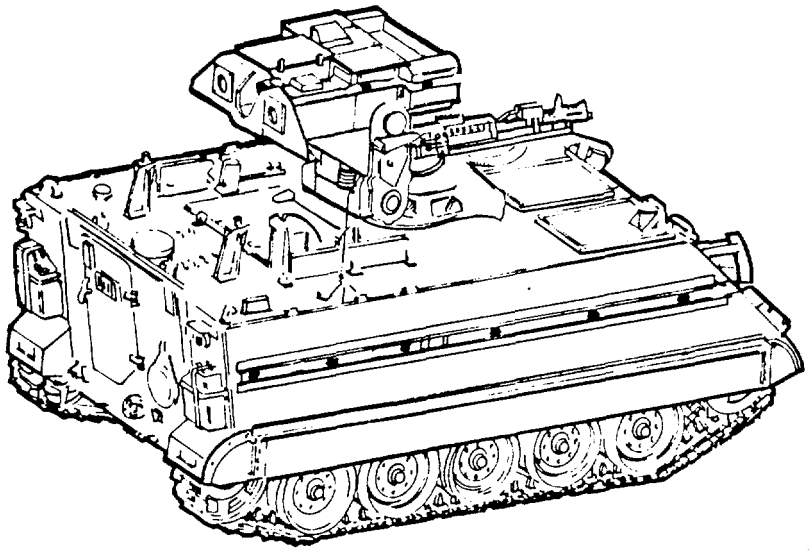
OPERATOR'S MANUAL

MULTIPLE INTEGRATED LASER ENGAGEMENT SYSTEM (MILES)

SIMULATOR SYSTEM, FIRING LASER: M73

FOR

M901 IMPROVED TOW VEHICLE



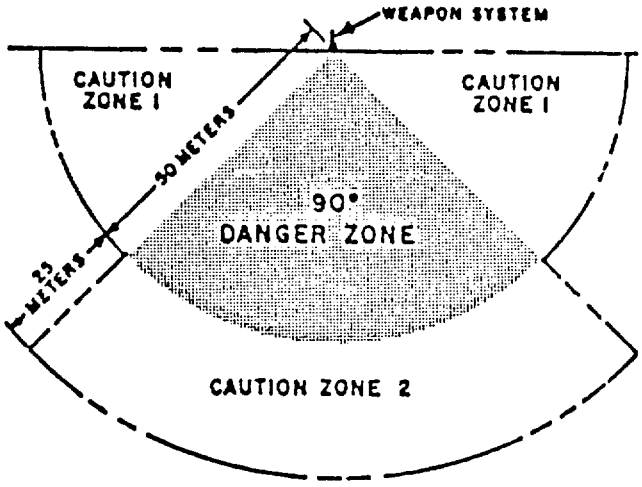
HEADQUARTERS, DEPARTMENT OF THE ARMY

JULY 1988

WARNING

STAY OUT OF THE DANGER ZONE

CAUTION 1:
Ear Damage



CAUTION 2:
Flying Debris

NEVER STAND WITHIN THE DANGER ZONE WHILE LOADING THE ATWESS. ALWAYS STAND TO THE RIGHT SIDE OF THE REAR OF THE LAUNCHER. AFTER THE CARTRIDGE IS INSERTED INTO THE CHAMBER, KEEP HANDS, ARMS, AND OTHER PORTIONS OF THE BODY AWAY FROM THE HOLE IN THE CENTER OF THE BREECH DOOR. FAILURE TO FOLLOW THESE INSTRUCTIONS COULD RESULT IN PERSONNEL BEING BURNED BY THE BACKBLAST ESCAPING THROUGH THE HOLE IN THE CENTER OF THE BREECH DOOR.

NEVER ARM AN ATWESS UNTIL YOU ARE READY TO FIRE.

TREAT THE TOW/MILES AS YOU WOULD ANY LOADED AND ARMED WEAPON. DO NOT DROP TOW/MILES WHEN ATWESS IS LOADED AND ARMED. A STRONG JOLT MAY SET OFF THE ATWESS.

HANDLE ATWESS CARTRIDGES WITH THE SAME CARE YOU USE WITH ANY LIVE AMMUNITION.

ALWAYS WEAR EARPLUGS WHEN FIRING THE TOW/MILES.

ALTHOUGH THE LASER LIGHT EMITTED BY MILES LASER TRANSMITTERS IS CONSIDERED EYE SAFE BY THE BUREAU OF RADIOLOGICAL HEALTH, SUITABLE PRECAUTIONS MUST BE TAKEN TO AVOID POSSIBLE DAMAGE TO THE EYE FROM OVEREXPOSURE TO THIS RADIATED ENERGY. TAKE THE FOLLOWING PRECAUTIONS:

- NEVER LOOK AT THE LASER EMITTER AT CLOSE RANGE (LESS THAN 12 METERS).

- NEVER LOOK AT THE LASER EMITTER THROUGH OPTICS SUCH AS BINOCULARS, TELESCOPES, OR WEAPON SIGHTS AT RANGES LESS THAN 75 METERS.

- NEVER LOOK AT THE LASER EMITTER DIRECTLY ALONG THE AXIS OF THE BORE OF THE WEAPON.

TAPE MOUNTING PRIMER IS HIGHLY FLAMMABLE. DO NOT SPRAY NEAR HEAT, SPARKS, OR OPEN FLAME. NO SMOKING. USE ONLY IN WELL-VENTILATED AREAS.

FOR INFORMATION ON FIRST AID, SEE FM 21-11.

TECHNICAL MANUAL

TM 9-1265-202-10

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, D.C., 15 JULY 1988

OPERATOR'S MANUAL
FOR
MULTIPLE INTEGRATED LASER ENGAGEMENT SYSTEM (MILES)
SIMULATOR SYSTEM, FIRING, LASER: M73
FOR
M901 IMPROVED TOW VEHICLE

REPORTING ERRORS AND RECOMMENDING IMPROVEMENTS

You can help improve this manual. If you find any. mistakes or if you know of a way to improve the procedures, please let us know. Mail your letter, DA Form 2028 (Recommended Changes to Publications and Blank Forms), or DA Form 2028-2 located in back of this manual direct to: Commander, US Army Armament, Munitions and Chemical Command, ATTN: AMSMC-MAS, Rock Island, IL 61299-6000. A reply will be furnished to you.

TABLE OF CONTENTS

*This manual supersedes manufacturers TM 9-1265-202-10, 1 June 1982, incl all changes.

Storage Instructions

Equipment Distribution:
The MILES equipment for the M901 ITV is shown in Task 2 of this Technical Manual (TM). Use the pictures with Task 2 as a guide for equipment distribution. Be sure to issue a copy of this TM along with the MILES equipment.

Equipment Return and Storage:

CAUTION

MAKE CERTAIN THAT THE MWLD TORSO AND HELMET HARNESS ARE COMPLETELY DRY BEFORE STORAGE IN TRANSIT CASE.

When receiving equipment for storage, always inspect the returned equipment using Operational Task 5 in this TM for guidance.

Return all MILES equipment and the TMs to their transit cases.

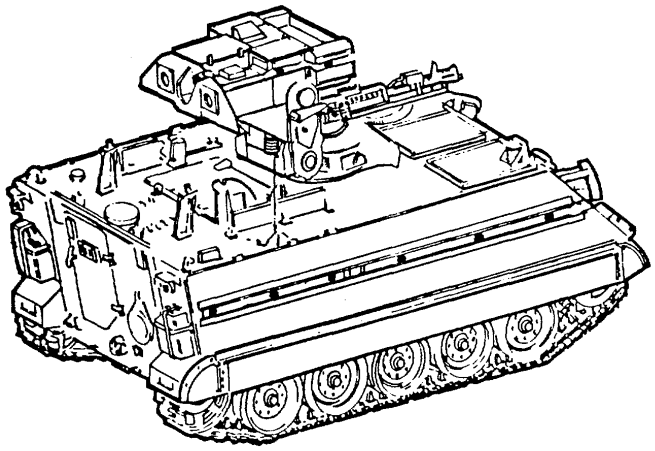
Special Instructions for Infrequently Used Equipment:

If M901 ITV/MILES equipment is unused for 60 days, remove from transit case and perform Outside Tasks 2, 3, 6, and 8; Inside Tasks 1 and 3; Machine Gun Task 1; MWLD Tasks 1 and 2; and Operational Task 5.

Skills Needed To Use This Manual

TO USE THIS MANUAL YOU MUST BE ABLE TO:

1. Aim and fire the M60 machine gun (See TM 9-1005-224-10)
2. Prepare the M60 for blank-fire operation (See TM 9-1005-224-10)
3. Set up a TOW weapon system for firing (See TM 9-1425-470-12)
4. Aim, fire, and track a TOW.
5. Complete DA Form 2404

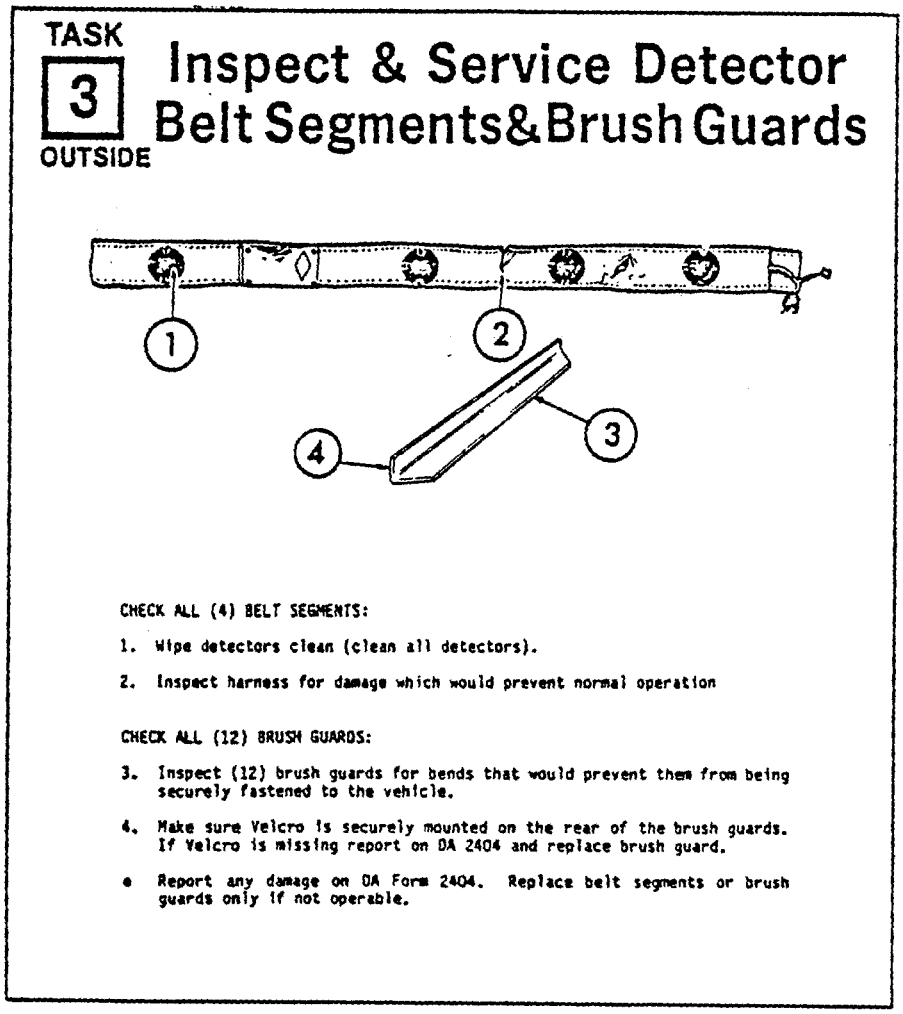


IF YOU CAN NOT DO THESE TASKS, ASK YOUR NCO OR INSTRUCTOR TO SHOW YOU HOW. WHEN YOU CAN DO ALL THESE TASKS, GO ON WITH THIS MANUAL.

How To Use This Manual

Before you use any M901 ITV/MILES equipment, read this manual.

- The first part of the manual briefly explains the purpose of the equipment and how it is used.
- Then comes step-by-step guidance for every task you need to do with the M901 ITV/MILES equipment.



TASK 3 OUTSIDE

Inspect & Service Detector Belt Segments&Brush Guards

CHECK ALL (4) BELT SEGMENTS:

1. Wipe detectors clean (clean all detectors).
2. Inspect harness for damage which would prevent normal operation

CHECK ALL (12) BRUSH GUARDS:

3. Inspect (12) brush guards for bends that would prevent them from being securely fastened to the vehicle.
4. Make sure Velcro is securely mounted on the rear of the brush guards. If Velcro is missing report on DA 2404 and replace brush guard.

- Report any damage on DA Form 2404. Replace belt segments or brush guards only if not operable.

- The task pages look like this. Some longer tasks run more than one page. Before you begin a task, read all of the steps in that task and look at each drawing carefully. To help perform the task, some steps have matching numbers in the drawings. Do each step just the way you are instructed.

- Do each task in the order it occurs in the manual.

- DON'T JUMP AHEAD - DON'T SKIP ANY STEPS -

- If your equipment has a problem you can't fix using this manual, report it on DA Form 2404. To get a replacement, turn in the faulty equipment and the completed DA Form 2404 to your NCOIC.

- In the back of this manual is a list of abbreviations and an explanation of terms (Glossary) used in this manual. If you read a word you don't understand, check the list of abbreviations and glossary.

General Information

This manual shows you how to operate and maintain the M901 ITV/MILES laser simulator equipment. The operator and organizational maintenance tasks are listed in the Table of Contents. The transit case containing the system components also contains items that allow this equipment to be used on an M113 APC. If you are installing this equipment on an M113 APC, refer to TM 9-1265370-10-3 also contained in the transit case.

Purpose of Equipment:

MILES equipment for the M901 ITV consists of a laser transmitter and a laser detector system. The simulator system allows realistic combat training without the hazards of using live ammunition.

Forms and Records:

a. Reports of Maintenance or Equipment Replacement.

Department of the Army forms and procedures used for equipment maintenance will be those prescribed by DA PAM 738-750, The Army Maintenance Management System (TAMMS).

b. Reporting Equipment Improvement Recommendations (EIRs).

EIRs can and must be submitted by anyone who is aware of an unsatisfactory condition with the equipment design or use. It is not necessary to show a new design or list a better way to perform a procedure, just simply tell why the design is unfavorable or why a procedure is difficult. EIRs may be submitted on SF 368. Mail directly to: Commander, U.S. Army Armament, Munitions and Chemical Command, ATTN: AMSMC-QAD, Rock Island, IL 61299-6000. A reply will be furnished to you.

c. Hand Receipt Manual

Hand receipts for Components of End Item (COEI), Basic Issue Items (BII), and Additional Authorizational List (AAL) items are published in a Hand Receipt manual, TM 9-1265-202-10-HR. This manual is published to aid in property accountability and is available through: Commander, the U.S. Army Adjutant General Publications Center, 2800 Eastern Boulevard, Baltimore, MD 21220.

Equipment Description

Capabilities and Features:

Major components of the M901/MILES System consist of:

1. Laser transmitter mounted on barrel of M60 machine gun, and activated by sound of blank cartridges being fired.

2. Detector belt segments mounted on all four sides of the vehicle hull and one belt segment mounted on the two sides and rear of the TOW launcher.

3. A Combat Vehicle Kill Indicator (CVKI) mounted on the engine cover lifting eye. The CVKI is a light which flashes to indicate laser hits on the vehicle.

4. A TOW laser daysight tracker simulator attached in place of the actual TOW daysight tracker.

5. Man Worn Laser Detector (MWLD) Assemblies, consisting of:

* • Helmet Harness
* • Torso Harness

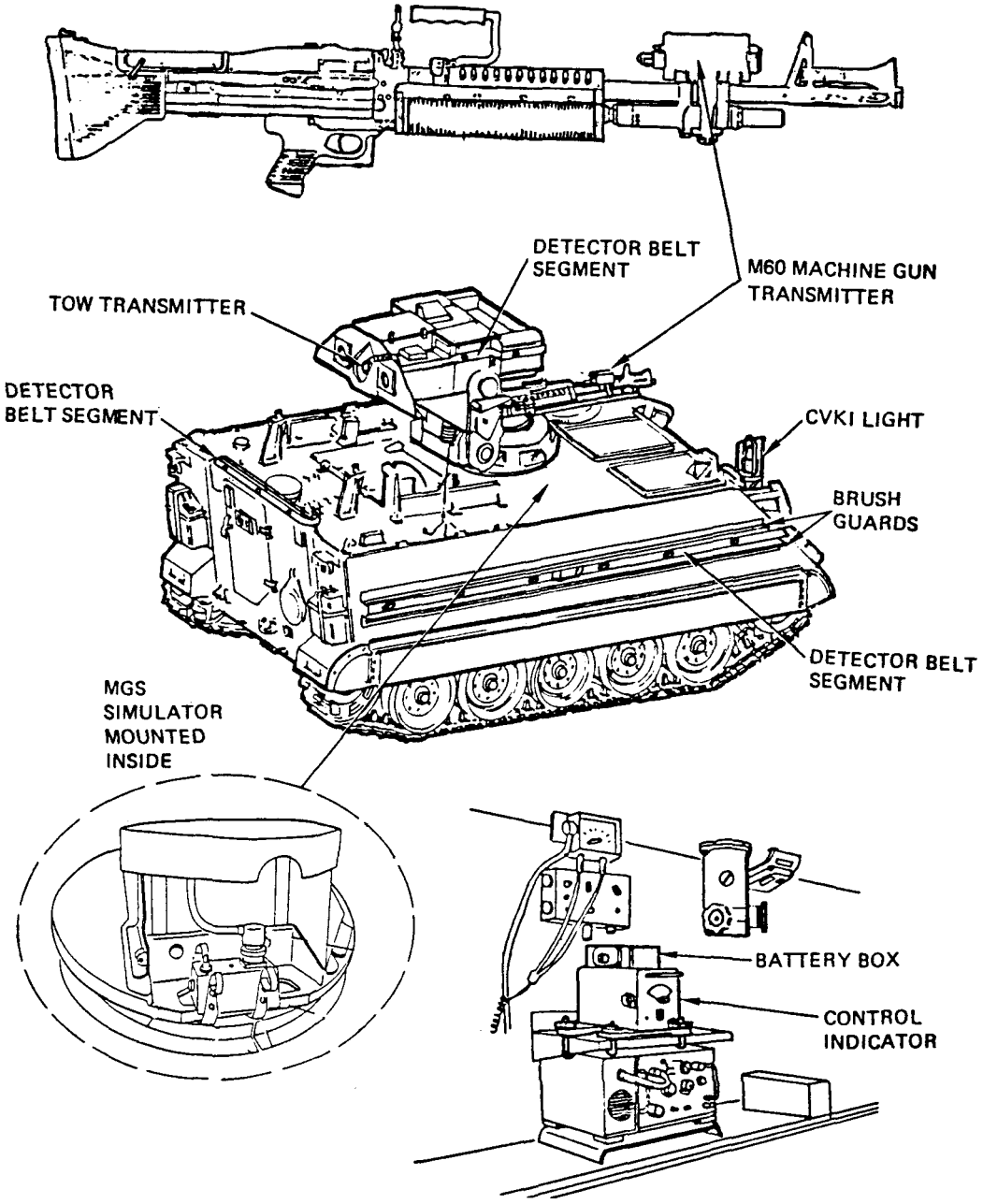
The M901/MILES system can be operated in temperatures from -350C (-310F) to 620C (1440F). It permits tactical skills to be practiced under realistic conditions.

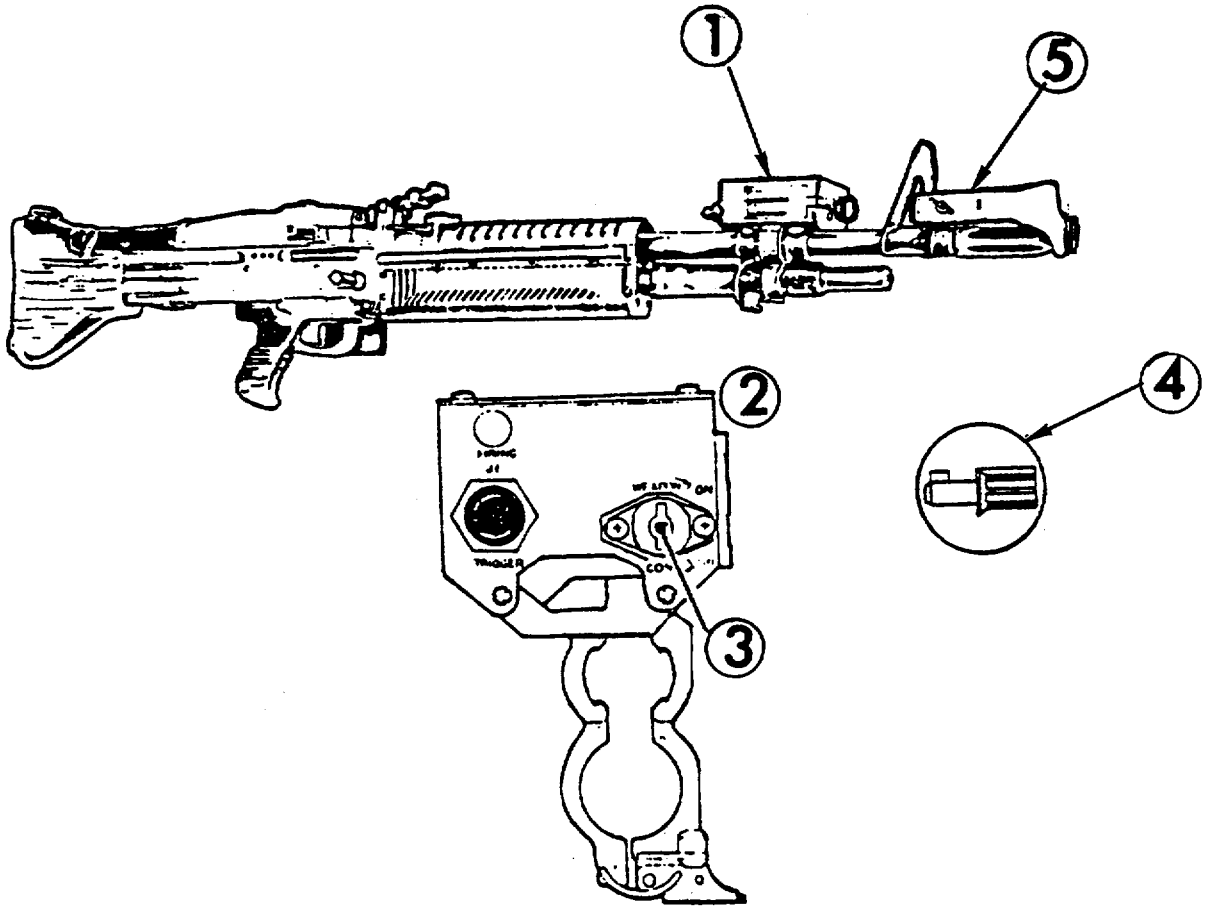
The laser transmitters send harmless invisible laser (light) beams toward targets. If the laser beam hits the target, a detector assembly on the target senses the beam, causes an alarm to sound in the intercom of the target vehicle, and causes the externally-mounted CVKI light to flash. If the laser beam hits a soldier, an alarm buzzer sounds on the man-worn laser detector harness.

