Chapter 12

A.R.I.18208/1

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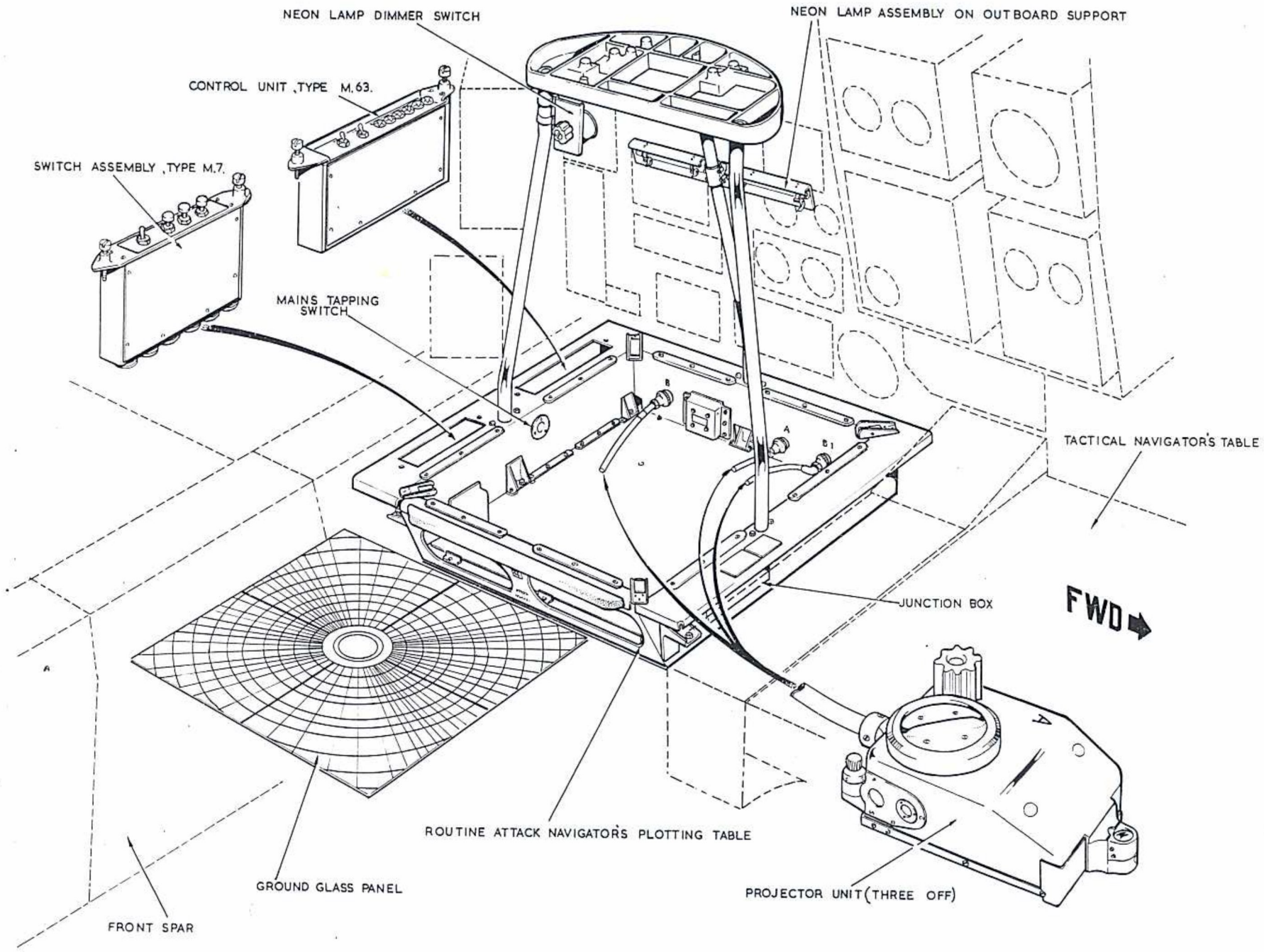
Introduction

1. This installation is designed for use with two A.R.I.18108/1 installations repeating bearings from three sonobuoy transmitters simultaneously, in the form of three beams of light projected onto a navigational chart. A ground position indicator (G.P.I.), is mounted so that it can project an arrow onto the same chart, thereby providing information regarding the aircraft's position and heading.

