TM 9-1220-223-14

DEPARTMENT OF THE ARMY TECHNICAL MANUAL

OPERATOR, ORGANIZATIONAL, DIRECT

SUPPORT AND GENERAL SUPPORT MAINTENANCE

MANUAL INCLUDING REPAIR PARTS AND

SPECIAL TOOLS LISTS FOR INDIRECT

FIRE PLOTTING BOARD M17 W/E

[1220-588-7282]

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HEADQUARTERS, DEPARTMENT OF THE ARMY

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CHANGE
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Operator, Organizational, Direct Support and General Support Maintenance Manual Including Repair Parts and Special Tools Lists FOR INDIRECT FIRE PLOTTING BOARD M17 W/E (1220488-7282)

TM 9-1220-223-14, 11 June 1971 is changed as follows:
Page C-6 Section II. Basic Issue Items List is superseded as follows:

Section II. BASIC ISSUE ITEMS LIST

(1) Source Maint and Recov Code			(2) Federal Stock No.	(3) Description	(4) Unit of Meas	(5) Qty Furn With Equip	(6) Illustration	
(a) Source	(b) Maint	(c) Recov		Reference Number & Mfr. Code — Usable on Code			(a) Fig No.	(b) Item No.
P-C			1220-769-1903	CASE, CARRYING, M72 7691903 (19200)	EA	1	1-1	2

By Order of the Secretary of the Army:

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Chief of Staff

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Major General, United States Army
The Adjutant General

Distribution :
To be distributed in accordance with DA Form 12-41, (qty rqr block no. 10) Operator maintenance requirements for Board Plotting,

TECHNICAL MANUAL
No. 9–1220–223-14

HEADQUARTERS,
DEPARTMENT OF THE ARMY
WASHINGTON, D. C., *11 June 1971*

OPERATOR, ORGANIZATIONAL, DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE MANUAL INCLUDING REPAIR PARTS AND SPECIAL TOOLS LISTS INDIRECT FIRE PLOTTING BOARD M17 W/E (1220-88-7282)

This manual supersedes TM 9-1220-223-15, dated 31 May 1961 including all changes.

CHAPTER 1

INTRODUCTION

Section I. GENERAL

1-1. Scope

a. This manual contains instructions for operator, organizational, direct support, general support, and depot maintenance for indirect fire plotting board M17 W/E (1220-588-7282).

b. Appendix A is a list of current references, including supply and technical manuals, forms and other publications applicable to plotting board M17.

c. Appendix B contains a maintenance allocation chart which lists maintenance responsibilities allocated to each category of maintenance.

d. Appendix C contains basic issue items, organizational, direct support, general support, and depot maintenance repair parts and special tools list.

1-2. Forms, Records and Reports

a. Authorized Forms. Refer to TM 38-750. For listing of all forms refer to DA Pam 310-2.

b. Report of Accidents. The necessary reports are prescribed in AR 385-40.

1-3. Reporting of Errors

Report of errors, omissions, and recommendations for improving this publication by the individual user is encouraged. Reports should be submited on DA Form 2028 (Recommended Changes to DA Publications) and forwarded direct to the Commanding Officer, Frankford Arsenal, ATTN: AMSWE–MAF–W3100, Philadelphia, Pa. 19137.

Section II. DESCRIPTION AND DATA

1-4. Description

a. General. Plotting board M17 (fig. 1–1) is a portable fire control instrument designed to help the operator in computing firing data for range and azimuth of a target for indirect firing of the weapon. The plotting board utilizes known range and azimuth data from the weapon to an observation post, in combination with reported data received from the post concerning location of the target with respect to the post. It is used to compute geometrically the range and azimuth of the target from the weapon.

b. Basic Components. Plotting board M17 (fig. 1–2) is a two-part assembly and consists fundamentally of a base (2) and an azimuth disk (1).

(1) Base. The base (6) (fig. 1-3) is composed of white laminated plastic to which a pivot (1) is secured to accommodate the azimuth disk. The azimuth disk is centrally mounted, and may be rotated on the pivot. The base is square on the right edge. The left edge, beginning at the index line (8) is semicircular. The top and bottom edges are straight and parallel to each other, from the right edge to the index line. The surface of the base is roughened slightly to receive pencil markings during firing problem computation. In addition to the plotting board name and model number, the base contains those markings on its surface described in (a) through (f) below. Printing on the base surface is black, unless otherwise stated.

(a) The right edge of the base has a scale 8 inches long graduated in inches from O to 7 in one direction, with each graduation subdivided into tenths of an inch. The remaining 1 inch, from O to 1 in the opposite direction, is divided into twentieths of an inch.

(b) The top edge of the base has a scale 9 centimeters long graduated in centimeters from 1 to 9 and reading from right to left. Each graduation is divided into millimeters. The figures 1 through 9 and the letters MM are red.

(c) The vernier scale (3) on the top edge

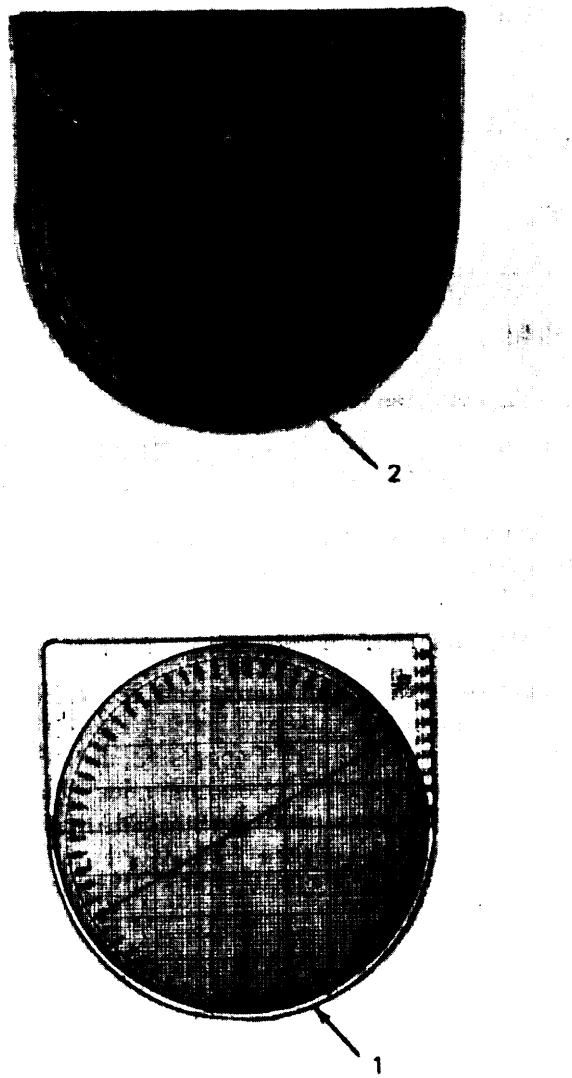

Figure 1-1. Indirect fire plotting board M17 W/E.

of the base is graduated into 20 equal spaces. The central graduation line of the scale is directly above the centrally located index mark (4). Ten equal divisions of the scale are located to each side of the index mark. The vernier scale marking is red.

(d) At the bottom of the base (6) is a triple map scale (5) graduated in meters with its legend and representative ratios of 1:50,000, 1:25,000, and 1:5,000. These representative ratios refer respectively to the top, middle, and lower scales. These scales are used to transfer data to or from a map or firing chart which has one of these scales. The triple map scale is 1 decimeter long and is divided into 10 divisions of

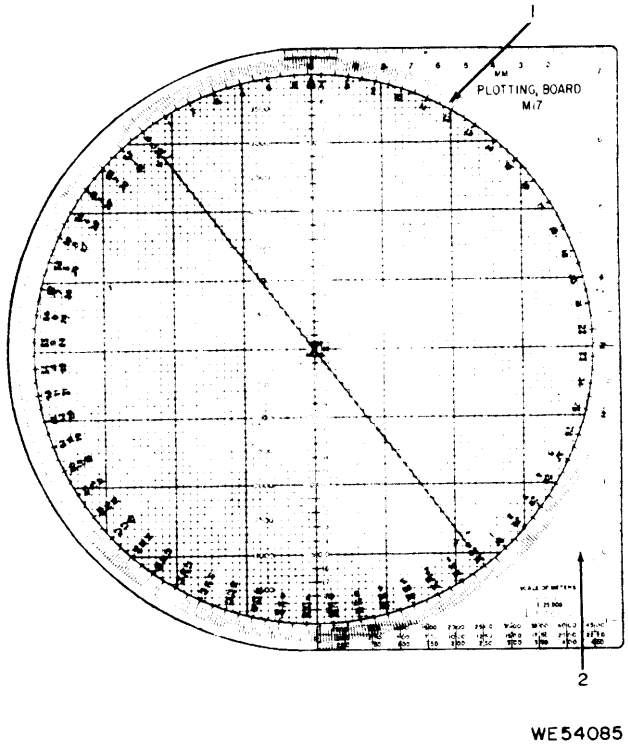

Figure 1-2. Indirect fire plotting board M17.

