TM 11-5855-213-10

TECHNICAL MANUAL

OPERATOR'S MANUAL

NIGHT VISION SIGHT, INDIVIDUAL SERVED WEAPON AN/PVS-4 (NSN 5855-00-629-5334) (EIC: IPJ)

HEADQUARTERS, DEPARTMENT OF THE ARMY

1 FEBRUARY 1993

CHANGE 1

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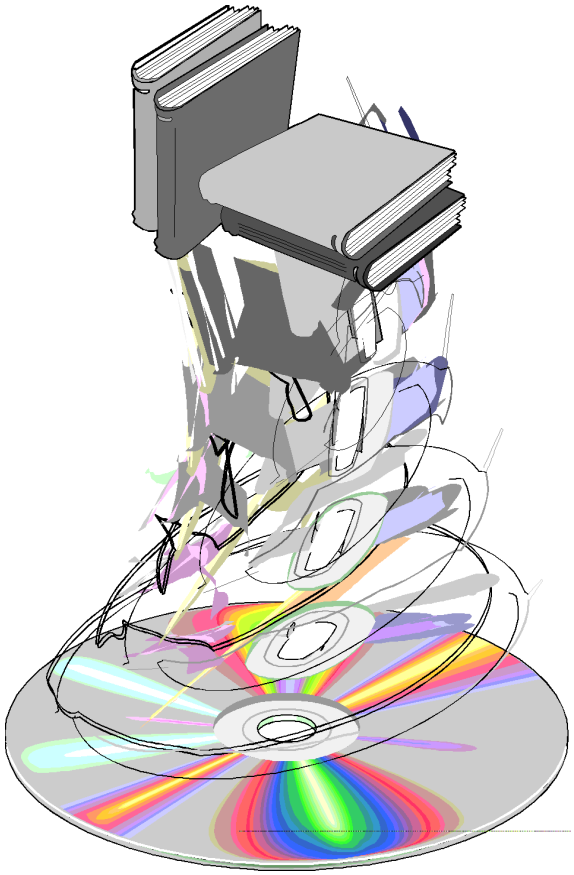


WARNING

To avoid equipment damage and personnel injury when using the sight, carefully read and understand the following warnings:

- The sight effectiveness is impaired by rain, fog, sleet, snow, smoke, and other reflective matter.
- DO NOT use sight without eyeguard attached or weapon recoil may cause personal injury.
- Extreme care should be taken to see that no stray light is visible from sight when in operation (to prevent detection by the enemy).
- Make sure there are no ammunition rounds in the weapon before attempting to install mounts. Weapon must be on SAFE.
- The batteries used in sight require special handling to avoid possible physical harm or equipment damage. Return all used or damaged batteries to Property Disposal.

WARNING

The BA-5567/U (lithium) battery contains sulphur dioxide gas under pressure and should be handled in the following manner:

- If the battery compartment becomes hot to touch and you hear a hissing sound (i.e., battery venting) or smell irritating sulfur dioxide gas, IMMEDIATELY turn off the equipment. Wait until battery has cooled before removing it.

- DO NOT heat, puncture, disassemble, test for capacity, short circuit, attempt to recharge, or otherwise tamper with battery.

- Batteries have a safety vent to prevent explosion. When they are venting gas, you will smell gas, your eyes may become irritated, or you may hear the sound of gas escaping. When safety vents have operated, batteries are fairly safe from bursting, but will be hot and must be handled with care.

WARNING

- DO NOT open plastic storage bag if cardboard box inside bag is stained or there is liquid visible inside bag.
- You can tell the difference between Mercury battery, BA-1567/U, and lithium battery, BA-5567/U, by the plastic sleeve. The lithium battery has a black band around the top and bottom of plastic sleeve. The lithium battery may be disposed of only in a sanitary landfill.
- DO NOT use batteries which look bulged or have burst. Turn these batteries in to the Property Disposal Office. Contact your unit safety officer for help with large quantities of bulged or burst batteries.
- DO NOT use water to extinguish lithium battery fire if a shock hazard exists due to high voltage electrical equipment in the immediate vicinity (i.e., greater than 30 volts, alternating current (ac) or direct current (dc).

WARNING

- DO NOT use two lithium batteries in the sight at the same time.

NBC DECONTAMINATION

- If the sight is exposed to NBC (nuclear, biological, chemical) decontamination chemicals, replace those parts of the sight that absorb the chemicals, such as the eyeguard cushion, and carrying case insert. Decontamination chemicals absorbed into these items could irritate the skin.

TOXIC MATERIAL

- The image intensifier phosphor screen contains toxic materials.

- A broken image intensifier maybe caused from damage to the sight, especially if the sight housing is cracked by force.

- If an image intensifier breaks, be extremely careful to avoid inhaling the phosphor screen material. Do not aHow the material to come in contact with the mouth or open wounds on the skin.

WARNING

TOXIC MATERIAL

- If the phosphor screen material contacts your skin, wash it off immediately with soap and water.

- If you inhale/swallow any phosphor screen material, drink a lot of water, induce vomiting, and seek medical attention as soon as possible.

FIRST AID

For first aid or artificial respiration, see FM 21-11, First Aid for Soldiers.

TECHNICAL MANUAL
No. 11-5855-213-10

HEADQUARTERS
DEPARTMENT OF THE ARMY
1 February 1993, Washington, D.C.

OPERATOR'S MANUAL

NIGHT VISION SIGHT INDIVIDUAL SERVED WEAPON AN/PVS-4 (NSN 5855-00-629-5334) (EIC: IPJ)

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, or DA Form 2028 (Recommended Changes to Publications and Blank Forms), to: Commander, U.S. Army Communications-Electronics Command and Fort Monmouth, ATTN: AMSEL-LC-LM-LT, Fort Monmouth, NJ 07703-5007. A reply will be furnished to you.

*This manual supersedes TM 11-5855-213-10 dated 1 April 1992.

TABLE OF CONTENTS

TABLE OF CONTENTS (Continued)

TABLE OF CONTENTS (Continued)

TABLE OF CONTENTS (Continued)

HOW TO USE THIS MANUAL

Usage

You must familiarize yourself with the entire manual before operating the equipment. Read and follow all WARNINGS.

The End Item Code (EIC) appears on the front cover for your convenience to use on various forms.

Manual Overview

The table of contents includes the paragraph number, paragraph title, and page number for each chapter. An index provides additional references to the subject contents.

Special Features

On the front cover certain section titles are boxed and at the right edge of each box is a blackened area. This blackened area matches a black mark appearing on the first page of that section in the manual.

CHAPTER 1
INTRODUCTION

Section I. General Information

1-1 SCOPE

This manual provides instructions for the operator to use and maintain the AN/PVS-4, (fig. 1-1) Night Vision Sight, Individual Served Weapon. The sight is a self-contained night vision device that enables improved night vision using available light from the night sky (moon, stars, skyglow, etc.).

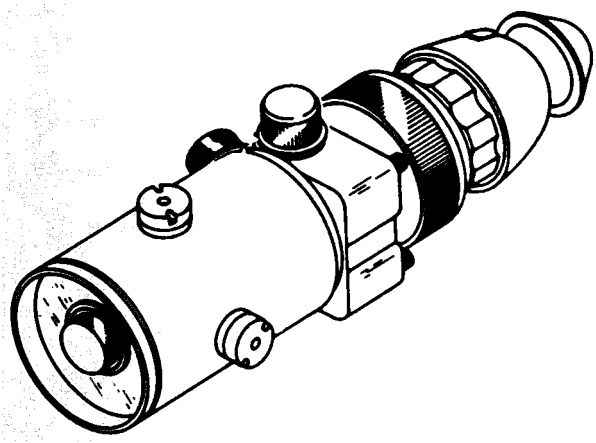


Figure 1-1. Night Vision Sight, Individual Served Weapon.

1-2 MAINTENANCE FORMS AND PROCEDURES

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)) (Maintenance Management UPDATE).

1-3 CORROSION PREVENTION AND CONTROL (CPC)

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

While corrosion is typically associated with rusting metal, it can also include deterioration of other materials such as rubber and plastic. Unusual cracking, softening, swelling, or breaking of these other materials maybe a corrosion problem.

If a corrosion problem is identified, report it using Standard Form 368, Product Quality Deficiency Report use words such as “corrosion, ” “deterioration,” or “cracking” to ensure that the information is identified as a CPC problem. Submit the form to the address specified in DA PAM 738-750.

1-4 DESTRUCTION OF ARMY MATERIEL TO PREVENT ENEMY USE

Destruction of Army electronics materiel to prevent enemy use shall be in accordance with TM 750-244-2, Destruction of Electronic Materiel to Prevent Enemy Use.

1-5 REPORTING EQUIPMENT IMPROVEMENT RECOMMENDATION (EIR)

If your equipment needs improvement, let us know. Send us an EIR. You, the user, are the only one who can tell us what you don't like about your equipment. Let us know why you don't like the design or performance. Put it on an SF 368 (Quality Deficiency Report). Mail it to us at Commander, U.S. Army Communications-Electronics Command, ATTN: AMSEL-PA-MA-D, Fort Monmouth, NJ 07703-5007, We will send you a reply.

1-6 WARRANTY INFORMATION

The AN/PVS-4 is warranted until the warranty expiration date on the name plate, Refer to warranty card for procedures for returning defective warranted items. Report all defects in material and workmanship to your supervisor, who will take appropriate action.

1-7 NOMENCLATURE CROSS-REFERENCE LIST

Table 1-1 provides a cross reference of nonofficial terms.

Table 1-1. Nomenclature Cross-Reference List

COMMON NAME	OFFICIAL NOMENCLATURE
Sight	Night Vision Sight, Individual Served Weapon AN/PVS-4

1-8 LIST OF ABBREVIATIONS

CRC Corrosion Prevention and Control
EIR Equipment Improvement Recommendation
NBC Nuclear Biological Chemical
SF Standard Form
SAW Squad Automatic Weapon
Vdc Voltage, direct current

1-9 GLOSSARY

BLACK SPOTS - These are blemishes in the image area of the sight (lens).

CAUTION - Conditions, practices, or procedures that must be observed to avoid damage to equipment, destruction of equipment, or a long-term health hazard.

CHICKEN WIRE - An irregular pattern of dark thin lines in the field of view either throughout the image area or in parts of the image area.

DARK (OR DARK AREA) - A place in which there is little light. It does not mean total darkness. Generally, this means conditions similar to a quarter- moon or starlight.

DIOPTER-A unit of refractive power of a lens. In a lens system, such as the eyepiece lens, it is equal to the reciprocal of the focal length measured in meters.

1-9 GLOSSARY (Continued)

EDGE GLOW - This is a defect in the image area of the sight. Edge glow is a bright area (sometimes sparkling) in the outer portion of the viewing area.

EMISSION POINTS - A steady or fluctuating pinpoint of bright light in the image area that does not go away or is faintly visible when all light is blocked from the objective lens of the monocular.

FIXED-PATTERN NOISE - This is usually a blemish in the image area characterized by a faint hexagonal (honeycomb) pattern throughout the viewing area that most often occurs at high-light or when viewing very bright lights.

FLASHING This is a defect in the image area. The image may appear to flicker flash.

FLICKERING - See flashing.

IMAGE INTENSIFIER ASSEMBLY- An electro-optical device inside the sight that detects and amplifies ambient light to produce a visual image. It consists of a photocathode, microchannel plate, phosphor screen optics, and integral power supply.

INFINITY FOCUS - Adjustment of the objective lens so that a distant object, such as a target (tree) or the point light on a distant tower, forms the sharpest image.

INTERMITTENT OPERATION - See flashing.

1-9 GLOSSARY (Continued)

NOTE - Essential information of special importance, interest, or aide in job performance.

OBJECTIVE ASSEMBLY - This consists of an objective lens cell and an objective focus ring. It attaches to the front of the night sight housing and adjusts for variations in distance to the viewed area or object.

SHADING - This is a defect in the image area of the night sight, When shading occurs you will see a faded image. Shading always begins on the edges and moves inward.

WARNING - Conditions, practices, or procedures that must be observed to avoid personal injury or loss of life.

Section II. Equipment Description

1-10 EQUIPMENT CHARACTERISTICS, CAPABILITIES, AND FEATURES

The AN/PVS-4 is a passive battery-operated night sight used for observation and accurate firing of individual served weapons during night time conditions (moonlight, starlight, skyglow) against targets out to 400 meters. The sight is less effective when viewing into rain, fog, sleet, snow, smoke, shadows, and other obscurants. The sight is portable and mounts to the following weapons: M16A1/A2, and M14 rifles; M203 and M79 granade launchers, M249 Squad Automatic Weapon (SAW), M60 machinegun, M67 recoilless rifle, and M72A1 rocket launcher.

1-11 LOCATION AND DESCRIPTION OF MAJOR COMPONENTS

Refer to (fig. 1-2) for location and description of major components.

a. Cap - Secures battery in battery port.

b. Battery - Provides power for sight (3.0 volts).

c. Eyepiece Assembly - Used to adjust for variations in the user's eyesight.

d. Eyeguard - Protects eye from weapon recoil.

f. Battery Housing - Contains ON/OFF reticle brightness and tube brightness switch for proper operation.

g. Objective Lens - Collects available light reflected from the scene in the field-of-view and focuses on the image intensifier.

h. AA Battery Adapter - Provides an alternative source of power for the sight.

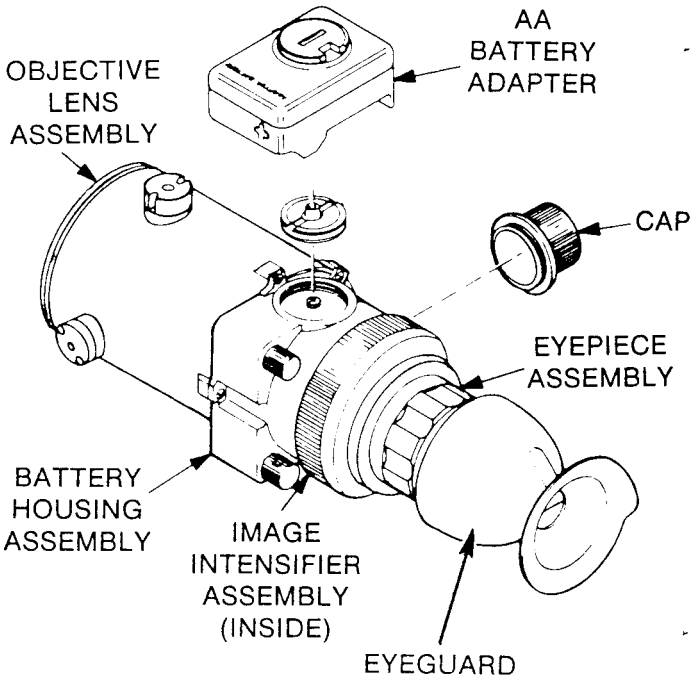


Figure 1-2. Location of Major Components.

1-12 DIFFERENCES BETWEEN MODELS

The latest AN/PVS-4 version has only one battery port to prohibit operating the sight with two BA-5567/U batteries at the same time. The early versions of the sight (pre-1990) have two battery ports. These earlier versions require the insertion of a battery port plug in the side port.