Battery Information:

The M901/MILES system uses BA-200/U, 6-volt carbon-zinc batteries, and BA3090/U, 9-volt alkaline batteries. These batteries provide approximately 100 hours of power to the system.

LOCATION OF COMPONENTS:





1. Transmitter
2. Transmitter (rear view)
3. Weapon key receptacle
4. Yellow weapon key
5. Blank fire adapter

How It Works:

MILES-equipped weapons work much like the real weapons, However, instead of firing bullets or TOW missiles, the MILES-equipped weapons fire laser light beams at targets. To make the simulation as realistic as possible, the machine gun fires blank ammunition.

How the MILES Equipment Is Used:

- After the equipment has been installed and tested, you will be ready for the exercise.

- Load the M60 machine gun with blank ammunition. Aim at your target and fire. The sound of blanks firing causes the laser transmitter to fire.

  For alignment purposes, the laser transmitter on the M60 machine gun can be fired without using blanks. To operate transmitter in the "dry-fire" mode, a controller key must be used to set the transmitter, and a dryfire cable must be installed.

- Load ATWESS cartridges into the rear of the TOW/ATWESS tube. Aim at your target and fire the weapon using the same tracking procedures needed with a real missile. The ATWESS cartridge provides backblast and smoke to simulate a real missile launch.
- If the laser detector belts on the vehicle are hit by laser fire, one of three things will happen:

1. The CVKI light will flash two times, and two tones will sound in the vehicle intercom. This indicates a "near miss".

2. The CVKI light will flash four to six times, and four to six tones will sound in the vehicle intercom. This indicates a "hit" but not a "kill".
3. The CVKI light will flash continuously, and a continuous tone will sound in the vehicle intercom. This means a "kill". To turn off the tone, you must insert the orange key in the receptacle of the control console and turn the key. The orange key is normally carried by the vehicle commander. The CVKI light continues to flash until the console is reset by a Controller.

   If you attempt to remove the orange key from the control indicator, the intercom tone will again sound.

- If any of the six detectors mounted on the TOW launcher, or the two detectors on the TOW daysight tracker are hit by laser fire, one of two things will happen.

1. The alarm on the MGS box will sound briefly. This indicates a "near miss".

How It Works: (Continued)

2. The alarm will beep continuously. This indicates a "kill." The TOW transmitter is automatically disabled and will not be able to fire until reset by the Controller.

   To turn off the alarm following a "kill", unplug the MGS box from

- The vehicle driver wears a harness equipped with laser detectors and an alarm. If the harness is ""hit" by fire from a MILES-equipped weapon, one of two things will happen:

1. The alarm on the harness will sound briefly. This means a "near miss". Take cover.

2. The alarm on the harness sounds continuously. This means the driver has been "killed". He must use his yellow weapon key to turn off the alarm, and then take the actions indicated on his casualty card.

Equipment Limitations:

CAUTION

NEVER PLUG A TOW/MILES DAYSIGHT TRACKER SIMULATOR INTO AN ACTUAL TO&E TOW MISSILE GUIDANCE SET (MGS). YOU WILL DAMAGE THE TOW/MILES EQUIPMENT.

The TOW/MILES system has the same range and operational capabilities, and limitations as the regular TOW weapons system. Factors which may reduce the effective range of a TOW/MILES system are a dirty laser transmitter lens and nearly exhausted batteries.

The M60 machine gun is effective against lightly armored MILES-equipped vehicles and personnel. The TOW is effective against armored MILES-equipped vehicle out to a range of 3000 or 3750 meters, depending upon the TOW version.

Task Assignment

- To speed up installation of MILES equipment on the M901 ITV, the "inspect" and "install" tasks may be divided among the vehicle crew members. This way several tasks may be accomplished at the same time.

  - Outside Tasks (1-13) are found on pages 21 through 38 of this manual.

    Inside Tasks (1-6) are found on pages 39 through 46 of this manual.

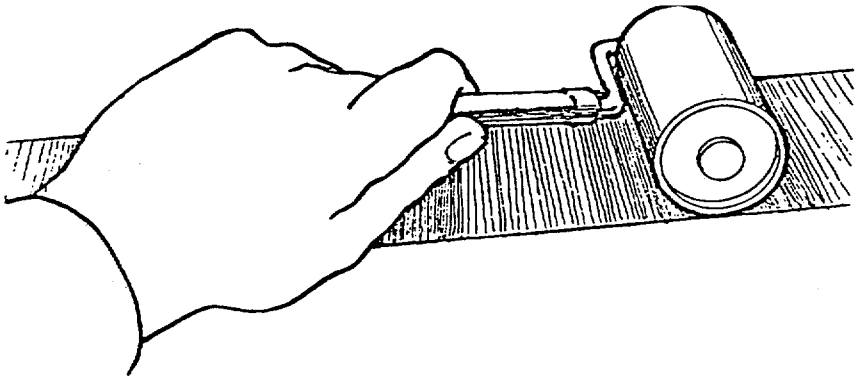
  - M60 MG Tasks (1-4) are found on pages 47 through 50 of this manual.

  - MWLD Tasks (1-5) are found on pages 51 through 55 of this manual.

- The vehicle commander should assign each crewman to a set of tasks. The crewman turns to the appropriate task section of the manual and performs his assigned tasks. Occasionally, the manual will tell you to wait to do a task until you have made sure that another crewman has completed an earlier task. On some tasks, two crewmen must work together. Certain tasks must be done with the Controller present. The vehicle commander will determine when to call the Controller.

- The vehicle commander should coordinate the tasks, give assistance to any crewman who needs it, and check to make sure that everything gets done.

☐ **Install Velcro Tape**



GENERAL INSTRUCTIONS FOR INSTALLING VELCRO TAPE

1. Before starting to mount Velcro tape, study the steps in this procedure. Before spraying the tape mounting primer, be sure you know where to mount the Velcro. The location of Velcro tape is shown in the drawings on the next few pages.

2. Using water, brush and rags, clean the areas where Velcro is to be mounted. The tape will not stick to dirt or grease.

WARNING

TAPE MOUNTING PRIMER IS HIGHLY FLAMMABLE. DO NOT USE NEAR HEAT, SPARKS, OR OPEN FLAME. NO SMOKING! USE ONLY IN WELL-VENTILATED AREAS.

3. Spray tape mounting primer on the areas where Velcro is to be mounted. Allow primer to dry for at least 10 minutes.

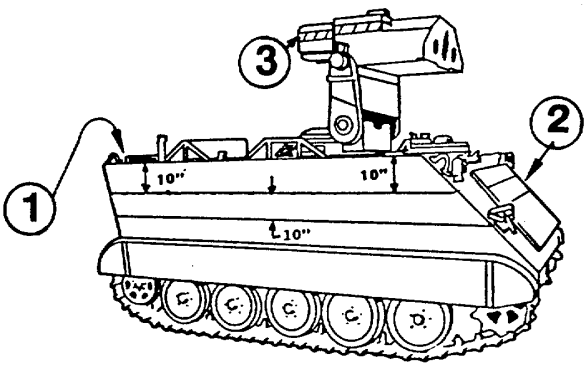
4. Mount Velcro as instructed in the steps on the following pages.

Velcro tape has a protective paper backing which must be removed before mounting the tape. For small lengths, the entire backing may be removed before mounting the tape. For long lengths of tape, however, it is recommended that the backing material be removed while the tape is being installed. This will prevent the adhesive on the back of the tape from accidentally sticking to itself.

5. After you put the Velcro in place, press it VERY HARD with the roller. Use the roller as shown in the picture above.

GET A ROLL OF VELCRO TAPE, TAPE MOUNTING PRIMER, AND A ROLLER FROM YOUR NCOIC.

CLEAN THE VEHICLE:



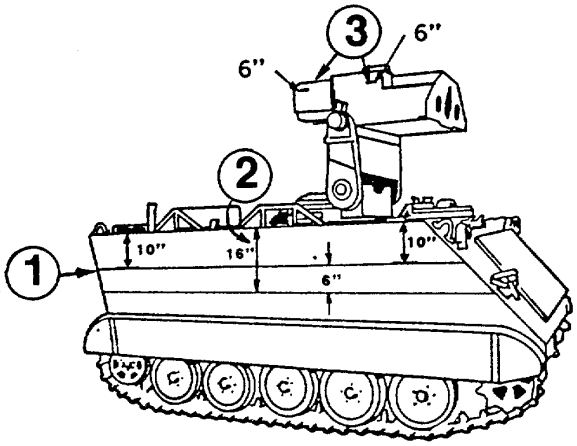
1 With water, clean a strip 10 inches wide on both sides beginning 12 inches from top of hull. Clean a 10-inch strip on the front slope.

2. Clean a 6-inch strip front and back of trim vane above released handle and rear.

3. With water, clean strip 4 inches wide on both sides and the rear of TOW launcher. On the sides, begin 6-inches from the top. On the rear, begin just below the top surface.

4. Clean door frame above ramp and area shown at b. on figure 4.

MARK LOCATION OF TAPE:

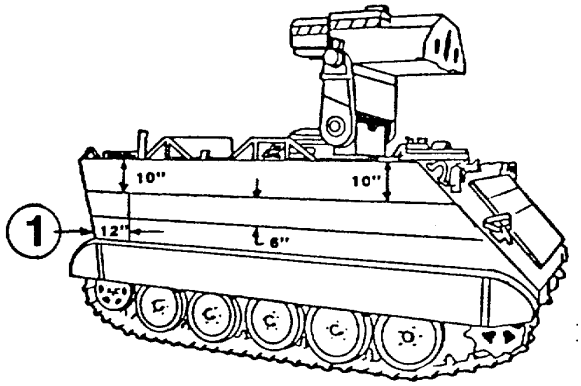


1. On each side of the vehicle, make two marks, each 10 inches from top of hull.

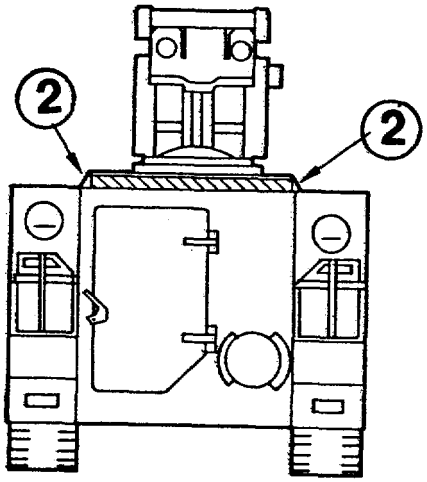
2. On each side of vehicle, make two marks each 16 inches from top of hull. Using a piece of chalk, draw a line from front to rear using the two marks as a guide.

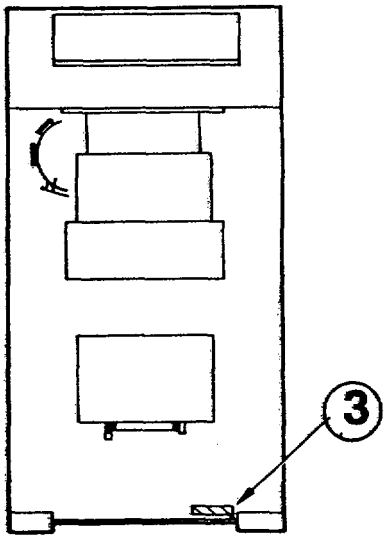
3. On each side of TOW launcher, make two marks, each 6 inches from the top. Using a piece of chalk, draw a line from front to rear using the two marks as a guide.

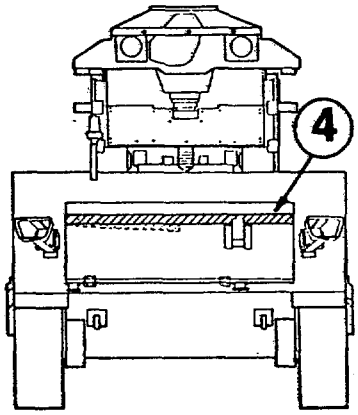
SPRAY PRIMER:



1. Starting 12 inches from rear, spray the 6-inch wide area between the two marked lines. Apply an even coat extending to front of vehicle.





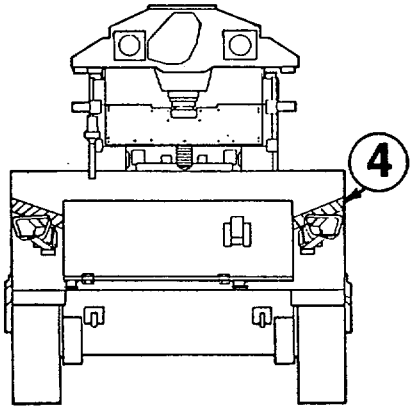


SPRAY PRIMER (CONTINUED)

2. Spray the door frame above the ramp.

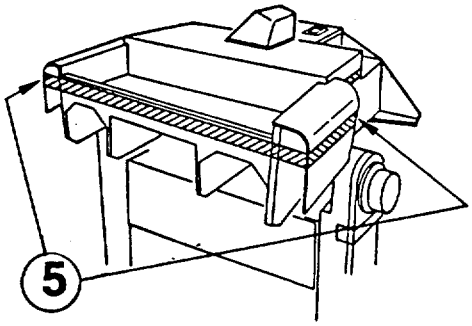
3. Spray a strip 3 inches wide and 18 inches long.

4. Face the trim vane, and spray a strip two-inches wide, right to left, across the trim vane just above the release handle. Continue the strip around to back side of trim vane and spray approximately halfway across.

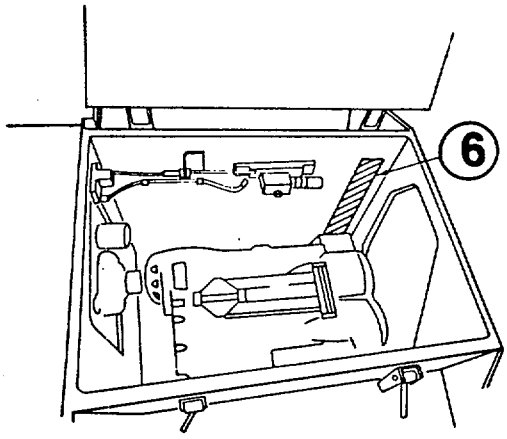


SPRAY PRIMER (CONTINUED)

4. Spray a two-inch strip from the front edge of the center side strip above the smoke grenade launcher to approximately 4 inches behind trim vane.



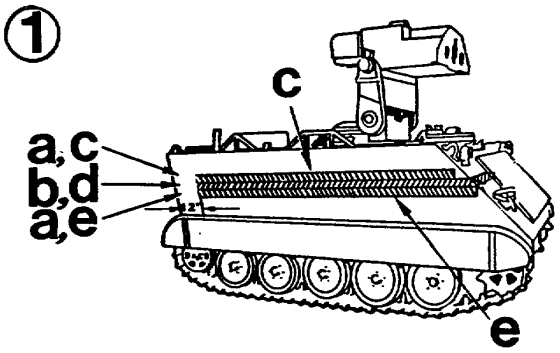
5. Spray a two-inch strip on both sides and rear of launcher. On the sides spray a two-inch strip under the marked line.



6. Clean and spray a 12-inch strip inside TOW launcher.

NOTE

Get another soldier to help with next steps to install Velcro.



INSTALL VELCRO ON SIDES AND UNDER TRIM VANE:

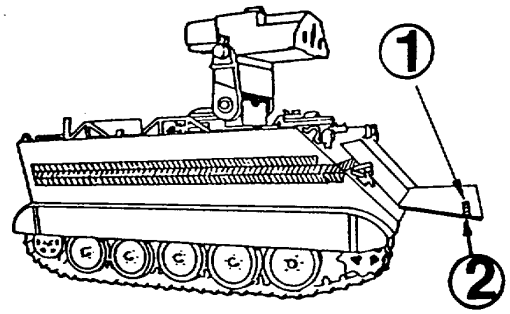
1a. Measure and cut two strips of Velcro, starting approximately 12 inches from rear and continuing to front slope.

1b. Measure and cut a third strip, starting approximately 12 inches from rear and continuing forward past front slope to approximately 4 inches under trim vane.

1c. Using top line as a guide, 'apply Velcro short strip starting from front slope.

1d. Apply longest strip immediately below short strip.

1e. Apply third strip. If. Repeat above steps for other side of vehicle.

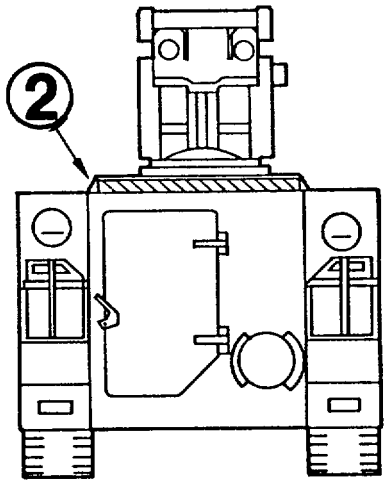


INSTALL VELCRO ON FRONT:

1. Measure and cut a strip of Velcro the same length as sprayed area on trim vane front and back side.

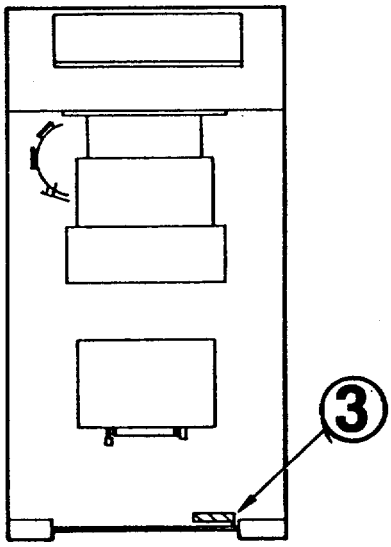
2. Apply Velcro on trim vane starting from right side as you face trim vane. Swing trim vane down and apply remaining Velcro on back side.

INSTALL VELCRO ON REAR:



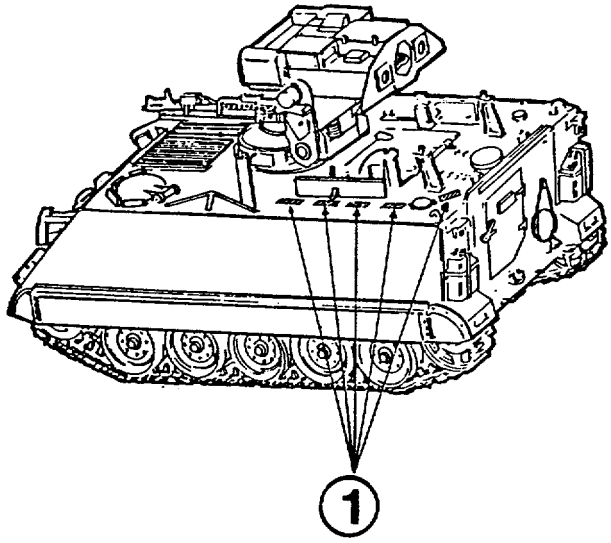
1. Measure and cut a strip Of Velcro the same length as detector belt No. 2.

2. Begin on top left rear, apply Velcro to vehicle door frame above ramp.



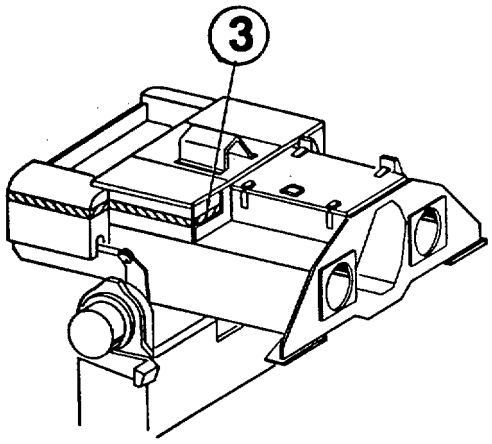
3. Just past the right side of ramp make a U-turn with the tape and lay the tape on the top, routed toward the left side of the vehicle.

INSTALL VELCRO ON TOP:



1. Cut and attach five pieces of Velcro each approximately 6 inches long to places **shown.**

INSTALL VELCRO ON LAUNCHER:

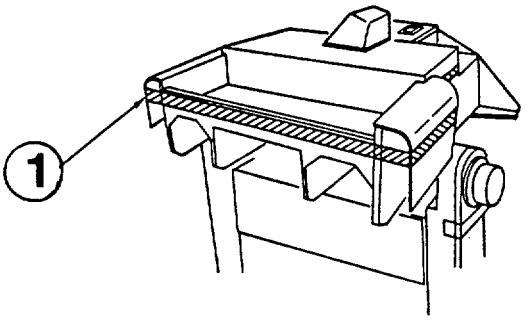


1. Stretch one of the No. 1 detector belt segments out on the ground.

2. Measure and cut a piece of Velcro tape 6 inches longer than the belt segment.

3. Start at the right side of launcher. Hold the Velcro tape under the marks you made. Begin applying the Velcro on the forward facing panel as shown.

INSTALL VELCRO ON LAUNCHER: (CONTINUED)

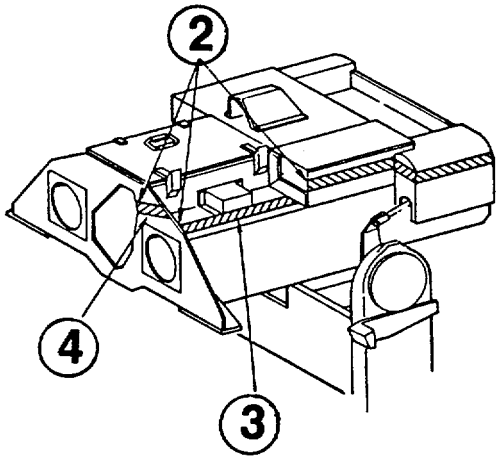


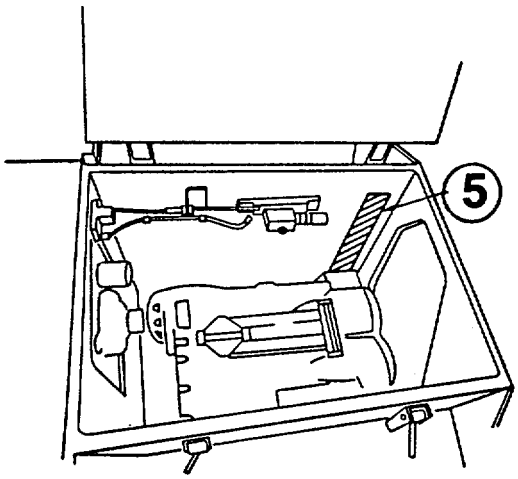
1. Continue applying the Velcro on the sides, along the rear edge near the top, and around the right side.

2. Cut the Velcro where shown.

3. Continue applying the Velcro to the flat area behind the launcher hatch. Cut off excess.

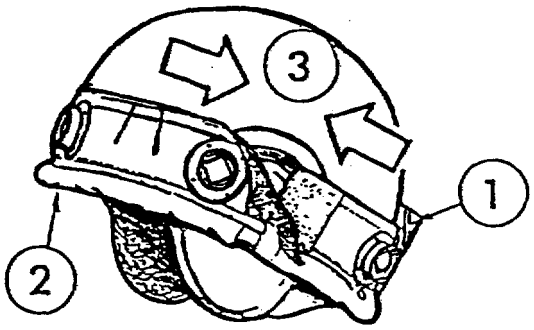
4. Apply the excess Velcro to the front of the launcher. If the excess Velcro is not long enough, add more as needed.





