2 MOA) and that the aiming method (two eyes open or one eye open) used to zero must be used to engage targets.

<b>Performance Measures</b>	<u><b>GO</b></u>	<u><b>NO GO</b></u>
1. Opened lens covers and turned the rotary switch clockwise until the red dot intensity contrasted suitably with the target background on the M68 sight.	—	—
2. Looked through the sight to get a rough estimate of the zeroing adjustment required.	—	—
3. Removed (if required) the adjustment screw caps from the adjustment screws by turning them counterclockwise.	—	—
4. Inserted (if required) an adjustment tool (coin, screwdriver, knife) in the adjustment screw slot and made the appropriate adjustments.	—	—
5. Zeroed the M68 sight by firing and striking the zero target center mass with a three-round shot group.	—	—
6. Confirmed zero by firing another three-round shot group at a zero target, checked the impact points on the target, confirmed accuracy.	—	—
7. Installed the adjustment (did not use tools) caps by rotating clockwise and hand tightened.	—	—

**Evaluation Guidance:** Score the soldier GO if all performance measures are passed. Score the soldier NO-GO if any performance measure is failed. If the soldier scores NO-GO, show the soldier what was done wrong and how to do it correctly.

**References**

**Required**

**Related**

- FM 23-9
- TM 9-1005-319-10
- TM 9-1240-413-12&P

**Boresight an M68 Sight****071-705-0004**

**Conditions:** Given an M68 sight with components, boresight target, and battery (0E890) DL1/3N.

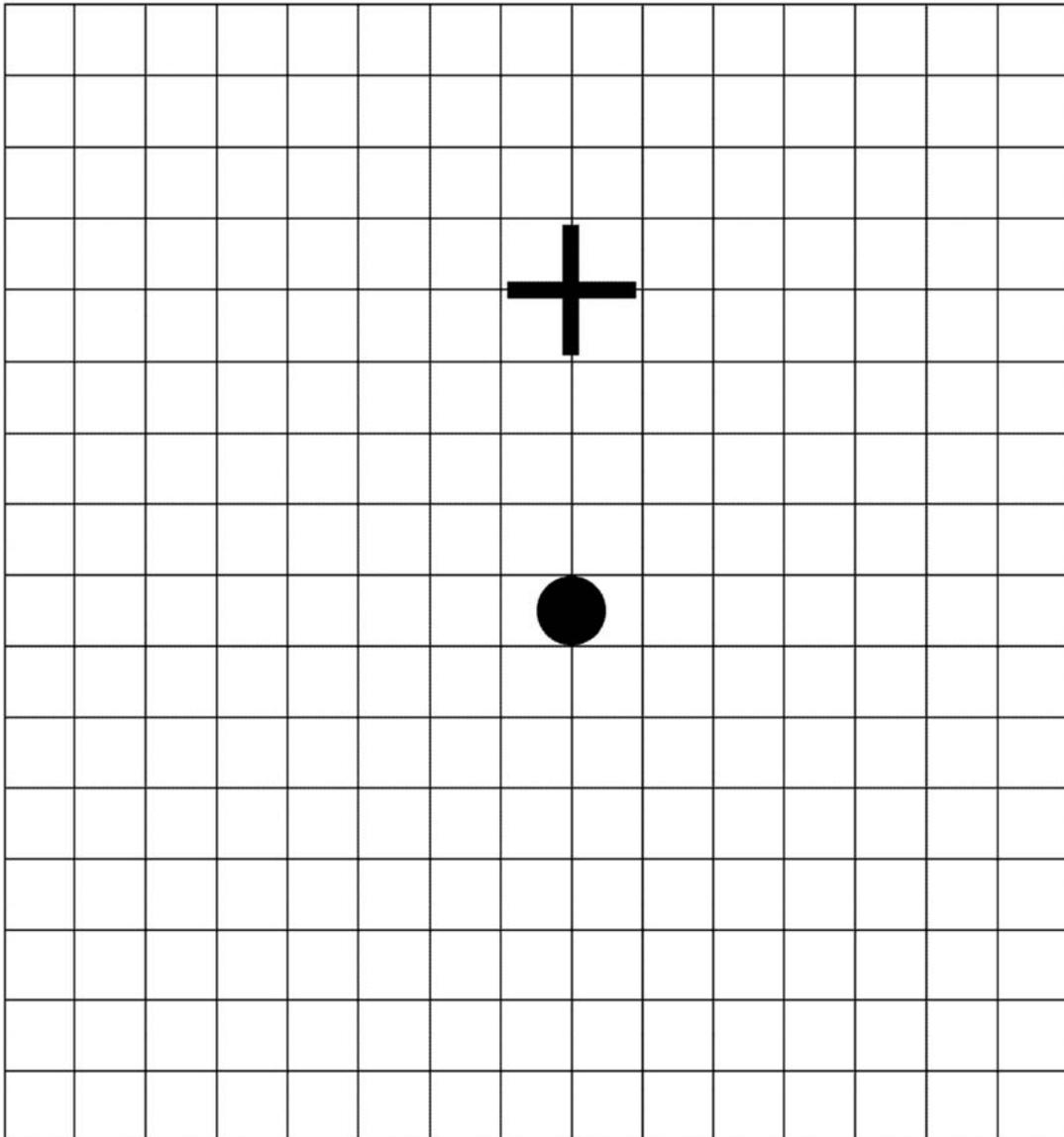
**Standards:** Centered the red dot of an M68 sight on the black dot of the boresight target striking center mass.

**Performance Steps**

1. Check the alignment of the borelight.
  - a. Place the appropriate mandrel with the borelight attached in the muzzle of the weapon.
  - b. Turn on the borelight so that the laser beam strikes the boresight target offset 10 meters away.
  - c. Slowly rotate the borelight one-half turn (180 degrees) while watching the beam on the target area (note any circular pattern made).
  - d. If the beam remains stationary, the laser is boresighted, go to step 3 and use the appropriate boresight target for the weapon being boresighted.
  - e. If the beam rotates in a circle, adjust the windage or elevation (or both) until the beam remains stationary or rotates on itself, no more than 1 centimeter (go to step 2).
2. Adjust the borelight (if necessary).
  - a. Move the target to a distance of 2 meters.
  - b. Mark the location of the laser beam.
  - c. Slowly rotate the borelight one-half turn.
  - d. Note the new location of the laser beam.
  - e. Adjust the windage and elevation until the laser beam moves one-half the distance to its original location.
  - f. Continue this procedure until the laser beam remains stationary (or spins upon itself within one centimeter) when the bore light is rotated.
  - g. Move the target to a distance of ten meters and recheck the boresight (repeat this process at 10 meters if necessary).
3. Boresight the M68 sight to the weapon.
  - a. Select the boresight target offset for the appropriate weapon (M16-series rifle, M4 carbine, or M4 modular weapon) and the M68 sight (Figures 1 and 2).

**Performance Steps**

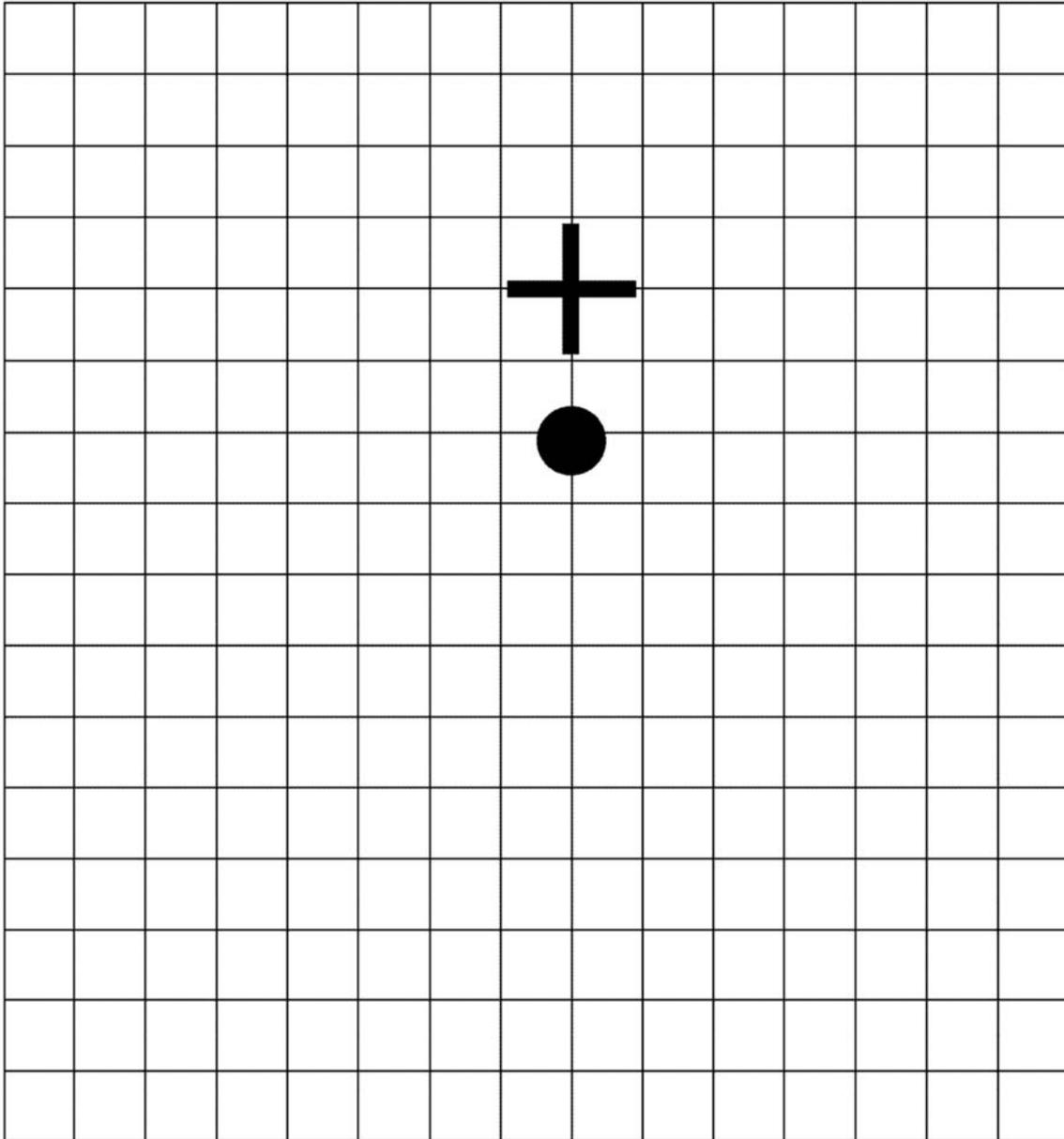
**10-METER BORESIGHT TARGET**



At a range of 10 meters aim at the cross and adjust the CCO so that the bore light strikes the dot.

Figure 1. 10-meter boresight target for M16-series rifle.

## Performance Steps

**10-METER BORESIGHT TARGET**

At a range of 10 meters aim at the cross and adjust the CCO so that the bore light strikes the dot.

Figure 2. 10-meter boresight target for M4-series carbine.

- b. Position the weapon so the borelight strikes the black dot on the boresight target.
  - c. Adjust the M68 sight until the red dot is centered on the cross on the boresight target offset.
  - d. The weapon is boresighted when the laser borelight is on the black dot and the red dot (from the M68 sight) is centered on the cross.
4. Sight adjustments for the M68 sight are as follows:

**Performance Steps**

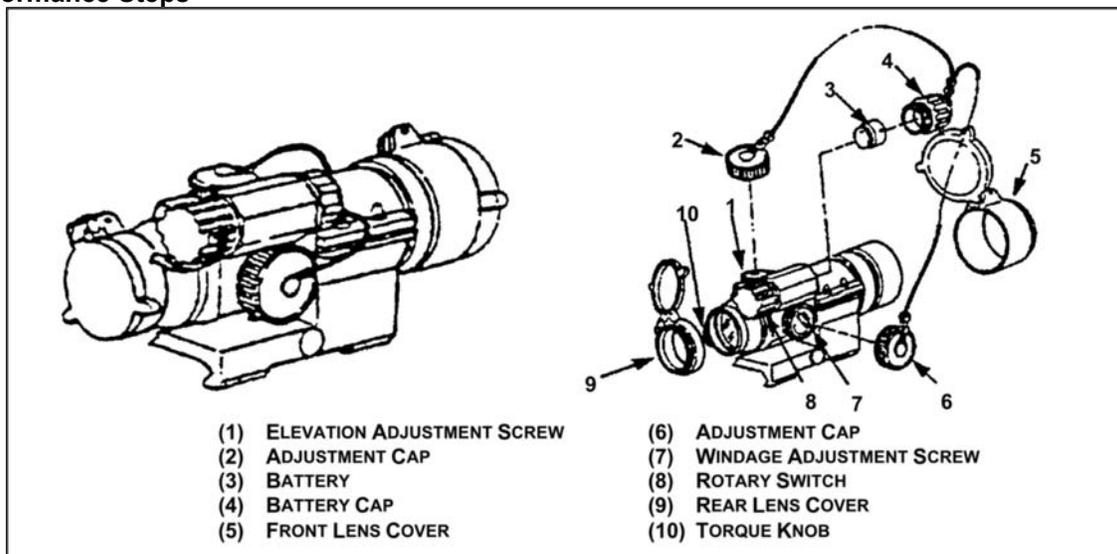


Figure 3. M68, close combat optic.

- a. Elevation adjustments screw (Figure 3): One click at 25 meters equals 4 millimeters; clockwise equals down.
- b. Windage adjustment screw (Figure 3): One click at 25 meters equals 4 millimeters; clockwise equals left.
- c. Rotary switch--10 positions (Figure 3):
  - (1) Position 1 equals OFF.
  - (2) Position 2 equals NIGHT.
  - (3) Position 3 through 10 equals daytime intensity.

**Evaluation Preparation:** SETUP: Before boresighting the weapon and M68 sight, zero the iron sights as outlined in FM 23-9.

BRIEF SOLDIER: Tell the soldier to boresight the weapon without damaging equipment or injuring personnel.

NOTE: At ranges of 150 meters and beyond, the effects of parallax are minimal. However, at ranges of 25 meters and closer, parallax exists and the firer must ensure that the red dot is centered while boresighting or zeroing.

**Performance Measures**

	<u>GO</u>	<u>NO GO</u>
1. Checked the alignment of the borelight.	—	—
2. Adjusted the borelight (If necessary).	—	—
3. Boresighted the M68 sight to the weapon.	—	—
4. Made appropriate sight adjustments.	—	—

**Evaluation Guidance:** Score then soldier GO if all performance measures are passed. Score the soldier NO-GO if any performance measure is failed. If the soldier scores a NO-GO, show the soldier what was done wrong and how to do it correctly.

**References  
Required**

**Related  
FM 23-9**

**References  
Required**

**Related**  
TM 9-1240-413-12&P

## Maintain a Bayonet

071-000-0004

**Conditions:** Given an M9 multipurpose bayonet system; small-arms repairman tool kit; abrasive cloth; cleaner, lubricant and preservative (CLP); lubricating oil, Arctic weapon (LAW); lubricating oil, semifluid, automatic weapon (LSA); dry cleaning solvent; rubber gloves; solid film lubricant; wash pan; wiping rag; M16 rifle or M4 carbine; and a requirement to perform required operator maintenance on the bayonet.

**Standards:** Cleaned and inspected the M9 bayonet system and reported any deficiencies not corrected to supervisor.

### Performance Steps

1. Inspect the M9 bayonet.
  - a. Check function of lock release levers by placing bayonet on rifle lug. Ensure bayonet is securely retained and mounts and dismounts without interference.
  - b. Inspect blade for cracks, nicks, or blunted point.
  - c. Inspect and check handguard for cracks or looseness.
  - d. Inspect handle for cracks, breaks, or looseness.
  - e. Inspect for broken or dulled saw teeth.
  - f. Inspect for broken, cracked, or chipped "false edge" on blade.
  - g. Remove cap screw and latch assembly. Check for rust.
  - h. Inspect for loose, cracked, or broken cap screw.
2. Inspect the scabbard.
  - a. Inspect for cracks, cut or worn fabric or web gear.
  - b. Inspect for cracked or broken buckle of attaching assembly.
  - c. Inspect for cracked or broken scabbard body.
  - d. Inspect for bent or broken belt fastener.
  - e. Inspect for cracked or broken screwdriver tip or wire cutter plate/stud.
  - f. Inspect for broken or missing sharpening stone.
  - g. Inspect snaps to ensure they function.

3. Disassemble the M9 bayonet.

NOTE: Refer to Figure 1 for the following steps.

- a. Unscrew and remove cap screw (1).
- b. Remove latch assembly (2).
- c. Remove handle (3) from blade assembly (4).

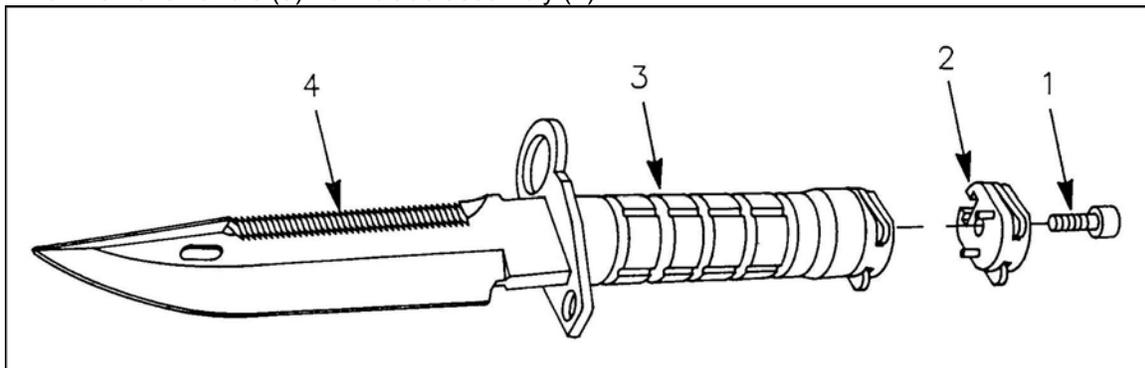


Figure 1. M9 bayonet disassembly.

4. Clean the M9 bayonet.
  - a. Reestablish finish as follows:

WARNING

### Performance Steps

Dry cleaning solvent is flammable and should not be used near an open flame or in a smoking area. Use only in a well-ventilated area. This solvent evaporates quickly and has a drying effect on the skin. When used without gloves, it may irritate, inflame, or cause cracks in the skin.

- (1) Remove all lubricant from surfaces to be treated with dry cleaning solvent. Wear rubber gloves and use wash pan and brush to apply dry cleaning solvent.
- (2) Roughen surface using abrasive cloth.
- (3) Apply solid film lubricant to shiny surfaces. Allow to dry 16 to 24 hours before handling.
- (4) Wipe bayonet with wiping rag and apply a light coat of CLP.

### 5. Reassemble the M9 bayonet.

NOTE: Refer to Figure 2 for the following steps.

- a. Install handle (1) on bayonet assembly (2) with small holes (3) for latch assembly (4) facing away from large hole (5) in hand guard (6).
- b. Install latch assembly (4) with locking lug (7) lined with large hole in hand guard (6).
- c. Install and tighten cap screw (8) until tight.

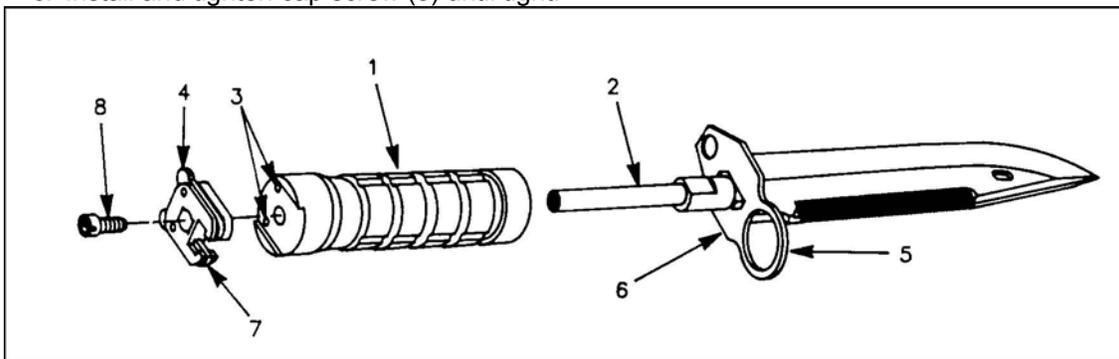


Figure 2. M9 bayonet reassembly.

### 6. Disassemble the M9 scabbard.

NOTE: Refer to Figure 3 for the following steps.

- a. Remove attaching assembly load bearing end (1).
- b. Separate attaching assembly scabbard end (2) by removing two socket head screws (3).

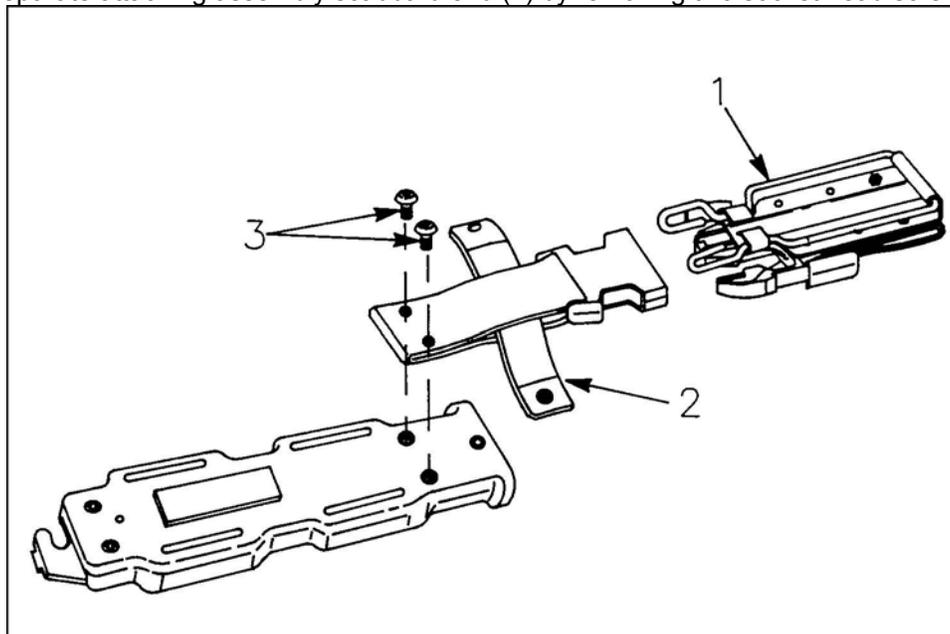


Figure 3. M9 scabbard disassembly.

**Performance Steps**

7. Clean the M9 scabbard.
  - a. Use solid film lubricant on shiny metal surfaces (see step 4).
  - b. Wipe metal parts of scabbard with wiping rag and apply a light coat of CLP.
  - c. Clean the scabbard body assembly with wiping rag.
  - d. Clean the load bearing end and attaching assembly with wiping rag.
8. Reassemble the M9 scabbard.
  - a. Position attaching assembly scabbard end (1) on scabbard body assembly (2) so that fastener will close around M9 bayonet. Install two socket head screws (Figure 4).

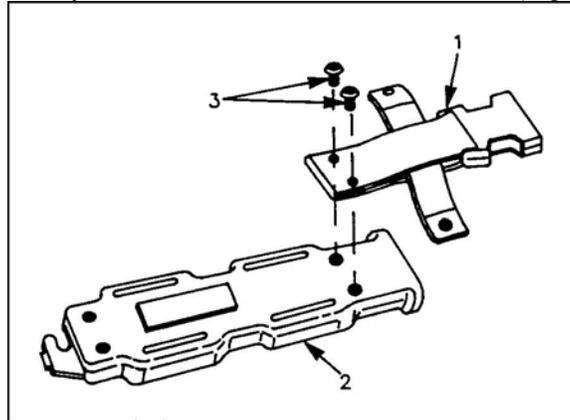


Figure 4. M9 scabbard reassembly.

- b. Install attaching assembly load bearing end (1) with plastic portion (2) towards M9 scabbard (3) as shown (Figure 5).

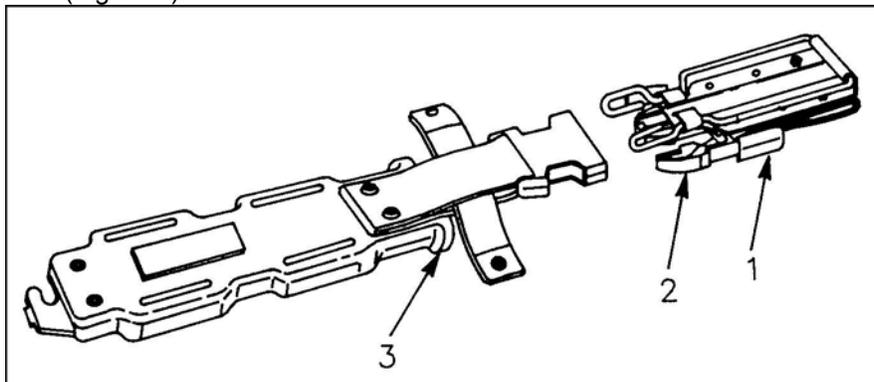


Figure 5. M9 scabbard reassembly (continued).

- c. Insert bayonet into the scabbard.
      - d. Fasten snap of restraining strap.

**Evaluation Preparation:** SETUP: At the test site, provide the soldier with all the equipment given in the task condition statement.

BRIEF SOLDIER: Tell the soldier to inspect the bayonet system for completeness and serviceability, and clean the parts of the system as required.

**Performance Measures**

1. Inspected the M9 multipurpose bayonet system.

<b><u>GO</u></b>	<b><u>NO GO</u></b>
—	—

**Performance Measures**

	<u>GO</u>	<u>NO GO</u>
2. Disassembled the M9 bayonet.	—	—
3. Cleaned the M9 bayonet.	—	—
4. Reassembled the M9 bayonet.	—	—
5. Disassembled the M9 scabbard.	—	—
6. Cleaned the M9 scabbard.	—	—
7. Reassembled the M9 scabbard.	—	—

**Evaluation Guidance:** Score the soldier GO if all performance measures are passed. Score the soldier NO-GO if any performance measure is failed. If the soldier scores NO-GO, show the soldier what was done wrong and how to do it correctly.

**References**  
**Required**

**Related**  
 FM 100-14

## Prepare an Antiarmor Range Card

071-317-0000

**Conditions:** Given a DA Form 5517-R (Standard Range Card), and all pertinent data (as received from the squad leader's briefing).

**Standards:** Completed the standard range card within 15 minutes. Included a scaled-down sketch of the terrain, marginal data, all data from the squad leader's briefing and data section of the range card which included the unit's designation (no higher than company level); a magnetic north arrow (properly oriented); a sector of fire, drawn in solid lines, which clearly showed the locations of left and right limits, maximum engagement line, and dead spaces within the sector of fire; target reference points (TRPs); the weapon's location, indicated by its distance and azimuth from and location relative to a known point (weapon reference point); and a data section, which included type of position, date (day and month), weapon type, circle intervals (in meters), azimuth distance, and descriptive remarks about anything of particular interest or not covered previously.

### Performance Steps

#### 1. Definitions.

- a. Range card (DA Form 5517-R). A range card is a sketch of the terrain that a particular weapon has been assigned to cover by fire. The range card contains data that--
  - (1) Helps a leader(s) plan and control fires.
  - (2) Orients replacement personnel or units.
  - (3) Helps the gunner quickly and correctly detect and engage targets in his assigned sector of fire.
- b. Sector of fire. A sector of fire is the portion of battlefield each gunner must cover. Leaders show each gunner where to position his weapon and what part of the terrain he will be responsible for. Leaders use terrain features (target reference points) or azimuths to indicate the boundaries (left and right limits) of each sector of fire. They may assign each gunner a primary and a secondary sector of fire.
- c. Target reference points. The company commander chooses natural or manmade terrain features as TRPs. These help leaders and gunners locate targets and adjust fires. Each TRP is identified by a unique combination of letters, numbers, or both. Leaders show each gunner the TRP(s) in or near his sector of fire, and the gunner marks each TRP on his range card. Normally, each sector of fire has between one and three TRPs.
- d. Dead space. Dead space is any natural or manmade feature that the gunner cannot fire into or behind. For example, dead space could include a hill, draw, or building. Each gunner marks the dead spaces in his sector with diagonal lines (////) or with the words, "DEAD SPACE." Other weapons will cover dead spaces.
- e. Maximum engagement line. The area a gunner can cover is also limited by the weapon's maximum engagement range. In some places, dead spaces may prevent the gunner from firing all the way to the maximum engagement range. Thus, he should draw the maximum engagement line in from of the dead spaces in his sector of fire. He can write out "MAXIMUM ENGAGEMENT LINE," or he can shorten it to, "MAX ENG LINE."
- f. Alternate and supplementary positions. Leaders may assign each gunner an alternate and supplementary position. Once leaders have given gunners the necessary information, each gunner may begin preparing a range card(s). He should prepare a separate range card for each assigned position (sector of fire).

## Performance Steps



Figure 1. Area of Coverage.

EXAMPLE: Figure 1 shows the terrain used in this example. The section leader says to the squad leader, "I want you to cover a sector of fire that starts here at your firing position and goes to a point about \_\_\_\_ meters past that windmill on the left, moves to the right across the high ground at \_\_\_\_ meters behind the houses, through the wood line, and behind the hill, church, and orchard, until it reaches a point about \_\_\_\_ meters beyond the right leading edge of that orchard, then returns here to your firing position.

"The enemy will approach from the north, so they will use those two roads to enter our sector. On the road behind the church and the orchard, engage enemy armored vehicles as soon as they come into range. On the other road, engage enemy targets as soon as they appear from behind the left side of that large hill. Copy down the two target reference points in your sector: The windmill is TRP C-1, and the church is TRP C-2."

2. Preparation of the range card. The leader gives the gunner the necessary information, and the gunner prepares the range card. If assigned a supplementary firing position, the gunner must prepare a range card for that also. To prepare the range card(s), he first must determine the following and write or draw it on the range card:
  - a. Sector sketch. Draw a sector sketch that covers the entire sector. Draw the sketch as large as possible, but no larger than the outer circle. For large areas covered by trees or woods, draw only the outline and label the area "woods" or "orchard," whatever best describes it (Figure 2). In the lower part of the range card, indicate the firing position, which is shown by a dot in the smallest arc.

Performance Steps

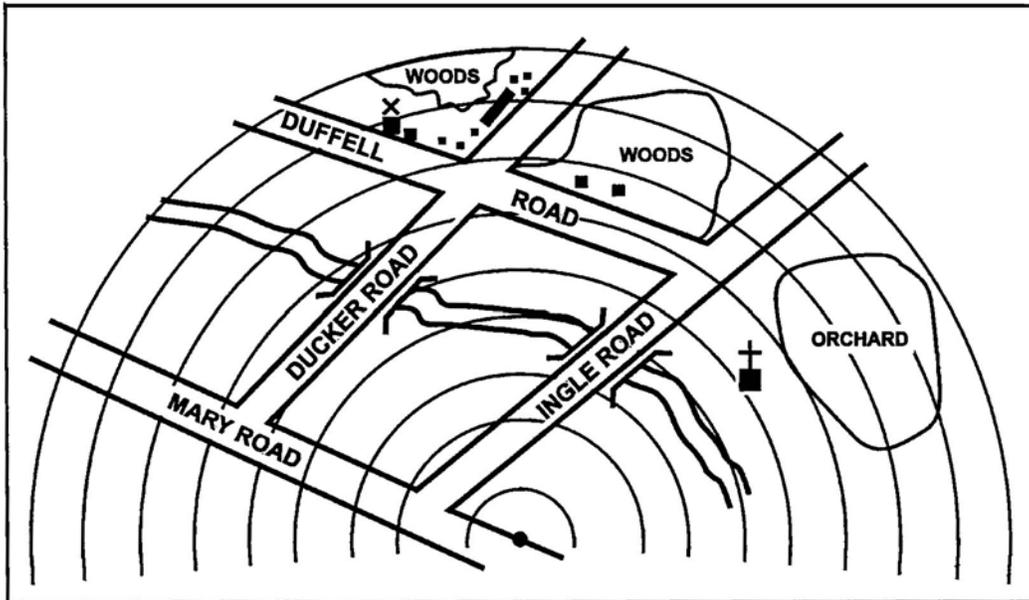


Figure 2. Sector sketch.

- b. Left and right limits. Draw lines from the firing position to reflect left and right limits (Figure 3). Number the left limit "1" and the right limit "2."

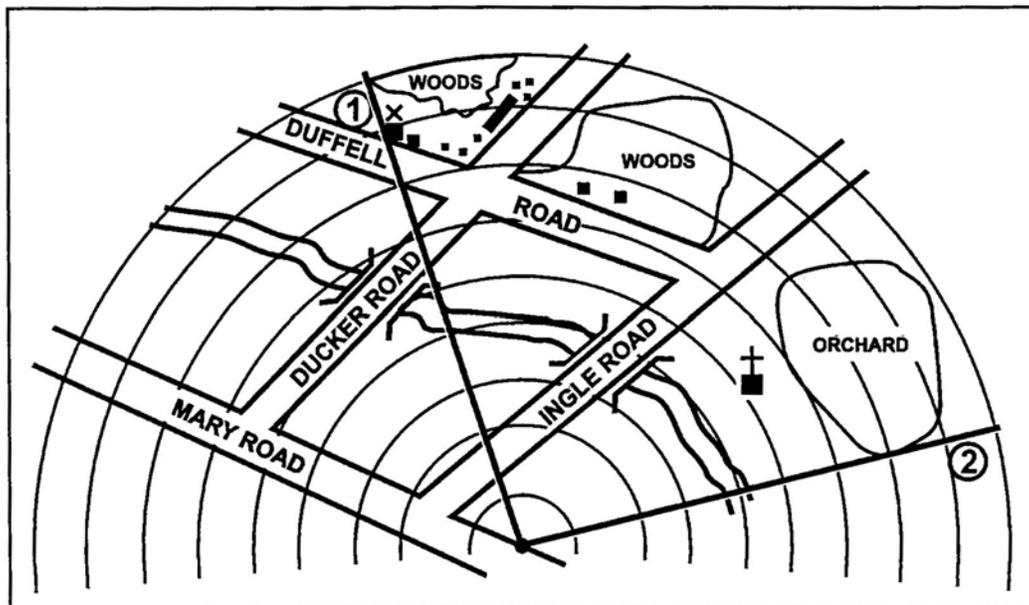


Figure 3. Left and right limits.

- c. Maximum engagement line. If there are no limitations, ensure the maximum engagement line follows the arc of the circle representing the maximum engagement range (Figure 4). Draw the maximum engagement line in front of anything that will prevent firing to the maximum engagement range.

Performance Steps

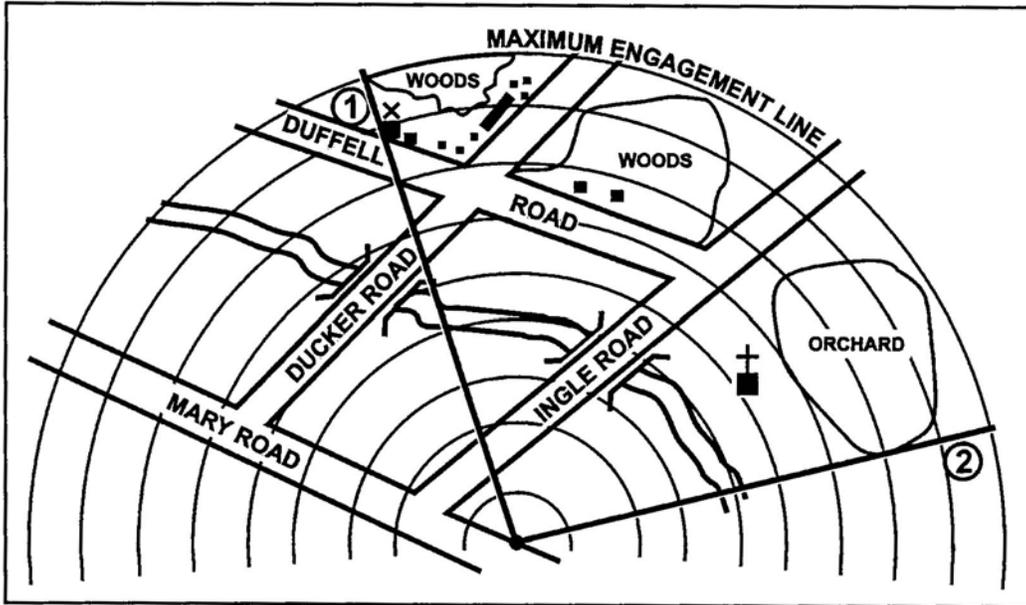


Figure 4. Maximum engagement line.

- d. Target reference points. Place the TRP numbers(s) on the range card (Figure 5) and number them from left to right, beginning with the number "3."

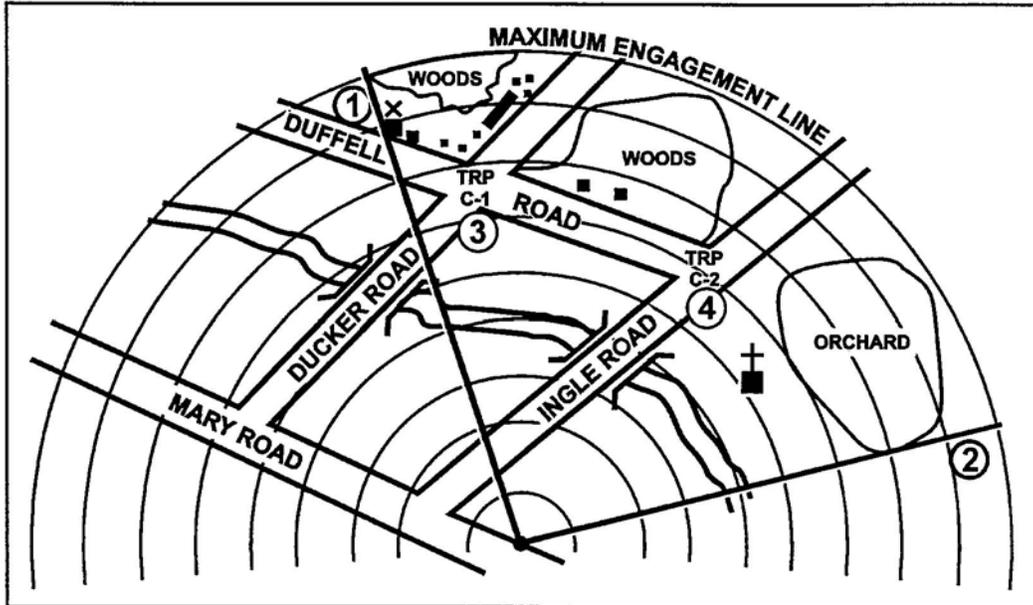


Figure 5. Target reference points.

- e. Dead spaces. Place diagonal lines, or the words "dead space," where significant dead space occurs (Figure 6).

Performance Steps

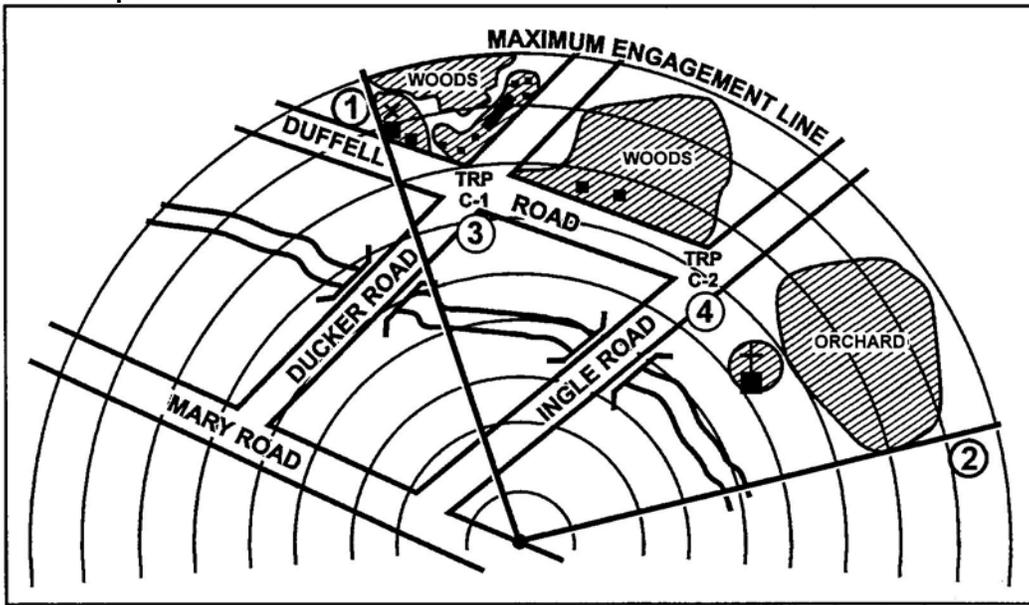


Figure 6. Dead spaces.

- f. Weapon reference point. Draw this as a line with a series of arrows. Extend the arrows from a known terrain feature. Aim the arrows at the weapon symbol. Number the WRP last-assign it a 6-digit grid. If there is no terrain feature to use as a WRP, show the weapon's location as an 8-digit grid coordinate and write it in the REMARKS block on the range card (Figure 7).

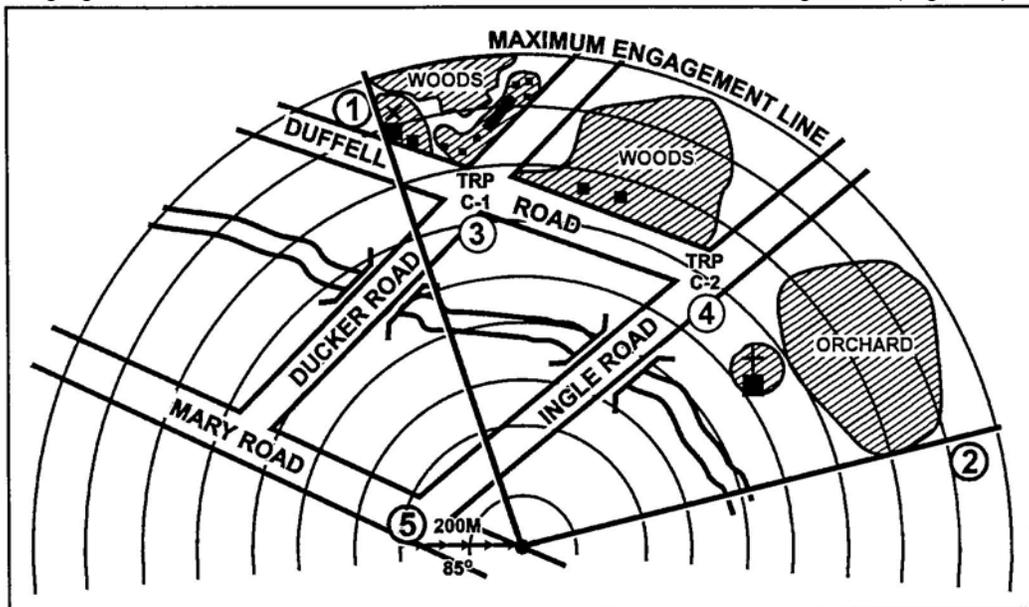


Figure 7. Gunner reference point.

- g. Marginal information. Place this at the top of the range card (Figure 8).

Performance Steps

<b>EXAMPLE</b>	<b>STANDARD RANGE CARD</b>	<b>EXAMPLE</b>
SQD _____ PLT _____ CO _____	<b>This range card may be used for all types of direct-fire weapons.</b>	 MAGNETIC NORTH

Figure 8. Example completed data section at top of range card.