There are also four different retitles used in the sight to provide accurate firing for the selected weapons. If you do not have the correct reticle for your sight, notify unit maintenance.

1-13 EQUIPMENT DATA

The following tables provide information pertaining to the operator adjustment limits and electrical, mechanical, optical and environmental data.

Table 1-2. Operator Adjustment Limits

Item	Limits
Eyepiece focus	+2.0 to -5 1/2 diopter
Objective lens focus	25.0 meters to infinity
Reticle adjustment	+ or -2.5” (in 1/4mil increments)

1-13 EQUIPMENT DATA (Continued)

Table 1-3. Electrical Data

Item	Limits
Battery , lithium (BA-5567/U)	
Voltage,	3.0 volts
Estimated Ceil Life	
(Two Batteries),	
100°F	32 Hrs
70°F	32 Hrs
0°F	24 Hrs
-20°F	18 Hrs
Battery, AA Alkaline (BA-3058/U)	
Voltage	1.5 Vdc (2)
Estimated Cell Life	
(Two Batteries)	
100°F	50 Hrs
70°F	40 Hrs
0°F	24 Hrs
-20°F	10 Hrs

1-13 EQUIPMENT DATA (Continued)

Table 1-4. Mechanical Data

Item	Data
Sight weight	4.0 lbs

Table 1-5. Optical Data.

Item	Data
Magnification	3.6X
Field of view	14.5”
Range	400-600 meters (for man target) in starlight and moon-light.

1-13 EQUIPMENT DATA (Continued)

Table 1-6. Environmental Data.

Item	Limits
Operating Temperature	-60°F (-51°C) to +126°F (+52°C)
Storage Temperature	-60°F (-51°C) to + 154°F (+68°C)
Illumination Required	Overcast Starlight to Moonlight

Section III. Principles of Operation

1-14 MECHANICAL FUNCTIONS

The mechanical functions of the AN/PVS-4 allow for differences in the physical features of individual operators and provide for operating the system. These functions include adjustments for on-off tube brightness, on-off reticle brightness, eyepiece diopter focus ring, and objective focus ring, Also includes reticle elevation adjustment actuator and reticle azimuth adjustment actuator which controls reticle adjustments up or down and right or left.

1-15 OPTICAL FUNCTIONS

a. Objective Lens Assembly. The objective lens assembly collects available light reflected from the scene in the field-of-view, magnifies the scene by a factor of 3.6, and focuses the light on the cathode of the image intensifier (fig. 1-3). The image intensifier receives light in the form of luminous energy, amplifies it, and projects it onto the screen of the image intensifier where it is received by the eyepiece assembly as an intensified image.

b. Eyepiece Assembly. The eyepiece assembly magnifies the image display on the screen of the image intensifier and focuses the image to the user's eye. The assembly is adjustable over a range from +2 to -5 1/2 diopters to accommodate for difference in user eyesight. The reticle projector located in the center of the objective lens assembly projects a reticle pattern on the cathode of the image intensifier where it is combined with the viewed scene and becomes a part of the sight picture.

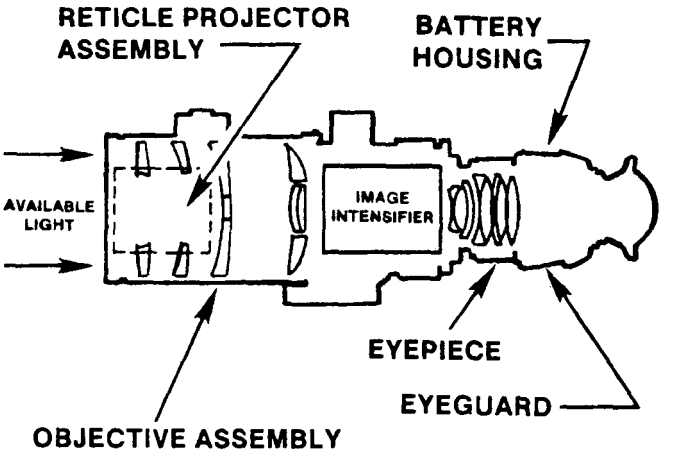


Figure 1-3. Optical Diagram.

1-16 ELECTRICAL FUNCTIONS

a. Power source. One 3.0 vdc battery (BA-5567/U) or two 1.5 vdc (BA 3058/U) batteries provide power for the image intensifier and reticle projector assembly.

b. Electrical Function. Power from the baftey is supplied to the image intensifier when the tube brightness ON/OFF switch is turned ON. Power to the light emitting diode in the reticle assembly is controlled by the reticle brightness switch.

CHAPTER 2
OPERATING INSTRUCTIONS

Section I. Description and Use of Operator's Controls and Indicators

2-1 OPERATOR'S CONTROLS AND INDICATORS

Operator's controls and indicators on the sight are described in table 2-1 and figures 2-1 through 2-4.

NOTE

Before attempting to use sight, make certain you are familiar with the location and operation of all controls and indicators.

Table 2-1. Controls and Indicators

NAME	FUNCTION
ON-OFF/TUBE BRIGHTNESS	Applies power to sight, Controls brightness of image intensifier.
IMAGE INTENSIFIER	Glows green when power is applied.
ON-OFF RETICLE BRIGHTNESS	Applies power to reticle and controls brightness of reticle.

Table 2-1. Controls and Indicators (Continued)

NAME	FUNCTION
OBJECTIVE FOCUS RING	Adjusts system focus from 25 meters to infinity.
DIOPTER FOCUS RING	Adjusts system focus of eyepiece.
DIOPTER INDICATOR	Indicates direction of rotation of diopter focus ring for + or - diopter.
RETICLE AZIMUTH ADJUSTMENT ACTUATOR	Controls reticle adjustment right or left. Each click of adjustment moves strike of round fired 1.0 inch at 100 meters.
RETICLE ELEVATION ADJUSTMENT ACTUATOR	Controls click of adjustment up or down. Each click of adjustment moves strike of round fired 1.0 inch at 100 meters.

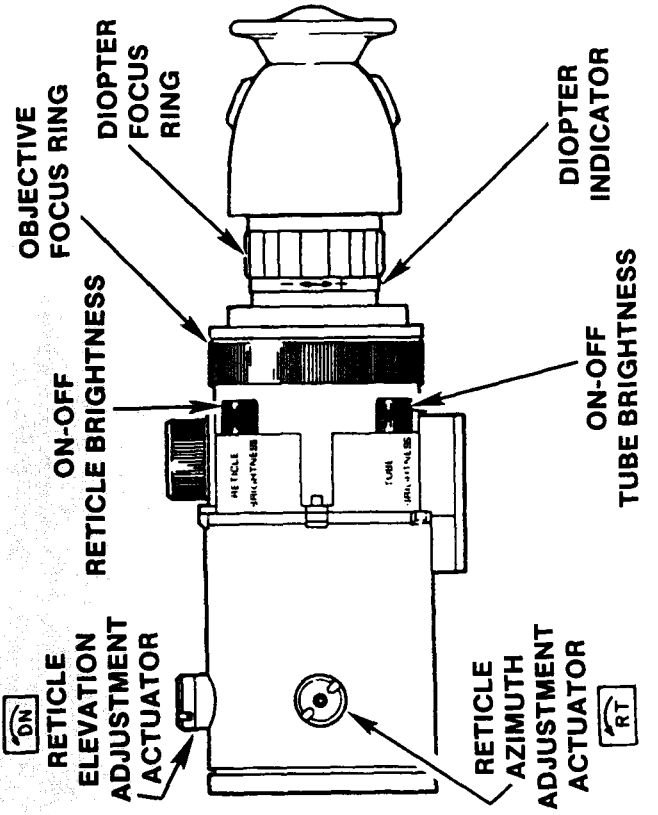


Figure 2-1. Controls and Indicators, AN/PVS-4.

Table 2-1. Controls and Indicators (Continued)

NAME	FUNCTION
RETICLE PATTERNS	Indicate aiming point of weapons and provides ranging information.
M203 ADAPTER BRACKET LOCKING KNOB AND RANGE SCALE	Locking knob secures adapter bracket at predetermined elevation setting. Range scale indicates estimated distance to target (fig. 2-2).
M79 ADAPTER BRACKET LOCKING KNOB AND RANGE SCALE	Range scale indicates estimated distance to target corresponding to evaluation setting of bracket (fig. 2-3).
M72A1 ADAPTER BRACKET LOCKING SCREW	Compensates for cold weather difference in aiming. Should be in “C” position at temperature below 32° F. (fig. 2-4).
M72A1 ADAPTER BRACKET AN/PVS-4 POSITION	Lever assembly shoulder screw is positioned in threaded hole, indicating the Night Vision Device to be used. (fig. 2-4).

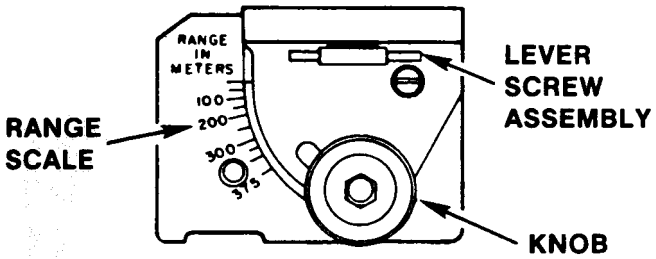


Figure 2-2. M203 Mounting Bracket.

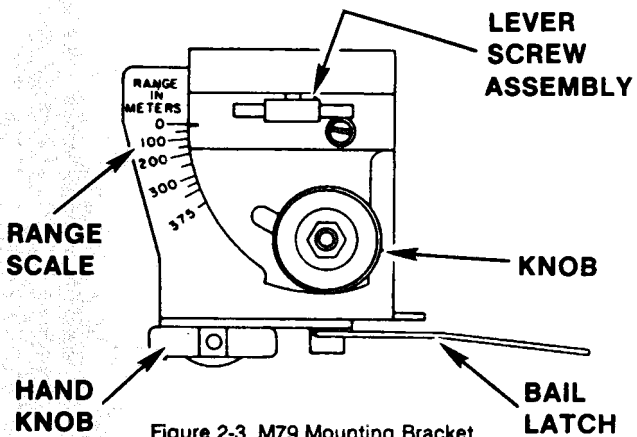


Figure 2-3. M79 Mounting Bracket.

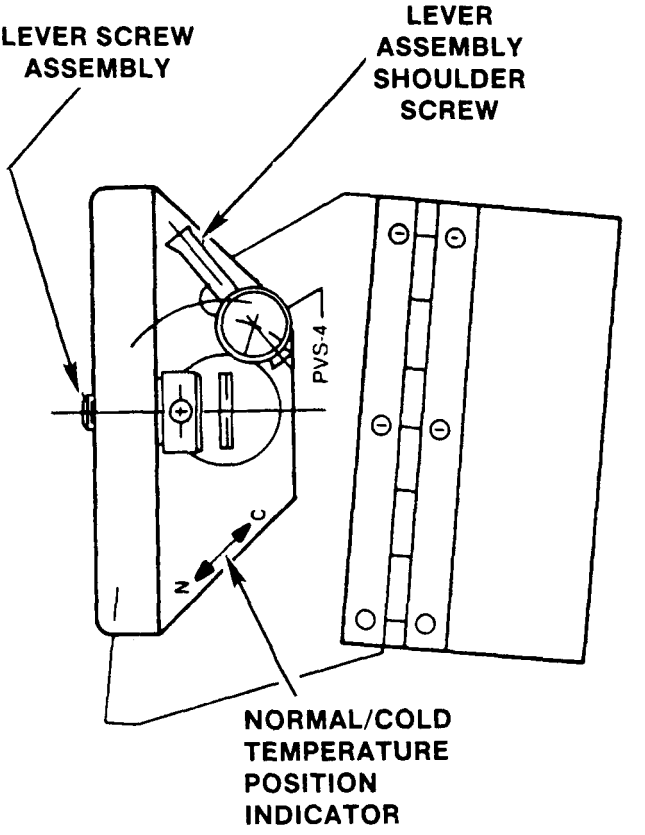


Figure 2-4. M72A1 Mounting Bracket.

Section II. Preventive Maintenance Checks and Services

2-2 PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS)

a. General. Table 2-2 (PMCS table) has been provided so you can keep your equipment in good operating condition and ready for its primary mission.

b. Warnings and cautions. Always observe the WARNINGS and CAUTIONS appearing in your PMCS table. Warnings and cautions appear before applicable procedures. You must observe these WARNINGS and CAUTIONS to prevent serious injury to yourself and others or prevent your equipment from being damaged.

c. Explanation of table entries.

(1) Item number column. Numbers in this column are for reference. When completing DA Form 2404 (Equipment Inspection and Maintenance Worksheet), include the item number for the check/service indicating a fault. Item numbers also appear in the order that you must do checks and services for the intervals listed.

2-2 PMCS (Continued)

(2) Interval column. This column tells you when you must do the procedure in the procedure column. BEFORE procedures must be done before you operate or use the equipment for its intended mission. DURING procedures must be done during the time you are operating or using the equipment for its intended mission. AFTER procedures must be done immediately after you have operated or used the equipment.

(3) Location, item to check/service column. This column provides the location and the item to be checked or serviced. The item location is underlined.

(4) Procedure column. This column gives the procedure you must do to check or service the item listed in the Check/Service column to know if the equipment is ready or available for its intended mission or for operation. You must do the procedure at the time stated in the interval column.

(5) Not Fully Mission Capable If: Column. Information in this column tells you what fault will keep your equipment from being capable of performing its primary mission. If you make check and service procedures that show faults listed in this column, do not operate the equipment Follow standard operating procedures for maintaining the equipment or reporting equipment failure.

c. Other Table Entries

Be sure to observe all special information and notes that appear in your table.

2-2 PMCS (Continued)

Table 2-2. Preventive Maintenance Checks and Services For Night Sight

Item No	Interval	Location Item Service	Procedure	Not Fully Mission Capable if:
1	Before	Sight	Inspect for dirt and moisture cm external surfaces and parts. Clean and dry with lint-free cloth (para 3-2).	
2	Before	Carrying bag	Inspect for dirt, moisture, and mildew. Clean and dry with lint-free cloth (para 3-2).	
3	Before	Battery Cap	Inspect for corrosion, damaged contact, spring tension and cap damaged.	Contacts corroded or damaged or spring is missing.

Table 2-2. PMCS (Continued)

Item No	Inteval	Location Item Service	Procedure	Not Fully Mission Capable if:
4	Before	Daylight cover	Inspect for dirt or cracks in cover or broken lenses. Rotate holder to be sure that all apertures can be used.	If daylght cover is missing or damaged.
5.	Before	Controls	Inspect each switch, and control for smooth mechani cal action.	If knob, switch or control binds or sticks.
6	During	ON-OFF/ tube brightness	Install battery (para 2-3b). Turn switch to ON position. Image intensifier should glow green. Color intensity should change as switch is rotated.	Green glow absent in image intensifier or itensity does not vary.

