Chapter 17
LIGHTING

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Introduction

1. This chapter contains descriptive and servicing information for all lighting systems on the aircraft.

2. The installations can be divided into two main groups:-

Interior lighting
Exterior lighting

The location of the lamp fittings and controls are illustrated in fig.1 to 3. Theoretical circuit diagrams of the ultra-violet (U/V) control, and the landing-taxying lamps installations, are contained in fig.4, 5 and 6 respectively.

3. A supply of 115-volt, 3-phase, 400 Hz, is fed to the U/V tubular and fluorescent lighting systems. All other lighting, including the U/V for the oxygen panels, are fed from the aircraft 28-volt d.c. supply.

4. Table 2 lists the various types of filaments used. For further details of the lamps reference should be made to the A.P.s listed in Table 1. Routing charts are contained at the end of this chapter. The following modifications are incorporated.

Mod.908 - Introduction of three extra pillar lamps two adjacent to the column on the port instrument panel and one on the port outer instrument panel.

Mod.1137 - Introduction of a lamp to illuminate the level indicator on the water glycol reservoir.

Mod.1233 - Introduction of a cocktail lamp Mk.1A for V.H.F. servicing.

Mod.1358 - Introduction of knee pad lighting at the first pilot's station.

Mod.1446 - Introduction of extra pillar lamps with amber filters for the beam compasses.

Mod.1631 - Introduction of A.R.I.18107/13 in lieu of A.R.I.5816.

Mod.1843 - Introduction of wiring changes due to repositioning of equipment at the rear crew stations.

Mod.1888 - To reposition the radio altimeter and phase sequence indicator and associated limit lamps at pilots' stations and to make provision for an additional radio altimeter indicator Type, 16094 at the nav. plotter's panel.

Mod.1964 - Introduction of a Thorn Type dimmer to control the density of light at the Rapid Blooming Window (R.B.W.).

Mod.2007 - Introduction of A.R.I. 23143/1 in lieu of A.R.I.18064.

Mod.2032 - Introduction of 'Grimes' anti-collision lamps, Type G9950-13 Ref.No.5CX/6664 in lieu of 'Thorn' lamps Ref.No.5CX/5315 in the upper and lower positions on the aircraft, superseding Mod.983.

Mod.2057 - Introduction of ARI-5959.

Mod.2258 - To alter the circuit for the RPM governors to feed fuses from the essential busbar. Fuses 675 and 678 are transposed so that the lamps at the port fuse and relay panel are fed from the non-essential busbar fuse 675.

Mod.2363 - Introduction of SFOM gunsight with associated lighting and dimmer switch (Com. Mod/Vulcan/0259/STC).

Mod.2381 - Introduction of a double-pole external lights master switch in lieu of the single-pole master switch, to enable the anti-collision and navigation lamps to be supplied from the essential supply. (Com. Mod./Vulcan/0250/STC).

Mod.2439 - Introduction of pilots' directional indicator at the navigator's (radar) station.

Mod.2473 - To interchange the pilots' direction indicator and the outside air temperature gauge at the crews station.

▶ Mod.2504 - To provide automatic illumination of the cabin light when either abandon aircraft switch is operated. ◀

INTERIOR LIGHTING

DESCRIPTION AND OPERATION

5. The interior lighting consists of the following main systems:-

(1) Cabin and general lighting - for interior ilumination.

(2) U/V radiation - for the pilots' instrument panels.

(3) Red floodlighting - for the pilcts' control consoles and instrument panels.

(4) Red fluorescent lighting - for floodlighting the crew stations.

(5) Red pillar lamp lighting – for the pilots instrument panel (1P), navigator bomber's selector switch panel and the navigator plotter's instrument panel.

(6) White fluorescent lighting – for white illumination of the pilots' consoles.

(7) High intensity anti-dazzle lighting for use in special circumstances.

(8) Concealed lighting – for internal illumination of the fuse and relay panels, 3P and 4P.

(9) Ground service lighting – for bomb bay, wheel bays, etc.

Cabin and general lighting

6. General purpose cabin lighting is provided by standard cabin and cockpit lamps Mk.1A. Each lamp is controlled by a switch built into each assembly, or by control switches fitted at suitable positions in the aircraft. Cockpit lamps Mk.1A are fitted with 2-pole sockets designed to accommodate Type 2 inspection lamps. Details of cabin lamps and switches are contained in the following para.

Cabin lamp

7. A lamp fed via fuse 532 in panel 4P, is installed in the fuselage roof. A two-way switching system is provided, with one switch located at the entrance door, the other at the A.E.O's position. On aircraft incorporating Mod.2504 this lamp is also illuminated from fuse 1166, via paralleled contacts of relay, when either abandon aircraft switch is operated.

Nose compartment

8. Two cockpit lamps, with their internal switches locked in the 'on' position, are fitted to the roof in the nose compartment. Supply is via fuse 585 in panel 4P. Fitted on the floor support below the second pilot's floor, is a single pole switch, labelled NOSE-LIGHT, ON-OFF, which controls both lamps.

Prone bomb aimer's compartment

9. A cockpit lamp providing general illumination, is fitted to the under surface of the pilots' floor structure. Supply is via fuse 585 in panel 4P. Two-way switching is provided, one switch located on the bomb aimer's panel (8P), and the other on panel 9P, at the navigator bomber's station.

Navigator's lighting

10. Two cockpit lamps are fitted to the under surface of the navigator's table, to provide illumination for equipment located at this position. Both lamps are supplied via fuse 532 in panel 4P. One lamp is controlled by a single-pole on-off switch at the A.E.O's position. The other lamp is controlled by the switch built into the lamp assembly. With Mod.1233 incorporated a cockpit lamp Mk.1A is connected into the navigator's table lighting for V.H.F. servicing. The lamp is fed from fuse 532.

Sextant lamps

11. A lamp is fitted adjacent to each sextant stowage (port and stbd.) The port lamp is supplied from fuse 677 in panel 3P and the stbd. lamp from fuse 584 in panel 4P. The lamps are controlled by individual switches adjacent to the lamps.

Pilots' station lighting

12. Lighting at both pilots' stations is divided into five groups:-

(1) U/V radiation - for instruments on the pilots' panel which have fluorescent markings.

(2) Red flood and pillar lamp lighting - to illuminate the controls on the panels and consoles.

(3) Knee pad lighting - to illuminate the pilots' knee pads.

(4) White fluroescent lighting - for general illumination of the port and stbd. consoles.

(5) High intensity anti-dazzle.

U/V lighting

13. Two forms of lighting are provided for U/V radiation. One, using lamps Type B, to irradiate the oxygen panels (port and stabd.), the other, a tubular black glass type, to irradiate the instrument panel 1P.

14. Two lamps Type B, are installed, one on each cockpit rail, so that they irradiate the pilots' oxygen panels. The lamps are connected in series, and controlled by a dimmer switch Type R., fitted on a panel adjacent to the oxygen instruments. Supply for these lamps is via fuse 660 in panel 3P.