5. Cut a 12-inch long piece of Velcro. Open the hatch on the top of launcher and attach the Velcro to the left front corner.

VELCRO MOUNTING INSTRUCTIONS FOR VEHICLE HELMET



The vehicle helmet requires three patches of Velcro glued to the outside to hold the MWLD helmet harness in place. The Velcro patches must be attached in the proper position on the helmet so that they will mate with the three patches of Velcro attached to the harness.

1. Slip the helmet harness over the helmet so that the electronics box is at the rear.

2. Make sure the thick bottom edge of the harness completely covers and overhangs the rim of the helmet.

3. Pull the harness tight and mark the helmet where the three Velcro patches on the harness touch the helmet. Remove the harness.

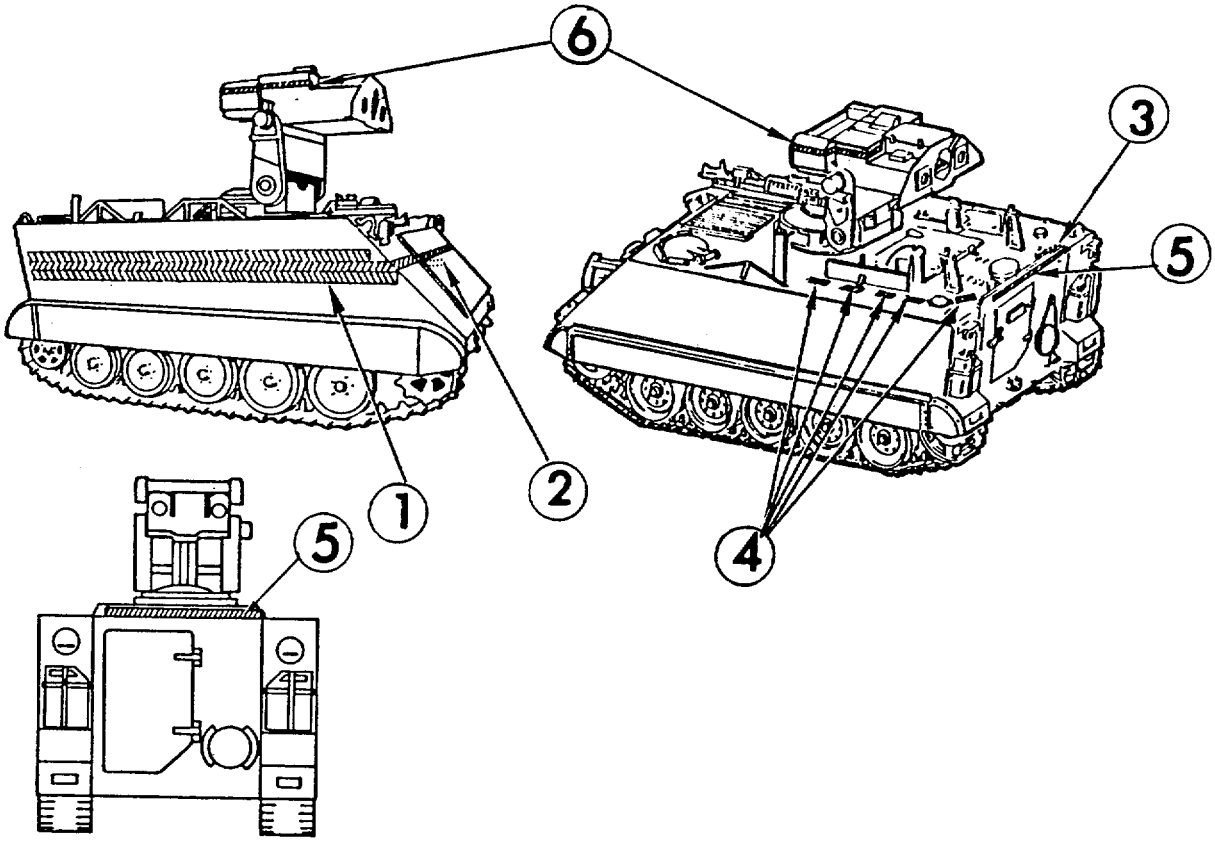
4. Spray mounting tape primer over the marked areas where the Velcro will be attached. Allow spray to dry.

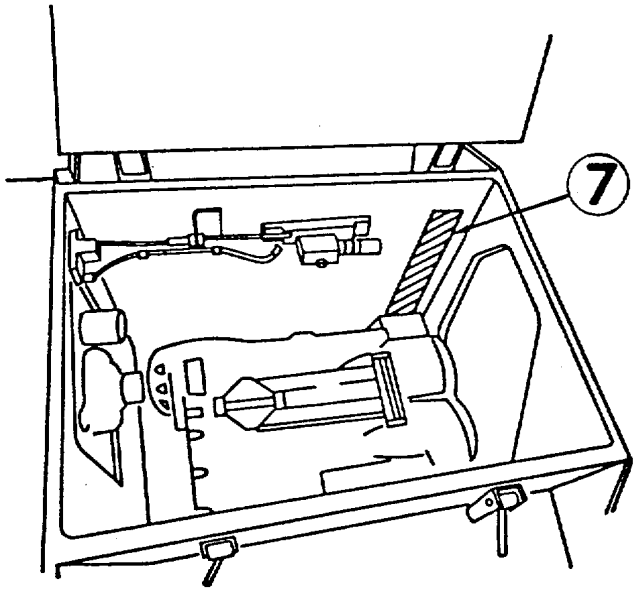
5. Cut three pieces of two-inch long Velcro.

6. Remove backing paper and firmly press the patches onto the helmet.

TASK 1 OUTSIDE

Inspect Velcro Tape





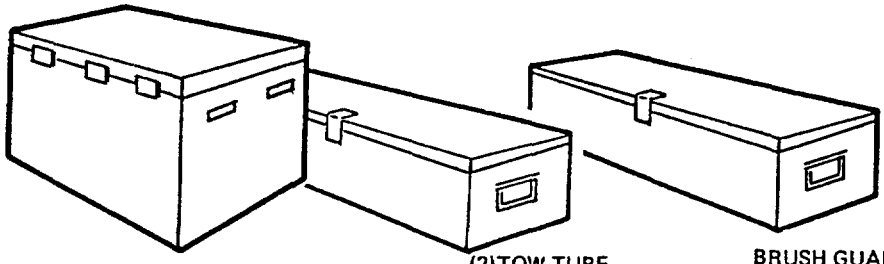
- Be sure Velcro Tape is in all the places shown. If any tape is missing, use the instructions given on pages 14 through 21 and put on the missing Velcro.

1. There are three rows of Velcro on the vehicle sides.
2. On the trim vane, the Velcro wraps around the back side about halfway.
3. Make sure there is an 18-inch length here.
4. Make sure there are five 6-inch lengths of Velcro on top.
5. On the rear, the Velcro is installed on the door frame above the ramp.
6. Velcro is attached to both sides and rear of the TOW launcher.
7. A 12-inch piece of Velcro is attached to the inside left front corner of launcher.

TASK

2 **Get This Equipment From Your NCOIC**

OUTSIDE

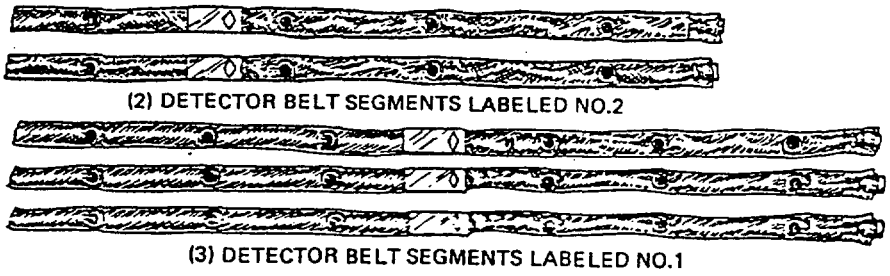


M901 ITV TRANSIT CASE

(2)TOW TUBE TRANSIT CASES

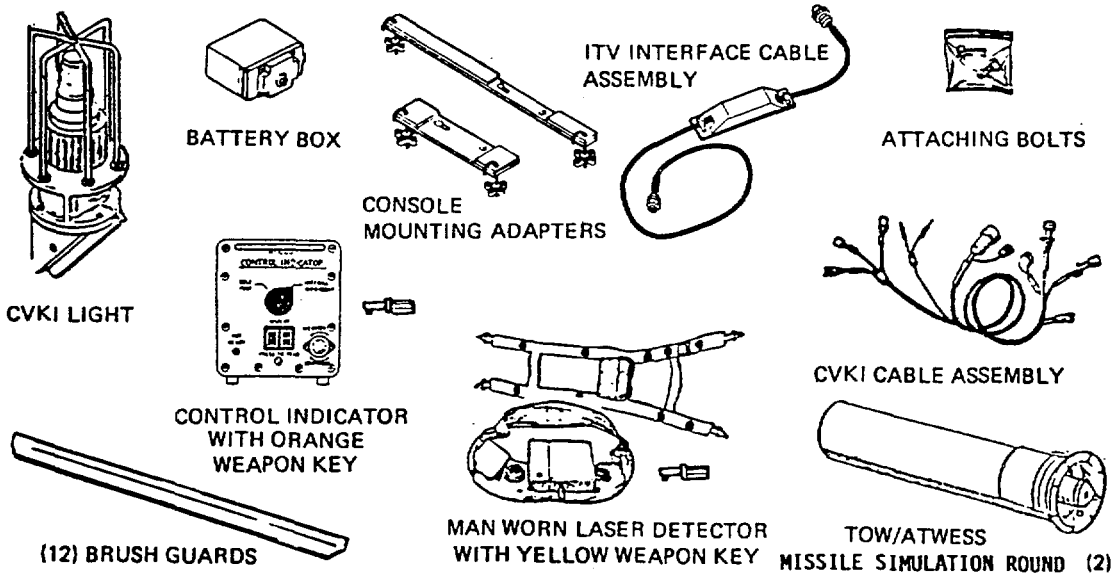
BRUSH GUARD TRANSIT CASE

CONTENT OF M901 ITV, TOW TUBE, AND BRUSH GUARD TRANSIT CASES:



(2) DETECTOR BELT SEGMENTS LABELED NO.2

(3) DETECTOR BELT SEGMENTS LABELED NO.1



CVKI LIGHT

BATTERY BOX

CONSOLE MOUNTING ADAPTERS

ITV INTERFACE CABLE ASSEMBLY

ATTACHING BOLTS

CONTROL INDICATOR WITH ORANGE WEAPON KEY

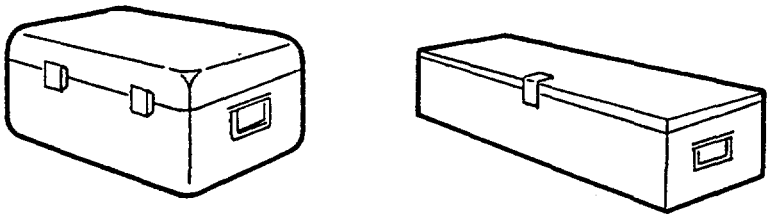
CVKI CABLE ASSEMBLY

(12) BRUSH GUARDS

MAN WORN LASER DETECTOR WITH YELLOW WEAPON KEY

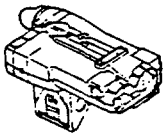
TOW/ATWESS MISSILE SIMULATION ROUND (2)

TASK
2
OUTSIDE

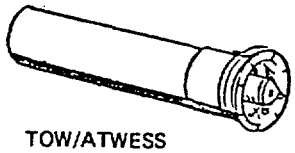


TOW TRANSIT CASES

CONTENT OF TOW TRANSIT CASES:

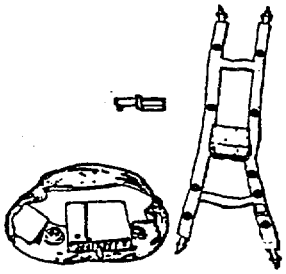


DAYSIGHT TRACKER HEAD



TOW/ATWESS MISSILE SIMULATION ROUND

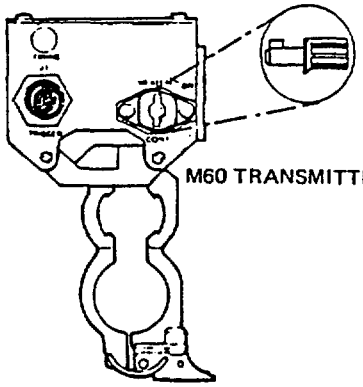
MGS SIMULATOR



MAN WORN LASER DETECTOR (2)
WITH YELLOW WEAPON KEYS (2)

M60 MACHINE GUN TRANSMITTER:

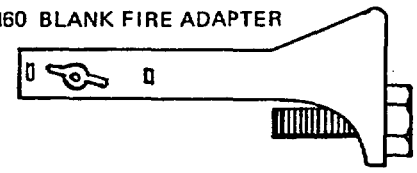
THE M60 TRANSMITTER WILL BE ISSUED TO YOU UNPACKED.



YELLOW WEAPON KEY
(IN TRANSMITTER)

M60 TRANSMITTER

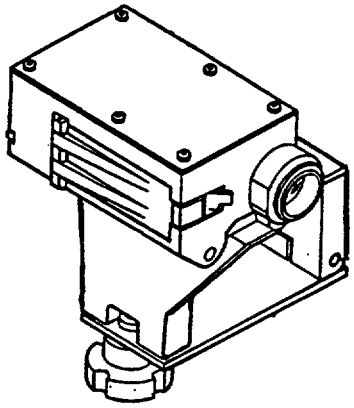
M60 BLANK FIRE ADAPTER



TASK
2

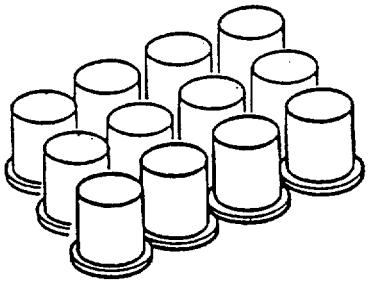
The following equipment is not used on the M901 vehicle. Leave this equipment packed in the transit case.

M2 MACHINE GUN TRANSMITTER



MOUNTING PLATE FOR CONTROL INDICATOR

ORDNANCE



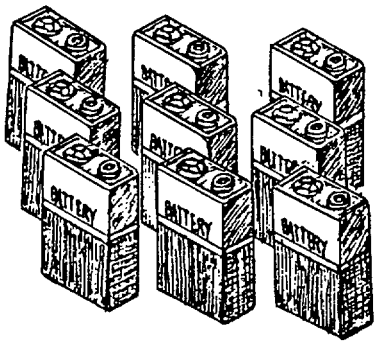
12 ATWESS CARTRIDGES

WARNING

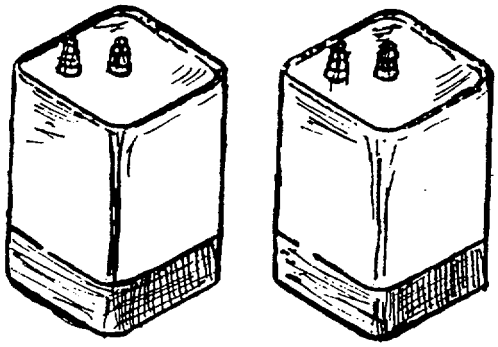
HANDLE ATWESS CARTRIDGES WITH THE SAME CARE YOU USE WITH ANY LIVE AMMUNITION

TASK
2
OUTSIDE

BATTERIES

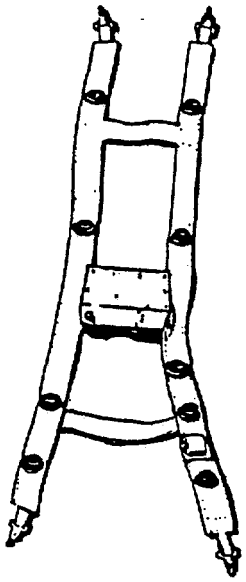


NINE 9-VOLT BA-3090/U BATTERIES



TWO 6-VOLT BA-200/U BATTERIES
FOR BATTERY BOX

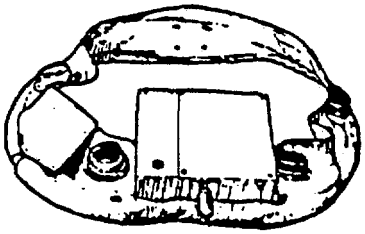
TASK
2
OUTSIDE



MILES MAN WORN LASER DETECTOR EQUIPMENT (MWLD):

- The MWLD equipment is worn by vehicle personnel.

MWLD TORSO HARNESS



MWLD HELMET HARNESS

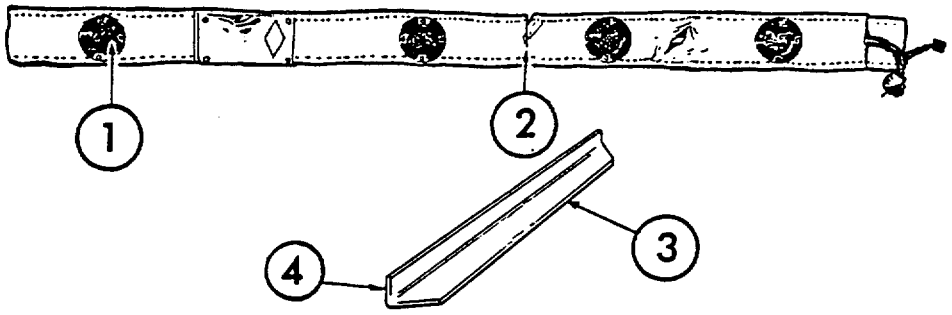
YELLOW KEY

- The vehicle personnel wearing MWLD equipment will carry this key.

TASK

3 **Inspect & Service Detector Belt Segments & Brush Guards**

OUTSIDE



CHECK ALL 5 BELT SEGMENTS:

1. Wipe 26 detectors clean.

2. Inspect harness for damage that would prevent normal operation.

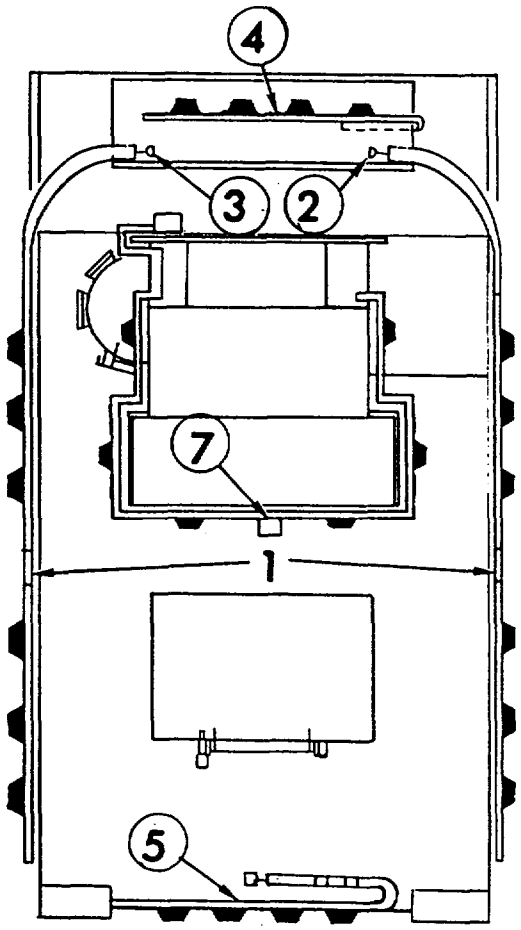
CHECK ALL 12 BRUSH GUARDS:

3. Inspect 12 brush guards for bends that would prevent them from being securely fastened to the vehicle.

4. Make sure Velcro is securely mounted on the rear of the brush guards. If Velcro is missing, report on DA 2404 and replace brush guard.

- Report any damage on DA Form 2404. Replace belt segments or brush guards only if not usable.

TASK
4 **Install Detector Belt Segments**
OUTSIDE



- Find the label on each detector belt segment. Belt segments labeled No. 1 go on the vehicle sides and on TOW launcher. Segments labeled No. 2 go on the front and rear of vehicle.

1. Put No. 1 belt segments on the vehicle sides. There are three rows of Velcro tape on the vehicle sides. Use the center row. Be sure the connectors are at the vehicle's front.

2. Begin by placing the connector behind the trim vane and work toward the rear.

3. When properly installed, the connectors will be hidden behind the trim vane. If connectors are not behind trim vane, move the belt segment forward. Repeat Step 3 for the other side.

4. Put a No. 2 belt segment on the vehicle front. Wrap the belt segment around the right side of the trim vane (side opposite driver) so that the electronics box and connector are hidden behind the vane. If the vehicle does not have a trim vane, center the belt segment across the front of the vehicle.

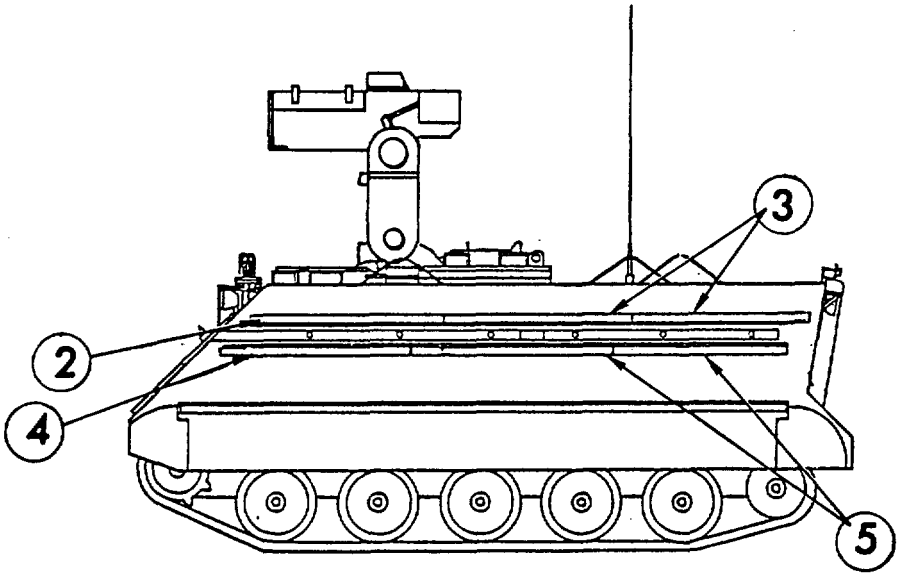
5. Put a No. 2 belt segment on the vehicle rear with the connector as shown. Put a No. 1 belt segment on the TOW launcher.

6. Face the rear of the launcher and lay out the belt so that the connector is on your left. Center the electronics box on the rear of the launcher and attach the belt across the rear and along the sides.

TASK

5 **Install Brush Guards**

OUTSIDE



NOTE

Install three brush guards above and three guards below the the detector belt on the other two rows of Velcro tape. No brush guards are installed on the front or rear of vehicle hull or on TOW launcher.

1. Begin at the front of the vehicle. Install the first brush guard on the top row of Velcro. Make sure the edge of the brush guard does not stick out in front of the vehicle.