Table 2-2. PMCS (Continued)

Item No	Interval	Location Item	Service	Procedure	Not Fully Mission Capable If:
7	During	ON-OFF/ reticle brightness control		Turn switch to ON position. Rotate control and check for change in reticle intensify.	Reticle cannot be seen or intensity does not vary.
8	During	Diopter focus ring		Turn reticle ON. Inspect for smooth move- ment and adjust for sharp image of reticle.	Binding of focus ring or inability to obtain sharp focus of the reticle.
9	During	Reticle display		Turn reticle ON. Check for correct reticle pattern for indfidual weapon (para 2-8).	Incorrect reticle is displayed.
10	During	Objective focus ring		Check for smooth movement.	Ring binds.
11	During	Reticle azimuth adjustment knob		Rotate knob and check that reticle moves in azimuth. Return knob to original position.	Reticle does not move with each click of adjuster.

Table 2-2. PMCS (Continued)

Item No	Interval	Location Item Service	Procedure	Not Fully Mission Capable If:
12	During	Reticle elevation adjustment knob	Rotate knob and check that reticle moves in elevat ion.	Reticle does not move with each click of adjuster.
13	During	Lenses	Inspect for cleanliness scratches, chips. If necessary, clean and dry lenses (para 3-2).	scratches or chips hinder vision.
14	During	Viewed image	Check for edge glow fixed pattern noise, and resolution. Refer to inspection criteria for proper image intensifier operation checks (para 2-4a). N0TE: Operator may use the TS-4348/UV to assist in checking the viewed image (para 2-4b).	Any one or more faults distracts viewing image.

Table 2-2. PMCS (Continued)

Item No	Interval	Location Item	Service	Procedure	Not Fully Mission Capable if:
15	After	Remove battery		Turn off sight and remove battery after operation. Replace battery cap If AA battery adapter is installed, remove adapter. Replace battery cap.	
16	After	Controls		Check each knob, switch and control for smooth mechanical action.	
17	After	Sight		Inspect for dirt and moisture on external surfaces and parts. Clean and dry with lint- free cloth (para 3-2).	
18	After	Storage case		Inspect for dirt, moisture, and mildew, Clean and dry with lint-free cloth. (para 3-2).	

Section III. Operation Under Usual Conditions

2-3 ASSEMBLY AND PREPARATION FOR USE

a. Unpacking of Sight.

CAUTION

Relieve air pressure inside carrying case by depressing core of relief valve located near carrying handle before releasing latches.

(1) Release the latches and open carrying case.

(2) Check contents of case for completeness. All items of equipment listed in the Components of End Item (COEI), appendix B, should be present. Report all discrepancies to higher level of maintenance.

(3) Remove carrying bag from carrying case. Open bag and remove the sight.

(4) Examine the sight for obvious evidence of damage (cracks, chips, abrasions) and check to see that decals are readable. Report deficiencies to higher level of maintenance.

2-3 ASSEMBLY AND PREPARATION FOR USE (Continued)

b. Preparation for Battery Operation.

WARNING

- DO NOT use two BA-5567/U (lithium) batteries in the sight at the same time.
- The BA-5567/U (lithium) battery contains sulfur dioxide gas under pressure and should be handled with care.
- DO NOT open plastic storage bag if cardboard box inside bag is stained or there is liquid visible inside bag.
- Do NOT use any batteries which show sign of damage, such as bulging, swelling, disfigurement, brown liquid in the plastic wrap, a swollen plastic wrap, etc.
- DO NOT use batteries which look bulged or have burst. Turn these batteries in to the Property Disposal Office. Contact your unit safety officer to help with large quantities of bulged or burst batteries.

2-3 ASSEMBLY AND PREPARATION FOR USE (Continued)

CAUTION

Batteries must be removed when the sight is not in use to prevent accidental turn-on of the sight.

NOTE

The following procedures apply to BA-5567/U (lithium) battery only

(1) Turn the ON-OFF TUBE BRIGHTNESS switch and ON-OFF RETICLE BRIGHTNESS switch counterclockwise to OFF before installing batteries (fig. 2-1).

(2) Remove battery cap by turning counterclockwise (fig. 2-5).

(2a) If your sight has two battery ports, remove the side battery port cap and replace it with the battery port cap plug

WARNING

- DO NOT test lithium batteries for capacity
- DO NOT recharge lithium batteries.
- DO NOT use lithium batteries in parallel.

2-3 ASSEMBLY AND PREPARATION FOR USE (CONT.)

(3) Insert BA-5567/U (lithium) battery in the battery cap with negative (-) terminal facing into the cap (fig. 2-5).

(4) Replace battery cap and tighten firmly.

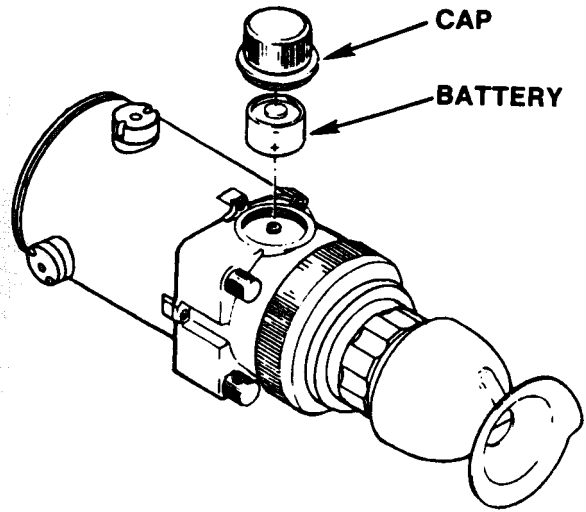


Figure 2-5. Installation of BA-5567/U (lithium) Battery.

2-3 ASSEMBLY AND PREPARATION FOR USE (Continued)

c. Installation for Battery Operation (BA-3058/U) in Battery Adapter (fig. 2-6).

NOTE

Batteries are shipped separately from the battery adapter and must be installed before operation of the sight.

(1) Remove retaining screw by turning counterclockwise.

(2) Lift off adapter housing cover.

(3) Insert AA batteries in adapter housing, observing terminal polarities marked on housing.

(4) Replace adapter housing cover.

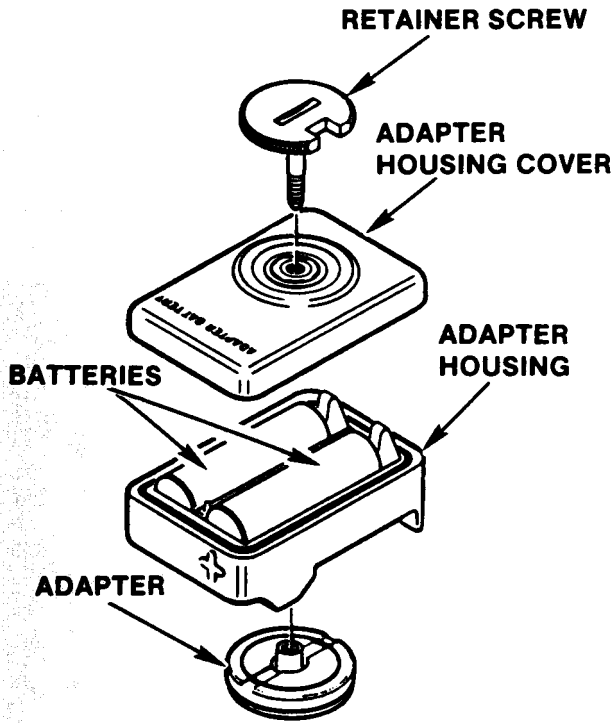


Figure 2-6. Installation of BA-3058/U in AA Battery Adapter.

2-3 ASSEMBLY AND PREPARATION FOR USE (Continued)

d. Installation of Battery Adapter (fig. 2-7).

(1) Remove top battery cap by turning counterclockwise.

(2) Remove top battery from cap

(3) Install adapter in place of top battery cap. Tighten using notched side of retainer screw as a tool.

(4) Properly position the adapter housing on the adapter.

(5) Insert retainer screw in top of housing. Turn clockwise to tighten.

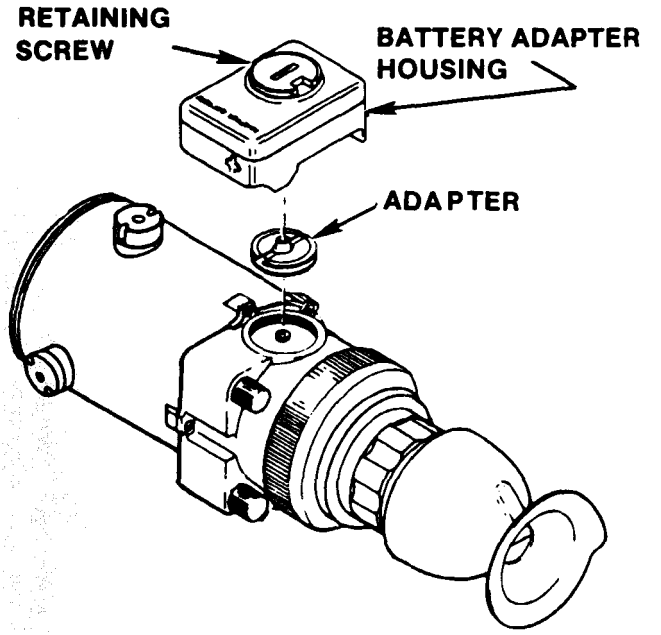


Figure 2-7. Installation of Battery Adapter.

2-3 ASSEMBLY AND PREPARATION FOR USE (Continued)

e. Installation for Daylight Cover (fig 2-8).

CAUTION

The daylight cover must be installed when operating the sight during daylight or highlight conditions to protect the image intensifier from damage. Use of the sight under high light conditions without a daylight cover will damage image intensifier,

(1) Install daylight cover by pressing cover on the objective end of the sight.

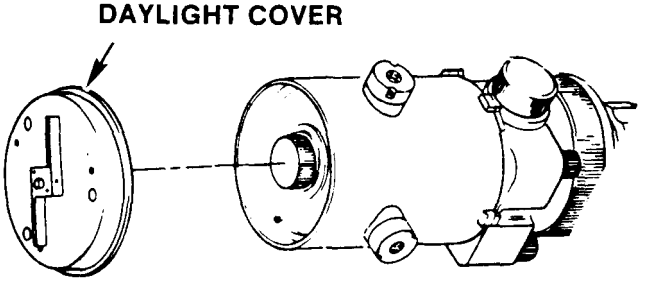


Figure 2-8. Daylight Cover.

2-3 ASSEMBLY AND PREPARATION FOR USE (Continued)

(2) Turn the external knob in the center of the cover, adjust the filter to provide the best view of the target scene and reticle. It will also be necessary to adjust tube brightness, reticle brightness, and objective focus to obtain the best sight picture. If the objective focus is not set correctly, three images or a blurred image will be seen.

2-4 INITIAL ADJUSTMENTS, CHECKS AND SELF TEST

General. This section provides information for the operator concerning what to look for, how to look for it , and how to determine if the AN/PVS-4 should be returned to the maintainer. Non-mission capable conditions for the AN/PVS-4 must be recorded on the appropriate maintenance forms so the maintainer can take corrective action. The image intensifier inspection criteria, resolution test, and zeroing procedures are mandatory for optimal performance of sight.

a. Inspection Criteria For Proper Image Intensifier Operation.

WARNING

- Image intensifier phosphor screen contains toxic materials.
- A broken image intensifier maybe caused from damage to the sight, especially if the sight housing is cracked by force.

2-4 INITIAL ADJUSTMENTS, CHECKS AND SELF TEST (Continued)

WARNING

- If an image intensifier breaks, be extremely careful to avoid inhaling the phosphor screen material. Do not allow the material to come in contact with the mouth or open wounds on the skin.
- If the phosphor screen material contacts your skin, wash it off immediately with soap and water.
- If you inhale/swallow any phosphor screen material, drink a lot of water, induce vomiting, and seek medical attention as soon as possible.

CAUTION

Perform the following inspection in a dark area or you may damage the image intensifier.

2-4 INITIAL ADJUSTMENTS, CHECKS AND SELF TEST (Continued)

The image intensifier must be checked before each use for proper operation. If maintenance personnel determines that the image intensifier peformance does not meet the specification or the operator finds that the performance interferes with his or her ability to perform the mission, he/she must record the problem on the appropriate maintenance forms and return the sight to higher level of maintenance.

To perform the following inspection, place the sight into operation (para 2-3 b).

(1) SHADING. This is a defect in the image area of the lens, When shading occurs you will see a faded image. Shading always begins on the edge and moves inward (fig. 2-9).

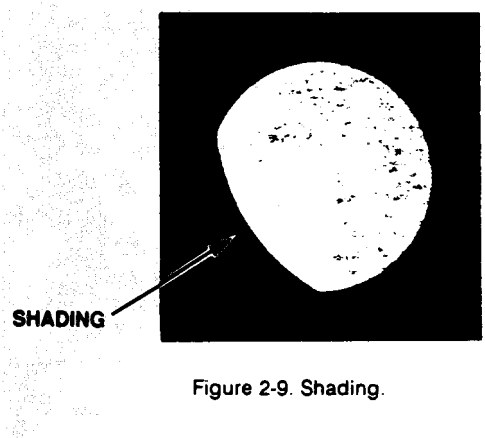


Figure 2-9. Shading.

2-4 INITIAL ADJUSTMENTS, CHECKS AND SELF TEST (Continued)

(2) EDGE GLOW. This is a defect in the image area (fig. 2-10). Edge glow is a bright area (sometimes sparkling) in the outer position of the viewing area. To check for edge glow, cover lens to block out all light, If the image intensifier is displaying edge glow, the bright area will still show up,

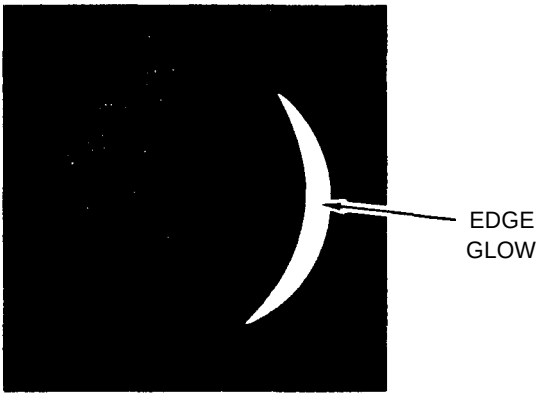


Figure 2-10. Edge Glow

(3) EMISSION POINTS - A steady or fluctuating pinpoint of bright light in the image area that does not goawayor is faintly visible when all light is blocked from the objective lens of the monocular (fig 2-3). The position of an emission point within the same image area does not moves, Not all emission points makes an image intensifier rejectable.

2-4 INITIAL ADJUSTMENTS, CHECKS AND SELF TEST (Continued)

Emission points are acceptable if they do not interfer with the ability to perform the mission. It found to be unacceptable, refer to a higher maintenance level.

