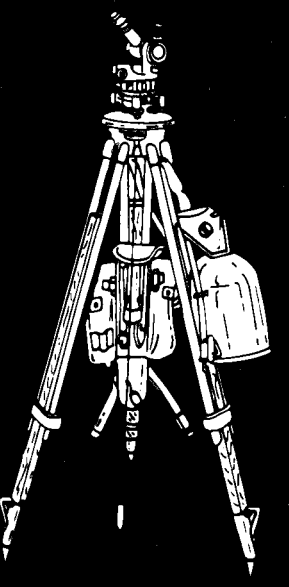
OPERATOR'S MANUAL

TM 9-1290-262-10



AIMING CIRCLE M2 W/E (1290-00-614-0008) AND M2A2 W/E (1290-01-067-0687)

HEADQUARTERS,
DEPARTMENT OF THE ARMY

APRIL 1981

W A R N I N G

Do not point the telescope directly at the sun unless the filter is used. Serious eye damage can result.

Change
No. 1

HEADQUARTERS
DEPARTMENT OF THE ARMY
Washington, DC, 15 January 2002

OPERATOR'S MANUAL

AIMING CIRCLE M2 W/E (1290-00-314-0008)

AND

M2A2 W/E (1290-01-067-0687)

TM 9-1290-262-10, 15 April 1981, is changed as follows:

1. Remove old pages and insert new pages as indicated below.

2. New or changed material is indicated by a vertical bar in the margin of the pages.

Remove Pages	Insert Pages
23 and 24	23 and 24

File this change sheet in the front of the publication for reference purposes.

By Order of the Secretary of the Army:

ERIC K. SHINSEKI
General, United States Army
Chief of Staff

Official:

Joel B. Hudson
Administrative Assistant to the
Secretary of the Army

0200702

DISTRIBUTION: To be distributed in accordance with the initial distribution requirements for IDN: 342407 requirements for TM 9-1290-262-10.

TECHNICAL MANUAL
NO. 9-1290-262-10

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, DC 15 April 1981

Operator's Manual
AIMING CIRCLE
M2 W/E
(1290-00-614-0008)
AND
M2A2 W/E
(1290-01-067-0687)

CONTENTS

This manual so much of TM 9-6166, 27 October 1955, as pertains to operator level; sections II, III, and so much of V, TM 9-1290-262-12P, 11 April 1972 as pertains to crew special tools, including all changes.

CONTENTS (cont)

CONTENTS (cont)

Page

CONTENTS (cont)

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). direct to: Commander. US Army Armament Materiel Readiness Command, ATTN: DRSAR-MAS. Rock Island. IL 61299. A reply will be furnished to you.

HAND RECEIPTS

Hand receipts for Components of End Item (COEI). Basic Issue Items (Bll). and Additional Authorization List (AAL) items are published in a Hand Receipt manual.
TM 9-1290-262-10-HR. This manual is published to aid in property accountability and is available through: Commander. US Army Adjutant General Publication Center. ATTN: AGDL-OD. 1655 Woodson Road. St. Louis. MO 63114.

REPORTING EQUIPMENT IMPROVEMENT RECOMMENDATIONS (EIR)

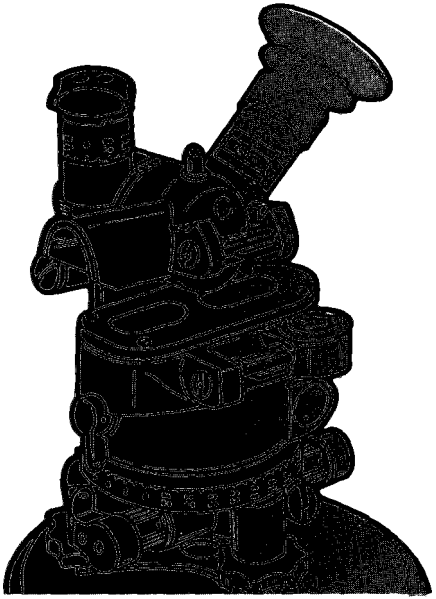
If your aiming circle needs improvement. let us know. Send us an EIR. You, the user. are the only one who can tell us what you don't like about your equipment. Let us know why you don't like the design. Tell us why a procedure is hard to perform. Put it on an SF 368 (Quality Deficiency Report). Mail it to us at Commander. U.S. Army Armament Materiel Readiness command. ATTN: DRSAR-MAO. Rock Island. IL 61299. We'll send you a reply.

FACTS ABOUT YOUR M2 AND M2A2 AIMING CIRCLE

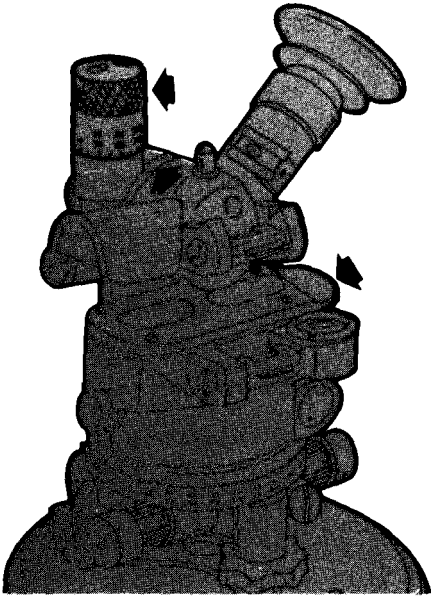
- Your aiming circle is used to measure azimuth and elevation angles of a ground or aerial target with respect to a preselected base line.

- Let's compare the M2 and M2A2 Aiming Circle:

	M2	*M2A2*
Weight, aiming circle w/cover	9 lb	9 lb
Weight, aiming circle w/equipment	21 lb	21 lb
Azimuth rotation	unlimited	unlimited
Elevation (maximum)	800 mils	1100 mils
Depression (maximum)	400 mils	400 mils
Telescope power	4 power	4 power
Field of view	10 degrees	10 degrees



M2 AIMING CIRCLE



M2A2 AIMING CIRCLE
Red arrows ➧
point to changes.

MORE FACTS

- Changing the maximum telescope elevation from 800 mils to 1100 mils permits greater use of the aiming circle.

- The operating instructions in this manual apply to the M2 and M2A2 Aiming Circle.

- The aiming circle is basically a telescope mounted on a base which permits exact azimuth and elevation measurements.

- The main housing is placed in a true level condition by using two types of levels:

  a. The circular level is used for coarse leveling.
  b. The tube levels are used for fine leveling.

- A tube level on the elbow telescope permits the elbow telescope to be adjusted to a true horizontal line of sight.

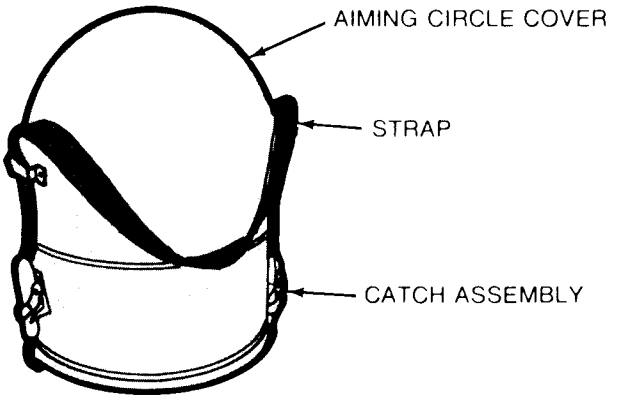
- A magnetic compass is located in an oblong box on top of the main housing. The magnetic compass needle can be seen through a window or through the magnifier.

- Zero azimuth heading with respect to magnetic north or any other selected compass treading can be made by turning the orienting knobs or the azimuth knob.

- Elevation angle of the telescope is adjusted by turning the elevation knob.

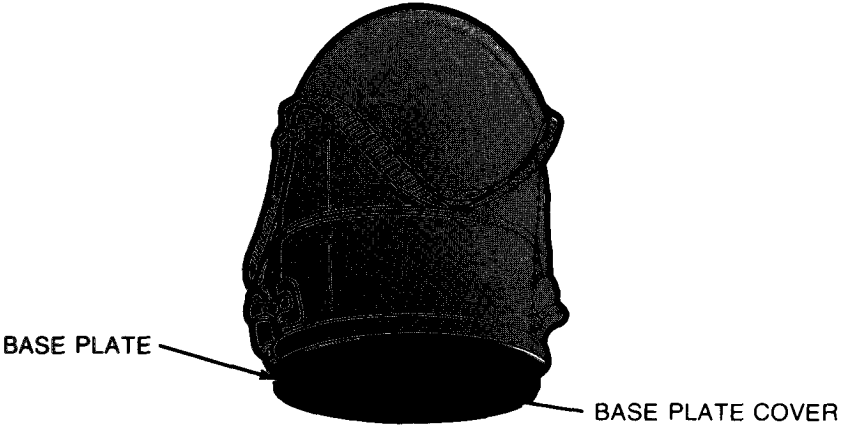
- Azimuth and elevation angles up to 85 roils can be read from the horizontal and vertical centerline on the reticle while looking through the elbow telescope,

EXTERNAL PARTS AND...