15. The U/V lighting for the pilots' instrument panel consists of six tubular lamps. Five are fitted under the coaming under the panel, the sixth is fitted behind the throttle box to irradiate the fuel contents gauges on

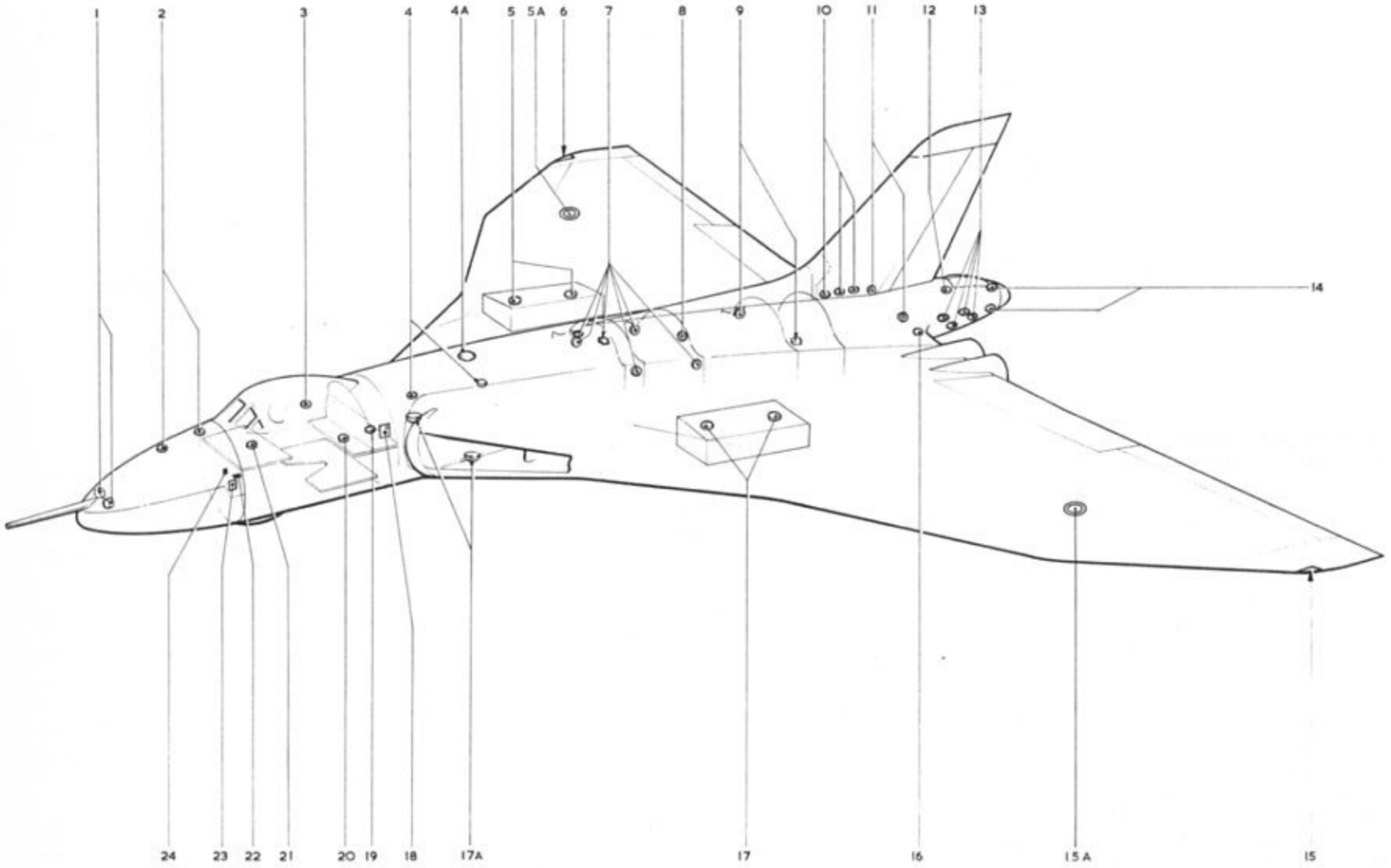

Fig.1 Location of exterior and servicing lamps

KEY TO FIG.1

Location of exterior and servicing lamps

1. *HIGH INTENSITY ANTI-DAZZLE LAMPS – REFUELLING PROBE*
2. *CABIN LAMPS – NOSE COMPARTMENT*
3. *MAIN CABIN LAMP – ROOF*
4. *GROUND SERVICING LAMPS – NOSE WHEEL BAY*
4A. *GRIMES ANTI-COLLISION LAMP – UPPER*
5. *GROUND SERVICING LAMPS – STBD. MAIN WHEEL BAY*
5A. *STBD. LANDING LAMP – STBD. WING*
6. *NAVIGATION LAMP – STBD. WING-TIP*
7. *GROUND SERVICING LAMPS – BOMB BAY (FORWARD)*
8. *GROUND SERVICING LAMP – HYDRAULIC RESERVOIR*
9. *GROUND SERVICING LAMPS – BOMB BAY (AFT)*
10. *GROUND SERVICING LAMPS – POWER COMPARTMENT*
11. *GROUND SERVICING LAMPS – RUDDER BAY*
12. *GROUND SERVICING LAMP – WATER/GLYCOL RESERVOIR*
13. *GROUND SERVICING LAMPS – E.C.M. COMPARTMENT*
14. *NAVIGATION LAMPS – TAIL*
15. *NAVIGATION LAMP – PORT WING-TIP*
15A. *PORT LANDING LAMP – PORT WING*
16. *DOWNWARD IDENT. LAMP – REAR FUSELAGE*
17. *GROUND SERVICING LAMPS – PORT MAIN WHEEL BAY*
17A. *GRIMES ANTI-COLLISION LAMP – LOWER*
18. *MASTER SWITCH – GROUND SERVICING LAMPS*
19. *LAMP – UNDER NAVIGATOR'S TABLE (AFT)*
20. *LAMP – UNDER NAVIGATOR'S TABLE (FORWARD)*
21. *LAMP – BOMB AIMER'S COMPARTMENT*
22. *COCKPIT LAMP AND DIMMER SWITCH PANEL – BOMB AIMER'S COMPARTMENT*
23. *SWITCH – BOMB AIMER'S COMPARTMENT LAMP*
24. *SWITCH – NOSE COMPARTMENT LAMP*

panel 2P. A supply of 115-volt, 3-phase, 400 Hz, is fed to the lamps from fuses 253R and B in panel 24P.

NOTE . . .
When U/V radiation is required, the lamps may be moved into position by their adjustable holders.

16. The a.c. supply is routed to two control boxes, B.T.H. Type 2126730, mounted on the port side of the first pilot's floor. Each box contains the necessary chokes and capacitors for striking three lamps. Two dimmer switches are installed, each one regulates three lamps in conjunction with a control box. One switch is fitted on the port console, the other on the stbd. console.

17. A theoretical circuit diagram of the U/V control system is shown in fig.4. Reference to this diagram will show that the throttle box lamp, and the port inner and outer lamps, are supplied from No.1 control unit, the input of which is regulated by the port dimmer switch. Similarly, the centre lamp, and the stbd. inner and outer lamps, are supplied from the No. 2 control unit, the input of which is controlled by the stbd. dimmer switch. These switches are of the 'ganged' type, and are wound so that when dimmer resistances B, C and D are out of circuit, the series resistance A is in circuit.

18. When the dimmer switch is rotated from the OFF position, an a.c. supply will be fed via resistance A, and the lamp chokes, to a pair of filaments in each tube; at this stage the filaments and chokes are in series, with resistances B, C and D, out of circuit. The filaments will begin to glow, and low radiation will take place. As the dimmer switch is turned to the BRIGHT position, resistance A will be taken out of circuit, and at the same time, resistances B, C and D will be connected in parallel across the lamp chokes. This will cause the filaments to glow brighter, giving increased radiation.

Red floodlighting

19. Red lighting is provided at the consoles at the pilots' station and the main instrument panel. The system is controlled by dimmer switches and operates from the aircraft 28-volt d.c. supply.