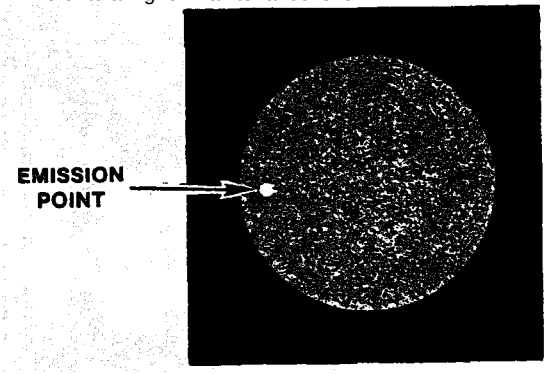


Figure 2-11. Emission Points.

(4) BLACK SPOTS. These are blemishes in the image intensifier or dirt or debris between the lens. Black spots are acceptable if they do not interfere with viewing the image. No action is required if this condition is present unless the spots or streaks interfere with the operator's ability to perform the mission.

2-4 INITIAL ADJUSTMENTS, CHECKS AND SELF TEST (Continued)

(5) FIXED-PATTERN NOISE. This is usually a blemish in the image area characterized by a faint hexagonal (honeycomb) pattern throughout the viewing area that most often occurs at high-light or when viewing very bright lights (fig. 2-12). This condition is acceptable as long as the pattern does not distract from viewing the image and interfere with the ability to perform the mission, If it remains when viewing in low-light conditions, return sight to maintainer.

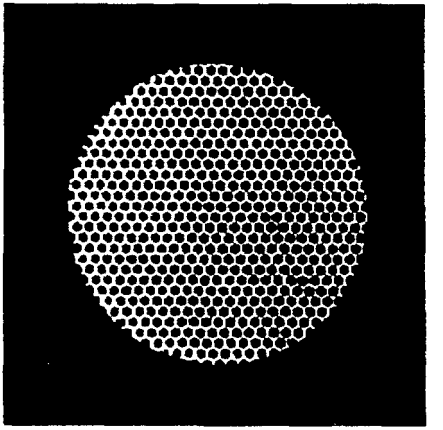


Figure 2-12. Fixed-Pattern Noise.

2-4 INITIAL ADJUSTMENTS, CHECKS AND SELF TEST (Continued)

(6) CHICKEN WIRE. An irregular pattern of dark thin lines in the field of view either throughout the image area or in parts of the image area (fig. 2-13). These lines are caused by defective fibers that do not transmit light occurring at the boundaries of fiber bundles in the output optic of the image intensifier. No action is required if this condition is present unless it distracts from viewing the image and interferes with ability to perform the mission.

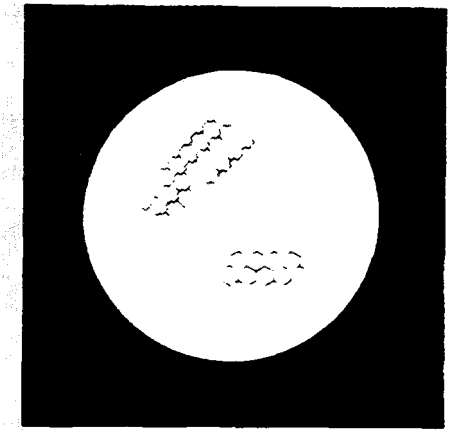


Figure 2-13. Chicken Wire.

2-4 INITIAL ADJUSTMENTS, CHECKS AND SELF TEST (Continued)

(7) FLASHING, FLICKERING or INTERMITTENT OPERATION - The image may appear to flicker or flash. Flashing or flickering may result from improper connections, intermittent power source, or low battery. Check battery or power source, if condition continues, refer to higher level of maintenance.

b. Resolution Test

NOTE

Testing should be performed in a dark location.

(1) Attach the test set (TS-4348/UV) with the adapter to the sight (fig. 2-14).

NOTE

Due to the size of the sight it is recommended that the sight be mounted or supported.

(2) Select High Light test by setting the High/Low switch to high.

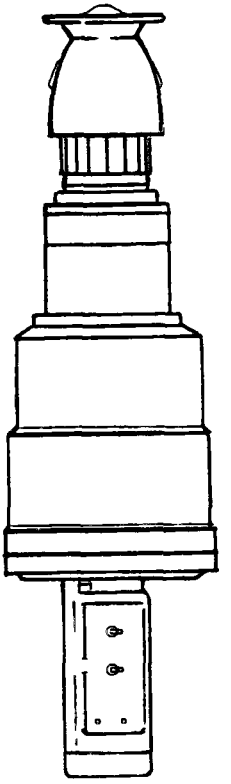


Figure 2-14. Test Set, TS-4348/UV, AN/PVS-4.

2-4 INITIAL ADJUSTMENTS, CHECKS AND SELF TEST (Continued)

(3) Turn on the test set by selecting the switch II position and check that the test set is operating by checking the green POWER ON light.

(4) Look through the sight and view the test pattern as shown in fig. 2-15.

(5) Turn the reticle on and adjust the eyepiece focus to obtain the sharpest view of the reticle, then turn reticle off, Adjust the objective lens focus to obtain the sharpest view of the test pattern.

(6) Determine the group number and element number of the smallest pattern resolvable.

(7) The sight must be able to resolve group 4, element 4 to pass the test, For a pattern to be resolvable, three vertical bars and three horizontal bars must be visible.

(8) If sight does not pass the test refer to higher level of maintenance.

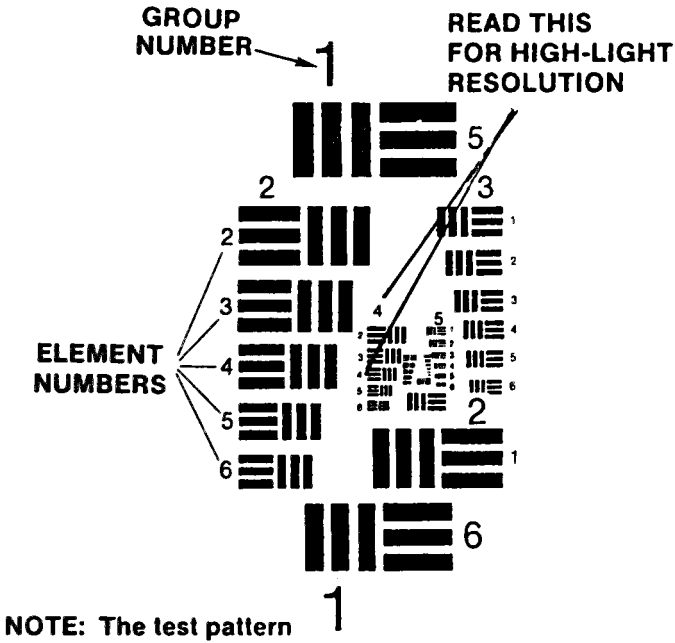


Figure 2-15. Testing Set Test Pattern

2-5 OPERATING PROCEDURES

General. This section contains instructions for placing the AN/PVS-4 in operation, and to operate it under normal conditions. The function of controls and indicators is explained,

Preparation for Operation.

WARNING

DO NOT use sight without eyeguard attached or weapon recoil may cause personnel injury.

CAUTION

The sight is a precision electro-optical instrument and must be handled carefully at all times.

Daylight cover must be installed when operating the sight during daylight to protect the image intensifier from damage.

NOTE

Familiarize yourself with all warnings at front of this TM before operating sight.

2-5 OPERATING PROCEDURES (Continued)

(1) Turn the ON-OFF/TUBE BRIGHTNESS switch and ON-OFF/RETICLE BRIGHTNESS switch counterclockwise to OFF before installing batteries (fig. 2-1).

(2) Install batteries. Refer to para 2-3b.

WARNING

Extreme care should be taken to see that no stray light is visible from sight when in operation (to prevent detection by the enemy).

(3) Press your eye against the eyeguard to open the rubber leaves that prevent emission of stray light.

(4) Turn the ON-OFF/TUBE BRIGHTNESS control as shown in (fig. 2-1), clockwise to turn on the sight.

NOTE

If equipment fails to operate, refer to trouble-shooting procedures in Chapter 3.

WARNING

The sight effectiveness is impaired by rain, fog, sleet, snow, smoke, and other reflective matter.

(5) Adjust the ON-OFF/TUBE BRIGHTNESS control to the setting that provides the best target-to-background contrast at a minimum distance of 25 meters.

2-5 OPERATING PROCEDURES (Continued)

CAUTION

Excessive reticle brightness may damage the image intensifier.

(6) Turn the ON-OFF/RETICLE BRIGHTNESS control clockwise to turn on the light emitting diode. Adjust the reticle light intensity so that the reticle is just visible against the background.

(7) Turn the diopter focus ring until you get the clearest image of the reticle pattern.

(8) Turn the objective focus ring until the target in the field of view is sharply defined at aiming distance of 25 meters.

(9) Turn the ON-OFF/RETICLE BRIGHTNESS and ON-OFF/TUBE BRIGHTNESS control fully counterclockwise to off position when you are through using the sight. Remove battery or battery adapter.

2-6 PREPARATION FOR MOVEMENT

Preparation for shutdown and storage.

(1) Turn the power switch to the OFF position and green glow will fade.

- DO NOT dispose of batteries in fire. Do not short circuit or otherwise tamper with battery. Return batteries to property disposal officer for disposal.

- You can tell the difference between Mercury and Lithium batteries by the plastic sleeve. The lithium battery has a black band around the top and bottom of plastic sleeve. The lithium battery may be disposed of only in a sanitary landfill.

(2) Remove battery or battery adapter.

(3) Check equipment for damage and perform all “after” PMCS procedures for preparation for movement or storage.

2-7 INSTALLATION OF NIGHT VISION SIGHT ON INDIVIDUAL SERVED WEAPON

General. Special mounting bracket assemblies, knobs, and locking devices are provided to mount the sight on the M249 Squad Automatic Weapon (SAW), M14 and M16A1/A2 rifles, recoilless rifle, M60 machinegun, and M203 grenade launcher, and M72A1 rocket launchers. Select the proper bracket assembly and install the bracket and sight as described below.

WARNING

Be sure there are no rounds in the weapon before attempting to install mounts. Weapon must be on SAFE.

NOTE

- Reticle for appropriate weapons must be requisitioned separately from brackets.
- Visually inspect each mounting bracket assembly (or mounting knob) for obvious damage or missing parts. Pay particular attention to stripped threads on the lever screw assembly and missing nuts and washers where applicable. If you are in doubt of the condition of the bracket assembly, or if the sight and bracket assembly cannot be installed as instructed, refer to higher level of maintenance.

2-7 INSTALLATION OF NIGHT VISION SIGHT ON INDIVIDUAL SERVED WEAPON (Continued)

a. M14 RIFLE (fig. 2-16).

(1) Position the sight in the groove on top of the M14 adapter bracket so the vertical scribe line on the bracket is aligned with the scribe line on the sight mounting adapter.

(2) Tighten the hexagonal head locking screw firmly with the socket head screw key (T-handle hex, wrench) provided and stored with the M14 adapter bracket, to secure the sight to the bracket.

(3) Place the sight and bracket against the left side of the M14 receiver and align the bracket with the horizontal and vertical grooves on the side of the receiver.

(4) Tighten the lever screw firmly to secure the adapter bracket to the rifle.

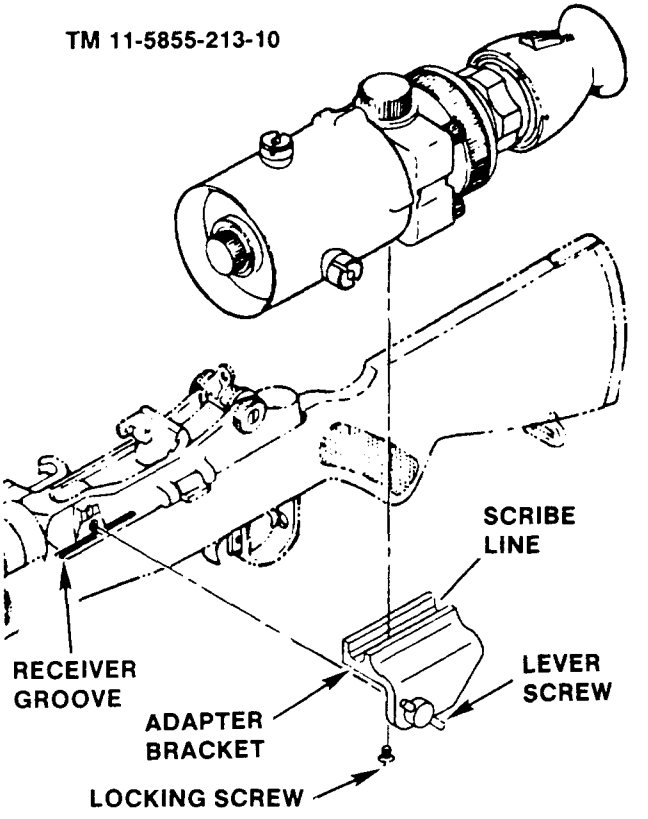


Figure 2-16. Installation of Mounting Bracket Assembly, M14.

2-7 INSTALLATION OF NIGHT VISION SIGHT ON INDIVIDUAL SERVED WEAPON (Continued)

b. M16A1/A2 RIFLE (fig. 2-17).

(1) Position the sight in the groove on top of the M16A1/A2 handle and align the threaded hole in the base of the sight mounting adapter over the hole in the handle.

(2) Insert the mounting knob assembly through the hole in the handle and screw firmly clockwise into sight mounting adapter.

(3) If difficulty is encountered, turn the sight and the rifle upside down. Place the rifle handle onto the sight mounting adapter, lining up the hole in the handle onto the sight mounting adapter. Place the mounting knob assembly through the hole in the handle and rotate clockwise.

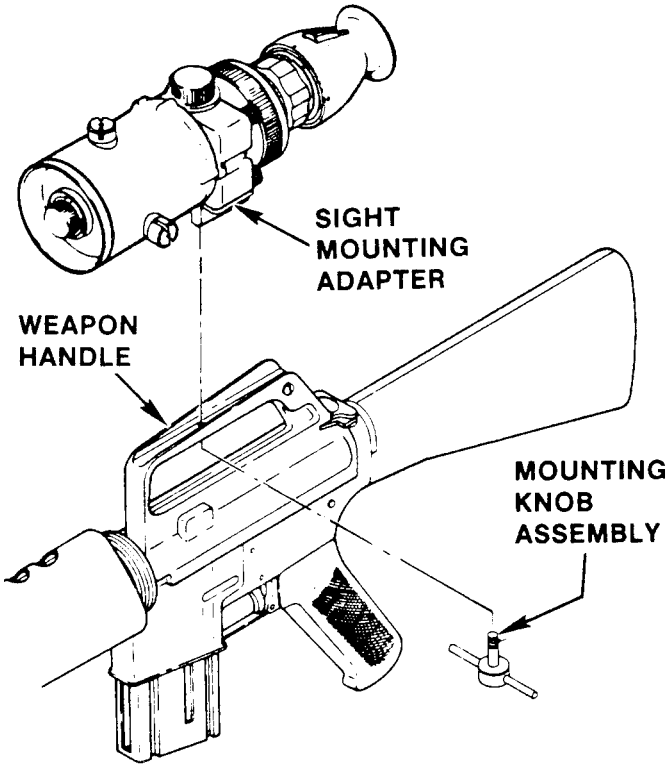


Figure 2-17. Installation of Mounting Knob Assembly M16A1/A2.