2. Full information on the optical plotting system is contained in A.P.116G-0401-16, but a brief description is included in the following paragraphs. Details of the installation are shown in fig.1. For information on the ground position, indicator, reference should be made to Sect.7, Chap.3.



'Fig.1 Plotting table assembly

DESCRIPTION AND OPERATION

Power supplies

3. The ARI 18208/1 is connected to socket No.5 on the sonics power distribution panel (Chap.13), and is supplied with 115-volt, single-phase a.c. and 28-volts d.c.

Plotting table

4. The plotting board is mounted between formers 4 and 6, and forms the routine attack navigators table. The working surface of the table is toughened glass, with a shelf of specially designed steel approximately 6.5 inches below. Provision is made in the side and back edge members of the table for mounting the associated control units, transformer and junction box. Supported above the table on three cranked tubes is a casting, which forms a mounting platform for a G.P.I. Mk.1C. The table is suspended on eight anti-vibration mountings; four at the base of the plotting board and four at the top plate casting.

5. Four clips at the corners of the board are provided to stretch and hold navigational charts when they are placed over the glass screen. A plastic cover, stowed under the top shelf adjacent to the table, is provided to cover the glass top when the board is not in use.

Control unit

6. The control unit, mounted on the aft outboard edge of the plotting board, carries the power supply control switches and fuses for the installation. The lamps switch and fuses are in the single-phase a.c. input to the table, whilst the MAGS switch and fuse protect the 28-volt d.c. input. Provision is made on the unit for three spare fuses to be carried.

7. On the side of the unit is a screw-driver access hole to the transformer tapping switch, identified 80.V-115-V. Due to the installation being connected to a 115-volt supply source, this switch must be selected to the 115-volt position.

8. Connections to the control unit are via six, Mk.4 plugs and sockets on the base of the unit.

Switch unit

9. This unit mounted on the aft inboard edge of the plotting table carries switches for selecting supplies to the projector units. As the installation works in conjunction with the two A.R.I.18108/1 installations, information from four sonobuoys may be fed simultaneously to the plotting board. As the table is only provided with three projectors, however, a change-over switch selects projector A to monitor either the receiver A information from either the "master" or "second" A.R.I. 18108/1 installation.

10. The lamps in the three projectors, together with the projector monitor signal lights, may be controlled by the three push switches on the switch unit, or by the push switches at the "master" and "second" sonics operator's stations.

11. Connections to the unit are via a Mk. 4 socket on the base of the unit.

Projection monitor signal lights

12. Two lights are positioned at each sonics operator's station, informing the operator concerned when the outputs from the receivers under his control are being monitored on the plotting table. A push-switch is mounted adjacent to each signal light, enabling the operator concerned to switch off the projector lamp, should the necessity arise. These switches are in parallel with those on the plotting table switch unit.

Projector unit

13. The projector unit is mounted on the steel shelf below the glass screen of the plotting table. A series of lenses within the unit focus the light from a double-filament lamp onto a graticule; the graticule being designed to pass light in the form of a dot and a fine line. A prism in the projector reflects the light up onto the glass screen causing a dot and fine line to appear on the navigational chart. The graticule is rotated by gearing it to an M type receiver motor. This has the effect of rotating the line about the dot on the navigational chart. Once the graticule has been synchronised with a bearing cursor on the A.R.I.18108 indicator, the line projected onto the chart represents bearings emanating from the "dot"

14. In addition to the "dot" and "line", the graticule causes an identification letter to be projected onto the charts. As mentioned in para. 9, three projectors may be used simultaneously, each being identified by the letters "A", "B" and "B1"

15. When in use, the projectors are held firm on the steel shelf by means of internal electro-magnets. The supply to these magnets is via the MAGS switch on the control unit. Stowage positions are provided for the projectors at the outboard edge of the shelf.

16. A short connecting lead, terminating in a twelve-pole Mk.4 plug, is permanently attached to each projector unit. Connection to the plotting table is via coupler sockets in the outboard edge of the table. The keyways on these coupler sockets are

of different orientation, therefore only one type of projector can be coupled to each plug.

Transformer

17. The transformer is mounted centrally on the edge member of the plotting table. The 115-volt input is stepped down to 12-volts for supplying the lamps within the projector units.

Junction box

18. The junction box is mounted on the forward member of the plotting table, and serves as an interconnecting point for various services on the installation.