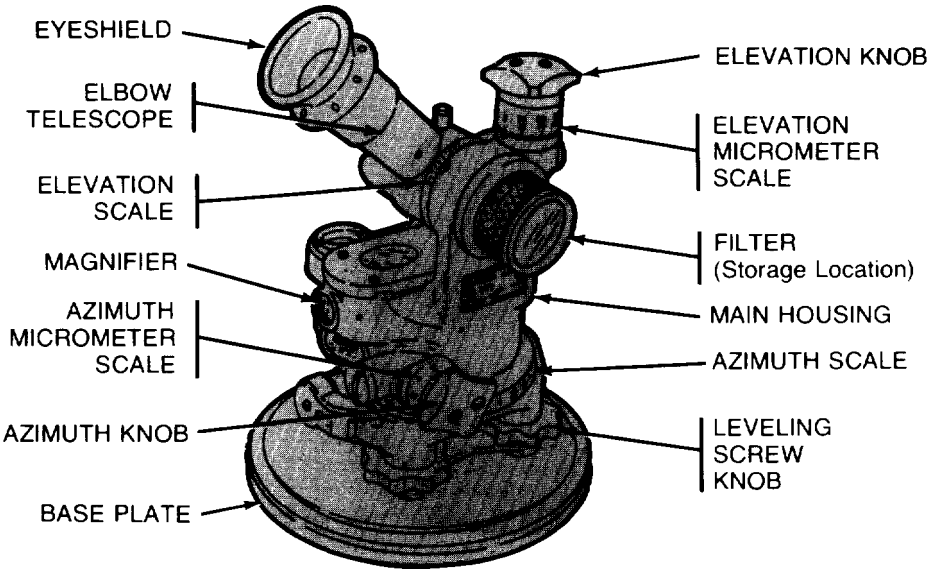
M2 and M2A2 AIMING CIRCLE WITH COVER INSTALLED

WHERE TO FIND THEM



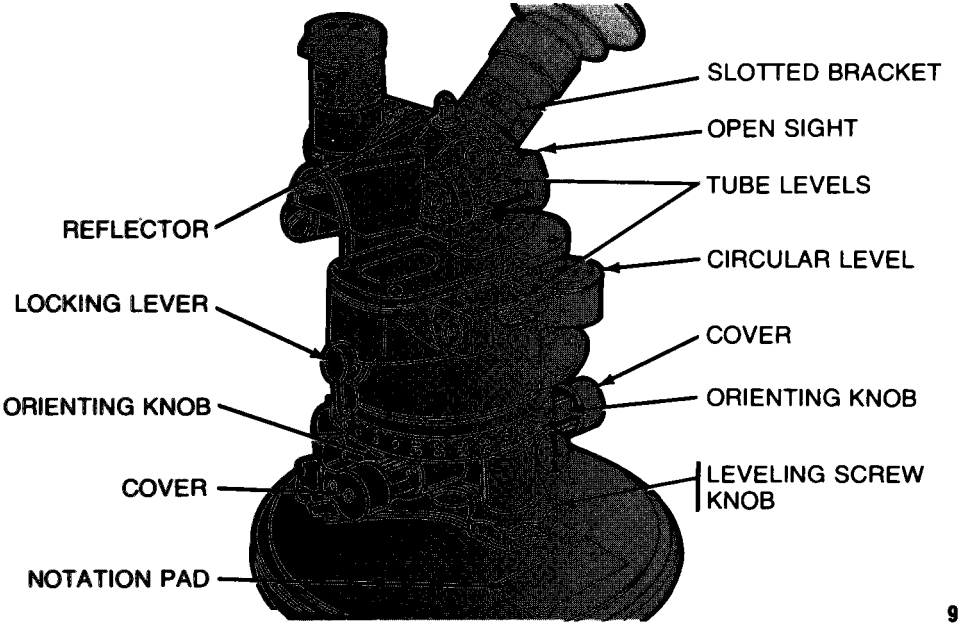
M2 and M2A2 AIMING CIRCLE WITH COVER INSTALLED

MORE ON EXTERNAL PARTS AND...

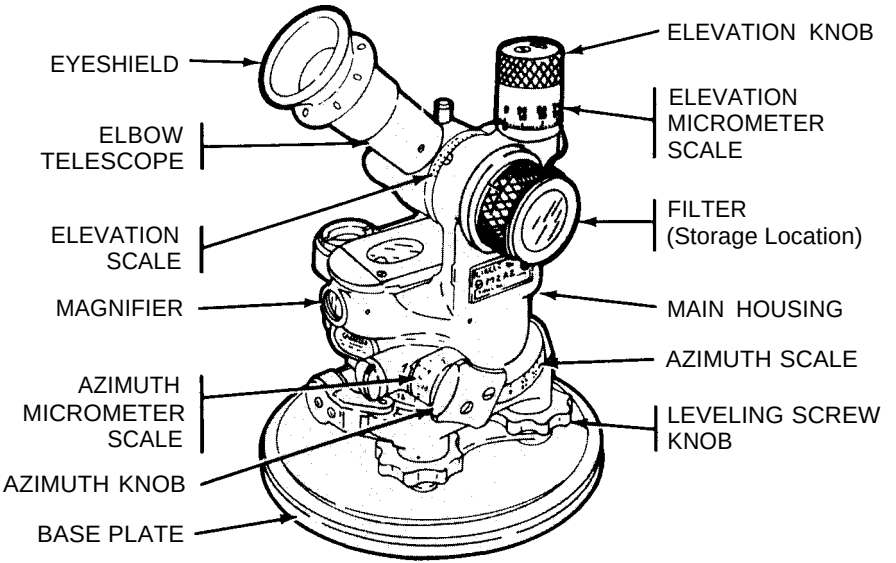


M2 AIMING CIRCLE WITH COVER REMOVED

WHERE TO FIND THEM

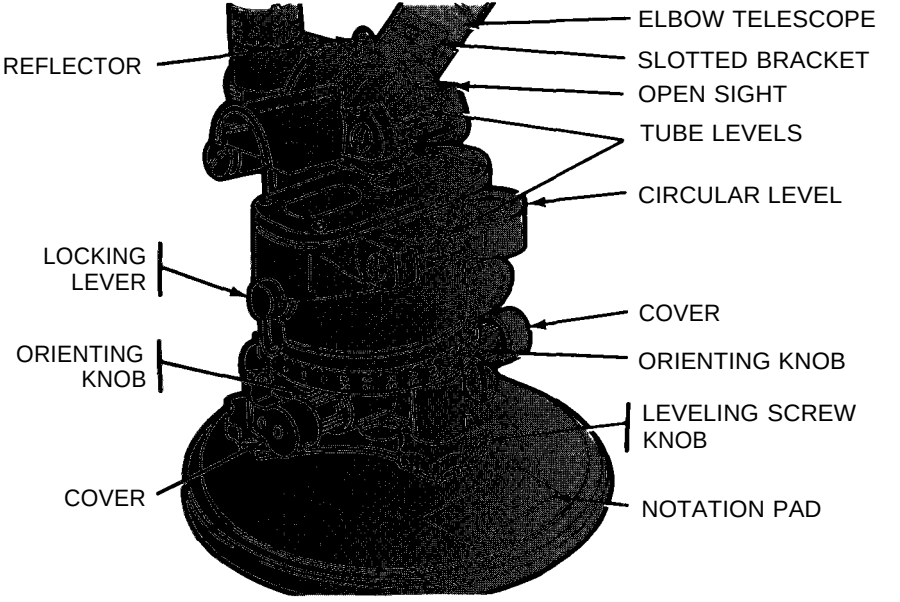


MORE ON EXTERNAL PARTS AND...

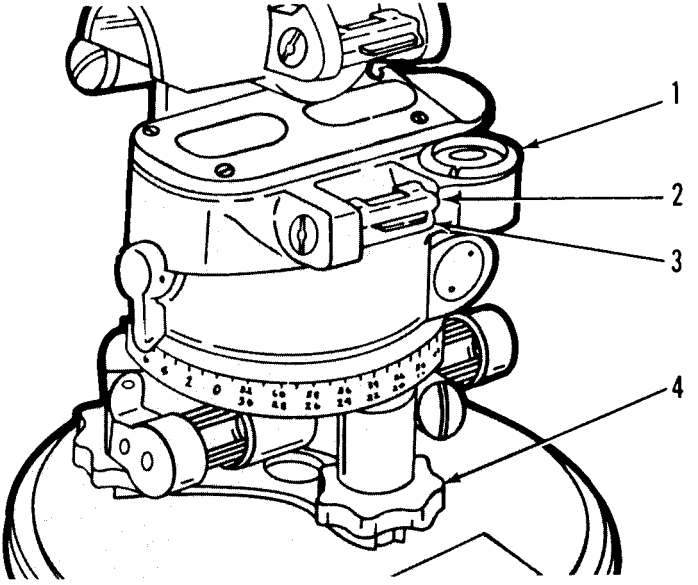


M2A2 AIMING CIRCLE WITH COVER REMOVED

WHERE TO FIND THEM



LEVELING CONTROLS AND . . .



WHERE TO FIND THEM

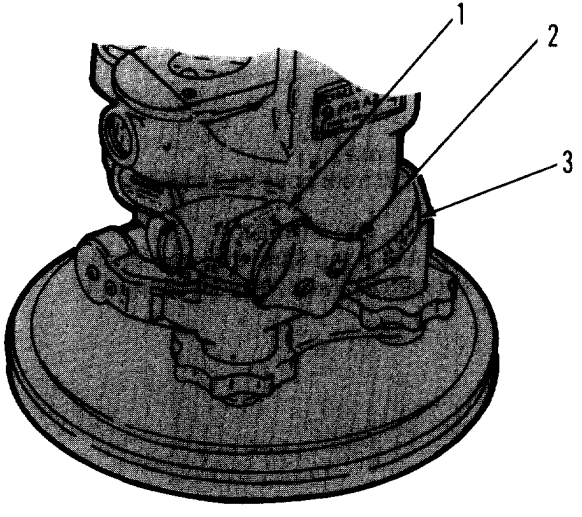
1 CIRCULAR LEVEL
- Used for coarse leveling of the aiming circle.

2 TUBE LEVEL (ONE OF TWO)
- Used for fine leveling of the aiming circle.

3 COVER
- Rotate cover to open or close.
- Protects the tube level vial from possible breakage.

4 LEVELING SCREW KNOB (ONE OF THREE)
- Used to center the bubble in the tube level and circular level.
- Clockwise raises, counterclockwise lowers instrument.

AZIMUTH CONTROLS AND . . .



M2 and M2A2 AIMING CIRCLE

WHERE TO FIND THEM

1 AZIMUTH MICROMETER SCALE

- Each graduation = 1 mil.
- Numbered at 10-mil intervals.
- Black numbers 0-100 mils - read azimuth.

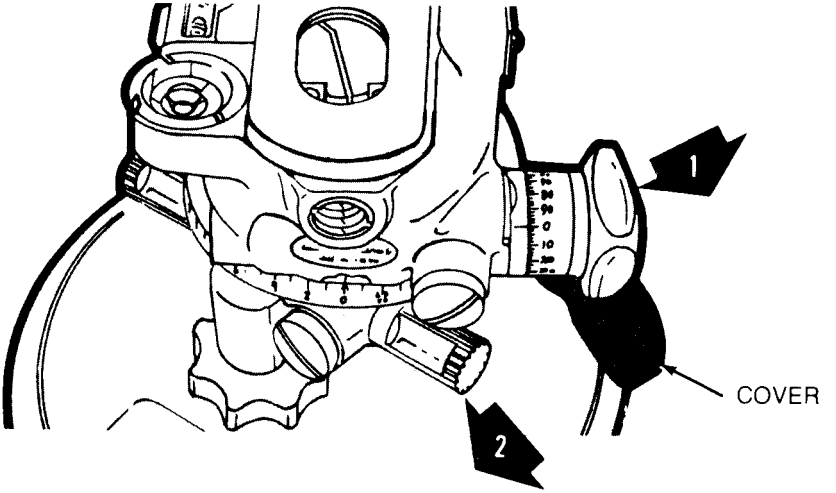
2 AZIMUTH KNOB

- Adjusts elbow telescope in azimuth.