2-7 INSTALLATION OF NIGHT VISION SIGHT ON INDIVIDUAL SERVED WEAPON (Continued)

c. M203 Grenade Launcher (fig. 2-18).

NOTE

Wingnuts, flat washers and clamp plate cannot be removed.

(1) Remove the grenade launcher daylight scope if installed (Refer to TM 9-1005-249-10).

(2) Position the mounting bracket assembly on the left side of the rifle so that the two clamp plates project through the opening under the handle; wingnuts should be fully loosened.

(3) Turn the clamp plates so that the pointed ends are in the up position and seated against the handle.

(4) Tighten the wingnuts clockwise until the mounting bracket is secured firmly to the weapon.

2-7 INSTALLATION OF NIGHT VISION SIGHT ON INDIVIDUAL SERVED WEAPON (Continued)

(5) Position the sight in the groove on top of the bracket and align the threaded hole in the base of the sight mounting adapter with the lever screw assembly. Tighten the screw (fig. 2-20) firmly clockwise to secure the sight to the bracket.

(6) Set the bracket range with the target distance.

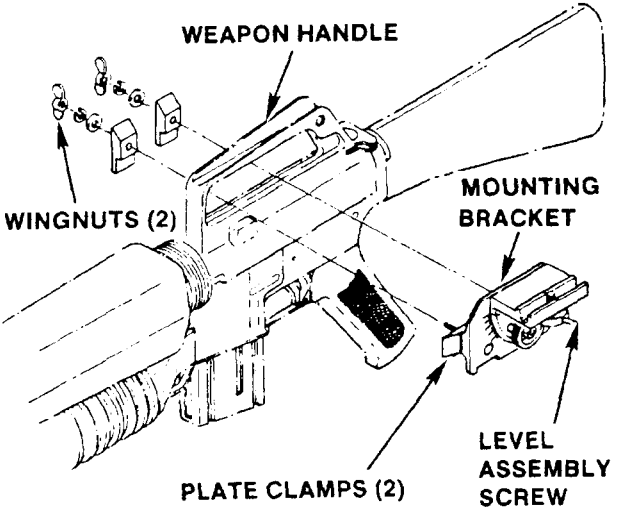


Figure 2-18. Installation of Mounting Bracket Assembly, M203.

2-7 INSTALLATION OF NIGHT VISION SIGHT ON INDIVIDUAL SERVED WEAPON (Continued)

d. M60 Machinegun (fig. 2-19).

(1) Pull the M60 bolt to the rear and put the weapon on SAFE.

(2) Raise the M60 feed cover and remove the hinge pin from the cover assembly by removing the latch inside the hinge pin first. Place the hinge pin in the storage position on the left side of the mounting bracket then insert the latch into the hinge pin to secure.

(3) Position the mounting bracket assembly on top of the feed cover so that the holes in the front of the bracket align with cover assembly hinge pin holes.

(4) Insert the longer hinge pin supplied with the bracket from the right side through the bracket and cover assembly and secure by inserting the hinge pin latch into the left side of the pin.

(5) Loosen the wingnuts on both leg clamps and position the clamp under the cover assembly. Secure the mounting bracket by tightening the wingnuts firmly. Close feed cover.

(6) Mount the sight to the bracket by alining the scribe line on the sight and the bracket. Tighten the screw to secure the sight to the bracket.

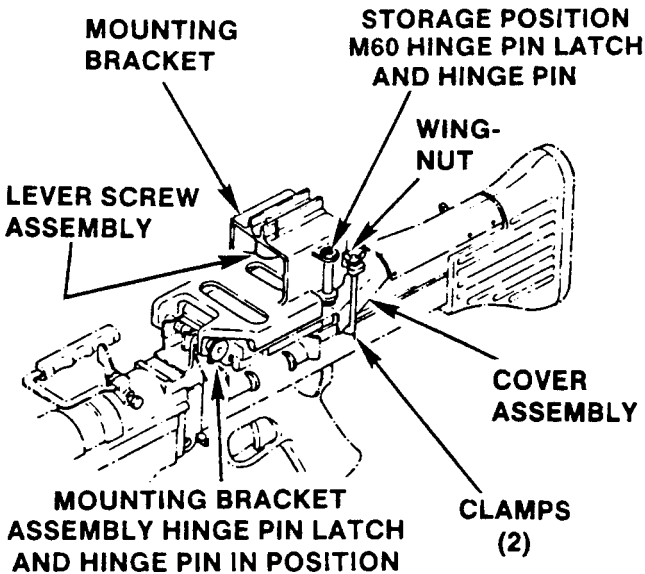


Figure 2-19. Installation of Mounting Bracket Assembly, M60.

2-7 INSTALLATION OF NIGHT VISION SIGHT ON INDIVIDUAL SERVED WEAPON (Continued)

e. M67 Recoilless Rifle (fig. 2-20).

(1) Remove the daylight scope if installed, by turning it clockwise until it stops rotating. Withdraw daylight scope, allowing it to rotate slowly counterclockwise.

(2) position the M67 mounting bracket so the index line on the bracket is aligned with the index line on the daylight scope mount. Press the bracket assembly into the mount while turning clockwise until the threads disengage and the bracket seats against the mount. Then rotate the bracket slowly counterclockwise until secure.

(3) Place the sight in the groove on the bracket so that the threaded screw hole in base of sight is aligned with the lever screw assembly and tighten the screw assembly firmly.

f. M72A1 Rocket Launcher (fig. 2-21).

(1) Place the mounting bracket assembly on top of rocket launcher so that the square cutout in the top of the bracket is around the extension release button.

(2) Swing the lower adapter section up and around the rocket launcher and secure it by turning the locking latch clockwise to engage the latch shoulder screw.

2-7 INSTALLATION OF NIGHT VISION SIGHT ON INDIVIDUAL SERVED WEAPON (Continued)

(3) Place the night sight in groove on the bracket so that threaded screw hole in base of the sight is aligned with the lever screw assembly and tighten the lever screw assembly firmly.

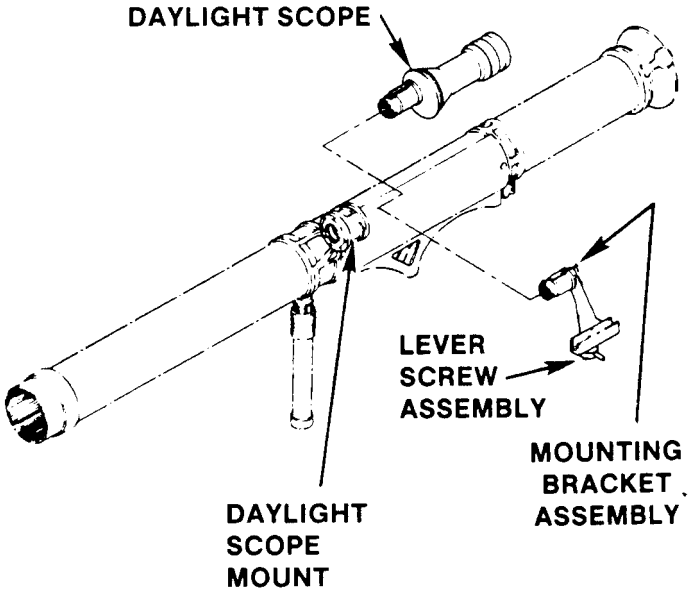


Figure 2-20. Installation of Mounting Bracket Assembly, M67.

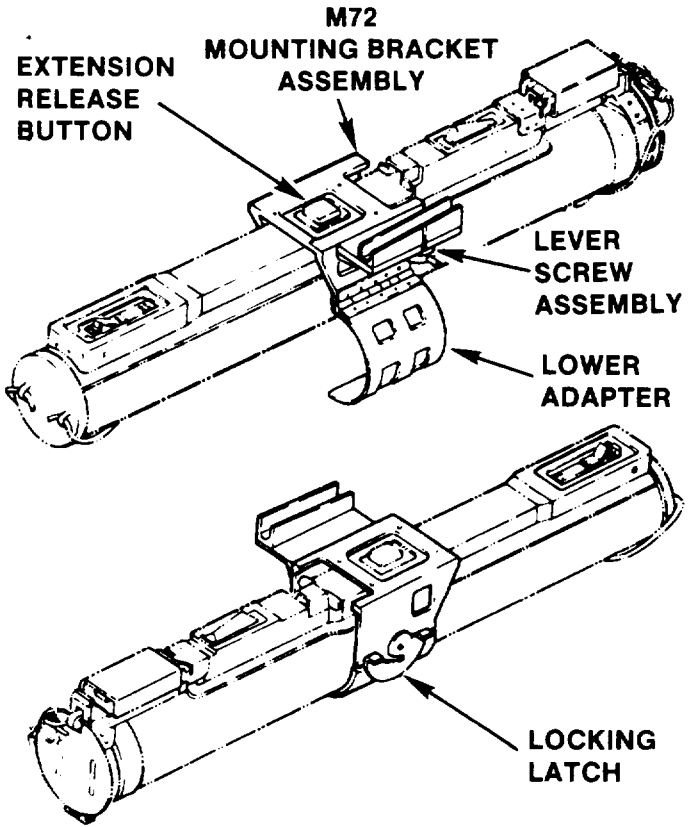


Figure 2-21. Installation of Mounting Bracket Assembly, M72A1.

2-7 INSTALLATION OF NIGHT VISION SIGHT ON INDIVIDUAL SERVED WEAPON (Continued)

g. M79 Grenade Launcher (fig 2-22).

(1) Remove the fore arm rear retaining screw which secures the forearm to the barrel of the grenade launcher.

(2) Slide the forearm forward off the grenade launcher.

(3) Position the mounting bracket assembly under the launcher just to the rear of the daylight sight.

(4) Slide the bracket back onto the receiver of the launcher until it stops.

(5) Swing the bail latch behind the trigger guard and push it up tight to launcher stock.

(6) Tighten the hand knob firmly.

(7) Install the forearm of the launcher and secure it with the rear retaining band screw.

(8) Install the sight on the bracket by placing it in the groove on top of the bracket and tightening the screw assembly.

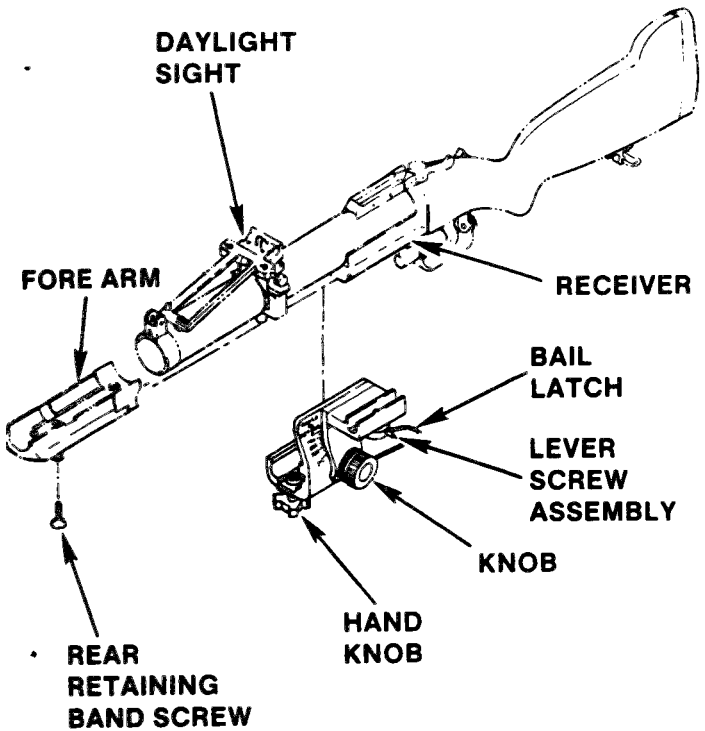


Figure 2-22. Installation of Mounting Bracket Assembly, M79.

2-7 INSTALLATION OF NIGHT VISION SIGHT ON INDIVIDUAL SERVED WEAPON (Continued)

h. M249 Weapon (fig. 2-23).

(1) Hook the bracket feet around the feed cover pin and position the bracket on top of the weapon.

(2) Turn bracket locking screw into the feed cover screw hole to secure bracket.

(3) Place the sight on the bracket aligning the sight mounting bracket locking screw.

(4) Tighten locking screw to secure night sight to bracket.

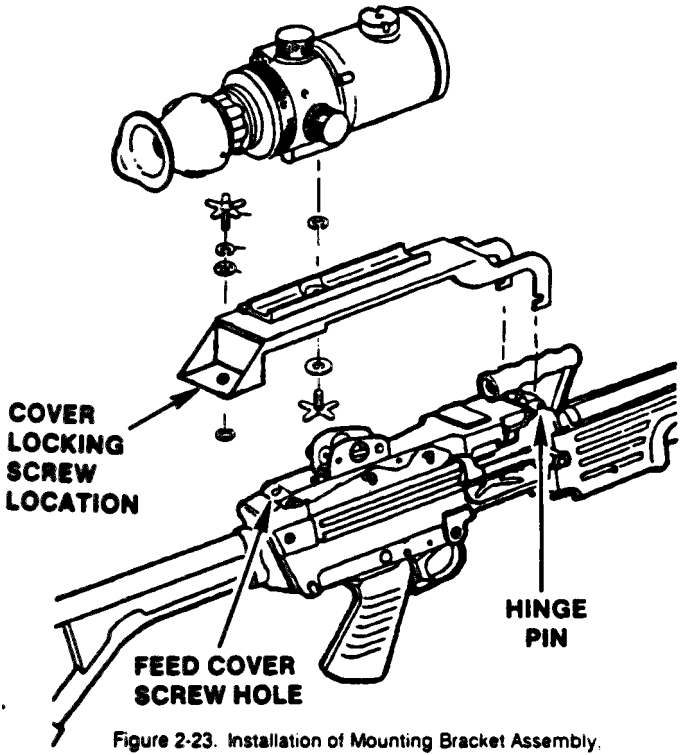


Figure 2-23. Installation of Mounting Bracket Assembly, M249, Squad Automatic Weapon.

2-8 RETICLE CELL OPERATION

WARNING

DO NOT use sight without eyeguard attached or weapon recoil may cause personal injury.

CAUTION

Excessive reticle brightness may damage the image intensifier.

NOTE

Installation and maintenance of the reticle assembly must be performed by higher level of maintenance.

a. Reticle cell for M16A1/A2, M203, and M79 weapons (fig. 2-24 and 2-25).

(1) Vertical lines at top of reticle indicate range (in hundreds of meters) of a 6 foot tall standing person. Measurement is made from the horizontal line to the top (or bottom) of each vertical line for the range indicated.