1 centimeter each. The first division, to the right of the index line is equally divided into 10 spaces of 1 millimeter each. The nine graduation lines in the first division and all figures in the middle scale are red.

(e) The grid pattern (7) is inclosed within an 8.000-inch circle. A series of l-inch vertical and horizontal squares and parts of squares are located within the circle parallel to the index and O. P. (observation post) lines (2). Each complete l-inch square is divided into 100 equal squares. Twenty-eight incomplete 1-inch squares, bordering on the circle, contain varying amounts of smaller squares and parts of squares. There are 78 equally spaced vertical and horizontal lines and 80 equal vertical and horizontal squares along the index and O.P. lines. All marking is red.

(f) The index line, passing through the center of the grid pattern, has an arrow touching the top inside diameter of the circle. The arrow points to the O (zero) index mark. A thin line, from the point of the arrow, intersects the index mark and extends to, and becomes the centerline of, the vernier scale. This thin line is the point on the plotting board base at which all deflections are read. The index line is graduated

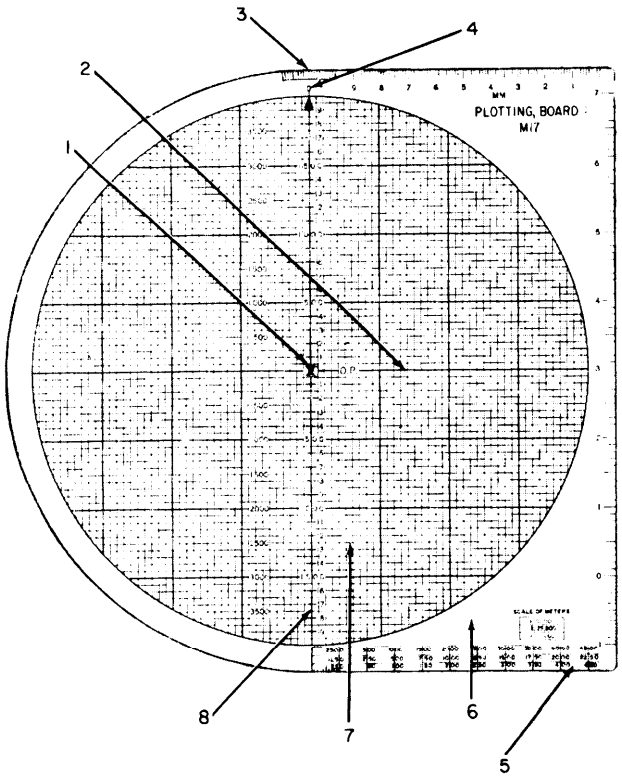

Figure 1-3. Plotting board M17—Base.

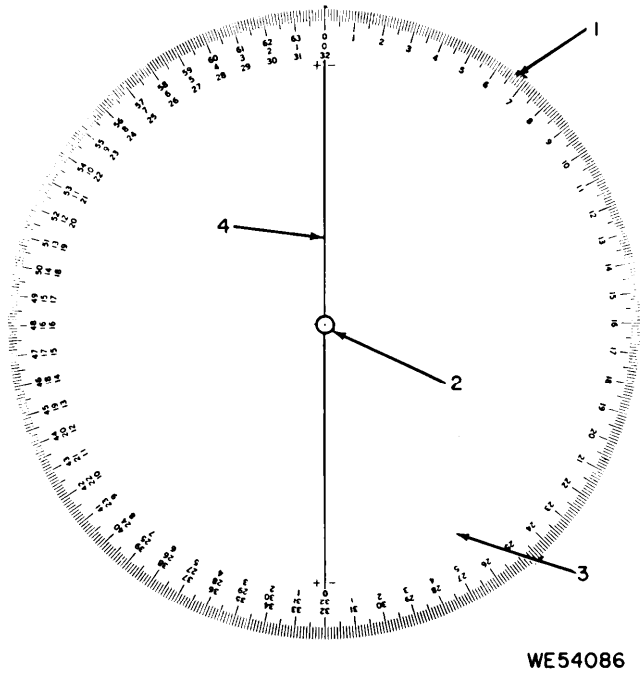

Figure 1-.4. Plotting board M17-azimuth disk.

outward, above and below the pivot, from 0 to 2000 meters, in fifty meter increments and is numbered from 1 to 19. These numbers are spaced on every second horizontal fine line. Each small square on the grid pattern is, therefore, 50 meters on a side. The numbers to the left of the index line indicate double values for the grid squares. Each small square is, therefore, 100 meters on a side when the double value scale is used. However, any value may be assigned to the small grid square which best suits the problem at hand. All marking is red.

(2) *Azimuth disk.* The azimuth disk (fig, 1–4) is a transparent, semirigid, plastic disk with graduations printed around the entire outer edge and a centerline which runs through the central pivot point (2). When the pivot point in the disk is on the pivot in the base (fig. 1-3), and the base is stationary, the disk can be rotated to all positions within 360 degrees. When the disk is properly mounted on the base, the markings on the disk will appear as shown in figure 1-4.

(a) The surface of the azimuth disk (3), facing the operator, is slightly roughened to take pencil marks which can be erased following completion of a problem.

(b) A thin centerline (4) is printed across the diameter of the disk and intersects the pivot point (2). Red plus and minus marks are printed near both ends of the centerline for use in computing angles of site.

(c) An azimuth scale (1) graduated in mils is printed around the entire outer edge of the disk in a clockwise direction to conform to the compass and is used to plot azimuth angles. This scale is graduated in 10-mil increments from 0 to 6400 and numbered at 100-mil intervals from 0 to 63.

(d) A supplementary, middle mil scale having red figures is located on the plus side of the centerline, running counterclockwise from 0 to 32 and continuing on the minus side of the centerline to 5. This middle scale is numbered in hundreds of mils. It is used in computing angles of site.

(e) A supplementary, innermost mil scale also on the plus side of the centerline, begins at a point 180 degrees from the 0 (zero) on the middle scale. This scale runs clockwise from 0 to 32 and is numbered in hundreds of mils. It is also used in computing angles of site.

c. Operation. The plotting board can be operated in two positions.

(1) To determine initial direction and range, the arrow at the end of the index line will be pointing away from the operator. The index line will be vertical.

(2) To determine angles of sight, the arrow at the end of the index line will be pointing toward the right. The index line will be horizontal.

1-5. Tabulated Data

a. Weight and Dimensions.

Weight	0.75 pounds
Diameter	8 inches
Thickness	3/32 inch

b. Limits of Operation.

Azimuth	0 to 6400 mils
Range	No limit

1-6. Equipment Issued with Plotting Board M17

Canvas carrying case M72 (fig. 1–1) is the only piece of equipment issued with plotting board M17. The case consists of a two-piece assembly into which the plotting board fits, and has a flap or cover which is an integral part of the back piece. This bends over the case and is fastened to the front with a snap fastener. The back of the case has a loop for carrying on a belt.

CHAPTER 2

OPERATING INSTRUCTIONS

Section I. SERVICE UPON RECEIPT OF MATERIEL

2-1. General

a. When a new, used, or reconditioned plotting board M17 is first received by the using organization, it is the responsibility of the officer in charge to determine whether the materiel has been properly prepared for service by the supplying organization and to be sure that it is in condition to perform its function.

b. Make a record of missing parts or equipment and malfunctions. Correct all deficiencies which can be corrected.

2–2. Duties

The organizational mechanic performs the inspection to determine whether the materiel has been properly prepared for service and is in condition to perform its assigned mission. It is the duty of the operator to assist the organizational mechanic in the performance of these services.