- (1) Unit description. Indicate up to company level only.
  - (2) Magnetic north. Orient the range card with the terrain and determine the direction of magnetic north with a compass. Write in the words, "MAGNETIC NORTH" and draw a magnetic north arrow using the straight edge of the compass.
- h. Data section. This is at the bottom of the range card (Figure 9).

DATA SECTION					
POSITION IDENTIFICATION Primary				DATE <u>24</u> May	
WEAPON			EACH CIRCLE EQUALS <u>111</u> METERS		
NO	DIRECTION/ DEFLECTION	ELEVATION	RANGE	AMMO	DESCRIPTION
<b>EXAMPLE</b>					
REMARKS					

Figure 9. Example completed data section at bottom of range card.

- (1) POSITION IDENTIFICATION. Write in "primary" or "secondary."
- (2) WEAPON. Write in the type of weapon: TOW, Dragon, javelin, or 90-mm recoilless rifle.
- (3) DATE. Enter the day and month.
- (4) EACH CIRCLE EQUALS \_\_\_\_\_ METERS. Write in the distance in meters between the circles. To determine the distance, count the intervals from the weapon to the maximum engagement line. Divide the number of intervals into the range. This gives the distance between circles (Figure 10).

Performance Steps

<b>STANDARD RANGE CARD</b>					
SQD _____ PLT _____ CO _____	<i>[You may use this range card for all types of direct-fire weapons.]</i>				 MAGNETIC NORTH
<div style="display: flex; justify-content: space-between;"> <span style="font-size: 24px; font-weight: bold;">EXAMPLE</span> <span style="font-size: 24px; font-weight: bold;">EXAMPLE</span> </div>					
DATA SECTION					
POSITION IDENTIFICATION <u>Primary</u>				DATE <u>24 May</u>	
WEAPON				EACH CIRCLE EQUALS <u>111 METERS</u>	
NO	DIRECTION/ DEFLECTION	ELEVATION	RANGE	AMMO	DESCRIPTION
1	346		1,000 M		Left limit
2	38		1,000 M		Right limit
3	350		672 M		TRP C-1 Junction of Ducker and Duffell Road
4	18		672 M		TRP C-2 Junction of Ingle and Duffell Road
5					
REMARKS    ⑤ WRP-RJ at GL 1632 1194, 85° at 200 M TRP C-1 Intersection Duffell and Ducker Roads.					

Figure 10. Example completed range card.

EXAMPLE: Dividing 1,000 meters by 7.5 intervals - 133 meters, which rounds down to 130 meters between circles.

(5) Number as many blank rows as there are numbered items on the range card.

EXAMPLE: This example has five numbered locations, so number rows 1 through 5 in the NO column.

(6) DIRECTION/DEFLECTION. List either the degrees or the azimuth from the azimuth bevel ring (improved TOW vehicle), but not both. Mark through either DIRECTION or

**Performance Steps**

- DEFLECTION, whichever does not apply.
- (7) ELEVATION: This applies only to ground-mounted machine guns with traversing and elevating mechanisms.
- (8) RANGE. Indicate distance in meters from the weapon to the TRP or target engagement area.
- (9) DESCRIPTION. Write "left limit" on the first line. Write in "right limit" on the second line. Write in the names of the other points numbered on the range card.

EXAMPLE: In this example, write on the third line, for number 3 on the range card, "TRP C-1, junction of Ducker and Duffels Roads," and so forth.

- i. Copies of range card. Draw two copies of each range card. Keep one copy at the firing position. The squad or section leader will normally pick up the second copy to prepare fire plans and coordinate final fires.

**Evaluation Preparation:** SETUP: At the test site, provide all equipment and information given in the task condition statement.

BRIEF SOLDIER: Tell the soldier he will be evaluated on his ability to correctly complete an antiarmor range card. Give him the following information: type of position, type of weapon, left and right limits, and TRPs.

**Performance Measures**

	<u>GO</u>	<u>NO GO</u>
1. Completed an antiarmor range card, including:	_____	_____
a. An arrow between the reference point and the weapon position, including azimuth and distance.		
b. Left and right limits.		
c. All target engagement locations.		
d. TRPs, including the TRP number.		
e. A maximum engagement line.		
f. All prominent terrain features, both natural and manmade.		
g. All dead spaces.		
h. Unit, not to exceed company.		
i. Arrow for Magnetic North.		
j. Type of position.		
k. Type of weapon.		
l. Correct interval between circles.		
m. Date.		
n. The following data on all target engagement locations and TRPs:		
(1) Direction or deflection.		
(2) Range.		
(3) Description.		
(4) TRP number for all TRPs.		
2. Ensured that the range card was readable and not cluttered.	_____	_____
3. When asked, stated two copies are required.	_____	_____

**Evaluation Guidance:** Score the soldier GO if all performance measures are passed. Score the soldier NO-GO if any performance measure is failed. If the soldier scores NO-GO, show the soldier what was done wrong and how to do it correctly.

**References**

**Required**  
DA FORM 5517-R

**Related**  
FM 23-34  
FM 3-23.35

**Engage an Enemy with a Bayonet**

**071-326-0100**

**Conditions:** Given a bayonet attached to an M16-series rifle or an M4 carbine.

**Standards:** Killed, captured, or forced the enemy to withdraw.

**Performance Steps**

1. Assume the attack position.
2. Perform attack movements.
  - a. Thrust.
  - b. Butt stroke to head.
  - c. Slash.
  - d. Butt stroke to groin.
  - e. Smash.
  - f. Whirl.
3. Perform defensive movements.
  - a. Parry right and left.
  - b. Parry right and thrust.
  - c. Parry right, slash, and butt stroke.
  - d. Low block.
  - e. Side block (left and right).
  - f. High block.

**Evaluation Preparation:**

SETUP: At the test site, provide the soldier with a pugil stick, padded helmet, chest protector, pugil gloves, and groin protector.

BRIEF SOLDIER: Tell the soldier to engage an enemy.

**Performance Measures**

	<u>GO</u>	<u>NO GO</u>
1. Assumed the attack position.	___	___
2. Performed attack movements.	___	___
3. Performed defensive movements.	___	___

**Evaluation Guidance:** Score the soldier GO if all performance measures are passed. Score the soldier NO-GO if any performance measure is failed. If the soldier scores NO-GO, show the soldier what was done wrong and how to do it correctly.

**Operate M145 Telescope, Straight  
071-703-0001**

**Conditions:** Given an M145 telescope, straight.

**Standards:** Placed the M145 telescope, straight, into operation without damaging equipment.

**Performance Steps**

1. Install and check the battery.
  - a. Remove the battery cap by turning it counterclockwise and holding the rotary reticle switch stationary.

**CAUTION**

Before installing the battery, inspect the threads on the battery housing and battery cap to ensure that they are free of moisture and dirt, and the O-ring in the battery cap is present. Failure to do so could result in loss of power and shorten battery life.

- b. Insert battery with positive end to cap.
  - c. Reinstall battery cap by holding the rotary reticle illumination switch stationary while turning the battery cap clockwise until snug.
  - d. Open rear lens cover. Turn rotary reticle illumination switch and look through rear lens. Verify that the reticle is illuminated. If not, replace the battery.
2. Turn the elevation adjustment dial.
  - a. Rotate the silver lock to the UP position.
  - b. Turn the elevation adjustment dial counterclockwise to move the elevation up.
  - c. Turn the elevation adjustment dial clockwise to move the elevation down.
3. Turn the windage adjustment screw.
  - a. Turn the windage adjustment screw clockwise to move the windage to the left.
  - b. Turn the windage adjustment screw counterclockwise to move the windage to the right.

**Evaluation Preparation:** SETUP: At the test site, provide the soldier with all the equipment given in the task condition statement.

BRIEF SOLDIER: Tell the soldier to place the M145 telescope into operation.

**Performance Measures**

1. Installed and checked the battery.
2. Turned the elevation adjustment dial--
  - a. Clockwise to move it up.
  - b. Counterclockwise to move it down.
3. Turned the windage adjustment screw--
  - a. Clockwise to move left.
  - b. Counterclockwise to move right.

**GO      NO GO**

_____	_____
_____	_____
_____	_____

**Evaluation Guidance:** Score the soldier a GO if all performance measures are passed. Score the soldier a NO-GO if any performance measure is failed. If the soldier scores a NO-GO, show the soldier what was done wrong and how to do it correctly.

**References  
Required**

**Related**  
TM 9-1240-415-13&P

**Maintain M145 Telescope, Straight**  
**071-703-0002**

**Conditions:** Given an M145 telescope with components, battery (OE890) DL1/3N, clean water, optical lens cleaning compound, lens paper, soft cloth, and a requirement to perform operator maintenance on the sight.

**Standards:** Cleaned and inspected the M145 telescope components and accessories for serviceability; reported unserviceable items to the supervisor.

**Performance Steps**

1. Inspect the M145 telescope, straight.
  - a. Inspect the exterior of the sight for loose or missing parts and cleanliness.
  - b. Inspect for visual obstruction of target image, dust, dirt, pits or moisture on optical surfaces and loose or broken optical elements by looking through the sight. Ensure that the 300m, 500m, 700m, and 800m marks in the reticle are visible.
  - c. Inspect the battery cap and ensure that battery cap threads are clean and undamaged. Ensure the O-ring and spring is in the battery cap.
  - d. Inspect mount for damage that will prevent sight from being installed.
  - e. Inspect both lens covers and ensure they can be snapped in place.
  - f. Inspect torque limiting knob for damage that will prevent sight from being installed.
  - g. Inspect torque limiting shaft and ensure threads are not stripped.
  - h. Inspect and ensure signature reduction device and laser filter is present.
  - i. Report any deficiencies not correctable to supervisor.
2. Clean the M145 telescope, straight.
  - a. Clean the exterior of the M145 telescope, straight, and metal components by flushing with water and wiping with a soft cloth.
  - b. Clean the lens.
    - (1) Remove large particles from exposed lens surfaces by first blowing on the surfaces. Blow as much dust and dirt as possible from the exposed lens surfaces. Gather the center of a sheet of lens paper and use the edges to brush dust from the front and back lens.
    - (2) Remove mud using optical lens cleaning compound or by splashing water onto the lens.
    - (3) When all visible particles of dust and dirt have been removed, moisten a piece of lens paper and gently wipe over the lens surface. Dry with clean lens paper.
  - c. Remove the signature reduction device by rotating in a counterclockwise direction. Clean the signature reduction device by running water through the honeycomb. Shake out excess water and leave to dry.
  - d. Remove the laser filter by rotating in a counterclockwise direction. Clean the laser filter with lens paper.
  - e. Replace the laser filter and signature reduction device by screwing clockwise onto the front objective lens.

**Evaluation Preparation:** SETUP: At the test site, provide the soldier with all the equipment given in the task condition statement.

**BRIEF SOLDIER:** Tell the soldier to inspect the M145 telescope and components for completeness and serviceability, clean the telescope and components, and report any problems to his supervisor as required.

**Performance Measures**

1. Inspected the M145 telescope, straight, and reported all deficiencies not correctable to supervisor.

**GO**    **NO GO**

—        —

**Performance Measures****GO**    **NO GO**

2. Cleaned the M145 telescope, straight, using correct cleaning procedures.

\_\_\_\_\_

**Evaluation Guidance:** Score the soldier a GO if all performance measures are passed. Score the soldier a NO-GO if any performance measure is failed. If the soldier scores a NO-GO, show the soldier what was done wrong and how to do it correctly.

**References****Required****Related**

TM 9-1240-415-13&amp;P

### Maintain an M68 Sight

071-705-0001

**Conditions:** Given an M68 sight with components, battery (OE890) DL1/3N, clean water, cleaning tissues, and a requirement to perform required operator maintenance on the sight.

**Standards:** Cleaned and inspected sight, components, and accessories for serviceability; reported unserviceable items to the supervisor. Complied with all warnings and cautions.

#### Performance Steps

1. Clean the M68 sight.
  - a. Remove large particles from exposed lens surfaces by first blowing on the surfaces. Blow as much dust and dirt as possible from the exposed lens surfaces.
  - b. When all visible particles of dust and dirt have been removed, moisten a piece of lens paper, then gently wipe over the lens surface. Dry with clean lens paper.
2. Inspect the M68 sight, quick release, and mount for conditions indicated.
  - a. Look through the sight. Inspect for visual obstruction of target image, dust, dirt, pits, or moisture on optical surfaces, and loose or broken optical elements.
  - b. Ensure that battery cap is present and that battery cap's threads are clean and undamaged. Inspect the O-ring and spring in the battery cap.
  - c. Ensure that red dot is visible when rotary switch is set to one of the operating positions.
  - d. Check mounting bracket for damage that will prevent sight from being installed.
  - e. Ensure that both adjustment caps are present and that the threads are clean and undamaged.
  - f. Ensure that both lens covers are present and can be snapped in place.
  - g. Check mount for damage that will prevent it from being installed on the M16A2.
  - h. Check mount for damage that would prevent installation of the sight.

**Evaluation Preparation:** SETUP: Provide the soldier with the equipment and materials listed in the task condition statement.

BRIEF SOLDIER: Tell the soldier to inspect the sight and components for completeness and serviceability, and clean them as required.

#### Performance Measures

- |  | <u>GO</u> | <u>NO GO</u> |
|--|-----------|--------------|
| 1. Cleaned the M68 and components; used correct cleaning techniques. | _____     | _____        |
| 2. Inspected the sight and components for serviceability.            | _____     | _____        |

**Evaluation Guidance:** Score the soldier GO if all performance measures are passed. Score the soldier NO-GO if any performance measure is failed. If the soldier scores NO-GO, show the soldier what was done wrong and how to do it correctly.

#### References

Required

Related

TM 9-1240-413-12&P

**Operate an M68 Sight  
071-705-0002**

**Conditions:** Given an M68 sight with components and battery (3 Volt, DL1/3N) mounted on an M16A2 rifle or an M4/M4A1 carbine.

**Standards:** Prepared and correctly placed the M68 sight into operation.

**Performance Steps**

1. Install battery.
  - a. Remove battery cap by turning it counterclockwise.
  - b. Insert battery with positive end (+) toward cap.

**CAUTION:** Before installing battery cap, inspect threads on battery housing and battery cap to ensure they are free of moisture and dirt and that the O-ring in the battery cap is present. Failure to do so could result in loss of power and shorten battery life.

- c. Install battery cap by turning clockwise until snug. Hand tighten only.
- d. Open rear lens cover. Turn rotary switch clockwise and look through rear lens. Verify that the red dot is present. If red dot is not present, replace battery. When finished, turn rotary switch counterclockwise to OFF position, then close rear lens cover.

2. Light adjustment:

**WARNING:** At higher intensity settings, the red dot is visible through front of sight. For night vision operations, close front lens cover before turning rotary switch clockwise to positions 1 or 2. Check light for proper intensity before opening front lens cover. Close front lens cover before turning rotary switch counterclockwise to OFF position. Failure to follow this warning could reveal your position to the enemy.

**NOTE:** Sight is equipped with 10 positions: one OFF position and 9 positions for different dot intensity settings.

- a. Turn rotary switch clockwise to make light adjustments. The first two positions are low intensity for night vision operations. The third position is the lowest daytime setting. The last position is the extra high-intensity (EHI) setting.
- b. Close the lens cover and turn rotary switch counterclockwise to OFF position when the sight is not being used.

3. Sighting:

- a. Two-eyes-open method (preferred). Position the head so that you can focus one eye on the red dot and can scan downrange with the other eye. Place the red dot on the center of mass of the target and engage.
- b. One-eye-open method. With the non-firing eye closed, look through the sight to ensure that the red dot can be seen clearly. Place the red dot on the center of mass of the target and engage.

**NOTE:** The aiming method used to zero must also be used to engage targets. The weapon must not be canted during aiming or firing.

**Evaluation Preparation:** **SETUP:** At the test site, provide the soldier with all the equipment given in the task condition statement.

**BRIEF SOLDIER:** Tell the soldier to place the M68 sight into operation.

**Performance Measures**

	<u>GO</u>	<u>NO GO</u>
1. Installed battery.	_____	_____
2. Set light adjustment to proper setting.	_____	_____
3. Used proper sighting method.	_____	_____

**Evaluation Guidance:** Score the soldier GO if all performance measures are passed. Score the soldier NO-GO if any performance measure is failed. If the soldier scores NO-GO, show the soldier what was done wrong and how to do it correctly.

**References  
Required**

**Related**  
TM 9-1240-413-12&P

Subject Area 38: WEAPONS: HG/MINES/DEMOLITIONS

**Locate Mines by Visual Means**  
**052-192-1021**

**Conditions:** Given a field location suspected of having mines and tripwires.

**Standards:** The soldier will locate possible mine sites and visually search suspected areas for mines and tripwires. No visible mines, parts of mines, or tripwires will be overlooked.

**Performance Steps**

1. Visually locate possible mine sites by identifying the following areas:
    - a. Likely avenues of approach.
    - b. Key intersections and turnouts.
    - c. Trails, paths, and cleared spots in wooded areas.
    - d. Approaches and exits to bridges, fords, and tunnels.
    - e. Wood lines.
    - f. Depression and ditches.
    - g. Open fields and grasslands.
  
  2. Visually search possible mine sites for suspected mines and trip wires:
    - a. Loose dirt, tall grass, trip wires, and any disturbed ground in or around helicopter landing sites.
    - b. Signs of road repairs--holes filled with asphalt or other material.
    - c. Mud smears, grass, sticks, loose dirt, dung, or other material on roads.
    - d. Shoulders of roads at likely ambush sites.
    - e. Trip wires near known or suspected AT mines.
    - f. Signs placed in trees, on posts, or stakes.
    - g. Tunnels under roads.
    - h. Any unusual or out of place material.
    - i. Wilted plants or brush.
    - j. Souvenirs such as flags, equipment, and supplies.
    - k. Areas that local civilians avoid.
    - l. Culverts and bridges.
  
  3. Report all suspected areas to the team/squad leader.
- NOTE: Conduct a check on learning and summarize the learning activity.

**Evaluation Preparation:** SETUP: Simulate a mined and tripwired area.

BRIEF SOLDIER: Tell the soldier to look at the terrain and visually locate possible mined and tripwired areas.

**Performance Measures**

	<u>GO</u>	<u>NO GO</u>
1. Visually located possible mine sites by locating the following areas:	—	—
a. Likely avenues of approach.		
b. Key intersections and turnouts.		
c. Trails, paths, and cleared spots in wooded areas.		
d. Approaches and exits to bridges, fords, and tunnels.		
e. Wood lines.		
f. Depressions and ditches.		
g. Open fields or grassland.		
2. Visually searched possible mine sites for suspected mines and tripwires.	—	—



**Install an M21 Antitank (AT) Mine**  
**052-192-1117**

**Conditions:** As a combat-engineer squad member in a field environment, given an M21 AT mine, an M120 booster, an M607 fuze, an M26 arming wrench, an entrenching tool, G697 silicone grease, and sandbags.

**Standards:** Installed an M21 AT mine, in the proper sequence, without causing the mine to detonate.

**Performance Steps**

1. Inspect the mine and components.

**CAUTION:** IF THERE IS A PROBLEM IN ANY OF THE FOLLOWING STEPS, NOTIFY THE NONCOMMISSIONED OFFICER IN CHARGE (NCOIC).

- a. Check to see if the mine is dented, cracked, or damaged. If it is, do not use it.
- b. Ensure that there is no obvious damage to the M607 fuze. Remove the closure cap and, while keeping your hand clear, inspect the fuze assembly by removing the D ring (cotter pin) and stop band to ensure that the plastic collar is intact. Rotate the fuze around the U-band in a 360-degree circle, inspecting the entire fuze (Figure 052-192-1117-1).

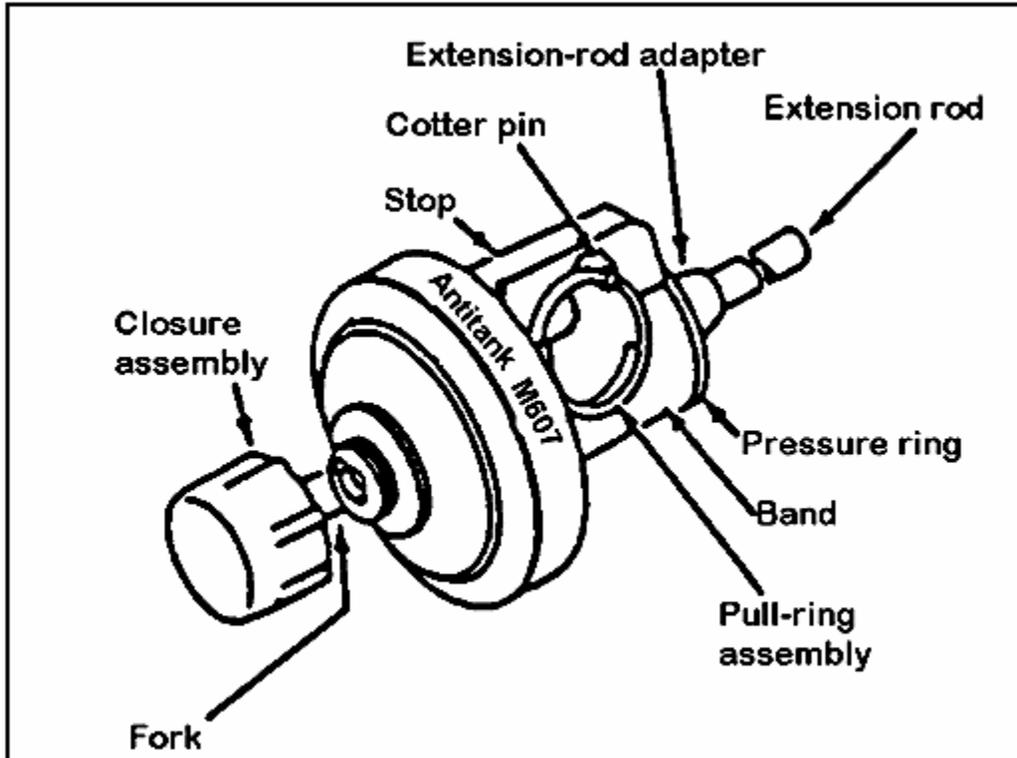


Figure 052-192-1117-1  
M607 Fuze

- c. Replace the stop band, D ring and closure cap.

**CAUTION:** IF THE TOP OF THE FUZE TURNS WITH THE STOP AND BAND, THE NECK OF THE FUZE IS BROKEN.

2. Insert the booster.

- a. Turn the mine upside down. Use the screwdriver end of the M26 wrench to remove the closing plug from the bottom of the mine by turning the plug counterclockwise (Figure 052-192-1117-2).

**Performance Steps**

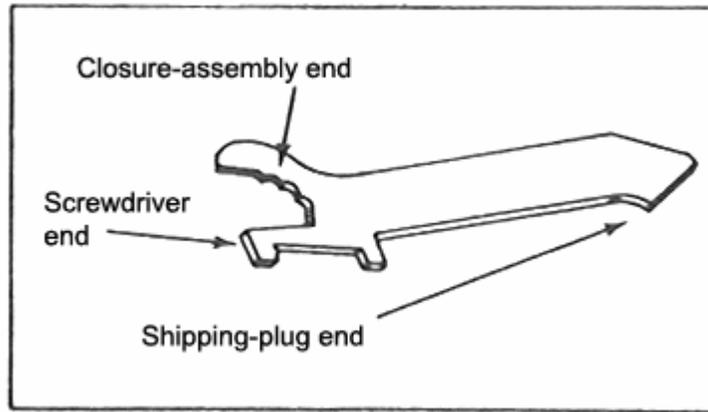


Figure 052-192-1117-2  
M26 Wrench

- b. Examine the booster well for foreign material. If foreign material is present, gently tap the side of the mine with your hand to dislodge it.

**CAUTION: IF THE FOREIGN MATERIAL CANNOT BE REMOVED, REPLACE THE CLOSING PLUG. DO NOT USE THE MINE.**

- c. Insert the M120 booster, with the washer side toward the fuze, into the booster well.
- d. Use the M26 wrench to replace the closure plug, with the gasket side toward the booster, and turn clockwise.

**NOTE:** For long-term emplacement, smear G697 silicone grease on the threads of the closing-plug assembly.

- 3. Fuze the mine.
  - a. Turn the mine over. Use the M26 wrench to remove the shipping plug from the fuze well on top of the mine (Figure 052-192-1117-3).

## Performance Steps

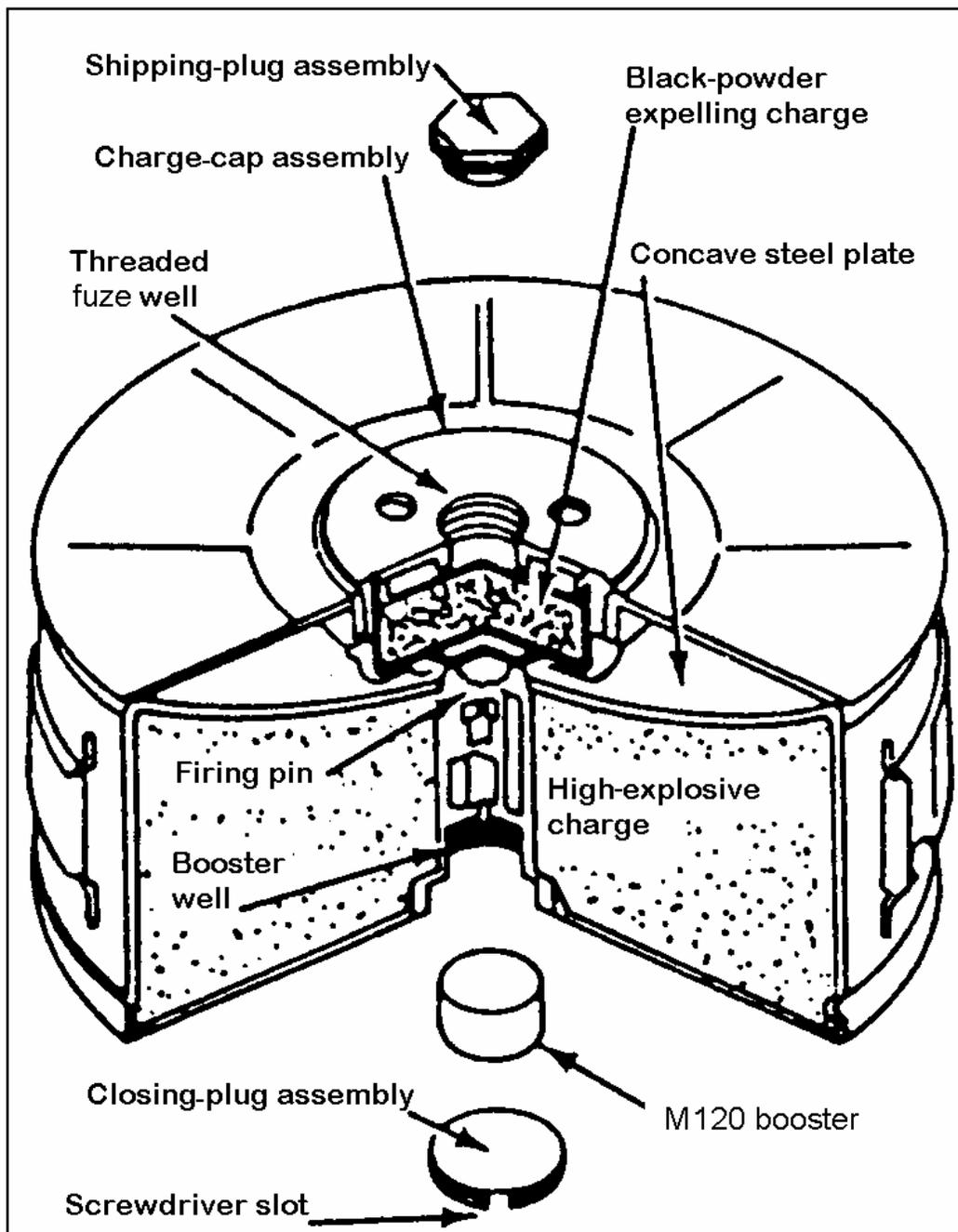


Figure 052-192-1117-3  
View of M21 AT Mine

- b. Examine the fuze well for foreign material. If foreign material is present, gently shake the mine to dislodge it.

**CAUTION:** IF THE FOREIGN MATERIAL CANNOT BE REMOVED, DO NOT USE THE MINE.

- c. Use the M26 wrench to remove the closure assembly from the M607 fuze. Ensure that the gasket remains in place on the fuze.

- d. Screw the fuze, hand tight, into the fuze well and set the mine to the side.

**NOTE:** For long-term emplacement, smear G697 silicone grease on the fuze threads.

### Performance Steps

4. Dig a hole to fit the mine.

NOTE: Mines with extension rods should be placed in tall grass, if possible.

- a. Dig a hole deep enough so that the top of the mine will be at ground level (Figure 052-192-1117-4).

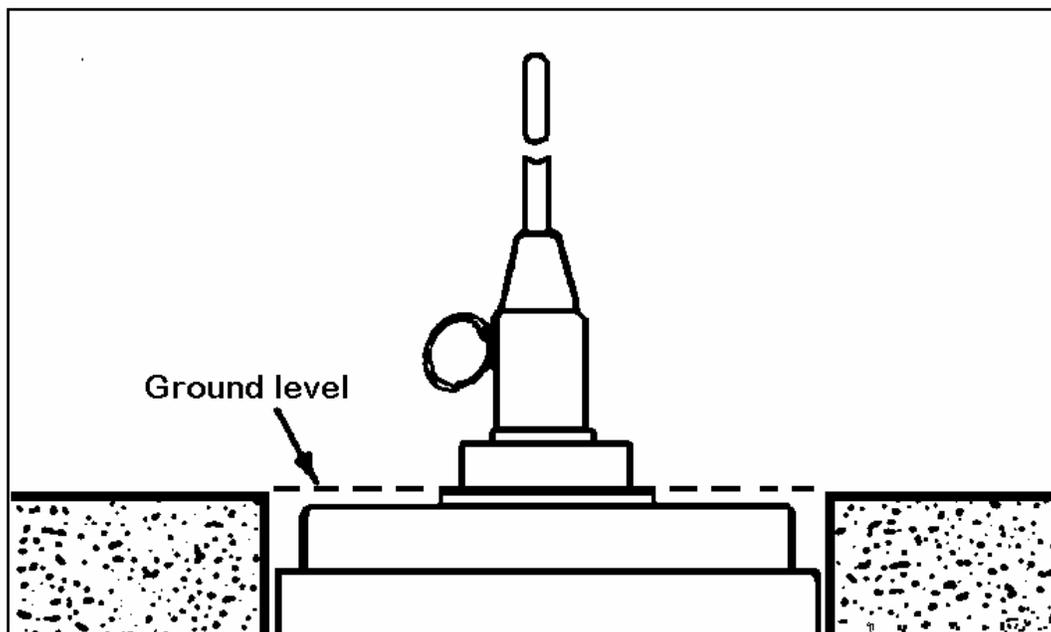


Figure 052-192-1117-4  
M21 AT Mine in a Hole

- b. Check the bottom of the hole to ensure that the ground is solid enough to support the mine. If necessary, place a flat object under the mine to provide a firm foundation. Allow additional depth for the object.

5. Emplace the mine.

- a. Put the mine in the hole.
- b. Cover the mine with soil until it is level with the top of the mine.
- c. Press the soil firmly around the sides of the mine.

NOTE: Ensure that no soil falls around or under the plastic collar.

6. Assemble the extension rod.

- a. Assemble the three pieces of the extension rod.
- b. Screw the extension rod on the M607 fuze.

WARNING: DO NOT TILT THE EXTENSION ROD. A 20-DEGREE TILT OF THE EXTENTION ROD WILL DETONATE THE MINE.

7. Arm the mine.

- a. Squeeze the end of the cotter pin together on the pull ring.
- b. Remove the cotter pin by holding the fuze firmly in one hand and pulling on the pull ring with the other hand.
- c. Remove the safety stop and safety band from the fuze slowly and carefully.

8. Camouflage the mine.

- a. Add twigs, grass, or other materials to make the area look natural. Ensure that no pressure is applied to the tilt rod or the fuze.

**Performance Steps**

- b. Place the excess soil in sandbags and remove it from the area.
- c. Give the band and stop, the pull-ring assembly, the shipping plugs, and the closure assembly to the NCOIC.

**Evaluation Preparation:** SETUP: Provide the soldier with the items listed in the condition statement. Use inert equipment when performing this task.

BRIEF SOLDIER: Observe the soldier's performance for any improper procedures that may cause the mine to detonate.

**Performance Measures**

	<u>GO</u>	<u>NO GO</u>
1. Inspected the mine and components.	—	—
2. Inserted the booster.	—	—
3. Fuzed the mine.	—	—
4. Dug a hole to fit the mine.	—	—
5. Emplaced the mine.	—	—
6. Assembled the extension rod.	—	—
7. Armed the mine.	—	—
8. Camouflaged the mine.	—	—

**Evaluation Guidance:** Score the soldier GO if all performance measures are passed. Score the soldier NO-GO if any performance measure is failed. If the soldier scores NO-GO, show the soldier what was done wrong and how to do it correctly.

**References  
Required**

**Related**  
FM 5-34  
GTA 05-10-036  
GTA 05-10-037

## Remove an M21 Antitank (AT) Mine

052-192-1118

**Conditions:** As a combat engineer squad member in a field environment, given the location of an emplaced M21 AT mine, an M26 arming wrench, a band and stop, cotter pins, a shipping plug, and a closure assembly.

**Standards:** Removed an M21 AT mine, in the proper sequence, without causing the mine to detonate.

### Performance Steps

**WARNING:** BEFORE ATTEMPTING TO DISARM AND REMOVE THE MINE, CHECK FOR BOOBY TRAPS, DAMAGE, OR MALFUNCTIONS TO THE MINE. IF ANY OF THESE CONDITIONS EXIST, NOTIFY THE NONCOMMISSIONED OFFICER IN CHARGE (NCOIC). DO NOT ATTEMPT TO DISARM THE MINE.

1. Disarm the mine.

**WARNING:** DO NOT APPLY PRESSURE TO THE TILT ROD OR FUZE AT ANY TIME.

- a. Clear the camouflage away from the mine.
- b. Attach the safety band and safety stop (Figure 052-192-1118-1).

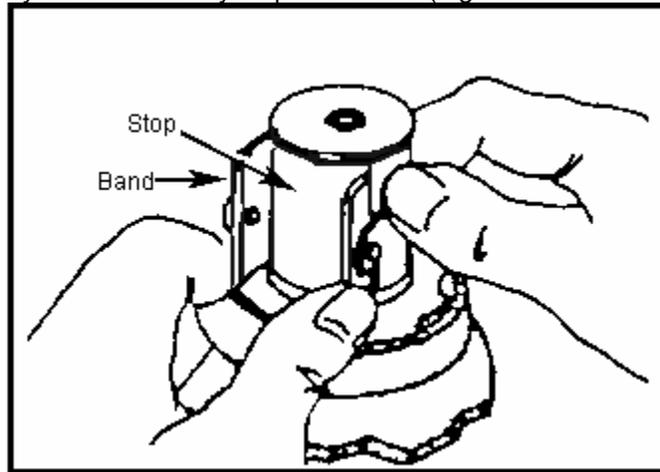


Figure 052-192-1118-1  
Attaching the Band and Stop

- c. Insert the cotter pin into the safety band and safety stop. Spread the ends of the cotter pin (Figure 052-192-1118-2).

**Performance Steps**

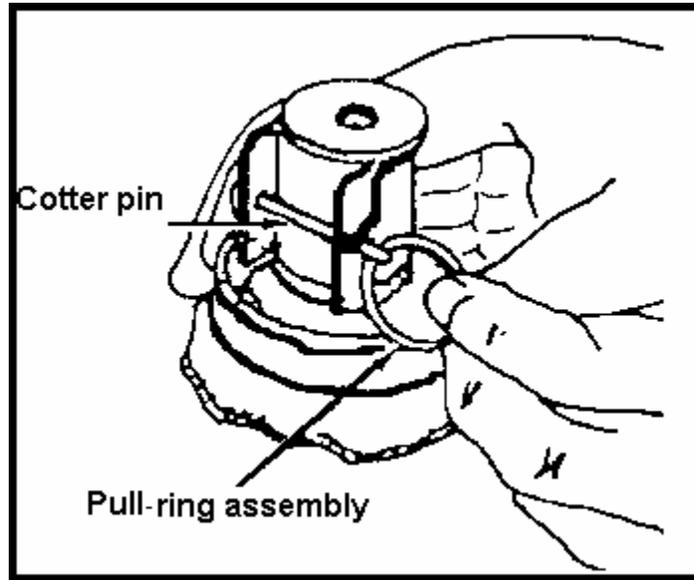


Figure 052-192-1118-2  
Inserting the Cotter Pin

- d. Unscrew and remove the extension rod.
  - 2. Check for antihandling devices (AHDs).
    - a. Hold the mine firmly in place with one hand. Do not put pressure on the fuze.
    - b. Feel for the AHDs, with the other hand, by digging around the sides and underneath the mine.
- WARNING: IF YOU FIND AN AHD, STOP AND NOTIFY THE NCOIC. DO NOT REMOVE THE MINE.**
- 3. Remove the mine.
    - a. Remove the mine from the hole.
    - b. Remove the fuze from the mine.
    - c. Install the closure assembly on the fuze.
    - d. Install the shipping plug into the fuze well of the mine.
    - e. Remove the closing plug from the bottom of the mine.
    - f. Remove the booster from the mine.
    - g. Install the closing plug into the booster well.

**Evaluation Preparation: SETUP:** Provide the soldier with the items listed in the condition statement. Use inert equipment when performing this task.

**BRIEF SOLDIER:** Observe the soldier's performance for any improper procedures that may cause the mine to detonate.

**Performance Measures**

	<u>GO</u>	<u>NO GO</u>
1. Disarmed the mine.	—	—
2. Checked for AHDs	—	—
3. Removed the mine.	—	—

**Evaluation Guidance:** Score the soldier GO if all performance measures are passed. Score the soldier NO-GO if any performance measure is failed. If the soldier scores NO-GO, show the soldier what was done wrong and how to do it correctly.

STP 7-11B1-SM-TG

**References  
Required**

**Related**  
FM 20-32  
FM 5-34  
GTA 05-10-036  
GTA 05-10-037

## Employ Hand Grenades During an Urban Operation

071-440-0031

**Conditions:** As a member of a unit operating in an urban environment, having received the order to engage targets; given a fragmentation, concussion, smoke, or incendiary grenade(s) with time-delay fuses and load-carrying equipment; and given restrictive rules of engagement.

**Standards:** Killed, captured, or forced the withdrawal of all enemy engaged and complied with the rules of engagement (ROE).

**NOTE:** An urban environment could require precise application of firepower, especially where the enemy is mixed with civilians. The presence of civilians can restrict the use of fires and available combat power. Soldiers might have to operate around "no fire" areas. The ROE can prohibit the use of certain weapons until after a specific hostile action takes place. All soldiers must know the ROE.

### Performance Steps

1. Identify the target to engage.

#### WARNING

Sometimes, if the walls of a building are made of thin materials, such as sheetrock or thin plywood, the soldier must either lie flat on the floor with his helmet pointing towards the area of detonation, or move away from any area that might be penetrated by grenade fragments, when using a fragmentation or concussion grenade.

- a. Windows, mouse holes, and loopholes. Suppress with grenades, when the ROE permit, because the enemy could use them for observation and fields of fire (Figure 1).

**Performance Steps**



Figure 1. Hand grenade being thrown through a loophole.

- b. Doorways. Known on the urban battlefield as the fatal funnel, doorways should be avoided if possible. Because sometimes they cannot be avoided, the assault team may want to lead with a grenade or distraction device before entering the room, if the ROE allow (Figure 2). This provides the team the elements of surprise and security, particularly when explosive breaches are not used. A similar tactic should be used for window entrances.

## Performance Steps



Figure 2. Soldier ready to throw grenade after breach of door.

- c. Entrances and passages of an underground passageway. Use of all types of grenades in underground passages presents many dangers. All friendly soldiers should be above ground when using grenades in the close confines of an underground passageway. Overpressure, shock, and noise not only can injure friendly soldiers, but could also cause damage to the tunnel. Smoke will linger in a tunnel for a long period of time. Large amounts of smoke can displace the oxygen to the point that it is hazardous to soldiers.
- d. Suspected or likely enemy positions inside a building such as around corners, on landings of stairs, in dead space, in rubble, and so on (Figure 3). Engaging these positions with available hand grenades could give you a marked advantage by suppressing the enemy with fragmentation, smoke, or special purpose grenades. When throwing grenades up stairwells, observation of the grenade is needed to ensure that it does not roll back down the stairs. Consideration should be given to the use of other than fragmentation grenades in case of a roll back. Always select a covered position to move to in case of such a roll back.

**Performance Steps**



Figure 3. Soldier tossing grenade up stairway.

- e. Throwing a grenade in an upper-story opening (Figure 4). Determine the target and then step out far enough to lob the grenade. Lobbing can be underhand or overhand. This technique should only be used when the window has been broken. Otherwise, the chances are high that the thrown grenade will fall back onto the ground without going into the room. Consideration should be given to the use of other than fragmentation grenades in case of such an event.

## Performance Steps



Figure 4. Hand grenade thrown through window.

NOTE: The technique of throwing a second grenade immediately after the first could catch the enemy off guard.

2. At all times, the individual throwing the grenade and the rest of his element should have a planned area to move to for safety if the grenade does not go where intended or if it rolls or falls back toward friendly troops.
3. Determine the type of grenade to use.

### WARNING

The composition of the target must be considered when employing grenades. The inside walls of a building are usually not heavily constructed and can be easily penetrated by the fragments of an M67 fragmentation grenade. All types of grenades can start fires if the target is composed of flammable items.

- a. M67 Fragmentation (Figure 5). This grenade is used to disable or kill personnel. It explodes four to five seconds after safety lever is released. The effective casualty-producing radius is 15 meters.

Performance Steps

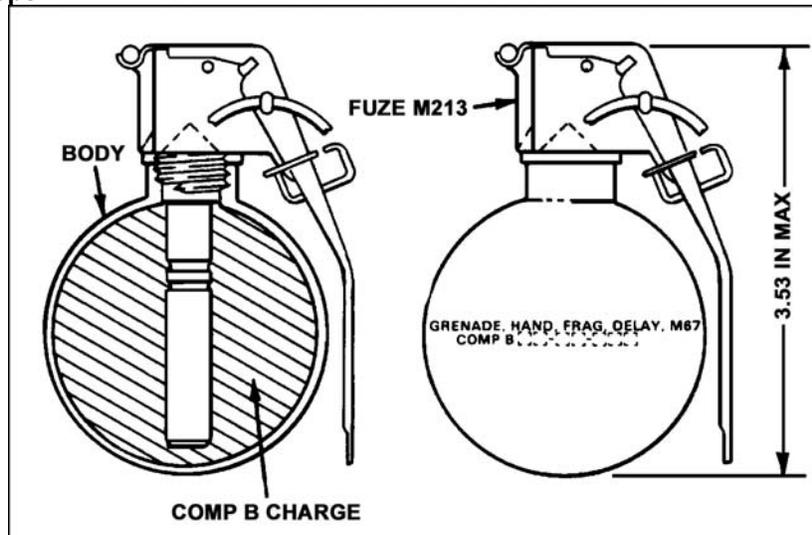


Figure 5. M67 fragmentation grenade.