3 AZIMUTH SCALE

- Each graduation = 100 mils.
- Numbered at 200-mil intervals.
- Black numbers 0-6400 mils - read azimuth. This forms the main azimuth scale.
- Red numbers 0-3200 mils - read azimuth. The lower row of graduations parallels the 3200- to 6400-mil upper graduations. This permits the aiming circle to be used with other instruments having scales graduated 0-3200 mils.

MORE ON AZIMUTH CONTROLS AND...



NOTE

In fast azimuth traversing, the elbow telescope moves in multiples of 100 mils (for example, 100, 200, 300, etc). The azimuth knob always reseats itself in the same relative position (for example, 170, 270, 370, etc). The azimuth micrometer scale reading is not affected by fast traversing.

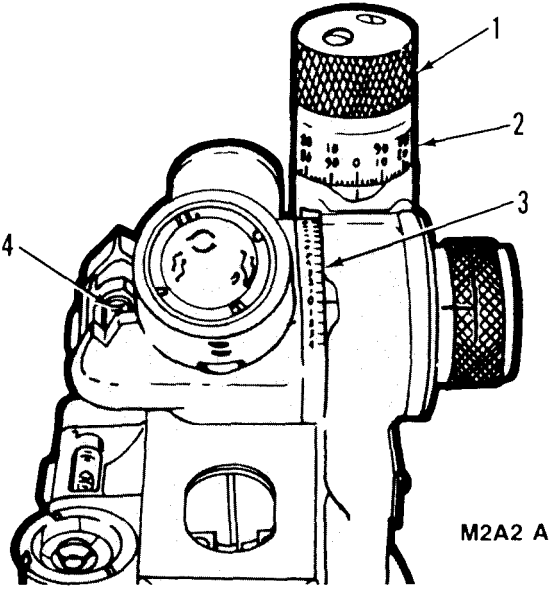
FAST AZIMUTH TRAVERSING OF ELBOW TELESCOPE

- Pull and hold azimuth knob in direction of red arrow. 1
- By hand, turn main housing to desired azimuth.
- Release azimuth knob. Turn azimuth knob for normal operation.

FAST AZIMUTH TRAVERSING OF AIMING CIRCLE

- Open covers on both orienting knobs.
- Pull and hold orienting knob in direction of red arrow. 2
- By hand, turn aiming circle to desired azimuth.
- Release orienting knob. Either orienting knob can be turned for normal operation.
- Close both covers.

ELEVATION CONTROLS AND...



M2A2 AIMING CIRCLE

WHERE TO FIND THEM

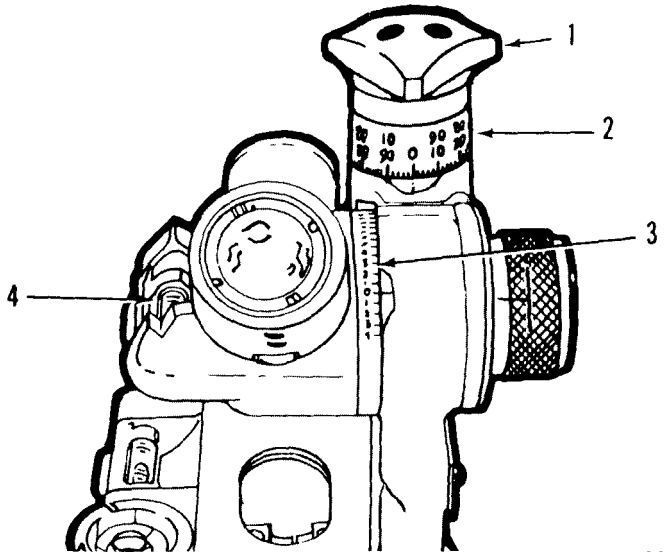
1 ELEVATION KNOB
- . Adjusts elbow telescope elevation

2 ELEVATION MICROMETER SCALE
- Each graduation 1 roil.
- Numbered at 10-mil intervals.
- Black numbers 0-100 mils - read elevation.
- Red numbers 0-100 roils - read depression.

3 ELEVATION SCALE
- Each graduation 100 roils.
- Numbered at 100-mil intervals.
- Black numbers 0-1100 roils read elevation
- Red numbers 0-400 roils - read depression.

4 ELBOW TELESCOPE TUBE LEVEL
- . Shows when elbow telescope is level.

MORE ON ELEVATION CONTROLS AND...



M2 AIMING CIRCLE

WHERE TO FIND THEM

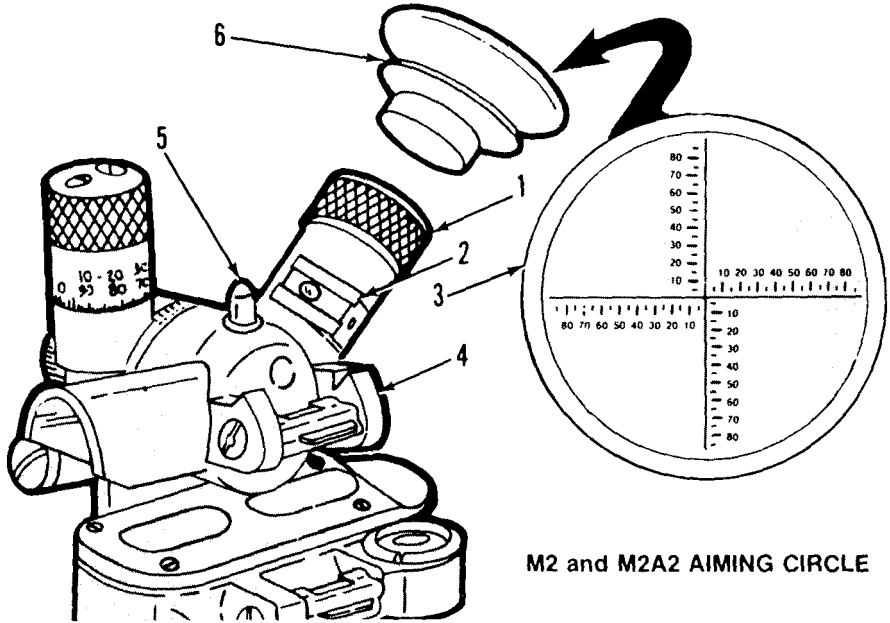
1 ELEVATION KNOB
- Adjusts elbow telescope elevation.

2 ELEVATION MICROMETER SCALE
- Each graduation = 1 mil.
- Numbered at 10-mil intervals.
- Black numbers 0-100 mils - read elevation.
- Red numbers 0-100 mils - read depression.

3 ELEVATION SCALE
- Each graduation = 100 mils.
- Numbered at 100-mil intervals.
- Black numbers 0-800 mils - read elevation.
- Red numbers 0-400 mils - read depression.

4 ELBOW TELESCOPE TUBE LEVEL
- Shows when elbow telescope is level.

ELBOW TELESCOPE PARTS AND . . .



M2 and M2A2 AIMING CIRCLE

WHERE TO FIND THEM:

1. FILTER

- Used to protect your eye from sun rays.
- Shown in in-use position.
- NSN:1290-00-155-8312

2. SLOTTED BRACKET

- Used for mounting the M51 instrument light bracket
- Reticle is lighted through the hole.

3. RETICLE

- As seen through telescope.
- Horizontal and vertical centerlines graduated to give azimuth and elevation angles while operator is looking through elbow telescope.
- Each graduation = 5 mils.
- Each scale reads 0 to 85 mils.

4. OPEN SIGHT

- As seen through telescope.
- Horizontal and vertical centerlines graduated to give azimuth and elevation angles while operator is looking through elbow telescope.
- Each graduation = 5 mils.
- Each scale reads 0 to 85 mils.
- Allows fast telescope orientation,

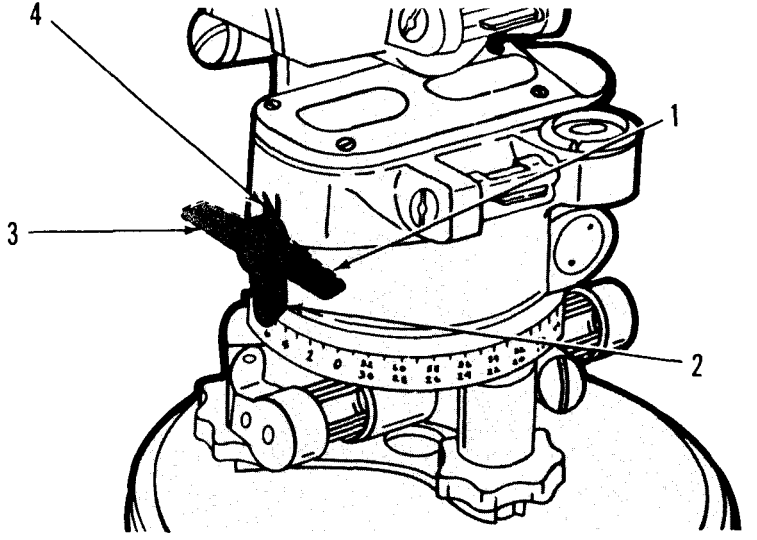
5, REFLECTOR

- Allows backlighting by artillery weapon's fire control instruments.
- Can be lighted at night with the M51 instrument light hand light.

6, EYESHIELD

- Blocks light entering your eye from the side.
- NSN: 6650-00-155-8331

MAGNETIC COMPASS CONTROLS AND ...



WHERE TO FIND THEM

1 LOCKING LEVER
- Turn and hold it in this position.
- Magnetic compass needle moves.
- Releasing the locking lever will let it return to the locked position.

2 LOCKING LEVER
- In locked position.
- Keep it in this position when magnetic compass is not used and when carrying or transporting the aiming circle.
- Magnetic compass needle cannot move.

3 LOCKING LEVER
- In unlocked position.
- Magnetic compass needle moves.
- Stays in this position until turned to locked position.