2-3. Services

Upon receipt of materiel, the operations described in a through *g* below shall be performed to place the plotting board into operating condition.

a. Open the sealed container and remove the contents consisting of plotting board M17 and folded carrying case M72.

b. Remove tape from plotting board.

c. Open one snap fastener securing carrying case M72 (fig. 1–1) in closed position and lift the cover flap.

d. Gently lift the azimuth disk (fig. 1–2) up and off the pivot (fig. 1-3) to remove the disk from the base (fig. 1-2).

e. If temperatures are above freezing (320 F.), use cloth slightly dampened with water and remove all dust and dirt from the surface of the base (fig. 1–3) and from all surfaces of the azimuth disk (fig. 1-4). If temperatures are below freezing, use a clean dry cloth.

f. Wipe the pivot (fig. 1-3) and pivot point (fig. 14) surfaces clean and carefully assemble the azimuth disk on the base.

g. Invert carrying case M72 and shake out all dust and dirt adhering to its internal surfaces.

h. Insert plotting board M17 into carrying case M72, and secure the cover flap of the case in a closed position with the snap fastener. Place the carrying case with installed plotting board in stowed position.

Note. Stow TM 9-1220–223-14 inside carrying case M72 with plotting board M17 when not in use.

Section II. OPERATION UNDER USUAL CONDITIONS

2-4. General

This section contains instructions for the proper care of the materiel, preparation for operation, and the operation of plotting board M17 under moderate temperatures and atmospheric conditions. Every organization equipped with this plotting board must thoroughly train its personnel in the procedures for its operation.

2-5. Care in Handling

Plotting board M17 will not stand rough handling or abuse. inaccuracy or breakage will result from mistreatment. Any instrument that is functioning inaccurately or that contains damaged parts must be brought to the attention of organizational maintenance personnel for disposition. Repairs other than those expressly authorized will not be performed by the operator.

a. Keep the plotting board and carrying case as clean and dry as possible. If the board and/or case is wet, wipe dry, spread case open, and allow to air-dry thoroughly. Do not place or allow the plotting board to dry in the direct rays of hot sun, on heated radiators, or on other types of heated equipment where damage to the plotting board base and/or azimuth disk may occur.

b. When not in use, keep the plotting board within the carrying case so that it is protected from dirt, dust, moisture, chipping, scratching, and destruction.

c. Do not place the plotting board on its edge or store other equipment on the board. These actions will bend, break, and/or chip and destroy the board.

2-6. Preparation for Use

a. Setting Up.

(1) Remove carrying case M72 with installed plotting board from stowed position.

(2) Open the snap fastener securing the cover flap of the carrying case in closed position, open the flap, and remove the plotting board from the case.

(3) Place the plotting board on a flat stable surface and proceed to operate it.

b. Inspection.

(1) *General.* Whenever inaccuracies, maladjustments, or other conditions affecting serviceability are disclosed by the inspection prescribed in table 2-1, remedial action should be taken if the maintenance required is within the scope of the operating personnel. If the maintenance required is beyond the scope of the operating personnel, the condition should be referred to the organizational maintenance personnel for disposition in accordance with the maintenance allocation chart (app B).

(2) *Procedure*. Visually examine the plotting board and carrying case for completeness and general appearance. There shall be no rust and/or corrosion on any metal part. The plastic surfaces of the plotting board shall not be cracked, chipped, warped, excessively scratched, pitted, or opaqued so that viewing of the grid pattern, scales, and graduations is hindered. In addition, inspect the plotting board and carrying case as outlined in table 2-1.

Table 2-1. Operator's Inspection Chart for Plotting Board M17 and Caring Case M72

Point of inspection	Figure	Accepted standard
		PLOTTING BOARD M17
Alinement	1-2, 1-3, and 1-4	When the azimuth disk is assembled on the base (fig. 1–2), it shall be rotatable to any required position. The index line on the base (fig. 1-3) and the centerline on the disk (fig. 1-4) shall be in coincidence when the disk and the index mark on the base are alined.
Azimuth disk	1 4	The azimuth disk shall be clean, flat, and in good condition as explained in the preceding text and shall rotate freely on its central pivot point to any azimuth position. The pivot point shall be a snug fit on the pivot.
Base	1–3	The base surface shall be clean, flat, and in good condition as explained in the preceding text.
Pivot		The pivot, secured in the base, shall not be loose or bent.
		CARRYING CASE M72
Snap fastener	1-1	One snap fastener shall be secured in the carrying case. It shall not be destroyed or loosened in the case fabric, and shall properly hold the cover flap in a secure and closed position.
Loop	1-1	The loop of the carrying case is secured by stitching to the reverse or back side (not shown in the illustration indicated). It shall be securely fastened to the case. The stitching shall not be loose or torn.

2-7. Operation

a. The theory of operation of the plotting board is simple and the accuracy of the results depends on the skill of the operator. The plotting board is used to plot accurately the relative positions of the weapons, base points, and targets and to determine the directions and distances between these points. The size of the dots placed on the plotting board affects the accuracy of the data determined. The dots shall be made as small as possible. To make it easier to locate these small dots, a small circle may be placed around each slot. In computing the data, be careful to use the dot and not the circle. Pencils harder than 2H and gritty erasers should not be used on the transparent plotting surfaces.

b. An arbitrary point on the disk may be selected as the weapon position or the observation post. Whenever possible, the center (pivot point) of the plotting board is used to represent either the weapon position or the observation post.

c. To plot a point with a given azimuth and distance from another point, proceed as indicated in (1) through (3) below.

(1) Select an arbitrary point on the disk as location of the first point and place a pencil dot. (If the pivot point is selected as the arbitrary point, it is not possible to make a pencil dot).

(2) Rotate the azimuth disk on the base (fig. 1–2) until the stated azimuth is indicated over the index mark.

(3) To determine the distance on the plotting board from the first point to the second point, divide the stated distance by 50 or 100 (depending on which scale on the grid pattern (fig. 1–3) is used). The result is the number of squares on the grid pattern between the two points. Count off the number of squares, or fractions of squares, thus determined from the first point toward the top of the plotting board and plot the second point. The second point may be plotted also by measuring off the stated distance from the first point toward the top of the plotting board using the range scales on the disk.

d. When the distance and azimuths to the target firing position have been determined from the observation post, the azimuth and range from the weapon position to the target position (WT = weapon to target) is determined as indicated in (1) through (4) below.

(1) Use the pivot point (figs. 1-3 and 14) as the observation post.

(2) The locations of the firing position and the target, as obtained at the observation post in terms of azimuth and distance, are plotted individually on the movable disk.

(a) Set the azimuth scale (fig. 14) graduation corresponding to the azimuth over the index mark (fig. 1–3).

(b) Mark each location with a pencil dot over the index line at the point on the range scale corresponding to the distance in meters. Each dot is plotted toward the top of the plotting board.

(3) To determine the azimuth between the

two plotted points, the operator must remember that all parallel lines have the same azimuth. Therefore, when a particular azimuth is rotated over the index mark, every vertical line on the grid pattern (fig. 1–3) is pointing along that same azimuth. This means also that the azimuth of any of the vertical lines of the grid pattern is read at the index mark. To find the azimuth of the target with respect to the firing position, rotate the azimuth disk (fig. 1–2) until the two pencil dots lie along one of the vertical lines on the base grid, or, until they are the same distance from the same vertical line with the target dot toward the top of the plotting board. The WT azimuth in this example may be read on the azimuth scale at the index mark on the base.

(4) Determine the range between the firing position and the target in meters by counting the number of small grid pattern graduations separating them when in the above position and multiplying this number by 50 or 100, depending on which scale on the grid pattern is used. The WT range can also be determined by measuring the distance, using one of the range scales on the base.

e. In many cases, the index mark does not fall exactly on one of the 10-mil graduation lines of the azimuth scale. When this occurs, the operator computing the range must use the vernier scale to read the azimuth to an accuracy of one mil (fig. 2–1). As an example, the use of the vernier scale for setting azimuth 5454 is shown in the figure 2–1.

Note. Figure 2-1 shows vernier setting method and does not reflect the appearance of the vernier on plotting board M17.