2. Install two more brush guards on the top row of Velcro, as shown.

3. Beginning at the front of the vehicle again, install another brush guard on the bottom row of Velcro. Make sure the edge of the brush guard does not stick out in front of the vehicle.

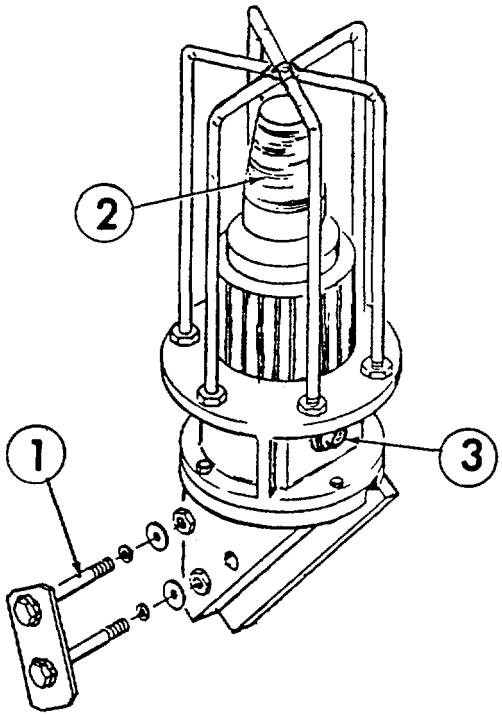
4. Install two more brush guards on the bottom row of Velcro, as shown.

- Repeat steps 1 and 4 for the other side of vehicle.

TASK

6 **Inspect CVKI**

OUTSIDE



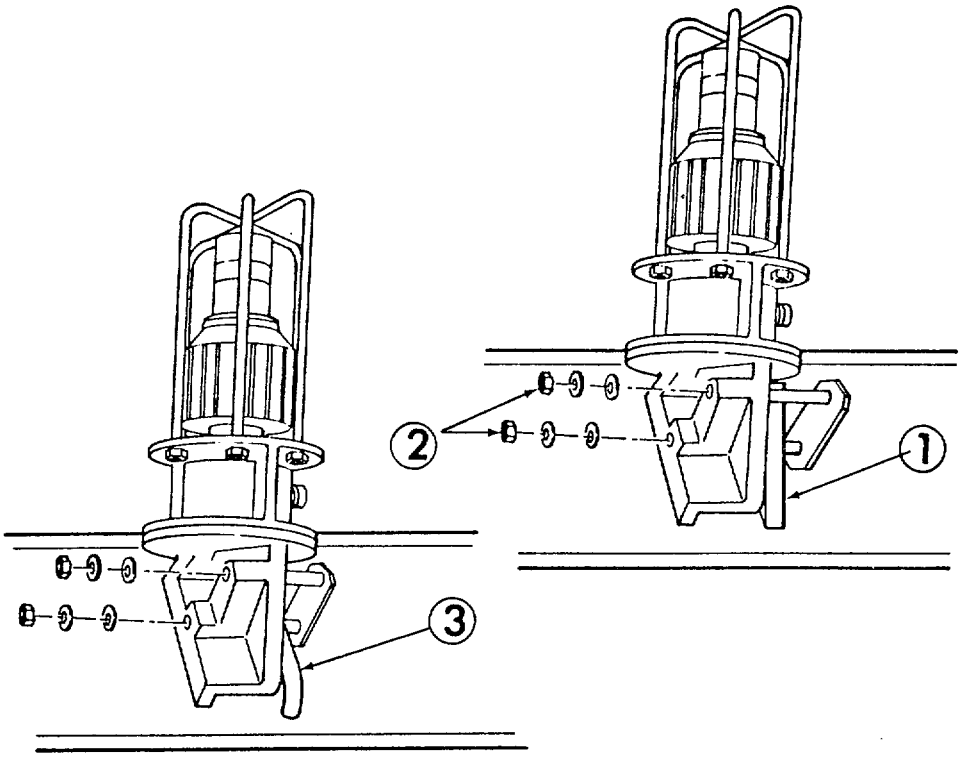
1. Make sure nuts on mounting attachment bolts turn freely and threads on bolts are not stripped.
2. Inspect yellow plastic lens for cracks or other damage.
3. Inspect receptacle and pins for damage.

• Report any damage on DA Form 2404, and replace CVKI.

TASK

7 INSTALL CVKI

OUTSIDE



1. Mount CVKI light to the engine cover lifting eye using mounting bolt holes through the adapter, as shown. Make sure mounting bracket is flush against lifting eye and extended end of plate rests against the vehicle body.

2. Tighten mounting bolts with wrench.

3. If your vehicle doesn't have an engine cover lifting eye, mount assembly to nearby utility bracket with the CVKI connector facing inboard as shown.

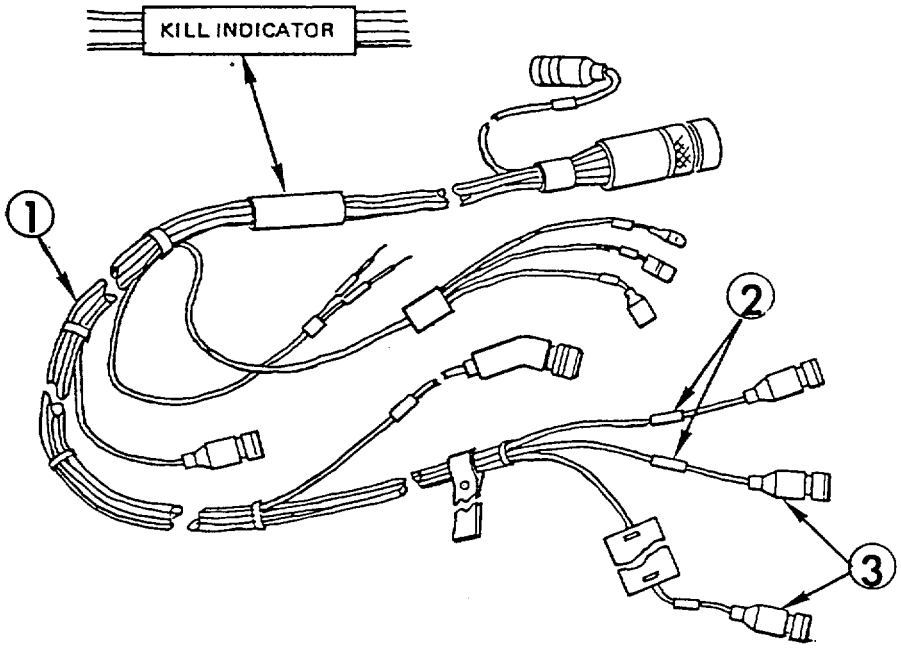
NOTE

If it is not possible to mount the assembly with the CVKI connector facing inboard, you have a CVKI Adapter that needs an additional bolt drilled. Notify your NCOIC before going further with the installation.

TASK

8 **Inspect CVKI Cable Assembly**

OUTSIDE

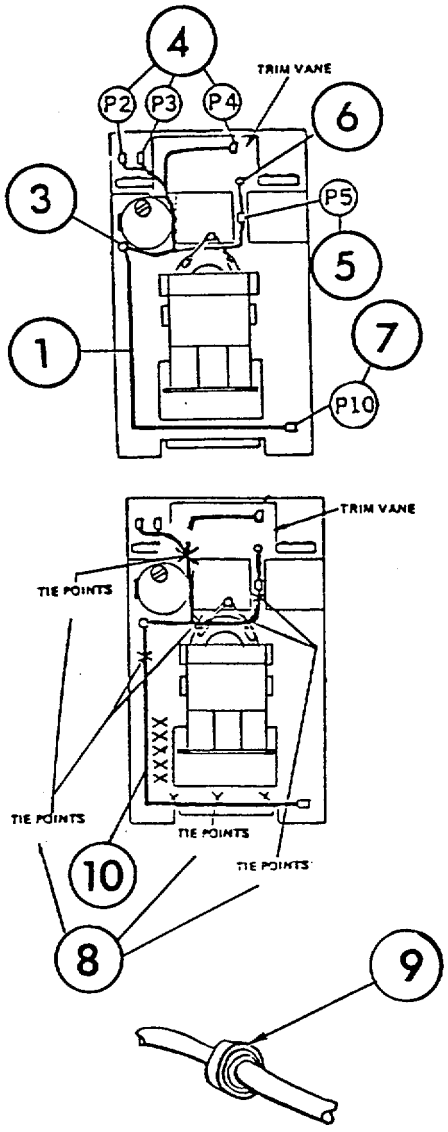


1. Inspect the CVKI cable assembly for worn insulation or bare wires.
2. Each connector should be labeled to show where it goes.
3. Check all connectors for obvious damage.
4. Report any damage on DA Form 2404, and replace CVKI cable assembly.

TASK

9 **Install CVKI Cable Assembly**

OUTSIDE



NOTE

Remove vehicle driver's left periscope before this task is started.

1. Climb on top of the vehicle and lay out the cable assembly as shown.

2. Find the cable ends labeled P2, P3, P4, P5, and P10.Pull them away from the other cables.

3. Feed the remaining cable connector ends into the vehicle through the driver's left periscope port.

4. Route cables P2, P3, P4 between driver's hatch and air intake grill, and drop the cables down the front of vehicle.

5. Route cable labeled P5 in front of machine gun turret and between air intake and exhaust grills to the back of the CVKI.

6. Attach P5 to the CVKI receptacle.

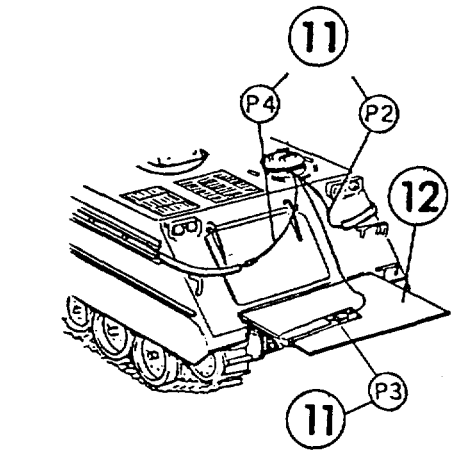
7. Route cable labeled P10 to the rear of the vehicle along the path shown and connect to the rear detector belt segment. Put the connector under the Velcro flap on the belt.

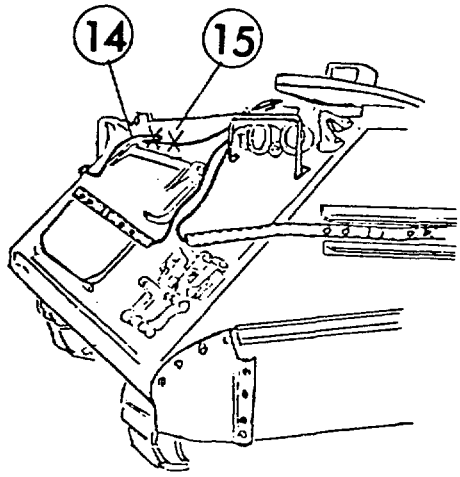
8. Securely attach cable to the eight tie points with the Velcro tie straps.

9. Cable P10 has five Velcro strips attached to it. Roll up the strips around the cable and allow the Velcro to stick to itself.

10. Attach each Velcro strip to one of the five Velcro patches on the vehicle. Move strips or add additional Velcro as necessary.

TASK
9
OUTSIDE





11. Release trim vane and swing down. Plug cable P2 into the left (driver's side) detector belt segment and cable P4 into the right side detector belt segment. Make sure the connectors and all excess cable are located in areas that will be covered by the trim vane when closed. Put -the connector under the Velcro flap on the belt.

NOTE

Two people are required for the next step.

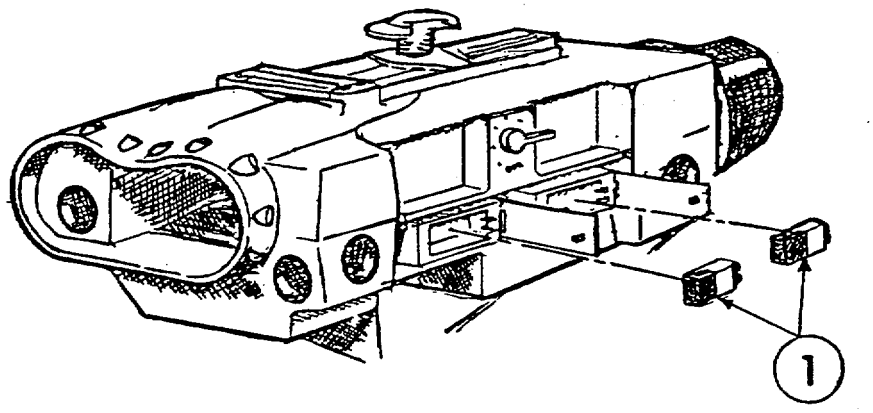
12. Raise the trim vane until it is approximately horizontal. Plug cable P3 into the connector on the front belt segment. Again, make sure that the connector and all excess cable are located in the area that will be covered by the trim vane when it is closed. Put the connector under the Velcro flap on the belt.

13. Close and secure the trim vane. Make sure that all connectors and excess cable are protected by the trim vane.

14. If the vehicle does not have a trim vane installed, gather up cable P4 and route it along the top of hinge to the engine access door.

15. Secure the cable to the hinge with the two Velcro tie straps attached to the cable.

TASK
10 **Install Daysight Tracker Simulator**
OUTSIDE

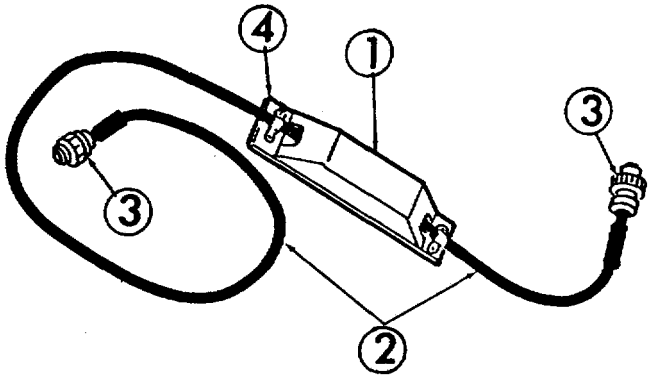


1. Install two 9-volt batteries in daysight tracker simulator.
   - Refer to TOW/MILES Operator Manual for installation procedures.
2. Inspect TOW/MILES daysight tracker simulator for any damage that would prevent normal operation.
   - Refer to TOW/MILES Operator Manual for inspection procedures.
3. Attach the TOW/MILES daysight tracker simulator the same way you attach the standard TOW daysight tracker.

TASK

11 **Inspect ITV Interface Assembly**

OUTSIDE



1.Inspect ITV interface assembly for any damage that would prevent normal operation.

2. Check the cables for worn insulation or bare wires.

3. Check both connectors for obvious damage.

4. Check that the back of the interface assembly has Velcro attached to it.

NOTE

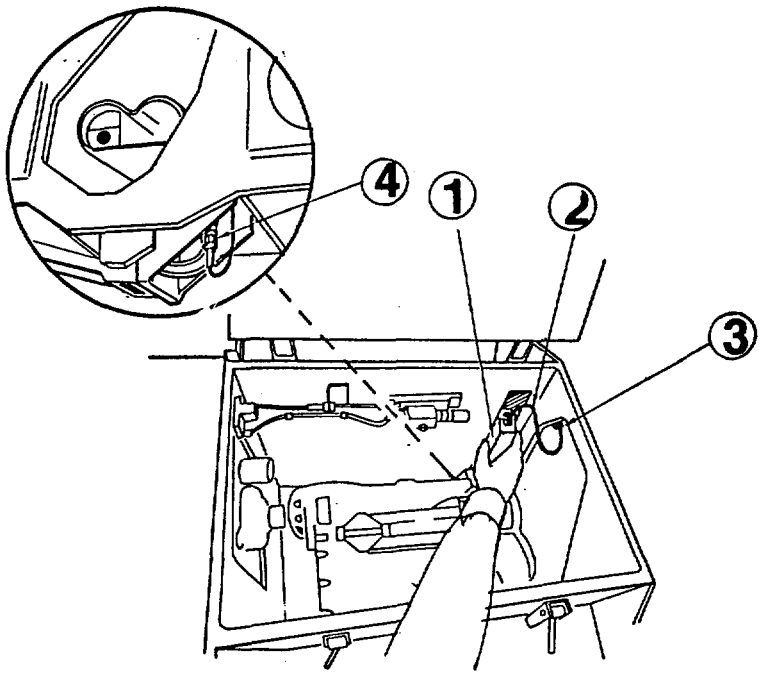
If ITV interface assembly is missing the Velcro on the back, replace box. Do not attach any Velcro from the rolls supplied. It is the wrong kind.

- Report any damage or missing Velcro on DA Form 2404 and replace ITV interface assembly.

TASK

12 **Install ITV Interface Assembly**

OUTSIDE



1. Install the ITV interface assembly on Velcro pad inside left front cover of launcher.
2. Make sure the shorter cable end (connector P1) is up.
3. Route the shorter cable out the front of the launcher and connect connector P1 to the launcher detector belt connector. Put connector under the Velcro flap on the belt.
4. Connect the longer cable (connector P2) to connector J2 on the bottom of the TOW/MILES daysight tracker simulator.

TASK

13 **Install TOW Launch Tubes**

OUTSIDE

WARNING

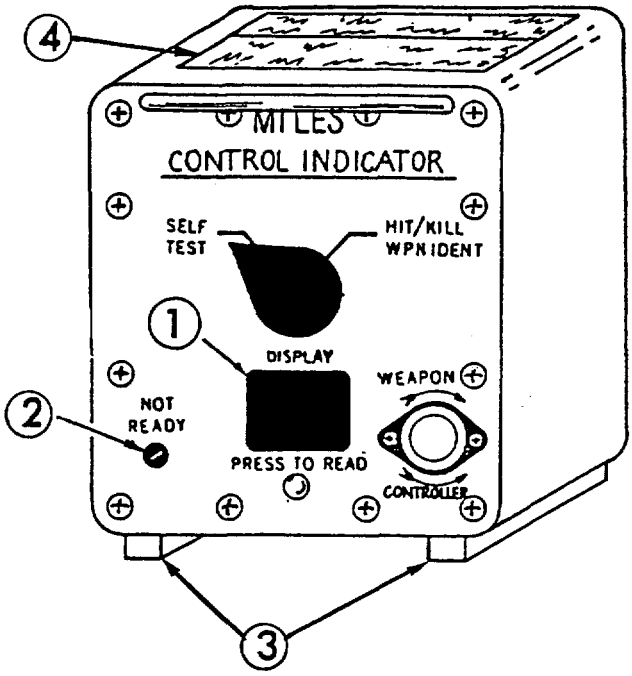
Do not load TOW Missile Simulation Rounds onto ITV with ATWESS cartridges installed. A sudden drop or heavy jolt could cause the ATWESS cartridge to go off and cause fatal injury to personnel.

1. Inspect TOW Missile Simulation Rounds and ATWESS device for any damage that would prevent normal operation. Refer to TOW/MILES Operator's Manual (TM 9-1265-368-10-2) for inspection procedures.

2. Load the TOW Missile Simulation Rounds the same way as you would standard TOW missile rounds.

TASK
1
INSIDE

Inspect Control Indicator



1. Look for cracks or other damage in the display.

2. Make sure the lens on the NOT READY indicator is not broken.

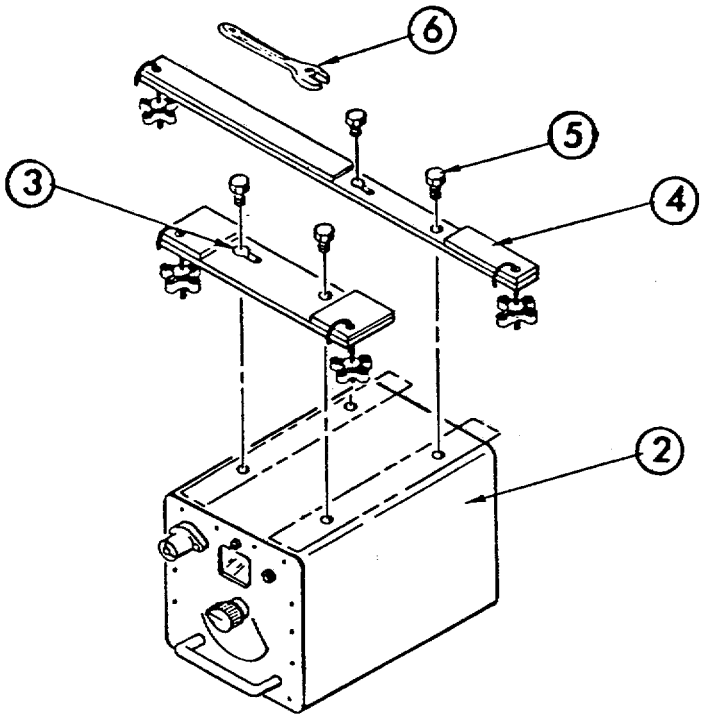
3. Mounting bars may be attached to the bottom of the control indicator. If they are attached, do not remove them. They do not interfere with the installation of the control indicator to the ITV adapters.

4. Make sure Velcro tape is securely fastened to top of indicator.

   • If tape is loose or missing, read the general instructions for installing Velcro tape on page 14 and replace the tape. Attach two strips of Velcro side-by-side as shown.

• Report any damage on DA Form 2404. Replace control indicator.

TASK
2 **Install Control Indicator**
INSIDE



1. Mounting bars, which are used for a different vehicle installation, may be attached to the bottom of the control indicator. It is not necessary to remove them as they do not interfere with the control indicator installation.

2. Turn the control indicator upside down with the front panel facing toward you.

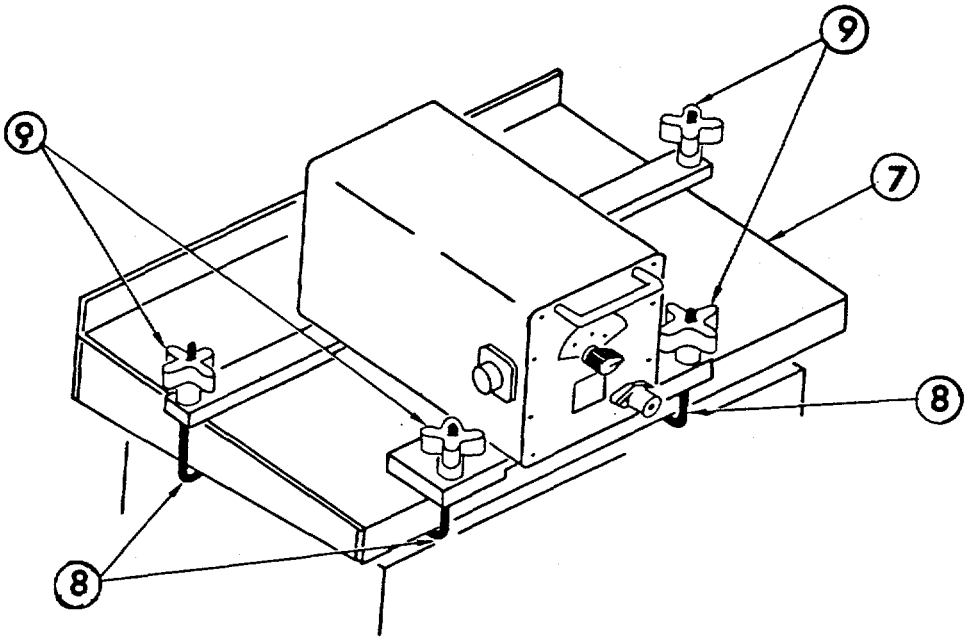
3. Place the short console mounting adapter over the holes in the bottom of the control indicator (or mounting bars) that are nearest to you. One mounting hole is round and the other is slotted. Install both adapters so that the slotted holes are on your left.