Instrument panel

20. The red floodlighting at the instrument

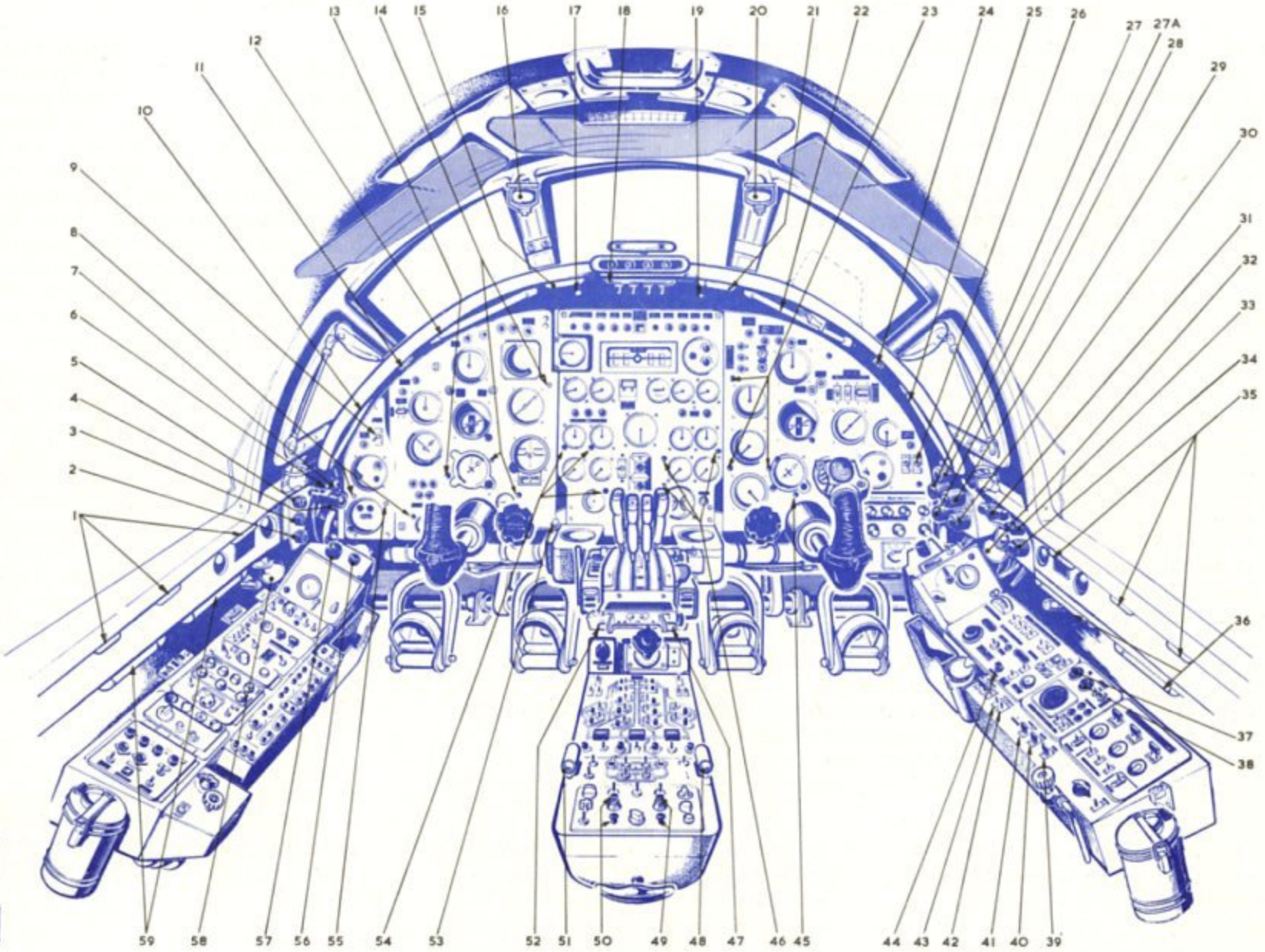

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Fig. 2 Pilots' station lighting
► *Item 27A inc. (Mod. 2363)* ◄

KEY TO FIG.2

PILOTS' STATION LIGHTING

1.	Red flood lamps	Port console
2.	Dimmer switch	1st pilot's knee pad lamp
3.	Dimmer switch	Port E2B compass bowl lamp
4.	Knee pad lamp	1st pilot
5.	Dimmer switch	Pillar lamps on instrument panel 1P
6.	Dimmer switch	Port console red flood lamps
7.	Dimmer switch	Port coaming red flood lamps
8.	Pillar lamp	Panel 1P
9.	Switch	Port console white flood lamps
10.	U/V lamp - 112-volt a.c.	Port outer coaming
11.	Red flood lamp	Port coaming
12.	U/V lamp - 112-volt a.c.	Port inner coaming
13.	Pillar lamp (Mod.908 and 1446)	Panel 1P
14.	Pillar lamps	Panel 1P
15.	Red flood lamp	Port coaming
16.	Lamp	E2B compass bowl (port)
17.	High intensity anti-dazzle lamp	Pilots' coaming
18.	U/V lamp 112-volt a.c.	Centre coaming
19.	High intensity anti-dazzle lamp	Pilots' coaming
20.	Lamp	E2B compass bowl (stbd.)
21.	Red flood lamp	Stbd. coaming
22.	U/V lamp 112-volt a.c.	Stbd. inner coaming
23.	Pillar lamps	Panel 1P
24.	Red flood lamp	Stbd coaming
25.	U/V lamp 112-volt a.c.	Stbd. outer coaming
26.	Switch	Stbd. console white flood lamps
27.	Dimmer switch	Centre console port red flood lamps
▶27A	Dimmer switch	S.F.O.M. gunsight (Mod.2363) ◀
28.	Dimmer switch	Stbd. coaming red flood lamps
29.	Dimmer switch	Centre console stbd. red flood lamps
30.	Dimmer switch	Stbd. console red flood lamps
31.	Knee pad lamp	2nd. pilot
32.	U/V lamp 12-volt d.c.	Oxygen panel (stbd.)
33.	Dimmer switch	2nd. pilot's knee pad lamp
34.	Dimmer switch	E2B compass bowl lamp (stbd.)
35.	Red flood lamps	Stbd. console
36.	White flood lamps	Stbd. console
37.	Dimmer switch	Stbd. fuel probe lamp
38.	Dimmer switch	Port fuel probe lamp
39.	Switch	Navigation lamps
40.	Switch	Stbd. landing/taxying lamp
41.	Switch	Port landing/taxying lamp
42.	Switch	Downward ident. lamp
43.	Master switch	External lights (post mod 2381 a double-pole switch is fitted)
44.	Dimmer switch	Stbd. and centre coaming U/V lamps
45.	Pillar lamp (Mod.908 and 1446)	Panel 1P
46.	Pillar lamps	Panel 1P
47.	Red flood lamp	Throttle box pedestal
48.	Red flood lamps	Centre console (stbd.)
49.	Lamps	Auto-pilot selector switch box (stbd.)
50.	Lamps	Auto-pilot selector switch box (port)
51.	Red flood lamps	Centre console (port)
52.	Red flood lamp	Throttle box pedestal
53.	Switch	High intensity anti-dazzle lamps
54.	Pillar lamps	Panel 1P
55.	Pillar lamps (Mod.908)	Panel 1P
56.	Dimmer switch	Port coaming and throttle box U/V lamps
57.	Dimmer switch	U/V lamps (oxygen panels)
58.	U/V lamp 12-volt d.c.	Oxygen panel (port)
59.	White flood lamps	Port console