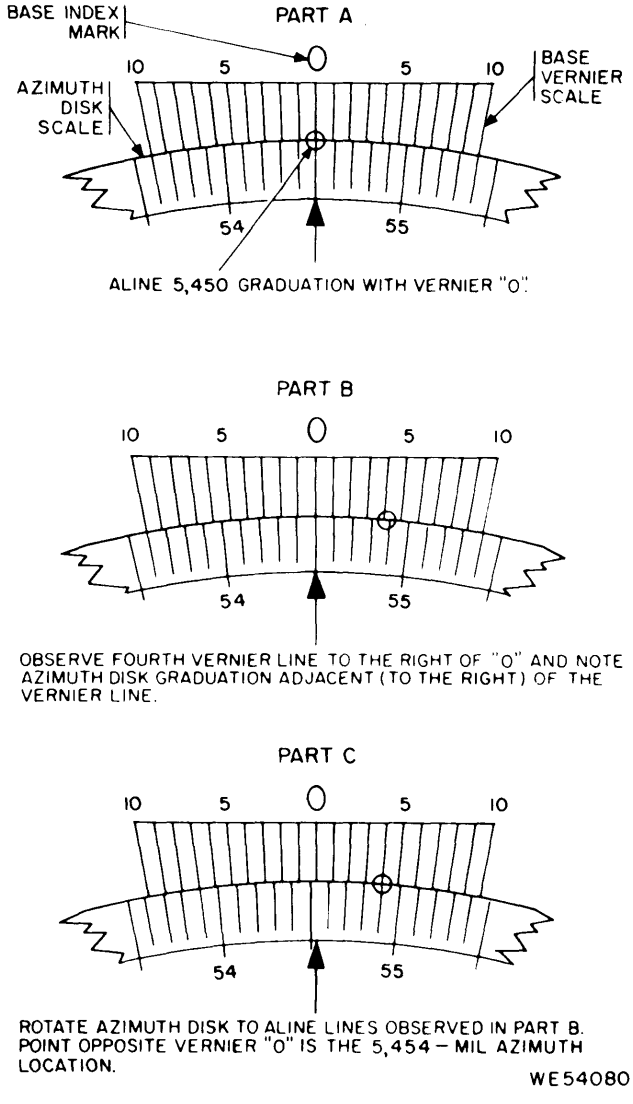

Figure 2–1. Use of vernier scale.

2-8. Uses for Plotting Board M17

a. To determine initial direction and range (para 2-9a).

b. To determine WT mil values from the azimuth scale on the azimuth disk (para 2-9b).

c. To solve problems involving mil relations (para 2-9c).

d. To solve survey notes (para 2-9d).

2-9. Sample Problems

a. Determination of the Initial Azimuth and Range From the Weapon Firing Position to the Target.

(1) Given. Observation post at the center (pivot point) of the disk.

OP to weapon: Azimuth 4150 mils
Distance 550 meters

OP to target: Azimuth 5454 mils
Distance 1500 meters

(2) Procedure. To determine the azimuth and range from the weapon to the target using the range scale along the index line (fig. 1–3), where the smallest grid graduation represents 50 meters, proceed as indicated in (a) through (d) below.

(a) Rotate the disk until 4150 mils is read over the index mark on the base. Mark the disk with a pencil dot over the index line at the 550-meter graduation. This dot represents the location of the weapon (W).

(b) Rotate the disk until 5454 mils is read over the index mark on the base. Mark the disk with a pencil dot over the index line at the 1500-meter graduation. This dot represents the location of the target (T).

(c) Rotate the disk until the two pencil dots are over, or parallel to, the same vertical line, or are the same distance from the same vertical line, with the dot representing the location of the target (T) toward the vernier scale.

(d) Read the WT azimuth, at the index mark on the base, as 5830 mils. The total number of meters between the pencil dots when this position (1400 meters above the horizontal OP line passing through the pivot plus 50 meters below) is the weapon-target (WT), range 1450 meters.

b. Determination of WT Mil Values from the Azimuth Scale on the Azimuth Disk.

(1) *Problem 1.* Observation post at center (pivot point) of the disk.

Observer (0) to Target (T) .
Azimuth 800 mils
Distance 2500 meters
Observer (0) to Weapon (W):
Azimuth 2500 mils
Distance 1250 meters
WT = 348 mils.

(2) *Problem 2.* Observation post at center (pivot point) of the disk.

Observer (0) to Target (T):
Azimuth 5900 mils
Distance 3200 meters
Observer (0) to Weapon (W):
Azimuth 3850 mils
Distance 1050 meters
WT = 6159 mils.

(3) *Problem 3.* Observation post at center (pivot point) of the disk.

Observer (0) to Target (T):
Azimuth 2510 mils
Distance 1400 meters
Observer (0) to Weapon (W)
Azimuth 1310 mils
Distance 1810 meters
WT-2702 (as read on the azimuth scale having red numerals).

c. Resolution of Problems Involving Mil Relations.

(1) *Problem 1.*

(a) Given. Observer has plotting board Ml7 and is adjusting the sheaf of the weapons on the base point. Observer (O) to Base Point: Distance 400 meters. Burst from one weapon: 25 mils to left of its proper place in the sheaf (measured with binocular at OP).

1. Angles involved are less than 30 mils. For ease in reading and to increase accuracy, count each 10-mil graduation of the mil scale as 1 mil (10/10 = 1). Therefore, count the smallest grid graduation for lateral measurements only at 5 meters (50/10 = 5) when using the range scale along the index line. When the range scale to the left of the index line is used, the smallest grid graduation for range represents 100 meters; therefore, count each lateral grid graduation as 10 meters (100/10 = 10).

2. Angles involved are more than 30 mils. Read the graduations on the mil scale as printed (10 mils each) and count each lateral grid graduation as either 50 or 100 meters, depending on the range scale used. Other types of mil relationship may be similarly obtained.

(b) *Procedure.* To determine the deflection correction in meters, using the range scale along the index line (where the smallest grid graduation represents 50 meters), proceed as indicated in 1 and 2 below.

1. Starting with the O (zero) on the mil scale at the index mark and with the pivot point of the disk representing the observer's location (OP), rotate the disk until 25 mils (250 mils, see (a) (1) and (2) above) is read over the index mark.

2. From the index line at the 400-meter graduation, measure laterally (perpendicular to the index line) to the black centerline on the disk (counting each small grid graduation as 5 meters (see (a) (1) and (2) above). Note that this distance measures two small grid graduations, or 10 meters. Since the burst was to the left of the OT line, the deflection correction is right 10 (meters).

(2) *Problem 2.*

(a) Given. Computer in the FDC has plotting board Ml? and is controlling the adjustment of the sheaf on the base point. Range Weapon to Base Point: 1700 meters. Observed correction for one weapon: Right 10 (meters) (1) (b) 2 above). Deflection setting on weapon: Right 30, base stake.

(b) *Procedure.* To determine the deflection correction to be placed on the sight, proceed as indicated in 1 through 4 below.

1. Set the 0 (zero) on the mil scale at the index mark. With the pivot point of the disk representing the weapon position, locate the 1700-meter graduation, (weapon-base point range) on the index line.

2. From the index line at the 1700-meter graduation, measure off laterally (perpendicular and to the left of the index line) two small grid graduations, or 10 meters, and mentally note this point (grid intersection) on the base.

3. Rotate the disk until the black centerline intersects this point (grid intersection) and read the angle at the index mark on the base, in this case 6 mils.

4. As the deflection setting on the sight is right 30, the deflection to be given to the weapon is right 35 (right 30 plus right 6 to the nearest 5-mil graduation).

d. Solving of Survey Notes.

(1) *Given.* The weapon personnel are placed in position by section, each section in a different location. The first section is plotted at the pivot point of the plotting board. The second section is located (surveyed) with reference to the first section by compass and pacing. A traverse of two legs is made to the second section from the first section.

(a) First leg:	Azimuth 3800 Distance 400 meters
(b) Second leg:	Azimuth 4400 Distance 500 meters

(2) *Procedure*. To plot the location of the second section with reference to the first section, proceed as indicated in (a) through (c) below.

(a) Use the range scale along the index line.

(b) Rotate the disk until azimuth 3800 is at the index mark. Count up 400 meters along the red index line and make a pencil dot.

(c) Rotate the disk until azimuth 4400 is at the index mark. From the pencil dot just plotted, count up 500 meters and make a pencil dot. This is the location of the second section.

Note. To determine the azimuth and distance from the first section to the second section, rotate the disk until the plotted location of the second section is _ toward the top of the plotting board and is on the same vertical *line, or the* same distance from the same vertical line, as the first section plot (in this case on the red index line). The azimuth is 4134 mils and the distance is 861 meters.

2-10. Accuracy

a. With one extremity of the dial index line in coincidence with each of the diametrical centerlines of the base, the other extremity of the index line shall not be more than 5 mils out of coincidence with the corresponding base centerline.

b. The plotting board accuracy for the weapon-target (WT) line shall be within 5.0 mils as determined by placing pencil dots at the target (T) and weapon (W) points as measured from observer (O) (represented by the center pivoting point of the dial) using the OT and OW values specified above. When a line is drawn through the WT dots, the WT line is then laid parallel to the base O centerline (index line, fig. 1–3) and the WT mil value is determined from the mil scale (azimuth scale, fig. 1-4) on the dial.