4. Place the long console mounting adapter over the holes in the bottom of the control indicator that are the farthest from you.

5. Attach both mounting adapters with the four bolts, four lock washers, and four flat washers provided.

6. Tighten the bolts with wrench.

TASK
2
INSIDE



7. Place control indicator on shelf.

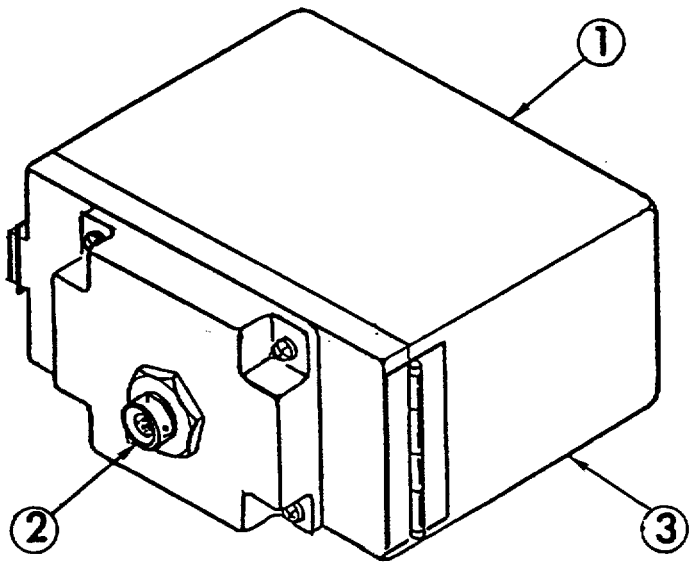
8. Adjust the four hooks so they are under the lip of the shelf.

9. Hand tighten the four knobs securely.

TASK

3 **Inspect Battery Box**

INSIDE



1. Inspect case for any damage that would prevent batteries from being inserted and the cover from properly closing.

2. Inspect connector for bent or damaged pins.

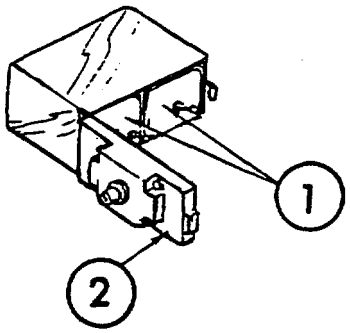
3. Inspect Velcro on top of case for any damage that would prevent it from properly holding the battery box. If Velcro is missing, do not attempt to replace it. Report on Form 2404 and replace battery box.

- Report any damage on DA Form 2404. Replace battery box.

TASK

4 **Install Battery Box and Batteries**

INSIDE

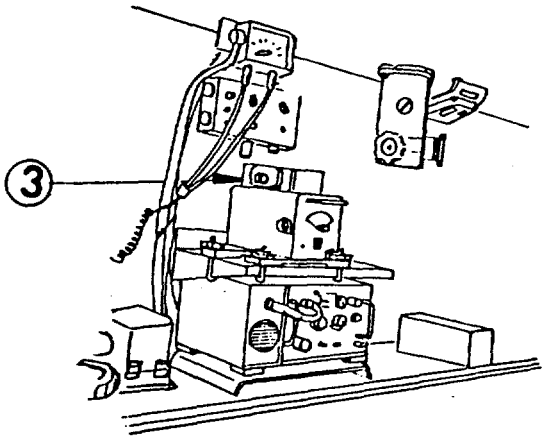


1. Insert two 6-volt batteries in the box.
2. Close and latch battery box cover.

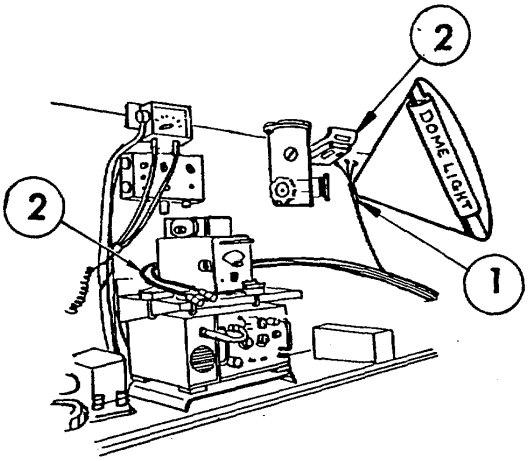
NOTE

If the battery box cannot be installed at the location shown, relocate it to another convenient place. Do not mount box in a vertical position.

3. Install battery box on top of the control indicator as shown.



TASK
5 **Finish Installing Cable Assembly**
INSIDE

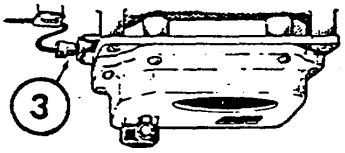


• First, check that Outside Task 9 has already been done. Ask your commander.

• Find the cables routed in the peri scope port from the CVKI and detector belt segments.

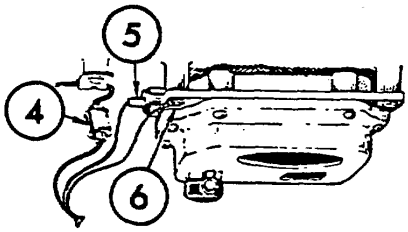
1. Locate connectors labeled DOME LIGHT.

2. Guide the dome light cable toward the driver's dome light. Route the remaining cables around the back of the control indicator.



3. Pull the plug out of the driver's dome light.

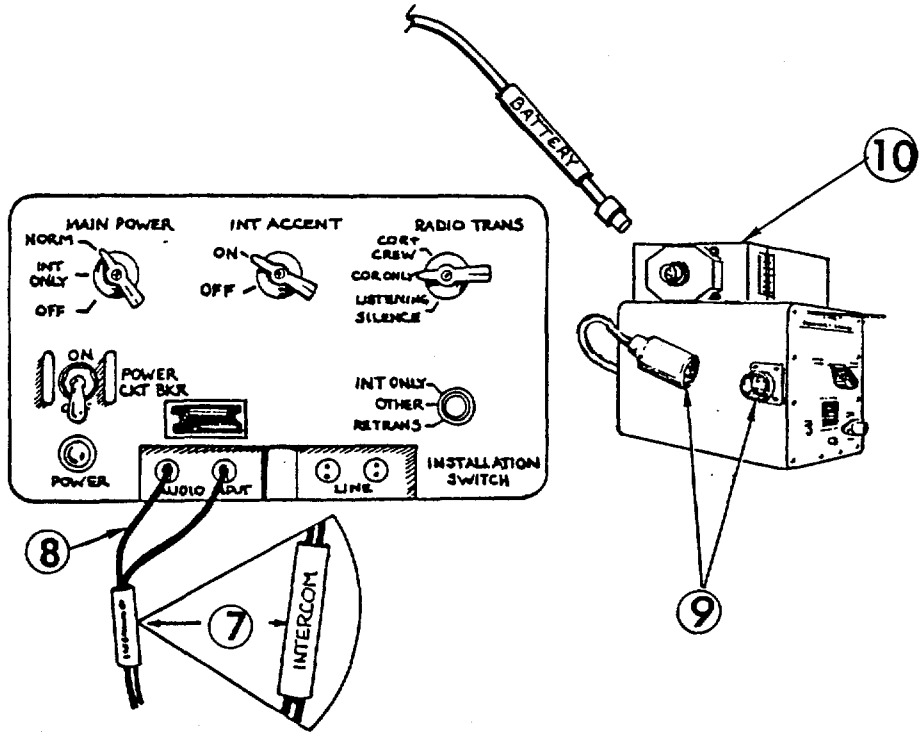
4. Put the plug from the dome light into MILES connector P7.



5. Plug MILES connector P6 into the dome light.

6. Remove the closest dome light bolt. Slip the bolt through MILES connector El. Make sure the connector is touching bare metal. Tighten the bolt.

TASK
5
INSIDE



7. Find the MILES cable labeled INTERCOM.

8. Plug MILES connectors P8 and P9 into the AUDIO INPUT jacks on the 1780 intercom unit. Either plug can go in either jack.

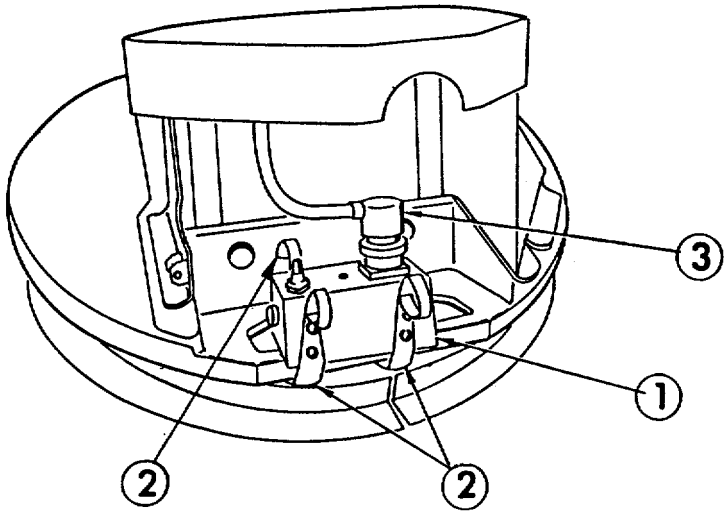
9. Find the cable connector labeled CONTROL INDICATOR. Plug it into the jack on the side of the Control Indicator.

10. Plug cable connector labeled BATTERY into the jack on the front of the battery box.

TASK
6 **Install MGS Simulator**
INSIDE

CAUTION

If an MGS box is already installed, remove and replace with the MILES MGS Simulator. If this is not done, severe damage to the MILES Equipment will result.



1. Place the MGS simulator on the forward edge of the shelf where the actual MGS is normally installed.

2. Wrap the two Velcro straps through hole in the shelf and up the opposite side of the simulator.

3. Locate cable to the TOW tracker head and plug connector into receptacle on the MGS box.

NOTE

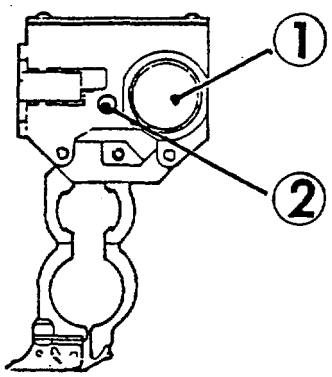
If batteries are installed in the TOW/MILES tracker, buzzer on the MGS simulator will sound when the cable is plugged in. If a Controller is available, ask him to silence the buzzer using his green controller key. If Controller is not immediately available, temporarily leave the cable unplugged from the simulator.

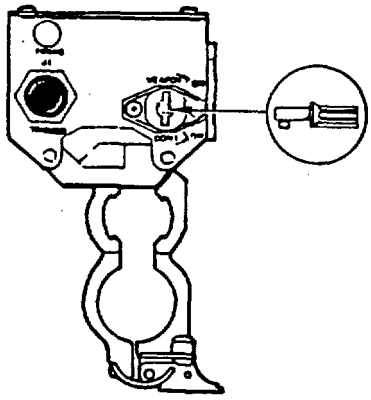
TASK

1

Inspect and Service M60 Machine Gun Transmitter

MG





1. Remove any dirt or oil from lens with lens paper (see page 83) or a soft, dry cloth.

2. Make sure foam microphone cover is dry and not caked with dirt or blankfire residue.

   - If wet or dirty, call the Controller. He will clean or, if necessary, replace the foam.

3. Check for damage that would prevent normal operation of the transmitter.

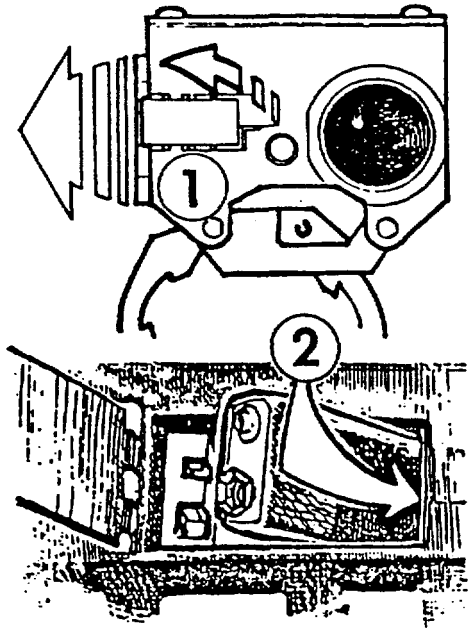
4. Wipe all surfaces clean.

   - Report damage on DA Form 2404. Replace transmitter.

TASK 2

Put Battery in Transmitter

MG

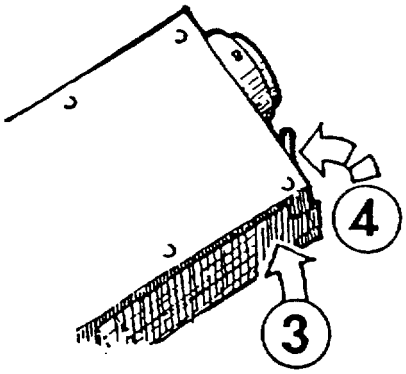


1. Flip the latch and open the door.

2. Put in the battery as shown. Push battery down to make sure it fits correctly.

NOTE

There is a large slot and a smaller slot for battery contacts.

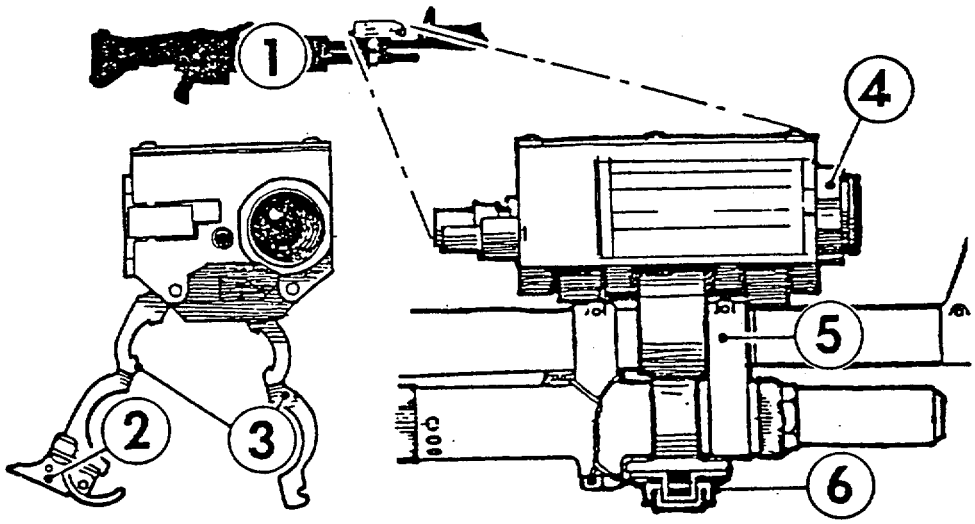


3. Close the door and fasten the clamp.

4. Press the latch closed.

TASK
3
MG

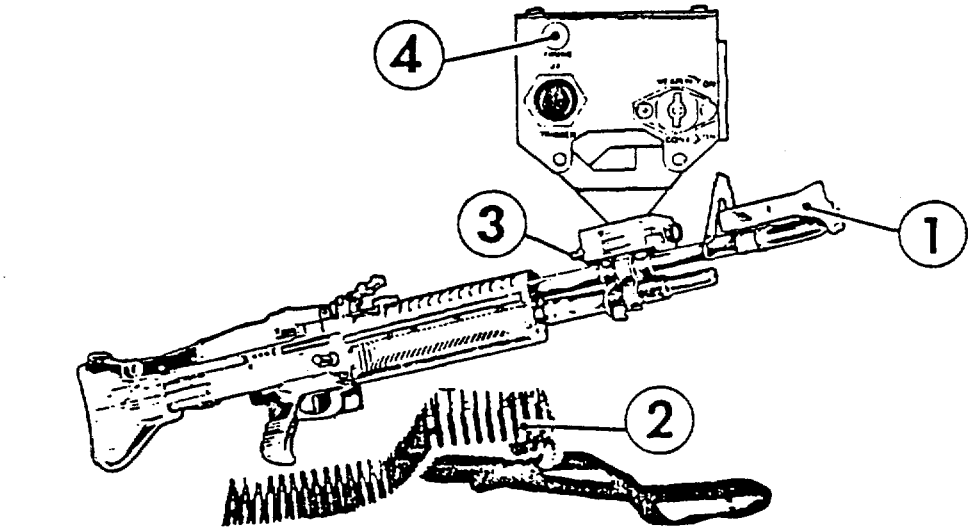
Attach Transmitter



1. Set the M60 down on its mount.
2. Open the clamp on the transmitter.
3. Pull the halves of the transmitter clamp apart.
4. With the lens pointed forward, lower the transmitter onto the barrel as shown.
5. Press the transmitter forward until it seats against but not on top of the front barrel clamp.
6. Hold the transmitter and fasten the clamp.

- It should be easy to fasten the clamp. If it is hard to fasten, repeat step 5.

Blank Fire Operation



1. Attach blank-fire attachment to barrel of M60 machine gun.

WARNING

NEVER LOAD M60/MILES WITH LIVE OR THE WRONG BLANK AMMUNITION. THE USE OF IMPROPER AMMUNITION MAY CAUSE FATAL INJURIES TO PERSONNEL.

2. Load the M60 with blank ammunition.

3. Insert yellow weapon key in transmitter key receptacle. Turn key to WEAPON ON position.

4. While watching the FIRING indicator, fire a short burst. The indicator lamp should light.

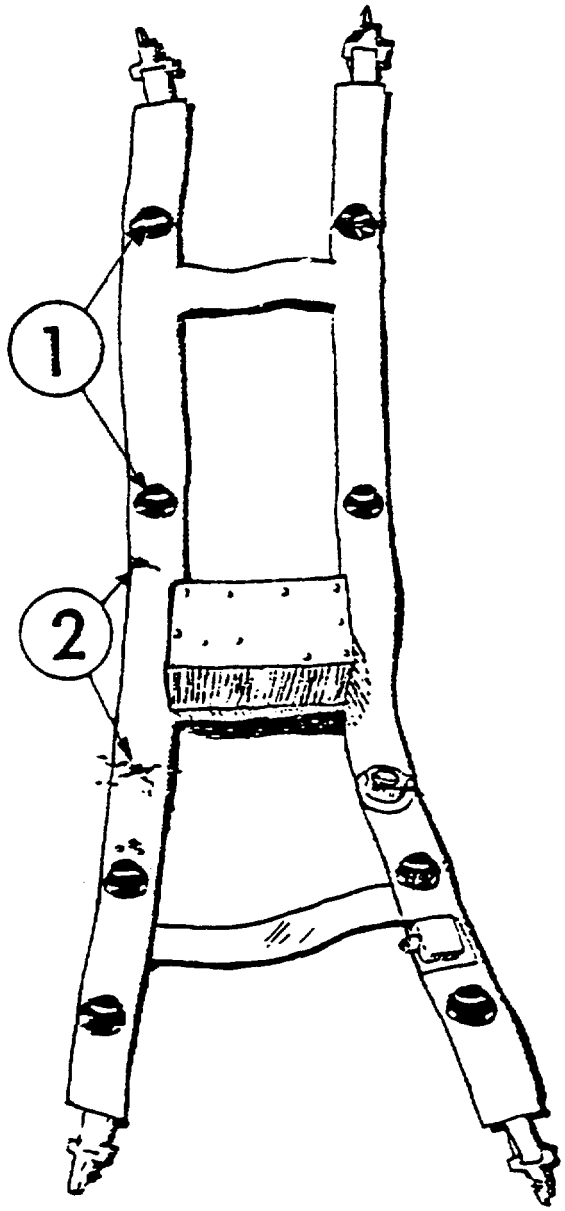
   If lamp does not light, fire again. If lamp still does not light, remove and reinsert the same battery in the transmitter and test again. If lamp still does not light, remove and install a new battery in the transmitter and test again. If lamp still does not light, report on DA Form 2404, and replace the transmitter.

   If the lamp stops lighting while you are using the M60 in an exercise, replace the transmitter battery.

TASK

1 **Inspect and Clean Torso Harness**

MWLD



1. Wipe all eight detectors clean.

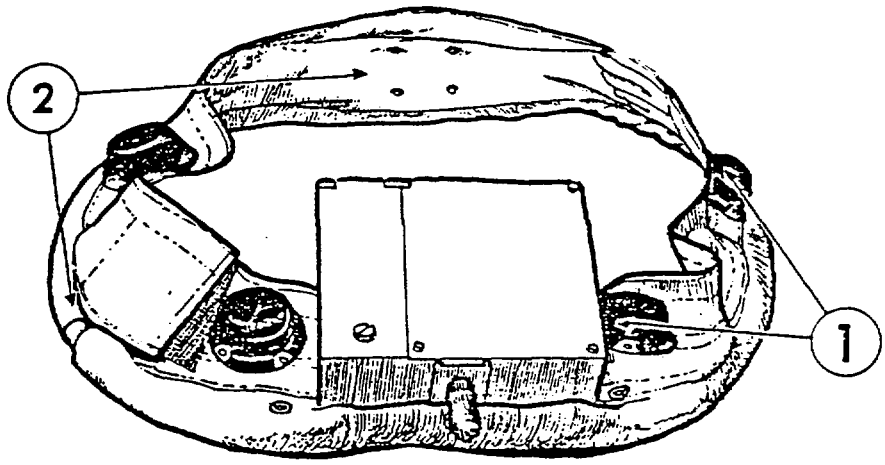
2. Inspect harness for damage that would prevent normal operation.

- Report any damage on DA Form 2404. Replace torso harness.

TASK

2 **Inspect and Clean Helmet Harness**

MWLD

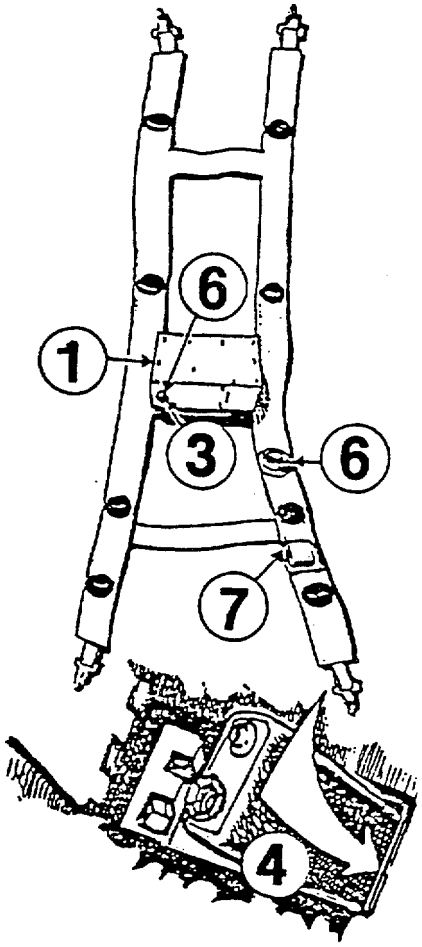


1. Wipe all five detectors clean.

2. Inspect helmet harness for any damage that would prevent normal operation.

- Report any damage on DA Form 2404. Replace helmet harness.