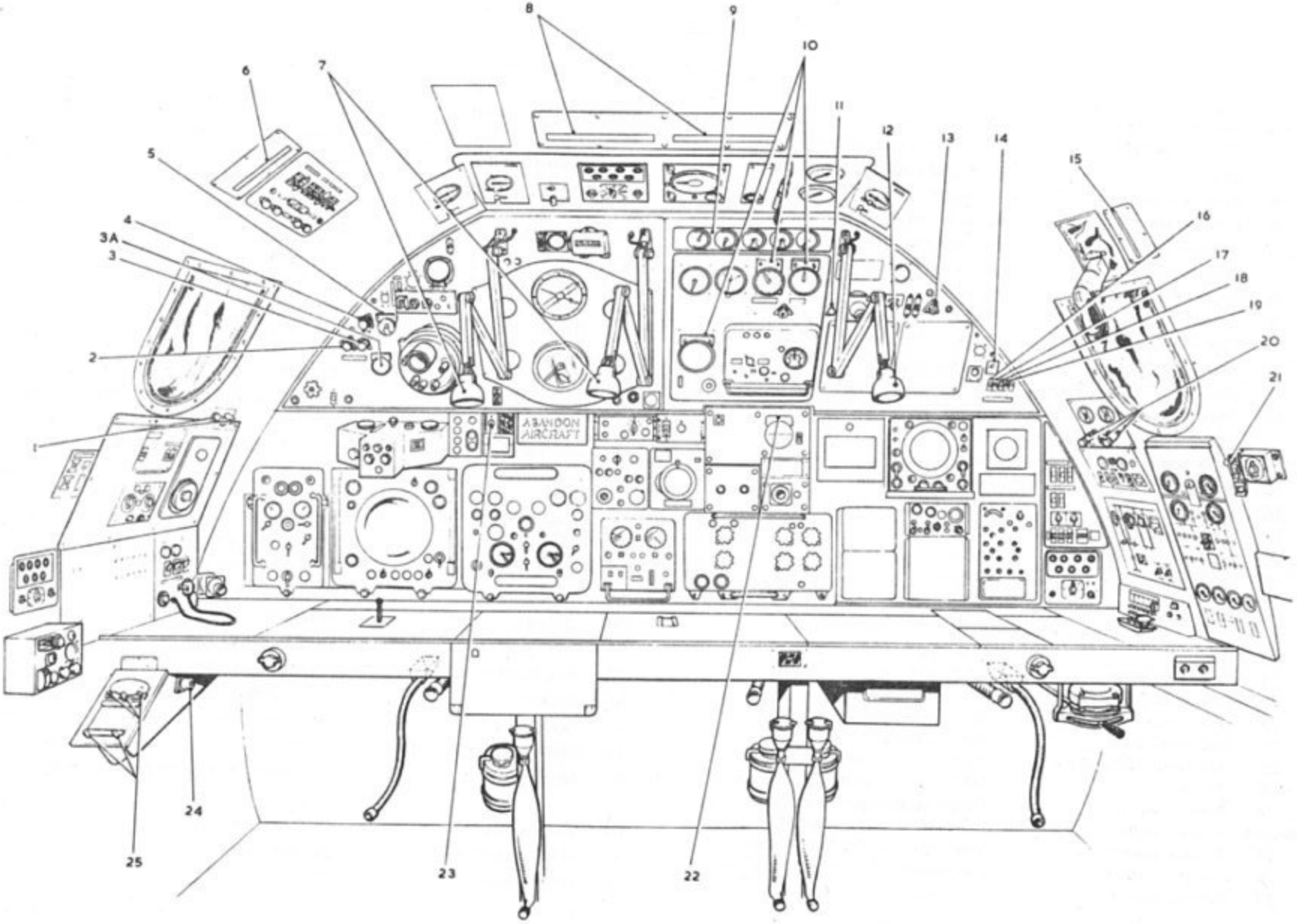

Fig. 3 Crew's station lighting

► *Mod. 2473* ◄

KEY TO FIG.3

Crews station lighting

1. LAMP AND DIMMER SWITCH–9P
2. DIMMER SWITCH – NAV/BOMBER'S CHARTBOARD LAMP
3. DIMMER SWITCH – NAV/PLOTTER'S CHARTBOARD LAMP
- ▶ 3A. GAUGE LAMPS – BOMB BAY TEMPERATURE ◀
4. DIMMER SWITCH – TEMPERATURE GAUGE LAMPS
- ▶ 5. GAUGE LAMPS – OUTSIDE AIR TEMPERATURE ◀
6. U/V RED FLUORESCENT LAMP – ROOF (STBD).
7. CHARBOARD LAMPS – NAV/PLOTTER AND NAV/BOMBER
8. U/V RED FLUORESCENT LAMPS – ROOF (CENTRE)
9. PILLAR LAMP – A.D.F. BEARING INDICATOR
10. PILLAR LAMPS – NAV/PLOTTER'S INST. PANEL
11. DIMMER SWITCH – ITEM 10
12. CHARTBOARD LAMP – A.E.O's STATION
13. DIMMER SWITCH – ITEM 12
14. DIMMER SWITCH – R.B.W. SELECTOR PANEL
15. U/V RED FLUORESCENT LAMP – ROOF (PORT)
16. ON/OFF SWITCH – ITEM 6
17. ON/OFF SWITCH – ITEM 15
18. ON/OFF SWITCH – CABIN LIGHTS
19. ON/OFF SWITCH – LAMP UNDER NAVS' TABLE
20. LAMPS AND DIMMER SWITCH – ABOVE 70P
21. LAMP – I.L.S. AND AUTO. THROTTLE SUPPLY PANEL
22. PILLAR LAMPS – TACAN INDICATOR
23. OFF/BRIGHT SWITCH – ANTI-DAZZLE LAMPS
24. DIMMER SWITCH – ITEM 25
25. PILLAR LAMPS – CONTROL UNIT TYPE 12480 MOUNTING

panel consists of eight lamps fitted under the panel coaming. They are contained in double lamp holders H.S.A. Part No. V7649, and are fitted as illustrated in fig.2. The lamps are controlled by dimmer switches Type R, located at the forward end of the port and stbd. cockpit rails.

Consoles

21. Red lighting on the three consoles consists of the following lamps and controls:-

(1) Fitted below the port cockpit rail are three double-lamp holders. The filaments located in these lamp holders, illuminate the port console when their associated dimmer switch is operated. Supply is via fuse 629 in panel 3P.

(2) A similar set of lamps is also fitted under the stbd. cockpit rail. Control is by means of a dimmer switch located at the forward end of the rail.

(3) Two lamp holders, Standard Telephones Type L.183328, arranged to illuminate the forward end of the retractable centre console, are fitted to the throttle-box pedestal. Each lamp is controlled by a dimmer switch, Type R, fitted to the forward end of the stbd. cockpit rail.

(4) Two shrouded lamp assemblies, H.S.A. Type 9534, are fitted one on each side of the aft portion of the retractable centre console. These lamps which provide illumination for this area, are controlled by the same dimmer switch as in (2).

(5) Four shrouded lamp holders are mounted on the pilots' selector switch box, fitted on the aft end of the retractable centre console. These lamps are controlled by the same dimmer switch as in (2).

(6) A red wander lamp assembly is fitted on the pilots' canopy, enabling either pilot to have local lighting for map reading etc. The lamp assembly consists of a rectangular box, housing a bungee-loaded extension lead, a built-in switch, a red filter, a focus unit and an iris for illumination control. A clip on the lamp enables it to be secured in any desired position. Supply is via fuse 535 in panel 3P.