Section III. OPERATION UNDER UNUSUAL CONDITIONS

2-11. General

In addition to the normal operating procedures for usual conditions described in section II, special instructions for operating under unusual conditions are contained herein. In addition to the normal preventative-maintenance services, special care in cleaning and handling must be observed where extremes of temperature and atmospheric conditions are present. Proper cleaning and handling not only insure proper operation and functioning, but also guard against breakage and/or deterioration of the materiel.

2-12. Operation in Extreme Cold

a. In temperatures below freezing, it is necessary that extra care be used when handling the plotting board. Extreme cold will make the plastic material of the board more brittle, hence it will be more easily broken if dropped or struck against other objects

b. Use a dry cloth for cleaning. A water dampened cloth will either freeze to the plotting board or it will leave a film of ice on the board and make it inoperable.

c. Do not permit the accumulation of snow or ice on the plotting board. When not in use, always keep the plotting board inside carrying case M72 to prevent such accumulation and/or damage or destruction.

d. Never apply heat from strongly concentrated sources directly to an extremely cold plotting board. Sudden great temperature changes may cause breakage of the component parts of the plotting board or it may result in nonadherence of the bonded components due to “breaking-up” of the bond.

2-13. Operation under Dusty or Sandy Conditions

Under extremely dusty or sandy conditions, extra care must be exercised when cleaning the plotting board so that scratching of the transparent plastic surfaces does not occur. Such scratching will damage the transparent quality of the base grid and azimuth disk surfaces. Excessive scratching will cause damage and/or destruction of the lines of the vernier and scales and render the plotting board difficult to read and/or useless. Shake all dust and sand from the carrying case.

CHAPTER 3

MAINTENANCE INSTRUCTIONS

Section I. REPAIR PARTS, TOOLS, AND EQUIPMENT

3-1. General

Repair parts, tools, and equipment are issued if necessary to the using organization for operating and maintaining plotting board M17. Tools and equipment should not be used for purposes other than prescribed and, when not in use, should be properly stored.

3-2. Repair Parts

Repair parts are supplied to the using organization for replacement of those parts that become worn, broken or otherwise unserviceable. These repair parts are listed in appendix C which is the authority for requisitioning replacements.

3-3. Common Tools and Equipment

No standard or commonly used tools and equipment are required or authorized.

3-4. Special Tools and Equipment

No special tools and equipment are required for the plotting board M17.

Section II. PREVENTIVE-MAINTENANCE SERVICES

3-5. General

a. Responsibility and Intervals. The primary function of preventive maintenance is to prevent the materiel from becoming unserviceable and, therefore, requiring repair or replacement. The preventive-maintenance services are the responsibility of the using organization. These services generally consist of before-operation, during-operation, and after-operation services performed by the operator and the scheduled services to be performed at designated intervals by the organizational, field, and depot mechanic when necessary. Intervals are based on normal operations or severe conditions. Intervals during inactive periods may be extended accordingly.

b. Definition of Terms. The general inspection of plotting board M17 and carrying case M72 is generally a check to see whether the items are in good condition and not excessively damaged or worn.

(1) The inspection for "good condition" is usually an external visual inspection to determine whether the unit is damaged beyond serviceable limits. The term "good condition" is defined as being not bent, warped, or twisted; not chafed or burred; not broken or cracked; not frayed, dented, torn or cut; and not mildewed or deteriorated.

(2) By "excessively worn" is meant worn beyond serviceable limits or to a point likely to result in failure if the item is not replaced before the next scheduled inspection.

3-6. Cleaning

a. General. General cleaning instructions are outlined in ***b*** and c below.

b. Metal and Plastic Parts.

(1) When the plastic disk or plastic base surfaces become dirty, they may be wiped with lens tissue paper, or with a clean cloth, moistened with lens-cleaning liquid soap. When clean, dry carefully by gently rubbing with lens tissue or clean cloth.

(2) Do not clean the plastic disk or base with dry-cleaning solvent, alcohol, acetone, or other solvents.

(3) Clean the metal snap fastener on carrying case M72 with dry-cleaning solvent. Wipe dry and apply a light film of light grade aircraft instrument lubricating oil or grease.

(4) Clean carrying case M72 with soap and

water when this is considered necessary. Allow the case to dry thoroughly before using it to store the plotting board.

c. General Precaution in Cleaning.

(1) Dry-cleaning solvents, referenced in TM 9–247, are flammable and shall be kept away from heat and open flame. Fire extinguishers should be provided or immediately available when these materials are used. Use only in well-ventilated places.

(2) The use of diesel fuel oil, gasoline, benzene (benzol), carbon tetrachloride, alcohol, and/or acetone, and all other unapproved cleaning compounds or liquids, is prohibited.

3–7. Preventive-Maintenance Services

a. Purpose. To insure efficient fulfillment of their designed purpose, it is necessary that plotting board M17 and carrying case M72 be systematically inspected at intervals each day it is operated, so that defects may be discovered and corrected before they result in serious damage or failure. Certain scheduled maintenance services (table 3–1) shall be performed at these designated intervals. Any defects or unsatisfactory operating characteristics of plotting board M17 and carrying case M72, that cannot be remedied or repaired by the organizational maintenance personnel shall be sufficient cause for replacement.

b. Services. Preventive-maintenance services listed in table 3–1 will apply primarily to the operator. However, those services will also apply to organizational, field, and depot personnel who may have occasion to use, stow, store, package, or ship plotting board M17 and carrying case M72.

Table 3–1. Periodic Maintenance Checks and Service
1st Echelon Daily Schedule

Interval and sequence No.			Items to be inspected	Procedure	Paragraph reference
Before operation	During operation	After operation			
				USUAL CONDITIONS	
1	.....	.....	Plotting Board M17	Clean and keep dry	3-6
		2	.....	Blean pivot and pivot point and apply a light film of instrument lubricating oil.	2-3f
		3	.....	Stow in carrying case M72.	
		4	Carrying Case M72	Clean and keep dry	3-6
		5	.....	Stow flat when plotting board is installed.	
				UNUSUAL CONDITIONS —EXTREME COLD	
6	.....	.....	Plotting Board M17	Clean with dry cloth (Avoid extreme temperature changes.)	2-12
		7	Carrying Case M72	Clean and keep dry	3-6
				EXTREME DUSTY OR SANDY CONDITIONS	
	8	.....	Plotting Board M17	Clean carefully to avoid scratches	2-13
		9	Carrying Case M72	Shake out dust and sand and clean	2-13, 3-6

Section II. TROUBLESHOOTING

3-8. Scope

Troubleshooting is the systematic isolation of inoperable or defective components by means of symptoms and tests.

3–9. Procedure

The troubleshooting procedure described in table 3-2 is one of determining malfunctions, their probable causes, and the necessary corrective actions required to remedy the malfunction. Corrective actions that are beyond the scope of the operator will be taken by the organizational, field, or depot maintenance personnel.

Table 3–2. Troubleshooting

Malfunction	Probable cause	Corrective action
Azimuth disk does not rotate freely.	Disk and/or base is damaged	Obtain new plotting board.
	Pivot point of disk binds on base point.	Clean the pivot point and pivot.
	Base pivot is bent, burred, or damaged.	Obtain new plotting board.
Azimuth disk loose on base pivot.	Pivot point of disk worn or oversize.	Open base pivot by inserting a pointed object, such as a pencil, in pivot hole to enlarge opening. [1]
	Pivot in base worn or undersize	Opening base pivot by inserting a pointed object, such as a pencil, in pivot hole to enlarge opening. [1]
Improper alinement of scales, grid lines, centerlines etc.	Pivot point of disk worn or oversize.	Opening base pivot by inserting a pointed object, such as a pencil, in pivot hole to enlarge opening. [1]
	Pivot in base worn or undersize	Opening base pivot by inserting a pointed object, such as a pencil, in pivot hole to enlarge opening. [1]
	Pivot in base loose or bent	Obtain new plotting board.
	Base and base grid bent or destroyed.	Obtain new plotting board.
	Azimuth disk loose on base pivot.	Open base pivot by inserting a pointed object, such as a pencil, in pivot hole to enlarge opening. [1]

[1] If the accuracy specified in praagraph 2–10 cannot be achieved by this action, obtain a new plotting board M17.

Section IV. REPAIR OF PLOTTING BOARD M17 AND CARRYING CASE M72

3-10. General

Repair of plotting M17 and/or carrying case M72 is not authorized.

3-11. Maintenance

If carrying case M72 (fig. 1–1) becomes worn, damaged, or destroyed in such a manner as to render it an inadequate protection for plotting board M17, it should be replaced as authorized in appendix C.