TASK
3 **Install Batteries in MWLD Harness**
MWLD



Ask your NCOIC to call the Controller.

1.Locate battery boxes on both MWLD helmet and torso harnesses.

2.First, put a battery in the helmet harness.

3. Loosen thumbscrew and open door.

4. Insert battery as shown. Push battery down to make sure it fits correctly.

5. Close door and tighten thumbscrew.

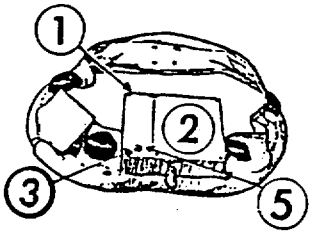
6. Put battery in torso harness by repeating steps 3, 4, and 5.

When you insert a battery in the torso harness, an alarm should sound. If no alarm, remove and reinsert the same battery. If still no alarm, get a new battery from your NCOIC and try again. If still no alarm, report on DA Form 2402, and replace torso harness.

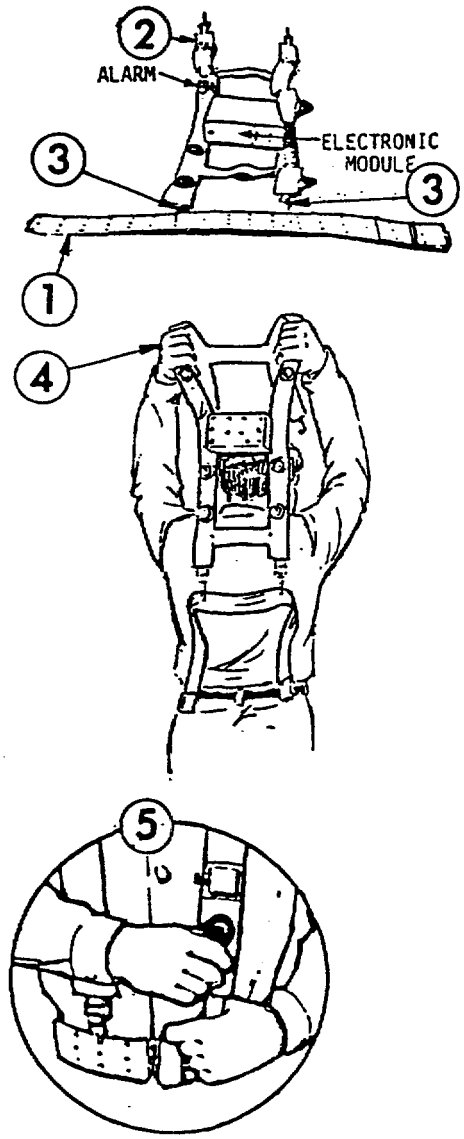
7. Ask Controller to insert his green key in key receptacle and turn off alarm.

NOTE

Be sure to insert batteries in both the helmet and torso harnesses.



TASK
4 **Put On Torso Harness**
MWLD



- If you are wearing them, remove the suspenders from your web gear.

1. Remove your web belt and lay it next to the harness like this.

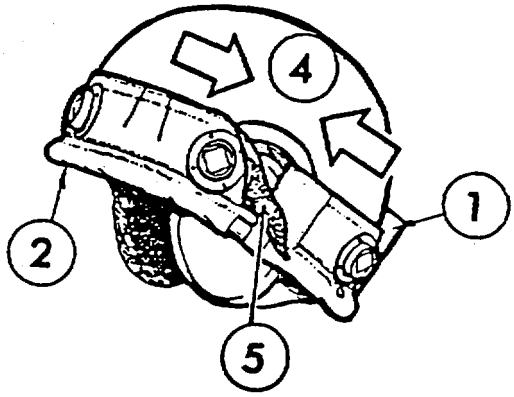
2. The harness should look like this with the alarm above the electronics unit.

3. Fasten both rear clips to the belt as shown.

4. With your web belt at the bottom, raise the harness and then lower it over your head.

5. Fasten your web belt and connect the harness to the belt. Adjust harness so battery box is at the back of your collar, at the collar line.

TASK
5 **Put Helmet Harness on Helmet**
MWLD

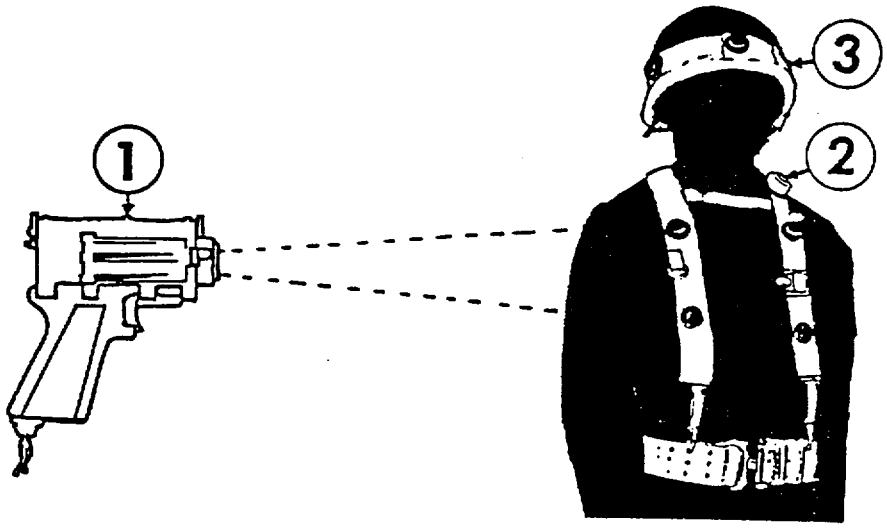


- Your helmet must have three patches of Velcro installed on the outside. If you do not have any Velcro on your helmet, turn to page 14 for instructions on installing the Velcro.

1. Slip harness over helmet so that the electronics box is at the rear.
2. Make sure the heavy cable overhangs the lip of the helmet.
3. Adjust the harness so that the three pieces of Velcro on the inside of the harness line up with the Velcro pieces attached to the outside of your helmet.
4. Pull the harness ends in the direction of the arrows to tighten the harness.
5. Fasten the Velcro flap tightly.

* When you wear your helmet, fasten the chinstrap. The added weight of the harness makes this necessary.

TASK
1 **Test Operation of MWLD**
TEST



1. Ask the Controller to test your torso harness. Ask him to fire his controller gun using "near miss."

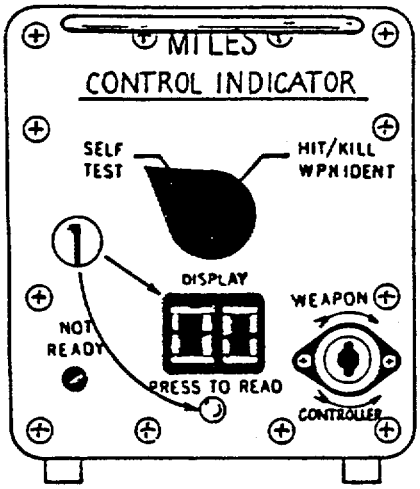
2. When he fires, your alarm should briefly sound.

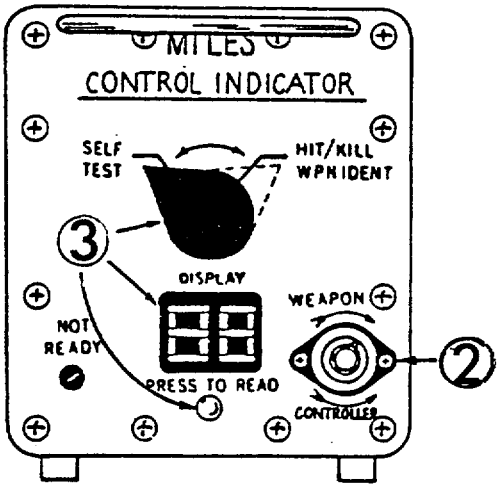
   If you do not hear an alarm, remove and reinsert the same battery in the torso harness and test again. If still no alarm, replace the battery in the torso harness with a new battery (see MWLD Task 3) and test again. If still no alarm, report on DA Form 2404, and replace the MWLD torso harness.

3. Ask the Controller to test your helmet harness for an alarm. You must be wearing your helmet during this test.

   If you do not hear an alarm, make sure that the bottom of the helmet harness overhangs the entire rim of the helmet and test again. If still no alarm, remove and reinsert the same battery and test again. If still no alarm, replace the battery in the helmet harness with a new battery (see MWLD Task 3) and test again. If still no alarm, find a soldier whose MWLD has already been checked and is working properly, and ask him to put on your helmet and test again .If still no alarm, report on DA Form 2404, and replace the helmet harness. If the alarm sounds, report on DA Form 2404, and replace your torso harness.

TASK 2 TEST **Test MILES System**





1. Press PRESS TO READ button on control indicator. DISPLAY should show 00.

   If DISPLAY does NOT show 00, go to page 62.

2. Ask Controller to reset the system by inserting his key in key receptacle on control indicator. Turn to CONTROLLER. Turn back and remove key.

3. Turn indicator switch to HIT/KILL, then turn to SELF TEST. Press PRESS TO READ button. DISPLAY should show 88.

   If DISPLAY does NOT show 88, go to page 62.

4. With vehicle master switch ON, insert the orange weapon key into control indicator and turn to WEAPON. Verify that the CVKI flashes continuously.

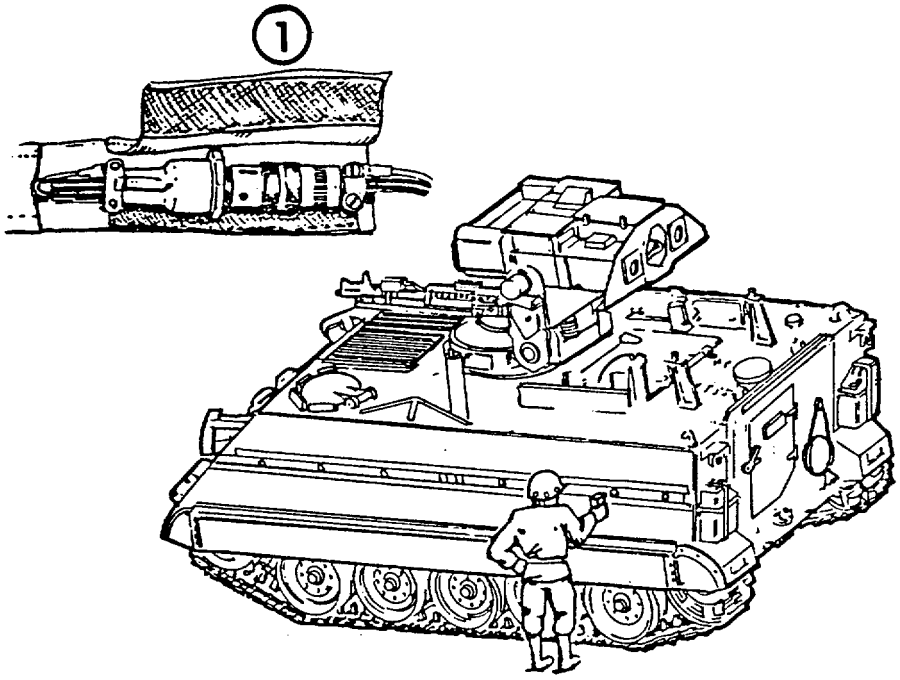
   If CVKI does not flash continuously, ask Controller to check out the equipment using the vehicle test set.

5. Remove orange weapon key, verify that a tone sounds in the vehicle's intercom and that the CVKI flashes continuously.

   If CVKI does not flash continuously or tone does not sound in intercom, ask Controller to check out the equipment using the vehicle test set.

6. Reset control indicator with controller key.

TASK
2
TEST



TEST VEHICLE HULL DETECTOR BELT SEGMENTS:

1. First, check that all cable connections to the detector belt segments are tight.

2. Ask the Controller to test your belt segments by aiming the controller gun at a detector-and firing in the "near miss" mode. Each time he does, the CVKI light should flash. If the light never flashes, go to page 62.

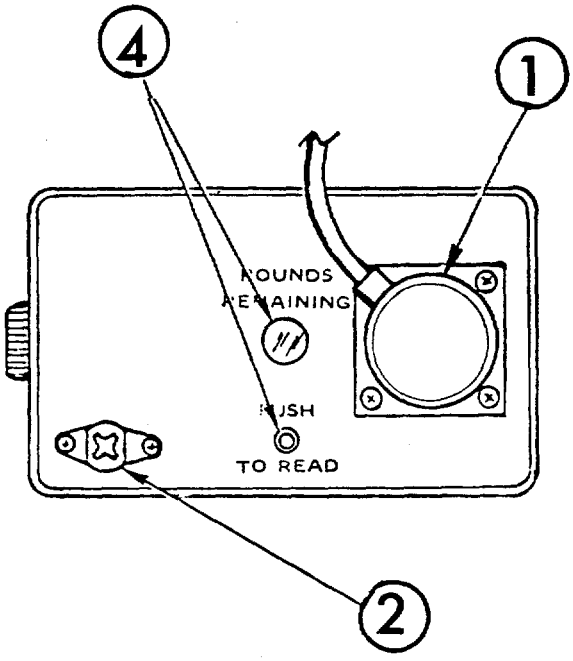
3. Next, test each of the belt segments by firing individually at all of the detectors. If the CVKI light does not flash for some or all of the detectors, go to page 61.

- It is OK for one detector on each belt segment to be bad.

TASK

2

TEST



Test TOW Transmitter and MGS Simulator

1. Make sure MGS cable is plugged into the MGS simulator box. Buzzer should sound (unless previously reset by Controller).

2. Ask Controller to insert his green key into the MGS box receptacle and turn it to SET position. Buzzer should silence.

3. Turn key to position 3 and remove key.

   - TOW is now in the DRY FIRE mode.

4. Press PUSH TO READ switch on MGS box. Display should show a "1" and then a "2". This indicates there are 12 rounds remaining.

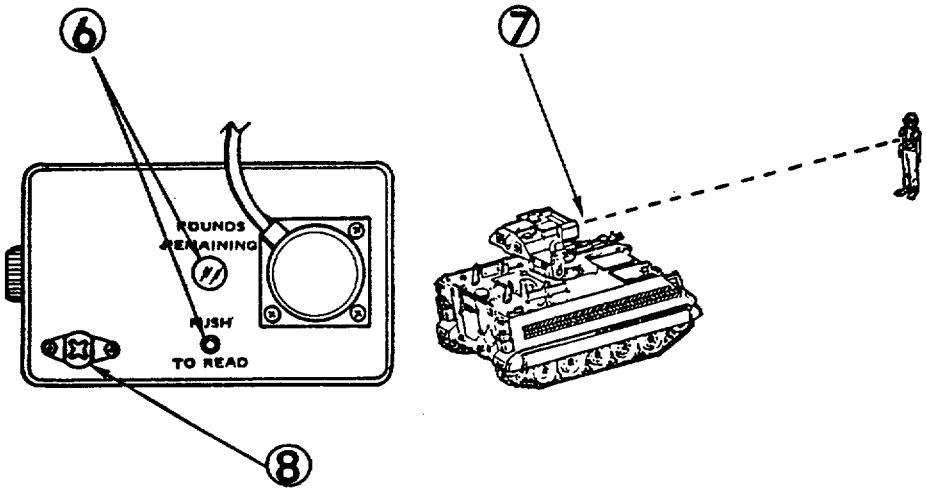
   If display does not show a "1" and then a "2", remove and reinsert the same batteries in the TOW transmitter and repeat step 4. If still no "1" and "2" display, replace both batteries with new batteries in the TOW transmitter and repeat step 4. If still no "1" and "2", report on DA Form 2404, replace the TOW transmitter, and repeat step 4. If still no "1" and "2", report on DA Form 2404 and replace the MGS simulator.

5. Fire the TOW in the normal manner used for a real weapon.

TASK

2

TEST



6. Press the PUSH TO READ button on the MGS box. The display should read "1" and then another "1" indicating 11 rounds remaining.

   If display does not show 11, report on DA Form 2404 and replace the TOW/MILES MGS box.

7. Test the TOW transmitter by firing at a man or vehicle target equipped with an operating MILES detector system. Observe a "kill" or "near miss" indication.

   If no "kill" or "near miss" indication, report on DA Form 2404 and replace the TOW/MILES transmitter.

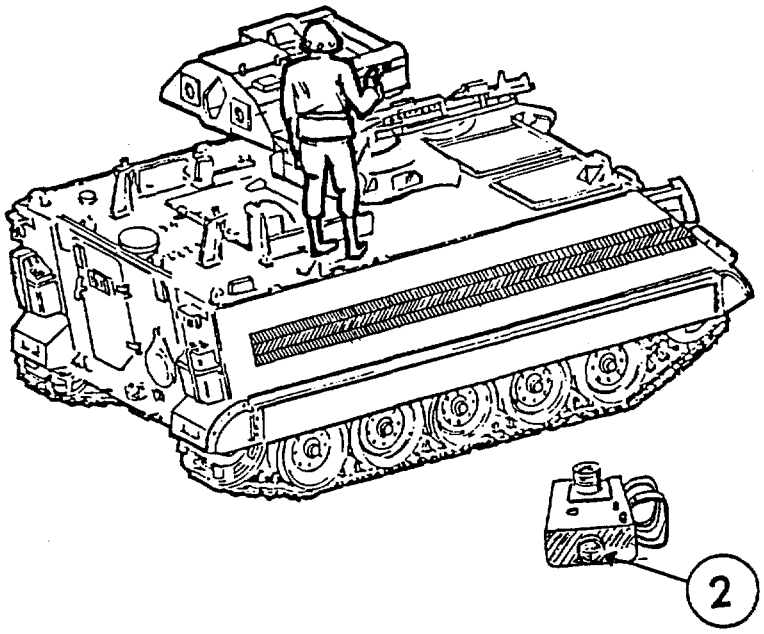
8. Ask the Controller to insert his green key into MGS box receptacle and turn to SET.

9. Then turn key to position 4 and remove key. TOW is now in the ATWESSfire mode.

TASK

2

TEST



Test Detectors:

1. Ask the Controller to aim and fire his controller's gun in the "near miss" mode at each of the six detectors on the TOW launcher detector belts. Also fire at the two detectors on the front of the TOW daysight tracker. Each time he fires, the buzzer on the MGS box should beep one time.

2. If the buzzer on the MGS box does not beep, report on DA Form 2404 and replace the defective detector belt segment.

    - If one detector is bad on the turret detector belt, exchange the belt with one of the side belts on the hull whose detectors all check OK.

TASK

2

TEST

TROUBLESHOOTING PROCEDURES:

No 00

I. If the display shows a number other than 00 or is blank:

A. Disconnect and reconnect cable connectors labeled CONTROL CONSOLE and BATTERY.

- Check for 00 by pressing DISPLAY PRESS TO TEST button on control indicator.
- If display shows 00, go to Step 2 on page 57.

B. If display is still blank, ask Controller to check out the equipment using the vehicle test set.

No 88

I. If the display does not show the number 88:

A. Turn control indicator switch to HIT/KILL and then back to SELF TEST.

- If display shows 88, go to Step 4 on page 57.

B. If display still does not show 88, ask Controller to check out the equipment using the vehicle test set.

FAULTY DETECTOR BELT SEGMENTS

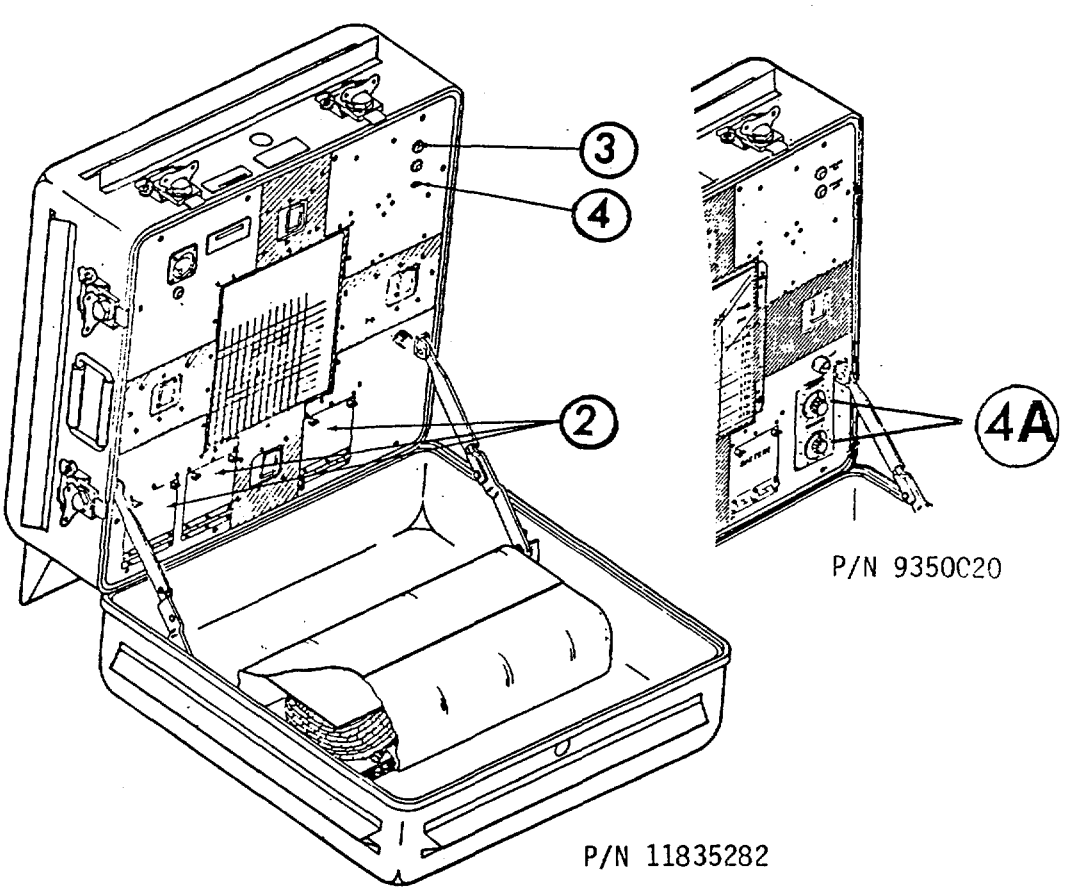
1. Check cable connections at the detector belt segments.
2. If detector belt segments are still faulty, ask Controller to checkout the MILES/TOW equipment using the vehicle test set.

TASK

1

Align M60 Transmitter

ALIGN



- This Alignment Target is a laser detecting device that you will use to align the weapon sights on the M60 machine gun with the MILES transmitter.