2-8 RETICLE CELL OPERATION (Continued)

(2) The horizontal line of the range scale indicates the range (in hundreds of meters) of a 20-foot target such as a tank viewed from the side. Place the left edge of the tank at the left side of the horizontal line. The range to the tank is read from the scale at the right edge of the tank, The width of the tank is approximately half the length, so replacement of the tank width on the ranging symbol is read as one-half the range scale value.

(3) Aiming points for the M16A1/A2, M203 and M79 grenade launchers are shown as small dots in a horizontal row to the right of the reticle center. Aiming points are for 200, 300, and 400 meters.

(4) The M16A1/A2 aiming point for ranges out to 250 meters is the center of the three straight lines. The top of the vertical line is the aiming point for 400 meters, and the bottom of the line is the aiming point for 600 meters.

(5) Locate target, estimate range and place the proper aiming point on the target. (For grenade launchers, also adjust the bracket to the proper elevation.)

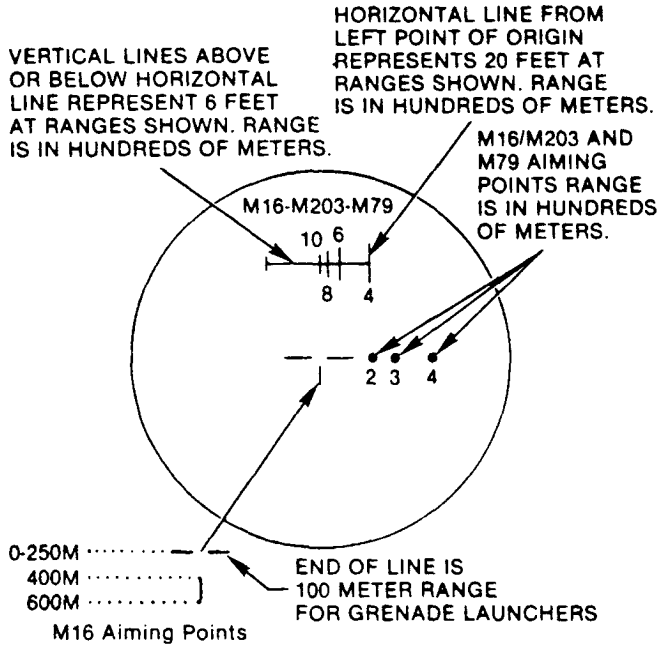


Figure 2-24. M16A1/A2, M203, and M79 Reticle Pattern

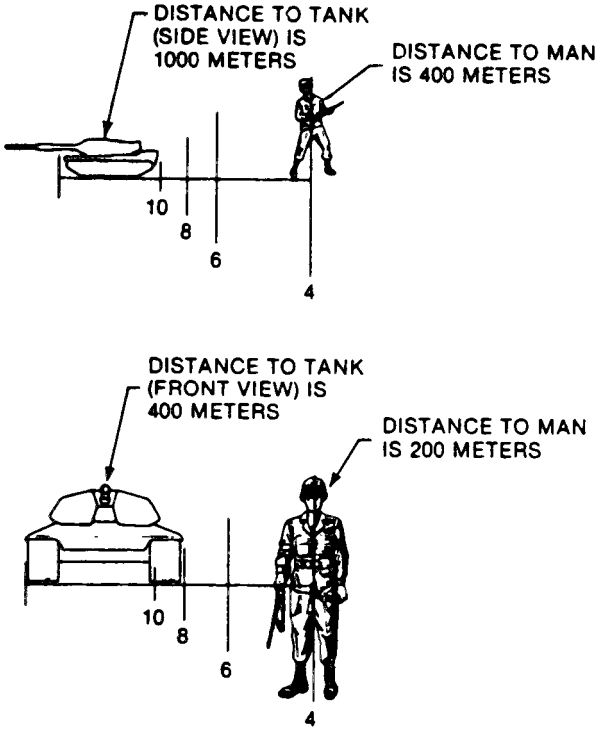


Figure 2-25. Use of Ranging Symbols M16A1/A2, M203 and M79.

2-8 RETICLE CELL OPERATION (Continued)

b. Reticle Cell for M14 Rifle, M60 and M249 Machinegun (fig. 2-26).

(1) Refer to para 2-8 a(2) and (3) above for use of the ranging symbol.

(2) M14 rifle and M60 machine-gun aiming points for ranges from 400 to 1000 meters are shown as small dots in a vertical line down through the center of the reticle. Use the center of the two horizontal lines for 0-250 meters.

(3) M249 Machinegun aiming points for ranges 300-800 meters are shown as small dots in a vertical line down through the center of the reticle. Use the center of the two horizontal lines for 0-300 meters. The four and six hundred meter aiming points are used for ranges indicated. The 800 meter aiming point is used for firing at 700 meters and the 1000 meter aiming point is used to fire the M249 at 800 meters.

(4) Locate target, estimate range, adjust the weapon to place the proper aiming point on the target.

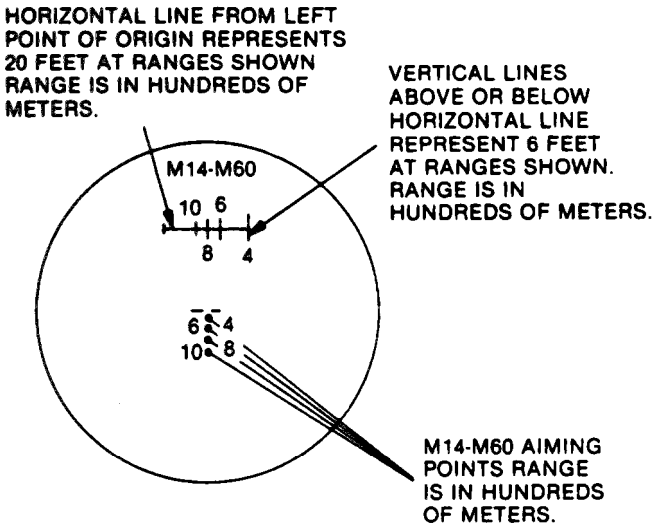


Figure 2-26. M14. M60 and M249 Reticle Pattern.

2-8 RETICLE CELL OPERATION (Continued)

c. Reticle Cell for M72A1 Rocket Launcher (fig. 2-27 and 2-28).

(1) The range to a 20-foot target such as a tank viewed from the side, is determined by placing the sight so that the rear and front of the target just fit between the curved vertical lines. In reading the range from the scale, the width of the tank isapproximately one-half the tank's length, so placement of the tank width between the curved vertical lines is read as one-half the range scale value.

(2) The bottom of each straight vertical line in the center of the reticle corresponds to an additional 25 meters.

(3) The length of each horizontal line represents 5 mils and the space between lines represent 5 mils.

(4) Locate the target between the curved lines to estimate the range and place the proper aiming point on the target.

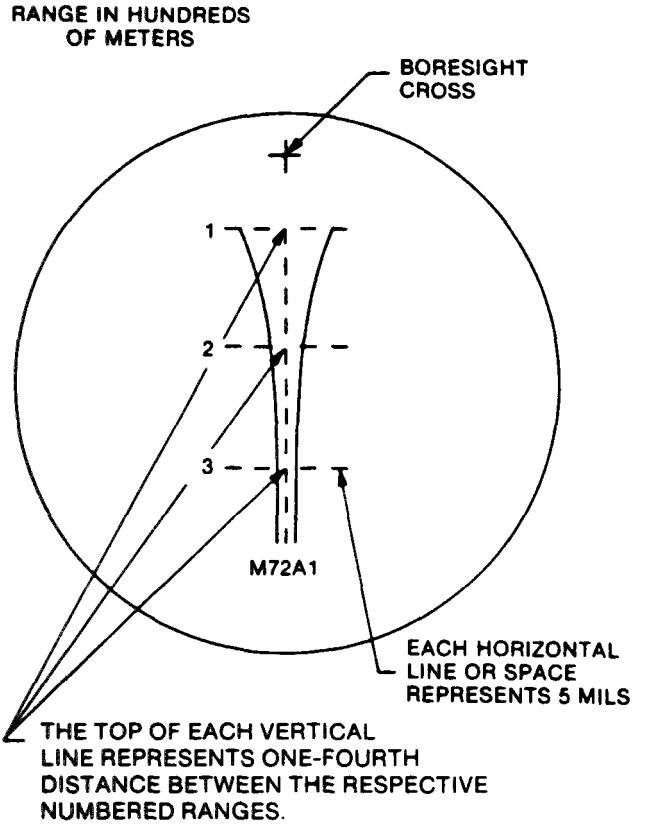


Figure 2-27. M72A1 Retical Pattern.

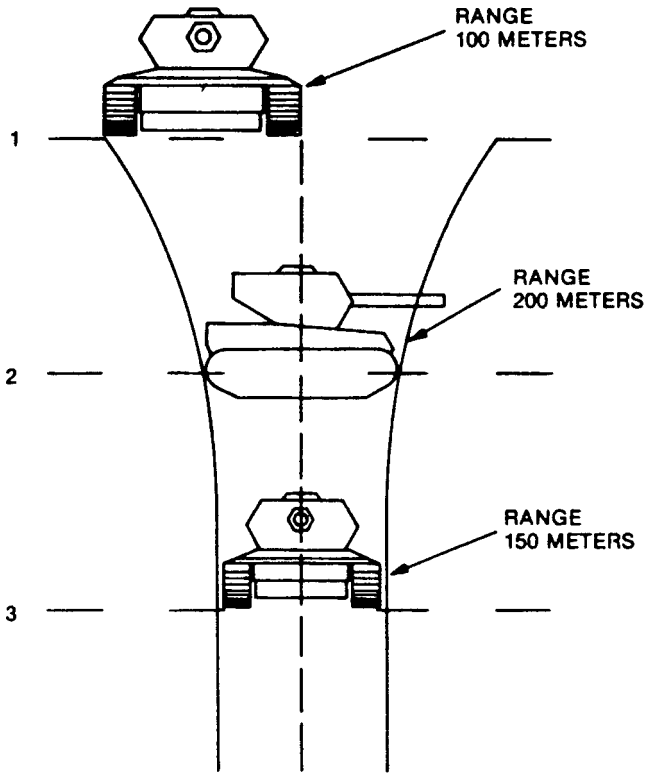


Figure 2-28. M72A1 Lines for Ranging.

2-8 RETICLE CELL OPERATION (Continued)

d. Reticle Cell for M67 Recoilless Rifle (Fig. 2-29).

(1) Refer to para 2-8 c(1) for instructions in the use of the reticle lines.

(2) The bottom of each vertical line in the center of the reticle corresponds to an additional 100 meters.

(3) The length of each horizontal line represents 5 mils and the space between lines represent 5 mils.

(4) Locate the target between the curved lines to estimate the range and place the proper aiming point on the target.

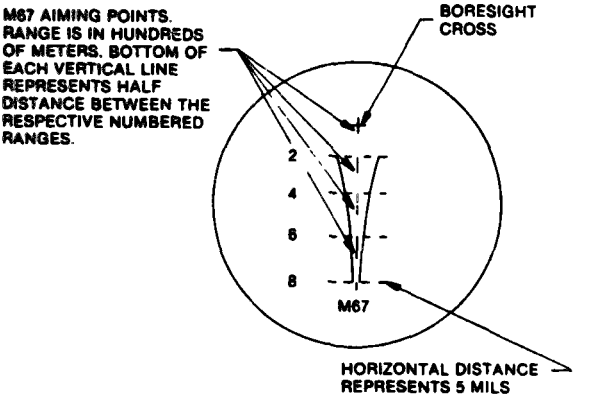


Figure 2-29. M67 Reticle Pattern.

2-9 ZEROING PROCEDURES

CAUTION

Use of the sight under high light conditions without a daylight cover will damage image Intensifier.

NOTE

- The sight may be zeroed during daylight or darkness. If zeroed during daylight, the daylight cover must be used.
- Refer to table 2-3, for zeroing distances of impact point from aiming point for M16A1/A2, M14, M249 and M203 weapons.

a. Procedures for zeroing M16A1/A2, M14, M60, M249, and M203 weapons (fig. 2-30).

(1) Make sure the appropriate reticle for the weapon to be zeroed is installed in the sight.

(2) Select either a M16A1 or M16A2 25 meter zeroing target.

(3) Mark the selected target with the appropriate impact point for the weapon to be zeroed (table 2-3).

(4) Place the selected target at a range of 25 meters.

2-9 ZEROING PROCEDURES (Continued)

Table 2-3. Distance of Impact Point From Aiming Point

WEAPON	VERTICAL	HORIZONTAL
M16A1/A2	7.0 cm (11 clks) DN	0 cm
M14	1.4 cm (02 clks) UP	0 cm
M60	11.9 cm (19 clks) ON	0 cm
M249	5.6 cm (9 clks) DN	2.0 cm (3 clks) RT
M203	9.8 cm (15 clks) DN	4.2 cm (7 clks) RT

(5) Place the sight in operation (see para 2-3), mount the sight to the selected weapon, and adjust the azimuth and elevation controls so that the reticle aiming point is approximately in the center of the field-of-view of the sight.

(6) Fire a few rounds to seat the sight on the weapon. Retighten all mounting screws/knobs.

(7) Place the zeroing range aiming point of the reticle on the target aiming point and fire enough rounds to obtain a good shot group. Locate the center of the shot group.

(8) Determine the distance (up/down and right/left) between the center of the shot group and the impact point on the target.

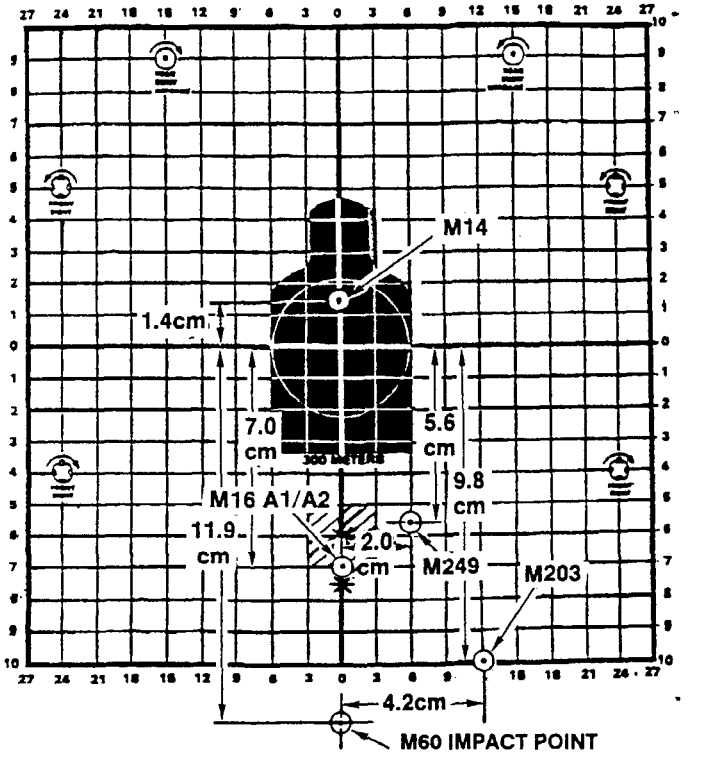


Figure 2-30. Rounds Impact Points For M16A1/A2, M14, M60, M249 and M203 Weapons.