WARNING

Although the killing radius is 5 meters and the casualty radius on this grenade is 15 meters, fragments can disperse as far away as 230 meters.

- b. MK3A2 Offensive Grenade (Figure 6). This grenade is commonly referred to as the concussion grenade and is designed to produce casualties during combat while minimizing danger to friendly personnel. The grenade is also used for concussion effects in enclosed areas, for blasting, or for demolition tasks. The shock waves (overpressure) produced by this grenade when used in enclosed areas are greater than those produced by the fragmentation grenade. It is, therefore, very effective against enemy soldiers located in bunkers, buildings, and fortified areas. The effective casualty radius in open areas is 2 meters. Secondary missiles and bits of fuse may be projected as far as 200 meters from the detonation point.

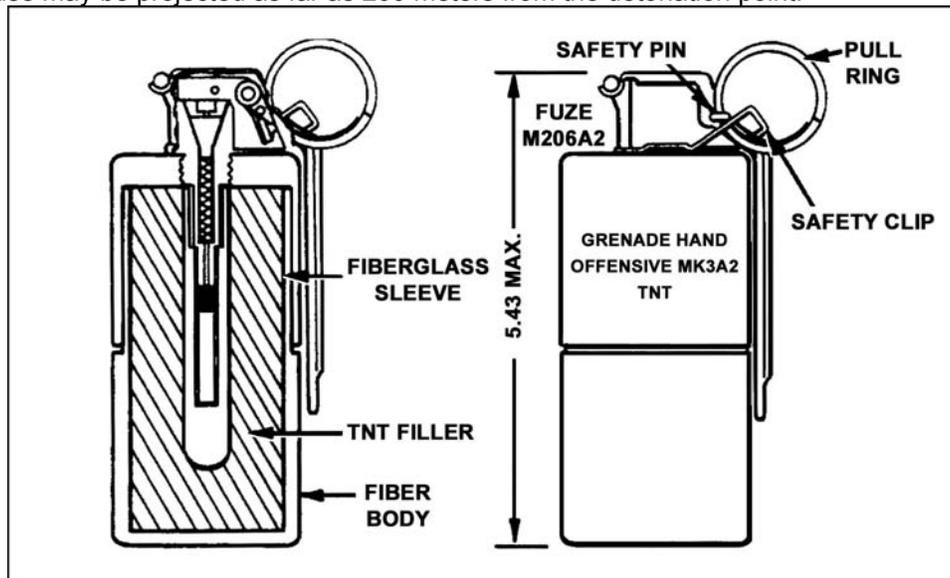


Figure 6. MK3A2 offensive grenade.

- c. M18 Colored Smoke (Figure 7). The grenade produces a cloud of colored smoke for 50 to 90 seconds. The colors of smoke are red, green, yellow, and violet. This grenade can be used for signaling and screening.

## Performance Steps

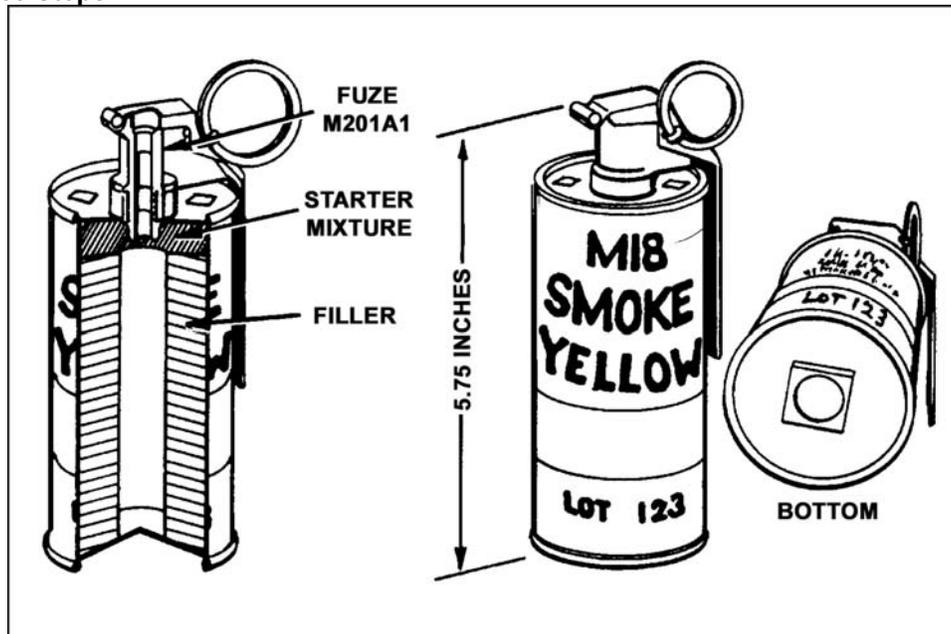


Figure 7. M18 colored smoke grenade.

- d. AN-M8 HC White Smoke (Figure 8). The grenade emits a dense cloud of white smoke for 105 to 150 seconds. This grenade can be used for signaling and screening.

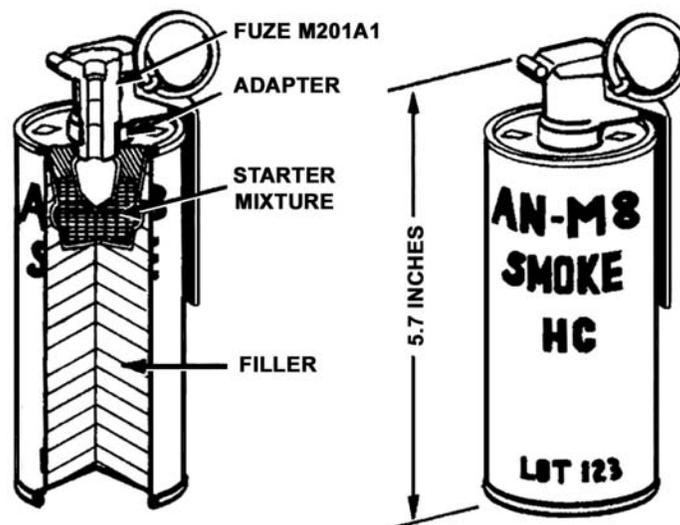


Figure 8. AN-M8 HC white smoke grenade.

## WARNINGS

1. Any damaged AN-M8 HC grenade's exposed filler is hazardous. Exposure of the filler to moisture and air could result in a chemical reaction that ignites the grenade.
2. The AN-M8 HC hand grenade produces harmful hydrochloric fumes that irritate the eyes, throat, and lungs. It should not be used in closed areas unless soldiers are wearing protective masks.
3. The AN-M8 and the M18 may both start a fire if used in a dry area. Smoke will linger in a tunnel for a

**Performance Steps**

long period of time. It will certainly confuse the enemy and, in dense concentrations, it can displace oxygen to dangerous levels. Protective masks may be of little use against smoke grenades because smoke displaces oxygen. Large amounts of smoke can displace the oxygen to the point that it is hazardous to soldiers unless they have forced air respirators.

- e. M15 White Phosphorous (Figure 9). The M15 grenade is a bursting type grenade with a bursting radius of 17 meters. The WP filler burns for about 60 seconds at a temperature of 5,000 degree Fahrenheit. This intense heat causes the smoke produced by the grenade to rise quite rapidly, especially in cool climates, which makes the M15 grenade less desirable as a screening agent.

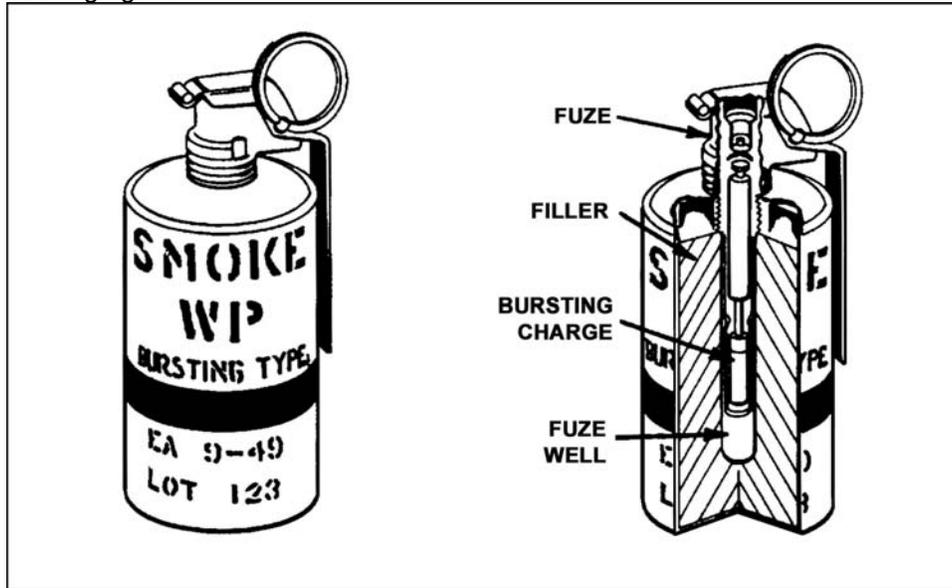


Figure 9. M15 WP smoke hand grenade.

**WARNING**

All friendly personnel within the 17-meter burst area of the M15 should be in a covered position to avoid being struck by burning particles. Careful consideration must be given prior to the use of the white phosphorous grenade inside an enclosed space as it spreads, ignites, and burns in the air and could cause extreme burns to the body. These grenades should be used with extreme caution, as no immediate follow up is possible. WP burns up all the available oxygen.

- f. M84 Diversionary/Flash-Bang Stun Hand Grenades (Figure 10). These grenades are used for building and room clearing operations where the presence of non-combatants is likely or expected and the unit is operating under restrictive rules of engagement.

## Performance Steps

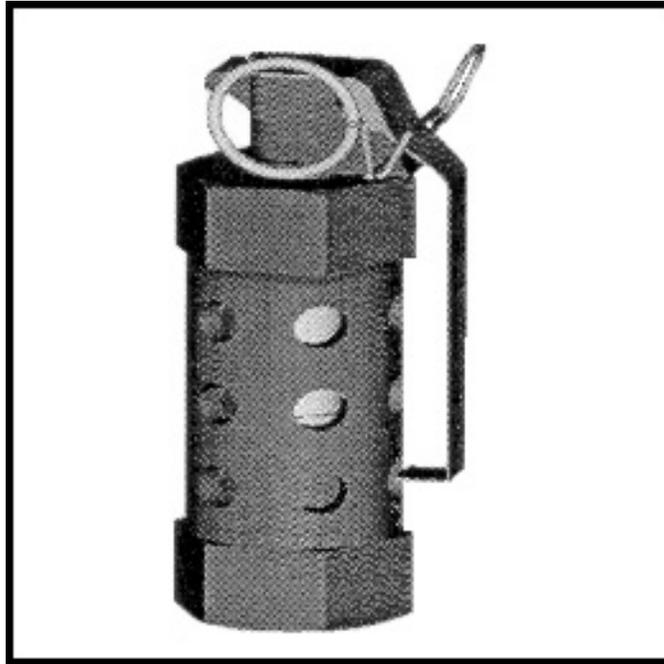


Figure 10. M84 diversionary/flash-bang stun hand grenade.

4. Attain the best body target alignment possible. Other unit members must provide security for the thrower. Keep the individual weapon in the non-throwing hand so it can be used if needed. The individual weapon should never be laid down in an urban environment, where the possibility of enemy fire is so great.
5. Prepare the grenade for throwing. Straighten the cotter pin, remove the grenade's safety clip (if applicable), and pull the pin.
6. Cook off the grenade, if needed. Different types of grenades have different detonation delays. To cook the grenade off, release the safety lever, count by thousands for the appropriate delay (one thousand and one, one thousand and two), and then throw the grenade toward the target. The cook off delay prevents the enemy from grabbing the grenade and tossing it back.

### WARNING

Grenades should be cooked off only in combat situations, where a thrown grenade might be picked up by opposing forces and thrown back at friendly personnel. Not all grenades can or should be cooked off.

7. Throw the grenade. Depending upon the type of target, type of grenade, and safety requirements for friendly forces, use any of the following methods: over arm throwing, throwing using low cover, underarm lobbing, throwing like a stone (sidearm delivery and or skipping a stone), flipping, or dropping in place.

### WARNING

After throwing a fragmentation grenade, the soldier must immediately announce "FRAG OUT" to indicate that a grenade has been thrown. He then takes cover since the grenade may bounce back or be thrown back or the enemy may fire at him.

**Evaluation Preparation:** SETUP: At the site, provide the soldier with five dummy grenades to engage the targets. Include some canister-type grenades such as smoke, WP, or concussion grenades. Provide targets in a building or upper-story room, or provide an open area that needs to be obscured.

**BRIEF SOLDIER:** Tell the soldier to fasten the grenades to the ammunition pouches on his LCE, or elsewhere in his equipment, as appropriate. Tell the soldier to correctly select the type of grenade to be

used IAW the situation and ROE. Tell the soldier not to expose himself to the target for more than three seconds at any one time.

<b>Performance Measures</b>	<b><u>GO</u></b>	<b><u>NO GO</u></b>
1. Identified the target to engage.	_____	_____
a. Windows, mouse holes, and loopholes.		
b. Doorways.		
c. Entrances to underground passageways.		
d. Likely enemy positions inside a building.		
2. Selected the appropriate grenade for the target.	_____	_____
3. Attained the best body alignment possible. Kept individual weapon in non-firing hand.	_____	_____
4. Cooked off grenade, if appropriate.	_____	_____
5. Designated area to move to for safety if the grenade did not go where intended.	_____	_____
6. Engaged targets safely and effectively.	_____	_____
a. Either laid flat on the floor with helmet toward detonation area or took cover.		
b. Threw grenades in openings before entering a building.		
c. Threw grenades onto stairway landings upward or downward to suppress suspected enemy.		
d. Threw a grenade in an upper-story opening.		
(1) Determined target, and then stepped out far enough to lob the grenade.		
(2) Lobbed the grenade either underhand or overhand.		

**Evaluation Guidance:** Score the soldier GO if all performance measures are passed. Score the soldier NO-GO if any performance measure is failed. If the soldier scores NO-GO, show the soldier what was done wrong and how to do it correctly.

**References**  
**Required**

**Related**  
TM 9-1330-200-12

Subject Area 39: WEAPONS: M136 LAUNCHER (AT4)

**Perform Misfire Procedures on an M136 Launcher**  
**071-054-0003**

**Conditions:** Given an armed M136 launcher (AT4) that has misfired.

**Standards:** Applied misfire procedures so that the AT4 can be fired, or ensured the weapon cannot fire, and informed the supervisor of the misfire.

**Performance Steps**

1. Perform misfire procedures.
  - a. When the launcher fails to fire, immediately shout "MISFIRE."
  - b. Continue to hold the launcher pointed in the area of the target.
  - c. Release the red safety catch.
  - d. Immediately recock the cocking lever, check the backblast area, aim, fully depress and hold down the red safety catch, and press the red trigger button.

NOTE: If the launcher still fails to fire, repeat steps 1a through 1d above.

- e. If the launcher again fails to fire, release the red safety catch and return the cocking lever to the SAFE (uncocked) position.
- f. Remove the launcher from the shoulder while keeping the muzzle pointed toward the target area.

**WARNING**

If transport safety pin cannot be reinserted, do not move the weapon. Notify the NCOIC.

- g. While cradling the launcher with the left arm, reinsert the transport safety pin.

NOTE: In a training situation only, after inserting the transport safety pin, wait two minutes. Keep the launcher pointed toward the target area.

- h. Carefully lay the launcher on the ground, muzzle pointed toward the target area.

2. Immediately use another launcher to engage the target.

**Evaluation Preparation:** SETUP: At the test site, provide an expended AT4 or a tracer trainer in the ready-to-fire configuration.

BRIEF SOLDIER: Tell the soldier to assume a correct standing, ready-to-fire position with the launcher. Tell the soldier to go through the firing procedure. Tell him go through the misfire procedures.

**Performance Measures**

**GO      NO GO**

NOTE: The performance measures are scored in sequence.

- |  |       |       |
|--|-------|-------|
| 1. Shouted "MISFIRE."  | _____ | _____ |
| 2. Released the red safety catch.  | _____ | _____ |
| 3. Recocked the cocking lever.   | _____ | _____ |
| 4. Tried to refire after checking the backblast area.  | _____ | _____ |
| 5. Repeated performance measures 1 through 4 when the launcher failed to fire.                 | _____ | _____ |
| 6. Returned the red safety lever to the SAFE (uncocked) position.                              | _____ | _____ |
| 7. Removed the launcher from the shoulder while keeping the muzzle pointed at the target area. | _____ | _____ |
| 8. Replaced the transport safety pin.  | _____ | _____ |

**Performance Measures**

**GO**    **NO GO**

9. Placed the launcher on the ground with the muzzle pointed toward the target area.

\_\_\_\_\_    \_\_\_\_\_

**Evaluation Guidance:** Score the soldier GO if all performance measures are passed. Score the soldier NO-GO if any performance measure is failed. If the soldier scores NO-GO, show the soldier what was done wrong and how to do it correctly.

**References**

**Required**  
FM 3-23.25

**Related**

Subject Area 40: WEAPONS: M16-SERIES RIFLE

**Mount a Night Vision Sight, AN/PVS-4, on an M16-Series Rifle  
071-008-0001**

**Conditions:** Given an M16-series rifle; night vision sight, AN/PVS-4, with storage case; one battery BA-5567/U (or two BA-3058 with AA battery adapter); expended cartridge case, and mounting knob assembly.

**Standards:** Secured night vision sight, AN/PVS-4, to the M16-series rifle so that it was stable and could be used to effectively engage targets without damage to equipment.

**Performance Steps**

**WARNING**

Be sure no rounds are in the weapon before attempting to mount the AN/PVS-4. The weapon must be on SAFE.

**CAUTION:** The AN/PVS-4 is a precision electro-optical instrument and must be handled carefully at all times.

1. Inspect equipment.
  - a. Visually inspect equipment for obvious damage and or missing parts.
    - (1) Mounting knob assembly.
      - (a) Stripped threads.
      - (b) Missing nuts or washers.
    - (2) AN/PVS.
      - (a) Batteries.
      - (b) Controls and indicators.
  - b. If serviceability is questionable, return to maintenance personnel as non-operational.
2. Mount the AN/PVS-4 to the rifle.
  - a. Using the luminous lines on the AN/PVS-4 and carrying handle, align the threaded hole on the sight mounting adapter of the AN/PVS-4 with the hole in the carrying handle of the rifle.
  - b. Attach mounting knob assembly.
    - (1) Insert the threaded end of mounting knob assembly through hole in carrying handle into hole of AN/PVS-4.
    - (2) Turn mounting knob clockwise to the right with firing hand until tight (if necessary, place empty cartridge case over the lever arm to increase leverage as the mounting knob assembly is tightened).

**NOTE:** If you encounter difficulty, turn the sight and the rifle upside down. Place the rifle handle onto the sight mounting adapter, lining up the adapter. Place the mounting knob assembly through the hole in the handle and rotate clockwise.

- c. Test the AN/PVS-4 to ensure it is mounted securely. Grasp it and attempt to move it back and forth.
- d. If the AN/PVS-4 does move, retighten the mounting knob.

**Evaluation Preparation:** SETUP: At the test site, provide the soldier all equipment and material given in the task condition statement.

**BRIEF SOLDIER:** Tell the soldier to mount the AN/PVS-4 on an M16-series rifle.

**Performance Measures**

	<u>GO</u>	<u>NO GO</u>
1. Inspected equipment.	_____	_____
2. Mounted the AN/PVS-4 to the rifle.	_____	_____

**Evaluation Guidance:** Score the soldier GO if all performance measures are passed. Score the soldier NO-GO if any performance measure is failed. If the soldier scores NO-GO, show the soldier what was done wrong and how to do it correctly.

**References**  
**Required**

**Related**  
TM 11-5855-213-10

**Dismount a Night Vision Sight, AN/PVS-4, from an M16-Series Rifle  
071-008-0002**

**Conditions:** Given an M16-series rifle with mounted AN/PVS-4, storage case, and carrying bag. The AN/PVS-4 is in the OFF position, with batteries installed, and is mounted with the mounting knob assembly.

**Standards:** Removed the AN/PVS-4 night vision sight from the rifle, and removed the batteries from the sight. Placed the sight, batteries, and mounting knob assembly in the storage case without damaging them.

**Performance Steps**

1. Dismount the AN/PVS-4 from the M16-series rifle.
  - a. Unscrew mounting knob assembly in a counterclockwise direction until the assembly is free, remove it from the weapon.
  - b. While removing the mounting knob assembly, hold the AN/PVS-4 and then remove it from the rifle.
  - c. Remove batteries.
2. Place items in the storage case.
  - a. Place batteries and mounting knob assembly into designated compartments in the storage case.
  - b. Place AN/PVS-4 into carrying bag and then into designated compartment in the storage case.
  - c. Close top of storage case and fasten all four latches.

**Evaluation Preparation:** SETUP: At the test site, provide all equipment and material shown in the task condition statement.

BRIEF SOLDIER: Tell the soldier to remove the AN/PVS-4 from the M16-series rifle and replace it in its storage case.

<b>Performance Measures</b>	<u><b>GO</b></u>	<u><b>NO GO</b></u>
1. Dismounted the AN/PVS-4 from the M16-series rifle.	_____	_____
2. Placed items in the storage case.	_____	_____

**Evaluation Guidance:** Score the soldier GO if all performance measures are passed. Score the soldier NO-GO if any performance measure is failed. If the soldier scores NO-GO, show the soldier what was done wrong and how to do it correctly.

**References  
Required**

**Related**  
TM 11-5855-213-10

**Mount an AN/PAS-13 Thermal Weapon Sight on an M16-Series Rifle**  
**071-008-0004**

**Conditions:** Given an M16-series rifle, AN/PAS-13-series thermal weapon sight (TWS) with M4 spacer installed, carrying case, and one battery (BA-5347A/U or BB-2847/U).

**Standards:** Secured the TWS to the M16-series rifle so that it was stable and could be used to effectively engage targets without damage to equipment.

**Performance Steps**

1. Check to ensure rifle is clear and the selector lever is on SAFE.
2. Inspect TWS and components.
  - a. Visually inspect equipment for completeness, obvious damage, and missing parts.
  - b. If serviceability is questionable, return to maintenance personnel as non-operational.
3. Install TWS on an M16-series rifle.
  - a. Install mounting bracket.
    - (1) Lower the rear sight of the M16 all the way down.
    - (2) Place the threaded rod of the mounting bracket through the hole in the carrying handle of the rifle.
    - (3) Secure the bracket by screwing the thumb wheel on the threaded rod (hand tighten only).
  - b. Install TWS.
    - (1) Loosen the knob on the TWS mount interface.
    - (2) Select a slot on the rail for mounting the TWS. Any slot may be used as long as the mount interface does not extend over the edge of the rail. The slot selected should also allow you to effectively aim and fire the rifle while sighting through the TWS.
    - (3) Place the bar of the mount interface in the selected slot. Hand tighten the knob until it clicks at least twice.

**Evaluation Preparation:** SETUP: At the test site, provide the soldier with all the equipment given in the task condition statement.

**BRIEF SOLDIER:** Tell the soldier that he must mount thermal weapon sight AN/PAS-13 on the M16-series rifle.

**Performance Measures**

	<u>GO</u>	<u>NO GO</u>
1. Inspected TWS and components.	_____	_____
2. Installed TWS on an M16-series rifle.	_____	_____

**Evaluation Guidance:** Score the soldier GO if all performance measures are passed. Score the soldier NO-GO if any performance measure is failed. If the soldier scores NO-GO, show the soldier what was done wrong and how to do it correctly.

**References  
Required**

**Related**  
TM 11-5855-309-12&P

**Dismount an AN/PAS-13 Thermal Weapon Sight from an M16-Series Rifle**  
**071-008-0005**

**Conditions:** Provide an M16-series rifle with a mounted AN/PAS-13-series thermal weapon sight (TWS) and a TWS carrying case with basic issue items. The TWS brightness control switch is at the OFF position, and the battery is installed.

**Standards:** Removed the TWS from the rifle without damage to equipment and stowed the TWS, battery, and spacer in correct place in the carrying case.

**Performance Steps**

1. Check to ensure rifle is clear and the selector lever is on SAFE.
2. Remove the TWS from the rifle
  - a. Secure the TWS with one hand to prevent it from falling, and loosen the knob on the mount interface until the TWS is free of the rail.
  - b. Remove the TWS from the weapon.
  - c. Unscrew the thumb wheel from the threaded rod and remove the mounting bracket from the weapon.
3. Stow the TWS and components parts.
  - a. Ensure brightness knob is at the OFF position.
  - b. Ensure objective lens cover is installed.
  - c. Remove the battery, close and secure battery door.
  - d. Stow the TWS and battery in their proper compartments in the carrying case.
  - e. Close carrying case.

**Evaluation Preparation:** SETUP: At the test site, provide the soldier with all the equipment given in the task condition statement.

BRIEF SOLDIER: Tell the soldier to remove the thermal weapon sight, AN/PAS-13 from the M16-series rifle and stow it in its case.

<b>Performance Measures</b>	<b><u>GO</u></b>	<b><u>NO GO</u></b>
1. Checked to ensure the weapon is clear.	_____	_____
2. Removed the TWS from the M16-series rifle.	_____	_____
3. Stowed the TWS and component parts.	_____	_____

**Evaluation Guidance:** Score the soldier GO if all performance measures are passed. Score the soldier NO-GO if any performance measure is failed. If the soldier scores NO-GO, show the soldier what was done wrong and how to do it correctly.

**References**  
**Required**

**Related**  
 TM 11-5855-309-12&P

**Zero an AN/PAS-13 Thermal Weapon Sight to an M16-Series Rifle**  
**071-008-0006**

**Conditions:** On a range or on terrain suitable for firing small arms, given an AN/PAS-13 thermal weapon sight (TWS) mounted on an M16-series rifle and magazines with 5.56-mm ammunition. You have a cutting tool (knife or scissors), adhesive tape, E-type silhouette or E-type thermal silhouette; M16-series 25-meter zeroing target located 25 meters from the firing point.

**Standards:** Adjusted TWS so that a round fired from the rifle, used correct sight alignment, impacted 8.1 squares (7.3 centimeters) below the aim point on the zeroing target.

**Performance Steps**

1. Prepare an M16-series rifle 25-meter zeroing target for TWS zero.
    - a. Cut out a hole four squares wide by four squares high from the center of the M16-series rifle 25-meter zeroing target.
    - b. Cut a piece of corrugated cardboard the same size as the M16-series rifle 25-meter zeroing target.
    - c. Measure one inch from each side of the cardboard and cut out a rectangle. You should have a one-inch cardboard frame.
    - d. Tape the cardboard frame to the back of the M16-series rifle 25-meter zeroing target.
    - e. Affix the target to a standard E-type silhouette or E-type thermal silhouette located 25-meters from firing position.
  2. Assume a supported firing position and place the TWS into operation.
  3. Adjust TWS controls for rounds to impact at desired aim point on 25-meter zeroing target.
    - a. Set FOV ring to WIDE position.
    - b. Press and release RETICLE SELECT switch until display shows M16 reticle.
    - c. Use RETICLE ADJUST switch to set azimuth and elevation indicators to zero (000L and 000D).
- NOTE: The TWS reticle zeroing aim point is the aim point located between the zeroing aim lines.
- d. Load the rifle and place selector lever on SEMI.
  - e. Aim center mass at the 25-meter zeroing target and fire three-round shot groups until you obtain a shot group that is 4 centimeters or less in diameter. Check tightness of sight after first three-round shot group. Tighten if necessary.
  - f. Adjust reticle to move center of shot group to the zero point of impact. The zero point of impact for the M16-series rifle is 8.1 squares (7.3 centimeters) below target aim point.
    - (1) Determine azimuth and elevation adjustment required to move the center of the shot group to the desired point of impact.

NOTE: At 25-meter range, each increment (one click) of azimuth or elevation moves the strike of the round 1 ¼ centimeter for medium weapon thermal sight (MWTS) WFOV and ¾ centimeter for MWTS NFOV and HWTS WFOV. However, when calculating for adjustments, use one click of azimuth or elevation to move strike of round one square on the 25-meter zeroing target.

- (2) Use the RETICLE ADJUST switch to adjust reticle position up (U), down (D), left (L) or right (R).
- (3) Fire and adjust reticle until five or six consecutive shots are within desired point of impact.
- (4) If the sight is mounted on a squad leader's weapon, set FOV ring to narrow (N) position and repeat zero procedures.
- (5) Record setting of azimuth and elevation indicators.

**Evaluation Preparation:** SETUP: At the test site, provide the soldier with all the equipment given in the task condition statement.

BRIEF SOLDIER: Tell the soldier to zero the thermal weapon sight AN/PAS-13 on the M16-series rifle.

**Performance Measures**

	<u>GO</u>	<u>NO GO</u>
1. Prepared an M16-series rifle 25-meter target for TWS zero.	—	—
a. Cut out a hole four squares wide by four squares high from the center of the target.		
b. Cut a piece of corrugated cardboard the same size as the M16-series rifle 25-meter zeroing target.		
c. Measured 1 inch from each side of the cardboard and cut out a rectangle. A one inch cardboard frame was formed.		
d. Taped the cardboard frame to the back of the M16-series rifle 25-meter zeroing target.		
e. Affixed the target to a standard E-type silhouette thermal sight located 25-meters from firing position.		
2. Assumed a supported firing position and placed the TWS into operation.	—	—
3. Adjusted TWS controls for rounds to impact at the desired aiming point on 25-meter target.	—	—
a. Set FOV ring to WIDE position.		
b. Pressed and released RETICLE SELECT switch until display showed M16 reticle.		
c. Used RETICLE ADJUST switch to set azimuth and elevation indicators to zero (000L and 000D).		
d. Loaded the rifle and placed the selector lever on SEMI.		
4. Fired three-round shot groups until a 4-centimeter or less shot group was obtained.	—	—
5. Adjusted the reticle moving the center of the shot group to the zero point of impact.	—	—
a. Determined azimuth and elevation adjustment required.		
b. Adjusted reticle position.		
c. Fired and adjusted weapon until six consecutive rounds were within the zero point of impact.		
d. Set the FOV ring to N (narrow) for squad leader's weapons.		
e. Recorded azimuth and elevations indicator settings.		

**Evaluation Guidance:** Score the soldier GO if all performance measures are passed. Score the soldier NO-GO if any performance measure is failed. If the soldier scores NO-GO, show the soldier what was done wrong and how to do it correctly.

**References  
Required**

**Related**  
TM 11-5855-309-12&P

**Mount an AN/PAQ-4-Series Aiming Light on an M16-Series Rifle**  
**071-008-0008**

**Conditions:** Given a cleared M16-series rifle, an AN/PAQ-4-series aiming light, M16-series mounting bracket, M16A1 barrel adapter, and a requirement to mount the aiming light to your rifle.

**Standards:** Attached and secured the AN/PAQ-4-series aiming light, the M16A1 barrel adapter, and the M16-series to the M16-series rifle.

**Performance Steps**

**WARNING**

Make sure the weapon is clear and on SAFE before proceeding.

1. On the rifle, first attach the M16A1 barrel adapter to the barrel to compensate for the smaller diameter of this barrel. When attaching the M16-series mounting bracket over the barrel adapter, make sure that the tabs on the adapter engage the cutouts on the bracket jaws.
  - a. Fully loosen the bracket knob and position the M16-series mounting bracket on the rifle, so that the bracket jaws clamp around the barrel and the front sight post fits through the bracket's cut out.

**NOTE:** Before clamping the bracket to the barrel, make sure that the front sight post is not in contact with the bracket.

- b. Hand tighten the bracket knob to clamp the bracket to the barrel. Fold down the metal ring.
- c. Rotate the IAL ON/OFF switch CW to the #5 OFF (vertical) position.
- d. Position the aiming light on the bracket mounting rail. Hand tighten the thumbscrew to secure the aiming light.

**Evaluation Preparation: SETUP:** At the test site, provide the soldier with all the equipment given in the task condition statement.

**BRIEF SOLDIER:** Tell the soldier to mount the AN/PAQ-4-series aiming light on the M16-series rifle.

**Performance Measures**

**GO**    **NO GO**

- |   |       |       |
|---|-------|-------|
| 1. Ensured the weapon was clear.                | _____ | _____ |
| 2. Installed the sight on the M16-series rifle. | _____ | _____ |

**Evaluation Guidance:** Score the soldier GO if all performance measures are passed. Score the soldier NO-GO if any performance measure is failed. If the soldier scores NO-GO, show the soldier what was done wrong and how to do it correctly.

**References**

**Required**

**Related**

TM 11-5855-301-12&P

**Dismount an AN/PAQ-4-Series Aiming Light from an M16-Series Rifle**  
**071-008-0009**

**Conditions:** Given an AN/PAQ-4-series aiming light mounted on an M16-series rifle and a requirement to dismount it from the rifle.

**Standards:** Removed the AN/PAQ-4-series and M16A1 barrel adapter without damaging the M16-series mounting bracket or without injury to personnel.

**Performance Steps**

1. Remove the aiming light from the mounting bracket by loosening the thumbscrew.
2. Remove the topmost portion of the mounting bracket by loosening the mounting screws. Set these parts aside.
3. Remove the bracket caps and set them aside with the small screws and washers.
4. Remove the top portion of the mounting bracket.
5. Screw the topmost portion of the bracket back onto the bracket.

**Evaluation Preparation:** SETUP: At the test site, provide the soldier with all the equipment given in the task condition statement.

BRIEF SOLDIER: Tell the soldier that he must remove the AN/PAQ-4-series aiming light from an M16-series rifle.

<b>Performance Measures</b>	<b><u>GO</u></b>	<b><u>NO GO</u></b>
1. Removed the aiming light.	—	—
2. Removed and set aside the topmost portion of the mounting bracket.	—	—
3. Removed and set aside the bracket caps with the small screws and washers.	—	—
4. Removed the top portion of the mounting bracket.	—	—
5. Screwed the topmost portion of the bracket back onto the bracket.	—	—

**Evaluation Guidance:** Score the soldier GO if all performance measures are passed. Score the soldier NO-GO if any performance measure is failed. If the soldier scores NO-GO, show the soldier what was done wrong and how to do it correctly.

**References**  
**Required**

**Related**  
 TM 11-5855-301-12&P

**Zero an AN/PAQ-4-Series Aiming Light to an M16-Series Rifle**  
**071-008-0010**

**Conditions:** Given an AN/PAQ-4-series aiming light mounted on an M16-series rifle, an M16A2 25-meter zeroing target, and a requirement to zero the rifle.

**Standards:** Zeroed the M16-series rifle with the AN/PAQ-4-series aiming light mounted when 2 out of 3 rounds hit the designated strike zone.

**Performance Steps**

1. Boresight the AN/PAQ-4-series aiming light to the M16-series rifle.
  - a. Check the alignment of the borelight.
    - (1) Place the appropriate mandrel with the borelight attached in the muzzle of the weapon.
    - (2) Turn on the borelight so that the laser dot strikes the target (offset) 10 meters away.
    - (3) Slowly rotate the borelight a half turn (180 degrees) while watching the dot made by the laser on the target area.
    - (4) If the dot remains stationary, the laser is boresighted.
    - (5) If the dot rotates in a circle, the windage or elevation or both must be adjusted until the dot remains stationary or rotates on itself no more than 1 centimeter.
  - b. Adjust the borelight (if necessary).
    - (1) Move the target to a distance of 2 meters.
    - (2) Mark the location of the laser dot.
    - (3) Slowly rotate the borelight a half turn.
    - (4) Note the new location of the laser dot.
    - (5) Adjust the windage and elevation until the laser dot moves half way back to its original location.
    - (6) Continue the procedure until the laser dot remains stationary (or spins upon itself within 1 centimeter) when the borelight is rotated.
    - (7) Move the target to a distance of 10 meters and recheck the boresight.
  - c. Boresight the AN/PAQ to the weapon.
    - (1) Position the weapon so the borelight strikes the small dot on the boresight target.
    - (2) Zero the aiming light by turning both windage and elevation knobs (for the pointer and illuminator) fully clockwise until they stop. Rotate counterclockwise 5 ½ turns and align the white dot on the adjuster with the center of the front adjuster flange.
    - (3) Adjust the aiming light until the emitted laser is on the appropriate dot on the boresight target.
    - (4) The weapon is boresighted when the laser bore light is on the small dot and the emitted laser is on the cross.

**NOTE:** You must use a night vision goggle to see the dot from the laser. Boresight zeroing must be conducted at 10 meters.

2. Zeroing.
  - a. When the weapon is sighted precisely center mass of the 25-meter target, the beam appears dimmer. Fire a round at this time.
    - (1) Choose the appropriate 25-meter strike zone for the weapon you are using and draw the strike zone on the 25-meter zero target.
    - (2) Staple the 25-meter zero target on an E-type silhouette and cut a 4-centimeter square out of the center through both the target paper and the E-type silhouette. Then place the target on the 25-meter range.
    - (3) Fire a three-round shot group. Remember to fire when the infrared aiming light's beam goes through the 4-centimeter cut-out in the target (the beam will appear dimmer).
    - (4) Triangulate the three-round shot group and adjust the windage and elevation knobs on the aiming light to move the impact of the rounds to the designated strike zone.
    - (5) Repeat steps 3 and 4 until five out of six rounds from two consecutive shot groups are within the designated strike zone.

**Evaluation Preparation:** SETUP: At the test site, provide the soldier with all the equipment given in the task condition statement.

BRIEF SOLDIER: Tell the soldier to zero the AN/PAQ-4-series aiming light to an M16-series rifle.

<b>Performance Measures</b>	<b><u>GO</u></b>	<b><u>NO GO</u></b>
1. Placed the AN/PAQ-4-series aiming light into operation.	—	—
2. Zeroed the aiming light to the M16-series rifle.	—	—

**Evaluation Guidance:** Score the soldier GO if all performance measures are passed. Score the soldier NO-GO if any performance measure is failed. If the soldier scores NO-GO, show the soldier what was done wrong and how to do it correctly.

**References  
Required**

**Related**  
TM 11-5855-301-12&P

**Engage Targets with an M16-Series Rifle Using an AN/PAQ-4-Series Aiming Light**  
**071-008-0011**

**Conditions:** Given an M16-series rifle with a mounted and zeroed AN/PAQ-4-series aiming light, magazines, ammunition, individual combat equipment, and stationary or moving targets (personnel) at engageable ranges.

**Standards:** Detected and determined range to targets. Fired the weapon and engaged the targets in the assigned sector of fire. Applied correct marksmanship fundamentals and target engagement techniques to hit or suppress the target or forced the enemy to move.

**Performance Steps**

1. Assume an appropriate firing position based on the situation. The firing position should protect you from enemy fire and observation, yet allow you to place effective fire on targets in your sector of fire.
  - a. Foxhole. Advantages: best when available. Disadvantages: no overhead cover.
  - b. Prone. Advantages: steady, easy to assume, low silhouette, and easily adapted to use of cover and support. Disadvantages: terrain and vegetation irregularities can limit effectiveness.
  - c. Prone supported. Advantages: steadier than prone, other advantages the same as prone. Disadvantages: same as prone.
  - d. Kneeling. Advantages: used when firing from behind something, used on ground that is level or gently sloping upward. Disadvantage: exposed to small arms fire.
  - e. Kneeling supported. Advantages: steadier than kneeling, other advantages the same as kneeling. Disadvantages: exposure to small arms fire.
  - f. Standing. Advantages: used in assault to surprise targets or when other positions are not appropriate. Disadvantages: exposure to small arms fire.
2. Identify targets in your designated sector of fire.
3. Determine range to a target.
4. Load and fire on targets using appropriate engagement techniques.
  - a. Load the weapon.
  - b. Use the appropriate aiming technique.

NOTE: When used with the M16A1/A2, the IAL is activated in the #4 ON MOMENTARY position only.

- (1) Press the ON/OFF switch against the weapon handguard to activate the IAL. The IAL will project an infrared pulsing spot towards the target.
  - (2) Engage the target when the IAL is on the desired point of impact.
  - (3) Engage a stationary target using reference points or sighting points.
  - (4) Engage a target moving towards you as you would a stationary target.
  - (5) Engage a target moving laterally using the new single lead technique by placing the trailing edge of the front sight post at the center of the target. This method causes the lead to increase automatically as the range increases.
  - (6) Engage multiple targets by first firing at the one presenting the greatest danger (usually the closest) and then rapidly proceeding to the next target.
- c. Use the quick-fire technique when you do not have time to aim properly. Use this technique on targets within 30 meters of your location. (This technique works best in urban terrain or heavy bush.)
    - (1) Use the standing position.
    - (2) Use the raised stock-well, looking 2 or 3 inches above the sights on a plane that is level with the barrel.
    - (3) Look at the target and not at the sights.
  - d. Fire on the targets until you destroy them or until you receive an order to cease fire.

**Evaluation Preparation:** SETUP: At a live-fire range, provide the equipment and materials listed in the task condition statement. Turn off the sight after evaluation.

BRIEF SOLDIER: Tell the soldier to engage all targets in his assigned sector.

<b>Performance Measures</b>	<b><u>GO</u></b>	<b><u>NO GO</u></b>
1. Assumed an appropriate firing position based on the situation.	—	—
2. Identified targets in your designated sector of fire.	—	—
3. Determined range to a target.	—	—
4. Loaded and fired on targets using appropriate engagement techniques.	—	—

**Evaluation Guidance:** Score the soldier GO if all performance measures are passed. Score the soldier NO-GO if any performance measure is failed. If the soldier scores NO-GO, show the soldier what was done wrong and how to do it correctly.

**References**  
**Required**

**Related**  
FM 23-9  
TM 11-5855-301-12&P

## Zero an M16A4 Rifle

071-310-0001

**Conditions:** On a 25-meter range, given an M16A4 rifle, 18 rounds of 5.56-mm ammunition, a 300-meter zero target, and sandbags for support. One of the following situations exists:

1. You receive a rifle that you have never fired.
2. Your rifle is returned after repair.
3. You think something may have changed the battlesight zero.

**Standards:** Battlesight zeroed your rifle so that five out of six rounds, in two consecutive shot groups, struck within the 4-centimeter circle on the target and used 18 rounds or less. Bullets that broke the line of the 4-centimeter circle were accepted.

### Performance Steps

1. Determine if you must establish a mechanical zero for the rifle. The rifle must have the mechanical zero established if the rifle--
  - a. Is being returned to service after direct support (DS) or general support (GS) maintenance.
  - b. Has not been zeroed for you.
  - c. Has been dropped or otherwise damaged.
2. Select the unmarked, long-range aperture on the rear sight for zeroing.
3. Set the sights to the mechanical zero, if required.
  - a. Set the front sight (consisting of a rotating post with a spring-loaded detent).
    - (1) Depress the detent using a pointed object such as a cartridge.
    - (2) Rotate the post up or down so the notched disk is flush with the top of the front sight post well.
  - b. Set the rear sight to the center.
    - (1) Align the index mark on the 0-2 aperture with the center line on the windage scale and the mark on the receiver.
    - (2) Rotate the elevation knob down until the range scale mark "6/3" is aligned with the mark on the left side of the receiver.
    - (3) Rotate the elevation knob two clicks clockwise past the "6/3" mark.

NOTE: The sight picture is obtained by aligning the rear sight and the front sight with the proper aiming point for your target. The sight picture depends on sight alignment and placement of the aiming point.

4. Establish the sight picture.
  - a. Align the sights.
    - (1) Center the top of the front sight post in the center of the rear sight.
    - (2) Draw an imaginary horizontal line through the center of the rear aperture so that the top of the front sight post touches the line.
    - (3) Draw an imaginary vertical line through the center of the rear aperture that bisects the front sight post.
    - (4) Verify the sight picture.