CHAPTER 4

FINAL INSPECTION

4-1. General

Final inspection of Plotting board M17 and Carrying case M72 will consist primarily of a visual inspection of the materiel by organizational, field, or depot maintenance personnel.

4-2. Good Condition

When it has been determined that the materiel is in good condition (para. 3–5b(l)), it shall be stowed or placed in storage.

4-3. Excessively Worn

When it has been determined that the material is excessively worn (para 5-3b (2)), it should be replaced in accordance with appendix B.

CHAPTER 5

PROCESSING AND PACKAGING SHIPMENT AND DESTRUCTION TO PREVENT ENEMY USE

Section I. PROCESSING, PACKAGING AND SHIPMENT

5-1. Processing and Packaging

For instructions for processing and packaging plotting board M17, carrying case M72, and TM 9–1220–223–15, refer to ML-P-116.

5-2. Shipping Instructions

When shipping the plotting board M17, carrying case M72, and the technical manual TM 9–1220–223–14, the officer in charge of preparing shipments will be responsible for plotting board M17 being shipped in a serviceable condition, properly packaged, and packed, including the preparation of Army shipping documents.

Section II. DESTRUCTION OF MATERIEL TO PREVENT ENEMY USE

5-3. General

a. Destruction of plotting board M17 when subject to capture or abandonment in the combat zone will be undertaken by the using arm only when, in the judgement of the unit commander concerned, such action is necessary in accordance with orders or policy established by the army commander.

b. The information which follows is for guidance only. Certain of the procedures outlined require the use of explosives and incendiary grenades which normally may not be authorized items of issue to the using organization. The issue of these and related materials and the conditions under which destruction will be effected are command decisions in each case, according to the tactical situation. Of the several means of destruction, those most generally applicable are indicated in (1) through (4) below.

(1) Mechanical which requires an axe, pick mattock, sledge, crowbar, or similar implement.

(2) Burning which requires gasoline, oil, incendiary grenades, and other flammables, or a welding or cutting torch.

(3) Demolition which requires suitable explosives or ammunition and gunfire, utilizing artillery, machine guns, rifles with rifle grenades, or launchers with antitank rockets. Under some circumstances, hand grenades may be used.

Note. These methods are generally applicable only when the plotting board is to be destroyed in conjunction with other equipment.

(4) Disposal which requires burying in the ground, dumping in streams, or marshes, or scattering so widely as to preclude recovery of essential parts.

c. In general, destruction of essential parts followed by burning will be sufficient to render the material useless. However, selection of the particular method of destruction requires imagination and resourcefulness in the utilization of the facilities at hand under the existing conditions. Time is usually critical.

d. If destruction to prevent enemy use is resorted to, the materiel must be so badly damaged that it cannot be restored to a usable condition in the combat zone either by repair or cannibalization. Adequate destruction requires that all parts essential to the operation of the materiel, including essential spare parts, be, destroyed or damaged beyond repair. However, when lack of time and personnel prevent destruction of all parts, priority is given to the destruction of those parts most difficult to replace. Equally, important, the same essential parts must be destroyed on all like materiel, so that the enemy cannot construct one complete unit from several damaged ones.

e. If destruction by demolition or gunfire is

directed, due consideration should be given to the observance of appropriate safety precautions.

5-4. Procedures for Destruction of Plotting Board M17

a. Method No. 1—By Mechanical Means.

(1) Remove the plotting board from its carrying case.

(2) Using an axe, pick mattock, sledge, or similar implement, destroy the plotting board by smashing the base, destroying the base grid surface, and azimuth disk. Elapsed time: about 2 minutes.

b. Method No. 2—By Burning.

(1) Remove the plotting board from the Carrying case.

(2) Using a welding or cutting torch, burn the base, base grid surface, and azimuth disk. Elapsed time: about 3 minutes.

(3) In the absence of a welding or cutting torch, place the plotting board on a pile of combustible. Pour gasoline or oil over the combustible and over the plotting board; ignite and take cover. A hot fire is required to render the materiel useless.

Warning: **When igniting gasoline, due consideration shall be given to the highly flammable and explosive nature of gasoline and its vapor. Carelessness in its use may result in painful burns.**

Elapsed time: about 2 minutes.

c. Method No. 3—BY Disposal. Bury the plotting board in a suitable hole or throw it into a stream. Elapsed time: about 2 minutes.

APPENDIX A

REFERENCES

A-1. Publication Indexes

The following indexes will be consulted frequently for latest changes or revisions of reference given in this appendix and for new publications relating to materiel covered in this technical manual.

Index of Administrative Publications	DA PAM 310-1
Index of Blank Forms	DA PAM 310–2
Index of Supply Catalogs and Supply Manuals	DA PAM 310–G
Index of Technical Manuals, Technical Bulletins, supply Bulletins, Supply Manuals (types 7, 8, and 9) and Lubrication Orders.	DA PAM 310-4
Index of Training Services	DA PAM 310-3
Modification Work Orders	DA PAM 310–7

A-2. Forms

DA Form 9–l, Materiel Inspection Tag
DA Form 829, Rejection Memorandum
DA Form 2028, Recommended Changes to DA Publications
DD Form 6, Report of Damaged or Improper Shipment
DD Form 250, Materiel Inspection and Receiving Report

A-3. Other Publications

a. General

Accident Reporting and Records	AR 385-40
Army Equipment Record Procedurs	TM 38-750
Authority Abbreviations and Brevity Codes	AR 310–50
Dictionary of United States Army Terms	AR 310–25

b. Maintenance

Command Maintenance Management Inspection	AR 750-8
General Maintenance Procedures for Fire Control Materiel	TM 9-254

c. Shipping and Storage

Logistics (General): Report of Damage or Improper Shipment Markings and Packing of Supplies and Equipment. Marking of Supplies and Shipment.	AR 700-58
Paper Lens Tissue Anti-Tarnish Wrapping	MIL-P-13988
Preservation, Methods of	AR 700–15
Preservation, Packaging and Packing	MIL-P-116

APPENDIX B

MAINTENANCE ALLOCATION CHART

Section I. INTRODUCTION

B-1. General

This Maintenance Allocation Chart designates overall responsibility for the performance of maintenance functions on the identified end item or component. The implementation of field maintenance tasks upon this end item or component will be consistent with the assigned maintenance operations.

B-2. Maintenance Functions

Maintenance functions will be limited to and defined as follows:

a. Inspect. To determine serviceability of an item by comparing its physical, mechanical and electrical characteristics with established standards.

b. Test. To verify serviceability and to detect electrical or mechanical failure by use of test equipment.

c. Service. To clean, to preserve, to charge and to add fuel, lubricants, cooling agents, and air. If it is desired that elements, such as painting and lubricating, be defined separately, they may be so listed.

d. Adjust. To rectify to the extent necessary to bring into proper operating range.

e. Align. To adjust specified variable elements of an item to bring to optimum performance.

f. Calibrate. To determine the corrections to be made in the readings of instruments or test equipment used in precise measurement. Consists of the comparison of two instruments, one of which is a certified standard of known accuracy, to detect and adjust any discrepancy in the accuracy of the instrument being compared with the certified standard.

g. Install. To set up for use in an operational environment such as an emplacement, site, or vehicle.

h. Replace. To replace unserviceable items with serviceable assemblies, subassemblies, or parts.

i. Repair. Those maintenance operations necessary to restore an item to serviceable condition through correction of material damage or a specific failure. Repair may be accomplished at each category of maintenance.

j. Overhaul. Normally, the highest degree of maintenance performed by the Army in order to minimize time work in process is consistent with quality and economy of operation. It consists of that maintenance necessary to restore an item to completely serviceable condition as prescribed by maintenance standards in technical publications for each item of equipment. Overhaul normally does not return an item to like new, zero mileage, or zero hour condition.

k. Rebuild. The highest degree of materiel maintenance. It consists of restoring equipment as nearly as possible to new condition in accordance with original manufacturing standards. Rebuild is performed only when required by operational considerations or other paramount factors and then only at the depot maintenance category. Rebuild reduces to zero the hours or miles the equipment, or component thereof, has been in use.

l. Symbols. The uppercase letter placed in the appropriate column indicates the lowest level at which that particular maintenance function is to be performed.