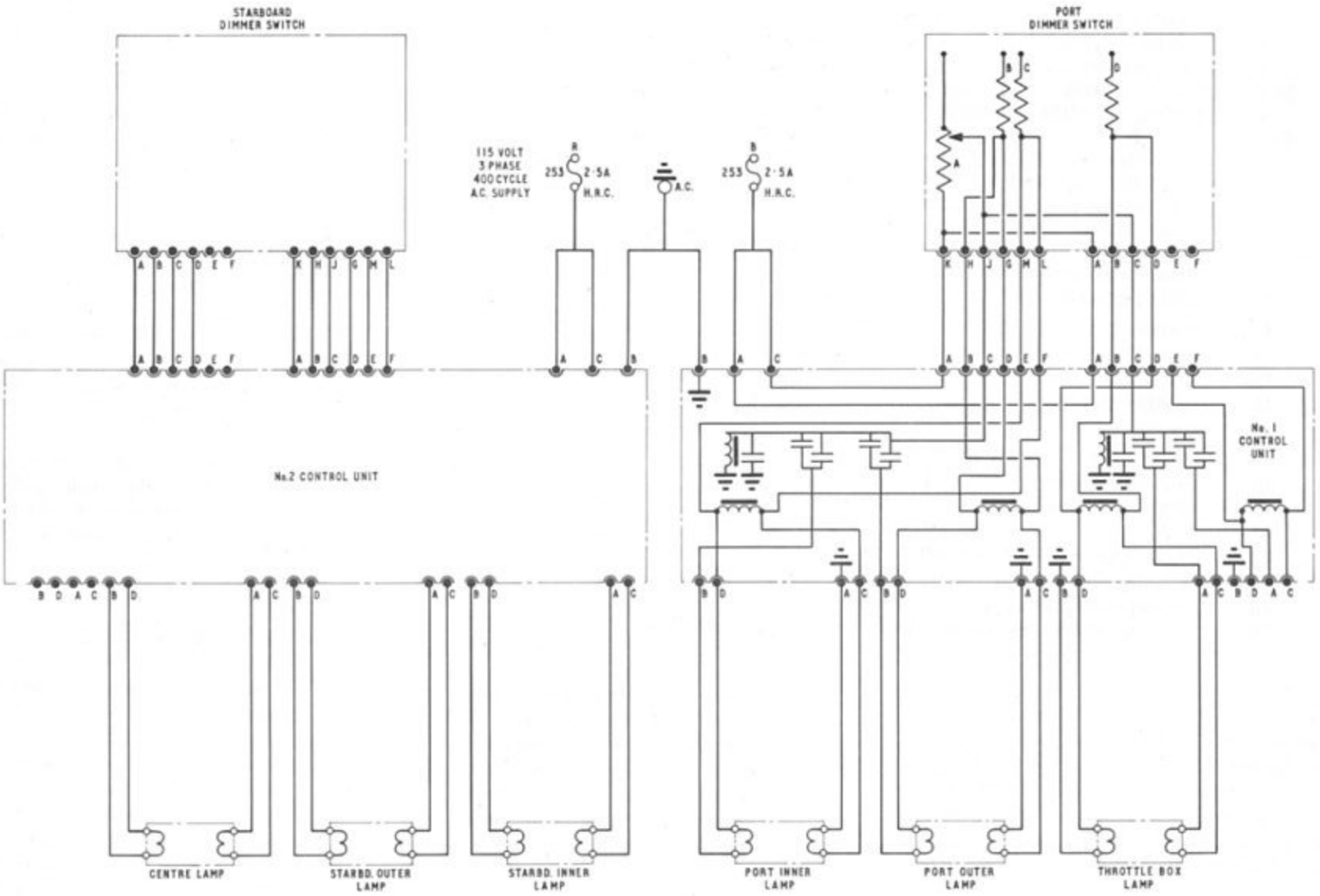

Fig. 4 U./V. Controls

Pillar lamp lighting

22. Fourteen pillar lamps are fitted, on the port, port outer, centre and stbd. instrument panels 1P. These lamps, which light up the instrument faces on the panels, are controlled by a dimmer switch located at the forward end of the port cockpit rail. Supply is via fuse 633 in panel 3P (fig.11).

23. Changes to the pillar lamp installation by the embodiment of certain modifications are as follows:

Mod.908 - Installation of three extra pillar lamps, two adjacent to the column on the port instrument panel and one on the port outer instrument panel. (Refer to fig.2 item 55 and fig.11).

Mod.1446 - Installation of two extra pillar lamps with amber filters for the beam compasses, one on the port and one on the starboard instrument panels (fig.11).

Knee pad lighting

24. Knee pad lighting is provided at the first pilot's station, by a Mk.1A cockpit lamp fitted with an amber filter. The lamp is controlled by a dimmer switch located at the forward end of the port cockpit rail and supplied from fuse 633 in panel 3P (fig.11).

25. A cockpit lamp Mk.1A, fitted with an amber filter, is provided at the second pilot's station. The lamp is controlled by a dimmer switch located at the forward end of the stbd. cockpit rail.

White fluorescent lighting

26. This lighting is installed at the pilots' stations for illuminating the port and stbd. consoles. Below each cockpit rail two tubular 115-volt, 4-watt lamps are fitted. Each pair of lamps is controlled by a single-pole on-off switch, located on either side of the pilot's instrument panel. A control box, BTH. Type X2126730, is fitted to the floor below the port console. This box contains the necessary chokes and capacitors to strike the lamps. Supply is via fuses 236R and B, in panel 25P.

High intensity anti-dazzle lighting

27. Fitted on the pilots' coaming are two high intensity, anti-dazzle cockpit lamps. These lamps enable essential instruments to be seen under the conditions described in AP 113F-0223-1.

28. The lamps may be controlled by either a single-pole, three-way switch, labelled DIM-OFF-BRIGHT, located on panel 2P at the pilots' station, or by a single-pole, two-way switch, labelled OFF-BRIGHT, fitted on the navigator's panel.

29. The dim condition is achieved with the pilots' switch selected to DIM, when a Type A, No.3 resistor is connected in series with each lamp filament. These two resistors are fitted under the port console. The supply to the lamps is from fuse 910 in panel 4P via the pilots' switch and fuse 925 in panel 3P via the navigator's switch (fig.13).

Stand-by compass lighting

30. Two compasses Type E2B, one for each pilot, are fitted to the centre windscreen supports fig.2. Each compass bowl incorporates a miniature 28-volt d.c. non-magnetic lamp for internal illumination. The lamps are controlled by dimmer switches Type R. The first pilot's control switch, located at the forward end of the port cockpit rail, is supplied via fuse 916 in panel 3P. The second pilot's control switch is fitted at the forward end of the stbd. rail, and is supplied via fuse 881 in panel 4P (fig.14).

NOTE . . .
The non-magnetic lamps have been specially developed for compasses and are identified by a red spot in addition to their Reference No. (5L/9959121). As these lamps are more costly than the magnetic variety, it is necessary that they are used for E2B compasses only. Conversely, magnetic lamps which are dimensionally interchangeable should not be used in E2B compasses.

S.F.O.M. gunsight lighting (Mod.2363)

30A. A pillar lamp, which is mounted on the second pilot's anti-dazzle light shroud, is used to illuminate the gunsight vernier scale.

30B. The pillar lamp and the gunsight light are controlled by a dimmer switch fitted at the forward end of the starboard cockpit rail. Supply is via fuse 1314 in panel 4P (fig.23).

Crew's station lighting

31. The lighting at this station can be divided into three main groups:-

(1) Red fluorescent – for general lighting of the crew station.

(2) Red pillar lamps – illuminate instruments on both the bomber's selector switch and plotter's panels.

(3) Chartboard lamps – for general lighting of equipment and controls.

