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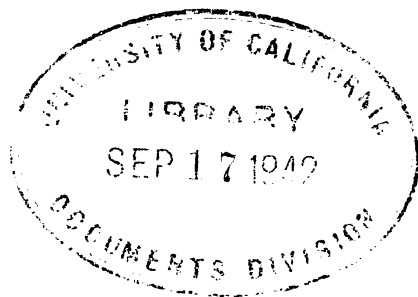
WAR DEPARTMENT
U.S. Dept. of Army

TECHNICAL MANUAL

ORDNANCE MAINTENANCE

ANGLE OF SITE INSTRUMENT, M1917

April 4, 1941



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WAR DEPARTMENT,
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ORDNANCE MAINTENANCE

ANGLE OF SITE INSTRUMENT, M1917

Prepared under direction of the
Chief of Ordnance

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1. **Purpose.**—This manual is published primarily for the information and guidance of ordnance maintenance personnel.

2. **Scope.**—This manual supplements the technical manuals which are prepared for the using arm. It contains descriptive matter, operating instructions, and detailed instructions for maintenance and repair by ordnance personnel.

3. **References.**—See appendix for Standard Nomenclature List and other publications pertaining to the angle of site instrument, M1917.

4. **Description.**—*a.* The angle of site instrument (fig. 1) is a level-type instrument used for measuring angles of site and for laying machine guns in elevation. In the latter case, it performs the functions of a clinometer.

b. The two side plates (8A) and (8B) and the base tube (5D) form the frame of the instrument.

c. The leveling arm (4H) above the base tube (5D) pivots on the leveling arm fulcrum screw (6L) fastened to the right side plate (8B). The end of the leveling arm is raised or lowered through an angle of 180 mils by means of the elevating screw (8D). A level assembly attached to the arm indicates the horizontal position.

d. The mirror (7B) within the base tube reflects an image of the level vial (A35764) toward the eyepiece (5C). This mirror is inclined at 45° to the base within tolerance of 1 mil. The mirror holder (4K) fastened by fillister head screw (BCGX4CB) is removable for cleaning of the mirror.

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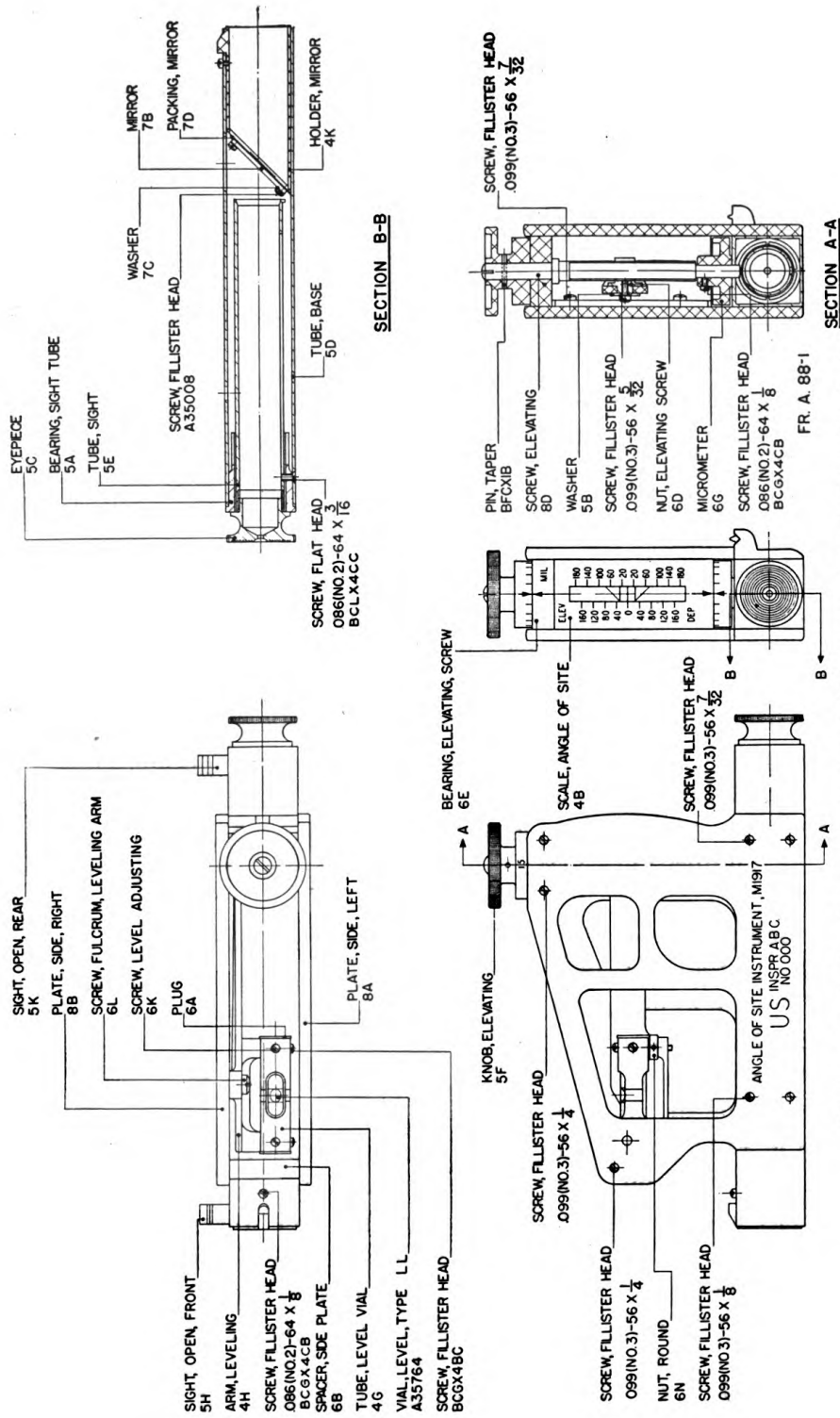