4 NORTH END OF MAGNETIC COMPASS NEEDLE INDICATED BY **N** ON THE MAIN HOUSING

MORE ON MAGNETIC COMPASS

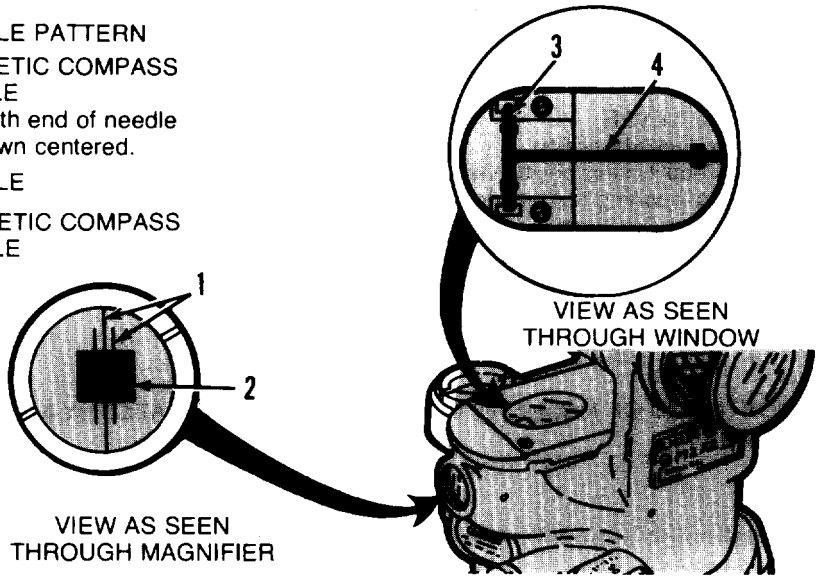
CONTROLS AND WHERE TO FIND THEM

1 RETICLE PATTERN

2 MAGNETIC COMPASS NEEDLE
- South end of needle shown centered.

3 RETICLE

4 MAGNETIC COMPASS NEEDLE

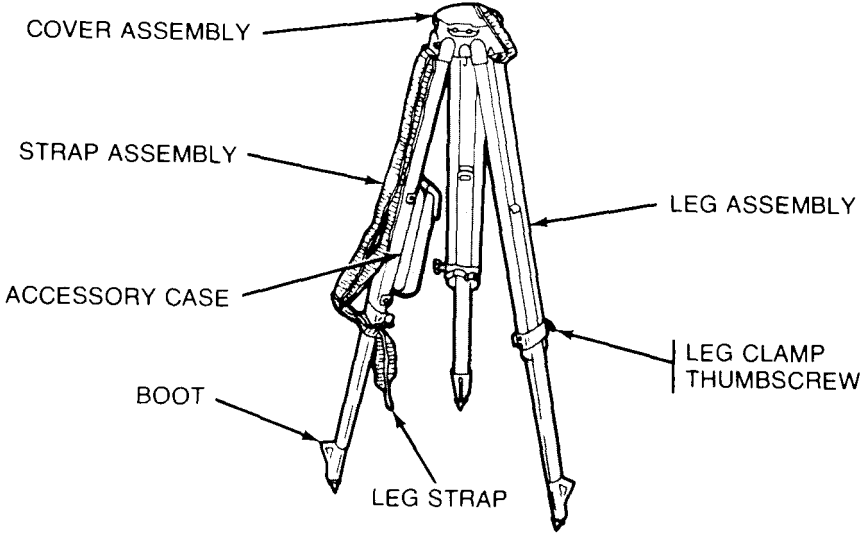


DATA PLATE AND NOTATION PAD

1 DATA PLATE
- Nomenclature
- Model number
- Serial number

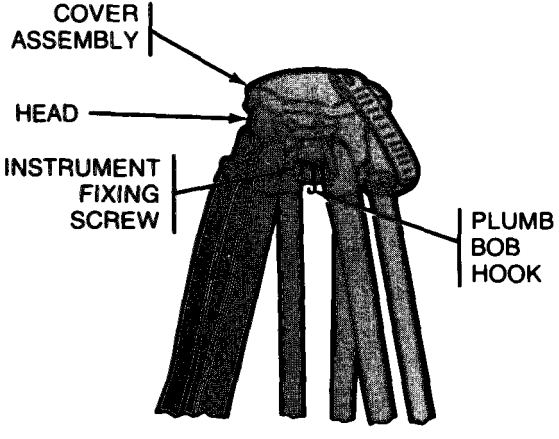
2 NOTATION PAD
- For recording declination constant, scale readings, settings, or other data using soft lead pencil.

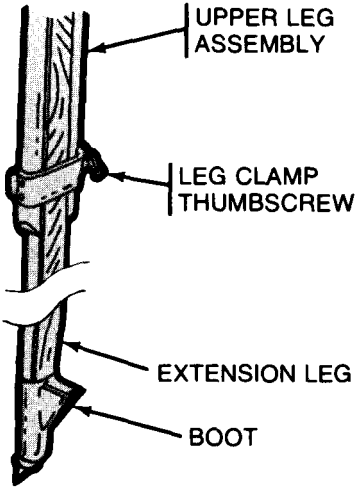
M2 and M2A2 AIMING CIRCLE



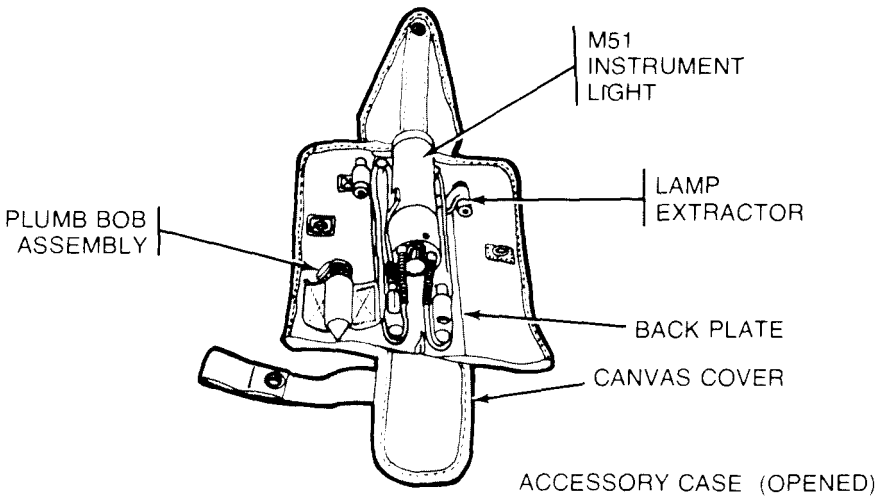
M24 TRIPOD FOR M2 and M2A2 AIMING CIRCLE

M2 OR M2A2 AIMING CIRCLE



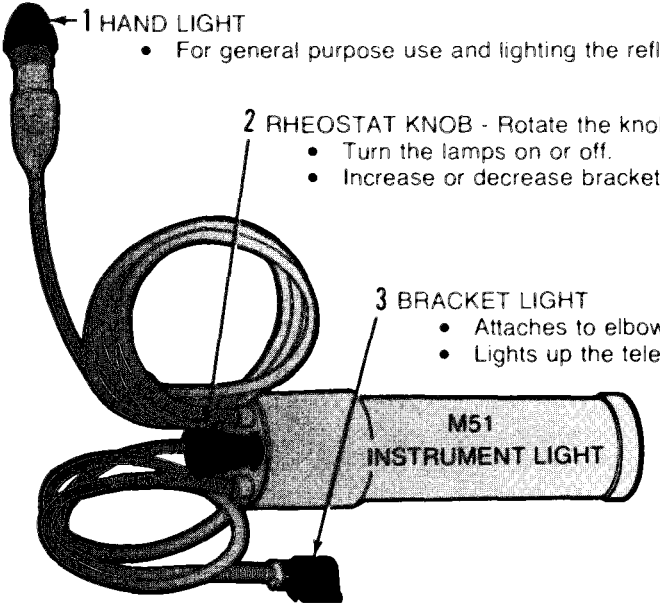


MORE ON EQUIPMENT USED WITH YOUR



MORE ON M24 TRIPOD FOR M2 and M2A2 AIMING CIRCLE

M2 OR M2A2 AIMING CIRCLE



1 HAND LIGHT
- For general purpose use and lighting the reflector.

2 RHEOSTAT KNOB - Rotate the knob to:
- Turn the lamps on or off.
- Increase or decrease bracket light brightness.

3 BRACKET LIGHT
- Attaches to elbow telescope slotted bracket.
- Lights up the telescope reticle.

SOME HANDLING DO's AND DONT'S FOR . . .

DO

- Keep it clean and dry If it gets wet, wipe it off with a clean, dry cloth.
- Keep the aiming circle covered when you are not using it.
- Keep the optical elements clean and dry. This will prevent etching of the glass surfaces. Use only lens tissue paper on optical surfaces.
- Keep the azimuth and elevation scales clean and dry. This will prevent corrosion of the surfaces.

YOUR M2 OR M2A2 AIMING CIRCLE

DON'T

- Force the rotation of any knob past its stop limit.
- Turn screws or other parts of the aiming circle that are not a part of your operation.

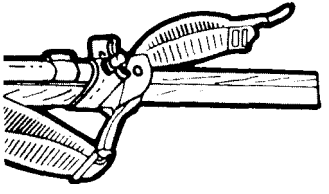
WARNING

Do not point the telescope directly at the sun unless the filter is used. Serious eye damage can result.

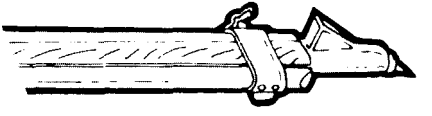
- Tighten leveling knobs, instrument fixing screw, or elevation knob past a snug contact.
- Scratch or damage optical elements.
- Place cover on the aiming circle if it is covered with moisture or condensation.

EMPLACING THE TRIPOD

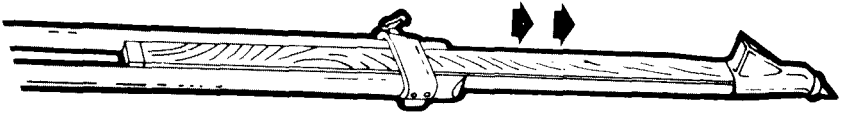
1 Unstrap tripod legs.



2 Loosen leg clamp thumbscrews.



3 Extend each leg to desired length Tighten leg clamp thumbscrews.

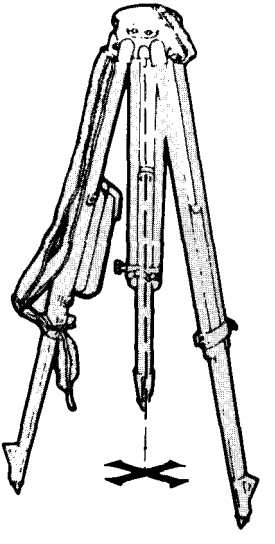


M2A2 AIMING CIRCLE

4 Spread tripod legs and position center of tripod over the orienting station, as shown at right.

NOTE

Point one leg in the direction of sighting. For convenient illumination adjustments during night sighting, place tripod leg with M51 instrument light next to your left leg.



