

CHAPTER 5 - PLOTTING TABLE Mks. 6 TO 9*

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PLOTTING TABLE Mk. 6Description

1. The plotting table Mk. 6 is designed for mounting on chart drawers or suitable metal framework to bring the upper frame plotting surface to approximately 3 ft 1 in from the deck level. The overall dimensions of the plotting table are:

Length 3 ft 11 in
Width 2 ft 7 in
Height 1 ft 3 in

2. Lower frame. The lower frame mechanism differs from the general arrangement shown in Plate 1 as follows:

- (a) The gear and scale change handwheel (31) and the speed and plotting scale change handwheel (30) are positioned on the right (east) side panel of the lower frame.
- (b) The gear and scale change handwheel (31) is not linked mechanically to the rotary shaft operated by gear lever (32).
- (c) Contact clock Patt. 0552/810 is fitted and not contact clock Patt. 0552/809 as shown. The clock is sited in the front (south) panel of the lower frame.
- (d) Oldham couplings (49) are not fitted to the E-W and N-S output shafts.
- (e) The E-W carriage, N-S traveller and the projector unit are of different design. In addition to the projector unit, the N-S traveller carries a pencil unit. This produces the lower plot and time marking.

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- (f) Spares box (40) is not fitted in the mechanism compartment.
3. The operation of the internal mechanism is as described in Chapter 2.
 4. A section of the chartboard top of the lower frame is hinged to allow access to the mechanism compartment.
 5. E-W carriage assembly. The design of the cross frame is such that a part of the weight of the N-S traveller is taken on the lead screw and sagging of the lead screw may cause irregular movement of the traveller.
 6. The E-W carriage can be disconnected from the lead screw driving nut by raising the disconnecting lever on the front carriage. This also lifts the pencil from the lower plot on the chartboard top of the lower frame.
 7. Projector unit. The N-S traveller supports a conical framework carrying a transparent disc on the surface of which range and bearing markings are engraved. The projector lamp Patt. 0584/995-2403, projects the image of the markings through the upper frame glass plotting surface on to the plotting sheet. The disc is fixed in position by four radial screws which are also used to set the centre of the markings vertically above the lamp filament.
 8. Two range and bearing discs are provided, engraved:
 - (a) Two inches to the mile, for use with the .5 scale on the plot.
 - (b) Four inches to the mile, for use with the .25 scale on the plot.
 9. A mask which allows only a small spot of light, marked with cross lines at the centre, to appear on the plotting surface, is available when the plot is used for navigational purposes.
 10. The upper frame. The glass plotting surface in its wooden frame is hinged about the rear supports and can be raised for inspection of the lower plot or internal mechanism.

Electrical Details

11. The electrical arrangement is shown on Plate 3.

Pencil Unit

12. The operation of the time marking arrangement is shown in Figure 5.1. When the circuit for the time marking solenoid is completed by the clock contact, the movement of the armature lifts the conical bearing of the pencil carrier, so giving the carrier a small freedom of movement. A spring then deflects the pencil which marks a short line at an angle to the pencil plot. When the solenoid is de-energised, a spring returns the conical bearing to its original position and the pencil is re-centred. A small castor wheel trails on the chart orientating the spring which deflects the pencil so that the time mark made on the plot also indicates the direction in which the ship is travelling.