FIGURE 1.—Angle of site instrument, M1917 (assembled and sectioned views).

e. The eyepiece (5C) is attached to the sight tube (5E) which slides in the sight tube bearing (5A) within the base tube. The eyepiece views the target through the open end of the base tube (5D) and simultaneously views the reflected image of the level vial (A35764). The line of sight on which observations are made is indicated by a horizontal scribed line on the mirror or, in some instruments, by a horizontal wire alongside the mirror.

f. The front open sight (5H) and rear open sight (5K) are provided for rapidly locating the target.

g. The elevating knob (5F) rotates the elevating screw (8D) which raises or lowers the movable end of the leveling arm (4H). Angle of site indications are obtained on the angle of site scale (4B) in conjunction with the micrometers. The micrometer graduations which are used in conjunction with the elevation (upper) portion of the scale are engraved on the elevating knob (5F). The micrometer (6G), which is used in conjunction with the depression (lower) portion of the scale, is fastened to the lower end of the elevating screw (8D).

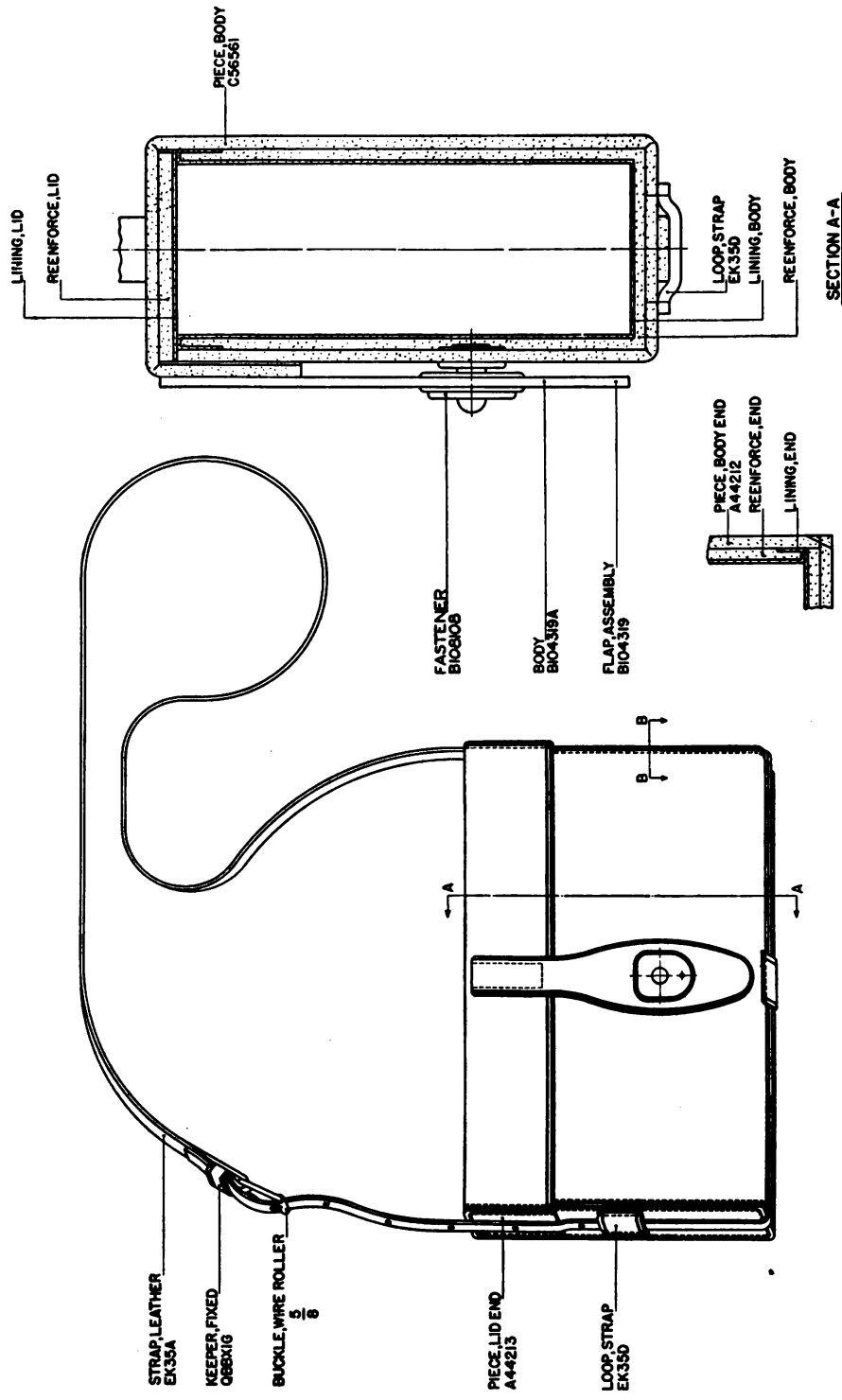
h. The instrument is furnished complete with carrying case (fig. 2).

5. Operation.—*a.* To measure the angle of site of an object, pull out the sight tube and set the leveling arm to indicate the approximate angle of the object. Direct the instrument approximately on the object by means of the open sights, then look through the eyepiece and elevate or depress the instrument until the scribed line on the mirror (or the horizontal wire), which marks the center of the field of view, is alined exactly on the object. Maintaining this alinement, rotate the elevating knob until the bubble is centered in the level vial. The angle of site is then indicated directly on the angle of site scale and corresponding micrometer. More accurate results are obtained by taking the mean of several readings.