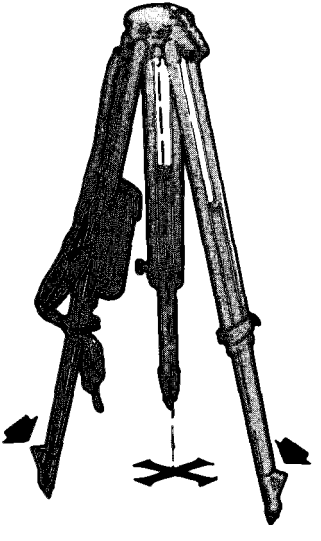
ORIENTING STATION

MORE ON EMPLACING THE TRIPOD

5 Place tripod on ground. Step on leg boots (shown by arrows at right) to set tripod firmly in place.

6 Bring tripod head into approximate level position by adjusting the length of the tripod legs. Make sure leg clamp thumbscrews are tight.

M2A2 AIMING CIRCLE



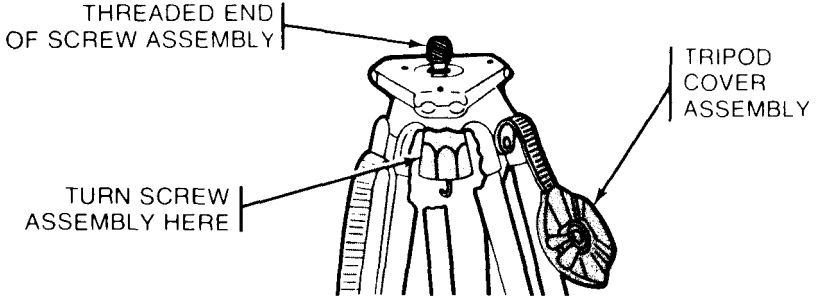
NOTE

On steep slopes, place two tripod legs on the downhill side.

MORE ON SETTING UP YOUR M2 OR...

PUTTING THE AIMING CIRCLE ON THE TRIPOD

1 Unscrew screw assembly and remove tripod cover assembly from tripod head.



M2A2 AIMING CIRCLE

2 Center screw assembly as shown at right.

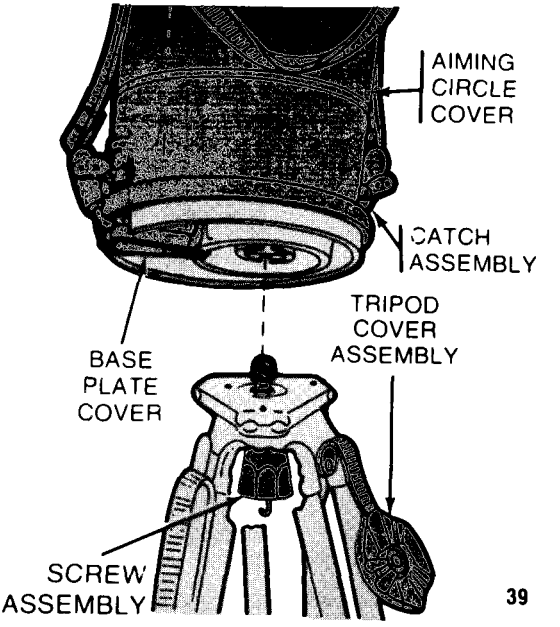
3 Open base plate cover and place aiming circle on tripod head as shown at right.

NOTE

Before tightening screw assembly position base plate cover so it is pointing toward you.

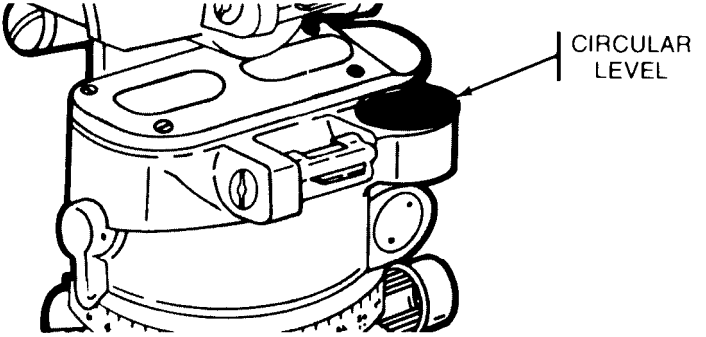
4 Turn screw assembly into threaded hole on aiming circle until screw is snug.

5 Release catch assemblies and remove cover from aiming circle. Hang aiming circle cover on the tripod cover assembly.



MORE ON PUTTING THE AIMING CIRCLE ON THE TRIPOD

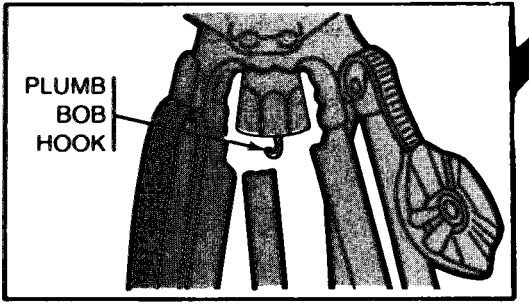
6 Check the circular level. The bubble should be approximately centered. If it is way off, readjust legs until bubble is approximately centered.



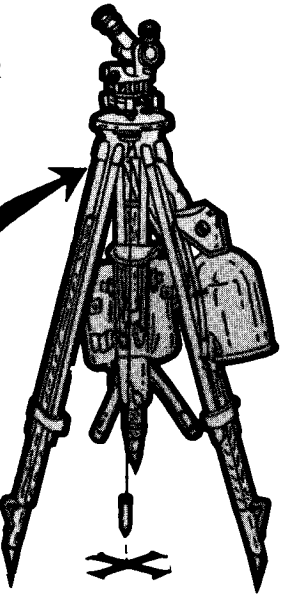
M2A2 AIMING CIRCLE

POSITIONING THE AIMING CIRCLE OVER AN ORIENTING STATION

1 Remove plumb bob assembly from canvas cover and hang the string on tripod plumb bob hook.



2 Adjust length of string until plumb bob just misses touching the orienting station.



MORE ON POSITIONING THE AIMING CIRCLE OVER AN ORIENTING STATION

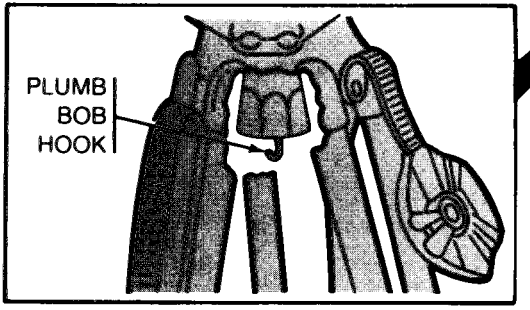
3 If necessary, adjust position of tripod until plumb bob is approximately over the center of the orienting station.

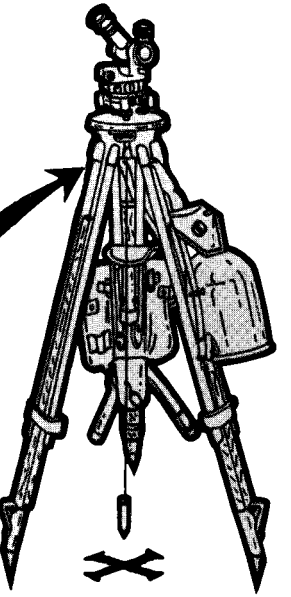
4 Check the circular level. The bubble should be approximately centered. If it is way off, readjust legs until bubble is approximately centered.

5 Position the aiming circle accurately over the orienting station

- Loosen screw assembly.
- Carefully slide aiming circle on the tripod head until the plumb bob is pointing right on the orienting station as shown at right.
- Tighten screw assembly.

M2A2 AIMING CIRCLE





ORIENTING
STATION

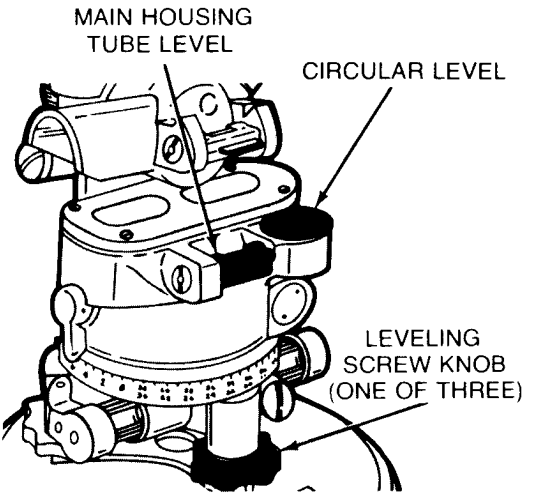
LEVELING THE AIMING CIRCLE

NOTE

For general use of aiming circle, such as laying artillery and mortars, centering the bubble in the circular level provides sufficient accuracy. If more accurate leveling is required, such as survey work, the main housing tube level bubble must be centered.

1 Turn aiming circle leveling screw knobs until the bubble is centered in the circular level.

2 Check that circular level bubble stays centered while fast traversing the aiming circle through 6400 mils. Spot check at 1600-mil intervals that bubble is centered.



3 If circular level bubble does not stay centered, repeat steps 1 and 2 above.

4 Uncover main housing tube level. Adjust leveling screw knobs until bubble in main housing tube level is centered.

5 Turn aiming circle in azimuth.

- Watch the bubble in the main housing tube level.
- The bubble must stay centered while the aiming circle is turned through 6400 mils. Spot check at 1600-mil intervals.

6 If the bubble in the main housing tube level does not stay centered:

- Turn leveling screw knobs to center bubble in main housing tube level.
- Turn aiming circle in azimuth to another azimuth setting.
- Again turn leveling screw knobs to center bubble in main housing tube level.
- Repeat the turning of the aiming circle in azimuth and the turning of the leveling screw knobs, as necessary.
- The main housing tube level bubble must remain centered while the aiming circle is turned through 6400 mils. Spot check at 1600-mil intervals.

MORE ON LEVELING THE AIMING CIRCLE

NOTE

In the following step the circular level bubble must also remain centered.

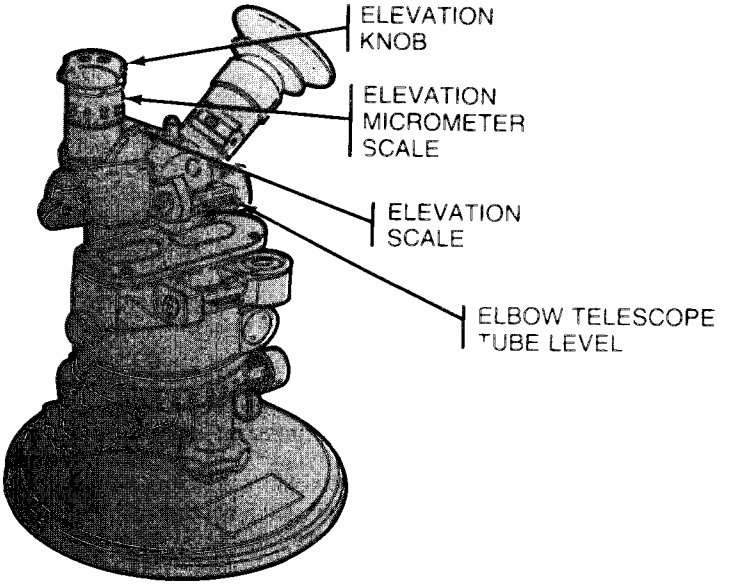
7 Check elbow telescope tube level bubble.