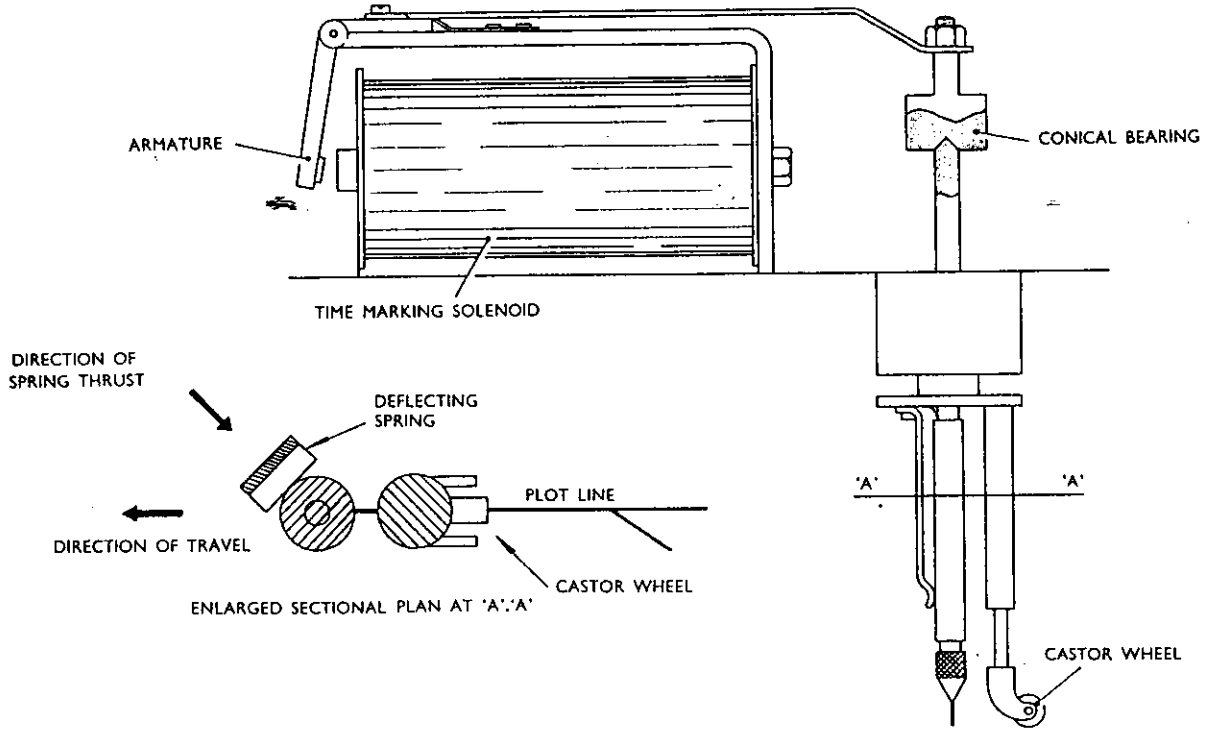


Fig. 5.1 Plotting tables Mks. 6 to 9* - Pencil unit

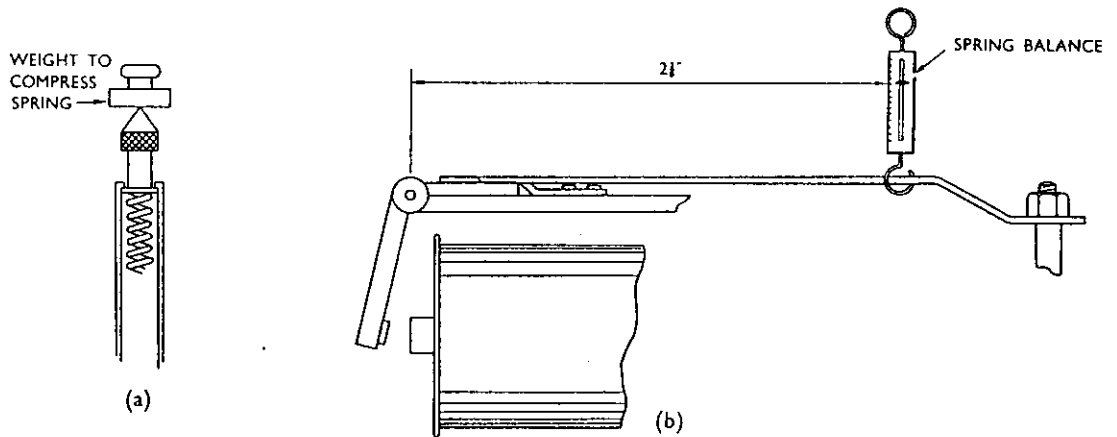


Fig. 5.2 Plotting tables Mks. 6 to 9* - Pencil unit tests

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Pencil Unit Tests

13. The pencil spring is tested as shown in Fig. 5.2(a). The spring should commence to yield with a weight of 4 oz and should close completely with 5 oz.
14. The castor wheel spring should commence to yield with a weight of 4 oz and close completely with a weight of 7 oz.
15. The length of the mark made by the operation of the time marking arrangements may be adjusted by screwing the conical bearing up or down.
16. The spring of the ~~time~~ time marking device is tested as shown in Fig. 5.2(b) and the conical bearing should lift with a pull of 6-7 ozs.

PLOTTING TABLE Mk. 6P

Description (Plate 4a)

17. Plotting table Mk. 6P, Patt. 0552/804(P), is similar to plotting table Mk. 6 except that the lower frame is mounted on the deck and the upper frame is supported by steel angles so that its plotting surface is approximately 3 ft 1 in from the deck.