B-3. Explanation of Columns

Listed below is an explanation of the columns shown in the maintenance allocation chart:

a. Column 1, Group Number. Column 1 lists group numbers, the purpose of which is to identify components, assemblies, subassemblies and modules with the next higher assembly.

b. Column 2, Functional Group. Column 2

lists the noun names of components, assemblies, subassemblies and modules on which maintenance is authorized.

c. Column 9, Maintenance Functions. Column 3 lists the lowest level at which that particular maintenance function is to be performed.

d. Column 4, Tools and Equipment. This column shall be used to specify, by code, those tools and test equipment required to perform the designated function.

e. Column 5, Remarks. Self-explanatory.

Nomenclature of End Item or Component

PLOTTING BOARD M17

SECTION II—MAINTENANCE ASSIGNMENT

(Group Number) (1)	Functional Group (2)	Maintenance Function (3)											Tools and Equipment (4)	Remarks (5)
		Inspect	Test	Service	Adjust	Align	Calibrate	Install	Replace	Repair	Overhaul	Rebuild		
1.	PLOTTING BOARD M17	C	--	C	--	--	--	--	O	--	--	--	N/A	None
2.	CARRYING CASE M72	C	--	C	--	--	--	--	O	--	--	--	N/A	None

APPENDIX C

BASIC ISSUE ITEMS LIST ORGANIZATIONAL, DIRECT SUPPORT, GENERAL SUPPORT AND DEPOT MAINTENANCE REPAIR PARTS AND SPECIAL TOOLS LIST

This manual is current as of 24 May 1971.

Section I. INTRODUCTION

C-1. Scope

This appendix is a list of repair parts and special tools and equipment for the performance of Operator, Organizational, Direct Support, General Support and Depot Maintenance for Plotting Board Ml7.

C-2. General

This Repair Parts and Special Tools List is divided into the following sections.

a. Basic Issue Items List-Section II. A list of items which accompany the plotting board M17 and are required by the operator/crew for installation, operation, or maintenance.

b. Maintenance and Operating Supplies—Section III. Not applicable.

c. Prescribed Load A Allowance (PLA) —Section IV. A composite listing of the repair parts and special tools, test and support equipment having quantitive allowances for initial stockage at the organizational level.

d. Repair Parts for Organizational Maintenance-Section V. Not applicable.

e. Speciul Tools, Test and Support Equipment for Organizational Maintenance-Section VI. A list of special tools, test, and support equipment authorized for the performance of maintenance at the organizational level.

f. Repair Parts for Direct Support, General Support and Depot Maintenance-Section VII. Not applicable.

g. Special Tools, Test and Support Equipment for Direct Support, General Support and Depot Maintenunee —Section VIII. A list of special tools, test and support equipment authorized for the performance of maintenance at the direct support, general support, and depot level.

h. Federal Stock Number and Reference Index-Section IX. A list of Federal stock numbers in ascending numerical sequence followed by a list of reference numbers in ascending alphanumeric sequence, cross-referenced to the illustration figure number and item number.

C-3. Explanation of Columns

The following provides an explanation of columns in the tabular list in Sections II through VIII

a. Source, Maintenance and Recoverability Code (SMR).

(1) Source code, indicates the selection status and source for the listed item. Source codes are:

Code	*Explanation*
P	Repair parts, Special Tools, and Test Equipment supplied from the GSA/DSA, or Army supply system, and authorized for use at indicated maintenance categories.
P2	Repair Parts, Special Tools, and Test Equipment which are procured and stocked for insurance purposes because the combat or military essentiality of the end item dictates that a minimum quantity be available in the supply system.
P9	Assigned to items which are NSA design controlled: Unique repair parts special tools, test, measuring and diagnostic equipment, which are stocked and supplied by the Army COMSEC Logistic System and which are not subject to the provisions of AR 380-41.
P10	Assigned to items which are NSA design controlled: Special tools, test, measuring and diagnostic equipment for COMSEC support which are accountable under the provisions of AR 380-41, and which are stoked and

Code	Explanation
	supplied by the Army COMSEC Logistic System.
M	Repair Parts, Special Tools, and Test Equipment which are not procured or stocked, as such, in the supply system but are to be manufactured at indicated maintenance levels.
A	Assemblies which are not procured or stocked as such, but are made up of two or more units. Such component units carry individual stock numbers and descriptions, are procured and stocked separately and can be assembled to form the required assembly at indicated maintenance categories.
X	Parts and assemblies that are not procured or stocked because the failure rate is normally below that of the applicable end item or component. The failure of such parts or assembly should result in retirement of the end item from the supply system.
X1	Repair Parts which are procured or stocked. The requirement for such items will be filled by the next higher assembly or component.
X2	Repair Parts, Special Tools, and Test Equipment which are not stocked and have no foreseen mortality. The indicated maintenance category requiring such repair parts will attempt to obtain the parts through cannibalization or salvage, if not obtainable through cannibalization or salvage, the item may be requisitioned with exception data, from the end item manager, for immediate use.
G	Major assemblies that are procured with PEMA funds for initial issue only as exchange assemblies at DSU and GSU level. These assemblies will not be stocked above the DS and GS level or returned to depot supply level.
	Note. Cannibalization or salvage maybe used as a source of supply for any items source coded above except those coded Xl and aircraft support items as restricted by AR 700–42.

(2) Maintenance Code, indicates the lowest category of maintenance authorized to install the listed item. The maintenance level codes are:

Code	Explanation
C	Operator/crew
O	Organizational Maintenance
F	Direct support maintenance
G	General support maintenance
D	Depot maintenance

(3) Recoverability Code, indicates whether unserviceable items should be returned for recovery or salvage. Items not coded are expendable. Recoverability codes are:

Code	Explanation
R	Applies to repair parts (assemblies and components) special tools and test equipment which are considered economically repairable at direct and general support maintenance levels. When the item is no longer economically repairable, it is normally disposed of at the GS level. When supply considerations dictate, some of these repair parts may be listed for automatic return to supply for depot level repair as set forth in AR 710-50. When so listed, they will be replaced by supply on an exchange basis.
S	Repair parts, special tools, test equipment, and assemblies which are economically repairable at DSU and GSU activities and which normally are furnished by supply on an exchange basis. When items are determined by a GSU to be uneconomically repairable, they will be evacuated to a depot for evaluation and analysis before final disposition.
T	Higher dollar value recoverable repair parts, special tools, and test equipment which are subject to special handling and are issued on an exchange basis. Such items will be evacuated to the depot for overhaul or final disposition. Communications-Electronics and Missile Support Items will be repaired/overhauled only at depots.
U	Repair parts, special tools, and tests equipment specifically selected for salvage by reclamation units because of precious metal content, critical materials, high dollar value, or reusable casings or castings.
	Note. When no code is indicated in the recoverability column, the part will be considered non-recoverable.

b. Federal Stock Number Column. This column indicates the Federal stock number assigned to the item and will be used for requisitioning purposes.

c. Description Column. This column indicates the Federal item name and, any additional description of the item required. The abbreviation "W/E", when used as a part of the nomenclature, indicates the Federal stock number includes all armament, equipment, accessories, and repair parts issued with the item. A part number or other reference number is followed by the applicable five-digit Federal supply code for manufacturers in parentheses.

d. Unit of Measure (U/M). A 2 character alphabetic abbreviation indicating the amount or quantity of the item upon which the allowances are based, e.g., ft, ea, pr, etc.

e. Quantity Incorporated in Unit. This column indicates the quantity of the item used in the assembly or the portion illustrated. A "V" appearing in this column in lieu of a quantity indicates that a definite quantity cannot be indicated (e.g., shims, spacers, etc.).

f. Quantity Furnished With Equipment. This column indicates the quantity of an item furnished with the equipment.

g. 15-Day Organizational Maintenance Allowance.

(1) The allowance columns are divided into four subcolumns. Indicated in each subcolumn opposite the first appearance of each item is the total quantity of items authorized for the number of equipments supported. Subsequent appearances of the same item will have the letters "REF" in the allowance columns. Items authorized for use as required but not for initial stockage are identified with an asterisk in the allowance column.

(2) The quantitative allowances for organizational level of maintenance represents one initial prescribed load for a 15-day period for the number of equipments supported. Units and organizations authorized additional prescribed loads will multiply the number of prescribed loads authorized by the quantity of repair parts reflected in the density column applicable to the number of items supported to obtain the total quantity of repair parts authorized.

(3) Organizational units providing maintenance for more than 100 of these equipments shall determine the total quantity of parts required by converting the equipment quantity to a decimal factor by placing a decimal point before the next to last digit of the number to indicate hundredths, and multiplying the decimal factor by the parts quantity authorized in the 51–100 allowance column. Example, authorized allowance for 51–100 equipment is 40; for 150 equipments multiply 40 X 1.50 or 60 parts required.