NOTE: When you concentrate on the front sight post, the rear sight aperture will be blurred.

- b. Align the aiming point.
  - (1) Position the top of the front sight post center mass of the scaled silhouette target.
  - (2) Confirm that an imaginary vertical line drawn through the center of the front sight post splits the target.
  - (3) Confirm that an imaginary horizontal line drawn through the top of the front sight post splits the target.

5. Fire a three-round shot group at the target.

6. Triangulate the shot group on the target.

**Performance Steps**

7. Repeat steps 5 and 6 until the shot group falls within 4 centimeters.  
 NOTE: The target is divided by labeled vertical and horizontal lines. It also has pictures of the front and rear sights with a direction arrow to assist you with adjusting the sights.

8. Adjust the sights to move the shot group within the zero circle if required.  
 NOTE: Do not adjust the sights if the shot group meets the task standard.
- a. Adjust the elevation.
    - (1) Find the horizontal line (right-to-left) nearest the center of the shot group.
    - (2) Follow the line either left or right to the nearest edge of the target.
    - (3) Identify the number of clicks and the direction of the adjustment shown at the edge of the target.
    - (4) Adjust the front sight in the indicated direction and number of clicks.
    - (5) Record the adjustment made on the target.
  - b. Adjust the windage.
    - (1) Find the vertical line (up-and-down) nearest the center of the shot group.
    - (2) Follow the line either up or down to the nearest edge of the target.
    - (3) Identify the number of clicks and the direction of the adjustment shown at the edge of the target.
    - (4) Adjust the rear sight in the indicated direction and number of clicks.
    - (5) Record the adjustment made on the target.

9. Fire a three-round shot group.

10. Repeat step 8 if the shot group is not within the 4-centimeter circle on the target.

11. Repeat steps 9 and 10 until the shot group is within the circle.

12. Compute the battlesight zero.

13. Label the rifle with the battlesight zero.

- a. Record the battlesight zero on the tape.
- b. Attach the tape to the rifle.

**Evaluation Preparation:** SETUP: On a 25-meter firing range, the soldier should have his or her assigned rifle and magazine. Give the soldier 18 rounds of 5.56-mm ball ammunition, a sandbag for support, and a rifle shot group analysis card (GTA 21-1-4).

NOTE: You can train rifle marksmanship skills using any and all rifle marksmanship training devices (for example, Weaponeer, Basic Rifle Marksmanship, DVC 07-57). The live-fire evaluation of a soldier's ability to zero the rifle requires firing on the standard zero range. The performance of this task for the common task test (CTT) can be done in conjunction with live fire on the standard zero range or during a unit weapon qualification firing cycle.

BRIEF SOLDIER: Tell the soldier to battlesight zero the rifle using no more than 18 rounds. Provide the soldier with a scenario that requires him or her to establish a mechanical zero.

**Performance Measures**

	<u>GO</u>	<u>NO GO</u>
1. Selected the unmarked, long-range aperture.	_____	_____
2. Established the mechanical zero, if necessary.	_____	_____
a. Set the front sight by rotating the post so the notched disk was flush with the front sight post well.		
b. Set the rear sight.		
(1) Aligned the index mark on the 0-2 aperture with the center line of the windage scale and the mark on the receiver.		
(2) Rotated the elevation knob down until the range scale mark "6/3" was		

<b>Performance Measures</b>	<b><u>GO</u></b>	<b><u>NO GO</u></b>
aligned with the mark on the left side of the receiver.		
(3) Rotated the elevation knob two clicks clockwise past the "6/3" mark.		
3. Established the sight picture.	—	—
a. Aligned the sights.		
b. Aligned the aiming point.		
4. Fired a three-round shot group.	—	—
5. Triangulated the shot group.	—	—
6. Repeated performance measures 3 and 4 until the shot group fell within 4 centimeters.	—	—
7. Adjusted the sights to move the shot group to within the zero circle, if necessary.	—	—
NOTE: Do not adjust the sights unless necessary.		
8. Repeated performance measures 3 through 6 until five of six rounds, in two consecutive groups, are within the 4-centimeter circle on the target.	—	—
9. Used no more than 18 rounds total.	—	—
10. Recorded the battlesight zero.	—	—

**Evaluation Guidance:** Score the soldier GO if all performance measures are passed. If the rifle does not require adjustment, score performance measure 6 acceptable if the soldier demonstrates with the target that the sights are within acceptable parameters. Score the soldier NO-GO if any performance measure is failed. If the soldier scores NO-GO, show the soldier what was done wrong and how to do it correctly.

**References  
Required**

**Related**  
FM 23-9  
TM 9-1005-249-10

**Construct Field-Expedient Firing Aids for an M16A1/A2 Rifle**  
**071-311-2006**

**Conditions:** As a member of a squad in a defensive position, given an M16A1 or M16A2 rifle, a magazine and ammunition, sticks or rocks and boards available in the area, instructions on target location(s) within the individual's sector of fire, and left and right limits of the sector.

**Standards:** Properly emplaced and aligned aiming and sector stakes on identifiable probable enemy avenues of approach, assault positions, and automatic weapons positions. Included left and right sector stakes to mark the sector of fire. When stakes were properly placed, they allowed placement of rounds in selected target areas or positions. All fires were within the sector of fire.

**Performance Steps**

NOTE 1: Use sector stakes to control the weapon within a sector of fire during limited visibility.

NOTE 2: Use aiming stakes to align a weapon on a known point or target during limited visibility.

1. Sector stakes. Sector stakes mark the left and right limits of your sector of fire (Figure 1).
  - a. Use tree limbs 1 to 1 1/2 inches in diameter or pieces of an ammunition box about 18 inches long for the sector stakes.
  - b. Ensure the stakes are sturdy; they must stick out of the ground far enough to keep you from pointing and firing your rifle out of the sector.
  - c. You must also drive the stakes far enough into the ground so that the rifle will not knock them down if it hits them.

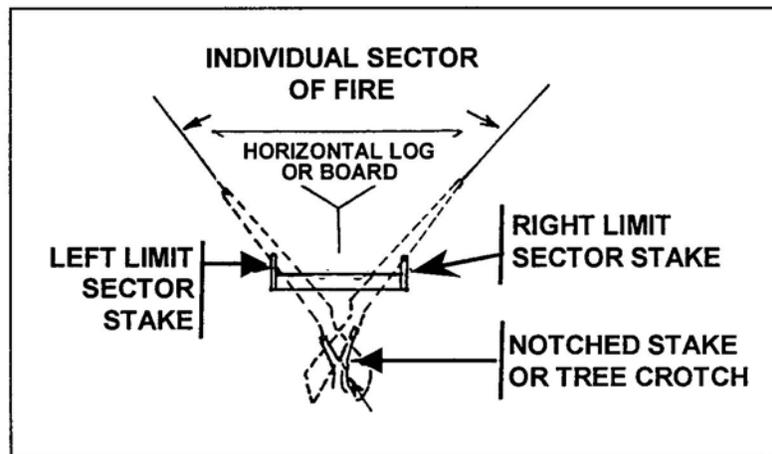


Figure 1. Sector stakes.

2. Aiming stakes. During limited visibility, aiming stakes help in placing fire on avenues of approach or on specific targets.
  - a. Locate probable enemy positions or likely avenues of approach within your sector.
  - b. Select forked tree limbs 12 to 14 inches long.
  - c. Drive one stake into the ground near the edge of the fighting position. The stock of your rifle rests on this stake. The stake should be high enough to allow the rifle stock to fit comfortably against your shoulder.
  - d. Place additional stakes forward of the stock stake and align each with a target or avenue of approach. Firmly drive each stake into the ground. Adjust the stakes so that, in a firing position, when the rifle is placed on the stock and forward stakes, the fire will strike its intended target (Figure 2). To fire, hold your shoulder firmly against the butt plate and the barrel in the aiming stakes.

**Performance Steps**

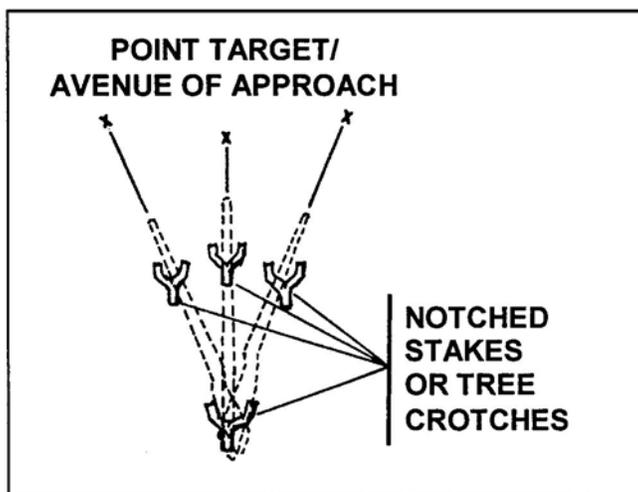


Figure 2. Aiming stakes.

NOTE: The soldier must hold the weapon in the exact position he held it when he positioned the stakes.

**Evaluation Preparation:** SETUP: At the test site, provide a prepared fighting position, an M16A1 or M16A2 rifle, one magazine with ammunition, and forked stakes and sticks. Show the soldier his sector of fire and the target(s) to be laid on.

BRIEF SOLDIER: Tell the soldier to emplace the M16A1 or M16A2 rifle using the field-expedient method with the materials provided.

<b>Performance Measures</b>	<u>GO</u>	<u>NO GO</u>
1. Emplaced the sector stakes so that the rifle could not be fired outside the assigned sector of fire, and so that they could not be knocked down when touched with the rifle.	—	—
2. Emplaced the aiming stakes so each target was hit when the rifle was fired. The aiming stakes provided a stable rest for the rifle.	—	—

**Evaluation Guidance:** Score the soldier GO if all performance measures are passed. Score the soldier NO-GO if any performance measure is failed. If the soldier scores NO-GO, show the soldier what was done wrong and how to do it correctly.

**References  
Required**

**Related**  
FM 21-75  
TM 9-1005-317-10

**Zero a Night Vision Sight, AN/PVS-4, to an M16-Series Rifle**  
**071-315-2307**

**Conditions:** Given an AN/PVS-4 mounted on a zeroed M16-series rifle, a magazine with 18 rounds of ammunition, a silhouette target (with a 25-meter zeroing target attached) 25 meters from the firing point, and sandbags.

**NOTE:** Ensure that the AN/PVS-4 has the M16, M203 sight reticle installed.

**Standards:** Placed the center of a three-round shot group 7 centimeters below the target aiming point.

**NOTE:** You may zero the sight during daylight or dark. If in daylight, use the daylight cover.

**Performance Steps**

**CAUTION:** Prolonged use of the sight under high light without a daylight cover will damage the image-intensifier assembly.

1. Assume a good prone-supported position 25 meters from the target.
2. Place the sight into operation.

**WARNING:** Do not use the sight without the eyeguard attached or weapon recoil may cause personnel injury.

3. Adjust the azimuth and elevation controls so that the reticle aiming point is about in the center of the sight's field of view.
4. Fire three rounds to seat the sight on the weapon. Fire them into a safe area; try not to hit the zero target. Retighten the mounting knob.
5. Place the zeroing range aiming point of the reticle on the target aiming point; fire three rounds to obtain a good shot group (Figure 1). Use either the M16A1 25-meter zero target shown in Figure 2 or the M16A2 25-meter zeroing target shown in Figure 3. When zeroing the night vision sight, you can use either of these targets with either the M16A1 or M16A2 rifle. Use the marginal information on the target to adjust the sights on the rifle--not the night vision sight.

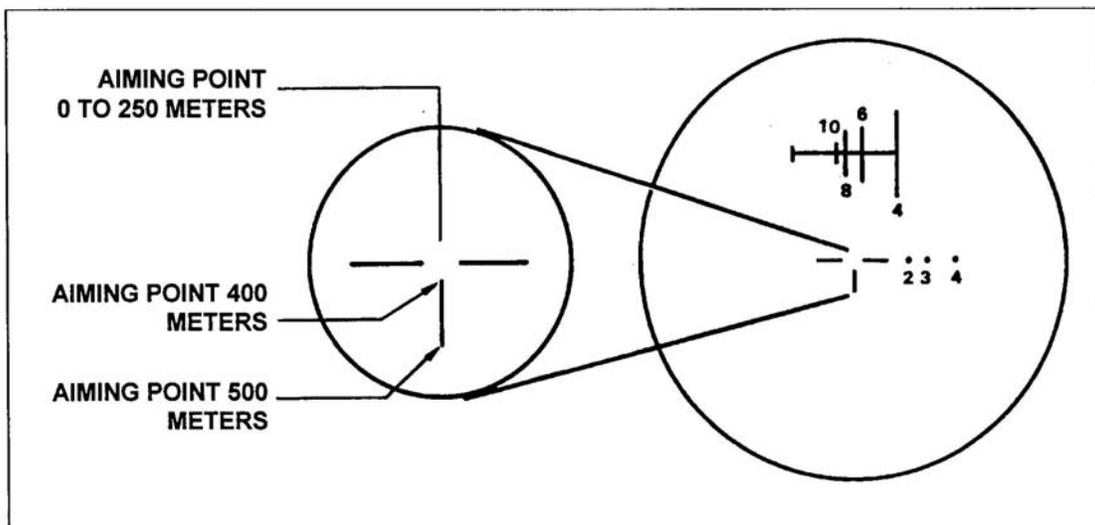


Figure 1. Zero aiming point.

6. Locate the center of the shot group. From the center of the group, adjust the reticle to move the center of the shot group to a point 7 centimeters (10 1/2 squares on the M16A1 target; 7.8 squares

**Performance Steps**

on the M16A2 target) directly below the target aiming point (Figures 2 and 3). Mark the reticle adjustment actuators to show the direction of round impact movement.

- a. Each click of the azimuth or elevation adjustment actuator moves the strike of the round 0.63 centimeter (1/4 mil or about 1/4 inch at a 25-meter range).
- b. On the M16A1 zero target, 1-1/2 squares equals 1 centimeter and 10 1/2 squares equals 7 centimeters (Figure 2). On the M16A2 zero target, each square is .9 centimeter and 7.8 squares equal 7 centimeters (Figure 3).

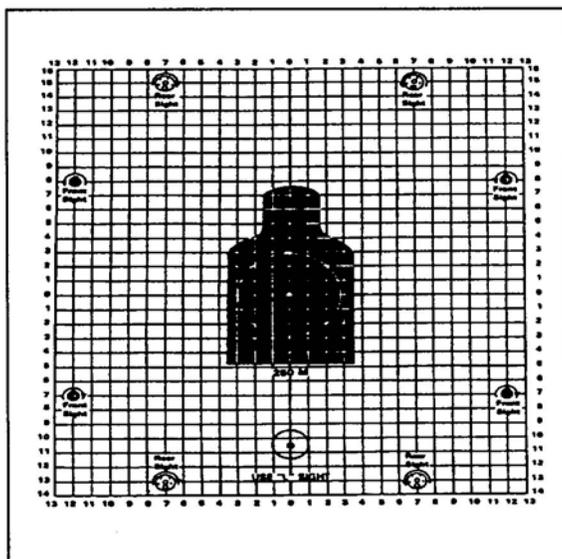


Figure 2. M16A1 zeroing target.

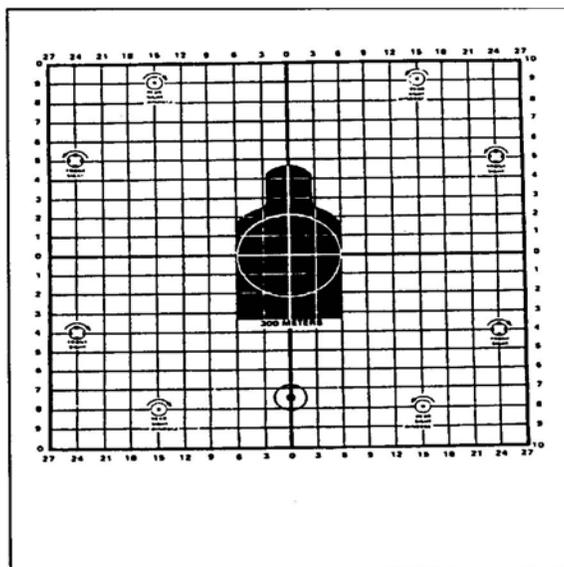


Figure 3. M16A2 zeroing target.

7. Perform the following actions after you adjust the controls:
  - a. Move a weapon so that the reticle aiming point is again on the target aiming point.
  - b. Repeat Steps 5 and 6 until the center of the shot group is 7 centimeters below the target aiming point as shown in Figures 4 and 5.

Performance Steps

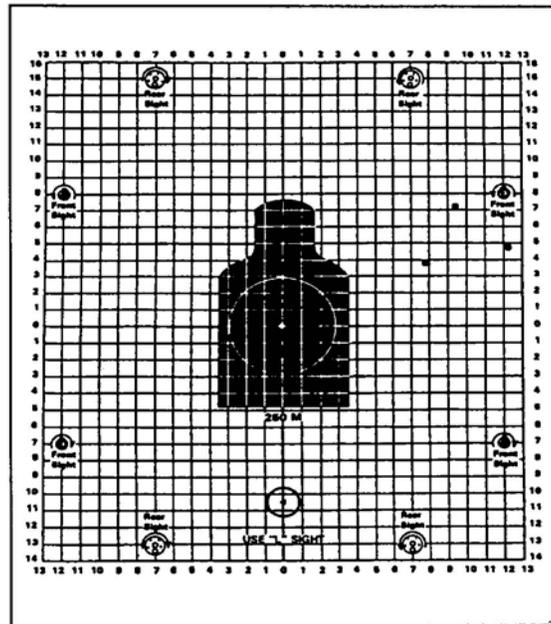


Figure 4. Sample 25-meter zeroing target for M16A1.

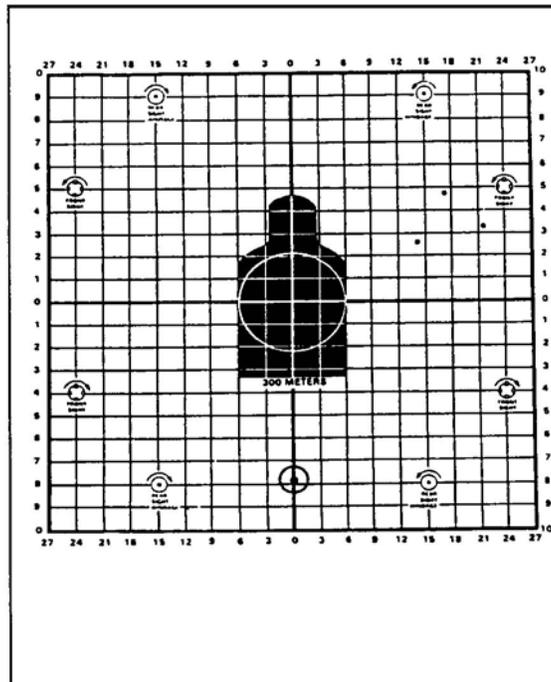


Figure 5. Sample 25-meter zeroing target for M16A2.

8. During zeroing, make sure the soldier places reticle aiming point (Figure 1) on the target aiming point in the silhouette's center of mass. Figure 6 shows what a zeroed shot group should look like.

**Performance Steps**

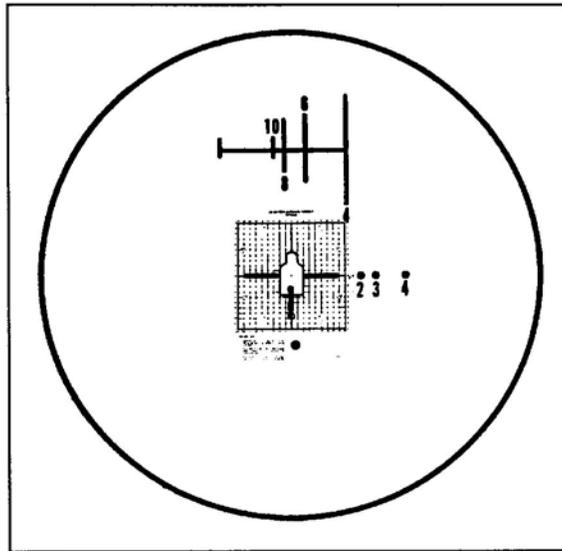


Figure 6. Sight picture and zeroed shot group.

**EXAMPLE:**

From the center of the shot group in Figure 4, move the azimuth adjustment actuator 11 clicks to the left. Move the elevation adjustment actuator down 17 clicks.

From the center of the shot group in Figure 5, move the azimuth adjustment actuator 9 clicks to the left. Move the elevation adjustment actuator 16 clicks.

**Evaluation Preparation:** **SETUP:** At the test site, provide all equipment and materials given in the task condition statement. Also provide a bipod for the rifle.

**BRIEF SOLDIER:** Tell the soldier to zero the AN/PVS-4 to the rifle within 18 rounds or less.

**Performance Measures**

1. Placed the AN/PVS-4 sight into operation.
2. Zeroed the AN/PVS-4 sight to the rifle within 18 rounds or less.
3. Removed the AN/PVS-4 sight from operation.

<u>GO</u>	<u>NO GO</u>
—	—
—	—
—	—

**Evaluation Guidance:** Score the soldier GO if all performance measures are passed. Score the soldier NO-GO if any performance measure is failed. If the soldier scores NO-GO, show the soldier what was done wrong and how to do it correctly.

**References**

**Required**

**Related**

TM 11-5855-213-10

## Subject Area 42: WEAPONS: M220-SERIES TOW

**Load the TOW Launcher on a BFV****071-056-0001**

**Conditions:** Given a BFV with the turret traversed to the TOW load position (5800 mils), a TOW launcher raised and positioned at 500 mils elevation (load and unload mode), a turret drive system switch OFF, a turret travel lock set in lock position, two practice TOW missiles, and a gunner as an assistant.

**Standards:** Inspected the TOW missiles and the launcher. Loaded the TOW missiles into the launcher so that it is ready to fire. Loaded the TOW launcher without causing any damage to the equipment or any injuries to personnel.

**Performance Steps**

CAUTION: Handle the TOW missile with extreme care to avoid damage to the plastic diaphragm at each end. If a TOW missile with a damaged diaphragm is loaded, it could misfire.

1. Open the cargo hatch to the second lock position.
2. Remove the TOW launcher dust cover (Figure 1).

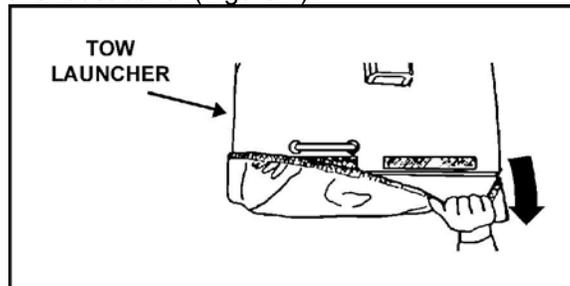
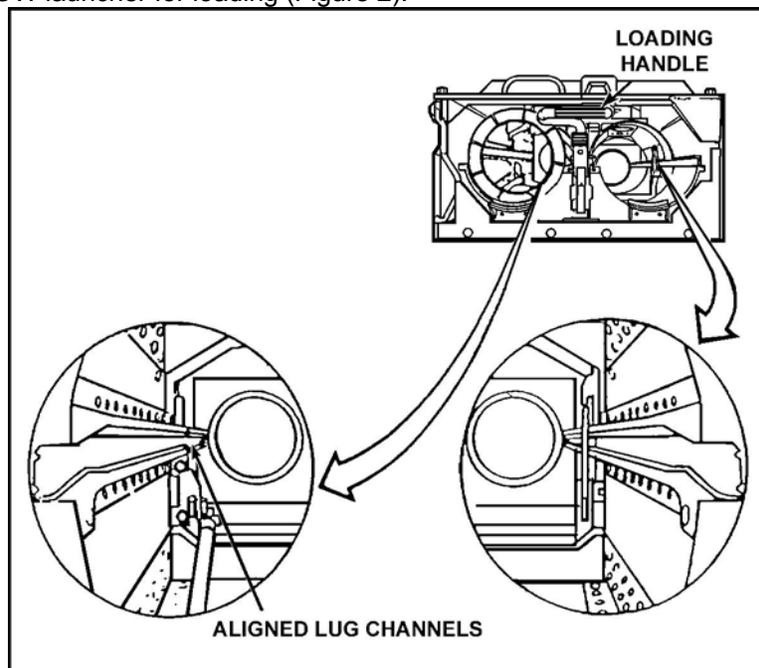


Figure 1. Dust cover.

3. Prepare the TOW launcher for loading (Figure 2).



**Performance Steps**

Figure 2. Loading handle.

NOTE: The M2/M2A1 has only one locking handle.

- a. Push and hold the lock handles to the left.
- b. Pull down the loading handles to align the lug channels in the missile tubes. Release the handle lock.

NOTE: The lug channels in the missile tubes can get out of alignment and block the TOW's loading. If the missiles meet resistance about halfway into the missile tube, pull down hard on the loading handle to realign the lug channels.

- 4. If reloading, pull the expended TOW missile casings from the TOW launch tubes and discard.
- 5. Inspect the TOW launch tubes.
  - a. Make sure the launch tubes are clear of obstructions such as leaves and dirt.
  - b. Ensure that umbilical connectors are not extending down into the tubes (Figure 3).

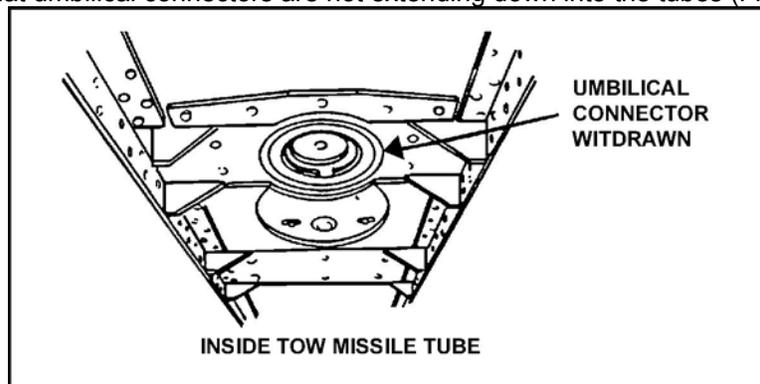


Figure 3. Umbilical connector.

CAUTION: The TOW and the command guidance electronics system could be damaged if the umbilical connector is extended down into the missile tube when the missile is loaded. If an extended umbilical connector cannot be withdrawn, DO NOT load the TOW.

- (1) Gunner: Withdraw the umbilical connectors by moving the ARM-SAFE-RESET switch to RESET, then to SAFE.
- (2) Recheck the umbilical connectors. If they are still extended, notify the chain of command.

- 6. Unstow the TOW missiles.

NOTE: Save two forward handling rings and two electrical connector covers for later use if unfired missiles are unloaded from a launcher.

- 7. Remove the forward handling ring from the nose end of the TOW. Release the clamp and remove the handling ring (Figure 4).

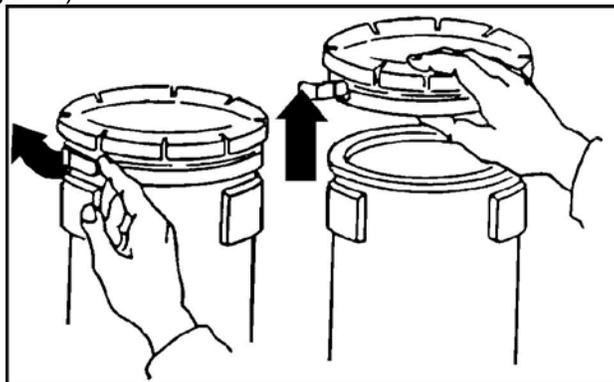


Figure 4. Handling ring.

## Performance Steps

8. Remove the electrical connector cover from the TOW electrical connector and save it until the missiles are fired (Figure 5).

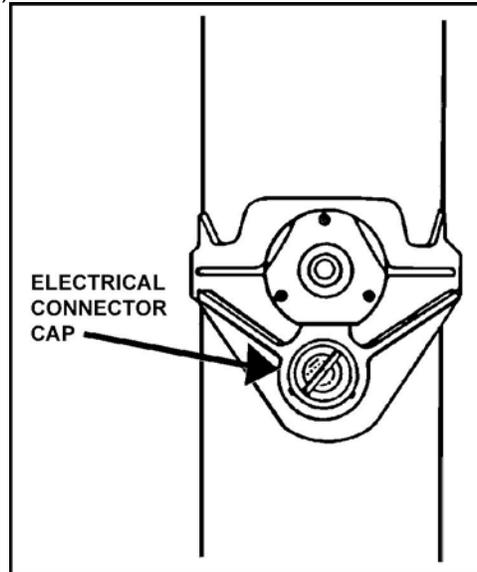


Figure 5. Electrical connector cover.

9. Inspect the TOW missiles in accordance with the steps below.
- Check the humidity indicator. It should be blue (Figure 6).

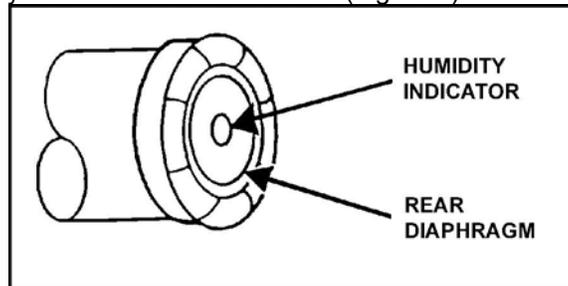


Figure 6. Humidity indicator.

**CAUTION:** A torn diaphragm lets moisture in, which damages the missile's electronic components.

**CAUTION:** In a training situation, if the humidity indicator is pink, do not load or fire the missile. In a combat situation, load and attempt to fire.

**WARNING:** A damaged TOW missile can cause a hangfire. Soldiers could be killed or injured. Except in combat situations, do not load the TOW missile if either end is damaged or if the humidity indicator on the rear diaphragm is pink.

- Check the nose and rear diaphragms for damage (Figure 7).

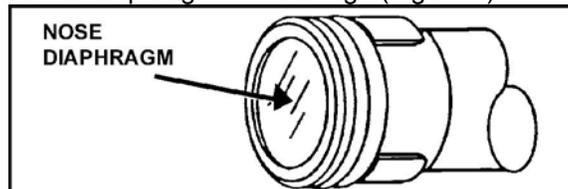


Figure 7. Nose diaphragms.

**Performance Steps**

c. Report any discrepancies to the supervisor.

10. Load the TOW missile into the left missile tube (No. 1 tube) (Figure 8).

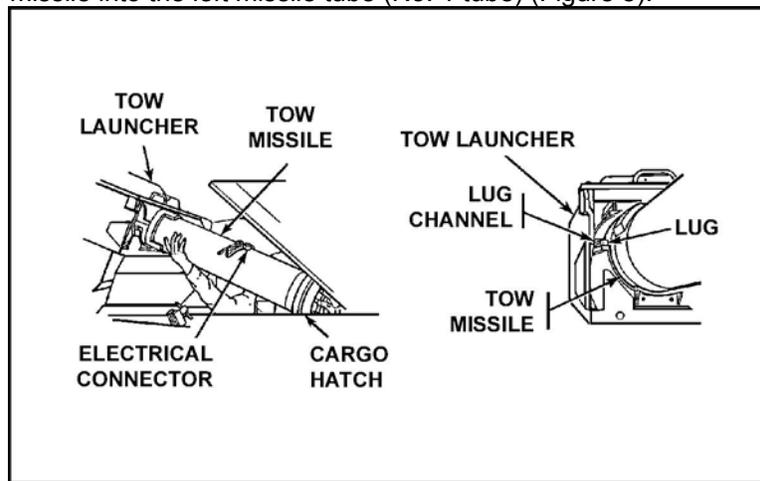


Figure 8. Load the missile.

- a. Lift the TOW missile out of the cargo hatch nose end first, with the electrical connector at the top.
- b. Slide the lugs on the sides of the nose end of the TOW missile into the missile tube lug channels.
- c. Carefully slide the missile all the way into the missile tube.
- d. Hold the missile in the tube and push the loading handle up until it is engaged by the loading handle lock.

11. Load the TOW missile into the right missile tube (No. 2 tube). Repeat steps 10a through 10d to load the right missile tube.

12. Close the cargo hatch and tell the gunner that the missiles are loaded. Announce, "TOW uploaded."

**Evaluation Preparation:** SETUP: Given a BFV, two practice TOW missiles, and a gunner. The turret is traversed to the TOW load position with the launcher elevated to 500 mils.

BRIEF SOLDIER: Tell the soldier to inspect the TOW missiles and launcher and to load the TOW missiles into the launcher so that it is ready to fire.

**Performance Measures**

	<u>GO</u>	<u>NO GO</u>
1. Opened the cargo hatch cover to the TOW load position.	—	—
2. Removed the dust cover from the launcher.	—	—
3. Inspected the TOW launch tubes.	—	—
4. Prepared the TOW launcher for loading.	—	—
5. Pulled down on the loading handle to align the lug channels.	—	—
6. Inspected the TOW missiles for damage.	—	—
7. Inspected the diaphragm and humidity indicator.	—	—
8. Lifted the TOW missile out of the cargo hatch nose end first, with the electrical connector at top.	—	—

**Performance Measures**

	<u>GO</u>	<u>NO GO</u>
9. Slid the lugs of the TOW missile into the launcher lug channels.	—	—
10. Slid the TOW missile all the way into the launcher.	—	—
11. Locked the missile in the TOW launcher.	—	—
12. Closed the cargo hatch and informed the gunner.	—	—

**Evaluation Guidance:** Score the soldier GO if all performance measures are passed. Score the soldier NO-GO if any performance measure is failed. If the soldier scores NO-GO, show the soldier what was done wrong and how to do it correctly.

**References  
Required**

**Related**  
TM 9-2350-252-10-2

**Unload the TOW Launcher on a BFV**  
**071-056-0002**

**Conditions:** Given a BFV with the TOW launcher in the load position, a loaded TOW launcher, and a requirement to unload the TOW launcher and stow the missiles in the missile racks.

**Standards:** Unloaded the TOW launcher. Returned the missiles to their original configuration and stowed them in the vehicle without causing damage to equipment or injury to personnel.

**Performance Steps**

1. Open the cargo hatch to the TOW load position.

**CAUTION:** Handle TOW missiles with care to avoid damaging the plastic diaphragms at each end. If a damaged TOW missile is loaded, it could misfire. Stow all damaged TOW missiles for turn-in to chain of command.

2. Inspect the rear end of the missiles by checking the rear diaphragm for tears or other damage before unloading (Figure 1).

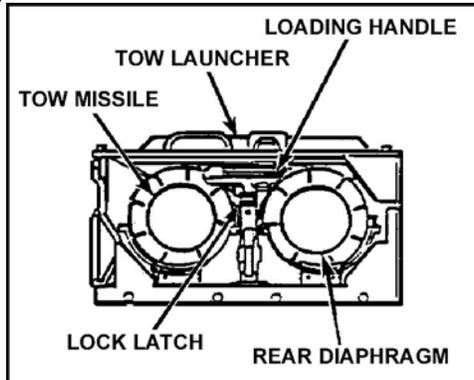


Figure 1. Rear of loaded TOW launcher.

3. Unload the right missile tube (No. 2 tube) first.
  - a. Push and hold the lock handle to the left.
  - b. Pull down the loading handle. Release the lock handle.
  - c. Carefully pull the missile out of the tube.
  - d. Lower the missile through the cargo hatch to the floor of the squad department.
4. Repeat step 3 to unload the left missile tube.
5. Push the latch handles up until they are engaged by the handle lock.
6. Install the dust cover on the rear of the TOW launcher.
7. Close the cargo hatch and tell the gunner that the TOW is unloaded.
8. Prepare the TOW missiles for stowage (Figure 2).

**Performance Steps**

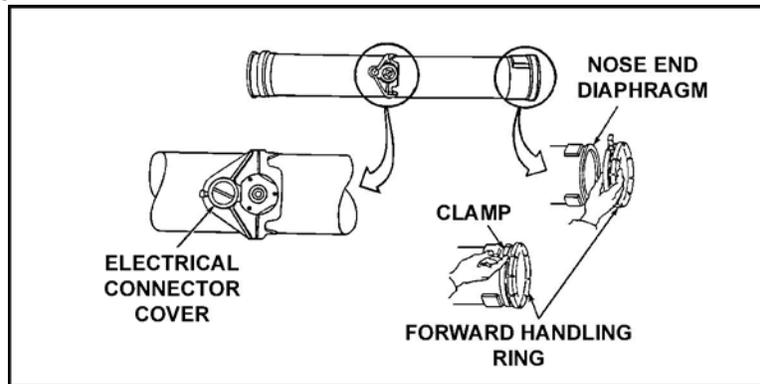


Figure 2. TOW missile.

- a. Check the nose end of the diaphragm for damage.
- b. Replace the forward handle rings and electrical connector covers.

9. Stow the TOW missiles.

**Evaluation Preparation:** SETUP: Provide the soldier with a BFV with the TOW launcher (loaded with two practice TOW missiles) in the load position and a gunner.

BRIEF SOLDIER: Tell the soldier to unload the TOW launcher and stow the missiles.

**Performance Measures**

	<u>GO</u>	<u>NO GO</u>
1. Opened cargo hatch to the TOW load position.	—	—
2. Inspected the rear of the missile for damage.	—	—
3. Unloaded the right missile tube first.	—	—
4. Unloaded the left missile tube.	—	—
5. Pushed the handles to the LOCK position.	—	—
6. Installed the dust cover on the rear of the launcher.	—	—
7. Closed the cargo hatch and informed the gunner that the launcher was unloaded.	—	—
8. Prepared the TOW missiles for stowage.	—	—
9. Stowed the TOW missiles.	—	—

**Evaluation Guidance:** Score the soldier GO if all performance measures are passed. Score the soldier NO-GO if any performance measure is failed. If the soldier scores NO-GO, show the soldier what was done wrong and how to do it correctly.

**References  
Required**

**Related**  
TM 9-2350-252-10-2

**Maintain an M220 Launcher System**

**071-056-0004**

**Conditions:** Given the components of an M220A1 or M220A2 launcher system, a scrub brush, denatured alcohol solvent, wiping rags, spill kit, approved hazardous waste accumulation containers, rubber gloves, goggles, detergent, glycerol, an orange stick, a camel-hair brush, lens paper, rubber syringe, deicer, cotton pads, lens cleaning solution, clean water, sandpaper, masking tape, primer, green polyurethane paint No. 383, black polyurethane paint No. 37039, desiccant pad (M220A1 only), and TM 9-1425-450-12 for an M220A2.

**Standards:** Inspected components IAW Table 2-1, preventive maintenance checks and services (PMCS), from the technical manual. Used correct cleaning materials and techniques and removed all foreign matter from components. Used correct painting materials and techniques to spot paint components. Performed system checkout procedures and determined if the launcher system was operational. Corrected all deficiencies the operator had the authority to correct. Reported all other deficiencies to the supervisor.

**Performance Steps**

Perform PMCS and system checkout procedures when you first receive a component; before, during, and after operation; and daily, when using the launcher system daily. Perform system checkout procedures before and after installing the launcher on a vehicle. When the launcher is in storage, perform checkout procedures weekly. Inspect each component IAW the PMCS outlined in TM 9-1425-450-12 for an M220A2.

NOTE: Leave each component on the launcher system while you perform PMCS.

1. Remove all spills and dispose of hazardous waste IAW the unit or installation SOP or OPORD.
2. Perform cleaning procedures as described in TM 9-1425-450-12 for an M220A2.
3. Spot paint as needed IAW procedures in TM 9-1425-450-12 for an M220A2.
4. Perform system checkout procedures IAW TM 9-1425-450-12 for an M220A2.
5. Correct all the deficiencies that the operator has the authority to correct.
6. Report all other deficiencies to the supervisor.

**Evaluation Preparation:** SETUP: Provide the soldier with all the equipment listed in the condition statement.

BRIEF SOLDIER: Tell the soldier to maintain an M220 launcher system IAW Section III of the appropriate technical manual.

<b>Performance Measures</b>	<b><u>GO</u></b>	<b><u>NO GO</u></b>
1. Inspected each component IAW the appropriate PMCS table.	—	—
2. Cleaned, decontaminated, contained, labeled, and transported components using correct materials and techniques.	—	—
3. Spot painted components using correct painting materials and techniques.	—	—
4. Performed system checkout procedures.	—	—
5. Corrected all the deficiencies that the operator had the authority to correct.	—	—
6. Reported all other deficiencies to the supervisor.	—	—

**Performance Measures****GO**    **NO GO**

7. Selected and wore appropriate PPE.

\_\_\_\_\_

**Evaluation Guidance:** Score the soldier GO if all performance measures are passed. Score the soldier NO-GO if any performance measure is failed. If the soldier scores NO-GO, show the soldier what was done wrong and how to do it correctly.

**References****Required**

TM 9-1425-450-12

**Related**

**Perform a System Self-Test on an M220A1 Launcher System**  
**071-056-0005**

**Conditions:** Given an assembled tripod-mounted or vehicle-mounted M220A1 launcher system.

**Standards:** Performed a system self-test and determined if the launcher system functions properly. Boresighted the daysight to the missile guidance set. Corrected all deficiencies the operator had the authority to correct. Reported all other deficiencies to the supervisor.

**Performance Steps**

1. Perform a system self-test--
  - a. Before and after installing the launcher system on a vehicle.
  - b. Daily, once the system is in use.
  - c. After changing any electrical component.
  - d. Whenever any of the following occur:
    - (1) The launcher system has been moved over rough terrain.
    - (2) The temperature rises or falls 10 degrees Fahrenheit.
    - (3) The launcher system has operated continuously for more than four hours.
    - (4) The launcher is moved to a new location using the extended travel mode.
    - (5) The tripod-mounted launcher is moved to a new operating site.

**WARNING:** If an encased missile is loaded, ensure that the arming lever is lowered to the safe position.

**CAUTION:** Perform the system self-test as quickly as possible. If performing the test takes too long, the battery assembly may not have enough power to fire missiles.

2. On the missile guidance set, turn the SELF-TEST switch to position 1.
  - a. Lift the cover over the TEST/OPERATE switch.
  - b. Push the TEST/OPERATE switch to the TEST position and hold it.

**NOTES:** Save time and prevent excessive wear on the TEST/OPERATE switch:

1. Set it to the TEST position and hold it continuously until you complete the system self-test.
2. Repeat the test after you remove and replace any component.
3. Check to ensure that the needles in the azimuth and elevation meters read between the in-band marks.
  - c. If the needles do not read between the in-band marks, remove and replace the battery assembly (tag the battery assembly for recharging). Repeat the self-test.
  - d. If the needles still do not read between the in-band marks, remove and replace the missile guidance set.
3. Check to ensure the azimuth and elevation meter lights work. If they do not work, you need do nothing about that at this time.
4. Set the SELF-TEST switch to position 2. Check to ensure the needles in the azimuth and elevation meters read between in-band marks. If not, remove and replace the missile guidance set.
5. Unlock the elevation lock on the traversing unit.
  - a. Move the launch tube up and down. Check to ensure that--
    - (1) When the launch tube moves up, the elevation meter needle moves right.
    - (2) When the launch tube moves down, the elevation meter needle moves left.
  - b. Lock the elevation lock and move the launch tube down until it locks in the 8-degree down position.
  - c. If the elevation needle does not move with the launch tube, remove and replace the traversing unit. Repeat the self-test.
  - d. If the needles still do not move with the launch tube, remove and replace the missile guidance set.
6. Unlock the azimuth lock on the traversing unit. Turn the launch right, left, and back to center.