Red fluorescent lighting

32. Four tabular fluorescent lamps fitted around the top section contour of former 260,

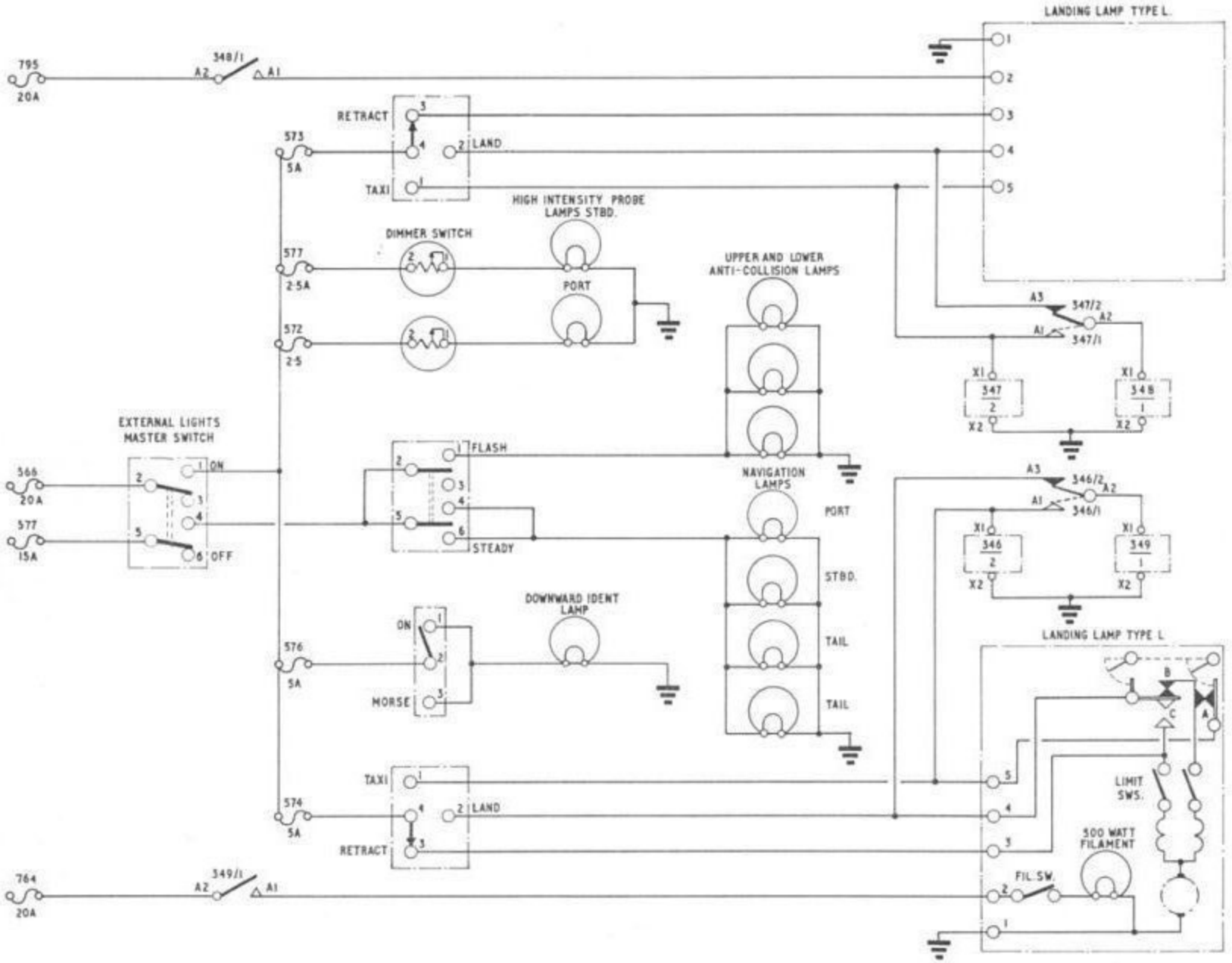

Fig 5 Exterior lighting circuit

▶ *Title amended* ◀

give even illumination at the navigators' station. A spring clip attaches each lamp to a white metal reflector. The lamps are supplied with 115-volt a.c. from fuses 264R and B in panel 25P (fig.15).

33. The lamps are controlled by two single-pole switches on the navigator's panel. Fitted on the forward port side face of the rear pressure bulkhead is a control box, B.T.H. Type X2126730, which contains the necessary chokes and capacitors to strike the lamps.

34. The circuit operation for the fluorescent lighting is similar to the U/V lighting except that the dimmer control is replaced by on-off switches.

Bomb bay temperature gauge lamps

35. A 2-lamp bridge, is fitted above the bomb bay temperature gauge on the navigator's radar panel (fig.3, Item 3A. A dimmer switch, Type E, mounted adjacent to the gauge, controls the lamps. Supply is via fuse 532 in 4P.

Control unit, Type 12580, lamps (N.B.S.)

36. Five pillar lamps, two for the control unit, Type 12580 and a 3-lamp bridge for the bombing selector switch, are fitted on a mounting at the starboard side of the navigator's table (fig.3). The lamps are fed from fuse 685 in panel 48P and are controlled by a dimmer switch on the side of the mounting (fig.16).

A.D.F. indicator lamp

37. A pillar lamp is provided for the A.D.F. bearing and tuning indicator located on the navigator's fuel contents panel. The lamp is controlled by the plotter's instrument panel dimmer switch and supplied from fuse 685. (fig.16).

Tacan indicator lamps

38. A 2-lamp bridge is fitted above the navigator's Tacan indicator. The lamps are supplied from fuse 685 and controlled by the plotter's instrument panel dimmer switch.

Plotter's instrument panel lamps

39. Nine pillar lamps (three single and three 2-lamp bridges) are fitted on the plotter's instrument panel to illuminate the various instruments. The lamps are fed from fuse 685 and are controlled by the plotter's dimmer switch.

Mod.1964

40. When Mod.1964 is embodied, a Thorn type dimmer switch is provided to control the density of light at the R.B.W. selector panel, via fuse 653 (2.5A) in panel 3P.

Panel lamps

▶41. Fitted above the A.A.P.P. control panel 70P are two cockpit lamps, Mk.2 and a control dimmer switch, Type 'R'. One lamp illuminates the control panel, the other the C.S.D.U. temperature gauges (Chap.2). Supply is via fuse 677 in 3P.◀

42. A cockpit lamp, Mk.2 and a dimmer switch, are fitted above the aft section of the bombing panel (9P). The lamp, which illuminates this portion of the panel, is supplied via fuse 532 in panel 4P.

Chartboard lamps

43. Each crew position at the navigation station is provided with a chartboard lamp and a control dimmer switch.

44. These lamps provide general lighting for the instruments at this station. Each lamp is fitted with an amber filter and chartboard lampshade. Supply fuses and location are as follows:-

Lamp	Fuse	Panel
A.E.O.	684	3P
Nav/plotter	909	4P
Nav/bomber	585	4P

Panel service lighting

45. Six cockpit lamps Type C, No.2 complete with filaments, are fitted inside the fuse and relay panel 3P. The lamps, which provide internal illumination for the panel, are operated by micro switches when the panel doors are opened. Supply is via fuse 675 in panel 3P. A similar installation is fitted in panel 4P, except that the supply is fed via fuse 542 in panel 4P.

Ground service lighting

46. Twenty-three cabin lamps are fitted at various positions in the aircraft to provide lighting facilities during ground servicing periods. The lamp assemblies are supplied ▶under Part Numbers with the exception◀ of lamps No.3 and 19. The location of the lamps are as follows:-

Nose-wheel bay	Lamp No.13 and 14 (1/V6798)
Bomb bay (forward)	Lamp No.4 and 5 (1/V6798), 10 and 11 (21/V4650)
Bomb bay (aft)	Lamp No.6 and 7 (21/V4650), 8 and 9 (1/V6798)
Port main-wheel bay	Lamp No.15 and 16 (1/V6798)
Stbd. main-wheel bay	Lamp No.17 and 18 (1/V6798)
Power compartment	Lamp No.1 and 2 (1/V6798)
Rear fuselage	Lamp No.3 and 19 (Ref. No.5CX/446)

NOTE . . .
Lamp No.12 is not allocated.

47. Five extra lamps, Part No. 1/V6798, are installed, four in the E.C.M. compartment and one on the hydraulic equipment panel located in the bomb bay (fig.18).

48. A master switch, Type XD779, fitted in the nose-wheel bay is fed from the 28-volt d.c. ground supply plug. This switch controls all the ground service lamps. Supplies are via fuses 838, 839 and 840 in panel 19P (fig.17).

Ground service lighting (Mod.1137)

49. When Mod.1137 is embodied, an instrument lamp, Type C, is fitted to illuminate the level indicator on the water glycol reservoir. ,Supply and control are as described in para.48.

Inspection sockets

50. Two inspection sockets are fitted, one on the front spar, and one on the rear spar bulkheads. The sockets, for use with inspection lamps, Type 2, are supplied via fuse 840 in panel 19P.

EXTERIOR LIGHTING

51. The exterior lighting system can be divided into four main groups:-

(1) Navigation

(2) Downward identification

(3) Landing/Taxying

(4) High intensity

Each group is individually fused and switched, the fuses being located in panel 4P, and the switches on the stbd. console fig.2. A double-pole master switch labelled EXTERNAL LIGHTS, ON-OFF, is mounted on the stbd. console. This switch enables all the lamps to be switched off simultaneously. Lighting groups 2, 3 and 4 are supplied from the aircraft 28-volt d.c. supply via fuse 566 on panel 4P. The navigation lamps (group 1) are supplied from the aircraft 28-volt d.c. supply via fuse 577 in panel 4P.