SERVICING

Precautions

19. The warning notice and general precautions outlined in Chapter 1 of this section should be noted before any servicing is attempted.

20. Full servicing details for the installation are contained in the publication listed in Table 1, but brief instructions are included in the following paragraphs.

General instructions

21. At the appropriate servicing periods, the items of equipment should be examined for security, damage, corrosion and bonding. The connectors should be examined for security and damage.

WARNING . . .

During servicing periods, heavy objects should not be placed on the plotting table. Failure to observe this precaution may result in damage to the table and/or the anti-vibration mounting.

22. When the plotting board is not in use, the plastic cover should be fitted to protect the glass surface.

23. When it is required to function test the A.R.I.18208, it is essential that both A.R.I.18108/1 installations are complete, and in a serviceable condition.

Power supplies

24. The a.c. and d.c. supplies to the installation may be conveniently checked at the fuse boxes in the radio power panel.

WARNING . . .

Due to the installation being connected to a 115-volt a.c. supply source, it is essential that the transformer tapping switch on the control unit, Type M.63, is set to the 115-volt position.

Projectors

25. When testing the projector units, both filaments of the lamp should be checked. To prevent overheating, the projector lamps should not be switched ON unless the projectors are firmly held by their electro-magnets, to the steel shelf in the plotting table.

REMOVAL AND INSTALLATION

Precautions

26. Before any attempt is made to remove equipment, the general precautions and instructions outlined in Chapter 1 should be noted.

Plotting table

27. If the plotting table is to be removed from the aircraft, the following procedure should be adopted.

(1) Disconnect fluorescent lighting dimmer switch, located on the aft support tube of the table.

(2) Disconnect and remove the G.P.I. from the upper casting.

(3) Remove strapping from outboard tube support to release the fluorescent lighting wiring.

(4) Remove the fluorescent light mounting bracket from the outboard tube by releasing the clamps. The lamp mounting should then be be safely stowed.

(5) Disconnect cables from the following sockets on the plotting table control unit:-

IND (MASTER) UPPER
P.D.P.
IND (2ND.) UPPER

(6) Disconnect cables from the following plugs and sockets on the plotting board junction box:-

PROJ. MON. (MASTER)
PROJ. MON. (2ND.)
IND. (MASTER) LOWER
IND. (2ND.) LOWER

(7) Release the cables disconnected in operations (5) and (6) from the two clips below the outboard edge of the table. Replace the clips to retain the remaining cables, which are part of the plotting table.

(8) Ensure that the projectors are firmly in their stowage positions.

(9) Remove the eight bolts securing the table and top casting to the eight anti-vibration mountings. The table may then be removed complete. Care should be exercised during this operation, bearing in mind the weight of the table is approximately 70lbs.

(10) With the table removed, all disconnected cables and fittings should be suitably stowed, to prevent damage.

28. If the existing table is to be replaced by another, then the following additional work must be carried out.

(1) Remove the fluorescent lighting dimmer switch from the aft support tube by releasing the clamps. The dimmer switch should then be fitted in a similar position on the new table.

(2) Remove the two clips mentioned in para.28 (7), and fit them in similar positions on the new table. The two similar clips removed from the new table should then be fitted to the old table.

29. When refitting a plotting table, the removal procedure should be reversed.

Control unit

30. If it is necessary to remove the control unit from the plotting table, the cables on the underside of the unit must be disconnected. When the two green coloured screws on the upper face of the unit have been loosened, the control unit may be easily withdrawn from the table.

WARNING . . .

When replacing a control unit, ensure that the transformer tapping switch is set at the 115-volt position.

Switch unit

31. This unit is removed in the manner similar to the control unit.

TABLE 1.