**Performance Steps**

- a. Check to ensure that the azimuth meter needle moves right and left with the launch tube. Lock the azimuth lock and turn the launch tube until it locks in the forward position.
- b. If the azimuth needle does not move with the launch tube, remove and replace the traversing unit. Repeat the self-test.
- c. If the needles still do not move with the launch tube, remove and replace the missile guidance set.

## 7. Set the SELF-TEST switch to position 3.

- a. Check to ensure the needles in the azimuth and elevation meters read between in-band marks.
- b. If the needles do not read between in-band marks, remove and replace the missile guidance set.

## 8. Set the SELF-TEST switch to position 4.

- a. Check to ensure the needles in the azimuth and elevation meters read between in-band marks.
- b. If the needles do not read between in-band marks, remove and replace the missile guidance set.

## 9. Set the SELF-TEST switch to position 5.

- a. Check to ensure that the needles in the azimuth and elevation meters read between in-band marks within 12 seconds.
- b. If the needles do not read between in-band marks, remove and replace the missile guidance set.

NOTES: You must hold the TEST/OPERATE switch in the TEST position while you move the SELF-TEST switch from position 4 to position 5. When you do so--

1. The azimuth meter needle will read to the extreme left. However, after 8 to 10 seconds, it should move between the in-band marks.

2. Likewise, the elevation meter needle will read to the extreme left, then move between the in-band marks, back to the extreme left, then back between the in-band marks.

## 10. Set the SELF-TEST switch to position 6.

- a. Check to ensure that the needles in the azimuth and elevation meters read between the in-band marks.
- b. If the needles do not read between in-band marks, remove and replace the missile guidance set.

## 11. On the daysight, set the FOCUS control to +3 or greater.

## 12. Set the SELF-TEST switch to position 7.

- a. Check to ensure the daysight motor is running.
- b. If you cannot hear the motor, remove and replace the daysight.
- c. Check to ensure that the azimuth and elevation meter needles read at the center of in-band area.
- d. If the azimuth and elevation meter needles do not read at the center of the in-band area, adjust the boresight. To adjust the boresight--
  - (1) Open the boresight adjustment knob covers.
  - (2) Turn the azimuth boresight adjustment knob to center needle in azimuth meter.
  - (3) Turn the elevation boresight adjustment knob to center needle in elevation meter.
  - (4) Close the boresight adjustment knob covers.
  - (5) If, after several adjustments, the azimuth or elevation meter needles do not center, release the TEST/OPERATE switch, set the boresight adjustment knobs to about center, and then repeat the self-test. If they still do not center, remove and replace the daysight tracker. Repeat the self-test. If you still cannot center the needles, remove and replace the missile guidance set.

NOTE: Whenever you adjust the boresight, you must also collimate the nightsight to the daysight.

## 13. Release the TEST/OPERATE switch, then close the cover.

**Performance Steps**

14. Set SELF-TEST switch to the unmarked position (do not repeat self-test position 1).
15. Report to your supervisor all deficiencies the operator has no authority to correct.

**Evaluation Preparation: SETUP:** Provide the soldier with all the equipment listed in the condition statement. Change the azimuth and elevation boresight adjustment knobs to ensure that the soldier will adjust the boresight.

**BRIEF SOLDIER:** Tell the soldier to perform a system self-test to determine if the launcher system functions properly. Have the soldier boresight the daysight to the missile guidance set. Correct all deficiencies the operator has the authority to correct. Report all other deficiencies to the supervisor.

<b>Performance Measures</b>	<b><u>GO</u></b>	<b><u>NO GO</u></b>
1. Checked SELF-TEST position 1 for in-band reading	—	—
2. Checked to ensure that the azimuth and elevation meter lights worked.	—	—
3. Checked SELF-TEST position 2 for in-band reading.	—	—
4. Checked to ensure that the elevation meter needle moved to the right when the launch tube moved up, and that the needle moved to the left when the launch tube moved down	—	—
5. Checked to ensure that the azimuth meter needle moved right and left with the launch tube.	—	—
6. Checked SELF-TEST position 3 for the in-band reading.	—	—
7. Checked SELF-TEST position 4 for the in-band reading.	—	—
8. Checked SELF-TEST position 5 for the in-band reading within 12 seconds.	—	—
9. Checked SELF-TEST position 6 for the in-band reading.	—	—
10. Set the daysight focus control to +3 or greater.	—	—
11. Checked SELF-TEST position 7 to determine whether the daysight motor was running.	—	—
12. Checked SELF-TEST position 7 for azimuth and elevation needles reading center of in-band area.	—	—
13. Adjusted the boresight (as needed).	—	—
14. Corrected all deficiencies the operator had the authority to correct.	—	—
15. Reported all other deficiencies to the supervisor.	—	—

**Evaluation Guidance:** Score the soldier GO if all performance measures are passed. Score the soldier NO-GO if any performance measure is failed. If the soldier scores NO-GO, show the soldier what was done wrong and how to do it correctly.

**References  
Required**

**Related**  
FM 23-34  
TM 9-1425-450-12  
TM 9-1425-472-12

**Perform a Preoperational Inspection of an M220 Launcher System and Encased Missile**  
**071-056-0006**

**Conditions:** Given an assembled tripod-mounted or vehicle-mounted M220A1 or M220A2 launcher system and an encased missile.

**Standards:** Performed a preoperational inspection of the launcher system to ensure that the battery assembly, lights, trigger, bridge clamp, and launch tube were operational and free of all foreign matter. Corrected all deficiencies the operator had the authority to correct. Performed a preoperational inspection of the encased missile to ensure that it remained free of all foreign matter, was undamaged, and was safe to fire. Reported all deficiencies to the supervisor.

**Performance Steps**

1. Perform preoperational inspection before installation of the launcher system on a vehicle; inspect daily, once the system is in use; and, if time is available, inspect after changing operating sites (tripod-mounted system only).

**WARNING:** Ensure the launcher does not contain an encased missile before you conduct a preoperational inspection. The missile could fire during the inspection causing injury to personnel.

2. Perform preoperational inspection of an M220 launcher system.
  - a. Inspect missile guidance set for battery.
    - (1) M220A1. Set the SELF-TEST switch to position 1. Lift the cover over the TEST/OPERATE switch. Push the TEST/OPERATE switch to the TEST/OPERATE position and hold it there. Check to ensure the needles in the azimuth and elevation meters read between the in-band marks and that the meter lights are on. However, if the needles read between in-band marks and the lights are not on, then move to the next step. Release the TEST/OPERATE switch and close the cover. If the needles do not read between the in-band marks, remove the battery assembly, tag it for recharging, and replace it. Repeat the self-test. If the needles still do not read between the in-band marks, remove and replace the missile guidance set.
    - (2) M220A2. Lift the cover over the TEST/OPERATE switch. Push the switch to the TEST/OPERATE position and hold it there. Check to ensure that all the lamps on the display light up and remain lit for three seconds. Release the TEST/OPERATE switch and close the cover. Remove and replace the battery assembly (tag battery assembly for recharging) if the lamps do not light up. Repeat the self-test. If the lamps still do not light up or remain lit for three seconds, remove and replace the missile guidance set.
  - b. Inspect the daysight reticle light by setting the focus control to -0+. Set the reticle light switch to ON. While looking into the eyepiece, adjust the focus control for sharp crosshairs. Check to ensure that the reticle light came on. During daylight, you may have to shield the daysight lens to see if it is on. If so, turn the reticle light switch to OFF. If the reticle light remains unlit, remove and replace the daysight.
  - c. Lift the trigger cover and inspect the trigger. Press the trigger in and release it. You should hear a click when you press the trigger. You should hear another click when you release the trigger. Also, the trigger should spring back when released. Close the trigger cover. If you do not hear a click when you press or release the trigger, or if the trigger does not spring back when you release it, remove and replace the traversing unit.
  - d. Inspect the bridge clamp. Unlock and raise the bridge clamp-locking handle, then open the bridge clamp itself. Check the clamp to ensure it unlocks and opens without binding. Check to ensure the electrical connector is free of foreign matter and completely inside the bridge clamp. Lower the bridge clamp, and then lower the locking handle. Slowly raise, then lower the locking handle. You should hear a click when you raise it and again when you lower it. Raise the arming lever to the armed position. Check to ensure the electrical connector extends about 1 inch. Lower the arming lever. For any deficiencies you cannot correct, remove and replace the traversing unit.
  - e. Inspect the launch tube to ensure that it is securely attached to the trunnion of the traversing

**Performance Steps**

unit by the launch tube bracket or indexing lugs and launch tube latch/catch. Check to ensure that the breech and inside of the launch tube are free of dirt, missile wire, and foreign matter. Also, check to ensure that the inside of the launch tube is free of splits, cracks, gouges, tears, pits, visible raised areas, and exposed fabric or threads. For any deficiencies you cannot correct, remove and replace the traversing unit.

f. Report all uncorrected deficiencies to the supervisor.

3. Perform a preoperational inspection of an encased missile.

a. Inspect the outside of the encased missile for oil, dirt, grease, dents, gouges, punctures, and cracks. Remove any oil, dirt, or grease.

**WARNING:** If the missile case is punctured or damaged in such a way that the missile inside may be damaged, treat the missile as hazardous material and notify EOD personnel.

b. Inspect the rear diaphragm to ensure that it remains intact (not ruptured) and that the humidity indicator is blue.

**CAUTION:** Do not break the rear diaphragm. Water can damage the missile if it gets into the missile case.

c. Inspect the protective cover on the electrical connector to ensure it is present and seated on the electrical connector.

d. Inspect the forward handling ring and quick release clamp to ensure they are present and secured.

e. Inspect the indexing lugs to ensure they sustained no damage.

f. Report all deficiencies to the supervisor.

**Evaluation Preparation:** **SETUP:** Provide the soldier with all the equipment listed in the condition statement. For training, use a missile simulation round (MSR) instead of an encased missile.

**BRIEF SOLDIER:** Tell the soldier to perform a preoperational inspection of an M220 launcher system and to ensure that the battery assembly, lights, trigger, bridge clamp, and launch tube are operational and free of all foreign matter. Have him perform a preoperational inspection of an encased missile to ensure that it is free of all foreign matter, is not damaged, and is safe to fire. Tell him to correct all deficiencies that operators have the authority to correct. Have him report all other deficiencies to the supervisor.

**Performance Measures**

**GO**      **NO GO**

1. Performed a preoperational inspection of an M220 launcher system.

\_\_\_\_\_      \_\_\_\_\_

- a. Inspected missile guidance set for battery.
- b. Inspected daysight reticle light.
- c. Inspected trigger.
- d. Inspected bridge clamp.
- e. Inspected launch tube.
- f. Corrected all deficiencies the operator had the authority to correct.
- g. Reported all other deficiencies to the supervisor.

2. Performed a preoperational inspection of an encased missile.

\_\_\_\_\_      \_\_\_\_\_

- a. Inspected outside of encased missile.
- b. Inspected rear diaphragm and humidity indicator.
- c. Inspected electrical connector protective cover.
- d. Inspected forward handling ring and quick release clamp.
- e. Inspected indexing lugs.
- f. Reported deficiencies to the supervisor.

**Evaluation Guidance:** Score the soldier GO if all performance measures are passed. Score the soldier NO-GO if any performance measure is failed. If the soldier scores NO-GO, show the soldier what was done wrong and how to do it correctly.

**References  
Required**

**Related**  
TM 9-1425-450-12

## Load an M220 Launcher System

071-056-0007

**Conditions:** Given an assembled, tripod-mounted M220A1 or M220A2 launcher system, encased missile, and a gunner as an assistant.

**Standards:** Loaded the encased missile so that it seated in the launch tube with the bridge clamp lowered and the locking handle in the locked position. Checked the backblast area and raised the arming lever to the armed position.

### Performance Steps

1. Check to ensure that the gunner closes the trigger cover and locks the launcher in the forward, 8-degree down position.
2. Raise the bridge clamp-locking handle and open the bridge clamp.
3. Inspect the encased missile to ensure there are no dents, gouges, punctures, or cracks in the missile case.

**WARNING:** If the missile case has a puncture or if you see evidence of any kind of damage that might mean the missile inside could also have damage, then treat the missile as hazardous material and notify EOD personnel.

4. Inspect the rear diaphragm to ensure that it remains intact (not ruptured) and that the humidity indicator is blue.

**CAUTION:** Do not break the rear diaphragm. If water gets into the launch case, it may damage the missile.

**WARNING:** If the humidity indicator is pink--

In a training situation, DO NOT fire the missile.

In a combat situation, load and try to fire it only if you cannot find any other missiles.

5. Remove the protective cover from the electrical connector.
  - a. Turn the ring in the center of the protective cover two complete turns counterclockwise, then turn the cover itself clockwise to remove the cover from the electrical connector.
  - b. Make sure that the rubber O-ring stays inside the cover and that the cover remains unattached to the electrical connector.
  - c. Save the protective cover to re-use if you do not fire the missile.
6. Inspect the indexing lugs to ensure they have sustained no damage.
7. Remove the quick release clamp and forward handling ring.
  - a. Slightly raise the forward end of the encased missile.
  - b. Pull up on the quick release clamp at the forward handling ring and remove both from the encased missile.

**CAUTION:** Use care not to punch a hole in the forward diaphragm when the forward handling ring is removed.

- c. Verify that the rubber O-ring remains inside the forward handling ring and that it remains unattached to the forward end of the encased missile.
  - d. Lower the forward end of the encased missile.
  - e. Save the forward handling ring and quick release clamp to be used again if the missile is not fired.
8. Load the missile.
    - a. Face the missile with the nose end to your right.
    - b. Pick up the missile by sliding both hands underneath the missile, palms facing up. Cradle the missile to you and stand up. Carry the missile to the launcher.
    - c. Raise rear end of the missile about 45 degrees and, with the electrical connector facing up,

**Performance Steps**

insert the indexing lugs into the launch tube indexing slots. Slide the encased missile forward and down into the launch tube until the indexing lugs are seated firmly in place.

- d. Lower the rear end of the encased missile until it seats fully in the trunnion.
- e. Lower the bridge clamp. Push down on top of the bridge clamp with one hand, and with the other hand, lower the locking handle until it locks.

NOTE: The gunner must unlock the launcher and acquire and identify a target before the launcher arms.

WARNING: DO NOT raise the arming lever until the gunner is ready to fire at a selected target.

- 9. Check the backblast area. Face the rear of the launcher and check left and right of the launcher to ensure there are no personnel, equipment, or flammable materials within the rear firing danger zone (75 meters out from the rear of the launcher at a 90-degree angle). When the rear firing danger zone is clear, announce "BACKBLAST AREA CLEAR."

WARNING: Before continuing with the missile-loading procedure, and while it is on-going, make sure that all personnel, equipment, and flammable materials remain clear of the rear firing danger zone. Anyone or anything that remains in the backblast area may sustain injury or damage when the missile fires.

- 10. Raise the arming lever to the armed position. Look to make sure that the electrical plug on the bridge clamp connects to the receptacle on the missile.
- 11. Announce "ARMING LEVER UP."

**Evaluation Preparation:** SETUP: Provide the soldier with all the equipment and personnel listed in the conditions statement. Ensure the encased missile is not loaded in the launcher. For training, use a missile simulation round (MSR) instead of an encased missile. Do not evaluate the gunner during this task.

BRIEF SOLDIER: Tell the soldier to prepare the launcher system. Have him inspect and prepare the encased missile, then load it so that it seats in the launch tube with the bridge clamp lowered and the locking handle in the locked position. Have him check the backblast area and raise the arming lever to the armed position.

**Performance Measures**

	<u>GO</u>	<u>NO GO</u>
1. After the gunner closed the trigger cover and locked the launcher in the forward, 8-degree down position, raised the bridge clamp-locking handle and opened the bridge clamp.	—	—
2. Inspected the encased missile case for dents, gouges, punctures, or cracks.	—	—
3. Inspected the rear diaphragm and the humidity indicator.	—	—
4. Removed the protective cover from the electrical connector.	—	—
5. Inspected the indexing lugs.	—	—
6. Removed the quick release clamp and forward handling ring.	—	—
7. Loaded the encased missile.	—	—
8. Checked the backblast area.	—	—
9. Announced "BACKBLAST AREA CLEAR."	—	—
10. Raised the arming lever to armed position.	—	—
11. Announced "ARMING LEVER UP."	—	—

**Evaluation Guidance:** Score the soldier GO if all performance measures are passed. Score the soldier NO-GO if any performance measure is failed. If the soldier scores NO-GO, show the soldier what was done wrong and how to do it correctly.

**References  
Required**

**Related**  
TM 9-1425-450-12

**Unload an M220 Launcher System**  
**071-056-0008**

**Conditions:** Given an assembled tripod-mounted M220A1 or M220A2 launcher system, empty missile case, encased missile, and a gunner to help you.

**Standards:** Removed the empty missile case (fired missile) from the launch tube and cleared the launcher. Removed the encased missile (not the fired missile) from the launch tube and prepared it for stowage.

**Performance Steps**

1. Unload the launcher after a missile has been fired.
  - a. Check to ensure that the gunner has closed the trigger cover and locked the launcher in the forward, 8-degree down position.

NOTE: The gunner must now close the trigger cover and lock the launcher in the forward, 8-degree down position before you can perform the next step, which is to open the bridge clamp.

- b. Raise the bridge clamp-locking handle and open the bridge clamp.

**CAUTION:**

1. Open the bridge clamp before you lower the arming lever. Lowering the arming lever will cause the wire-cutting mechanism to malfunction--it will fail to cut the command-link wires. If this occurs, you will have to cut the wires manually before you can remove the empty missile case.

2. During training or support and stability operations, dispose of wire, case, and retaining rings (scrap metal) IAW SOP after firing practice rounds.

- c. Lift the back end of the missile container and remove it from the launch tube.
  - d. Dispose of the empty missile case IAW the unit SOP.
  - e. Clear the launch tube of command-link wires and any foreign matter.

WARNING: Be careful when pulling command-link wires out of the launch tube. The wires are very small and strong, and you can injure yourself if you handle them carelessly.

2. Unload the launcher when a missile has not been fired.

NOTE: You can lower the arming lever at the same time the gunner closes the trigger cover and locks the launcher in the forward, 8-degree down position. However, the gunner must close the trigger cover and lock the launcher in the forward, 8-degree down position before you can unlock and open the bridge clamp.

- a. Lower the arming lever.
  - b. Ensure that the gunner has closed the trigger cover and locked the launcher in the forward, 8-degree down position.
  - c. Raise the bridge clamp-locking handle and open the bridge clamp.

**CAUTION**

If the missile was not fired, lower the arming lever before you open the bridge clamp. If you do not lower the arming lever first, the wire-cutting mechanism will cut the command-link wires.

- d. Lift the back end of the encased missile and remove it from the launch tube.
  - e. Replace the electrical connector protective cover, forward handling ring, and quick release clamp.
  - f. Tag the missile with the date that it was initially prepared for firing.

**Evaluation Preparation:** SETUP: Provide the soldier with all equipment and personnel listed in the condition statement. Load an encased missile or empty missile case in the launcher. For training, use a missile simulation round (MSR) instead of an encased missile or empty missile case. Do not evaluate the gunner during the performance of this task.

BRIEF SOLDIER: Tell the soldier to unload an M220 launcher system. Be sure he removes the empty (fired) missile case from the launch tube after cutting the command-link wires, disposes of it IAW unit SOP, and clears the launch tube of command-link wire and foreign matter. Also tell him to remove the

encased missile (not fired) from the launch tube and to replace the protective cover on the electrical connector, to replace the forward handling ring, and to replace the quick release clamp. Also, tell him to tag the missile with the date it was initially prepared for firing.

<b>Performance Measures</b>	<b><u>GO</u></b>	<b><u>NO GO</u></b>
1. Unloaded the launcher after a missile had been fired.	_____	_____
a. After the gunner closed the trigger cover and locked the launcher in the forward, 8-degree down position, raised the bridge clamp-locking handle and opened the bridge clamp.		
b. Removed the empty missile case from the launch tube.		
c. Disposed of the empty missile case IAW the unit SOP.		
d. Cleared the launch tube of command-link wires and foreign matter.		
2. Unloaded the launcher when a missile had not been fired.	_____	_____
a. Lowered the arming lever.		
b. After the gunner closed the trigger cover and locked the launcher in the forward, 8-degree down position, raised the bridge clamp-locking handle and opened the bridge clamp.		
c. Removed the encased missile from the launch tube.		
d. Replaced the protective cover on the electrical connector, the forward handling ring, and quick release clamp.		
e. Tagged the missile with the date it was initially prepared for firing.		

**Evaluation Guidance:** Score the soldier GO if all performance measures are passed. Score the soldier NO-GO if any performance measure is failed. If the soldier scores NO-GO, show the soldier what was done wrong and how to do it correctly.

**References  
Required**

**Related**  
TM 9-1425-450-12

## Engage Targets with an M220 Launcher System

**071-056-0009**

**Conditions:** Given an assembled tripod-mounted or vehicle-mounted M220A1 or M220A2 launcher system, loaded with an encased missile and armed for firing; a sector of fire; and an engageable target within the sector of fire.

**Standards:** Acquired, tracked, and fired so that the missile hit the target.

### Performance Steps

1. Assume a comfortable firing position. An uncomfortable position causes muscle tension, which affects your ability to track smoothly.
  - a. Look into the eyepiece of either the daysight or the nightsight, whichever gives you the better target image, depending upon battlefield visibility.

**WARNING:** Remove your glasses before you look through the daysight or nightsight. Do not look at the sun or bright lights through the daysight. Doing so could seriously damage your eyes. If you do receive an eye injury in this way, cover your eyes and seek medical help right away.

**NOTE:** For the M220A2 launcher system, the nightsight also allows the gunner to track missiles through battlefield obscurants such as dust, smoke, fog, or electronic countermeasures. To take advantage of this capability, be sure to turn on the nightsight before using the daysight to engage a target.

- b. Place both hands firmly on the control knobs.
  - c. Place your body so there is no contact between your shoulder and the encased missile. Your only contact with the launcher should be your hands and face.
  - d. When firing from the tripod, kneel on one or both knees.
2. Focus the sight selected for engagement.
  - a. Daysight.
    - (1) Adjust the focus control until the crosshairs are in focus.
    - (2) If needed, set the reticle light switch to ON to see the crosshairs clearly.
    - (3) Turn the control knobs to line up the crosshairs on the center of the target's visible mass.
    - (4) Move the launch tube left or right by applying a smooth, steady force to both control knobs (pushing one and pulling on the other) and rotating the body from the waist up as the launcher moves.
    - (5) Elevate (up) or depress (down) the launch tube by applying a smooth, twisting force to both control knobs.
  - b. Nightsight.
    - (1) Turn the diopter adjustment ring until the reticle (crosshairs) focuses.
    - (2) Check to ensure that both the battery monitor and the NOT READY lights are off.
    - (3) Set the field-of-view selector switch to WFOV.
    - (4) Turn the control knobs to line up the crosshairs on the center of the target's visible mass.
    - (5) Move the launch tube left or right by applying a smooth, steady force to both control knobs (pushing one and pulling on the other) and rotating the body from the waist up as the launcher moves.
    - (6) Elevate (up) or depress (down) the launch tube by applying a smooth, twisting force to both control knobs.
    - (7) If needed, adjust range focus, contrast (CTRS), and brightness (BRT) controls to obtain the best possible sight picture of the target.
    - (8) Set the field-of-view selector switch to NFOV.
    - (9) If needed, adjust the range focus, contrast (CTRS), and brightness (BRT) controls to improve the sight picture of the target.
3. Turn the control knobs to line up the crosshairs on the center of the target's visible mass.
  - a. Move the launch tube left or right by applying a smooth, steady force to both control knobs (pushing one and pulling on the other) and rotating the body from the waist up as the launcher

### Performance Steps

moves.

- b. Elevate (up) or depress (down) the launch tube by applying a smooth, twisting force to both control knobs.

#### 4. Track the target.

- a. Raise the trigger cover.
- b. Establish a smooth tracking rate while keeping the crosshairs lined up on the center of the target.
  - (1) Track with smooth motions. As the target moves, apply even pressure to both control knobs to move the launch tube left, right, up (elevate), or down (depress). Applying pressure to only one control knob, or uneven pressure, makes it more difficult to track smoothly.
  - (2) Do not make any jerky movements. Maintain the same arm position, shoulder position, and head position throughout an engagement. Any change in your body position other than leaning with the controls will cause a jerky movement. This could cause you to maneuver the missile erratically and possibly cause it to hit the ground.
  - (3) A target you are tracking may be obscured or hidden for a short time. Continue to track at the same rate as before you lost sight of the target. When the target reappears, it should be near the aiming point. Without jerking, turn the control knobs to realign the crosshairs on the center of the target.
  - (4) Do not switch from the daysight to the nightsight or vice versa after a missile has been fired.
  - (5) Use proper breath control throughout an engagement. Breathing improperly will cause you to track poorly. Proper breath control is especially important during the first and last 400 meters of the missile's flight.

#### 5. Fire the missile.

##### WARNINGS:

1. Wear ear plugs (V-51R or equal) when you fire missiles. If you do not wear ear plugs when firing a missile, you may suffer ear damage.
2. Before firing a missile, ensure you lock down the bridge clamp-locking handle. If the locking handle is not locked fully, the command-link wires may be cut at firing.
3. Do not fire a missile over or in the direction of electrical wires. Contact between the missile's command-link wires and a live high-voltage power line can injure personnel and damage equipment.
4. Ensure the crew is out of the firing danger zone before you press the trigger. All crew members should remain in their firing positions until the missile either hits the target or explodes. When you fire the missile, you and anyone else still in the firing danger zone can be seriously injured.
  - a. Take a deep breath and let part of it out.
  - b. Press the trigger in and release it, then resume breathing. The missile will launch after a 1.5-second delay. Be prepared for this so you do not flinch or to jerk the control knobs.
    - (1) Also prepare for two noises that will occur as soon as you press the trigger:
      - (a) The sound of the gyro activating. This is not a loud noise, but it may make you think the missile misfired. When you hear it, prepare yourself mentally for the next noise.
      - (b) The sound of the launch motor firing. This is a loud noise similar to the one the AT4 makes when fired.
    - (2) Be prepared for the backblast. Do not let the dust, smoke, heat, and debris from the backblast cause you to flinch.
  - c. Ignore the missile when it appears in the sight picture. Never try to guide the missile itself. If you allow it to distract you, you will track poorly and greatly reduce your chances of hitting the target.
6. Continue to track the target at a smooth tracking rate, keeping the crosshairs on the center of the target, until missile impact. Stop tracking only after missile has ended its flight.
7. Lower the trigger cover.

**Performance Steps**

8. Lock the launcher in the forward, 8-degree down position.

**Evaluation Preparation:** SETUP: Provide the soldier with all the equipment and information listed in the condition statement. To evaluate this task during training, use the Precision Gunnery Training System (PGTS), TOW Field Tactical Trainer (TFTT), or the TOW Gunnery Trainer (TGT).

BRIEF SOLDIER: Tell the soldier to acquire, track, and fire the M220 launcher system so that the missile impacts on the target.

**Performance Measures**

	<u>GO</u>	<u>NO GO</u>
1. Assumed a firing position.	—	—
2. Focused the sight being used to engage the target.	—	—
3. Acquired the target in the sight. Centered the crosshairs on the target's visible mass.	—	—
4. Established a smooth tracking rate and, at the same time, kept the crosshairs centered on the target's visible mass.	—	—
5. Fired the missile.	—	—
6. Kept the crosshairs centered on the target's visible mass until the missile impacted.	—	—
7. Lowered the trigger cover.	—	—
8. Locked the launcher in the forward, 8-degree down position.	—	—

**Evaluation Guidance:** Score the soldier GO if all performance measures are passed. Score the soldier NO-GO if any performance measure is failed. If the soldier scores NO-GO, show the soldier what was done wrong and how to do it correctly.

**References**

**Required**

**Related**

FM 23-34  
TM 9-1425-450-12

**Perform Immediate Action for an M220 Launcher System Misfire**  
**071-056-0010**

**Conditions:** Given an assembled, tripod-mounted M220A1 or M220A2 launcher system loaded with an encased missile that has failed to launch (hangfire or misfire), and a gunner to assist you.

**Standards:** Performed immediate action for a hangfire so that the missile fired, or removed it from the launcher and disposed of it IAW the unit SOP. Performed immediate action for a misfire so that the missile fired, or removed it from the launcher and disposed of it IAW the unit SOP.

**Performance Steps**

1. If you press the trigger and the missile fails to leave the launch tube after the normal 1.5-second delay, either a hangfire or misfire condition exists.
  - a. A hangfire is an unexpected delay in the functioning of components within the missile. It may occur anywhere in the series of events, from the pressing of the trigger to the ignition of the launch motor. After you press the trigger, you will normally hear the sound of the prefire functions of the explosive squib firing ("pop") and the gyroscope spinning (whirring). When you hear these sounds, but the missile fails to launch, a hangfire condition exists.
  - b. A misfire is a complete failure to fire. It may be caused by improper loading procedures, a faulty firing circuit, a failure of electrical power, poor electrical connections, short circuits, or faulty components within the missile. When you do not hear the prefire functions and the missile fails to launch, a misfire condition exists.

**WARNING:** In the event of a hangfire or misfire, remember that the missile may still fire. Carefully avoid any actions that could result in an injury from a delayed missile launch. Most delayed launches occur within one minute. However, some occur as much as 30 minutes after you pressed the trigger.

Keep all personnel out of the forward and rear firing danger zones.

2. Perform immediate action for a hangfire.

**NOTE:** When the missile fails to launch, the gunner alerts the crew by announcing "HANGFIRE," then continues to track the target for one more minute. If the missile still fails to launch after one minute, the gunner closes the trigger cover.

- a. Lower the arming lever.

**NOTE:** The gunner locks the launcher in the forward, 8-degree down position.

- b. In combat, proceed to the next step immediately. However, in a training situation, wait 30 minutes before proceeding to the next step.
- c. Unlock and open the bridge clamp.
- d. Remove the missile from the launch tube.
- e. Carry the missile to a dud pit. If no dud pit is located close by, place the missile on the ground at least 200 meters from the launcher.
- f. Even after removing the missile from the launcher, keep it pointed downrange and keep all personnel out of the forward and rear danger zones.
- g. Notify EOD personnel.
- h. Dispose of the missile IAW unit SOP.

3. Perform immediate action for a misfire.

**NOTE:** When the missile fails to launch, the gunner presses the trigger again. If the missile still fails to launch, the gunner alerts the crew by announcing "MISFIRE," then continues to track the target for one minute.

- a. After one minute, perform the missile guidance set self-test for battery strength.
  - (1) M220A1. Set the SELF-TEST switch to position 1. Lift the cover over the TEST/OPERATE switch. Push the TEST/OPERATE switch to the TEST position and hold it. Check to ensure the needles in the azimuth and elevation meters read between the in-band marks and that the meter lights are working. However, if the needles read between the in-band marks and the lights are not working, then no action is required. Release the

**Performance Steps**

TEST/OPERATE switch and close the cover. If the needles do not read between the in-band marks, remove and replace the battery assembly. Tag the battery assembly for recharging.

- (2) M220A2. Lift the cover over the TEST/OPERATE switch. Push the TEST/OPERATE switch to the TEST position and hold it. Check to ensure that all the lamps on the display light up and remain lit for 3 seconds. Release the TEST/OPERATE switch and close the cover. If the lamps do not light up and remain lit for 3 seconds, remove and replace the battery assembly. Tag the battery assembly for recharging.
- b. On the missile guidance set, check to ensure that the coil cord connector remains properly attached to the connector J1. To ensure that the connector is locked in place, turn the coil cord connector locknut clockwise until tight.
- c. Check to ensure that the bridge clamp-locking handle is properly seated.
- d. Lower the arming lever.
- e. Check the backblast area to ensure that it is clear.
- f. Announce "BACKBLAST AREA CLEAR."
- g. Raise the arming lever to the armed position.
- h. Announce "ARMING LEVER UP."

NOTE: The gunner presses the trigger again. If the missile still fails to launch, the gunner alerts the crew by announcing "MISFIRE," then continues to track the target for one minute. If the missile still fails to launch after one minute, the gunner closes the trigger cover.

- i. Lower the arming lever.

NOTE: The gunner locks the launcher in the forward, 8-degrees down position.

- j. In a combat situation, proceed immediately to the next step. However, in a training situation, wait 30 minutes, then proceed to the next step.
- k. Unlock and open the bridge clamp.
- l. Remove the missile from the launch tube.
- m. Carry the missile to a dud pit. If no dud pit is located close by, place the missile on the ground at least 200 meters from the launcher.
- n. Even after removing the missile from the launcher, keep it pointed downrange and keep all personnel out of the forward and rear danger zones.
- o. Notify EOD personnel about the hangfire or misfire.
- p. Dispose of the missile IAW the unit SOP.

**Evaluation Preparation:** SETUP: Provide the soldier with all equipment and personnel listed in the condition statement. For training, use a missile simulation round (MSR) instead of an encased missile. Do not evaluate the gunner during the performance of this task.

BRIEF SOLDIER: Tell the soldier to perform immediate action for an M220 launcher system hangfire so that he fires the missile or removes it from the launcher and disposes of it IAW the unit SOP. Have the soldier perform immediate action for a misfire so that he fires the missile or removes it from the launcher and disposes of it IAW the unit SOP.

**Performance Measures**

**GO**      **NO GO**

- 1. Performed immediate action for a hangfire.
  - a. Waited one minute, then lowered the arming lever.
  - b. Waited 30 minutes.
  - c. Unlocked and opened the bridge clamp.
  - d. Removed the missile from the launch tube.
  - e. Carried the missile to the dud pit, or placed it on the ground 200 meters away from the launcher.
  - f. Kept the missile pointed downrange at all times.
  - g. Notified EOD personnel.
  - h. Disposed of the missile IAW unit SOP.

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**Performance Measures**

GO      NO GO

- 2. Performed immediate action for a misfire.
  - a. Waited one minute, then performed the missile guidance set self-test for the battery.
  - b. Checked to ensure that the coil connector was properly attached to connector J1 and tightened the locknut.
  - c. Checked to ensure that the bridge clamp-locking handle was properly seated.
  - d. Lowered the arming lever.
  - e. Checked the backblast area.
  - f. Announced "BACKBLAST AREA CLEAR."
  - g. Raised the arming lever to the armed position.
  - h. Announced "ARMING LEVER UP."
  - i. Waited one minute, then lowered the arming lever.
  - j. Waited 30 minutes.
  - k. Unlocked and opened the bridge clamp.
  - l. Removed the missile from the launch tube.
  - m. Carried the missile to the dud pit or placed it on the ground 200 meters away from the launcher.
  - n. Kept the missile pointed downrange at all times.
  - o. Notified EOD personnel.
  - p. Disposed of missile IAW unit SOP.

\_\_\_\_\_

**Evaluation Guidance:** Score the soldier GO if all performance measures are passed. Score the soldier NO-GO if any performance measure is failed. If the soldier scores NO-GO, show the soldier what was done wrong and how to do it correctly.

**References**

**Required**

**Related**

TM 9-1425-450-12

**Collimate an AN/TAS-4-Series Nightsight to an M220 Launcher System Optical Sight**  
**071-056-0011**

**Conditions:** Given an assembled M220A1 or M220A2 launcher system with the daysight boresighted and the nightsight not collimated, and a boresight collimator (with battery for an M220A1 only).

**Standards:** Aligned the boresight collimator and the nightsight reticles with the daysight crosshairs.

**Performance Steps**

**CAUTION:** During training or support and stability operations, dispose of wire, case, and retaining rings (scrap metal) IAW SOP after firing practice rounds.

**NOTE:** Before performing this task, you must first boresight the daysight.

1. Collimate the nightsight to the daysight whenever the following occur:
  - a. The launcher system has been moved over rough terrain.
  - b. The temperature rises or falls 10 degrees Fahrenheit.
  - c. The launcher system has operated continuously for more than four hours.
  - d. The launcher system has been moved to a new location using the extended travel mode.
  - e. The operating site has changed (tripod-mounted system only).
  - f. During a system self-test, the daysight azimuth and elevation boresight adjustment knobs are moved.

2. Release the two latches on the boresight collimator carrying case. Open the case and remove the boresight collimator.

**WARNING:** Latches on the boresight collimator carrying case snap open roughly. Be careful when opening the case so injury to fingers does not occur.

**CAUTION:** Be careful when handling the boresight collimator. It is a precision electro-optical instrument and can be damaged with rough handling.

3. Inspect the mating surfaces of the boresight collimator and the nightsight for any foreign matter. If necessary, clean the mating surfaces to ensure proper mating for boresight accuracy.
4. (M220A1 only) Install battery onto boresight collimator.
  - a. Remove battery from battery case.
  - b. Line up battery guide pins on boresight collimator with guide holes on battery.
  - c. Line up boresight collimator connector with battery connector.
  - d. Slide battery onto boresight collimator until it locks into place and the connectors mate.
5. Mount the collimator onto the nightsight.
  - a. Position the boresight collimator mating surfaces over the locating pins and pads of the nightsight.
  - b. Fit the boresight collimator onto the nightsight.
  - c. To lock the boresight collimator to the nightsight, push in and turn the securing latches.
6. (M220A2 only) To boresight the collimator and the nightsight, first connect the boresight collimator power cable.
  - a. Remove the boresight collimator power cable from the case.
  - b. Remove the dust covers from the ends of the boresight collimator power cable.
  - c. Connect one end of the power cable to the boresight collimator power cable.
  - d. Connect the other end of the power cable to the nightsight connector J4.
7. Look into the daysight eyepiece. If needed, adjust the focus control knob for best focus of the daysight crosshairs. Check to be sure you can see the boresight collimator reticle. If you cannot, remove and replace the boresight collimator battery (M220A1) or the boresight collimator power cable (M220A2). If you still cannot see the collimator reticle, remove and replace the boresight

### Performance Steps

collimator. Repeat the steps.

8. Adjust the boresight collimator azimuth (AZ) and elevation (EL) adjustment knobs to align the boresight collimator reticle with the daysight crosshairs. Accuracy is very important. The small circle of the collimator reticle should be centered on and divided into four equal parts by the daysight crosshairs. If the collimator reticle will not adjust enough to align with the daysight crosshairs--
  - a. Secure the nightsight by placing your left hand on top of it.
  - b. With your right hand, move the latch handle to the rear position to release the nightsight.
  - c. Move the coarse azimuth control knob to position number 2.
  - d. Move the latch handle forward to lock the nightsight into position.
  - e. Ensure the nightsight is securely mounted to the daysight before you let go.
  - f. Adjust the boresight collimator AZ and EL adjustment knobs to align the collimator reticle with the daysight crosshairs. If you still cannot align the boresight collimator reticle with the daysight crosshairs, then remove and replace the boresight collimator. Repeat all steps.
9. Set the nightsight field-of-view selector to NFOV.
10. Look into the nightsight eyepiece. If needed, adjust the nightsight diopter adjustment ring for the best focus of the nightsight reticle crosshairs. Adjust the nightsight BRT, CTRS, and range focus knobs until the boresight collimator reticle is sharp and clear. If you cannot see the boresight collimator reticle, remove and replace the boresight collimator battery (M220A1 only) or the boresight collimator power cable (M220A2 only). If the collimator reticle is still not visible, remove and replace the boresight collimator. Repeat all steps.
11. Move the nightsight AZ and EL boresight lock levers fully counterclockwise to unlock.
12. Adjust the nightsight AZ and EL boresight knobs to align the nightsight reticle crosshairs with the boresight collimator reticle. Accuracy is important. The nightsight reticle crosshairs should be centered on and divide the small circle of the collimator reticle into four equal parts. If the nightsight reticle will not adjust enough to align with the collimator reticle, then remount the nightsight in coarse azimuth position number 2 and repeat steps 8 through 12. If it has already been remounted in position 2, remove and replace the nightsight. Repeat all steps.
13. Move the nightsight AZ and EL boresight lock levers fully clockwise to lock.
14. Look into the nightsight eyepiece. Verify that the nightsight reticle crosshairs are still aligned with the collimator reticle. If the nightsight reticle moved, repeat steps 11 through 14.
15. Look into the daysight eyepiece. Verify that the collimator reticle is still aligned with the daysight crosshairs. If the collimator reticle moved, repeat steps 8 through 15.
16. Set the nightsight field-of-view selector to WFOV.
17. Look into the nightsight eyepiece. If needed, adjust the BRT and CTRS knobs for the best image of the boresight collimator reticle. Verify that the center circle of the boresight collimator reticle is less than one diameter from the center of the nightsight reticle crosshairs. If the center circle of the boresight collimator reticle has moved more than one diameter from the center of the nightsight reticle crosshairs, remove and replace the nightsight. Repeat all steps.
18. (M220A2 only) Remove the power cable from the boresight collimator and nightsight.
  - a. Remove the boresight collimator power cable from the nightsight connector J4.
  - b. Remove the boresight collimator power cable from the collimator connector 3J1.
  - c. Replace the dust covers on the ends of the power cable; place the power cable into the case.
19. Hold the boresight collimator, turn the securing latches to unlock it, and slide it off the nightsight.
20. (M220A1 only) Remove the battery from the collimator by sliding the battery down and off the collimator. Place the battery in the battery case.

**Performance Steps**

21. Place the boresight collimator in the carrying case. Close the latches.

**Evaluation Preparation:** SETUP: Provide the soldier with all equipment listed in the condition statement. Set the nightsight field-of-view selector switch to WFOV. For an M220A1, set the nightsight actuator switch to AIR/BATT/CHECK. For an M220A2, set the ON/OFF/STBY switch to ON.

BRIEF SOLDIER: Tell the soldier to inspect, prepare, and mount the boresight collimator onto the nightsight. Have the soldier adjust the azimuth and elevation knobs on the boresight collimator and nightsight so that the reticles of the collimator and nightsight align with the daysight crosshairs.

**Performance Measures**

	<u>GO</u>	<u>NO GO</u>
1. (M220A1 only) Installed the battery onto the boresight collimator.	—	—
2. Inspected the mating surfaces of the collimator and the nightsight.	—	—
3. Mounted the collimator onto the nightsight.	—	—
4. (M220A2 only) Connected the boresight collimator power cable.	—	—
5. Aligned the boresight collimator reticle with the daysight's crosshairs.	—	—
6. Set the nightsight field-of-view selector to NFOV.	—	—
7. Unlocked the nightsight AZ and EL boresight lock levers.	—	—
8. Aligned the nightsight reticle crosshairs with the boresight collimator reticle.	—	—
9. Locked the nightsight AZ and EL boresight lock levers.	—	—
10. Verified that the nightsight reticle crosshairs aligned with the boresight collimator reticle.	—	—
11. Verified that the boresight collimator reticle aligned with the daysight's crosshairs.	—	—
12. Set the nightsight field-of-view selector to WFOV.	—	—
13. Verified that the center circle of the boresight collimator reticle was less than one diameter from the center of the nightsight reticle crosshairs.	—	—
14. (M220A2 only) Removed the boresight collimator power cable.	—	—
15. Removed the boresight collimator from the nightsight.	—	—
16. (M220A1 only) Removed the battery and placed it into the battery case.	—	—
17. Placed the collimator into the carrying case.	—	—

**Evaluation Guidance:** Score the soldier GO if all performance measures are passed. Score the soldier NO-GO if any performance measure is failed. If the soldier scores NO-GO, show the soldier what was done wrong and how to do it correctly.

**References**

Required

**Related**

TM 9-1425-450-12

## Perform a System Self-Test on an M220A2 Launcher System

071-056-0013

**Conditions:** Given an assembled, tripod-mounted or vehicle-mounted M220A2 launcher system.

**Standards:** Performed a system self-test to determine if the launcher system functioned properly. Boresighted the daysight to the missile guidance set. Corrected all deficiencies the operator had the authority to correct. Reported all other deficiencies to the supervisor.