Navigation lamps

Wing and tail

52. Two wing and two tail navigation lamps, are fitted, which give steady indication when switched on. The wing navigation lamps are located in the wing tips, each lamp being protected by a transparent plastic window which forms part of the wing tip contour. The tail lamps are fitted, one above and one below the E.C.M. compartment, each lamp assembly consisting of a lampholder, secured to a bracket, and a 12-watt filament. The lampholders are covered by plastic windows which protrude from the skin surface and are shielded to give the correct angle of divergence. For further details reference should be made to AP 113F-0227-1 and 113F-0229-1.

Grimes anti-collision lamps

53. In order to provide anti-collision warning to other aircraft, three additional navigation lamps, which give a red flashing light, are fitted. These lamps, Grimes tandem oscillating, Type G9950-13 contain two motor-driven filaments, and are located, one on the upper surface of the fuselage near the front spar, and two on the lower surface of the fuselage below the port and starboard air intakes (fig.1). The filaments are rated at 28-volts, 40 watts. Further details of the lamps will be found in AP 113F-0208-1.

Control switches

54. Both sets of navigation lamps are controlled from a double-pole, 3-position, centre-off switch, labelled STEADY-FLASH, on the starboard console. When the switch is selected to STEADY, a supply from fuse 577 is fed via contacts 5-4 of the external lights master switch, to the wing and tail navigation lamps only to give steady indication (fig.5).

▶ When the switch is selected to FLASH, the same supply is fed to both sets of lamps simultaneously. The Grimes anti-collision lamps, however, will oscillate continuously to give 80-90 flashes per minute.

Downward identification lamp

55. A downward identification lamp, Type C, fitted with an amber filter, is mounted in a shallow tray located on the under-surface of the rear fuselage. The lamp assembly is protected by a transparent window which forms part of the fuselage contour.

56. A single-pole three-position control switch, labelled STEADY-OFF-MORSE is fitted to the stbd. console. This switch, which is spring loaded from the MORSE to OFF position, enables the lamp to produce either a steady or intermittent light. Supply for this circuit is via fuse 576 in panel 4P. Details of the lamp are contained in AP 113F-0002-1.

Combined landing/taxying lamps

57. A landing/taxying lamp, Type L, is mounted on the under-surface of each wing. The lamps are fitted so that they can retract into the wing, leaving the glass front flush with the wing surface. For further details refer to AP 113F-0246-1.

Controls

58. Each lamp is controlled by a three position switch, Type XD801. The switches, labelled RETRACT – LANDING – TAXI, are mounted together on the stbd. console.

59. With the switch selected to either the LANDING or TAXI position, the filament will be switched on, when the lamp has been extended through 45 deg. When the RETRACT position is selected, the filament will be switched off and the lamp assembly will be retracted into the wing.

Circuit operation

60. The circuit operation described in the following para. should be read in conjunction with fig.5. Only the port lamp circuit is described as the stbd, circuit is similar. It should be noted that the EXTERNAL LIGHTS master switch must be in the ON position before the lamp filaments can be supplied.

61. When the LANDING position is selected on the port landing/taxying switch, a 28-volt d.c. supply is fed from fuse 574 via contacts 4-2 of the switch and normally closed contacts 346/2 to energize relay 349. Contacts 349/1 close connecting a supply from fuse 764 to terminal 2 of the lamp assembly. The supply from fuse 574 is also routed to the 'extend' field of the actuator via lamp terminal 4 and internal contacts B and A. The actuator will extend the lamp to the landing position. When the lamp has been extended 45 deg. the filament switch is mechanically closed connecting the supply at lamp terminal 2 to the lamp filament so illuminating the lamp. As the lamp reaches the landing position internal contacts B will open breaking the supply to the 'extend' field of the actuator, and internal contact C will close to prepare a circuit for the 'retract' field of the actuator. The lamp will remain in the landing position with the filament illuminated.

62. Operating the switch to the TAXI position, will connect the supply again from the fuse to the 'extend' field of the actuator, via lamp terminal 5 and the internal contacts A. At the same time relay 346 will be energized to close contacts 346/1 and energize relay 349. As the lamp reaches the fully extended (TAXI) position, contacts A will open and the actuator micro switches will change over. The lamp circuit will now be prepared for either LANDING or RETRACT selection.

Probe lighting - high intensity

63. Two lamps are fitted in the nose section to provide high intensity lighting at the flight re-fuelling probe. The lamps are controlled by two dimmer switches Type R, located on the flight refuelling receiver panel (attached to the stbd. console fig.2 items 37 and 38). The supply to the port lamp is fed from fuse 572, the starboard lamp being supplied from fuse 575. All fuses are located in panel 4P.

SERVICING

General

64. All lighting systems should be examined at the intervals laid down in the servicing schedule, for signs of abrasion and security of connections. When serviceable filaments are replaced reference should be made to Table 2 to ensure that the correct type and wattage lamps are fitted. Detailed servicing of the lamp assemblies, is governed by the instructions ◀

▶ contained in AP 113F-0223-1. ◀

INTERIOR LIGHTING

65. Functional tests of all cabin, chartboard and panel flood-lamps, should be carried out at the intervals laid down in Vol.4 of this publication. Dimmer switches should be handled with care to avoid forcing them past their stops.

U/V and fluorescent lighting

66. The control boxes for the U/V and fluorescent lighting systems should be examined for security of plug and socket connections and ingress of moisture. Should any box be suspect, it should be removed and a serviceable replacement fitted.

WARNING ...

Broken fluorescent tubes should be handled with care, as the fluorescent coating inside the tube is of a poisonous nature.

EXTERIOR LIGHTING

Navigation lamps

67. All navigation lamps should be examined for security of connections and cleanliness of the lamp glasses and transparent windows. At all inspections prior to night flying, the external lights master switch should be placed in the ON position and a functional test of the navigation lamps carried out by operating the control switch to the STEADY and FLASH positions.

Downward identification lamp

68. The downward identification lamp should be examined for security of connections, and cleanliness of the lamp glass assembly and reflector. At all inspections prior to night flying, the external lights master switch should be switched on and a functional test carried out on the lamp. This is achieved by ensuring that the lamp operates when the selector switch is placed in the STEADY position.

Combined landing/taxying lamps

69. The landing/taxying lamps should be examined for security of connections and deterioration of the supply cables. At all inspections prior to night flying, the following tests should be carried out:-

(1) Operate the external lights master switch to the ON position.

(2) Extend the port lamp to the landing position. Ensure that the lamp extends to the correct position and that the filament lights.

(3) Select the TAXI position and ensure that the lamp extends to the correct position. The filament should remain illuminated.

(4) Allow the filament to burn for 5 to 10 seconds, then select the RETRACT position.

(5) As the filament cools, check that no white lines form inside the glass envelope. Should they appear, the sealing will have failed and a serviceable replacement should be fitted. The filament life is rated at 50 hours, but it should be changed after 30 hours use, or when undue blackening of the glass is evident.

(6) Check inside the lamp assembly visually for damage to the lens unit and reflector. Check also for cleanliness, and if necessary polish the reflector with a soft cloth. Abrasive polishes must not be used.

(7) Examine the filament supply cable for signs of deterioration.

(8) Repeat the tests outlined in (2) to (7) for the stbd. landing/taxying lamp.

Setting the landing/taxying lamps

70. The lamps are set on the bench to give the following beam angles:-

Landing	-	76 deg
Taxying	-	82.5 deg

The method of setting the lamps is described in ▶ AP 113F-0246-1. ◀

Probe lighting - high intensity

71. The high intensity probe lamps should be examined for security of connections and

cleanliness of the plastic windows. Before night flying takes place, the exterior lights master switch should be placed to the ON position and a functional test carried out on the lamps. This is achieved by ensuring that they light when the dimmer switches are operated.