2-9 ZEROING PROCEDURES (Continued)

NOTE

- Reticle adjustment actuators are marked to indicate direction of movement of round impact, for example, if the shot group is high and to the left of the desired impact point, move the elevation adjustment in the DN direction, and the azimuth adjustment in the RT direction.

- Each click of the azimuth or elevation adjustment actuator will move the strike of the round 0.63 cm (0.25 inch) at 25 meter range. Using the M16A1 zeroing target, 2 clicks adjustment moves the reticle approximately one square on the target. Using the M16A2 zeroing target, 3 clicks vertical adjustment will move the reticle approximately 2 squares and 2 clicks horizontal adjustment will move the reticle approximately one square.

(9) Adjust the reticle to move the center of the shot group the measured distance to the impact point. Repeat steps 7 and 8 until the impact point on the target is at the center of the shot group. The sight is now zeroed to the weapon.

2-9 ZEROING PROCEDURES (Continued)

b. Procedures for zeroing M67 Recoilless Rifle (fig. 2-31)

(1) Select the stable firing position for the weapon.

(2) Place the sight in operation (para 2-3b) and adjust the sight so that the reticle aiming point is approximately in the center of the field-of-view of the sight.

(3) Make a crosshair across the muzzle end of the tube by attaching two pieces of string or cord in the notches provided and securing to the tube with the tape or rubber bands, etc.

(4) Open the breechblock and insert the breech boresight in the rifle chamber.

(5) Construct a target and place it in the vertical position directly in front of the rifle tube at a distance of 25 meters.

(6) Sight through the breech boresight and align the cross-hair on the tube with the crosshair on target.

(7) Turn the reticle adjustment control to align the crosshair on the sight reticle with the aiming point at the upper left of the test target.

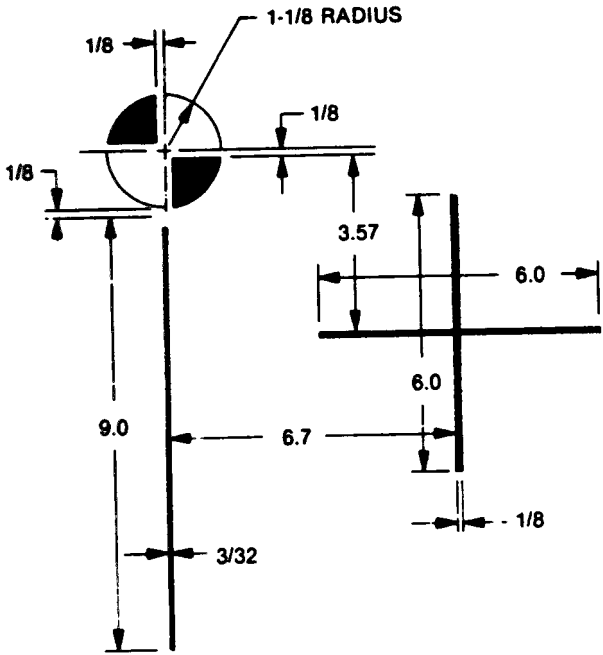


Figure 2-31. M67 Boresight Target.

2-9 ZEROING PROCEDURES (Continued)

c. Procedures for zeroing M72A1 rocket launcher (fig. 2-32).

CAUTION

When zeroing the sight to a loaded rocket launcher, be extremely careful to prevent accidental firing of the weapon.

NOTE

Zeroing of the sight to the launcher may be performed using a rocket launcher that has been fired (empty). Once zeroed for one M72A1, the sight will be zeroed for all M72A1 rocket launchers.

(1) Place the target at a range of 25 meters, and mark an impact point 6.3 cm to the left and 3.5 cm above target aim point.

(2) Select a stable firing position for the weapon.

(3) Place the sight in operation (para 2-3b).

(4) Align the weapon to bring the 200 meter range on the daylight sight to coincide with the aiming point on the target.

2-9 ZEROING PROCEDURES (Continued)

(4) Without moving the weapon, adjust the sight reticle so that the 200 meter range mark coincides with the impact point.

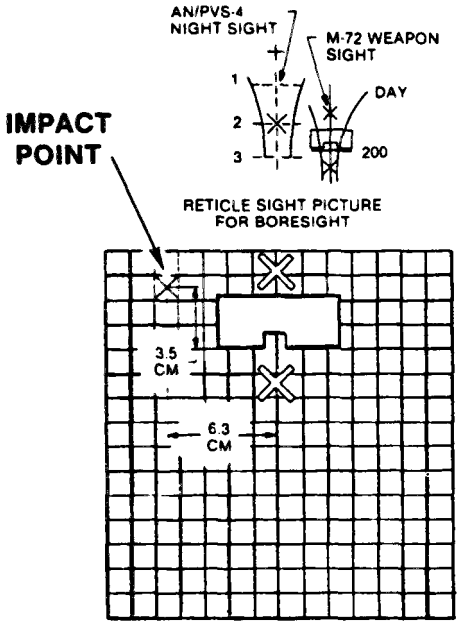


Figure 2-32. Boresighting Target for M72A1 When Using AN/PVS-4.

2-9 ZEROING PROCEDURES (Continued)

d. Procedures for zeroing M79 grenade launcher.

(1) Select a stable position for the weapon.

(2) Place the sight in operation (para 2-3) and adjust the azimuth and elevation knobs to place the reticle aiming point approximately in the center of the field-of-view of the sight.

(3) Select a suitable target (normal boresight range is 200 meters) and using the proper reticle aiming point (fig. 2-24) and elevation setting for range (fig. 2-3), fire one round.

(4) Retighten the lower locking knob (fig. 2-3) and adjust the azimuth and elevation settings if necessary to correct for misalignment shown from firing the first round. Repeat the reticle adjustment firing sequence until the sight is boresighted to the weapon.

Section IV. Operation Under Unusual Conditions

2-10 UNUSUAL ENVIRONMENT/WEATHER

Extreme Cold. Under conditions of extreme cold, use the BA-5567/U battery only. The BA-3058/U batteries do not have sufficient capacity to be used in the sight under extreme cold conditions. Lenses may fog over or frost up during cold, damp weather. Under those conditions, remove the eyeguard and clean lens (para 3-2), coat lens with antifogging compound, shake off excess compound and allow to dry. When dry, replace eyeguard.

2-11 OPERATION IN DUSTY OR SANDY CONDITIONS

CAUTION

Operating sight in dusty and sandy conditions can pit and scratch the optical elements and damage the mechanical components.

a. Avoid pointing the sight into the wind to prevent dust and sand from pitting or scratching objective lens.

b. Cover as much of the sight as possible to prevent damage to external surfaces.

2-11 OPERATION IN DUSTY OR SANDY CONDITIONS

c. Keep carrying case latched and carrying bag closed except to remove or replace equipment.

d. Clean eyepiece and objective lenses frequently with a lens brush and lens tissue.

e. Make sure all dust and sand is removed from the system, ancillary equipment, and storage case after operation.

2-12 OPERATION IN RAIN OR HUMID CONDITIONS

CAUTION

Operating sight in rainy or humid conditions can corrode and deteriorate the system unless precautions are followed.

a. Keep storage case closed unless removing items.

b. Dry all parts that have been exposed to high level of moisture, rain or high humidity.

c. Do not put any parts of the system away wet or store them in a wet storage case.

2-13 OPERATION IN SALT WATER AREAS

NOTE

Observe the following precautions when using the sight in salt water areas:

a. After exposure to salt water, clean all components with a soft cloth dampened with fresh water.

b. Do not attempt to disassemble the system.

c. Dry the components and ensure electrical contacts are clean and dry.

d. Use lens tissue to clean the optical surfaces.

e. Do not put the AN/PVS-4 away wet or store it in a wet storage case.

2-14 OPERATION IN NUCLEAR, BIOLOGICAL AND CHEMICAL (NBC) ENVIRONMENT

The sight may be used while wearing a protective mask. Observe the following precautions when using the system in Nuclear, Biological and Chemical (NBC) environment or when undergoing decontamination.

WARNING

If the daysight or nightsight is exposed to NBC decontamination chemicals, replace those parts of the sight that absorb the chemicals, such as the eyeguard, Decontamination chemicals absorbed into the eyeguard rubber boot could irritate the skin.

a. Do not use DS-2 to decontaminate the components, instead decontaminate with a cloth and a 5-percent solution of sodium hypochlorite and clean with a cloth dampened with soapy water followed by fresh, clean water. Do not immerse the system.

b. Dry the components and ensure all electrical contacts are clean and dry. Use lens tissue to clean the optical surfaces. Do not attempt to disassemble the system. Do not put the system away wet or store in a wet storage case.

CHAPTER 3
MAINTENANCE INSTRUCTIONS

Section I. Lubrication Instructions

There are no lubrication requirements for the sight.

Section II. Troubleshooting Procedures

Table 3-1 lists common malfunctions that you may find with your equipment. Perform the tests, inspections, and corrective actions in the order they appear in the table.

This table cannot list all malfunctions that may occur, nor are all the tests or inspections and corrective actions listed. If a malfunction is not listed or is not corrected by the listed corrective actions, notify higher level of maintenance.

Troubleshooting Table 3-1. Sight

Problem	Probable Cause	Corrective Action
Weak or no illumination of image	Check to see if ON-OFF TUBE BRIGHTNESS control is turned off or down.	If control is turned off, turn it on. If control is turned down, adjust until image intensifier is illuminated.

Troubleshooting Table 3-1. Sight (Continued)

Problem	Probable Cause	Corrective Action
	Check to see if battery is weak	Replace battery and recheck illumination of image intensifier.
Blurred Image	Check to see if the diopter focus ring is out of focus.	Adjust focus ring.
	Check to see if objective focus ring is out of focus	Adjust objective focus ring until image is sharply defined.
	Check lenses for dirt.	Clean lenses with lens tissue: damped with clean water if necessary: dry thoroughly.
No visible reticle pattern, or intensity is too low.	Check to see if reticle intensity is turned down or OFF.	If control is turned off, turn it on. If control is turned down, adjust until reticle is clearly visible.

Troubleshooting Table 3-1. Sight (Continued)

Problem	Probable Cause	Corrective Action
	Check to see if battery is weak.	Replace battey and recheck reticle visibility.
Image intensifier illuminates but no reticle pattern.	Defective reticle.	Report failure to higher level of maintenance.

Section III. Maintenance Procedures

3-1 MAINTENANCE PROCEDURES

General. Operator maintenance consists of visual inspection of components of the sight for serviceability and cleaning. Maintenance instructions covered elsewhere in this manual are not repeated in this section.

Inspecting of Mounting Bracket Assemblies. When installed on the weapon, the sight and the mounting bracket must be held firmly in place when the weapon is fired. This requires that all parts of the bracket assembly are present and in good working order. If the sight or the mounting bracket is loose and can not be tightened, report the deficiency to higher level of maintenance.

3-2. CLEANING

General. The operator is responsible for keeping the sight and accessories clean and serviceable. Consumable cleaning items are listed in appendix D.

3-2. CLEANING (Continued)

a. Lenses.

CAUTION

- The AN/PVS-4 is a precision electro-optical instrument and must be handled carefully.
- Do not scratch or touch the external lens surface

NOTE

- Clean the objective lens, eyepiece lens, and daylight cover lenses as follows:
- After one wipe, discard the lens paper. Repeat this step until the glass surface is clean.

(1) Remove loose dirt with a lens brush.

(2) Clean the glass surface of the lenses with lens tissue. You may saturate the lens tissue with water to remove dirt that is caked on the surface.

3-2. CLEANING (Continued)

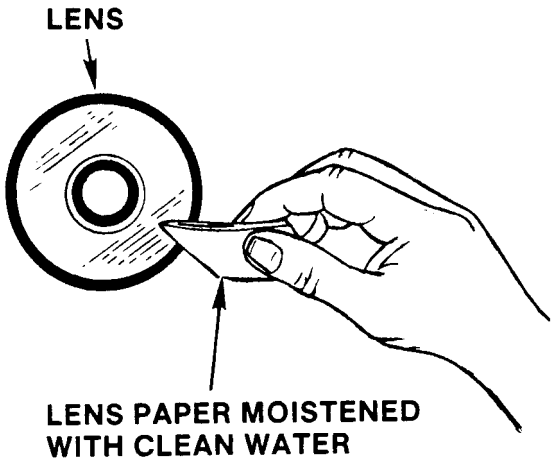


Figure 3-1. Cleaning Lens.

NOTE

After one wipe, discard the lens paper. Repeat this step until the glass surface is dry.

(3) Dry lenses with a dry lens tissue.

3-2. CLEANING (Continued)

b. Housing Assembly Surface.

Clean all exposed metal surfaces with a lint-free cloth. If necessary, dampen the cloth with water. Allow surfaces to dry thoroughly before storing the sight.

c. Eyeguard (fig. 3-2).

NOTE

The eyeguard is removed only for cleaning.

(1) To remove the eyeguard, grip it firmly where it joins the eyepiece and unscrew counterclockwise until free of the eyepiece.

(2) Clean the rubber eyeguard with a wet cloth.

(3) Dry eyeguard with a clean lint-free cloth.

(4) Install the eyeguard by positioning it on the threads of the eyepiece, grasp it firmly close to the eyepiece, and screw clockwise on the eyepiece until fully seated.

3-2. CLEANING (Continued)

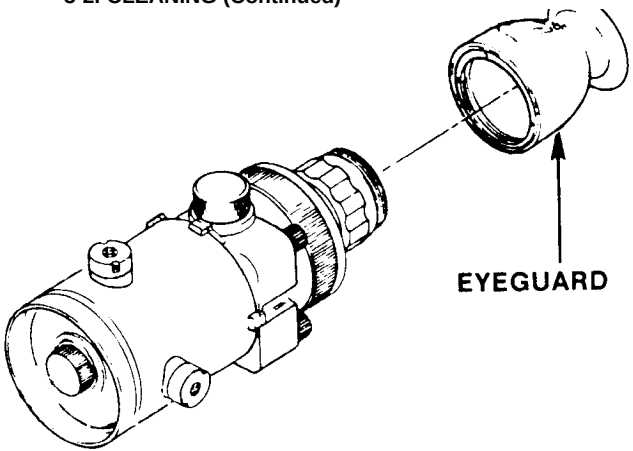


Figure 3-2. Cleaning Eyeguard.

d. Carrying Bag and Storage Case.

(1) Shake out loose dirt or foreign matter. Wipe the inside and outside of the bag with a damp cloth and allow to dry thoroughly before storing.

(2) Storage case. Shake out loose dirt or foreign matter Clean the exterior of the case with a clean cloth (do not dampen the cloth unless absolutely necessary). Allow the interior to dry thoroughly before storing the sight and closing the case.

APPENDIX A
REFERENCES

A-1 . SCOPE

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

A-2. ARMY REGULATIONS.

Report of Transportation Discrepancies in shipments.	AR 55-38
Reporting of item and packaging discrepancies.	AR 735-11-2

A-3. DEPARTMENT OF THE ARMY PAMPHLETS.