- Aiming circle must be in the level position.
- Turn elevation knob to set elevation scale to zero. The elevation micrometer scale must also read zero.
- The elbow telescope tube level bubble should be centered.

8 When you need light to set up and use the aiming circle:

- Uncoil the bracket light wire and slip the bracket light dovetail into the slot on the elbow telescope.
- Uncoil the hand light wire if you need the hand light.
- Turn rheostat knob to ON. The hand light will remain at full brightness. Turn rheostat knob to decrease brightness of the bracket light lamp.

M12A2 AIMING CIRCLE



PMCS PROCEDURES.

General. The PMCS procedures are contained in the table below. Perform the procedures by the numbered sequence on a daily basis when the aiming circle is in use. When not in use, the aiming circle PMCS procedures should be performed on a monthly basis.

Item Number Column. Checks and services are numbered in chronological order regardless of interval. This column shall be used as a source of item numbers for the 'TM Item Number' column on DA Form 2404, Equipment Inspection and Maintenance Worksheet, in recording results of PMCS.

Interval Columns. The columns headed 'B,' 'D,' and 'A' contain a dot (.) opposite the appropriate check. Thus, if a given check is performed before operation a dot is placed opposite the checks in the 'B' column; if the check is accomplished after operation, the dot is placed in the column headed 'A,' and if the same check is made in two or more periods, a dot is placed in each applicable column.

Item to Be Inspected and Procedure Column. The items listed in this column are divided into groups indicating the portion of the equipment of which they are a part. Under these groupings, the items to be inspected are to be identified by as few words, usually the common name, as will clearly identify the item. This column contains a brief description of the procedure by which the check is to be performed. It contains all the information required to accomplish the checks and services, including appropriate tolerances, adjustment limits, and instrument and gage readings.

For Readiness Reporting, Equipment Is Not Ready/Available If: Column. This column contains the criteria which will cause the equipment to be classified as not ready/available because of inability to perform its primary mission.

Preventive-Maintenance Checks and Services

B-Before Operation D-During Operation A-After Operation

ITEM NO.	INTERVAL B	D	A	ITEM TO BE INSPECTED PROCEDURE	FOR READINESS REPORTING EQUIPMENT IS NOT READY/ AVAILABLE IF:
1	•		•	AIMING CIRCLE. Clean exposed surfaces of optical elements with lens tissue.	Any optical surfaces are chipped or cracked.
2	•			Check that base plate cover pivots freely.	Base plate cover is missing, broken, or binds.

ITEM NO.	INTERVAL B	D	A	ITEM TO BE INSPECTED PROCEDURE	FOR READINESS REPORTING EQUIPMENT IS NOT READY AVAILABLE IF
3	•	•		Check for looseness or binding in azimuth orienting and elevation knobs.	Any of the controls have looseness sticking, or binding.
4	•			Check for loose or damaged level vials.	Level vials are loose or broken.

ITEM NO.	INTERVAL B	D	A	ITEM TO BE INSPECTED PROCEDURE	FOR READINESS REPORTING EQUIPMENT IS NOT READY/ AVAILABLE IF:
5				Turn azimuth knob until azimuth scale reads 0. Check that azimuth micrometer scale also reads 0 and that circular level bubble and main housing tube level bubble remain centered while the aiming circle is rotated through 6400 mils.	Scales will not match up and/or level bubbles will not remain centered.
6				Turn elevation knob until elevation scale reads 0. Check that elevation micrometer scale also reads 0 and that elbow telescope tube level bubble is centered.	Scales will not match up and/or level bubble is not centered.

ITEM NO.	INTERVAL B	INTERVAL D	INTERVAL A	ITEM TO BE INSPECTED PROCEDURE	FOR READINESS REPORTING EQUIPMENT IS NOT READY/ AVAILABLE IF:
7	•			M24 TRIPOD. Check that tripod legs are not cracked or broken and do not bind Check that accessory case is complete.	Tripod legs are cracked or broken or bind. Accessory case or any of its components are missing.
8			•	COVER. Check that cover properly attaches to and seats on the aiming circle base plate.	Cover will not attach and seat properly over aiming circle.

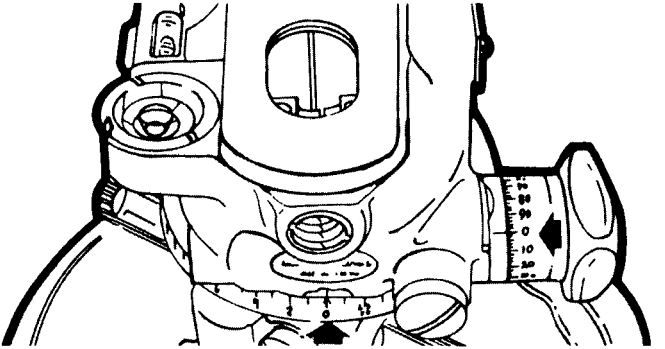
ITEM NO.	B	D	A	ITEM TO BE INSPECTED PROCEDURE	FOR READINESS REPORTING EQUIPMENT IS NOT READY/ AVAILABLE IF:
9	•			M51 INSTRUMENT LIGHT. Check that bracket light and hand light illuminate.	Bracket light and hand light will not illuminate.
	•			Check that bracket light can be dimmed with rheostat.	Bracket light will not dim.
	•			Check that there is no leakage/ corrosion on batteries or inside the instrument light tube.	Batteries are leaking or if there is corrosion inside the instrument light tube.

OPERATION UNDER USUAL CONDITIONS . . .

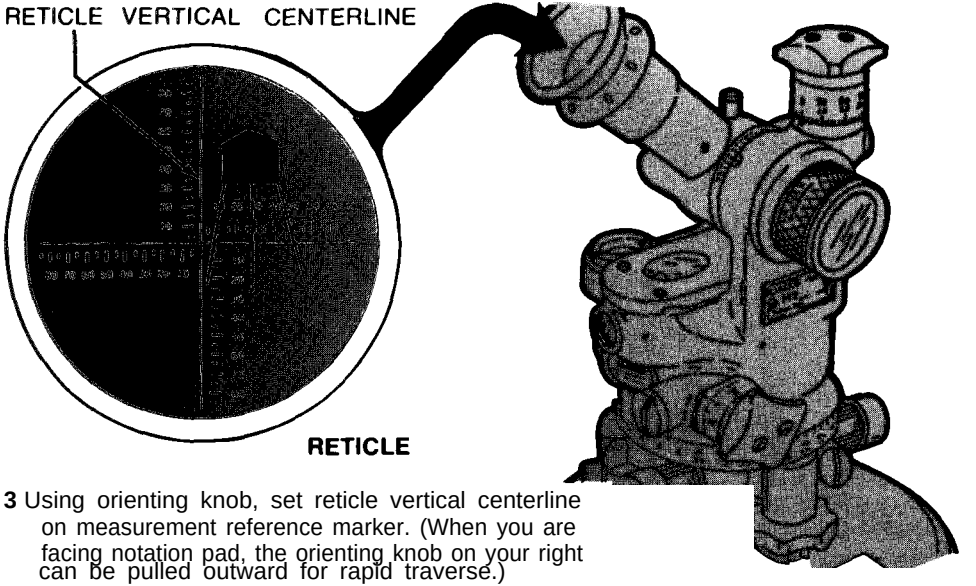
MEASURING HORIZONTAL ANGLES

1 Make sure aiming circle IS level.

2 Turn azimuth knob and set azimuth scale and azimuth micrometer scale to zero as shown below

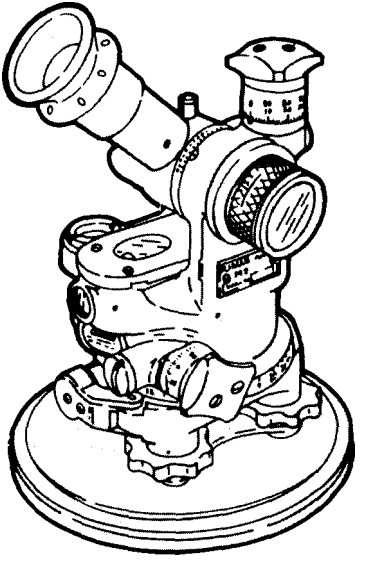


FOR M2 OR M2A2 AIMING CIRCLE



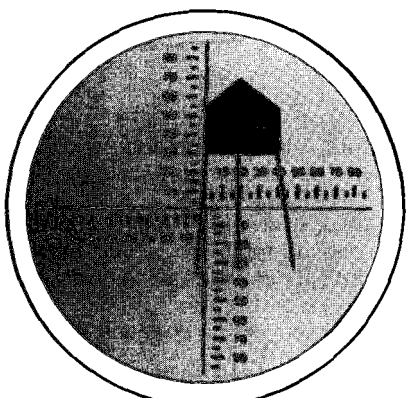
3 Using orienting knob, set reticle vertical centerline on measurement reference marker. (When you are facing notation pad, the orienting knob on your right can be pulled outward for rapid traverse.)

MORE ON OPERATION UNDER USUAL CONDITIONS...

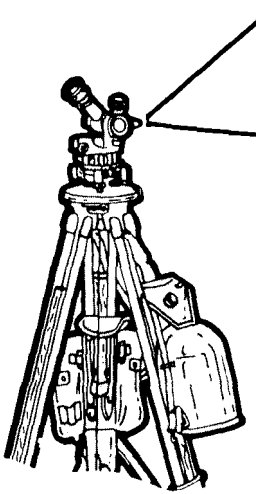


4 Turn azimuth knob until reticle vertical centerline is on unknown point to which measurement is to be made. (Azimuth knob can be pulled outward to make rapid azimuth changes.)

5 Read angle from azimuth scale and azimuth micrometer scale.



MORE ON OPERATION UNDER USUAL CONDITIONS...



ORIENTATION ON A POINT OF KNOWN AZIMUTH

1. Turn azimuth knob and set azimuth scale and azimuth micrometer scale to known azimuth.
2. Open covers on orienting knobs and turn orienting knobs to rotate the aiming circle until the reticle vertical centerline alines with the known point.
3. Close covers on orienting knobs.