### Performance Steps

1. Perform a system self-test before and after installing the launcher system on a vehicle; perform a system self-test daily after the system is in use and each time you change an electrical component. Also perform a system self-test whenever--
  - a. The launcher system has been moved over rough terrain.
  - b. The launcher system has been moved using the extended travel mode.
  - c. The temperature rises or falls by at least 10 degrees (Fahrenheit).
  - d. The launcher system has operated continuously for more than four hours.
  - e. The tripod-mounted launcher has been moved to a new operating site.

**WARNING:** If an encased missile is loaded, ensure the arming lever is lowered to the safe position.

**CAUTION:** Perform the system self-test as quickly as possible. If you take too long to perform the test, the battery assembly may not have enough power to fire the missiles.

2. Set the FOV selector switch on the nightsight to NFOV.
3. On the daysight, set the focus control to +3.
4. On the nightsight, set the ON/OFF/STBY switch to ON. Check to ensure that the nightsight cooler is running.
  - a. If the cooler does not run, check to ensure that the nightsight battery power conditioner CB1 circuit breaker is set to ON. If the nightsight cooler still does not run, then remove and replace the following, in this order, until it does:
    - (1) The nightsight battery power conditioner batteries.
    - (2) The nightsight battery power conditioner cable.
    - (3) The nightsight battery power conditioner.
    - (4) The nightsight.
  - b. If using vehicle power, check to ensure that the nightsight vehicle power conditioner CB1 circuit breaker is set to ON, then remove and replace the nightsight vehicle power conditioner cable. If the nightsight cooler still does not run, use the nightsight battery power conditioner instead of the nightsight vehicle power conditioner.
5. On the missile guidance set, lift the cover over the TEST/OPERATE switch. Push the TEST/OPERATE switch to the TEST position and hold it.

**NOTE:** To save time and prevent excessive wear of the TEST/OPERATE switch, set the switch to the TEST position and hold it continuously until the self-test ends. If you release the TEST/OPERATE switch during the self-test, allow at least three seconds before restarting the test. Repeat the complete system self-test after removing and replacing any component.

6. Check to ensure all of the pass/fail indicators on the missile guidance set display light up and remain lit for three seconds.
  - a. If the indicators do not light up, remove and replace the battery assembly (and tag the battery assembly for recharging). Repeat the self-test. If the indicators still do not light up, remove and replace the missile guidance set.
  - b. If the indicators light up but do not remain lit for three seconds, remove and replace the missile guidance set.

**NOTE:** The pass/fail indicators show the results of the system self-test as it applies to the components of

**Performance Steps**

the launcher system. After the initial light up of all pass/fail indicators, the missile guidance set will display either PASS or FAIL as it tests each component.

7. Check to ensure the BATT PASS indicator lights up. If the BATT FAIL indicator lights up instead, remove and replace the battery assembly (and tag the battery assembly for recharging). Repeat the self-test. If the BATT FAIL indicator still lights up, remove and replace the missile guidance set.
8. Check to ensure the MGS PASS indicator lights up. If the MGS FAIL indicator lights up instead, remove and replace the missile guidance set.
  - a. If the MGS PASS indicator flashes, one of the system self-test setup conditions has not been met. Check to ensure the nightsight field-of-view selector switch is set to NFOV, nightsight ON/OFF/STBY switch is set to ON, and the arming lever is lowered. Repeat the self-test. If the MGS PASS indicator still flashes, remove and replace the nightsight.
  - b. If the MGS FAIL indicator comes on at the same time as another fail indicator, address the other problem first. Check to ensure that all cables are connected and the night-sight ON/OFF/STBY switch is set to ON. Usually, when the other problem is corrected, the missile guidance set reads the proper signals and all other faults are corrected.
9. Check to ensure the PA PASS indicator lights up. If the PA FAIL indicator lights up instead, remove and replace the nightsight.

NOTE: The launcher system can still fire under a "degraded firing condition." If the PA FAIL indicator lights up and that is the only failure, the missile can still be fired using the daysight. However, this increases the chance that you might lose control of the missile.

10. Check to ensure the OSS PASS indicator lights up. If the OSS FAIL indicator lights up instead, release the TEST/OPERATE switch. Open the boresight adjustment knob covers, turn both azimuth and elevation boresight adjustment knobs fully in one direction, then back off one full turn to about center. Push the TEST/OPERATE switch to the TEST position. Restart the self-test. If the OSS FAIL indicator still lights up, remove and replace the daysight.
11. Check to ensure that the green center lamp in the azimuth/elevation cross lights up. If the green center lamp is lit and not blinking, then boresight adjustments are correct. Make boresight adjustments if the green center lamp is blinking or if any red lamps in the cross are lit.
  - a. Adjust the boresight by opening the boresight adjustment knob covers. Turn the azimuth and elevation boresight adjustment knobs until the green center lamp is lit and not blinking. Close the boresight adjustment knob covers.
  - b. If after several adjustments the green center lamp will not light up, release the TEST/OPERATE switch, set the boresight adjustment knobs to about center, then repeat the self-test. If your efforts to boresight the daysight continue to fail, remove and replace the daysight.

NOTE: Whenever you adjust the boresight, you must collimate the nightsight to the daysight IAW task number 071-056-0011, Collimate an AN/TAS-4 Series Nightsight to an M220 Launcher System Daysight in STP 7-11B1-SM-TG.

12. Unlock the elevation lock on the traversing unit. Move the launch tube up and down. Check to ensure that the lights on the azimuth/elevation cross move up and down with the launch tube. Lock the elevation lock. Move the launch tube down until it locks in the 8-degree down position. If the lights do not move with the launch tube, remove and replace the traversing unit.
13. Unlock the azimuth lock on the traversing unit. Turn the launch tube right, left, and back to the center. Check to ensure that the lights on the azimuth/elevation cross move right and left with the launch tube. Lock the azimuth lock. Turn the launch tube until it locks in the forward position. If the lights do not move with the launch tube, remove and replace the traversing unit.
14. Release the TEST/OPERATE switch and close the cover.
15. Report to your supervisor all deficiencies the operator is not authorized to correct.

**Evaluation Preparation:** SETUP: Provide the soldier with all equipment listed in the conditions statement. Reset azimuth and elevation boresight adjustment knobs to ensure that the soldier will have to adjust the boresight.

**BRIEF SOLDIER:** Tell the soldier to perform a system self-test to determine if the launcher system functions properly. Boresight the daysight to the missile guidance set. Have the soldier correct all deficiencies the operator has the authority to correct. Report all other deficiencies to the supervisor.

<b>Performance Measures</b>	<b><u>GO</u></b>	<b><u>NO GO</u></b>
1. Placed the nightsight FOV selector switch to NFOV.	—	—
2. Set the nightsight ON/OFF/STBY switch to ON.	—	—
3. Set the daysight focus control knob to +3.	—	—
4. Checked to ensure the indicator lights remained lit for three seconds.	—	—
5. Checked the BATT PASS/FAIL indicator.	—	—
6. Checked the MGS PASS/FAIL indicator.	—	—
7. Checked the PA PASS/FAIL indicator.	—	—
8. Checked the OSS PASS/FAIL indicator.	—	—
9. Checked the azimuth/elevation cross to see if the green center lamp was on.	—	—
10. Adjusted boresight as needed.	—	—
11. Checked to see if the azimuth/elevation cross lamps moved up and down with the launch tube.	—	—
12. Checked to see if the azimuth/elevation cross lamps moved right and left with the launch tube.	—	—
13. Corrected all deficiencies the operator had the authority to correct.	—	—
14. Reported all other deficiencies to the supervisor.	—	—

**Evaluation Guidance:** Score the soldier GO if all performance measures are passed. Score the soldier NO-GO if any performance measure is failed. If the soldier scores NO-GO, show the soldier what was done wrong and how to do it correctly.

**References**  
**Required**

**Related**  
 TM 9-1425-450-12

**Load a Dual Launcher While Mounted on an M901 Vehicle**  
**071-056-0020**

**Conditions:** Given an operational ITV (M901) with the engine running, two encased missiles (MSR for training) with the forward handling rings and secure the dust covers, the launcher in the READY TO LOAD position with the cargo hatch closed, and a requirement to load the launcher.

**Standards:** As a loader, announced, "READY TO LOAD, LIGHT ON." Opened the cargo hatch to the first stop position. Loaded the two encased missiles, closed the cargo hatch, and announced to the gunner, "UP."

**Performance Steps**

1. Inspect the missiles--
  - a. For gouges, punctures, and cracks.
  - b. To see whether the humidity indicator is blue.
  - c. To locate any damaged indexing lugs.
  - d. To ensure the diaphragm has not ruptured.
  - e. To ensure the electrical connector and dust cover are present.
  - f. To ensure the forward handling ring and quick-release clamp are present and secured.
2. Prepare the missiles in the ready racks.
  - a. Remove the straps from both missiles. Remove the quick-release clamp, the forward handling ring, and the dust cover.
  - b. Place one missile on the carrier floor.
  - c. Ensure the READY TO LOAD light is on.
  - d. Open the cargo hatch to the first detent; unlock the left launch tube locking handle (up is the unlocked position).
3. Load the missiles.
  - a. Secure the encased missile by placing your right hand about midway on the missile. Position your left hand so that the heel of your hand is at the bottom of the missile and your fingers are underneath the missile.
  - b. Raise the front of the missile; place the indexing lugs on the launcher rail. Slide the missile forward until the front of the missile seats against the forward centering ring.
  - c. Hold the missile in place while you pull down the locking handle.
  - d. Repeat steps 1 through 3 for the other missile, if two missiles are to be loaded.
4. Close the cargo hatch by releasing the cargo hatch stop locking lug, then pull down on the cargo hatch strap.

**CAUTION:**

1. Ensure the missile is fully seated against the forward centering ring of the launch tube before engaging the missile locking handle.
2. If locking the missile locking handle requires abnormal force (greater than 30 pounds), place it in the unlocked position and reseat the missile. Ensure it is fully seated against the forward centering ring of the launch tube.
3. Push the missile up firmly against the launcher, and try to place the missile locking handle to the locked position.
4. If abnormal force is still required to lock the missile locking handle, remove the missile and inspect it for damage. If the missile is damaged, dispose of it IAW malfunction procedures. Load a serviceable missile into the launch tube.
5. If the missile is not damaged, notify unit maintenance. Failure to observe this caution may result in damage to the system.

**Evaluation Preparation:** SETUP: At the test site, provide all the equipment and personnel listed in the task condition statement. Use simulated missile rounds instead of live missiles.

**BRIEF SOLDIER:** Tell the soldier that he will be required to load the dual launcher. Tell the soldier that he must perform the task without damage to equipment or injury to personnel.

<b>Performance Measures</b>	<b><u>GO</u></b>	<b><u>NO GO</u></b>
1. Inspected the missile.	_____	_____
2. Ensured the READY TO LOAD light was ON.	_____	_____
3. Opened the cargo hatch to the first detent.	_____	_____
4. Loaded the two missiles.	_____	_____
5. Closed the cargo hatch	_____	_____

**Evaluation Guidance:** Score the soldier GO if all performance measures are passed. Score the soldier NO-GO if any performance measure is failed. If the soldier scores NO-GO, show the soldier what was done wrong and how to do it correctly.

**References  
Required**

**Related**  
FM 23-34  
TM 9-2350-259-10

**Unload a Dual Launcher While Mounted on an M901 Vehicle**  
**071-056-0021**

**Conditions:** Given an operational ITV (M901) with the engine running, two encased missiles (MSR for training) or expended missile casings in the launcher, launcher in the load position, and a requirement to unload the launcher system.

**Standards:** Removed the encased missiles from the launch tubes and prepared them for storage without damage to equipment or injury to personnel. If the missiles were fired, removed the expended missile casings, and cleared the launcher.

**CAUTION:** During training or support and stability operations, dispose of wire, case, and retaining rings (scrap metal) IAW SOP after firing practice rounds.

**Performance Steps**

1. Unload the launcher. The loader--
  - a. Ensures the READY TO LOAD light is on.
  - b. Opens the cargo hatch to the first detent.
  - c. Places the rear of the left hand, palm up, on the bottom rear of the missile and pushes slightly up.
  - d. Unlocks the left launch tube by grasping the locking handle with the right hand, pushes in on the detent lock, and pushes up on the handle.
  - e. Removes the expended missile case from the left launch tube by moving the right hand under the missile.
    - (1) Lowers the rear of the missile.
    - (2) Slides the indexing lugs along the launcher rails rearward until the missile clears the tube.
    - (3) Throws expended missile out of the carrier over the left side.
2. Repeats the same procedures for the right tube, except all left-handed actions are right-handed actions.

**NOTE:** If the missiles are not fired, recover them by replacing the forward handling ring, quick-release clamp, and the electrical connector dust cover. Place the missiles in the ready racks.

**Evaluation Preparation: SETUP:** At the test site, provide all the equipment and personnel listed in the task condition statement. Use simulated missile rounds instead of live missiles.

**BRIEF SOLDIER:** Tell the soldier to unload two of the simulated missiles without damage to equipment or injury to personnel.

<b>Performance Measures</b>	<b><u>GO</u></b>	<b><u>NO GO</u></b>
1. Ensured the READY TO LOAD light was illuminated.	_____	_____
2. Opened the cargo hatch to the first detent.	_____	_____
3. Removed the missiles from the tubes and threw them outside the carrier.	_____	_____
4. Recovered the missiles if they were not fired.	_____	_____
<b>NOTE:</b> If the missiles were not fired, recovered them by replacing the forward handling ring, quick-release clamp, and the electrical connector dust cover. Placed the missiles in the ready racks.		
5. Closed the cargo hatch.	_____	_____

**Evaluation Guidance:** Score the soldier GO if all performance measures are passed. Score the soldier NO-GO if any performance measure is failed. If the soldier scores NO-GO, show the soldier what was done wrong and how to do it correctly.

**References**  
**Required**

**Related**  
FM 23-34  
TM 9-2350-259-10

**Stow M220 Encased Missiles in a Missile Storage Rack**

**071-056-0061**

**Conditions:** In a field or garrison environment, given M220 encased missiles, M220 launcher system carrier (M113, M901, and M966) equipped with missile storage rack, and a requirement to stow the encased missiles upon receipt.

**Standards:** Secured encased missiles in the missile rack, nose end forward. Seated the retaining band of rear coupling clamp in rear resting pad groove. Ensured coupling clamps were free of resting pads and electrical connectors were facing up.

**Performance Steps**

1. Release securing latches and allow the upper tiers of the encased missile rack to pivot upward.
2. Stow all encased missiles in the rack, nose end forward (toward front of vehicle), with retaining band of rear coupling clamp seated in rear resting pad groove. Rotate encased missiles in the rack so that coupling clamps are free of resting pads and electrical connectors are facing up.
3. Stow encased missiles in the base tier first, then lower, secure, and load the remaining tiers. Secure encased missiles in the top tier with mounting straps.

**Evaluation Preparation:** SETUP: At the test site, provide the soldier with all the equipment given in the task condition statement.

BRIEF SOLDIER: Tell the soldier to stow encased missiles in the missile storage rack.

<b>Performance Measures</b>	<b><u>GO</u></b>	<b><u>NO GO</u></b>
1. Released securing latches and allowed the upper tiers of the encased missile rack to pivot upward.	—	—
2. Stowed all encased missiles in the rack, nose end forward (toward front of vehicle), with retaining band of rear coupling clamp seated in rear resting pad groove.	—	—
3. Rotated encased missiles in the rack so that coupling clamps were free of resting pads and electrical connectors were facing up.	—	—
4. Stowed encased missiles in the base tier first, then lowered, secured, and loaded the remaining tiers. Secured encased missiles in the top tier with mounting straps.	—	—

**Evaluation Guidance:** Score the soldier GO if all performance measures are passed. Score the soldier NO-GO if any performance measure is failed. If the soldier scores NO-GO, show the soldier what was done wrong and how to do it correctly.

**References  
Required**

**Related**  
TM 9-2350-259-10

**Remove a Misfired TOW Missile from the TOW Launcher on a BFV**  
**071-316-3015**

**Conditions:** Given a BFV with the turret at either 1600 mils or 4800 mils, the TOW launcher raised to maximum elevation, all hatches closed, a misfired TOW missile that failed to launch after the gunner applied immediate action, an oral directive to unload a misfired TOW missile from the No. 1 or No. 2 launch tube, and an assistant.

**Standards:** Removed the misfired TOW missile from a BFV making sure that the missile was kept pointed away from friendly troops so that no equipment was damaged and no personnel were injured.

**Performance Steps**

**WARNING:** The misfired missile is unloaded from outside the vehicle, not from the cargo hatch.

**NOTE:** The gunner notifies squad members which TOW missile misfired.

1. Exit through the ramp access door and climb on top of the hull, keeping away from the rear and front of the TOW launcher.
2. Unlock the TOW launcher. Push and hold the lock handle to the left. Pull down the loading handle as far as it will go. Keep hand clear of the backblast area as much as possible, and release the lock handle.
3. Remove the misfired TOW missile from its launch tube.
  - a. Start pulling the missile by the edges of the rear flange (Figure 1).

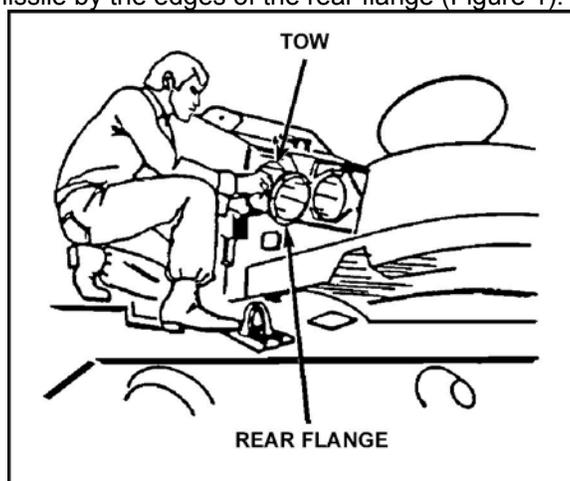


Figure 1. Rear flange of missile.

- b. Carefully pull the missile straight out until it is removed from its launch tube.

**NOTE:** If the missile fails to release from the launch tube, inform the gunner of the situation. After the appropriate procedures are completed by the vehicle crew, the gunner will tell you to try again. If the missile fails to release a second time, inform the gunner again so that the chain of command and unit maintenance can be notified.

4. Hand the TOW missile to the assistant. The assistant carries the misfired missile at least 200 meters away from the vehicle, places it on the ground (does not drop it), and positions the missile where the backblast area can be the least destructive. Keep your body away from the front and rear of the encased missile while carrying and handling it.
      5. Put visible stake and flag at the location of the misfired TOW missile (Figure 2).

**Performance Steps**

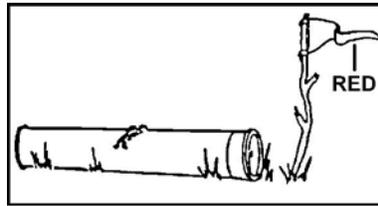


Figure 2. Mark misfired TOW locations.

6. Inform the Bradley commander when the task is completed, so that he can notify the chain of command of the existence and location of the misfired TOW missile (Figure 2).
- NOTE: When the tactical situation permits, dispose of the missile in accordance with the unit SOP.

**Evaluation Preparation:** SETUP: Provide the soldier the equipment and materials called for in the task condition statement.

BRIEF SOLDIER: Tell the soldier to remove a misfired TOW missile from a BFV and, along with his helper, carry the missile 200 meters from the vehicle, lay the missile on the ground, and mark its location.

**Performance Measures**

	<u>GO</u>	<u>NO GO</u>
1. Exited through the ramp access door and kept away from the rear and front of the TOW launch tube.	—	—
2. Unlocked the TOW launch tube.	—	—
3. Removed the TOW from the launch tube without being exposed to the backblast area.	—	—
4. Handed the TOW to his assistant, who carried the missile at least 200 meters away from the vehicle and placed it on the ground.	—	—
5. Marked the location of the misfired TOW missile.	—	—
6. Informed the Bradley commander when the task was completed.	—	—

**Evaluation Guidance:** Score the soldier GO if all performance measures are passed. Score the soldier NO-GO if any performance measure is failed. If the soldier scores NO-GO, show the soldier what was done wrong and how to do it correctly.

**References  
Required**

**Related**  
TM 9-2350-252-10-2

Subject Area 43: WEAPONS: M240B MACHINE GUN

**Perform a Function Check on an M240B Machine Gun**  
**071-025-0002**

**Conditions:** Given a cleared M240B machine gun, bipod- or tripod-mounted.

**Standards:** Conducted an function check of the M240B machine gun; ensured it was correctly assembled and functioned properly.

**Performance Steps**

WARNING: Before performing a task on any weapon, always check to ensure that the weapon is clear.

1. Place safety lever to the "F" position.
2. Lock the bolt to the rear position by pulling the cocking handle to the rear.
3. Push cocking handle to the forward position until it locks in the forward position.
4. Place safety lever to the "S" position.
5. Depress the trigger; the bolt should not fall.
  - a. If the bolt falls, notify supervisor. The machine gun is inoperative.
  - b. If the bolt does not fall, continue to the next step.
6. Place safety lever to the "F" position.
7. Pull and hold the cocking handle to the rear.
8. While holding the cocking handle to the rear, depress the trigger, and ease the bolt to the forward and locked position.

**Evaluation Preparation:** SETUP: At the test site, provide one M240B machine gun.

BRIEF SOLDIER: Tell the soldier to perform a function check on the M240B machine gun.

**Performance Measures**

	<u>GO</u>	<u>NO GO</u>
1. Placed the safety lever to the "F" position.	—	—
2. Locked the bolt to the rear position.	—	—
3. Pushed the cocking handle to the forward locking position.	—	—
4. Placed the safety lever to the "S" position.	—	—
5. Depressed the trigger.	—	—
6. Placed the safety lever to the "F" position.	—	—
7. Pulled and held the cocking handle to the rear position.	—	—
8. Depressed the trigger and eased the bolt to the forward and locked position.	—	—

**Evaluation Guidance:** Score the soldier Go if all performance measures are passed. Score the soldier NO-GO if any performance measure is failed. If the soldier scores NO-GO, show the soldier what was done wrong and how to do it correctly.

**References  
Required**

**Related**  
FM 3-22.68  
TM 9-1005-313-10

Subject Area 44: WEAPONS: M240C MACHINE GUN (COAX)

**Perform Operator Maintenance on an M240/M240C Machine Gun  
171-122-1012**

**Conditions:** Given a dismounted M240/M240C machine gun; TM 9-1005-313-10: DA Form 2404 (Equipment Inspection and Maintenance Worksheet); cleaning rod; bore brush; chamber and receiver brushes; clean cotton rags and swabs; and Break Free cleaner, lubricant, preservative (CLP).

**Standards:** 1. The machine gun is cleared. 2. The machine gun is disassembled. 3. The machine gun is inspected, cleaned, and lubricated. 4. Defective or worn parts are replaced or reported to organizational maintenance on DA Form 2404. 5. The machine gun is reassembled. 6. A safety/function check is performed.

**Performance Steps**

**WARNING:** Make sure the loader's machine gun is cleared before removing it. The loader's machine gun can fire and kill you.

**WARNING:** If the loader's machine gun has been fired in the past hour, wear heat protective mittens. The loader's machine gun will be hot and can burn you.

**WARNING:** If the coaxial machine gun has fired more than 200 rounds within 2 minutes or has fired a long continuous burst, consider it a hot gun. Keep the cover closed and the machine gun pointed down range. Allow the machine gun to cool at least 15 minutes. When the machine gun is hot, it can accidentally fire, causing injury or death. Keep all personnel clear of the muzzle until the coaxial machine gun has cooled.

**WARNING:** If the machine gun is hot, do not place your fingers in chamber area. Injury could occur to your fingers.

**WARNING:** Charging the weapon with the safety in the safe position can cause damage to the weapon.

**ENVIRONMENTAL NOTE:** Dispose of hazardous materials (such as lubricants, solvents, and contaminated rags) in accordance with (IAW) standing operating procedures (SOP)/operations order (OPORD), local regulations, and/or host nation laws. Use rags to contain any excess fluids. Dispose of rags in appropriate accumulation containers.

1. Clear the machine gun.
2. Remove the machine gun from the tank.
  - a. Remove the quick-release mounting pins from the cradle mounting holes.
  - b. Lift the front of the loader's machine gun up.
  - c. Slide the loader's machine gun back and take it off the mount.
  - d. Put the quick-release mounting pins into the cradle mounting holes.
  - e. Remove the loader's machine gun from the tank.

3. Disassemble the machine gun.
  - a. Remove the barrel.

**WARNING:** A hot barrel can burn you. If the barrel is hot, use the heat resistant mittens.

**CAUTION:** Be sure the bolt is forward or the receiver can be damaged.

- (1) Depress the barrel locking latch and hold.
- (2) Turn the barrel release left to the upright position.
- (3) Pull the barrel straight out of the receiver.
- b. Remove the trigger housing assembly.
  - (1) Turn the receiver upside down.

**Performance Steps**

- (2) Depress the spring and remove the spring pin.
- (3) Pull the trigger housing down and back to remove.
- (4) Pull the charger cable through the cable guide.
- (5) Turn the receiver right side up.

## c. Remove the buffer assembly.

**CAUTION:** Do not stand behind the weapon while removing the buffer, as the driving spring may be released striking you or others.

- (1) Depress the backplate latch.
- (2) Lift the buffer straight up.

## d. Remove the driving spring assembly.

- (1) Press the spring in with the thumb and hold.
- (2) Move the spring to the left and allow the tension to unwind gently.
- (3) Pull the spring out of the receiver.

## e. Remove the bolt and the operating rod assembly.

- (1) Open the cover to the full-open position.
- (2) Pull the charger handle to the rear slowly.
- (3) Pull the bolt and the operating rod out of the receiver.
- (4) Close and latch the cover assembly.

## f. Remove the cover assembly.

- (1) Push out the spring pin as far as possible.
- (2) Press in the cover latches and hold.
- (3) Lift the cover up and off the receiver.
- (4) Remove the feed tray.

## 4. Clean, inspect, and lubricate the machine gun.

**WARNING:** The use of gasoline, kerosene, hydraulic oil, benzene, benzol, and high-pressure water, steam, or air for cleaning is prohibited.

**CAUTION:** Do not use abrasives to clean the bore, piston, gas cylinder, or gas regulator plug. Do not submerge the buffer in any liquid. Wipe with a clean wiping rag only. Do not allow cleaning solvents to come in contact with the rubber handle of the charger cable.

**ENVIRONMENTAL NOTE:** Dispose of hazardous materials (such as lubricants, solvents, and contaminated rags) in accordance with (IAW) standing operating procedures (SOP)/operations order (OPORD), local regulations, and/or host nation laws. Use rags to contain any excess fluids. Dispose of rags in appropriate accumulation containers.

## a. Inspect the barrel assembly.

- (1) Check the flash hider.
- (2) Check the gas regulator. Rotate the regulator collar until it releases, then pull it out.

## b. Inspect the gas plug.

## c. Inspect the barrel adapter and the barrel release.

- (1) Inspect the chamber assembly.
- (2) Clean the barrel exterior.
  - (a) Flash hider.
  - (b) Barrel adapter.
  - (c) Barrel release.

## d. Clean the gas regulator.

## e. Install the gas regulator on the barrel.

- (1) Place the plug in the collar with the number 1 facing the barrel.
- (2) Install the collar on the plug.
- (3) Rotate the collar until it slips onto the plug.
- (4) Press the collar in and rotate it to the lock.

## f. Clean the barrel bore.

## g. Clean the chamber.

## h. Inspect the buffer assembly.

**Performance Steps**

- i. Clean the buffer assembly.
- j. Inspect the driving spring assembly.
- k. Clean the driving spring assembly.
- l. Inspect the bolt and operating rod assembly.
- m. Clean the bolt and operating rod assembly.
- n. Inspect the trigger spring pin and the cover hinge pins.
- o. Clean the trigger spring pin and the cover hinge pins.
- p. Inspect the trigger housing assembly.
  - (1) Tripping lever.
  - (2) Sear.
  - (3) Trigger.
  - (4) Safety.
- q. Clean the trigger housing.

**CAUTION:** Do not submerge the trigger housing assembly in any liquid. Solvents may cause damage to the pistol grips on the trigger housing.

- r. Inspect the cover assembly.

**CAUTION:** The crew does not disassemble the cover.

- (1) Feed lever.
- (2) Cover latches.
- (3) Cartridge guides and feed pawls.
- s. Clean the cover assembly.
- t. Inspect the feed tray.
- u. Clean the feed tray.
- v. Inspect the receiver assembly.
  - (1) Charger cable.
  - (2) Charger slide pin and spring plate cotter pins.
  - (3) Barrel latch.
  - (4) Access cover.
- w. Clean the receiver assembly.

**5. Assemble the machine gun.**

- a. Install the feed tray.
- b. Install the cover assembly.
- c. Insert the cover spring pin.
- d. Open the cover assembly.
- e. Install the bolt and operating rod.
- f. Close the cover assembly.
- g. Install the driving spring assembly.
- h. Install the buffer assembly.
- i. Turn the receiver upside down.
- j. Install the trigger housing.
- k. Slide the charger cable through cable guide.
- l. Insert the trigger spring pin.
- m. Turn the receiver right side up.
- n. Install the barrel.
  - (1) Insert the barrel into socket.
  - (2) Push the barrel release to the right.

**NOTE:** If the barrel binds in the socket or will not rotate when pushed, do not pound on the barrel release. Take the machine gun to unit maintenance.

**WARNING:** Before firing, make sure the barrel is locked tightly in the receiver. If the barrel is not locked tight, threads in the receiver could be damaged or cause personal injury.

**6. Perform a safety/function check.**

- a. Place the safety to the F (fire) position.

**Performance Steps**

WARNING: Charging the weapon with the safety in the S (safe) position can cause damage to the weapon.

- b. Charge the weapon by pulling the handle rearward until bolt is locked in the rear position.
- c. Place the safety in the S (safe) position.
- d. Depress the rigger.
- e. Notify unit maintenance on DA Form 2404 or ULLS Form 5988-E if the bolt goes forward.
- f. Place the safety to the F (fire) position.
- g. Hold the charger cable, depress the trigger, and ease the bolt forward.

7. Load the machine gun.

**Performance Measures**

- 1. Clear the machine gun in sequence.
- 2. Remove the machine gun from the tank.
- 3. Disassemble the machine gun.
- 4. Clean, inspect, and lubricate the machine gun.
- 5. Assemble the machine gun.
- 6. Perform a safety/function check.
- 7. Load the machine gun.

<u>GO</u>	<u>NO GO</u>
—	—
—	—
—	—
—	—
—	—
—	—
—	—

**Evaluation Guidance:** Score the soldier GO if all steps are passed (P). Score the soldier NO-GO if any steps are failed (F). If the soldier fails any steps, show what was done wrong and how to do it correctly.

**References**

**Required**  
TM 9-1005-313-10

**Related**

Subject Area 45: WEAPONS: M242 (25-MM GUN)

**Load the 25-mm Ammunition Can (HEI-T) on a BFV**  
**071-024-0001**

**Conditions:** Given a BFV with stowed 25-mm HE ammunition (master power is ON) and a gunner in the turret to assist in loading the HE ammunition can.

**Standards:** Identified, inspected, cleaned, and loaded the high-explosive incendiary tracer (HEI-T) ammunition into the HE ammunition can. Fed the ammunition into the feed chutes without binding. Set ammunition switches to match the type of ammunition being loaded. Loaded the HE ammunition can without causing damage to the equipment or injury to personnel.

**Performance Steps**

**WARNING**

Handle ammunition with care. Do not bump primers against any hard surface. If a cartridge explodes, soldiers could be hurt or killed.

1. Gunner: Moves the turret to HEI-T (2150 mils); announces when he has set the turret travel lock.

**WARNING**

For training safety, the gunner must shut down the turret drive system before the turret shield door is opened.

2. Open the turret shield door.
3. Open and remove the 25-mm ammunition can door and access door from the HE ammunition can.
4. Open and remove the HE ammunition can door (Figure 1).

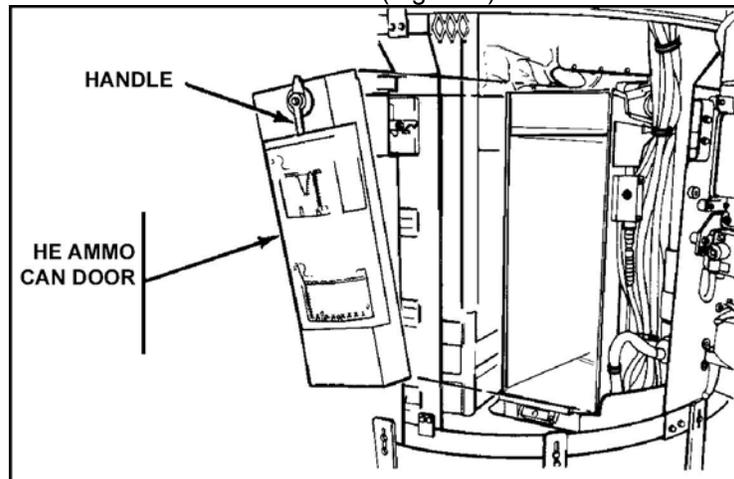


Figure 1. HE ammunition can door.

5. Prepare the HE ammunition for loading.

**CAUTION:** Rounds not aligned properly can cause jamming in the 25-mm ammunition can and chutes. Rounds must be aligned at tips. Severe damage to the feeding system could result if the ammunition is not aligned.

- a. Unstow the HE ammunition (Figure 2).

## Performance Steps

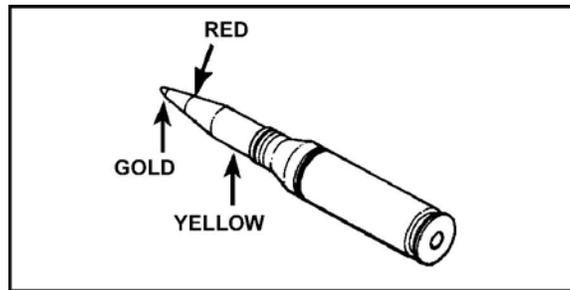


Figure 2. HE round.

b. Inspect the ammunition to ensure it is serviceable. Clean as necessary.

NOTE: Placing the rounds into a fan shape will damage the ammunition links and should not be done.

c. Align all rounds (Figure 3).

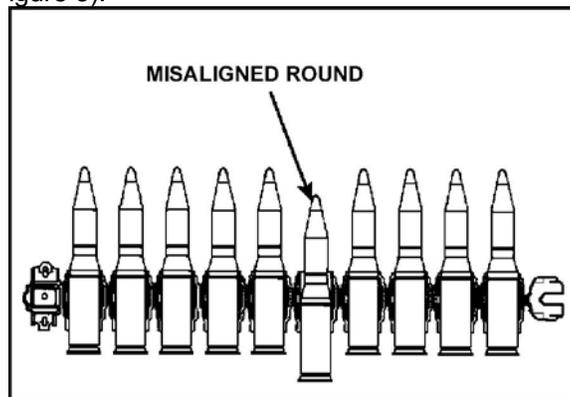


Figure 3. Misaligned round.

CAUTION: Links may be damaged if rounds are not removed correctly. If a round does not release from a link, stop pulling on the round. To free a round from a link, twist and pull up on the round at the same time.

d. Join ammunition belts until 230 rounds are in the belt.

CAUTION: The end of the ammunition belt with the double links always goes in the ammunition can first. The end of the ammunition belt with the empty single link goes in last. If the ammunition is not loaded correctly, it will bind in the chutes and damage the equipment.

NOTE: An ammunition belt must be loaded with the links to the top and the rounds pointed to the right of the vehicle. Count the rounds as they are loaded.

6. Load the first 44 rounds in the ammunition can.

a. Turn the ammunition belt over so that the links are to the top. Rounds should point to the right of the vehicle.

b. Count out the 5th and 19th rounds. Feed the ammunition into the ammunition can, belt with the double links first. Hang the first five rounds on the loading rail.

c. Hang the 19th round on the loading rail.

d. Count the next 25 rounds. Hang both the 24th and the 25th rounds on the loading rail (Figure 4).

**Performance Steps**

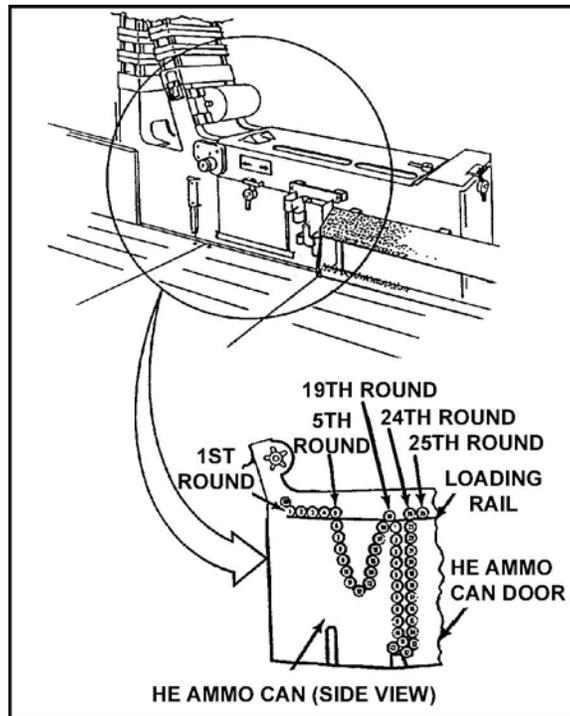


Figure 4. Round placement.

7. Gunner: Releases the upper roller to the rear of the ammunition can.
8. Gunner: Forwards the ammunition belt (Figure 5).

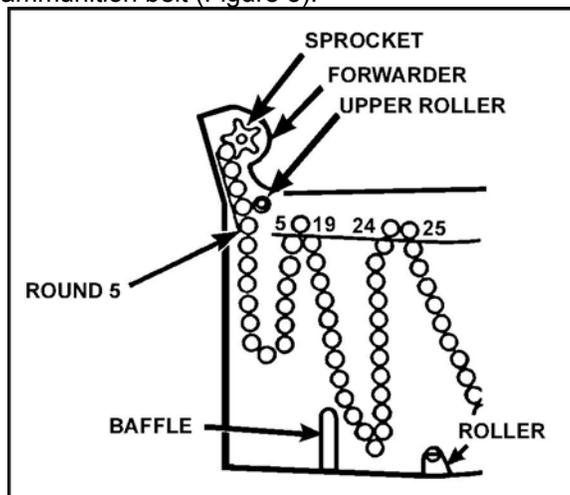


Figure 5. Rounds in forwarder.

9. Gunner: Locks the upper roller.
10. Load the remainder of the rounds in the ammunition can by hanging each successive 24th and 25th round on the loading rail.
11. Lift the ammunition belt loops over the baffle (Figure 6).

## Performance Steps

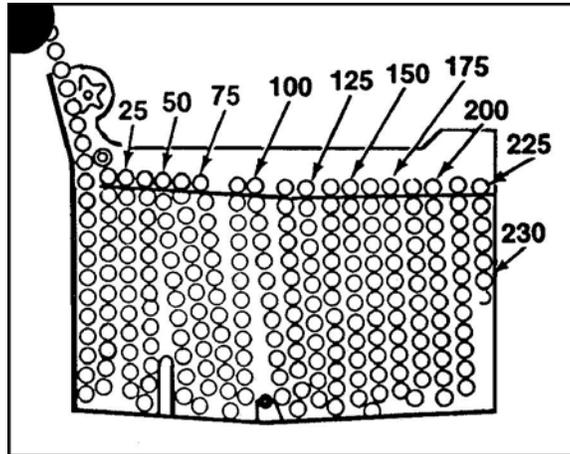


Figure 6. HE ammunition can full.

## NOTES:

1. The total number of rounds required during reload depends on the number of rounds left in the ammunition can.
2. A single empty link must be left at the end of the ammunition belt.

12. Gunner: Installs and closes the 25-mm ammunition can door and the access door on the ammunition can.

13. Install and close the HE ammunition can door.

NOTE: If the mission requires APDS ammunition to be loaded in the HE ammunition can, the AP-HE ammunition selector switch must be placed in the AP position.

14. Move the HE-AP selector switch to the correct position for the ammunition loaded (Figure 7).

**Performance Steps**

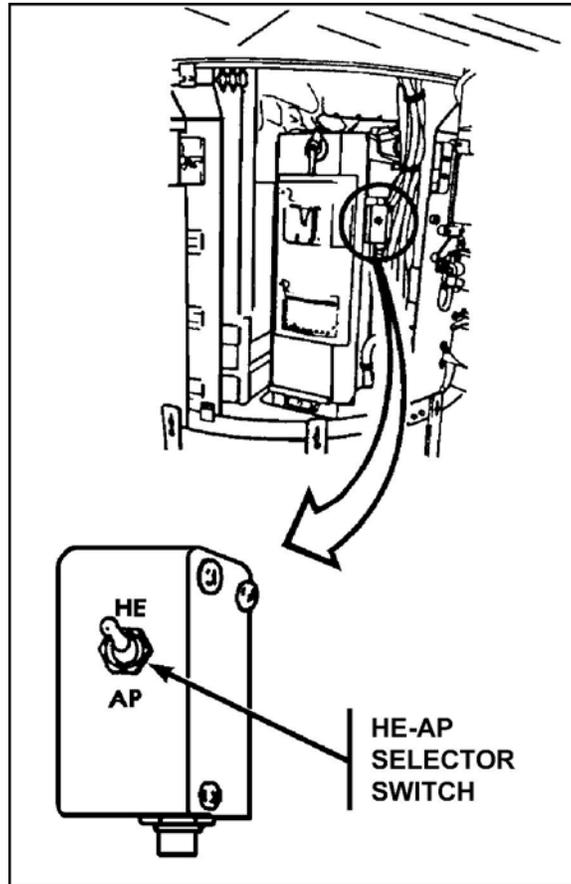


Figure 7. HE-AP selector switch.

15. Close the turret shield door and tell the gunner that HE ammunition is loaded.

**Evaluation Preparation:** SETUP: Provide the soldier with a BFV, a gunner as an assistant to help with loading 230 rounds of dummy, belted ammunition.

BRIEF SOLDIER: Tell the soldier and assistant that they will be tested on their ability to load the 25-mm HE ammunition can with high-explosive incendiary tracer ammunition without causing damage to equipment or injury to personnel.

**Performance Measures**

	<u>GO</u>	<u>NO GO</u>
1. Opened the turret shield door. Removed the HE ammunition can door from the HE ammunition.	—	—
2. Inspected the HE ammunition for alignment and serviceability.	—	—
3. Connected the belts together until 230 rounds were linked together.	—	—
4. Hung the first 5 rounds and the 19th, 24th, and 25th rounds on the loading rail.	—	—
5. The gunner forwarded the ammunition belt. NOT TESTED	—	—
6. The gunner locked the upper roller. NOT TESTED	—	—
7. Loaded the remainder of the ammunition (hung each successive 24th and 25th	—	—

**Performance Measures**

	<u>GO</u>	<u>NO GO</u>
rounds on the loading rail).		
8. Lifted the 1st and 2d ammunition belt loops over the baffle.	—	—
9. Installed the HE ammunition can door.	—	—
10. Moved the HE-AP selector switch to the HE position. Closed the turret shield door and told the gunner that the HE ammunition can was loaded.	—	—

**Evaluation Guidance:** Score the soldier GO if all performance measures are passed. Score the soldier NO-GO if any performance measure is failed. If the soldier scores NO-GO, show the soldier what was done wrong and how to do it correctly.