Consolidated Index of Army Publications and Blanks Forms.	DA PAM 25-30
The Army Maintenance Management System (TAMMS).	DA PAM 738-750

A-4. FORMS.

Equipment Inspection and Maintenance Worksheet.	DA Form 2404

A-4. FORMS (Continued)

NVG Inspection and Maintenance Record	DA Form 2408-30
Recommended Changes to Publications and Blank Forms	DA Form 2028
Recommended Changes to Equipment Technical Manuals	DA Form 2028-2
Product Quality Deficiency Report	SF 368

A-5. FIELD MANUALS.

NBC Contamination Avoidance	FM 3-3
NBC Decontamination	FM 3-5
First Aid for Soldiers	FM 21-11

A-6. TECHNICAL MANUALS.

Administrative Storage of Equipment	TM 740-90-1
Procedures For Destruction of Electronics Materiel to Prevent Enemy Use	TM 750-244-2

A-6. TECHNICAL MANUALS (Continued)

Defense Scrap Yard Handbook	TM 755-200
Operator's Manual MT641 Rifle	TM 9-1005-249-10
Hand Receipt Manual, Night Vision Sight, Individual Served Weapon, AN/PVS-4	TM 11-5855-213-10-HR
Operator's and Unit Maintenance Manual for Electronics System Test Set, TS-4348/UV	TM 11-5855-299-12&P

A-7. OTHER PUBLICATIONS.

Battery Disposition/Disposal Handbook	TB 43-0134
Expendable Items (except Medical, Class V, Repair Parts, and Heraldic Items)	CTA 50-970
FSC Class 6135: Dry Battery Management Data	SB 11-30

APPENDIX B
COMPONENTS OF END ITEM (COEI) AND BASIC ISSUE ITEMS (BII) LISTS

SECTION I. INTRODUCTION

B-1 SCOPE

This appendix lists components of the end item and basic issue items for the Night Vision Sight (AN/PVS-4) to help you inventory the items for safe and efficient operation of the equipment.

B-2 GENERAL

The Components of End Item and Basic Issue Items are divided into the following sections:

a. **Section II. Components of End Item List.** This listing is for information purposes only and is not authority to requisition replacements. These items are part of the AN/PVS-4. As part of the end item, these items must be with the end item whenever it is issued or transferred between property accounts. Illustrations are furnished to assist you in identifying the items.

b. Section III. Basic Issue Items List. These are minimum essential items required to place the sight in operation, to operate it, and to perform emergency repairs. Although shipped separately packaged, BII must be with the equipment during operation and when it is transferred between property accounts. Listing these items is your authority to request/requisition them for replacement based on authorization of the end item by the TOE/MOTE. Illustrations are furnished to help you identify the items.

B-3 EXPLANATION OF COLUMNS

a. Column (1), Illustration Number (Illus. Number). This column indicates the number of the illustration that shows the item.

b. Column (2), National Stock Number. Indicates the national stock number assigned to the item and will be used for requisition purposes.

c. Column (3), Description. Indicates the Federal item name and, if required, a minimum description in parentheses to identify and locate the item. The entry for each item ends with the Commercial and Government Entity Code (CAGEC) in parentheses followed by the part number. Usable On Code indicates the vehicle to which the item is assigned.

d. Column (4), Unit of Measure (U/M). Indicates the measure used in performing the actual operation/maintenance function. This measure is expressed by a two character alphabetical abbreviation (e.g., ea, in, pr).

e. Column (5), Quantity Required (Oty Rqr). Indicates the quantity of the item authorized to be used with/on the equipment.

Section II. COMPONENTS OF END ITEM LIST

(1) Illus Number	(2) National Stock umber	(3) Description CAGEC and P/N	Usable On Code	(4) U/M	(5) Qty r q r
1	855-01-040-3793	Case, carrying and storage. (80063) SM-D-850480-1		EA	1
2	855-01-039-2854	Reticle cell assembly M16A1/A2 and M203 (80063) SM-D-850490-7		EA	1
3	855-01	Reticle cell assembly M60, M14 (80062) SM-D-850490-2		EA	1
4	5355-01-039-2834	Mounting knob assembly, M16A1/A2 (80063) SM-D-850500-1		AY	1
5	855-01-017-7366	Night vision sight (80063) SU-87/PVS-4		EA	1
6	5855-01-252-5428	Daylight cover (80063) SM-D-850315-1		EA	1

Section II. **COMPONENTS OF END ITEM LIST (Contiued)**

(1) Illus Number	(2) National Stock Number	(3) Description CAGEC and P/N	Usable On Code	(4) U/M	(5) Qty qr
7	5855-01-039-2830	Carrying bag (80063) SM-D-850482-1		EA	1
8	5855-01-046-7272	Mounting bracket M60 (80063) SM-D-850340-1		EA	1
9	7920-00-205-0565	Brush, lens dusting (81 MIL-B-43363SIZE1		EA	1
10	6640-00-597-6745	Lens, paper (81348) NNNP40TYPE1		PK	
11	5855-01 -0506	AA Battery adapter assembly (80063) A3009873		EA	1

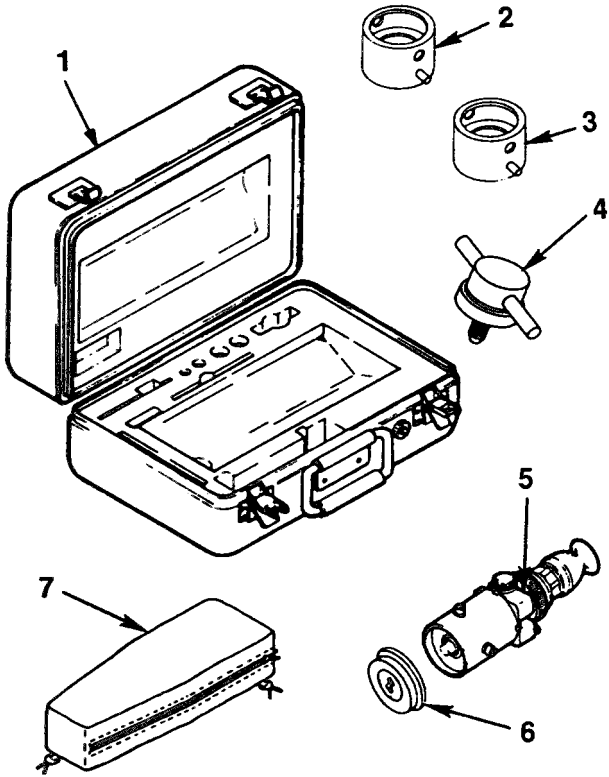
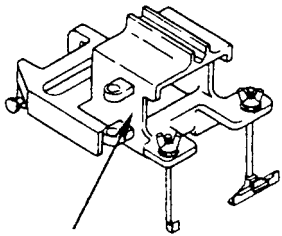


Figure B-1. Components of End Item.
(Sheet 1 of 2)



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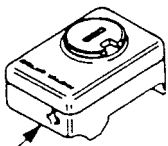

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Figure B-1. Components of End Item.
(Sheet 2 of 2)

SECTION III. BASIC ISSUE ITEMS

(1) Illus Number	(2) National Stock Number	(3) Description CAGEC and P/N	(4) U/M	(5) Qty rqr
		Operator's Manual Night Vision Sight, Individual Served Weapon TM 11-5855-213-10	EA	1

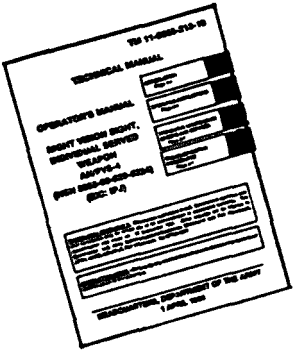


Figure B-2. Basic Issue Items.

APPENDIX C

ADDITIONAL AUTHORIZATION LIST (AAL) ITEMS

SECTION I. INTRODUCTION

C-1 SCOPE

This appendix lists additional items you are authorized for the support of the AN/PVS-4 Night Vision Sight.

C-2 GENERAL

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

C-3 EXPLANATION OF LISTING

National Stock Numbers, descriptions, and quantities are provided to help you identify and request the additional items you require to support this equipment. If the item required differs for difference models of this equipment, see the "Usable On Code" column for the applicable model or models.

Section II. ADDITIONAL AUTHORIZATION LIST

(1) National stock Number	(2) Description CAGEC & Part number	Usable on Code	(3) U/M	(4) QTY RECM
5855-01-039-2845	Mounting bracket assembly M67 (80063) SM-D-850350-1		EA	1
5855-01-039-2841	Mounting bracket assembly M72A1 (80063) SM-D-850360-1		EA	1
5855-01-039-2846	Mounting bracket assembly M79 (80063) SM-D-850370-1		EA	1
5855-01-039-283!	Mounting bracket assembly M203 (80063) SM-		EA	1
5855-01-039-2833	Mounting bracket assembly M14 (80063) SM-		EA	1
3040-01-233-0352	Mounting bracket M249 (80063) A3079160		EA	1
5855-01-039-2843	Reticle cell assembly M67 (80063) SM-D-850490-4		EA	1

Section II. **ADDITIONAL AUTHORIZATION LIST (Continued)**

National stock Number	Description CAGEC & Part number	Usable on Code	U/M	QTY RECM
5855-01-039-2844	Reticle cell assembly M72A1 (80063) SM-D-850490-5		EA	1
5855-01-039-2830	*Carrying bag (80063) SM-D-850482-2		EA	1
6625-01-323-9584	Test set, elec. system, (80058) TS-4348/UV			1
5935-01-327-2705	TS-4348/UV adapter (05234) 668148		EA	1
6135-01-090-5365	Battery (80058) BA-5567/U		EA	1
6135-00-935-2587	Battery (80058) BA-3058/U		EA	2
5340-01-355-2139	Cap Plug, Battery (80063) A3181242		EA	1
	* To be requisitioned for arctic use.			

APPENDIX D

EXPENDABLE AND DURABLE ITEM LISTS

Section I. INTRODUCTION

D-1 Scope

This appendix lists expendable supplies and materials you will need to operate and maintain the AN/PVS-4. These items are authorized to you by CTA 50-970, Expendable Items (Except Medical, Class V, Repair Parts, and Heraldic Items).

D-2. Explanation of Columns

a. Column 1- Item Number. This number is assigned to the entry in the listing and is referenced in the narrative instruction to identify the material (e.g., "Use cleaning compound, item 5, Appendix D").

b. Column 2- Level. This column identifies the lowest level of maintenance that requires the listed item.

c. Column 3- National Stock Number. This is the national stock number assigned to the item; use it to request or requisition the item.

d. Column 4- Description. Indicates the Federal item name and, if required, a description to identify the item. The last line for each item indicates the part number followed by the Federal Supply Code for Manufacturer (FSCM) in parentheses, if applicable.

e. Column 5 - Unit of Measure (U/M). Indicates the measure used in performing the actual maintenance function, This measure is expressed by a two-character alphabetical abbreviation (e.g., ea, in, pr). If the unit of measure differs from the unit of issue, requisition the lowest unit of issue that will satisfy your requirements.

Section II. EXPENDABLE AND DURABLE ITEM LIST

(1) tem number	(2) Level	(3) National stock number	(4) em name, Description CAGEC, Part Number	(5) U/M
1	0	7920-00-205-0565	ens dust brush 31349) IIL-B-43363SIZE1	EA
2	0	6850-00-200-3297		EA
3	0	6640-00-597-6745	ens paper, (81 INNP40TYPE1	PK
4	0	7920-00-823-9773	Towel, shop	PK

ALPHABETICAL INDEX

A

B

c

ALPHABETICAL INDEX (Continue)

C

D

E

ALPHABETICAL INDEX (Continued)

E

F, G,

H, I,

ALPHABETICAL INDEX (Continued)

I

L

M

N, O

ALPHABETICAL INDEX (Continued)

O

P

Q R

S

ALPHABETICAL INDEX (Continued)

T

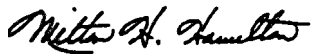
U,V

W,X,Y,Z

By Order of the Secretary of the Army:

GORDON R. SULLIVAN
General, United States Army
Chief of Staff

Official:



MILTON H. HAMILTON
Administrative Assistant to the
Secretary of the Army

Distribution:

To be distributed in accordance with DA Form 12-36-E, block 2992, requirements for TM 11-5855-213-10.

☆ U.S. G.P.O.: 1996 406-421/41354

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THE METRIC SYSTEM AND EQUIVALENTS

'NEAR MEASURE

. Centimeter = 10 Millimeters = 0.01 Meters = 0.3937 Inches
1 Meter = 100 Centimeters = 1000 Millimeters = 39.37 Inches
1 Kilometer = 1000 Meters = 0.621 Miles

'VEIGHTS

Gram = 0.001 Kilograms = 1000 Milligrams = 0.035 Ounces
1 Kilogram = 1000 Grams = 2.2 lb.
1 Metric Ton = 1000 Kilograms = 1 Megagram = 1.1 Short Tons

LIQUID MEASURE

1 Milliliter = 0.001 Liters = 0.0338 Fluid Ounces
1 Liter = 1000 Milliliters = 33.82 Fluid Ounces

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 = 1000 Cu. Millimeters = 0.06 Cu. Inches
1 Cu. Meter = 1,000,000 Cu. Centimeters = 35.31 Cu. Feet

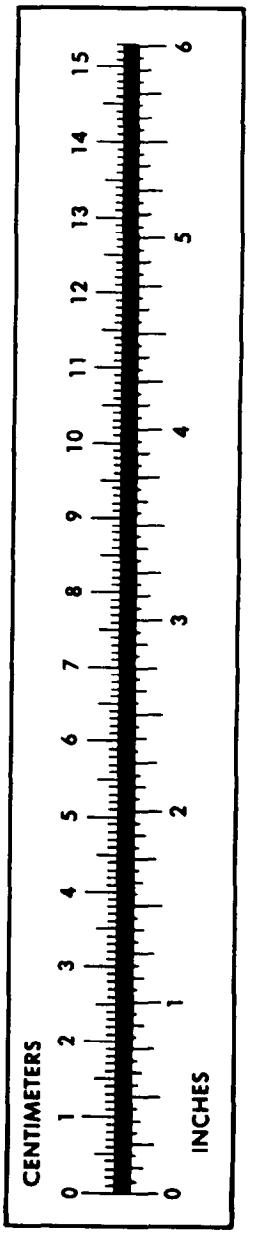
TEMPERATURE

5/9(°F - 32) = °C
212° Fahrenheit is evuivalent to 100° Celsius
90° Fahrenheit is equivalent to 32.2° Celsius
32° Fahrenheit is equivalent to 0° Celsius
9/5C° + 32 =°F

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
ıts	Liters	0.473
arts	Liters	0.946
allons	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
ers	Gallons	0.264
ms	Ounces	0.035
ograms	Pounds	2.205
Metric Tons	Short Tons	1.102
Newton-Meters	Pounds-Feet	0.738
Kilopascals	Pounds per Square Inch	0.145
lometers per Liter	Miles per Gallon	2.354
meters per Hour	Miles per Hour	0.621



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