18. The overall dimensions are:

Length 4 ft
Width 2 ft 9 in
Height 3 ft $1\frac{5}{8}$ in

19. Lower frame. The internal mechanism is identical with that of the Mk. 6 table (Para. 2).

20. E-W carriage assembly (Plate 4(b)). A new design of cross frame and N-S traveller ensures that the weight of the traveller is supported on the steel rods of the cross frame and that the N-S lead screw serves only to move the traveller. A hinged carriage guard protects the front of the carriage from damage.

P Type Projector (Plates 3, 4(c))

21. The projector consists of a 12V, 36W lamp Patt. 0584/995-2414, an optical condenser Patt. 0552/798 to concentrate the light, and a projector lens Patt. 0552/797. Any one of a set of graticules provided may be inserted in the projector immediately above the condenser, and the arrangement of projector and upper frame enables an enlarged image of the graticule markings to be projected through the glass plotting surface. If the adjustments are correct the image will appear in sharp focus on the plotting sheet laid over the glass. The graticule is located in the projector by a pin which fits in a slot in the graticule frame.

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22. Graticules. The following graticules are supplied with this table:

Patt. 0552/780	Scale 1/50000
0552/781	1/250000
0552/782	$\frac{1}{4}$ mile to 1 inch
0552/783	$\frac{1}{2}$ " " "
0552/784	1 " " "
0552/785	2 " " "
0552/786	4 " " "
0552/787	5 " " "
0552/788	10 " " "
0552/789	15 " " "
0552/790	20 " " "

23. A dimmer is fitted in the lamp circuit to control the intensity of the illumination and, as the circuit is supplied from the 24V mains switch S3, a stop in the dimmer switch ensures that a part of the dimming resistance is permanently in the circuit and a higher voltage than 12V cannot be applied to the lamp (Plate 3).

Projector Adjustments

24. If the image illumination is unsatisfactory, adjust the lamp position by easing back the lamp clamping screw and moving the lamp fitting until the best position is found, then re-tightening the clamping screw. The spherical seating of the lamp fitting allows it to be moved in any direction for this adjustment.

25. To determine the correct position of the projector lens, switch on the 24V supply and insert the 1 mile to 1 inch graticule in the projector. Loosen the bush clamping screw and turn the adjusting bush until the image is in sharp focus and the outer circle is as near 20 in in diameter as possible. The image remains in sharp focus over a small range of adjustment of the bush so that it is possible to adjust the diameter of the image within the limits 19.8 inches and 20.2 inches and also to remain in focus.

PLOTTING TABLE Mk. 7

Description

26. Plotting table Mk. 7, Patt. 0552/805 differs from the Mk. 6P plotting table as follows:

- (a) The table is slightly larger, a wider wooden frame being fitted around the upper plotting surface.
- (b) The following controls and switches have been repositioned on the upper frame:

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- (i) The E-W carriage and N-S traveller lining up handwheels. These operate bowden wire drives.
 - (ii) Gear lever control.
 - (iii) The projector lamp dinner which also includes an OFF position.
 - (iv) The contact clock Patt. 0552/810 is fitted on a bracket at either the left or right hand edge of the upper plotting surface, just below table top level.
- (c) An improved E-W carriage cross frame and N-S traveller are fitted.
 - (d) The projector unit is of improved design.

Projector Unit (Plate 5)

27. The projector works on the same principle as the P type but the construction is slightly different. The 12V, 36W lamp Patt. 0584/995-2414 is mounted in a collet, which holds the lamp steady under conditions of shock or vibration, and the lamp fitting has a spherical seating. The metal shield over the lamp slides on guides so that, when replacing the lamp, the shield can be removed without withdrawing the seating.

28. Graticules. The graticule scales supplied are the same as for plotting table Mk. 6P but the locating pin, which enters the slot in the graticule, is adjustable to enable the 000° line on the graticule to be aligned with the N-S of the table.