1. Set up the target at a range of 25 meters from the firing point.

2. Install three BA-200/U batteries.

3. Turn the POWER switch on.

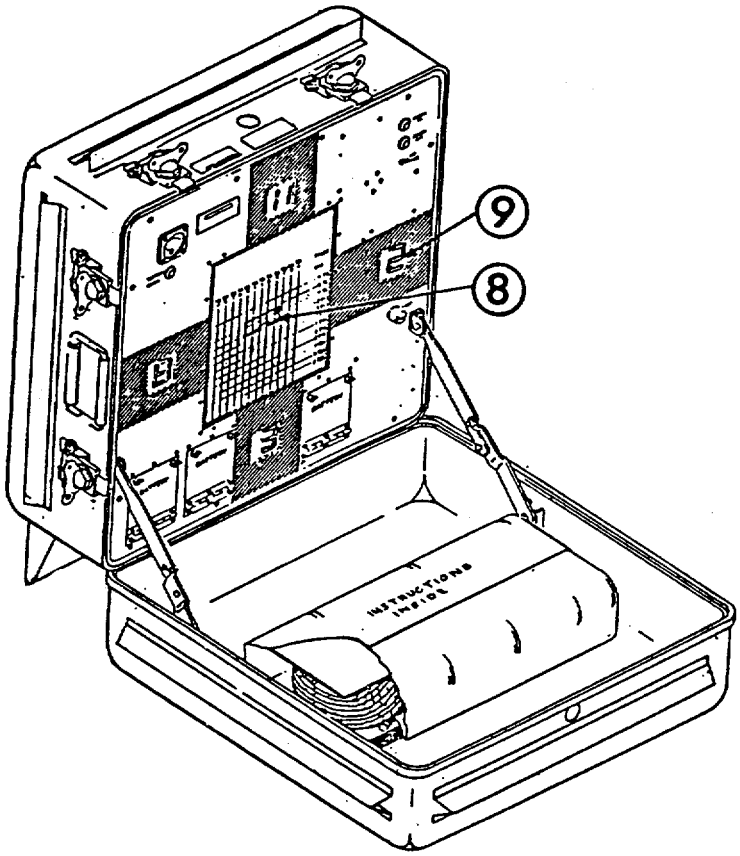
4. On P/N 11835282, set the WEAPON switch to M60.

4A. On P/N 9350020, set the AZIMUTH and ELEVATION switches to the appropriate settings as indicated on the target face plate.

TASK

1

ALIGN



5. Make sure your weapon is loaded with blank ammunition.

6. Set range to 500 meters.

7. Set windage to zero.

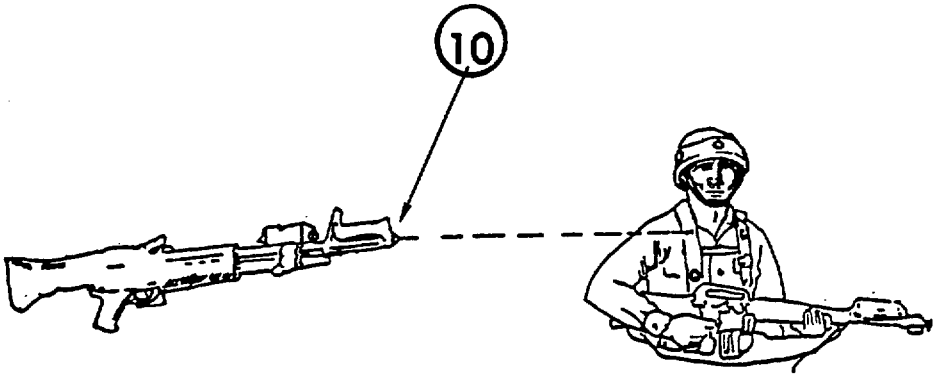
8. Fire one round at the target's bull's-eye.

9. The target displays show you what to donext. For example, if the right display shows 2, move the windage 2 clicks to the right. If the lower display shows 3, move the range adjustment 3 clicks down, etc.

TASK

1

ALIGN



10. If no display appears at close range (approximately 25 meters), fire at another soldier who is wearing an operable MWLD. While firing, observe the transmitter firing light. It should light when the transmitter fires. If no MWLD alarm sounds or no firing light appears, replace the battery in the transmitter. If still no response, report on DA Form 2404 and replace the transmitter.

11. Verify alignment:

- From a distance of 100 meters, fire at a soldier wearing an operable MWLD. The alarm should sound continuously indicating a "kill".

- If alarm does not sound or sounds briefly, indicating a "near miss", your transmitter may not be properly aligned. Realign using the Alignment Target.

TASK

1

OPER

Load and Fire TOW/ATWESS

WARNING

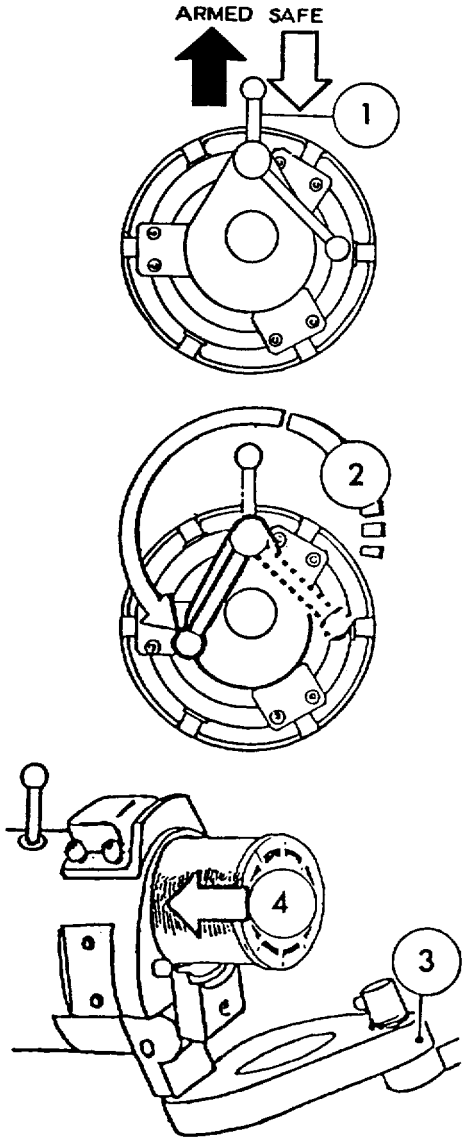
TREAT THE TOW/MILES AS YOU WOULD ANY LOADED AND ARMED WEAPON. DO NOT DROP A MISSILE SIMULATION ROUND WHEN ATWESS IS LOADED AND ARMED. A STRONG JOLT MAY SET OFF THE ATWESS.

A LOADED ATWESS WILL ALWAYS FIRE WHEN THE TOW/MILES IS IN THE ATWESS MODE.

DO NOT LOAD OR ARM ATWESS FROM INSIDE OF VEHICLE.

NEVER STAND BEHIND ATWESS WHEN ARMING ATWESS OR LOADING ATWESS CARTRIDGES.

TO LOAD ATWESS CARTRIDGES, STAND ON TOP OF THE VEHICLE AND TO THE SIDE OF THE TOW LAUNCHER.



Do NOT do this task unless you are ready to fire.

Two ATWESS cartridges are required, one for each TOW Missile Simulation Round (MSR).

1. Push both SAFE/ARM levers to the "SAFE" position.

2. Move both the ATWESS breech lock levers to the open position.

3. Open both breech doors as far as they go. This cocks the ATWESS. Visually check to see if the firing pins are protruding. If unsure, use one hand to feel if each firing pin has retracted to its full length. If a firing pin is protruding, or has not retracted to its full length, tag the MSR as unsafe, and return it to the point of issue.

4. Insert an ATWESS cartridge in each TOW MSR.

TASK

1

OPER

WARNING

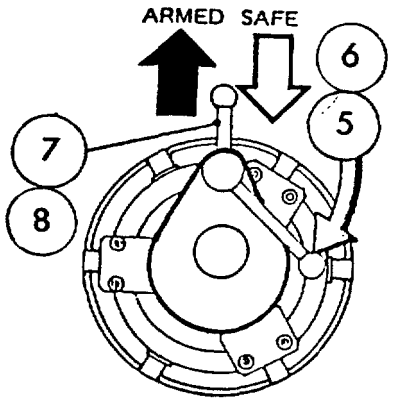
FAILURE TO FOLLOW THESE INSTRUCTIONS COULD RESULT IN PERSONNEL BEING BURNED BY THE BACKBLAST ESCAPING THROUGH THE HOLE IN THE CENTER OF THE BREECH DOOR.

5. Stand to the right side of the rear of the TOW launcher, face away from the target, and use your right hand to close the breech door of the right ATWESS. Move the breech lock lever to the closed position.

6. Standing to the left side of the rear of the TOW launcher, face away from the target and, using the left hand, close the breech door of the left ATWESS and move the breech lock lever to the closed "SAFE" position.

7. Pull both SAFE/ARM levers up to the "ARM" position.

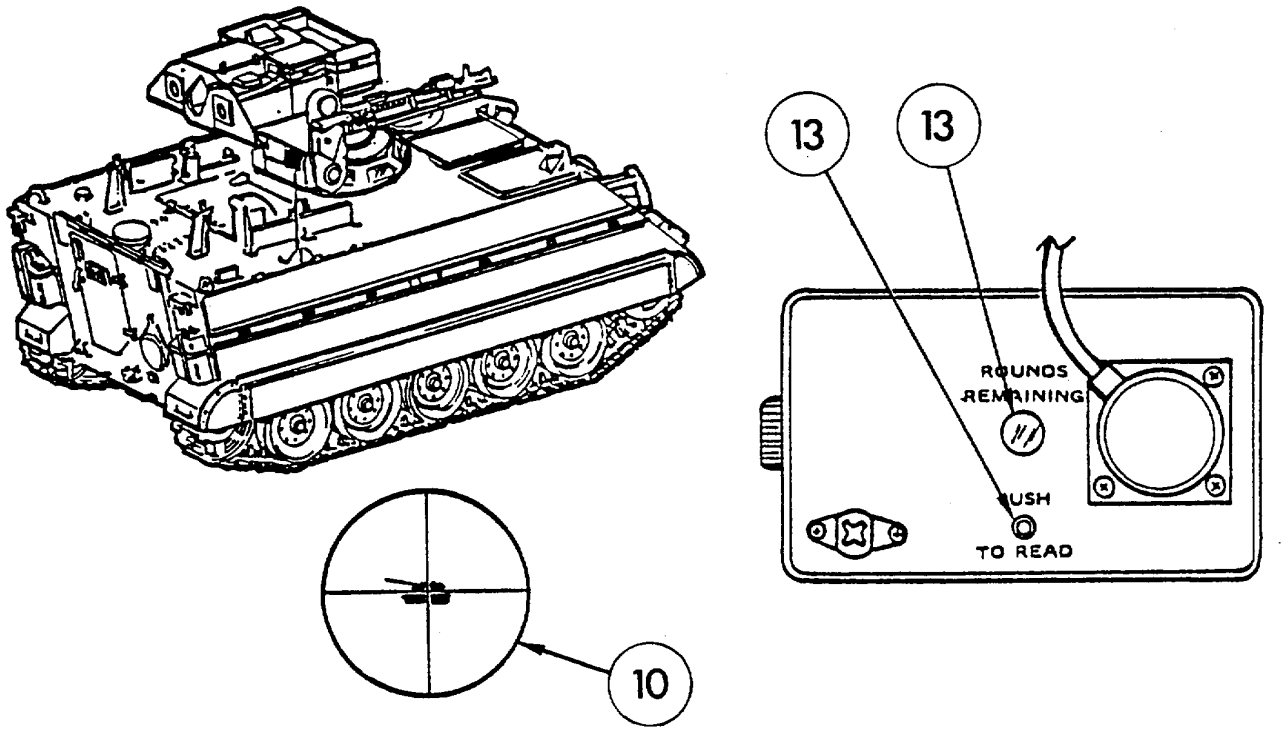
8. If you decide not to fire, push both SAFE/ARM levers to the "SAFE" position. Then open breech doors and remove ATWESS cartridges.



TASK

1

OPER



9. Prior to firing the TOW, wait 10 seconds after selecting the missile to be fired. Observe this delay only once, at the beginning of each exercise.

10. Aim TOW at target.

11. If reticle cannot be seen through the sight, turn on reticle light. Reticle light switch is located on the side of the daysight tracker.

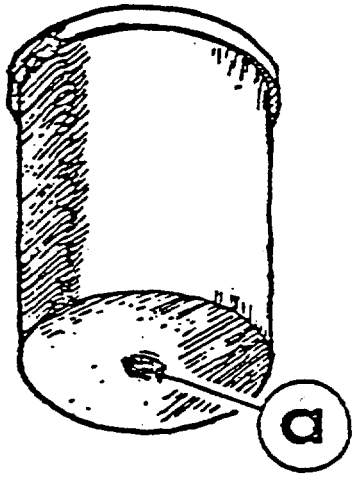
12. Fire the TOW in the normal manner. The ATWESS will fire, providing weapon backblast. Track your target and count off 11 seconds. The laser starts to transmit 1 second after firing and continues to transmit for 10 seconds.

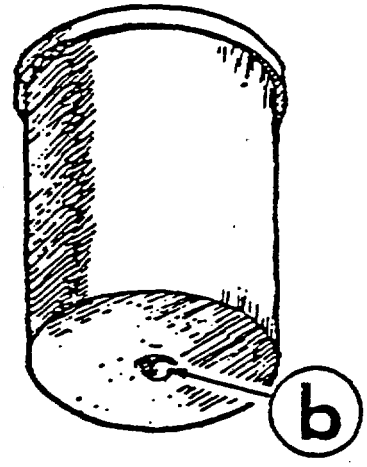
NOTE

To be sure of a "kill", you must track your target for a full 11 seconds. The last few seconds of tracking are the most important.

After firing a TOW missile, you must wait 5 seconds before firing the second missile.

13. To see the number of rounds remaining in the TOW/MILES system, push the PRESS TO READ button on the MGS box. The number of rounds remaining will be displayed in the ROUNDS REMAINING window.





IF ATWESS DOES NOT FIRE:

Remove cartridge from ATWESS.

Check the cartridge primer.

a. If the primer is dented, both the laser transmitter and the ATWESS have fired. Your cartridge is a dud. RETURN THE DUD CARTRIDGE TO YOUR NCOIC FOR DISPOSAL.

b. If the cartridge is NOT dented, the ATWESS has not fired. Load a new ATWESS cartridge and fire again making sure that the 10 second delay after first arming is observed.

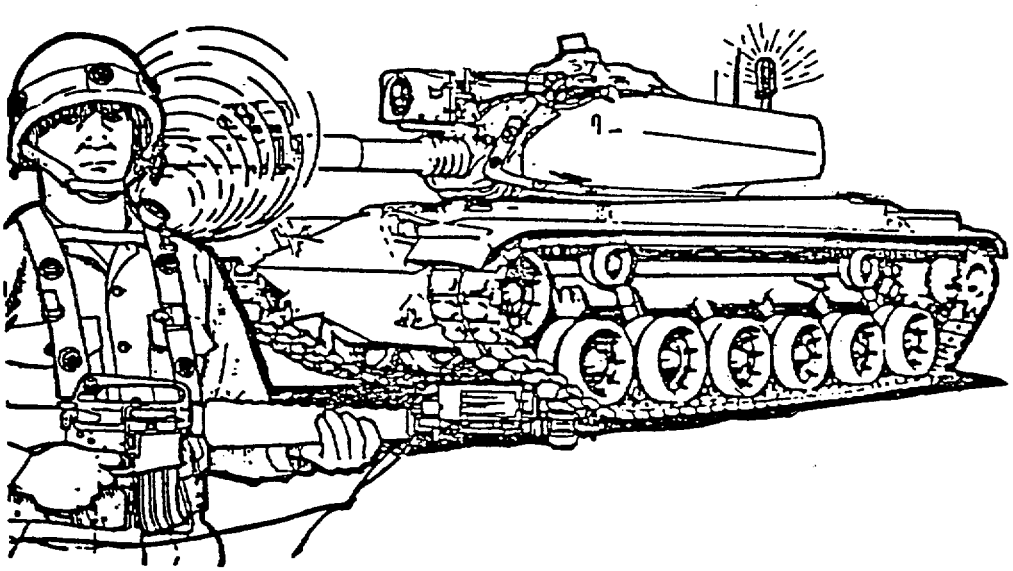
c. If ATWESS still does not fire, check that connector end of TOW coil cord is tightly plugged into MGS box. If the ATWESS still does not fire, report on DA Form 2404 and replace the TOW system.

TASK

2

OPER

Observe Your Target



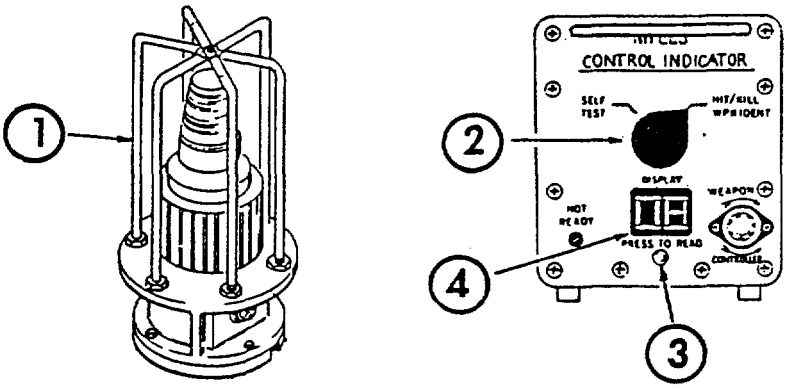
- When detectors are hit by laser fire, the CVKI light on top of vehicles will flash and personnel MWLD alarms will sound. Usually you will not be close enough to hear the personnel alarms, but you should be able to see the vehicle CVKI lights.
- If the shot was a "near miss", the CVKI light flashes two or three times.
- If a target vehicle is "hit" but not "killed", the CVKI light flashes four to six times.
- If the target vehicle was "killed", the CVKI light flashes continuously.
- If personnel are "killed", their MWLD alarms sound continuously.

TASK

3

OPER

Recognizing Enemy Fire



1. If your vehicle is hit by laser fire, the CVKI light will begin to flash. You will also hear alarm tones in the intercom unit. Four to six beeps mean a "HIT", two beeps mean a "NEAR MISS", and a continuous tone means a "KILL".

2. To determine what kind of weapon has fired on you, turn the switch on the control indicator to the HIT/KILL position.

3. Press the PRESS TO READ button.

4. The DISPLAY will show a number. Use the chart below to match the number on the DISPLAY with the type of weapon firing on you.

NOTE

A "NEAR MISS" indication does not register on the display.

Weapon Number	Weapon
00	Controller Gun
07	TOW or Shillelagh
08	DRAGON
12	105 mm
13	152 mm
14	2.75" Rocket
15	VIPER
23	20 mm Cannon
24	M2 or M85 Machine Gun
99	Self-Kill

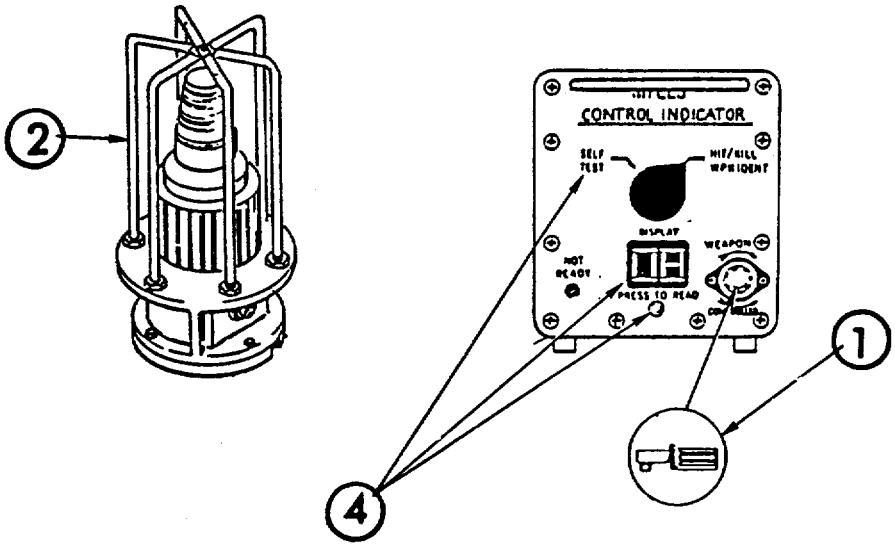
5. "Self-Kill" results when the orange vehicle key is put in the control indicator when you have not been "killed" by laser fire. When the key is inserted and turned to WEAPON position, the 99 will be displayed and the CVKI light will flash continuously. When the key is removed, a continuous tone will sound in the intercom. You must then call the Controller to reset your system.

TASK

4

Reset After a “Kill”

OPER



1. To silence your alarm after a "KILL", insert the orange key (normally carried by the vehicle commander) in the control indicator and turn off the intercom alarm. If you remove key from the control indicator, your intercom alarm will operate again.

2. The CVKI continues to flash until turned off by Controller.

3. To reset: Remove orange weapon key. Intercom alarm sounds. Ask Controller to insert his green key in receptacle on control indicator and reset the system.

4. Turn control indicator switch to HIT/KILL; then turn to SELF-TEST. Press the PRESS TO READ DISPLAY button. The DISPLAY should read 88. If not 88, do troubleshooting procedures on page 61.

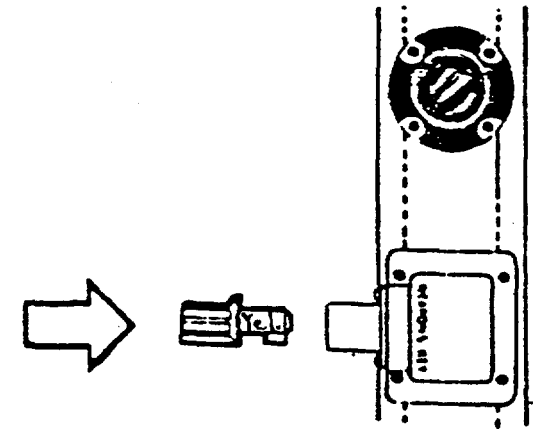
NOTE: The Controller will determine when to reset your system.

TASK

5

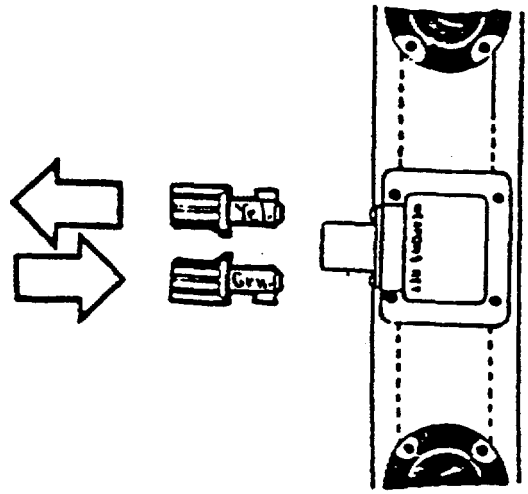
OPER

Turn Off and Reset MWLD Alarm



To turn off alarm:

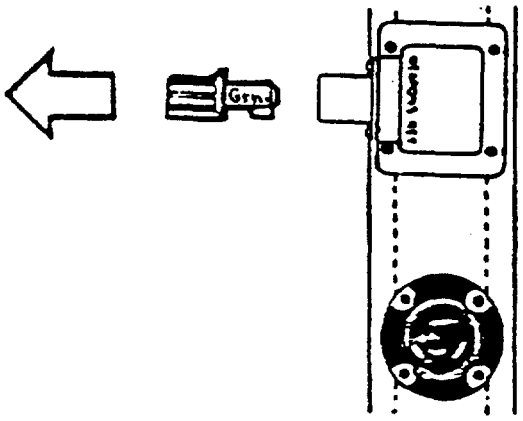
1. Insert your yellow weapon key in receptacle on torso harness. Turn key to turn off alarm.