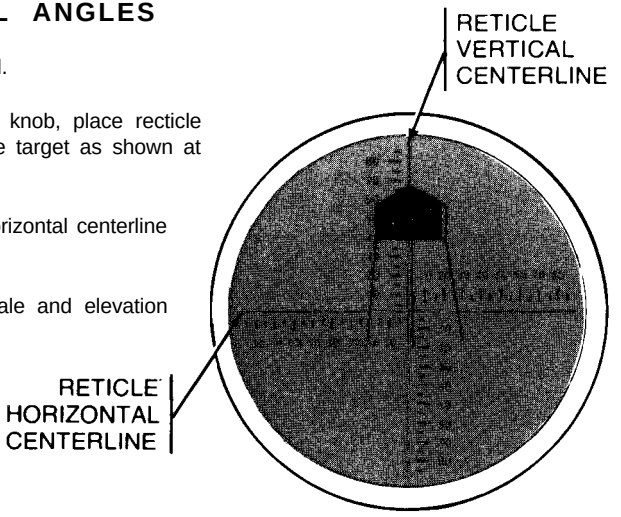
MEASURING VERTICAL ANGLES

1 Make sure aiming circle is level.

2 Using either azimuth or orienting knob, place recticle vertical centerline on center of the target as shown at right.

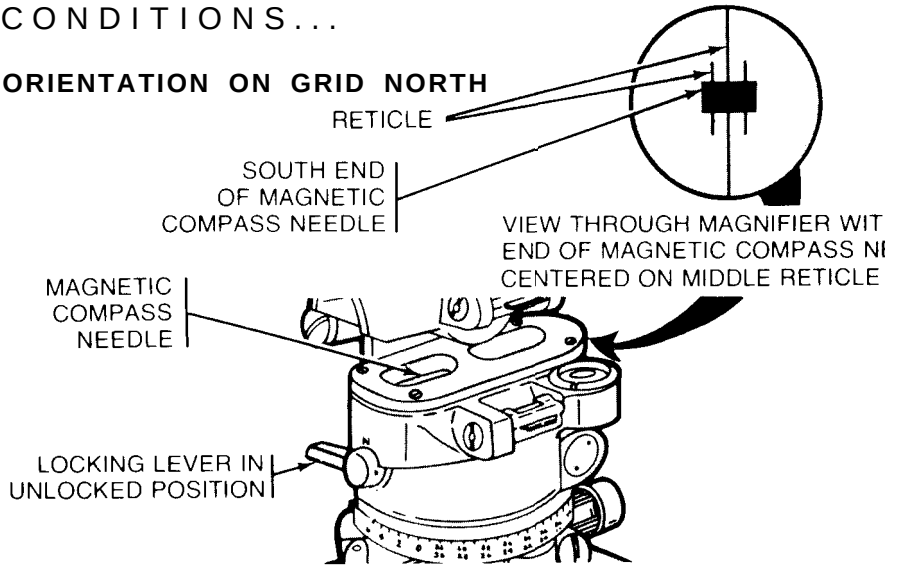
3 Turn elevation knob until reticle horizontal centerline is on target as shown at left.

4 Read elevation from elevation scale and elevation micrometer scale.



MORE ON OPERATION UNDER USUAL CONDITIONS...

ORIENTATION ON GRID NORTH



DECLINATION PROCEDURES

1 Setup the aiming circle over a declination station. Carefully level the instruments.

2 Set azimuth scale and azimuth micrometer scale to zero.

3 Point elbow telescope in the general direction of NORTH.

NOTE

The aiming circle magnetic compass cannot be used near iron or steel masses as inaccurate readings will result.

4 Unlock magnetic compass needle.

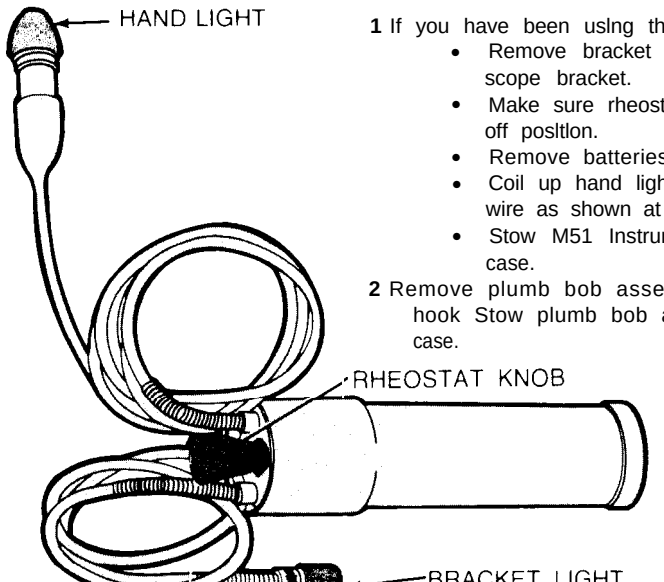
5 Turn orienting knobs until magnetic compass needle is centered on the middle reticle. Look through magnifier.

6 Turn azimuth knob until elbow telescope reticle alines with a point of known azimuth. Record this indication. Do this process four times and record the average of these four indications. Subtract this average from the known Grid-Azimuth (add 6400 roils to the Grid-Azimuth, if necessary). This is the declination constant of the instrument.

7 If more than one point of known Grid-Azimuth is visible, repeat the computation for each point and take the average of these computations as the declination constant.

8 Lock magnetic compass needle.

TAKING DOWN YOUR M2 OR . . .



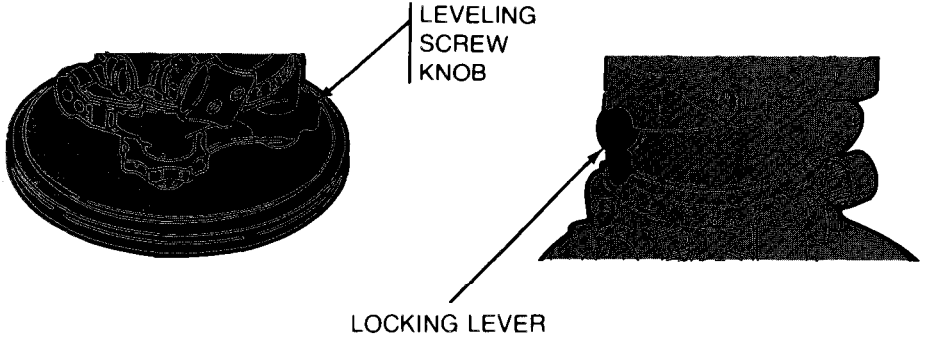
1 If you have been uslng the M51 Instrument light:

- Remove bracket light from elbow telescope bracket.
- Make sure rheostat knob IS turned to the off posltlon.
- Remove batteries (see page 72)
- Coil up hand light wire and bracket light wire as shown at right.
- Stow M51 Instrument light in accessory case.

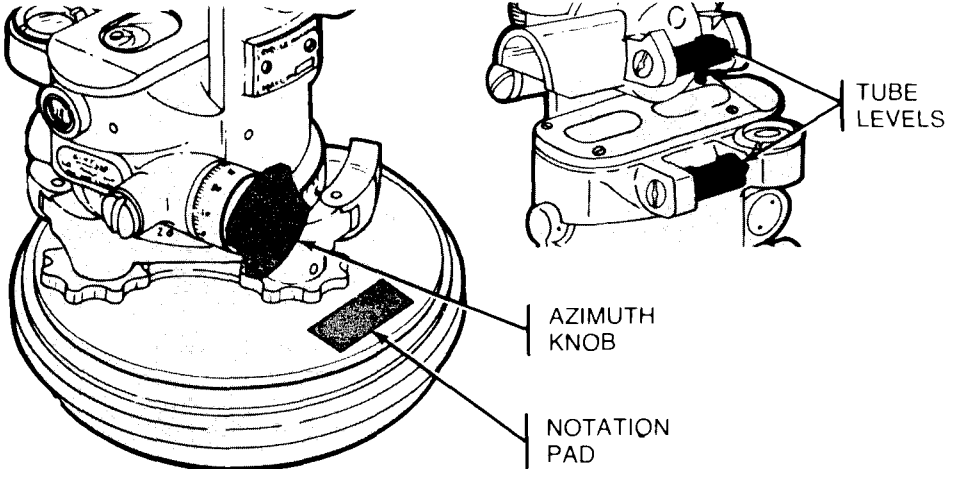
2 Remove plumb bob assembly from plumb bob hook Stow plumb bob assembly in accessory case.

3 Tighten leveling screw knobs to their lower stops. Then loosen each leveling screw knob one-quarter turn.

4 Check to be sure that magnetic compass needle locking lever is locked as shown at right.



MORE ON TAKING DOWN YOUR M2 OR ...



5 Close covers on orienting knobs.

6 Cover tube levels by rotating their covers into place.

7 Place the azimuth knob over the notation pad as shown at left.

8 Place cover on aiming circle. Engage and lock the catch assemblies.

9 Unscrew the instrument fixing screw and lift the aiming circle off the tripod.

10 Replace tripod cover assembly.

11 Take down the tripod.
- Ž Loosen leg clamp thumbscrews.
- Ž Collapse tripod legs fully.
- Ž Tighten leg clamp thumbscrews.
- Ž Close and strap tripod legs together.

OPERATION UNDER UNUSUAL CONDITIONS FOR M2 OR...

EXTREME COLD

1 Keep the aimig circle absolutely moisture free.

2 Wipe excess oil off working parts.

3 Never breathe on a lens in cold weather. It will only make things worse.

4 Use gloves if at all possible. Touching metal parts with your bare hands can cause frozen fingers or loss of skin. Do not touch optical surfaces.

5 Do not bring your aiming circle indoors unless it is absolutely necessary.

- Store in protected outdoor storage.
- Use snowtight lockers.
- Use an anticondensation container to bring your aiming circle indoors. This will allow the aiming circle to warm up without condensation forming on it.

6 If you must bring an aiming circle into a warm room, condensation will form on it.
- Wipe it dry.
- Use only lens tissue paper on lenses or windows.

7 Inspect it frequently.
- Look for rust or corrosion.
- Check operation of all controls

8 Cover it when not in use. Keep it dry.

9 Keep it clean.

10 Never apply heat directly to the aiming circle.

MORE ON OPERATION UNDER UNUSUAL CONDITIONS FOR M2 OR...