Projector Adjustment (Plate 5)

29. To obtain an even illumination, pin a thin sheet of paper over the glass plotting surface and adjust the dimmer switch to give maximum brilliancy. Insert a graticule in the projector and screw the lens adjusting bush, up or down, until the graticule image is roughly focused. If the lamp is correctly set, the circle of light should appear evenly illuminated, free from coloured markings and should extent the full diameter of the graticule image. This result is obtained when the lamp filament lies on the axis of the optical system and at the correct distance from the condenser. To ensure this proceed as follows:

- (i) Remove the time marker. Slacken the three locking screws and examine the lamp. Rotate the lamp bush until the plane of the V filament is horizontal.
- (ii) Use the adjusting and locking screws to move the lamp until the circle of light is as large as possible and entirely free of dark patches. The adjusting screw moves the lamp in and out in the horizontal plane. The locking screws move the lamp in its spherical seating in any direction and are primarily of use in obtaining vertical adjustment and locking the final adjustment.

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They must always be slackened off before attempting to move the horizontal adjusting screw.

30. To obtain the correct size and focus of image:

- (1) Adjust to give an even illumination as in Para. 24.
- (2) Insert the 1 mile to 1 inch graticule.
- (3) Slacken back the locking ring and turn the lens adjusting bush until the projected image is in sharp focus and as near 20 inches as possible. The image remains in focus over a small range of adjustment of the bush and it should be possible to obtain a diameter between the acceptable limits of 19.8 inches and 20.2 inches. When adjusted tighten up the locking ring. Care must be taken during this adjustment to grip the adjusting bush by the knurled shoulder and not by the lens which is only screwed in hand tight.

PLOTTING TABLE Mk. 8

Description

31. Plotting table Mk. 8 Patt. 0552/800 is a small table developed for use in submarines, the overall dimensions being:

Length 2 ft $3\frac{3}{8}$ in
Width 1 ft $6\frac{1}{4}$ in
Height 2 ft $10\frac{1}{4}$ in

The plotting table is fitted into the framework of the chart table to ensure correct alignment of the projector, and an armoured glass panel, built into the chart table, serves as the upper plotting surface.

32. Lower frame. The internal mechanism is similar to previous plotting tables but the layout is slightly different, the mechanism being laid out in depth because of the reduced cross sectional area of the lower frame. The lower frame is resiliently mounted.

33. Projector unit. The cross frame and projector unit are of the same type as fitted to the Mk. 7 plotting table and the adjustments for obtaining the correct image are as given in Paras. 24, 25 except that the acceptable limits in the diameter of the image are 9.9 inches to 10.1 inches. The graticule pin adjustment is the external screw type as fitted to the projector units in the later Mk. 7 plotting tables.

34. The 12V, 36W projector lamp Patt. 0584/995-2414 is controlled by a dimmer similar to that used with P type projectors which has no OFF position. A separate projector switch has been fitted in series with the main switch

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so that the lamp may be switched off without opening the main switch. The electrical circuits are shown in Plate 3.

35. Graticules. The set of graticules supplied for use in submarines with this table, comprises one each of the following:

Patt. 0552/791	Scale	$\frac{1}{4}$	mile	to	1	inch
0552/792		$\frac{1}{2}$	"	"	"	"
0552/793		1	"	"	"	"
0552/794		2	"	"	"	"
0552/795		5	"	"	"	"
0552/796		10	"	"	"	"

PLOTTING TABLE Mk. 9

Description

36. The overall dimensions of the Mk. 9 plotting table are:

Length 5 ft 5 in
 Width 4 ft 3 in
 Height 3 ft $1\frac{5}{8}$ in

37. Lower frame. The internal mechanism, E-W carriage, N-S traveller and projector of this table are similar to the Mk. 6P plotting table.

38. Upper frame. The plotting surface of the upper frame accommodates the 20 inch projected image to the full limits of travel of the carriage. The plotting surface projects horizontally beyond the lower frame and, since all the controls and switches are on the south panel of the lower frame, the arrangement is not convenient for plot operation.