(4) Subsequent changes to allowances will be limited as follows. No change in the range of items is authorized. If additional items are considered necessary recommendations should be forwarded to Commanding Officer, Frankford Arsenal, ATTN: AMSWE–SMF–W3100 Philadelphia, Pennsylvania 19137, for exception or revision to the allowance list. Revisions to the range of items authorized will be made by the Commanding Officer, Frankford Arsenal, ATTN: AMSWE-SMF-W3100, Philadelphia, Pennsylvania 19137, based upon engineering experience, demand data, or TAERS information.

h. 30-Day DS/GS Maintenance Allowan.ces.

Note. Allowances in GS Column are for GS maintenance only.

(1) The allowance columns are divided into three subcolumns. Indicated in each subcolumn, opposite the first appearance of each item, is the total quantity of items authorized for the number of equipments supported. Subsequent appearances of the same item will have the letters "REF" in the applicable allowance column. Items authorized for use as required but not for initial stockage are identified with an asterisk in the Allowance Column.

(2) The quantitive allowances for DS/GS levels of maintenance will represent initial stockage for a 30-day period for the number of equipment supported.

(3) Determination of the total quantity of parts required for maintenance of more than 100 of these equipments can be accomplished by converting the equipment quantity to a decimal factor by placing a decimal point before the next to last digit of the number to indicate hundredths, and multiplying the decimal factor by the parts quantity authorized in the 51–100 allowance column. Example, authorized allowance for 51–100 equipments is 40; for 150 equipments multiply 40 by 1.50 or 60 parts required.

i. 1-Year Allowance Per 100 Equipments/ Contingency Planning Purposes. This column indicates opposite the first appearance of each item the total quantity required for distribution and contingency planning purposes. The range of items indicates total quantities of all authorized items required to provide for adequate support of 100 equipments for one year.

j. Depot Maintenance Allowance Per 100 Equipments. This column indicates opposite the first appearance of each item, the total quantity authorized for depot maintenance of 100 equipments. Subsequent appearances of the same item will have the letters "REF" in the allowance column. Items authorized for use as required but not for initial stockage are identified with an asterisk in the allowance column.

k. Illustration Column. This column is divided as follows:

(1) Figure number column, Indicates the figure number of the illustration on which the item is shown.

(2) Item number column. Indicates the call out number used to reference the item in the illustration.

C-4. Special Information

Action change codes indicated in the left hand margin of the listing page denote the following:

N—Indicates an added item not included in previous publications.

C—Indicates a change in data.

F—Indicates a change in FSN only.

C-5. How to locate Repair Parts

a. When Federal stock number or reference number is unknown.

(1) *First.* Using the table of contents, determine the assembly group to which the repair parts belong.

(2) *Second.* Find the illustration covering the assembly group to which the repair part belongs.

(3) *Third.* Identify the repair part on the illustration and note the illustration figure and item number of the repair part.

(4) *Fourth.* Using the Repair Parts Listing, find the assembly group to which the repair part belongs and locate the illustration figure and item number noted on the illustration.

b. When Federal stock number or reference number is known.

(1) *First.* Using the index of Federal Stock Numbers and Reference Numbers find the pertinent Federal stock number or reference number. This index is in ascending FSN sequence followed by a list of reference numbers in ascending alpha-numeric sequence, cross-referenced to the illustration figure number and item number.

(2) *Second.* Using the Repair Parts Listing, find the assembly group of the repair part and the illustration figure number and item number referenced in the index of Federal Stock Numbers and Reference Numbers.

C-6. Abbreviations

Abbreviation	*Explanation*
W/E	With equipment

C-7. Federal Supply Codes for Manufacturers

Code	Manufacturer
19200	Frankford Arsenal Philadelphia, Pa. 19137

Section II. BASIC ISSUE ITEMS LIST

	(1) SMR code			(2)	(3)	(4)	(5)	(6)	(7)	
	(a) Source	(b) Maint	(c) Recov	Federal stock No.	Description *Reference Number & Mfr. Code* *Usable on Code*	Unit of meas	Qty inc in unit	Qty furn with equip	Illustration (a) Fig. No.	(b) Item No.
C	P -	O-		1220-588-7282	INDIRECT FIRE, PLOTTING BOARD, M17 W/E 8213870	EA			1-1	—
C	X1-	-			INDIRECT FIRE, PLOTTING BOARD, M17 7689472 (19200)		1	1	1-1	1
					EQUIPMENT					
C	P -	C-		1220-769-1903	CASE, CARRYING, M72 7691903 (19200)	EA	1	1	1-1	2

Section III. MAINTENANCE AND OPERATING SUPPLIES

(1) Component application	(2) Federal stock number	(3) Description	(4) Qty required for initial operation	(5) Qty required for 8 hours operation	(6) Notes
		NOT APPLICABLE			

Section IV. PRESCRIBED LOAD ALLOWANCE LIST

(1) Federal stock No.	(2) Description Usable on Code	(3) 15-day organizational maint allowance			
		(a) 1–5	(b) 6–20	(c) 21–50	(d) 51–100
1220–769–1903	CASE, CARRYING M72	*	*	*	1

Act on code	(1) SMR code (a) Source	(b) Maint	(c) Recov	(2) Federal stock No.	(3) Description *Reference number & mfr code* *Usable on code*	(4) Unit of meas	(5) Qty inc in unit	(6) 15-day organizational maintenance alw (a) 1–5	(b) 6–20	(c) 21–50	(d) 51–100	(7) Illustration (a) Figure No.	(b) Item No.
					NOT APPLICABLE								

Section VI. SPECIAL TOOLS, TEST AND SUPPORT EQUIPMENT FOR ORGANIZATIONAL MAINTENANCE

Act on code	(1) SMR code (a) Source	(b) Maint	(c) Recov	(2) Federal stock No.	(3) Description *Reference Number & Mfr Code* *Usable on Code*	(4) Unit of meas	(5) Qty inc in unit	(6) 15 day organizational maintenance ALW (a) 1–5	(b) 6–20	(c) 21–50	(d) 51–100	(7) Illustration (a) Figure No.	(b) Item No.
					EQUIPMENT								
C	P –	C–		1220–769–1903	CASE, CARRYING, M72 7691903 (19200)	EA	1	*	*	*	1	1-1	2

Section VII. REPAIR PARTS FOR DIRECT SUPPORT, GENERAL SUPPORT AND DEPOT MAINTENANCE

Act on code	(1) SMR code (a) Source	(b) Maint	(c) Recov	(2) Federal stock No.	(3) Description *Reference Number & Mfr Code* *Usable on Code*	(4) Unit of meas	(5) Qty inc in unit	(6) 30-Day DS maint allowance (a) 1-20	(b) 21-50	(c) 51-100	(7) 30-Day GS maint allowance (a) 1-20	(b) 21-50	(c) 51-100	(8) 1-Yr alw per 100 equip cntgcy	(9) Depot maint alw per 100 equip	(10) Illustration (a) Fig No.	(b) Item No.
					NOT APPLICABLE												

Section VIII. SPECIAL TOOLS, TEST, AND SUPPORT EQUIPMENT FOR DIRECT SUPPORT, GENERAL SUPPORT AND DEPOT MAINTENANCE

Act on code	(1) SMR code (a) Source	(b) Maint	(c) Recov	(2) Federal stock No.	(3) Description *Reference Number & Mfr Code* *Usable on Code*	(4) Unit of meas	(5) Qty inc in unit	(6) 30-Day DS maint allowance (a) 1-20	(b) 21-50	(c) 51-100	(7) 30-Day GS maint allowance (a) 1-20	(b) 21-50	(c) 51-100	(8) 1-Yr alw per 100 equip entgcy	(9) Depot maint alw per 100 equip	(10) Illustration (a) Fig No.	(b) Item No.
					EQUIPMENT												
C	P	– C	–	1220–769–1903	CASE, CARRYING, M72 7691903 (19200)	EA	1	*	1	1	*	1	1	12	5	1-1	2

Section IX. INDEX–FEDERAL STOCK NUMBER AND REFERENCE NUMBER CROSS-REFERENCED TO FIGURE AND ITEM NUMBER

Stock number	Figure No.	Item No.
1220–588–7282	1-1	—

Stock number	Figure No.	Item No.
1220–769–1903	1-1	2

Reference No.	Mfr. code	Figure No.	Item No.
7689472	19200	1-1	1
7691903	19200	1-1	2

Reference No.	Mfr. code	Figure No.	Item No.
8213870	19200	1-1	--

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By Order of the Secretary of the Army.

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Chief of Staff.

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