HOT CLIMATES

1 Operate from some kind of shade, if at all possible.

2 Inspect aiming circle frequently.
- Look for rust, corrosion, or fungus.
- Check operation of all controls.

3 Keep it clean.

4 After use, wipe off hand prints.

M2A2 AIMING CIRCLE

DUSTY AND SANDY AREAS

1 Keep it covered when not in actual use.

2 Keep dust and sand from collecting on working parts.

3 Keep it clean.

WET AND SALTY AREAS

1 Keep it covered when not in actual use.

2 Inspect aiming circle frequently.

- Look for rust or corrosion.
- Check operation of all controls.

3 Keep it clean and dry.

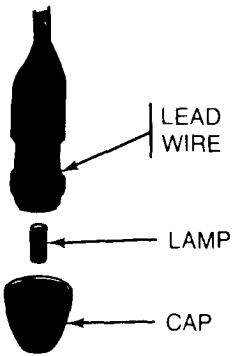
M51 INSTRUMENT LIGHT

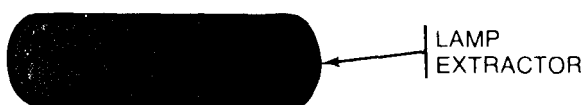
HAND LIGHT LAMP - REMOVE

- Unscrew cap from lead wire.
- Unscrew lamp from lead wire.
  Use lamp holder extractor (Stored in accessory case).

HAND LIGHT LAMP - INSTALL

- Push glass bulb of lamp into lamp extractor.
- Screw lamp Into lead wire and remove lamp extractor.
- Screw cap onto lead wire.





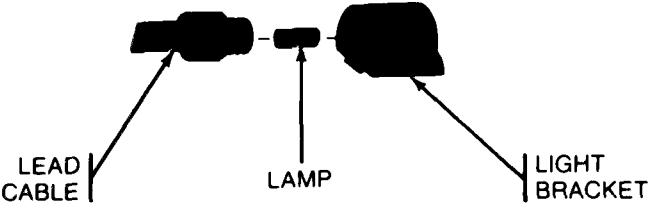
OR M2A2 AIMING CIRCLE

BRACKET LIGHT LAMP - REMOVE

- Unscrew light bracket from lead cable.
- Unscrew lamp from lead cable.
  Use lamp extractor (Stored in accessory case).

BRACKET LIGHT LAMP - INSTALL

- Push glass bulb of lamp into lamp extractor.
- Screw lamp into lead cable and remove lamp extractor.
- Screw light bracket onto lead cable.

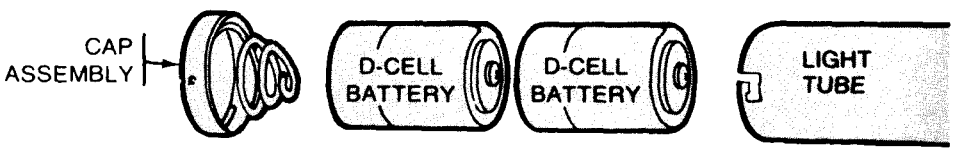


MORE ON PARTS YOU REPLACE ON M2 or M2A2 AIMING CIRCLE

M51 INSTRUMENT LIGHT

BATTERIES - REMOVE

- Press cap assembly and turn counterclockwise.
- Remove cap assembly from light tube.
- Remove D-cell batteries from light tube.



BATTERIES - INSTALL

- Insert two D-cell batteries in light tube as shown above.
- Aline pins in cap assembly with slots in light tube.
- Press in on cap assembly and turn clockwise to lock it in place.

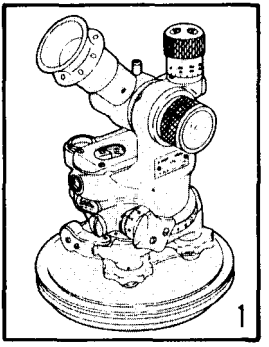
COMPONENTS OF END ITEM AND BASIC ISSUE ITEMS LIST

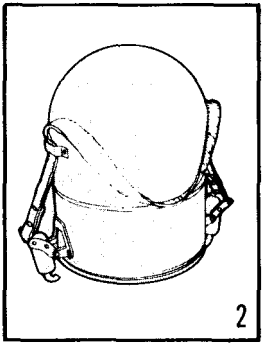
INTRODUCTION

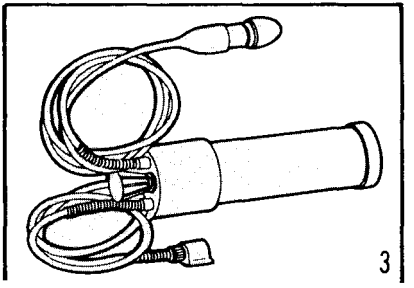
Components of End Item Listing is for information only and is not authority to requisition replacements. These items are part of end item but are removed and packaged separately for shipment. These items must be with the end item whenever it is issued or transferred between property accounts.

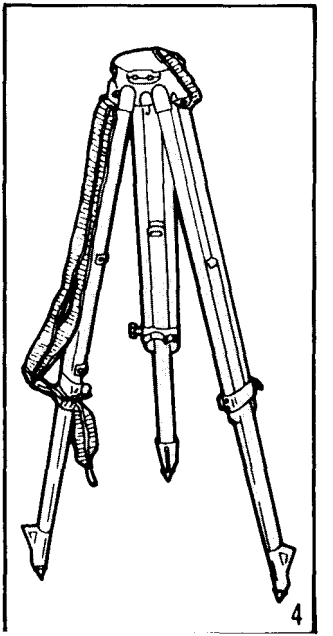
Basic issue Items are the minimum essential items required to place the M2 or M2A2 aiming circle in operation. Although shipped separately, Bll must be with the M2 or M2A2 aiming circle during operation and whenever it is transferred between property accounts. This TM is your authority to requisition replacement Bll based on TOE/MTOE authorization of end item.

COMPONENTS OF END ITEM





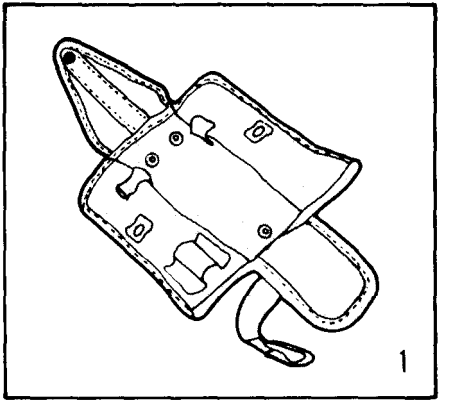


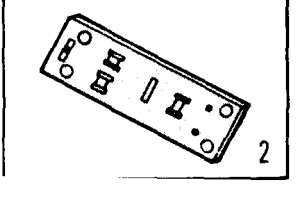


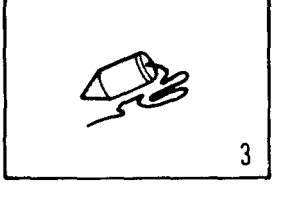
COMPONENTS OF END ITEM (cont)

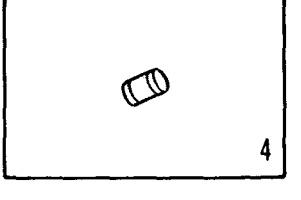
(1) ILLUS NUMBER	(2) NATIONAL STOCK NUMBER	(3) DESCRIPTION FSCM AND PART NUMBER	(4) U/M	(5) QTY RQR
1		AIMING CIRCLE M2 (19200) 8211637	EA	1
1		AIMING CIRCLE M2A2 (19200) 11834483	EA	1
2	1290-00-346-8171	COVER (19200) 8211749	EA	1
3	1290-00-346-8186	LIGHT. INSTRUMENT. M51 (19200) 8293478	EA	1
4	1290-00-346-8184	TRIPOD. AIMING CIRCLE. M24 (19200) 8242777	EA	1

BASIC ISSUE ITEMS









BASIC ISSUE ITEMS (cont)

(1) ILLUS NUMBER	(2) NATIONAL STOCK NUMBER	(3) DESCRIPTION FSCM AND PART NUMBER	(4) U/M	(5) QTY RQR
1	1240-00-346-8147	COVER, CANVAS: 7659605 (19200)	EA	1
2	1290-00-346-8177	PLATE, BACK: 8211759 (19200)	EA	1
3	1290-00-346-8185	PLUMB BOB ASSEMBLY: 8261635 (19200)	EA	1
4	5120-00-505-5477	EXTRACTOR, LAMP: 8293477 (19200)	EA	2

ADDITIONAL AUTHORIZATION LIST

NONE AUTHORIZED

EXPENDABLE SUPPLIES AND MATERIALS LIST

The list of expendable supplies and materials IS what you will need to operate and maintain the aiming circle. Anything else you might need is authorized to you by CTA 50-970. Expendable Items.

EXPENDABLE SUPPLIES AND MATERIALS LIST (cont)

(1) ITEM NUMBER	(2) LEVEL	(3) NATIONAL STOCK NUMBER	(4) DESCRIPTION	(5) U/M
1	C	6135-00-120-1020	BATTERY, DRY: 1.5V MS75059 (96906)	EA
2	C	6240-00-635-9800	LAMP. INCANDESCENT: MS51608-3 (96906)	EA
3	C	6640-00-663-0832	PAPER, LENS: tissue sheet NNN-P-40. type 1 (81348)	EA

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TM 9-1290-262-10

By Order of the Secretary of the Army

E.C. MEYER
General, United States Army
Chief of Staff

Official:

J.C. PENNINGTON
Major General, United States Army
The Adjutant General

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To be distributed in accordance with DA Form 12-41, operato
maintenance requirements for Aiming Circle.

PIN: 048383-000

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 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

TEAR ALONG PERFORATED LINE

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

'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

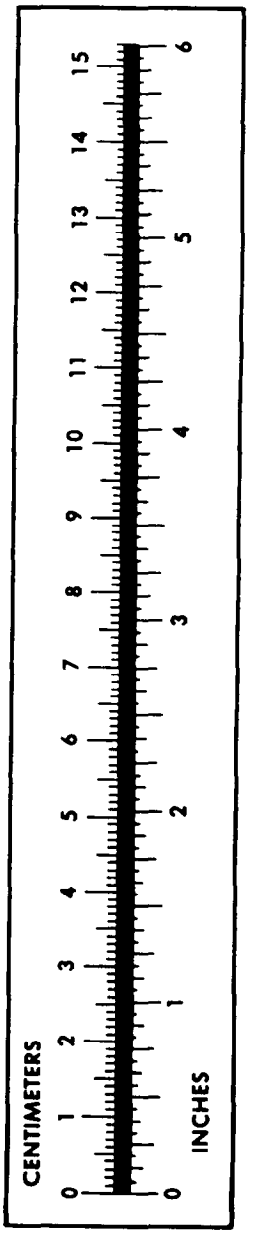
TEMPERATURE

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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