b. To lay the gun, using the instrument as a clinometer, set the leveling arm to the desired angle of elevation or depression and place the instrument on a straight portion of the gun which is parallel to the bore. Elevate or depress the gun until the bubble is centered in the level vial. Remove the instrument from the gun before firing.

c. To measure the angle of elevation of the gun, using the instrument as a clinometer, place the instrument on a straight portion of the gun, parallel to the bore. Rotate the elevating knob until the bubble is centered in the level vial. Note the reading of the angle of site scale and corresponding micrometer.

6. Field test and adjustment.—*a. Test.*—Place the instrument on a plane surface, rotate the elevating knob until the bubble is cen-



SECTION B-B F.R.A. 89-1
SECTION A-A

FIGURE 2.—Carrying case (assembled and sectioned views).

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tered in the level vial, and note the reading of the angle of site scale and corresponding micrometer. Reverse the instrument end for end, rotate the elevating knob until the bubble is again centered in the level vial, and note the new reading of the scale and micrometer. The two test readings so obtained should be in opposite directions and should be numerically equal to each other. If the two readings are not numerically equal, it will be necessary to apply a suitable correction angle when using the instrument. The value of this angle is equal to one-half the difference between the two previously obtained readings. The correction angle is added to the scale (elevation or depression) which showed the lower test reading and subtracted from the scale which showed the higher test reading.

b. Adjustment.—Adjustment of the instrument by the using arm is not permitted.

7. Inspection.—Inspection is for the purpose of determining the condition of the instrument, whether repairs or adjustments are required, and the remedies necessary to insure serviceability and proper functioning. The listing below will serve as a guide for inspection.