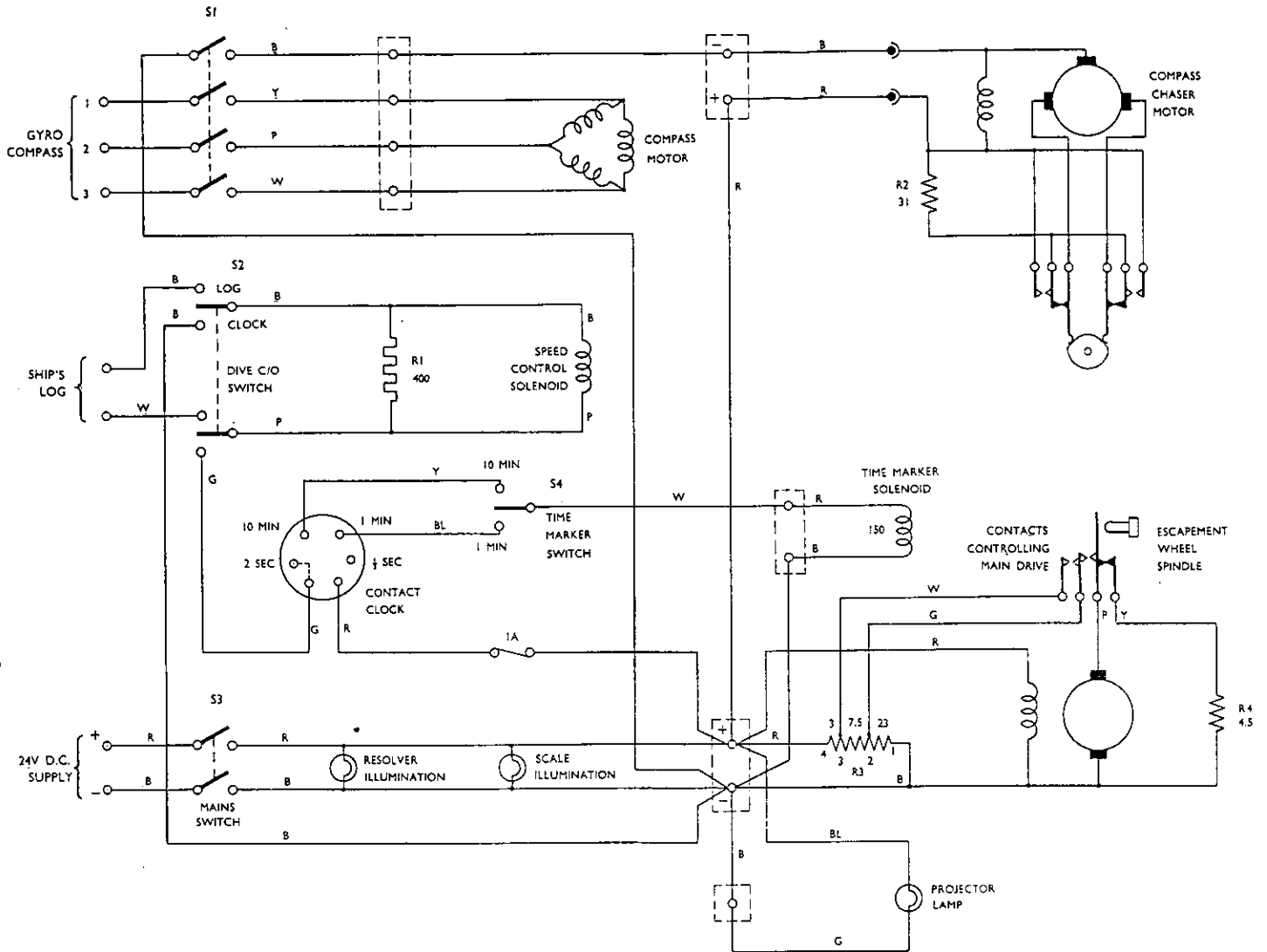
39. Graticules. The graticule scales are the same as those supplied for the plotting table Mk. 6P.

PLOTTING TABLE Mk. 9*

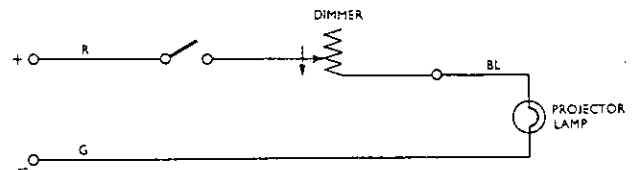
Description

40. The overall dimensions are the same as those of the plotting table Mk. 9. The N-S and E-W lining-up handwheels and the gear lever have been sited on the front panel of the upper frame for convenience in operating.

41. The E-W carriage, cross frame and N-S traveller are as fitted in the plotting table Mk. 7.



- COLOUR CODE
 R—RED
 B—BLUE
 Y—YELLOW
 W—WHITE
 BL—BLACK
 G—GREEN
 P—PURPLE



ALTERNATIVE WIRING TO PROJECTOR LAMP
 FITTED TO P TYPE AND MkS 7, 8, AND 9* PLOTTING TABLES

PLOTTING TABLES MkS 6 TO 9*
 CIRCUIT DIAGRAM

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