**References**

**Required**

**Related**

TM 9-2350-252-10-2

**Load the 25-mm Ammunition Can (APDS-T) on a BFV  
071-024-0002**

**Conditions:** Given a BFV with stowed 25-mm AP ammunition (master power is ON) and a gunner in the turret to assist in loading the AP ammunition can.

**Standards:** Identified, inspected, cleaned, and loaded the APDS-T ammunition into the AP ammunition can so that the ammunition was fed into the feed chutes without binding. Set ammunition switches to match the type of ammunition loaded. Loaded the AP ammunition can without causing damage to equipment or injury to personnel.

**WARNING:** When loading, handling, or stowing M919 ammunition, follow steps in TM 9-2350-252-10-2. Follow all caution and warning statements referring to depleted uranium rounds. Mishandling of rounds could cause serious injury or death.

**Performance Steps**

**WARNING**

If a cartridge explodes, soldiers could be hurt or killed. Handle ammunition with care. Do not bump primers against any hard surface.

1. Gunner: Moves the turret to APDS-T (4350 mils) and announces when he has set the turret travel lock.

**WARNING**

Gunner must shut down the turret drive system for safety before the turret shield door is opened.

2. Open the turret shield door.
3. Open and remove the AP ammunition can door from the AP ammunition can (Figure 1).

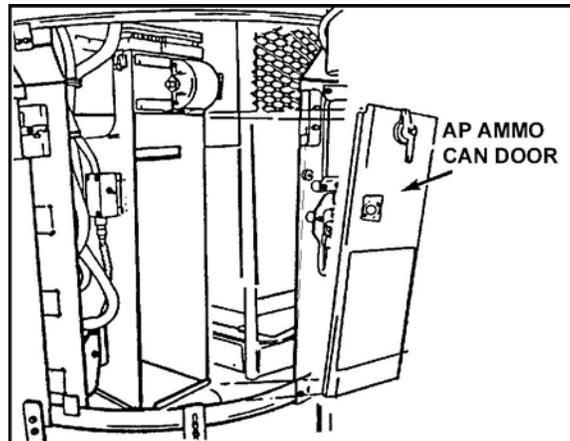


Figure 1. AP ammunition can door.

4. Prepare the AP ammunition for loading.
  - a. Unstow the AP ammunition.

**CAUTION:** Rounds not aligned properly can cause jamming in the ammunition can and chutes. Rounds must be aligned at the tips. Severe damage to the feeding system could result if the ready box is not aligned.

- b. Inspect the ammunition to ensure it is serviceable. Clean as necessary and align rounds (Figure 2).

## Performance Steps

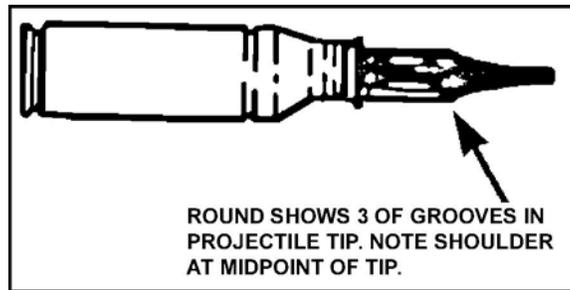


Figure 2. AP round.

NOTE: Placing the rounds into a fan shape will cause damage to the ammunition links and should not be practiced.

- c. Align all rounds (Figure 3).

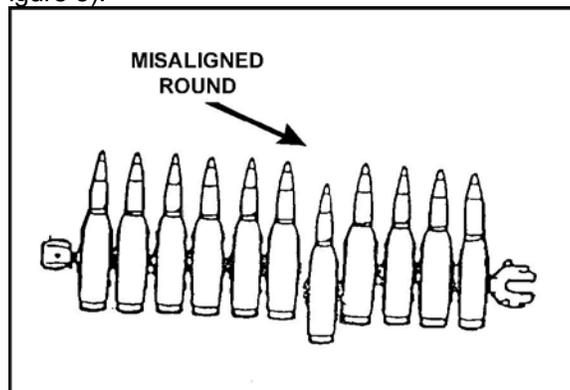


Figure 3. Misaligned round.

CAUTION: Links may be damaged if the rounds are not removed correctly. If a round does not release from a link, stop pulling on the round. To free a round from a link, twist and pull up on the round at the same time.

- d. Join ammunition belts until 70 rounds are in the belt. If reloading, fewer than 70 rounds will be needed.

CAUTION: The end of the ammunition belt with the double links always goes in the ammunition can first. The end of the ammunition belt with the empty single link goes in last. If ammunition is not loaded correctly, ammunition will bind in chutes and damage equipment.

NOTE: An ammunition belt must be loaded with the links down and the rounds pointed to the left side of the ammunition can.

5. Load the ammunition belt onto the loading rail.
  - a. Align the ammunition belt with the ammunition can and hang the first double-linked round (nearest the ammunition can) onto the loading rail.
  - b. Count the next 25 rounds. Hang both the 25th and the 26th rounds onto the loading rail (Figure 4).

**Performance Steps**

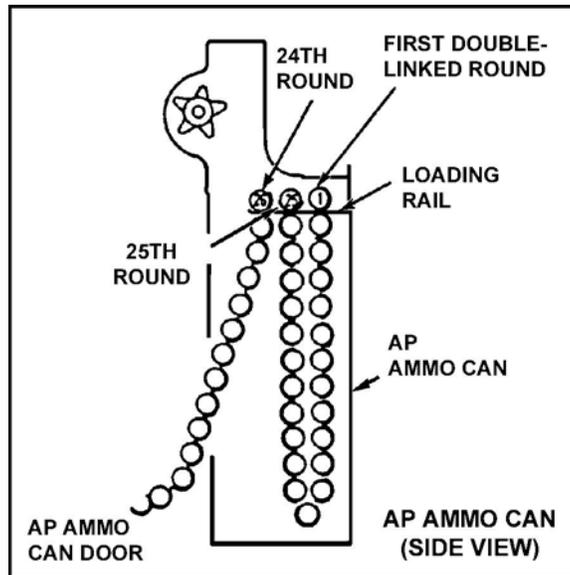


Figure 4. Loading rail.

6. Load or reload ammunition as required (Figure 5).

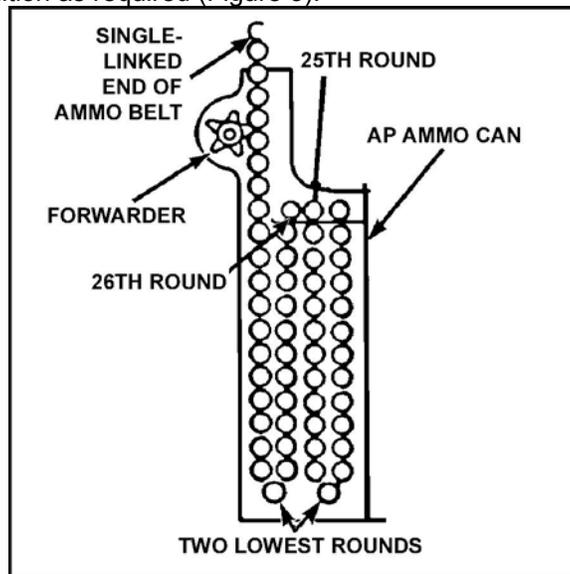


Figure 5. Rounds in forwarder.

- a. If loading, forward the ammunition belt.
  - (1) Lift the single-linked end of the ammunition belt up into the forwarder. Push the last round up until it is engaged in the sprocket.
  - (2) Gunner: Using the 14-mm ratchet wrench, turns the forwarder to the right until the two lowest rounds hang down the same distance from the loading rail.
- b. If reloading, join the second ammunition belt to the ammunition belt hanging from the AP feed chute.
  - (1) Count the rounds on the loaded ammunition belts below the loading rail. Forty-nine less the amount below the loading rail is the number of rounds that can be loaded.
  - (2) Join more ammunition belts, as required.

7. Install the AP ammunition can door. Put the door into place and turn the handle to lock the door in

**Performance Steps**

the closed position.

NOTE: If the mission requires training practice tracer (TP-T) or HE ammunition to be loaded in the ammunition can, the AP-HE ammunition selector switch must be placed in HE position.

8. Move the HE-AP ammunition selector switch to the correct position for the ammunition loaded (Figure 6).

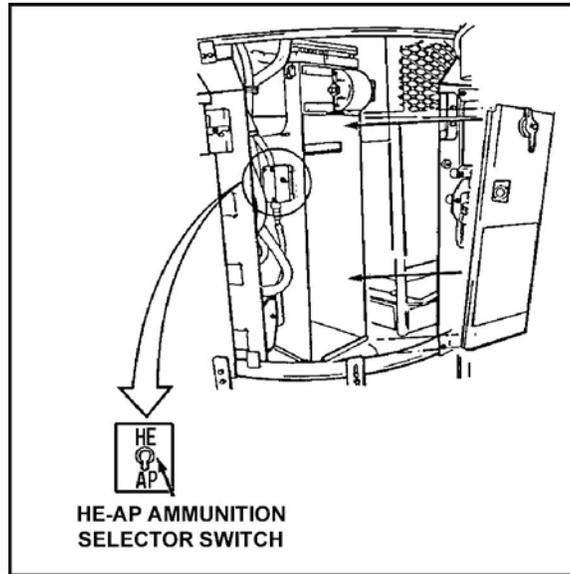


Figure 6. HE-AP ammunition selector switch.

9. Close the turret shield door and inform the gunner that the AP ammunition can is loaded.

**Evaluation Preparation:** SETUP: Provide the soldier with a BFV, a gunner to help with loading, and 70 rounds of dummy, belted ammunition.

BRIEF SOLDIER: Tell the soldier that he will be tested on his ability to load the AP ammunition can with APDS-T ammunition without causing damage to equipment or injury to personnel.

**Performance Measures**

	<u>GO</u>	<u>NO GO</u>
1. Opened the turret shield door, and opened and removed the door from the AP ammunition can.	—	—
2. Inspected the AP ammunition for alignment and serviceability.	—	—
3. Connected the belts together until 70 rounds were linked together.	—	—
4. Hung the first double-linked round and 25th and 26th rounds on the loading rail.	—	—
5. Lifted the single-linked end of the ammunition belt into the forwarder and pushed the last round up until it engaged in the sprocket	—	—
6. Gunner used the 14-mm ratchet wrench, turned the forwarder to the left until the two lowest rounds hung down the same distance from the loading rail.	—	—
7. Loaded the remainder of the ammunition into ammunition can.	—	—
8. Installed the AP ammunition can door.	—	—
9. Moved the HE-AP selector switch to the AP position. Closed the turret shield	—	—

**Performance Measures**

**GO   NO GO**

door. Informed the gunner that the AP ammunition can was loaded.

**Evaluation Guidance:** Score the soldier GO if all performance measures are passed. Score the soldier NO-GO if any performance measure is failed. If the soldier scores NO-GO, show the soldier what was done wrong and how to do it correctly.

**References**

**Required**

**Related**

TM 9-2350-252-10-2

## Unload the 25-mm Ammunition Can (HEI-T) on a BFV

071-024-0003

**Conditions:** Given a BFV with the 25-mm HE ammunition can loaded, the master power switch ON, empty HE ammunition boxes, and a gunner in the turret as an assistant.

**Standards:** Removed the HEI-T ammunition from the HE ammunition can, stored it in the original ammunition boxes, and stowed the boxes in accordance with unit SOP without causing damage to equipment or injury to personnel.

### Performance Steps

#### WARNING

Check the top of the vehicle and be sure that soldiers or equipment are not in the path of the moving gun or turret. Keep the turret shield door closed and latched while the turret is in motion.

1. Gunner moves the turret to the HE load position (2150 mils); announces when the turret travel lock is set.

#### WARNING

For training safety, the gunner must shut down the turret drive system before the turret shield door is opened.

2. Open the turret shield door.

3. Open and remove the HE ammunition can door from HE ammunition can.

#### WARNING

Handle ammunition with care. Do not bump primers against any hard surface. If a cartridge explodes, soldiers could be hurt or killed.

4. Remove the ammunition belt from the ammunition can.
  - a. Gunner moves HE ammunition onto the loading rail.
  - b. Pull out and pass free end of ammunition belt to helper (Figure 1).

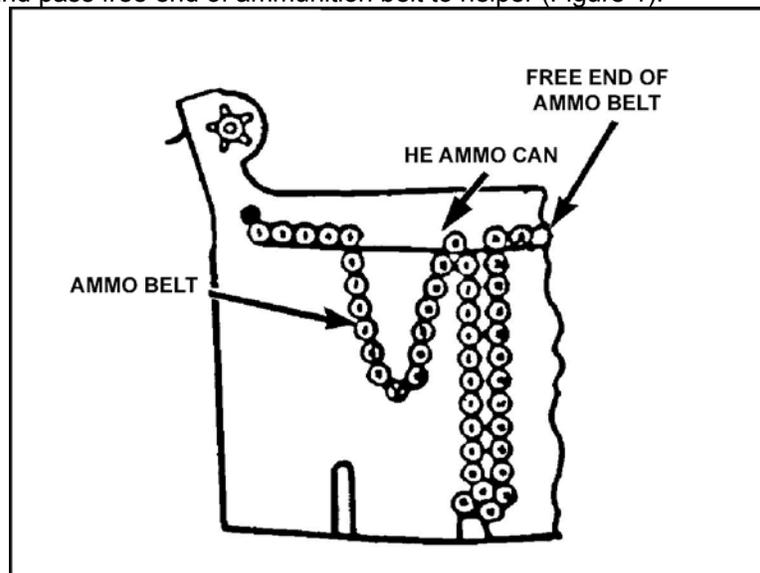


Figure 1. Free end of belt.

- c. Move ammunition belt down and away from ammunition can.
- d. Stretch and turn the ammunition belt so the links are to the bottom. Place the ammunition belt on the vehicle floor.

**NOTE:** If the round does not release from the link, stop pulling the round. To free the round, twist and pull up on the round at same time.

### Performance Steps

5. Separate the ammunition belt into 15-round belts.  
NOTE: The last ammunition belt may have less than 15 HE rounds.

6. Stow the ammunition in the HE ammunition boxes.  
a. Form each belt into an "S" shape and use a separator (Figure 2).

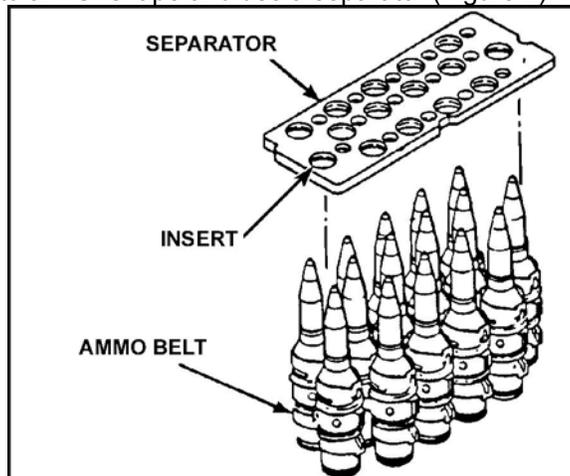


Figure 2. Separator.

b. Place the first ammunition belt in the ammunition box with the rounds pointed down. Close and latch the lid. Turn the box over (Figure 3).

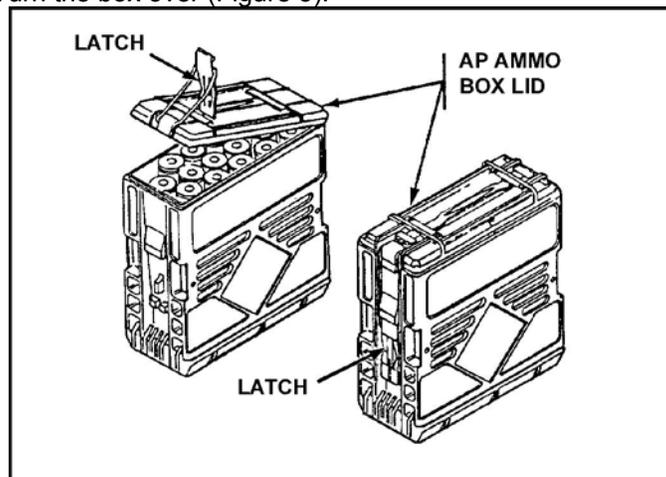


Figure 3. Ammunition box.

c. Place the second ammunition belt in the ammunition box with the rounds pointed down. Close and latch the lid.

7. Install and close the HE ammunition can door on HE ammunition can.

- a. Close turret shield door.
- b. Tell the gunner that the HE ammunition can is unloaded

8. Stow HE ammunition in accordance with unit SOP.

**Evaluation Preparation:** SETUP: Provide the soldier with a BFV, an assistant to help with unloading, and 230 rounds of dummy, belted ammunition loaded in the HE ammunition can.

**BRIEF SOLDIER:** Tell the soldier that he will be tested on his ability to unload the 25-mm HE ammunition can and stow the ammunition without causing damage to equipment or injury to personnel.

<b>Performance Measures</b>	<b><u>GO</u></b>	<b><u>NO GO</u></b>
1. Opened the turret shield door; opened and removed the HE ammunition can door.	—	—
2. Removed the ammunition belt from the ammunition can.	—	—
3. Separated the ammunition into 15-round belts.	—	—
4. Used the separator, stowed each 15-round belt in an "S" shape into an ammunition box.	—	—
5. Installed and secured the HE ammunition can door. Closed the turret shield door. Informed the gunner that the HE ammunition can was unloaded.	—	—
6. Stowed the ammunition boxes.	—	—

**Evaluation Guidance:** Score the soldier GO if all performance measures are passed. Score the soldier NO-GO if any performance measure is failed. If the soldier scores NO-GO, show the soldier what was done wrong and how to do it correctly.

**References  
Required**

**Related**  
TM 9-2350-252-10-2

## Unload the 25-mm Ammunition Can (APDS-T) on a BFV

071-024-0004

**Conditions:** Given a BFV with the master power switch ON and the AP 25-mm ammunition can loaded, empty AP ammunition boxes, and one additional squad member as an assistant.

**Standards:** Unloaded the 25-mm AP ammunition box, restored the ammunition into the original ammunition boxes, and stowed the ammunition boxes on the BFV in accordance with the unit load plan without causing damage to equipment or injury to personnel.

### Performance Steps

#### WARNING

Check the top of the vehicle and be sure that soldiers or equipment are not in the path of the moving gun or turret. Keep the turret shield door closed and latched while the turret is in motion.

1. Gunner: Move the turret to the AP load position (4350 mils); announce when the turret travel lock is set.

#### WARNING

For training safety, the gunner must shut down the turret drive system before the turret shield door is opened.

2. Open the turret shield door.

#### WARNING

Handle ammunition with care. Do not bump the primers against any hard surface. If a cartridge explodes, soldiers could be hurt or killed.

3. Remove the AP ammunition can door (Figure 1).

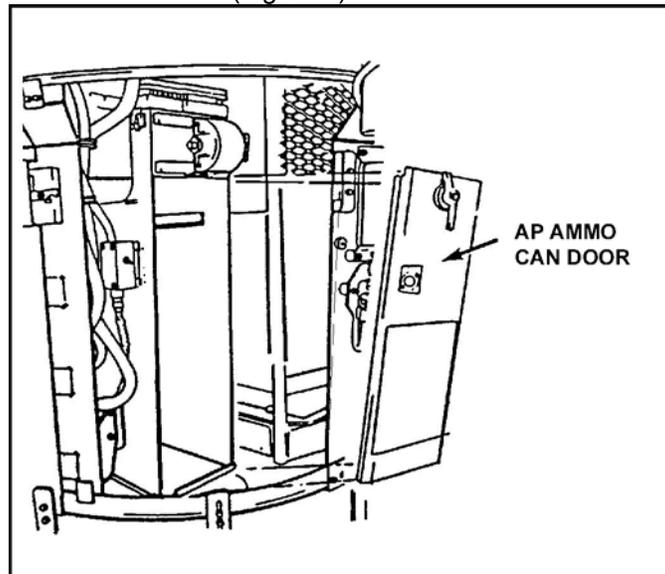


Figure 1. AP ammunition can door.

4. Remove the ammunition belt from the ammunition can.
  - a. Pass the free end of the ammunition belt to a helper.
  - b. Pull out and remove the next two folds of ammunition belt from the loading rail.
  - c. Stretch and place the ammunition belt on the vehicle floor.
5. Separate the ammunition belt into 15-round belts.
6. Stow the ammunition in AP ammunition boxes.

**Performance Steps**

- a. Form each belt into an "S" shape and use a separator (Figure 2).

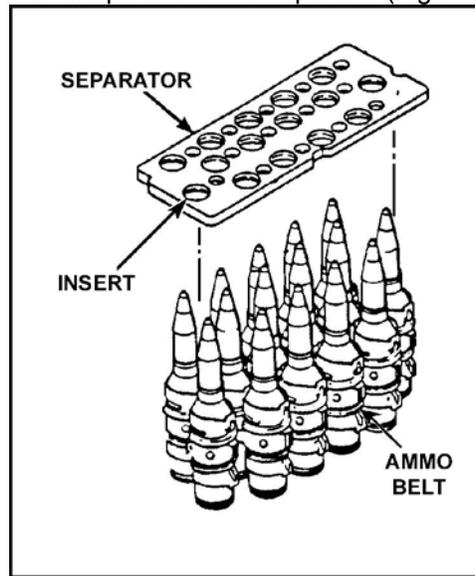


Figure 2. Separator.

- b. Place the first ammunition belt in the ammunition box with the rounds pointing down. Close and latch the lid. Turn the ammunition box over.
- c. Place the second ammunition belt in the ammunition box with the rounds pointing down. Close and latch the lid (Figure 3).

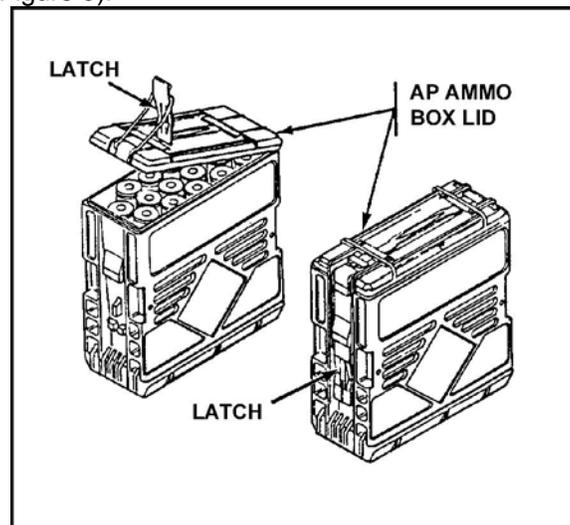


Figure 3. Ammunition box.

7. Install and close the AP ammunition can door.
- Close the turret shield door.
  - Tell the gunner that the AP ammunition can is unloaded.
8. Stow the ammunition in accordance with unit SOP.

**Evaluation Preparation:** SETUP: Provide the soldier with a BFV, an assistant to help with loading, and 70 rounds of dummy, belted ammunition.

**BRIEF SOLDIER:** Tell the soldier that he will be tested on his ability to unload the 25-mm AP ammunition can and stow the ammunition without causing damage to the equipment or injury to personnel.

<b>Performance Measures</b>	<b><u>GO</u></b>	<b><u>NO GO</u></b>
1. Opened the turret shield door, and opened and removed the AP ammunition can door.	—	—
2. Removed the ammunition belt from the ammunition can.	—	—
3. Separated the ammunition into 15-round belts.	—	—
4. Used the separator, stowed each 15-round belt in an "S" shape into an ammunition box.	—	—
5. Installed and secured the AP ammunition can door. Closed the turret shield door. Informed the gunner that the AP ammunition can was unloaded.	—	—
6. Stowed the ammunition in boxes.	—	—

**Evaluation Guidance:** Score the soldier GO if all performance measures are passed. Score the soldier NO-GO if any performance measure is failed. If the soldier scores NO-GO, show the soldier what was done wrong and how to do it correctly.

**References  
Required**

**Related**  
TM 9-2350-252-10-2

**Load the 25-mm Ammunition Can (APDS-T) on an M2A3/M3A3 BFV**  
**071-024-0012**

**Conditions:** Given an M2A3/M3A3 BFV, master power ON, with stowed 25-mm AP ammunition and a gunner in the turret to assist in loading the AP ammunition can.

**Standards:** Identified, inspected, cleaned, and loaded the APDS-T ammunition into the AP ammunition can so that the ammunition was fed into the feed chutes without binding. Set ammunition switches to match the type of ammunition loaded. Loaded the AP ammunition can without causing damage to equipment or injury to personnel.

**WARNING:** When loading, handling, or stowing M919 ammunition, follow steps in TM 9-2350-294-10-2-1. Follow all caution and warning statements referring to depleted uranium rounds. Mishandling of rounds could cause serious injury or death.

**Performance Steps**

**WARNING**

If a cartridge explodes, soldiers could be hurt or killed. Handle ammunition with care. Do not bump primers against any hard surface.

1. Gunner moves the turret to APDS-T (4350 mils) and announce when the turret travel lock is set.

**WARNING**

Gunner must shut down the turret drive system for safety before the turret shield door is opened.

2. Open the turret shield door.
3. Open and remove the AP ammunition can door from the AP ammunition can (Figure 1).

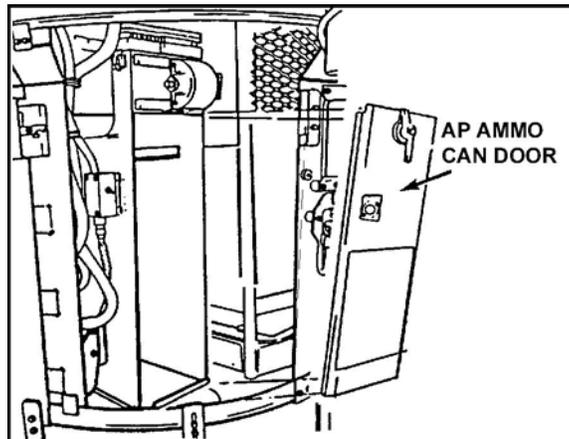


Figure 1. AP ammunition can door.

4. Prepare the AP ammunition for loading.
  - a. Unstow the AP ammunition.

**CAUTION:** Rounds not aligned properly can cause jamming in the ammunition can and chutes. Rounds must be aligned at the tips. Severe damage to the feeding system could result if the ready box is not aligned.

- b. Inspect the ammunition to ensure it is serviceable. Clean as necessary and align rounds (Figure 2).

**Performance Steps**

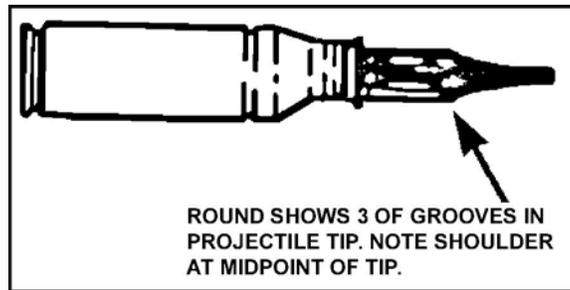


Figure 2. AP round.

NOTE: Placing the rounds into a fan shape will cause damage to the ammunition links and should not be done.

- c. Align all rounds (Figure 3).

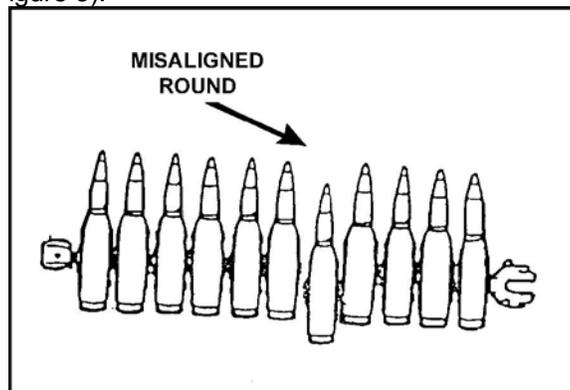


Figure 3. Misaligned round.

CAUTION: Links may be damaged if the rounds are not removed correctly. If a round does not release from a link, stop pulling on the round. To free a round from a link, twist and pull up on the round at the same time.

- d. Join ammunition belts until 70 rounds are in the belt. If reloading, fewer than 70 rounds will be needed.

CAUTION: The end of the ammunition belt with the double links always goes in the ammunition can first. The end of the ammunition belt with the empty single link goes in last. If ammunition is not loaded correctly, ammunition will bind in chutes and damage equipment.

NOTE: An ammunition belt must be loaded with the links down and the rounds pointed to the left side of the ammunition can.

- 5. Load the ammunition belt onto the loading rail.
  - a. Align the ammunition belt with the ammunition can and hang the first double-linked round (nearest the ammunition can) onto the loading rail.
  - b. Count the next 25 rounds. Hang both the 25th and the 26th rounds onto the loading rail (Figure 4).

## Performance Steps

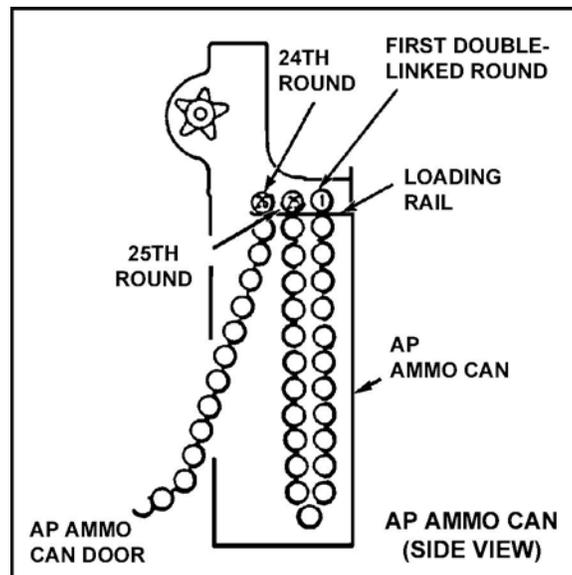


Figure 4. Loading rail.

6. Load or reload ammunition as required (Figure 5).

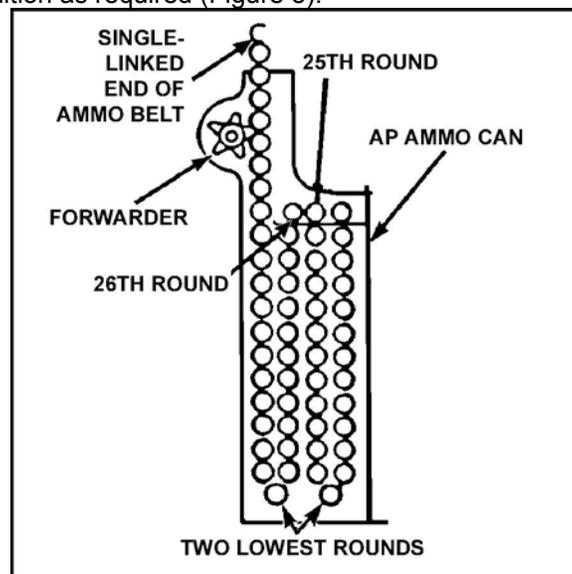


Figure 5. Rounds in forwarder.

- a. If loading, forward the ammunition belt.
  - (1) Lift the single-linked end of the ammunition belt up into the forwarder. Push the last round up until it is engaged in the sprocket.
  - (2) Gunner uses the 14-mm ratchet wrench to turn the forwarder to the right until the two lowest rounds hang down the same distance from the loading rail (gunner).
- b. If reloading, join the second ammunition belt to the ammunition belt hanging from the AP feed chute.
  - (1) Count the rounds on the loaded ammunition belts below the loading rail. Forty-nine less the amount below the loading rail is the number of rounds that can be loaded.
  - (2) Join more ammunition belts, as required.

7. Install the AP ammunition can door. Put the door into place and turn the handle to lock the door in

**Performance Steps**

the closed position.

NOTE: If the mission requires training practice-tracer (TP-T), M919 (APFSDST) or HE ammunition to be loaded in the ammunition can, the HE-M919-AP ammunition selector switch must be placed in HE position.

8. Move the HE-M919-AP ammunition selector switch to the correct position for the ammunition loaded (Figure 6).

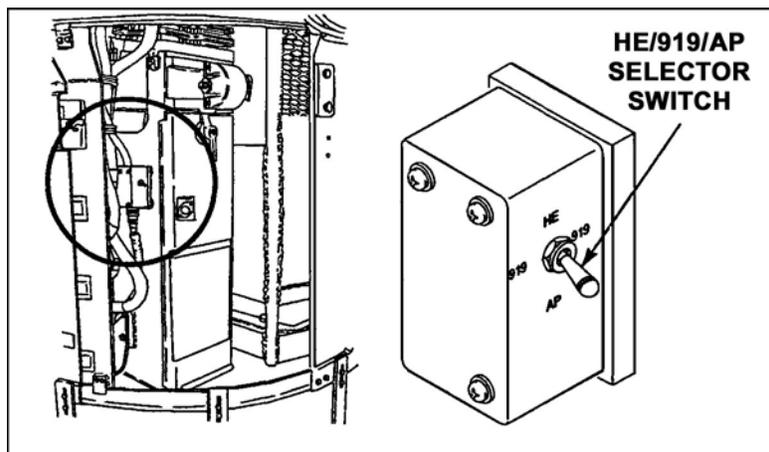


Figure 6. Selector switch.

9. Close the turret shield door and inform the gunner that the AP ammunition can is loaded.

**Evaluation Preparation:** SETUP: Provide the soldier with an M2A3/M3A3 BFV, a gunner to help with loading, and 70 rounds of dummy, belted ammunition.

BRIEF SOLDIER: Tell the soldier that he will be tested on his ability to load the AP ammunition can with APDS-T ammunition without causing damage to equipment or injury to personnel.

**Performance Measures**

1. Opened the turret shield door and opened and removed the door from the AP ammunition can.
2. Inspected the AP ammunition for alignment and serviceability.
3. Connected the belts together until 70 rounds were linked together.
4. Hung the first double-linked round and 25th and 26th rounds on the loading rail.
5. Lifted the single-linked end of the ammunition belt into the forwarder and pushed the last round up until it engaged in the sprocket
6. Used the 14-mm ratchet wrench to turn the forwarder to the left until the two lowest rounds hung down the same distance from the loading rail (gunner).
7. Loaded the remainder of the ammunition into ammunition can
8. Installed the AP ammunition can door.
9. Moved the HE-M919-AP selector switch to the AP position. Closed the turret shield door. Informed the gunner that the AP ammunition can was loaded.

GO    NO GO

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**Evaluation Guidance:** Score the soldier GO if all performance measures are passed. Score the soldier NO-GO if any performance measure is failed. If the soldier scores NO-GO, show the soldier what was done wrong and how to do it correctly.

**References**  
**Required**

**Related**  
TM 9-2350-252-10-2

**Load the 25-mm Ammunition Can (HEI-T) on an M2A3/M3A3 BFV  
071-024-0013**

**Conditions:** Given an M2A3/M3A3 BFV with stowed 25-mm HE ammunition (master power is ON) and a gunner in the turret to assist in loading the HE ammunition can.

**Standards:** Identified, inspected, cleaned, and loaded the high-explosive incendiary tracer (HEI-T) ammunition into the HE ammunition can so that the ammunition was fed into the feed chutes without binding. Set ammunition switches to match the type of ammunition being loaded. Loaded the HE ammunition can without causing damage to the equipment or injury to personnel.

**Performance Steps**

**WARNING**

Handle ammunition with care. Do not bump primers against any hard surface. If a cartridge explodes, soldiers could be hurt or killed.

1. Gunner moves the turret to HEI-T (2150 mils) and announce when the turret travel lock is set.

**WARNING**

For training safety, the gunner must shut down the turret drive system before the turret shield door is opened.

2. Open the turret shield door.
3. Open and remove the 25-mm ammunition can door and access door from the HE ammunition can.
4. Open and remove the HE ammunition can door (Figure 1).

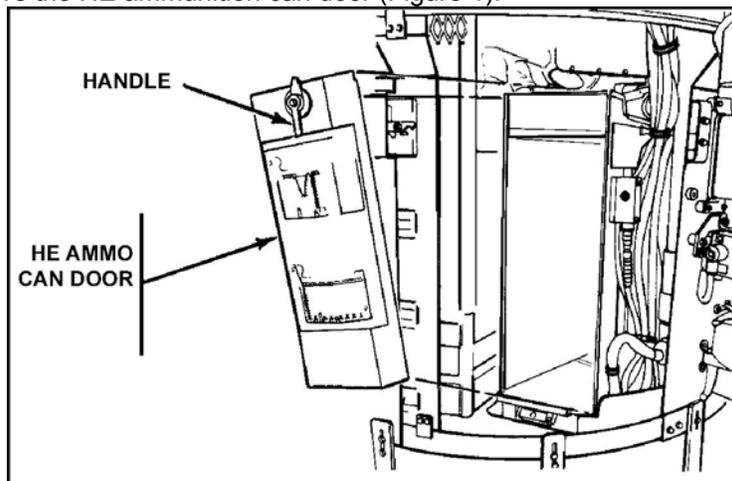


Figure 1. HE ammunition can door.

5. Prepare the HE ammunition for loading.

**CAUTION:** Rounds not aligned properly can cause jamming in the 25-mm ammunition can and chutes. Rounds must be aligned at tips. Severe damage to the feeding system could result if the ammunition is not aligned.

- a. Unstow the HE ammunition (Figure 2).

## Performance Steps

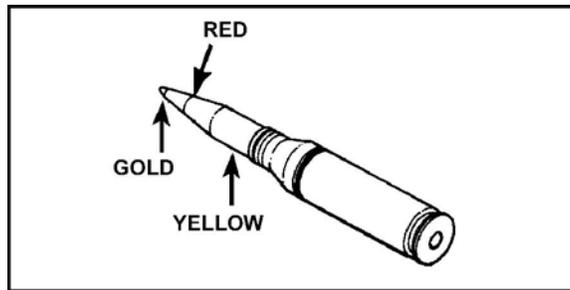


Figure 2. HE round.

b. Inspect the ammunition to ensure it is serviceable. Clean as necessary.

NOTE: Placing the rounds into a fan shape will damage the ammunition links and should not be done.

c. Align all rounds (Figure 3).

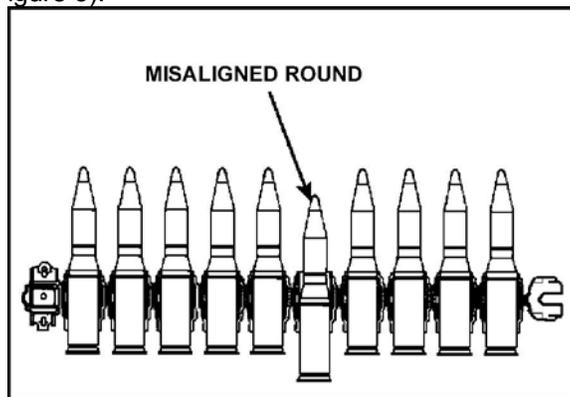


Figure 3. Misaligned round.

CAUTION: Links may be damaged if rounds are not removed correctly. If a round does not release from a link, stop pulling on the round. To free a round from a link, twist and pull up on the round at the same time.

d. Join ammunition belts until 230 rounds are in the belt.

CAUTION: The end of the ammunition belt with the double links always goes in the ammunition can first. The end of the ammunition belt with the empty single link goes in last. If the ammunition is not loaded correctly, it will bind in the chutes and damage the equipment.

NOTE: An ammunition belt must be loaded with the links to the top and the rounds pointed to the right of the vehicle. Count the rounds as they are loaded

6. Load the first 44 rounds in the ammunition can.
  - a. Turn the ammunition belt over so that the links are to the top. Rounds should point to the right of the vehicle.
  - b. Count out the 5th and 19th rounds. Feed the ammunition into the ammunition can with the double links first. Hang the first five rounds on the loading rail.
  - c. Hang the 19th round on the loading rail.
  - d. Count the next 25 rounds. Hang both the 24th and the 25th rounds on the loading rail (Figure 4).

**Performance Steps**

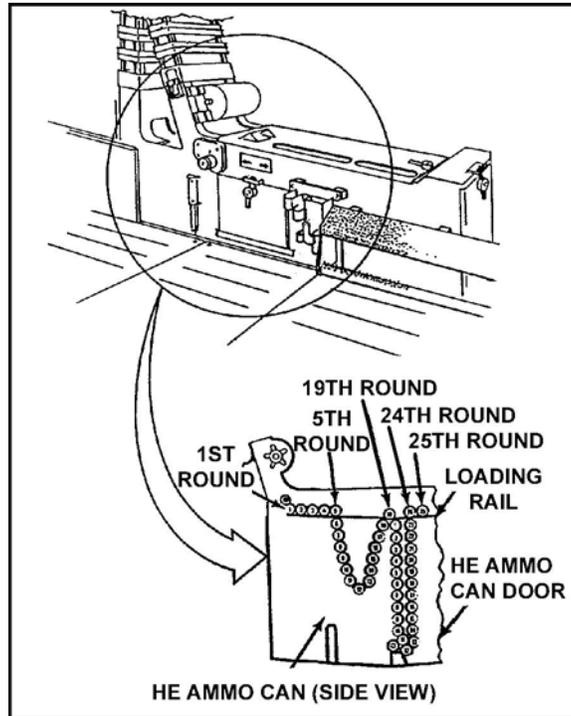


Figure 4. Round placement.

7. Gunner releases the upper roller to the rear of the ammunition can.
8. Gunner forwards the ammunition belt (Figure 5).

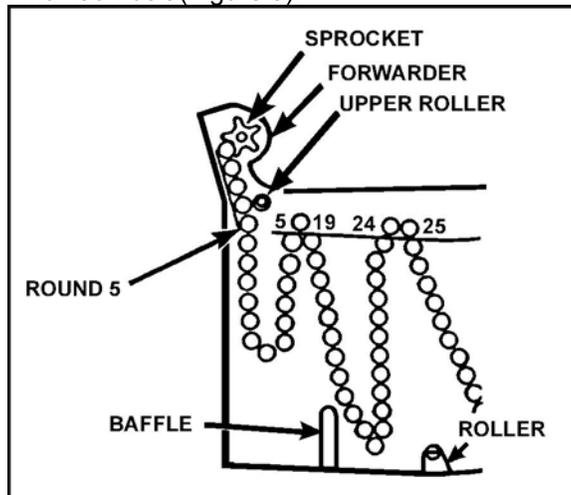


Figure 5. Rounds in forwarder.

9. Gunner locks the upper roller.
10. Load the remainder of the rounds in the ammunition can by hanging each successive 24th and 25th round on the loading rail.
11. Lift the ammunition belt loops over the baffle (Figure 6).

## Performance Steps

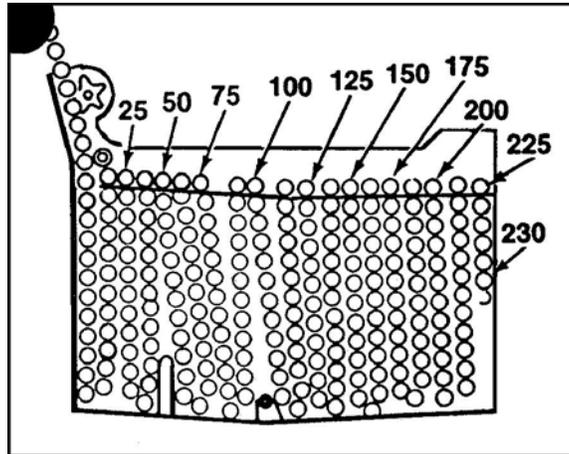


Figure 6. HE ammunition can full.