Parts to be inspected	Points to be observed
<i>a.</i> General appearance...	<i>a.</i> Note any bent or missing parts or loose screws. See that scale and micrometer graduations are clear and legible.
<i>b.</i> Level vial.....	<i>b.</i> Level vial should be intact and should be secure in its mounting.
<i>c.</i> Sight tube.....	<i>c.</i> Sight tube should operate smoothly in the sight tube bearing with sufficient friction to hold the tube in position.
<i>d.</i> Base tube.....	<i>d.</i> Base should be perfectly plane, smooth, and clean.
<i>e.</i> Mirror.....	<i>e.</i> Mirror should be clean and securely mounted. Remove mirror holder, if necessary, to examine mirror surface.
<i>f.</i> Elevating screw.....	<i>f.</i> Elevating screw should operate smoothly through entire operating range without irregularities, undue looseness, or binding.
<i>g.</i> Micrometers.....	<i>g.</i> With the elevating arm in level position and elevating screw set to zero, angle of site scale should indicate exactly zero. The micrometer at the lower end of the screw should also indicate zero.
<i>h.</i> Alinement.....	<i>h.</i> Bubble should be centered in level vial when base tube is horizontal, line of sight is horizontal, and scale and micrometers read zero.

8. Disassembly and assembly.—*a.* Disassembling is required for cleaning in event of extreme fouling and for replacement of parts.

b. Remove mirror holder (4K) by removing the fillister head screw at the front of the base tube and tapping the lug of the mirror holder toward the front until the holder is free.

c. Unscrew eyepiece (5C) from sight tube (5E).

d. Remove flathead screw (BCLX4CC) in bottom of base tube and push sight tube (5E) out through front of base tube.

e. Remove left side plate (8A) by removing six fillister head screws therein. Do not remove right side plate.

f. This completes normal disassembly required for cleaning or similar purposes. The remaining parts are readily accessible for further disassembly if required.

g. To replace a broken level vial, remove two fillister head screws (BCGX4BC) on side of level vial tube (4G) and loosen round nut (6N). Remove level adjusting screws (6K) thereby releasing level assembly from leveling arm. Mark end plugs (6A) for identification on reassembly and remove from level vial tube. Clean out broken glass and old packing. Fit new level vial in level vial tube so that graduations on top surface of vial center properly with graduations on side of tube. Pack with calcined gypsum (plaster of paris) and replace end plugs. When plaster has partly set, clean excess from screw holes and openings. Replace all screws and nuts previously removed and reassemble level assembly on leveling arm. When plaster has fully set, adjust level as described in paragraph 9*c*.

h. Reassembling operations are performed in the reverse order of disassembly.

9. Adjustment.—*a.* To adjust the lower micrometer (6G), set the elevating knob (5F) to zero, loosen the two fillister head set screws (BCGX4CB), and turn the micrometer to zero. Tighten the screws.

b. The elevating knob (5F) cannot be adjusted as it is secured to the elevating screw (8D) by a taper pin.

c. Level vial bubble should be central when base tube is horizontal and elevation reading is zero. To adjust level vial tube, loosen round nut (6N) and fillister head screw (BCGX4BC), then turn level adjusting screw (6K) until bubble is central when base in on level surface. Tighten round nut and fillister head screw. Check setting. Repeat adjustment, if necessary, until bubble centers properly.

10. Care and preservation.—*a.* The instrument should be handled gently to avoid unnecessary shocks. It should be kept in the carrying case when not in use. After use in wet weather, the instru-

ment should be wiped dry before being placed in the carrying case.

b. Dust should be removed by use of a camel's-hair brush.

c. The mirror should be kept clean to secure the best reflection of the level bubble. The mirror holder is removable to permit cleaning the mirror. A camel's-hair brush is used to remove dust, and lens tissue paper for final cleaning.

d. Lubricate leveling screw threads and bearings and fulcrum screw journal at occasional intervals. Use only a very small amount of oil. The approved oil for this purpose is aircraft instrument and machine gun lubricating oil.

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APPENDIX

REFERENCES

Standard Nomenclature List.

Instrument, Angle of Site, M1917----- SNL F-7

Technical Manuals.

Cleaning and Preserving Materials-- TM 9-850 (now published
as TR 1395-A)

Matériel Inspection and Repair----- TM 9-1100

[A. G. 062.11 (2-11-41).]

BY ORDER OF THE SECRETARY OF WAR:

G. C. MARSHALL,
Chief of Staff.

OFFICIAL:

E. S. ADAMS,
*Major General,
The Adjutant General.*

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