Major items of equipment

Equipment	Type	Ref. No.	A.P.Reference
Plotting board	-	10AQ/848	◀ A.P.116G-0401-1 & 6 ▶
Control unit	M.63	10L/18669	
Switch unit	M.7	10F/21399	
Transformer	-	10K/24500	
Junction box	-	10D/23717	
Projector unit (A)	7158	10D/22519	
Projector unit (B)	7159	10D/22520	
Projector unit (B1)		10D/23715	

TABLE 2

Connectors for A.R.I. 18208/1

Item No.	Cable form	Connecting
2/T.5679	Miniature cable 4C (DEF.10) 1 off	Plotting table P.D.P. to Sonics P.D.P.5
3/T.5679	Uninyvin 22, 8 off	Plotting table PROJ.MON. (MASTER) to lights signal (Master Sonics)
4/T.5679	Uninyvin 22, 8 off	Plotting table PROJ.MON. (2ND.) to lights signal (Second Sonics)

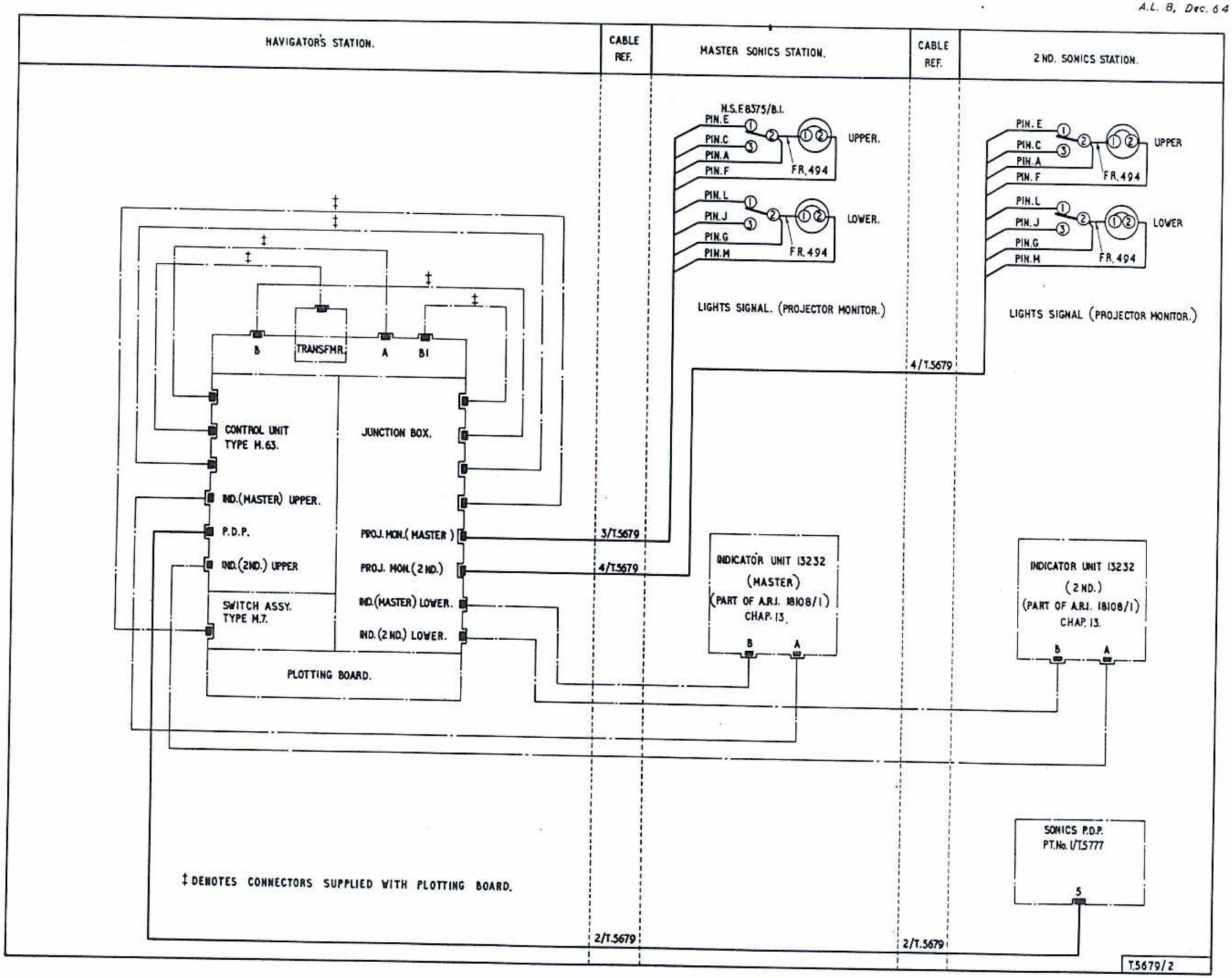


Fig. 2. A.R.I. 18208/1