To reset alarm, you must call the Controller.

2. Remove your yellow weapon key from receptacle. (Alarm will sound.)

3. Ask Controller to put his green controller key in receptacle and turn off alarm.



4. Controller will remove his green key. Alarm is now reset.

TASK

6

Remove, Inspect, Service, and Return All MILES Equipment

OPER

Use the checklist below to do this task. If you need help doing a step, refer to the tasks listed beside it.

Inside Tasks:

1. Remove and inspect MGS simulator. See Outside Task 6.
2. Remove and inspect MILES inside cables. See Inside Task 5.
3. Remove battery box. Remove batteries from battery box and inspect battery box. See Inside Tasks 3 and 4.
4. Remove and inspect control indicator. See Inside Tasks 1 and 2.

Outside Tasks:

1. Remove and inspect the two TOW Missile. Simulation Rounds. See Outside Task 13.
2. Remove and inspect ITV interface box. See Outside Tasks 11 and 12.
3. Remove and inspect TOW/MILES daysight tracker. See Outside Task 10.
4. Remove and inspect CVKI cable assembly. See Outside Tasks 8 and 9. (Do this after Inside Step 1 has been done.)
5. Remove and inspect the CVKI. See Outside Tasks 6 and 7.
6. Remove and inspect detector belt segments and brush guards. Leave the Velcro tape on the vehicle. See Outside Tasks 3, 4, and 5.

M60 MG Tasks:

1. Remove the M60 transmitter. See MG Task 3.
2. Remove the battery from the M60 transmitter and close battery compartment door. See MG Task 2.
3. Inspect and service M60 MG transmitter. See MG Task 1.
4. Remove, inspect, and service M60 MG blank firing attachment.

TASK

6

OPER

MWLD Tasks:

1. Remove MWLD torso and helmet harnesses. See MWLD Tasks 4 and 5.

2. Remove batteries from MWLD harnesses and close battery doors. See MWLD Task 3.

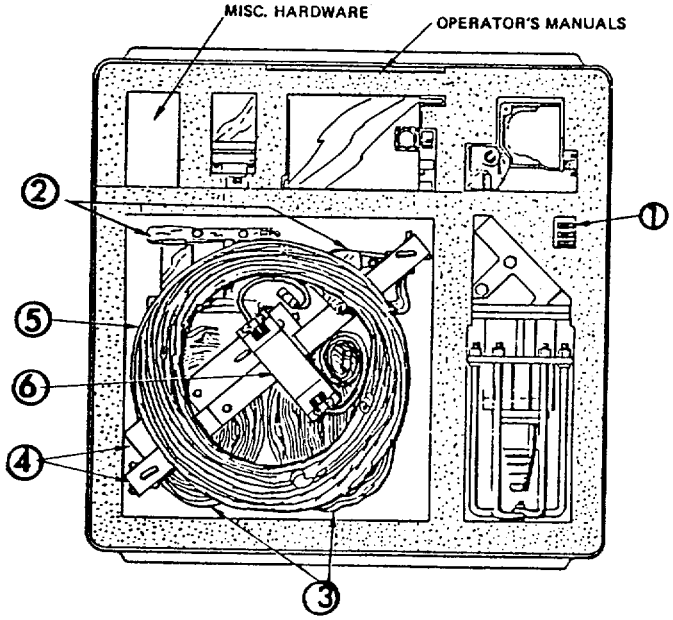
3 Inspect and service the MWLD harnesses and detectors. See MWLD Tasks 1 and 2.

Return all MILES equipment and unused blank ammunition to your NCOIC. You may be asked to return your MILES equipment to the transit case. If so, follow the instructions on the next page.

TASK

6

OPER



M901 Transit Case Loading Instructions

1. Place weapon and MWLD keys in space provided.

2. Fold up the MWLD torso and helmet harnesses and place them in the space provided.

3. Roll up the five detector belts and place them next to the MWLD harnesses.

4. Place the two console mounting adapters on top of the belts.

5. Roll up the cable assembly and place it on top of the detector belts and MWLD harnesses.

6. Place the ITV interface box in the middle of the cable assembly.

7. Return the remaining MILES equipment to their proper places as shown on the drawing above.

8. Pack the 12 brush guard rails in their separate transit case.

9. Refer to the TOW/MILES operator's manual, TM 9-6920-368-10-2 for transit case loading instructions for the TOW equipment.

APPENDIX A

REFERENCES

A-1. SCOPE

This appendix lists all forms, field manuals, and technical manuals referenced in this manual.

A-2. FORMS

SF 368	Quality Deficiency Report
DA Form 2028-2	Recommended Changes to Equipment Technical Publications
DA Form 2062	Hand Receipt
DA Form 2402	Exchange Tag
DA Form 2404	Equipment Inspection and Maintenance Work Sheet

A-3. FIELD MANUALS

FM 21-11	Field Manual: First Aid for Soldiers

A-4. TECHNICAL MANUALS

TM 9-1006-224-10	Operator's Manual, M60 Machine Gun
TM 9-1265-368-10-3	Operator's Manual, MILES Simulator System for TOW Weapons System
TM 9-1425-470-12	Operator's and Organizational Maintenance Manual for TOW Heavy Anti-Tank/Assault Weapon System

A-5. MISCELLANEOUS PUBLICATIONS

AR 310-2	Identification and Distribution of DA Publications
SB 11-6	Dry Battery Supply Data
DA PAM 738-750	The Army Maintenance Management System (TAMMS)

APPENDIX B

COMPONENTS OF END ITEM AND BASIC ISSUE ITEMS LISTS

SECTION I. INTRODUCTION

This appendix lists integral components of the M901 ITV system. All these items, except for the expendable items in the Installation Kit, must be returned to the NCOIC following a training exercise.

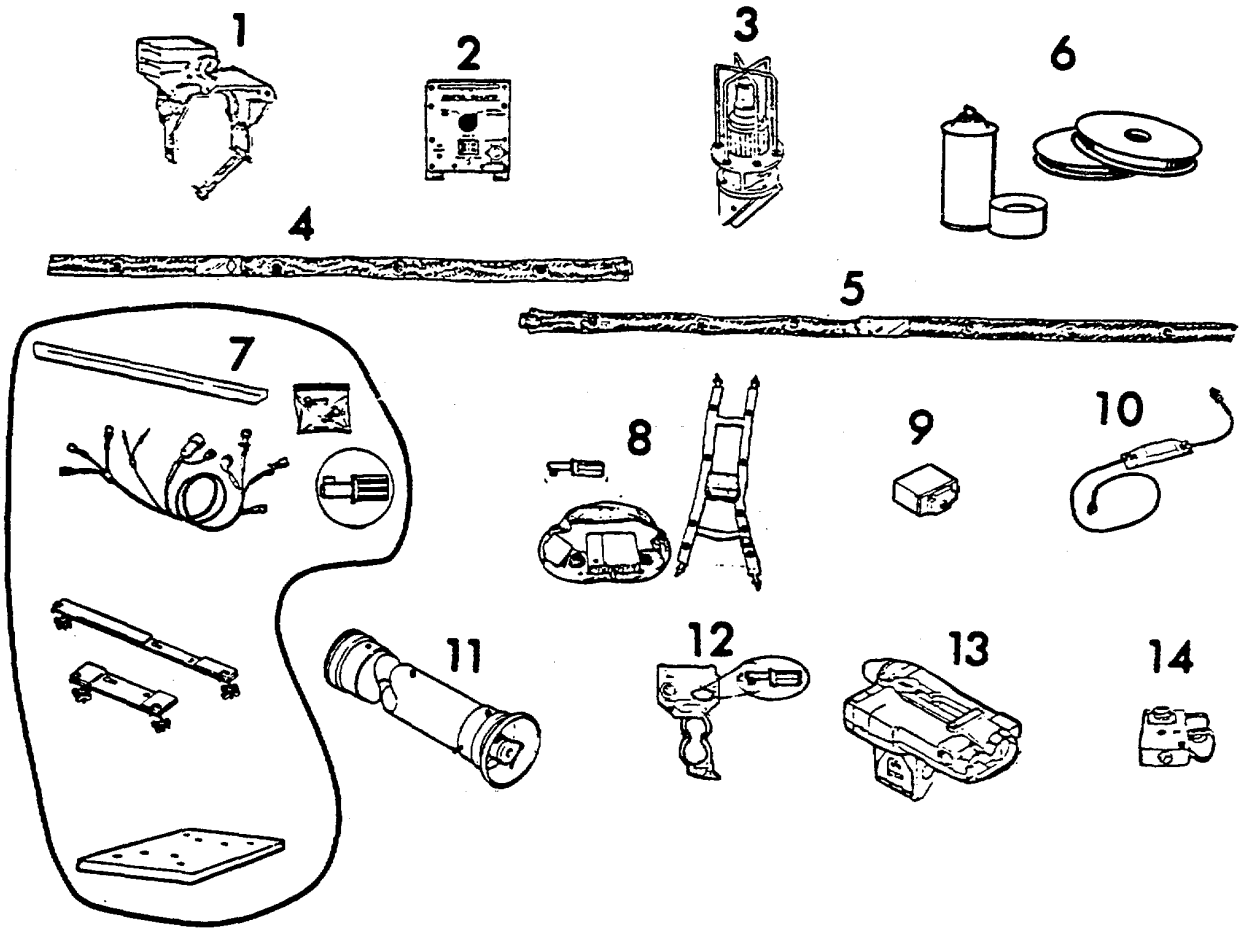
Explanation of columns:

National Stock Number:	Stock requisition number.
Description:	Lines 1 and 2 give a brief item description. Line- 3 lists the Federal Supply Code for Manufacturer (FSCM) and the part number.
U/M:	Unit of Measure.
Qty:	Quantity of item furnished for each piece of equipment.
Illustration:	Shows where to find an illustration of the item.

SECTION II. COMPONENTS OF END ITEM

National Stock Number	Description FSCM & Part Number	U/M	Qty	Illustration
1265-01-075-4889	M2 Machine Gun Laser Transmitter Assembly (19200) 11748803	ea.	1	1
1265-01-077-6393	Control Indicator (19200) 11749448	ea.	1	2
	CVKI Adapter Assembly (19200) 11749728-1	ea.	1	3
1265-01-075-4905	Detector Belt Assembly Segment Number 1 (19200) 11749230	ea.	3	4
1265-01-075-4907	Detector Belt Assembly Segment Number 2 (19200) 11749238	ea.	2	5

National Stock Number	Description FSCM & Part Number	U/M	Qty	Illustration
	Installation Kit (19200) 11836021	ea.	1	6
	Adapter Set (19200) 11748819	ea.	1	7
1265-01-075-4901	Control Indicator Mounting Adapter - Right (19200) 11749081	ea.	1	2
1265-01-075-4902	Control Indicator Mounting Adapter - Left (19200) 11749082	ea.	1	2
1265-01-075-4893	Man Worn Laser Detector Assembly (19200) 11748808	ea.	1	8
	Battery Box (19200) 11749790	ea.	1	9
	ITV Interface Cable Assembly (19200) 11836014	ea.	1	10
1265-01-076-6532	TOW Missile Simulation Round (19200) 11749561	ea.	2	11
1265-01-075-4903	M60 Machine Gun Laser Transmitter Assembly (19200) 11748802	ea.	1	12
	TOW Laser Simulator System, Transmitter Assembly (19200) 11748818	ea.	1	13
	Missile Guidance Set Adapter Assembly (19200) 11749482	ea.	1	14



SECTION III. BASIC ISSUE ITEMS

1 ea. TM 9-1265-202-10	Operator's Manual f/ Simulator System, Firing Laser: M73 f/ M901 Improved Tow Vehicle

APPENDIX C

ADDITIONAL AUTHORIZATION LIST

This appendix lists additional items you will need to operate the M901 ITV system.

Explanation of Columns:

National stock numbers, descriptions, unit of measure, and quantities are provided to help you identify and request the additional items you will need to operate the M901 ITV system.

National Stock Number	Description FSCM & Part Number	U/M	Qty	Illustration
6135-01-063-1978	*Battery, 9-volt (80058) BA-3090/U	ea.	9	Task 1
	*Battery, 6-volt (80058) BA-200U	ea.	2	Task 1

* Dry battery listed is used with the equipment. It will not be shipped automatically but is to be requisitioned in quantities necessary for the particular organization in accordance with SB 11-6.

APPENDIX D

SPECIAL TOOLS AND TEST EQUIPMENT

This appendix lists the special tools and test equipment which are used with the M901 ITV system.

Explanation of Columns:

National stock numbers and descriptions are provided to help you identify and request the special tools and test equipment used with the M901 ITV system.

National Stock Number	Description FSCM & Part Number	Illustration
5120-00-243-9401	Hand Roller	Page 12

APPENDIX E

EXPENDABLE SUPPLIES AND MATERIALS LIST

This appendix lists the expendable supplies and materials you will use to operate and maintain the M901 ITV system.

Explanation of Columns:

National stock numbers, descriptions, unit of measure, and quantities are provided to help you identify and request the expendable supplies and materials you will use to operate and maintain the M901 ITV system.

National Stock Number	Description FSCM & Part Number	U/M	Qty
	Velcro Tape (19200) 11749431	roll	1
	Tape Primer (19200) 11749034	16 oz.	1
6640-00-240-5851	Paper, Lens (81349) NNN-P-40	pk.	1

APPENDIX F

AUTHORIZED AMMUNITION

This appendix lists the ammunition authorized for this item: M22 Practice Cartridge, part number 11749380 (19200).

REFERENCE INFORMATION

This section includes the nomenclature cross reference list, list of abbreviations, and explanations of terms (glossary) used in this manual.

A. NOMENCLATURE CROSS REFERENCE LIST

Common Name	Official Nomenclature
Brush Guard	Guard, Brush Assembly.
Controller Gun	Controller's Gun, Simulator System, Laser.
CVKI	Indicator Simulator System, Laser: Combat Vechicle Kill/Hit/Miss.
Detector Belt Segments	Detector Belt Assembly, Segment No. 1 and Segment No. 2.
Helmet Harness	Detector Belt Assembly, Simulator Laser: Man Worn.
M60 Transmitter	Transmitter Assembly, Simulator System, Laser: For M60 Machine Gun.
Torso Harness	Detector Assembly, Simulator System, Laser: Man Worn.
TOW/ATWESS Missile Simulation Round	Tube Assembly, Simulator, Anti-tank Missile Fire: For TOW missile.
TOW Daysight Tracker	Transmitter Assembly, Simulator System, Laser: For TOW Missile.

B. LIST OF ABBREVIATIONS

ATWESS	Anti-tank Weapon Effects Signature Simulator
CVKI	Combat Vehicle Kill Indicator.
MILES	Multiple Integrated Laser Engagement System.
MWLD	Man Worn Laser Detector.

C. GLOSSARY

ATWESS Assembly	A device installed in the rear of the TOW tube to provide simulated back-blast, noise, and smoke.
ATWESS Cartridge	The explosive round used in the ATWESS Assembly.
Control Indicator	The MILES device used in the M901 ITV to turn equipment on/off.
Controller	The umpire or referee in a MILES training exercise.
Controller Gun	The device used to test MILES detector systems. May also be used to disqualify soldiers or vehicles from an exercise.
Controller Key	The green key used by the Controller to reset MILES transmitters.
Combat Vehicle Kill Indicator, CVKI	The MILES device attached to armored vehicles to provide external flashing light to indicate that the vehicle has been "killed".
Helmet Harness	The part of the personnel laser detector assembly worn on a combat helmet.
Hit	A beep alarm in vehicle intercom an flashing CVKI light repeated four to six times means your vehicle has been hit by laser fire.
Kill	In a MILES training exercise, a continuous alarm in vehicle intercom and continuous flashing CVKI light indicates the detector assembly was hit by a laser beam. The orange weapon key is put in the control indicator to silence the alarm.
Laser Beam	In MILES, a harmless invisible beam of light which simulates weapon fire.

Laser Detector Assembly	A device which senses the laser beam directed at it.
Laser Transmitter	A device that sends the laser beam.
Man Worn Laser Detector (MWLD)	The helmet and torso assemblies worn by personnel that sense a laser beam directed at them.
MGS Box	Plugs into the cord in place of the actual Missile Guidance Set.
Near Miss	A vehicle intercom alarm and flashing light repeated two times indicates laser fire directed toward you.
Orange Weapon Key	When continuous vehicle intercom alarm sounds and CVKI light flashes, put key in the control indicator to run off intercom alarm.
Simulator	A training device that takes the place of real equipment and has many of its characteristics.
Torso Harness	The part of the personnel laser detetor assembly worn on the upper body.
Velcro Tape	A particular brand name for hook and pile fastener tape. It is used to hold vehicle detector belts and other MILES equipment in place.
Yellow Key	Carried by vehicle personnel wearning MWLD. When continous alarm sounds, it is put in the MWLD key receptacle to silence alarm. Also used to turn on and off the M60 machine gun transmitter.

By Order of the Secretary of the Army:

CARL E. VUONO
General, United States Army
Chief of Staff

Official:

R. L. DILWORTH
Brigadier General, United States Army
The Adjutant General

DISTRIBUTION:

To be distributed in accordance with DA Form 12-37, Operator's Maintenance requirements for MILES Simulator Sys, Firing, Laser,M73 (for M901 ITV).

☆U.S. GOVERNMENT PRINTING OFFICE: 1992 - 311-831/44292

TEAR ALONG PERFORATED LINE

RECOMMENDED CHANGES TO EQUIPMENT TECHNICAL PUBLICATIONS

THEN. . JOT DOWN THE DOPE ABOUT IT ON THIS FORM, CAREFULLY TEAR IT OUT, FOLD IT AND DROP IT IN THE MAIL!

SOMETHING WRONG WITH THIS PUBLICATION?

FROM: (PRINT YOUR UNIT'S COMPLETE ADDRESS)

DATE SENT

PUBLICATION NUMBER	PUBLICATION DATE	PUBLICATION TITLE

BE EXACT. . .PIN-POINT WHERE IT IS

PAGE NO.	PARA-GRAPH	FIGURE NO	TABLE NO.

IN THIS SPACE TELL WHAT IS WRONG AND WHAT SHOULD BE DONE ABOUT IT:

PRINTED NAME, GRADE OR TITLE, AND TELEPHONE NUMBER	SIGN HERE:

DA FORM 1 JUL 79 2028-2

PREVIOUS EDITIONS ▸ ARE OBSOLETE.

P.S.—IF YOUR OUTFIT WANTS TO KNOW ABOUT YOUR RECOMMENDATION MAKE A CARBON COPY OF THIS AND GIVE IT TO YOUR HEADQUARTERS.

THE METRIC SYSTEM AND EQUIVALENTS

LINEAR MEASURE

1 Centimeter = 10 Millimeters = 0.01 Meters = 0.3937 Inches

1 Meter = 100 Centimeters = 1,000 Millimeters = 39.37 Inches

1 Kilometer = 1,000 Meters = 0.621 Miles

SQUARE MEASURE

1 Sq Centimeter = 100 Sq Millimeters = 0.155 Sq Inches

1 Sq Meter = 10,000 Sq Centimeters = 10.76 Sq Feet

1 Sq Kilometer = 1,000,000 Sq Meters = 0.386 Sq Miles

CUBIC MEASURE

1 Cu Centimeter = 1,000 Cu Millimeters = 0.06 Cu Inches

1 Cu Meter = 1,000,000 Cu Centimeters = 35.31 Cu Feet

LIQUID MEASURE

1 Milliliter = 0.001 Liters = 0.0338 Fluid Ounces

1 Liter = 1,000 Milliliters = 33.82 Fluid Ounces

TEMPERATURE

5/9 (°F -32) = °C

212° Fahrenheit is equivalent to 100° Celsius

90° Fahrenheit is equivalent to 32.2° Celsius

32° Fahrenheit is equivalent to 0° Celsius

9/5 C° +32 = F°

WEIGHTS

1 Gram = 0.001 Kilograms = 1,000 Milligrams = 0.035 Ounces

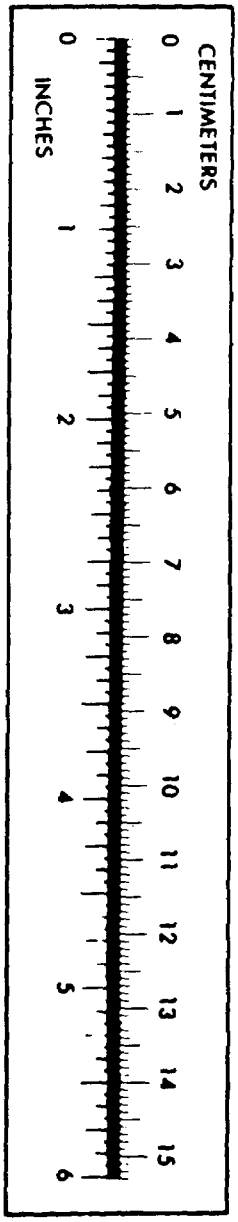
1 Kilogram = 1,000 Grams = 2.2 Lb.

1 Metric Ton = 1,000 Kilograms = 1 Megagram = 1.1 Short Tons

APPROXIMATE CONVERSION FACTORS

TO CHANGE	TO	MULTIPLY BY
Inches	Centimeters	2.540
Feet	Meters	0.305
Yards	Meters	0.914
Miles	Kilometers	1.609
Square Inches	Square Centimeters	6.451
Square Feet	Square Meters	0.093
Square Yards	Square Meters	0.836
Square Miles	Square Kilometers	2.590
Acres	Square Hectometers	0.405
Cubic Feet	Cubic Meters	0.028
Cubic Yards	Cubic Meters	0.765
Fluid Ounces	Milliliters	29.573
Pints	Liters	0.473
Quarts	Liters	0.946
Gallons	Liters	3.785
Ounces	Grams	28.349
Pounds	Kilograms	0.454
Short Tons	Metric Tons	0.907
Pound-Feet	Newton-Meters	1.356
Pounds Per Square Inch	Kilopascals	6.895
Miles Per Gallon	Kilometers Per Liter	0.425
Miles Per Hour	Kilometers Per Hour	1.609

TO CHANGE	TO	MULTIPLY BY
Centimeters	Inches	0.394
Meters	Feet	3.280
Meters	Yards	1.094
Kilometers	Miles	0.621
Square Centimeters	Square Inches	0.155
Square Meters	Square Feet	10.764
Square Meters	Square Yards	1.196
Square Kilometers	Square Miles	0.386
Square Hectometers	Acres	2.471
Cubic Meters	Cubic Feet	35.315
Cubic Meters	Cubic Yards	1.308
Milliliters	Fluid Ounces	0.034
Liters	Pints	2.113
Liters	Quarts	1.057
Liters	Gallons	0.264
Grams	Ounces	0.035
Kilograms	Pounds	2.205
Metric Tons	Short Tons	1.102
Newton-Meters	Pound-Feet	0.738
Kilopascals	Pounds Per Square Inch	0.145
Kilometers Per Liter	Miles Per Gallon	2.354
Kilometers Per Hour	Miles Per Hour	0.621



PIN: 064521-000