### NOTES:

1. The total number of rounds required during reload depends on the number of rounds left in the ammunition can.
2. A single empty link must be left at the end of the ammunition belt.

12. Gunner installs and closes the 25-mm ammunition can door and the access door on the ammunition can.

13. Install and close the HE ammunition can door.

NOTE: If the mission requires APDS-T or M919 (APFSDST) ammunition to be loaded in the HE ammunition can, the HE-M919-AP ammunition selector switch must be placed in the AP or M919 position.

14. Move the HE-M919-AP selector switch to the correct position for the ammunition loaded (Figure 7).

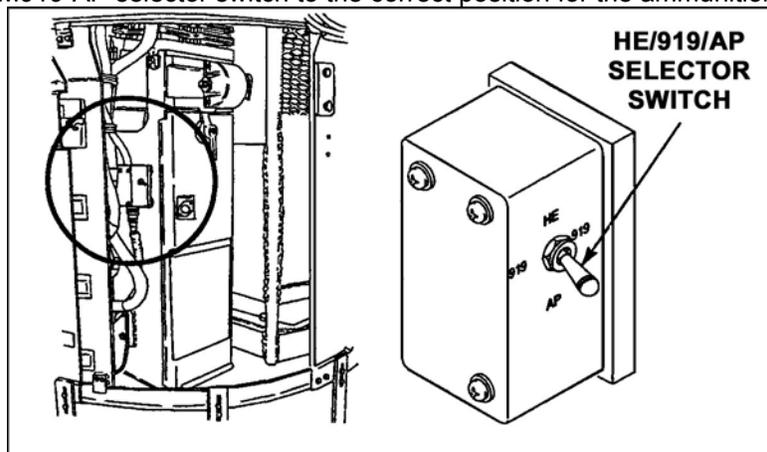


Figure 7. Selector switch.

15. Close the turret shield door and tell the gunner that HE ammunition is loaded.

**Evaluation Preparation:** SETUP: Provide the soldier with an M2A3/M3A3 BFV, a gunner as an assistant to help with loading, and 230 rounds of dummy, belted ammunition.

**BRIEF SOLDIER:** Tell the soldier and assistant that they will be tested on their ability to load the 25-mm

HE ammunition can with high-explosive incendiary tracer ammunition without causing damage to equipment or injury to personnel.

<b>Performance Measures</b>	<b><u>GO</u></b>	<b><u>NO GO</u></b>
1. Opened the turret shield door. Removed the HE ammunition can door from the HE ammunition.	—	—
2. Inspected the HE ammunition for alignment and serviceability.	—	—
3. Connected the belts until 230 rounds were linked together.	—	—
4. Hung the first 5 rounds and the 19th, 24th, and 25th rounds on the loading rail.	—	—
5. Gunner forwarded the ammunition belt. NOT TESTED	—	—
6. Gunner locked the upper roller. NOT TESTED	—	—
7. Loaded the remainder of the ammunition (hung each successive 24th and 25th round on the loading rail).	—	—
8. Lifted the 1st and 2d ammunition belt loops over the baffle.	—	—
9. Installed the HE ammunition can door.	—	—
10. Moved the HE-M919-AP selector switch to the HE position. Closed the turret shield door and told the gunner that the HE ammunition can was loaded.	—	—

**Evaluation Guidance:** Score the soldier GO if all performance measures are passed. Score the soldier NO-GO if any performance measure is failed. If the soldier scores NO-GO, show the soldier what was done wrong and how to do it correctly.

**References  
Required**

**Related**  
TM 9-2350-252-10-2

## Subject Area 49: WEAPONS: MK19 MACHINE GUN

**Correct Malfunctions of an MK 19 Machine Gun****071-030-0008**

**Conditions:** Given a loaded MK 19 machine gun mounted on an M3 tripod or vehicle, linked 40-mm grenade ammunition, a caliber .50 cleaning rod, a bore obstruction device (BOD), an assistant gunner, rifle bore cleaner (RBC), lubricating oils (LSA and either LSAT or LAW), grease (GMD), cleaning solvent (PD680), wiping rags, cloth (abrasive crocus), cleaning rod assembly, small-arms cleaning brushes, and one of the following situations: the weapon has failed to fire; the weapon is firing sluggishly; or the weapon has uncontrolled fire (continues to fire after the trigger is released).

**Standards:** Took immediate action on an MK 19 machine gun that had failed to fire without identifying the cause of the malfunction. If immediate action was unsuccessful, performed remedial action to identify the cause of the malfunction. Took immediate action to secure a runaway MK 19 machine gun and took remedial action to eliminate the malfunction. Took corrective action for an MK 19 machine gun that was firing sluggishly.

**Performance Steps**

1. Apply immediate action when the weapon fails to fire (during peacetime and during training).
- NOTE: Clear all non-essential personnel away from the gun position.

**DANGER:**

1. If anything unusual occurs during firing (including short recoil, out of battery, excess smoke, flash, loud or muffled report, malfunction, or stoppage) immediately inspect the weapon. Clear the weapon. Check the barrel for obstruction. Check the feeder, bolt face, and receiver for damage or unusual debris. DO NOT try to clear an obstructed bore. To get assistance, follow the instructions in the local or unit SOP. Continued firing may cause death or injury.
2. DO NOT relink or fire ammunition that has been cycled through the weapon.

**WARNING:**

1. Clear all non-essential personnel away from the gun position.
2. If, when you fire a round, you--
  - Hear a muffled sound;
  - See excess smoke coming out of the chamber area;
  - See excess debris, gas, or both coming from below the gun;

DO NOT perform immediate action.

DO notify your supervisor.

- a. Keep the weapon pointed at the target.
- b. Pull the bolt to the rear to charge the weapon and have the assistant gunner catch the live round as it is ejected.
- c. If the weapon will not charge, stop immediate action and apply remedial action to clear a jammed bolt (Step 2b).
- d. Push the charging handles forward and up.
- e. Place the safety switch in the safe (S) position.
- f. Check for bore obstruction.

(1) Make sure the safety switch is on safe (S).

**WARNING:**

1. DO NOT let the bolt go forward--this could cause a round to fire accidentally.
2. DO NOT insert your hands into the receiver with the bolt locked to the rear on sear. If you do so, you could suffer a severe injury.
3. DO make sure the safe/fire switch is in the safe (S) position.
  - (2) Lower the charging handles, maintain your grip, and apply back pressure to the bolt.
  - (3) Have the assistant gunner open the top cover and check the bolt face for a live round.

### Performance Steps

- (4) If a live round, spent case, or debris is present--
  - (a) Have the assistant gunner remove the catch bag and be prepared to catch any live ammunition that falls from the bottom of the weapon.
  - (b) Charge the bolt completely until the bolt clicks (locks) to the rear. Return the handles to the forward position, handles down.
  - (c) If a round is still present, have the assistant gunner clear it from the bolt face by inserting a cleaning rod through the slot in the charger handle assembly and catching the round.
  - (d) Have the assistant gunner place the bore obstruction device (BOD) into the chamber end of the barrel (weighted end first).
  - (e) Snake the BOD into the barrel.
  - (f) If the cable stops feeding, pull it back and push it forward again.
  - (g) If you cannot push the cable forward any farther, the bore is obstructed. STOP. Notify your supervisor at once.

**WARNING:** If you find that the bore of the weapon is obstructed, notify your supervisor and follow your unit SOP. Never try to remove an obstructing round from the bore. Only trained and qualified personnel should do so. DO NOT transport a weapon with a projectile lodged in the bore.

- (5) If you are able to insert the BOD cable through the barrel so that you see the weighted end of the cable protruding from the flash suppressor, then the barrel is clear.
- (6) Move the safety switch to the fire (F) position and try to fire.
- (7) If the weapon does not fire, put the safety switch on safe (S) and wait 10 seconds.
- (8) Pull the bolt to the rear. Have the assistant gunner catch the live round as it ejects.
- (9) Notify your supervisor.

#### 2. Apply immediate action during combat.

- a. Press the charger handle locks, and rotate the charger handles down.
- b. Pull the charger handles to the rear until the bolt sears.
- c. Push the charger handles forward and rotate them up.
- d. Relay the gun and fire.
- e. If the gun fails to fire, apply remedial action.

**WARNING:** Do not use combat misfire procedures during peacetime or training. Serious injury can result if you do not observe precautions.

**NOTE:** Both charger handles must be forward and up for firing. If either handle is down, the gun will not fire.

#### 3. Apply remedial action to correct malfunctions.

- a. Correct sluggish operation of an MK 19 machine gun.
  - (1) Clean weapon and perform operator-level maintenance.
  - (2) Check recoil springs for weakness and bent guide rods.
  - (3) If you find defects that are not correctable, notify your supervisor.

**WARNING:** Be sure bolt is forward before removing back plate pin assembly. Otherwise, serious injury could result!

- b. Clear a jammed bolt (weapon will not charge).

**DANGER:** Perform these procedures in sequence. Otherwise, the bolt could spring forward suddenly and fire a round, causing injury or death.

**NOTE:** Clear all non-essential personnel away from the gun position.

- (1) Place the safety switch on the safe (S) position.
- (2) Press the charger handle locks, and rotate the charger handles down.
- (3) Pull the charger handles to the rear as far as possible. Maintain rearward pressure on them, and have the assistant gunner lift the top cover.

**DANGER:** Do not allow the bolt to slam forward while you are opening the top cover.

If the bolt were to slam forward while you are opening the top cover, the weapon could fire a live round, causing injury or death.

**Performance Steps**

- (4) Pull the charger handles to the rear until the bolt clicks (locks); make sure the bolt stays to the rear when you release the charger handles.
- (5) Insert the cleaning rod section through the slot in the side of the receiver. Prepare to catch the ejected round.
- (6) Raise the cleaning rod to force the live round down. Catch the live round as it ejects.
- (7) Remove the ammunition belt from feeder.
- (8) Reposition the ammunition belt in the feeder.
- (9) Place the safety switch on fire (F) position.
- (10) Ride the bolt forward by grasping one charging handle and depressing the trigger.
- (11) Make sure the feed slide assembly is to the left.
- (12) Make sure the secondary drive lever is engaged with the feed slide pin. If not, engage the forked end with the feed slide pin.
- (13) Close the top cover gently.
- (14) Charge the weapon and try to fire.
- (15) If the bolt jams again, repeat (1) through (7). Then place the safety switch on the safe (S) position, and notify your supervisor.

c. Apply corrective action for uncontrolled fire (runaway gun).

**WARNING:** Never try to twist the belt with your hands. This could result in serious injury to personnel.

- (1) Keep the gun pointed on target.
- (2) Lower one charging handle to make the gun stop firing.
- (3) Place the safety switch on safe (S) position.
- (4) Clear the weapon and report its condition to your supervisor.

**Evaluation Preparation:** SETUP: Provide soldier with the equipment and personnel listed in condition.

**BRIEF SOLDIER:** Tell the soldier to take corrective action for each situation listed in standards, one situation at a time. If it is unclear what actions the soldier is performing, have the soldier describe the action.

**Performance Measures**

	<u>GO</u>	<u>NO GO</u>
1. Applied immediate action when the weapon failed to fire.	_____	_____
a. Peacetime and training.		
b. Combat only.		
2. Applied remedial action to correct malfunction.	_____	_____
a. Corrected the sluggish operation of an MK 19 machine gun.		
b. Cleared a jammed bolt (weapon would not charge).		
c. Applied corrective action for uncontrolled fire (runaway gun).		

**Evaluation Guidance:** Score the soldier GO if all performance measures are passed. Score the soldier NO-GO if any performance measure is failed. If the soldier scores NO-GO, show the soldier what was done wrong and how to do it correctly.

**References**

**Required**

**Related**

FM 23-27  
TM 9-1010-230-10

Subject Area 53: WEAPONS: SMOKE GRENADE LAUNCHER

**Load an M243 or M259 Smoke Grenade Launcher**

**071-034-0001**

**Conditions:** In a field or garrison environment, given an M113-series vehicle equipped with an M243/M259 smoke grenade launcher, smoke grenades, and a requirement to load the smoke grenade launcher. Mission requires employment of the vehicle smoke grenade launcher.

**Standards:** Smoke grenades are inserted in each launch tube so the spring clip at the base of each grenade engages the tip plug at the bottom of the launch tube and has positive electrical contact. Each smoke grenade stowage box is loaded with spare grenades and its cover closed and secured.

**Performance Steps**

**WARNING:** Do not stand in front of loaded grenade launcher. Do not place any part of the body other than hands in front of launch tubes while loading or unloading. Keep the grenade launcher ARM/OFF switch in the OFF position until ready to fire.

1. Ensure that the grenade launcher ARM/OFF switch is in the OFF position and the power-on lamp is not lit.
2. Remove covers from launch tubes and ensure that tubes are free of foreign matter.
3. Insert a smoke grenade into each launch tube. With palm of hand push grenades down so that the spring clip at base of each grenade engages tip plug at bottom of launch tube.
4. Rotate each grenade 1/2 turn to ensure electrical contact.
5. Place four spare grenades into each grenade stowage box. Close and secure stowage box cover.

**Evaluation Preparation:** SETUP: At the test site, provide the soldier with all the equipment given in the task condition statement.

BRIEF SOLDIER: Tell the soldier to load the M243 or M259 smoke grenade launcher.

**Performance Measures**

	<u>GO</u>	<u>NO GO</u>
1. Ensured the grenade launcher ARM/OFF switch was in the OFF position and the power-on lamp was not lit.	—	—
2. Removed covers from launch tubes and ensured tubes were free of foreign matter.	—	—
3. Inserted a smoke grenade into each launch tube.	—	—
4. Rotated each grenade 1/2 turn.	—	—
5. Placed four spare grenades into each grenade stowage box.	—	—
6. Closed and secured stowage box cover.	—	—

**Evaluation Guidance:** Score the soldier GO if all performance measures are passed. Score the soldier NO-GO if any performance measure is failed. If the soldier scores NO-GO, show the soldier what was done wrong and how to do it correctly.

**References**

**Required**

**Related**

TM 9-2350-259-10



**Unload an M243 or M259 Smoke Grenade Launcher**  
**071-034-0002**

**Conditions:** In a field or garrison environment, given an M113-series vehicle equipped with a loaded M243 or M259 smoke grenade launcher, and a requirement to unload the smoke grenade launcher.

**Standards:** Removed the smoke grenades from launch tubes and grenade stowage boxes and placed them in shipping containers. Placed covers on each launch tube, and closed and secured doors on grenade stowage boxes.

**Performance Steps**

**WARNING:** Do not stand in front of loaded grenade launcher. Do not place any part of the body other than hands in front of launcher while unloading.

1. Ensure that grenade launcher ARM/OFF switch is in the OFF position and the power-on indicator lamp is not lit before unloading grenades.
2. Remove grenades from launch tubes and stowage boxes and place in ammunition shipping containers.
3. Place covers on each launch tube.
4. Close and secure doors on grenade stowage boxes.

**Evaluation Preparation:** SETUP: At the test site, provide the soldier with all the equipment given in the task condition statement.

**BRIEF SOLDIER:** Tell the soldier to unload the M243 or M259 smoke grenade launcher.

**Performance Measures**

	<u>GO</u>	<u>NO GO</u>
1. Ensured the grenade launcher ARM/OFF switch was in the OFF position and the power-on indicator lamp was off.	—	—
2. Removed grenades from launch tube and stowage boxes, and placed them in ammunition shipping containers.	—	—
3. Placed covers on each launch tube.	—	—
4. Closed and secured doors on grenade stowage boxes.	—	—

**Evaluation Guidance:** Score the soldier GO if all performance measures are passed. Score the soldier NO-GO if any performance measure is failed. If the soldier scores NO-GO, show the soldier what was done wrong and how to do it correctly.

**References**

**Required**

**Related**

FM 23-34  
TM 9-2350-259-10

**Perform Misfire Procedures on an M243 or M259 Smoke Grenade Launcher**  
**071-034-0003**

**Conditions:** Given an M113-series vehicle equipped with a loaded M243 or M259 smoke grenade launcher that has misfired, and a requirement to perform misfire procedures.

**Standards:** The misfired grenade is fired from its launch tube, or it is removed and an attempt is made to fire it from another launch tube. A determination is made as to whether the grenade launcher is defective or the smoke grenade is a dud.

**Performance Steps**

1. Correct a smoke grenade launcher misfire.
  - a. Make two more attempts to fire the grenade.
  - b. If the grenade still does not fire, ensure that the ARM/OFF switch is OFF, the power-on indicator is not lit, and the grenade is firmly seated.
  - c. If the grenade is not firmly seated, load properly, position the ARM/OFF switch to ARM, and attempt to fire the grenade.
  - d. If the grenade will not fire when firmly seated, attempt to fire the grenade from another discharger tube. If the grenade fires, notify organizational maintenance of a defective discharger.
  - e. If grenade still does not fire, treat as a dud.

**Evaluation Preparation:** SETUP: Provide the soldier the equipment and materials called for in the task condition statement.

BRIEF SOLDIER: Tell the soldier he must perform misfire procedures on an M243 or M259 smoke grenade launcher.

<b>Performance Measures</b>	<b><u>GO</u></b>	<b><u>NO GO</u></b>
1. Made two more attempts to fire the grenade.	—	—
2. If the grenade did not fire, ensured the ARM/OFF switch was in the OFF position, the power-on indicator was not lit, and the grenade was firmly seated.	—	—
3. Positioned the ARM/OFF switch in the ARM position, and attempted to fire the grenade.	—	—
4. If the grenade did not fire, attempted to fire the grenade from a different launch tube. If the grenade fired, notified supervisor of a defective launch tube. If the grenade did not fire, treated it as a dud.	—	—

**Evaluation Guidance:** Score the soldier GO if all performance measures are passed. Score the soldier NO-GO if any performance measure is failed. If the soldier scores NO-GO, show the soldier what was done wrong and how to do it correctly.

**References  
Required**

**Related**  
 FM 23-34  
 TM 9-2350-259-10

**Fire an M243 or M259 Smoke Grenade Launcher**  
**071-034-0004**

**Conditions:** Given an M113-series vehicle equipped with a loaded M243 or M259 smoke grenade launcher, and a requirement to fire the smoke grenade launcher.

**Standards:** Fired the smoke grenade launcher to launch smoke grenades in a desired area without damage to equipment or injury to personnel.

**Performance Steps**

1. Ensure that vehicle is pointed directly at area where smoke is desired.
2. Place the grenade launcher ARM/OFF switch in the ARM position.
3. Press FIRE switch when ready to fire. Eight grenades should detonate around a 105-degree arc, 30 meters from the vehicle.

**Evaluation Preparation:** SETUP: At the test site, provide the soldier with all the equipment given in the task condition statement.

BRIEF SOLDIER: Tell the soldier to fire the M243 or M259 smoke grenades to prevent enemy observation of the vehicle.

**Performance Measures**

	<u>GO</u>	<u>NO GO</u>
1. Ensured the vehicle was pointed directly at the area where smoke was desired.	—	—
2. Placed the grenade launcher ARM/OFF switch in the ARM position.	—	—
3. Pressed the FIRE switch when ready to fire. Eight grenades should have detonated around a 105-degree arc, 30 meters from the vehicle.	—	—

**Evaluation Guidance:** Score the soldier GO if all performance measures are passed. Score the soldier NO-GO if any performance measure is failed. If the soldier scores NO-GO, show the soldier what was done wrong and how to do it correctly.

**References**  
**Required**

**Related**  
TM 9-2350-259-10

**Load the M257 Smoke Grenade Launcher on a BFV**  
**071-034-0005**

**Conditions:** Given a BFV with operational M257 smoke grenade launchers, 16 smoke grenades, and a helper.

**Standards:** Inspected the smoke grenades and the M257 smoke grenade launchers. Loaded the M257 smoke grenade launchers so they are ready to fire.

**Performance Steps**

1. Turn the turret drive system OFF and engage the turret travel lock.
2. Inspect and clean the smoke grenade stowage bins and launcher tubes in accordance with TM 9-2350-252-10-2. Be sure not to misplace the discharger caps (Figure 1).

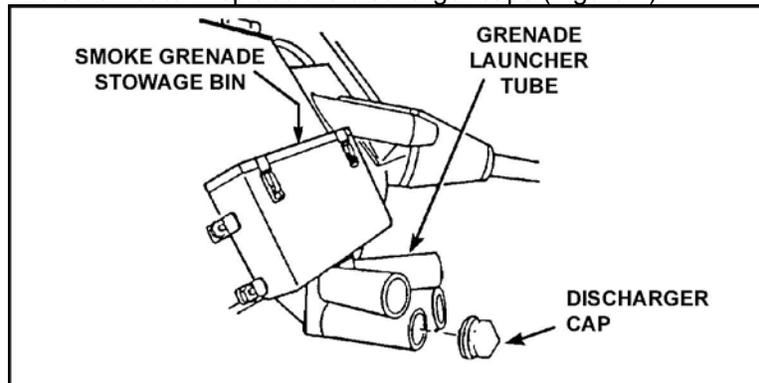


Figure 1. M257 smoke grenade launcher.

Note: The loader and the helper can work on the right and left sides at the same time.

3. Unpack and inspect the smoke grenades.  
**WARNING:** Do NOT maintain and clean damaged grenades; the red phosphorus can cause severe burns if the round explodes. Keep grenades away from electric sparks and high heat. Do NOT drop or throw them. Do NOT force grenades into tubes. Death or injury could occur.
4. Stow eight smoke grenades with metal ends down in the stowage bins, four grenades on each side.
5. Load eight smoke grenades in the launch tubes, four grenades on each side (Figure 2).

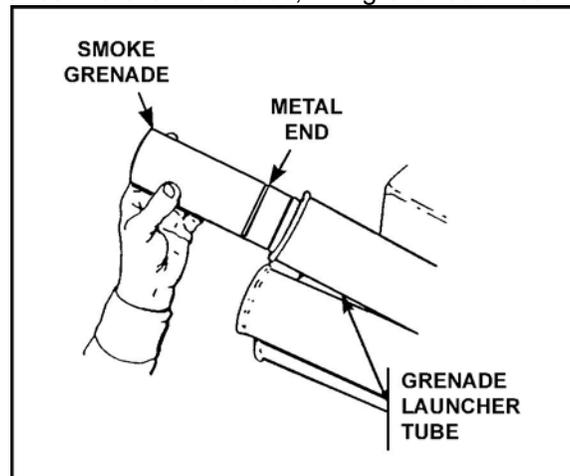


Figure 2. Load smoke grenade.

**Performance Steps**

- a. Straddle the launch tubes or load from the cargo hatch; be sure that no portion of the body is in front of the loaded tubes.
  - b. Grasp the smoke grenade around the sides and carefully push the metal end first, all the way into the tubes, until two clicks are heard or felt. This seats the grenade on the firing pin.
  - c. Turn the smoke grenade 1/2 turn to the right (clockwise) to ensure a good electrical contact.
  - d. Pull gently on the grenade to ensure it is properly seated.
6. Repeat step 5 to load all eight launch tubes. Reinstall the discharger caps.
7. Turn the turret drive system ON and notify the chain of command when loading is completed.

**Evaluation Preparation:** SETUP: Provide the soldier with the equipment and material as outlined in the task condition statement.

BRIEF SOLDIER: Tell the soldier to load smoke grenades without damaging equipment or injuring personnel.

**Performance Measures**

	<u>GO</u>	<u>NO GO</u>
1. Turned the turret drive system OFF and engaged the travel lock.	_____	_____
2. Inspected and cleaned the smoke grenade stowage bins and launcher tubes.	_____	_____
3. Loaded smoke grenades.	_____	_____

**Evaluation Guidance:** Score the soldier GO if all performance measures are passed. Score the soldier NO-GO if any performance measure is failed. If the soldier scores NO-GO, show the soldier what was done wrong and how to do it correctly.

**References  
Required**

**Related**  
TM 9-2350-252-10-2

**Unload the M257 Smoke Grenade Launcher on a BFV**  
**071-034-0006**

**Conditions:** Given a BFV with operational M257 smoke grenade launchers, 16 smoke grenades, and a helper.

**Standards:** Unloaded and stowed the smoke grenades from the smoke grenade launcher. Unloaded a misfired smoke grenade without causing damage to equipment or injury to personnel.

**Performance Steps**

1. Unload the smoke grenades. Ensure the turret drive system switch and the turret power switch are turned to OFF and the turret travel lock is engaged.
2. Unload the launch tubes. Inspect and clean the smoke grenade stowage bins and launcher tubes in accordance with TM 9-2350-252-10-2. Be sure not to misplace the discharger caps (Figure 1).

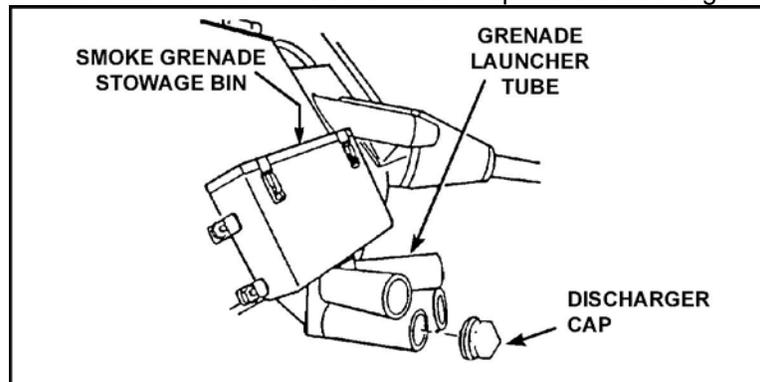


Figure 1. Smoke grenade and launcher.

- a. Stow eight smoke grenades with metal ends down in the stowage bins, four grenades on each side.

**WARNING:** Do NOT put any part of the body in front of the loaded tubes. Death or injury could occur.

**Note:** One soldier can unload the smoke grenades; however, two soldiers (one on each side) should do it at the same time.

- (1) Straddle the smoke grenade launch tubes.
  - (2) Grasp the grenade with the thumb and first finger and pull while twisting to the left (counterclockwise).
  - (3) Lift the grenade out of the launch tube.
  - b. Repeat the steps above to unload all eight launch tubes. Reinstall the discharger caps.
3. If a misfired smoke grenade is unloaded, hand it down to the helper. Move it at least 200 meters from the vehicle and personnel. Mark the grenade and notify chain of command of its location, or destroy in accordance with unit SOP.
  4. Unload the smoke grenades from the stowage bins.
    - a. Inspect the grenades for damage. Pack serviceable grenades into their original container(s).
    - b. Turn the turret drive system ON (if required). Notify chain of command when unloading is completed.

**Evaluation Preparation:** SETUP: Provide the soldier with the equipment and material as outlined in the task condition statement.

**BRIEF SOLDIER:** Tell the soldier to unload smoke grenades and dispose of a misfired smoke grenade without damaging equipment or injuring personnel.

**Performance Measures**

1. Turned the turret drive system OFF and engaged the turret travel lock.
2. Unloaded smoke grenades.
3. Unloaded and disposed of a misfired smoke grenade.
4. Reinstalled the discharger caps.

**GO**    **NO GO**

\_\_\_\_    \_\_\_\_  
\_\_\_\_    \_\_\_\_  
\_\_\_\_    \_\_\_\_  
\_\_\_\_    \_\_\_\_

**Evaluation Guidance:** Score the soldier GO if all performance measures are passed. Score the soldier NO-GO if any performance measure is failed. If the soldier scores NO-GO, show the soldier what was done wrong and how to do it correctly.

**References**

**Required**

**Related**

TM 9-2350-252-10-2

**Maintain an M243 or M259 Smoke Grenade Launcher**  
**071-034-0007**

**Conditions:** In a field or garrison environment, given an M113/M901/ITV-series vehicle equipped with an M243 or M259 smoke grenade launcher, cleaning compound MILC372, dry cleaning solvent PD680, dry cotton cloth, and an order to clean and service the smoke grenade launchers.

**Standards:** All grease, dirt, and debris are removed from smoke grenade dischargers. The smoke grenade launcher is inspected for serviceability, and any deficiencies are reported to the supervisor.

**Performance Steps**

1. Ensure vehicle master switch is OFF, smoke grenade launcher ARM/OFF switch is in the OFF position, and the power-on indicator is not lit.

**WARNING:** The following safety precautions apply when using dry cleaning solvents: do not breathe fumes, ensure there is plenty of ventilation, and avoid contact with skin. Failure to observe safety precautions can result in death or injury to personnel.

2. Inspect the dischargers for damage and serviceability and report any deficiencies to supervisor.
3. Remove any buildup of grease or dirt from dischargers by wiping with a soft cloth dampened with dry cleaning solvent PD680. Wipe dry with a dry soft cloth.
4. Immediately after firing, and on two consecutive days thereafter, thoroughly clean dischargers with cleaning compound MILC372, ensuring that all surfaces are well coated. Do not wipe dry.

**Evaluation Preparation:** SETUP: Provide the soldier with all the equipment given in the task condition statement.

**BRIEF SOLDIER:** Tell the soldier to perform preventive maintenance checks and services on an M243 or M259 smoke grenade launcher.

<b>Performance Measures</b>	<b><u>GO</u></b>	<b><u>NO GO</u></b>
1. Ensured vehicle master switch was OFF, smoke grenade launcher ARM/OFF switch was in the OFF position, and the power-on indicator was not lit.	—	—
2. Inspected the dischargers for damages and serviceability.	—	—
3. Reported any deficiencies to supervisor.	—	—
4. Removed any buildup of grease or dirt from dischargers by wiping with a soft cloth.	—	—
5. Cleaned discharger thoroughly with cleaning compound MIL-C-372 immediately after firing and on two consecutive days thereafter, ensuring that all surfaces were well coated.	—	—
6. Cleaned dischargers with cleaning compound and wiped dry with a dry, soft cloth for two days. On third day after firing, cleaned dischargers with cleaning compound but did not wipe dry.	—	—
7. Cleaned dischargers with cleaning compound but did not wipe dry during continuous firing.	—	—

**Evaluation Guidance:** Score the soldier GO if all performance measures are passed. Score the soldier NO-GO if any performance measure is failed. If the soldier scores NO-GO, show the soldier what was done wrong and how to do it correctly.

STP 7-11B1-SM-TG

**References  
Required**

**Related**  
TM 9-2350-259-10

**Maintain an M257 Smoke Grenade Launcher on a BFV  
071-034-0008**

**Conditions:** In a field or garrison environment, given a BFV equipped with an M257 smoke grenade launcher, 25-mm bore brush, 25-mm cleaning rod, rifle bore cleaner (RBC), pipe cleaners, dry cotton cloth, and an order to clean and service the smoke grenade launchers.

**Standards:** All grease, dirt, and debris are removed from smoke grenade dischargers. The smoke grenade launcher is inspected for serviceability and any deficiencies are reported to the supervisor.

**Performance Steps**

1. Ensure vehicle master power, turret power, and turret drive system switches are in the OFF position, and the power-on indicators are not lit.
2. Remove rubber caps from the smoke grenade launcher tubes.
3. Clean drain holes.
  - a. Use a pipe cleaner to get into the drain hole at the bottom of each tube.
  - b. Clean out any dirt and debris.
4. Clean inside of smoke grenade launcher tubes.
  - a. Use RBC on a 25-mm bore brush.
  - b. Wipe dry with a dry, soft cloth.
5. Inspect smoke grenade launcher tubes for any damage such as crushed or bent tubes.
6. Ensure electrical firing pin is not corroded and smoke grenade launcher is securely mounted.
7. Install rubber caps on the smoke grenade launcher tubes.
8. Report any deficiencies to supervisor.

**Evaluation Preparation:** SETUP: At the test site, provide the soldier with all the equipment given in the task condition statement.

BRIEF SOLDIER: Tell the soldier to inspect and perform operational maintenance on the M257 smoke grenade launcher.

**Performance Measures**

	<u>GO</u>	<u>NO GO</u>
1. Ensured vehicle master power, turret power, and turret drive system switches were in the OFF position, and the power-on indicators were not lit.	—	—
2. Removed rubber caps from the smoke grenade launcher tubes.	—	—
3. Cleaned drain holes.	—	—
4. Cleaned inside smoke grenade launcher tubes.	—	—
5. Inspected smoke grenade launcher tubes.	—	—
6. Ensured electrical firing pin was not corroded and smoke grenade launcher was securely mounted.	—	—
7. Installed rubber caps on the smoke grenade launcher tubes.	—	—
8. Reported any deficiencies to supervisor.	—	—

**Evaluation Guidance:** Score the soldier GO if all performance measures are passed. Score the soldier NO-GO if any performance measure is failed. If the soldier scores NO-GO, show the soldier what was done wrong and how to do it correctly.

**References  
Required**

**Related**  
TM 9-2350-252-10-2  
TM 9-2350-284-10-2

**Fire the M257 Smoke Grenade Launcher on a BFV**  
**071-324-4003**

**Conditions:** Given a moving or stationary BFV with all power ON and the M257 launch tubes loaded.

**Standards:** Fired the smoke grenades from the M257 grenade launcher and prevented enemy observation of the BFV without damage to equipment or injury to personnel.

**Performance Steps**

Note: If the tactical situation permits, remove the discharged caps before firing the smoke grenades.

**WARNING:** Before firing, close all hatches and make sure no friendly personnel or obstacles are in front of or above the BFV.

1. The Bradley commander announces, "GRENADE LAUNCHER," to alert the crew that the grenade launcher is to be fired.
2. The gunner moves the grenade launcher switch to ON (Figure 1).

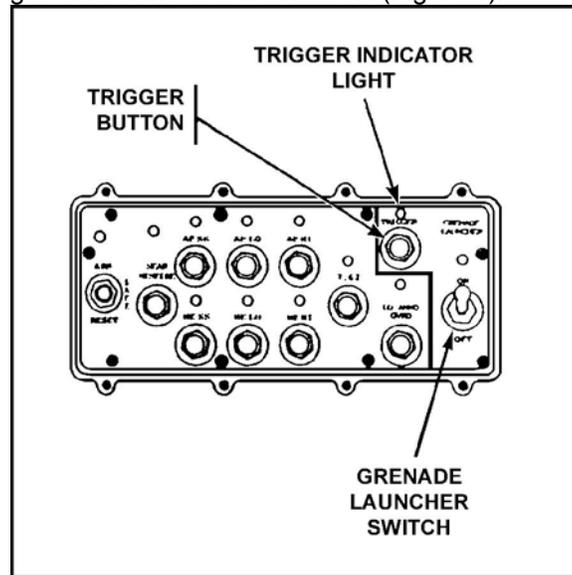


Figure 1. Weapon control box.

3. On the command FIRE, press the smoke grenade trigger button to fire the smoke grenades, and check the trigger indicator light.
  4. If the trigger indicator light is on, the Bradley commander announces, "GRENADES LAUNCHED." The gunner moves the grenade launcher switch to OFF.
  5. If the trigger indicator light is not on, the gunner takes immediate action.
    - a. Press the trigger button again.
    - b. Look through the periscopes for smoke.
- Note: Seeing smoke does not mean that all grenades have launched.
- c. Move the grenade launcher switch to OFF.
  6. When the tactical situation permits, the gunner checks the launch tubes for misfired smoke grenades.
  7. The Bradley commander notifies the chain of command of the situation.

**Evaluation Preparation:** SETUP: Provide the gunner an M2/M3 Bradley vehicle with smoke grenades loaded in the M257 smoke grenade launcher.

BRIEF SOLDIER: Tell the gunner to correctly fire the launcher in sequence without causing damage to equipment or injury to personnel.

<b>Performance Measures</b>	<b><u>GO</u></b>	<b><u>NO GO</u></b>
1. Moved the smoke grenade launcher switch to ON.	—	—
2. Bradley commander announced, "GRENADE LAUNCHER," and ensured that all hatches were closed.	—	—
3. Pressed the smoke grenade trigger button.	—	—
4. Checked the trigger indicator.	—	—

**Evaluation Guidance:** Score the soldier GO if all performance measures are passed. Score the soldier NO-GO if any performance measure is failed. If the soldier scores NO-GO, show the soldier what was done wrong and how to do it correctly.

**References**  
**Required**

**Related**  
FM 23-1  
TM 9-2350-252-10-2

## GLOSSARY

### Section I

#### Acronyms & Abbreviations

<b>BNCOC</b>	Basic Noncommissioned Officer Course
<b>DAP</b>	decontamination apparatus, portable
<b>HAW</b>	heavy antitank weapon
<b>HMMWV</b>	high-mobility, multipurpose wheeled vehicle
<b>ICOM</b>	intercommunications
<b>ITEP</b>	Individual Training Evaluation Program
<b>LAW</b>	lubricating oil, Arctic weapon; light antitank weapon
<b>MAW</b>	medium antitank weapon
<b>METT-T</b>	mission, enemy, terrain, troops and time available
<b>MOUT</b>	Military Operations on Urban Terrain
<b>NATO</b>	North Atlantic Treaty Organization
<b>OSUT</b>	One-station Unit Training
<b>SAW</b>	squad automatic weapon
<b>TOW</b>	tube-launched, optically tracked, wire-guided

### Section II

#### Terms

**AC**

Active Component; assistant commandant; alternating current

**ACCP**

Army Correspondence Course Program

**AGS**

a 30-mm automatic grenade launcher developed by the former Soviet Union

**AHD**

antihandling device

**AIT**

Advanced Individual Training

**AKM**

STP 7-11B1-SM-TG

a 7.62-mm assault rifle developed by the former Soviet Union

**AKMS**

a 7.62-mm assault rifle developed by the former Soviet Union

**ALT**

alternate

**ammo**

ammunition

**APC**

armored personnel carrier

**AR**

Army Regulation; Army Reserve

**ARNG**

Army National Guard

**ARTEP**

Army Training and Evaluation Program

**AT**

antitank

**AT**

antitank

**ATGM**

antitank guided missile

**BATT**

battery

**beaten zone**

the pattern formed where rounds or bursts have struck the ground or a target

**BII**

basic issue items

**BMD**

a vehicle developed by the former Soviet Union

**BML**

by-product materials license

**BMP**

a fighting vehicle developed by the former Soviet Union

**BRDM**

a scout car developed by the former Soviet Union

**BT**

basic training

**C**

centigrade

**CB**

circuit breaker; chemical, biological

**centigray**

a unit of absorbed dose of radiation equal to a rad

**cGy**

Centigray

**cGyph**

centigray per hour

**CLP**

cleaner, lubricant, preservative

**cm**

centimeter; control monitor

**COMSEC**

communications security

**CP**

command post

**CRT**

cathode ray tube

**CSS**

combat service support

**CTA**

common table of allowance

**CTT**

Common Task Test

**CX**

blister agent; coaxial cable designator

**DA**

Department of the Army

**defile**

a narrow passage in which troops can march only in a file

**DS**

direct support

**DS2**

decontaminating solution No. 2

**DTG**

date-time group

**ECCM**

Electronic Counter-Counter Measures

**ECM**

Electronic Countermeasures

**EENT**

end of evening nautical twilight

**ENCODED**

(a message) converted into code

**EOD**

explosive ordnance disposal

**EPW**

enemy prisoner of war

**ERF**

electronic remote fill (offset frequency)

**EW**

electronic warfare

**F**

fahrenheit; fail

**F**

fahrenheit; fail

**FDC**

fire direction center

**FH**

frequency hopping

**FM**

field manual; frequency modulated (radio)

**FM**

field manual; frequency modulated (radio)

**FO**

forward observer

**FOV**

field of view

**FPF**

final protection fires

**FPL**

final protection line

**FRAGO**

fragmentary order

**FREQ**

frequency

**ft; FT**

feet; firing table

**gnd**

ground

**GSR**

ground surveillance radar

**GTA**

Graphic Training Aid

**HE**

high-explosive

**IAW**

in accordance with

**ID**

identification

**IEDK**

individual equipment decontamination kit

**IET**

initial entry training

**IL**

Illinois

**in; IN**

Infantry

**ir; IR**

infrared; intelligence requirements; information requirement

**ITP**

individual training plan

**JB**

job book

**km**

kilometer

**LBE**

load-bearing equipment

**LD**

line of departure

**LSA**

lubricating oil, semifluid, automatic weapon; logistics support analysis

**LZ**

landing zone

**m**

meter(s)

**MANPACK**

designed to be carried by one person

**MEDEVAC**

medical evacuation

**METL**

mission-essential task list

**MG**

machine gun

**MIJI**

meaconing intrusion jamming interference

**mm**

millimeter

**MOPP**

mission-oriented protective posture

**MOS**

military occupational specialty

**MOSC**

military occupational specialty code

**MPRJ**

Military Personnel Records Jacket, US Army

**MRL**

multiple rocket launcher

**MTP**

mission training plan

**NBC**

nuclear, biological, and chemical

**NCO**

noncommissioned officer

**NCOIC**

Noncommissioned Officer In Charge

**NCOIC**

Noncommissioned Officer In Charge

**NCS**

net control station

**NSN**

national stock number; nonstandard number

**OEG**

operational exposure guidance

**OIC**

officer in charge

**OP**

observation post

**OPCODE**

operations code

**OPLAN**

operation plan

**OPORD**

operation order

**OPSEC**

operations security

**ORP**

objective rally point

**P**

pass

**PDF**

principal direction of fire

**PEWS**

Platoon Early Warning System

**PIR**

priority intelligence requirement

**PKM**

a general-purpose machine gun developed by the former Soviet Union

**PL**

phase line

**PLAINTEXT**

the intelligible form of an encrypted text or of its elements

**PLDC**

Primary Leadership Development Course

**PMCS**

preventive maintenance checks and services

**PSI**

pounds per square inch

**PSYOP**

psychological operations

**PTT**

push-to-talk

**RATELO**

radiotelephone operator

**RBC**

rifle bore cleaner

**RCU**

remote control unit

**RDF**

radio direction finding

**RF**

Reserve Forces; radio frequency

**ROE**

rules of engagement

**RPG**

a rocket-propelled grenade launcher developed by the former Soviet Union

**RPK**

a 7.62-mm light machine gun developed by the former Soviet Union

**RPK-74**

a 5.45-mm light machine gun developed by the former Soviet Union

**RPO**

radiation protection officer

**RT**

receiver/transmitter

**SC**

Signal Corps; single-channel

**SI**

skill identifier; set indicator

**SINGARS**

single-channel ground-air radio system

**SL**

squad leader; skill level

**SM**

soldier's manuals

**SMCT**

soldier's manual of common tasks

**SOI**

signal operating instructions

**SOP**

standing operating procedure

**SPG-9**

a 73-mm antitank recoilless gun developed by the former Soviet Union

**STP**

soldier training plan

**SVD**

a 7.62-mm sniper rifle developed by the former Soviet Union

**T&E**

traversing and elevating

**TC**

training circular

**TEK**

traffic encryption key

**TG**

trainer's guide

**TMDE**

test measurement and diagnostic equipment

**TOE**

table of organization and equipment

**TP**

target practice; tank platoon

**TRIP WIRE**

a low-placed concealed wire used to trip an enemy or trespasser and to trigger an alarm or explosive device

**TRP**

target reference point

**TW**

target width

**US**

United States

**USAIS**

STP 7-11B1-SM-TG

United States Army Infantry School

**USAR**

United States Army Reserve

**w**

with; wire

**ZULU TIME**

Greenwich mean time

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#### Army Regulations

AR 350-41 Training in Units 19 March 1993

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 DA Form 5986-E Preventive Maintenance Schedule and Record (Automated)  
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 FM 24-19 Radio Operator's Handbook 24 May 1991  
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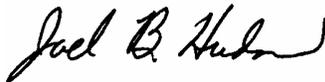


**STP 7-11B1-SM-TG**  
**6 AUGUST 2004**

By Order of the Secretary of the Army:

**PETER J. SCHOOMAKER**  
*General, United States Army*  
*Chief of Staff*

Official:



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