72. At the conclusion of the foregoing tests, the external lights master switch should be returned to the OFF position.

REMOVAL AND INSTALLATION

General

73. Removal of the various lamp assemblies and control switches described in this chapter is straightforward and no special instructions are required. In all cases of removal however, it is important to ensure that the associated cable ends are insulated and stowed.

TABLE 1

LIGHTING EQUIPMENT

Equipment	Type
Pillar lamps	–
Pillar lamps bridge	–
Instrument lamp	C
Cockpit lamp	Mk.1A
Cockpit lamp	Mk.2
Cockpit lamp	C No.2
Navigation lamp (tail)	A
Navigation lamp (Port)	B
Navigation lamp (Stbd)	B
Downward identification lamp	C
Landing/Taxying lamp	L
Grimes oscillating	G.995D-13
High intensity anti-dazzle lamp	–
High intensity probe lighting	–

TABLE 2

LAMPS, FILAMENT AND DISCHARGE

Service and location	Type	No. off
Ground servicing lighting	28 volt 18 watt	21
Ground service lighting – rear fuselage	28 volt 7 watt	2
Water/glycol reservoir	28 volt 3.5 watt	1
Nose cabin lamps	28 volt 7 watt	2
Cabin lamp below pilots floor	28 volt 7 watt	1
Main cabin lamp	28 volt 12 watt	1
Cabin lamps below navigators table	28 volt 7 watt	3
Cabin lamp in power compartment	28 volt 7 watt	1
Cockpit lamp on panel 8P (prone bomber)	24 volt 6 watt	1
Cockpit lamps on panel 9P	24 volt 6 watt	2
Cockpit lamps above panel 70P	28 volt 7 watt	2
Red floods – port console	28 volt 3.5 watt M.E.S.	6
Red floods – stbd. console	28 volt 3.5 watt M.E.S.	6
Red floods – centre console	28 volt 3.5 watt M.E.S.	4
Red floods – pilots' coaming	28 volt 3.5 watt M.E.S.	8
Red floods – throttle box pedestal	28 volt 3.5 watt M.E.S.	2
Pillar lamps – instrument panel 1P	28 volt 0.04A	17
Auto-Pilot selector switch box (5P)	28 volt 0.04A	4
E2B compass lamps	28 volt 0.04A	2
Beam compass lamps	28 volt 0.04A	4
Knee pad lamp – first pilot	28 volt 7 watt	1
Knee pad lamp – second pilot	24 volt 6 watt	1
High intensity anti-dazzle lamps	28 volt 12 watt	2
Wander lamp	28 volt 3.5 watt M.E.S.	1
U/V lamps – oxygen panels	12 volt 7 watt	2
U/V lamps – pilots coaming	115 volt 4 watt	5
U/V lamp – throttle box	115 volt 4 watt	1
White fluorescent – port and stbd. consoles	115 volt 4 watt	4
Red fluorescent – crews roof	115 volt 4 watt	4

TABLE 2 (continued)

LAMPS, FILAMENT AND DISCHARGE

Service and location	Type	No. off
Pillar lamps – navigator's panel	28 volt 0.04A	12
Pillar lamps – control unit Type 12580 mounting	28 volt 0.04A	5
Chartboard lamps – crews' station	28 volt 18 watt	3
Bomb bay temperature gauge lamps	24 volt 0.04A	2
Sextant lamps	28 volt 2.8 watt	2
Lamp on the I.L.S. and Auto-throttle supply switch panel	28 volt 3.5 watt M.E.S.	1
Navigation lamps – wingtips	28 volt 24 watt	2
Navigation lamps – tail	28 volt 12 watt	2
Navigation lamps – upper and lower	28 volt 40 watt	6
Grimes anti-collision lamps	28 volt 40 watt	3
Downward identification lamp	28 volt 80 watt	1
Landing/taxying lamps	28 volt 500 watt	2
High intensity lamps – fuel probe	28 volt 12 watt	2

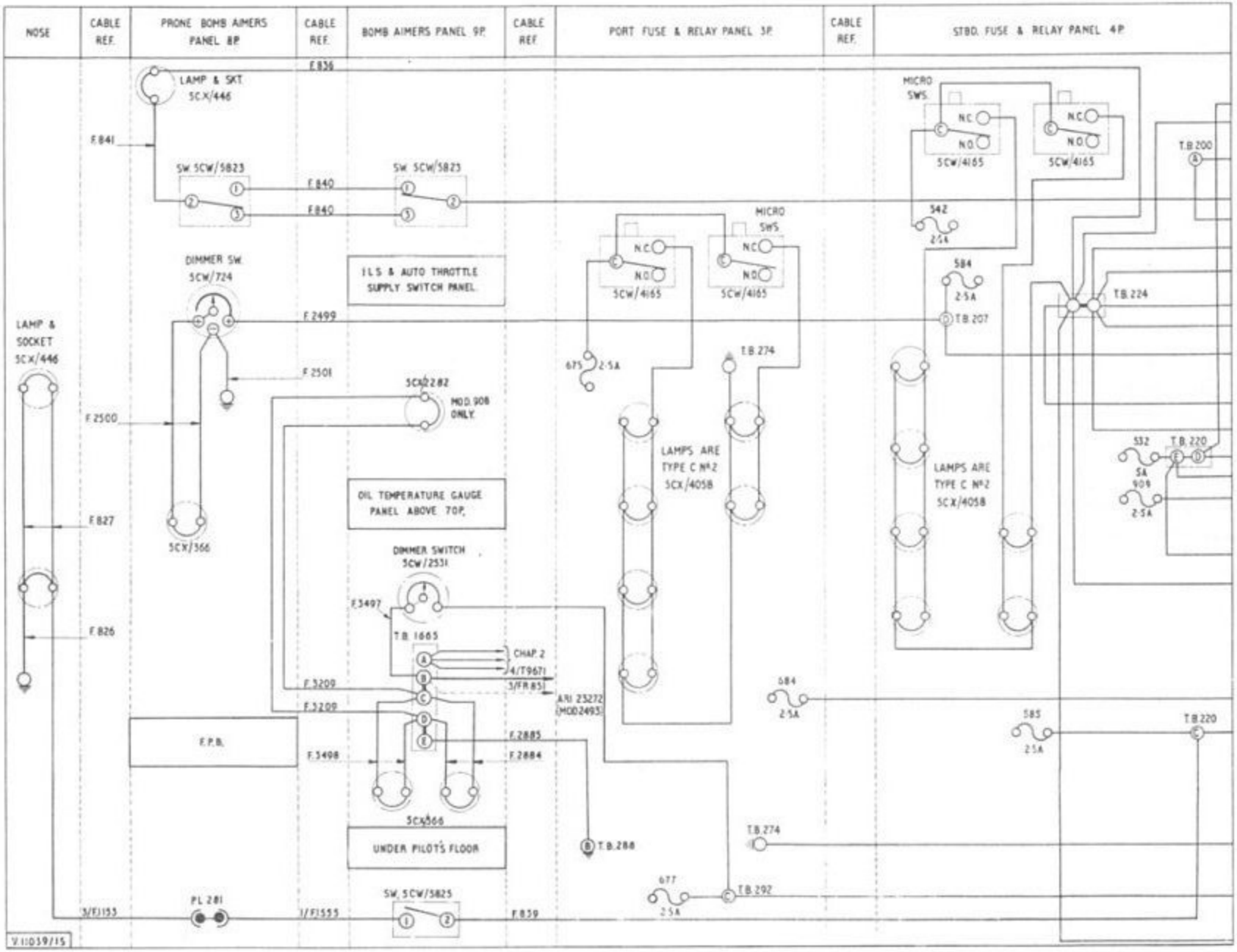

Fig 6 (1) Cabin lamps and inspection sockets - Pre Mod 2504

▶ *Title amended and Mod 2493* ◀

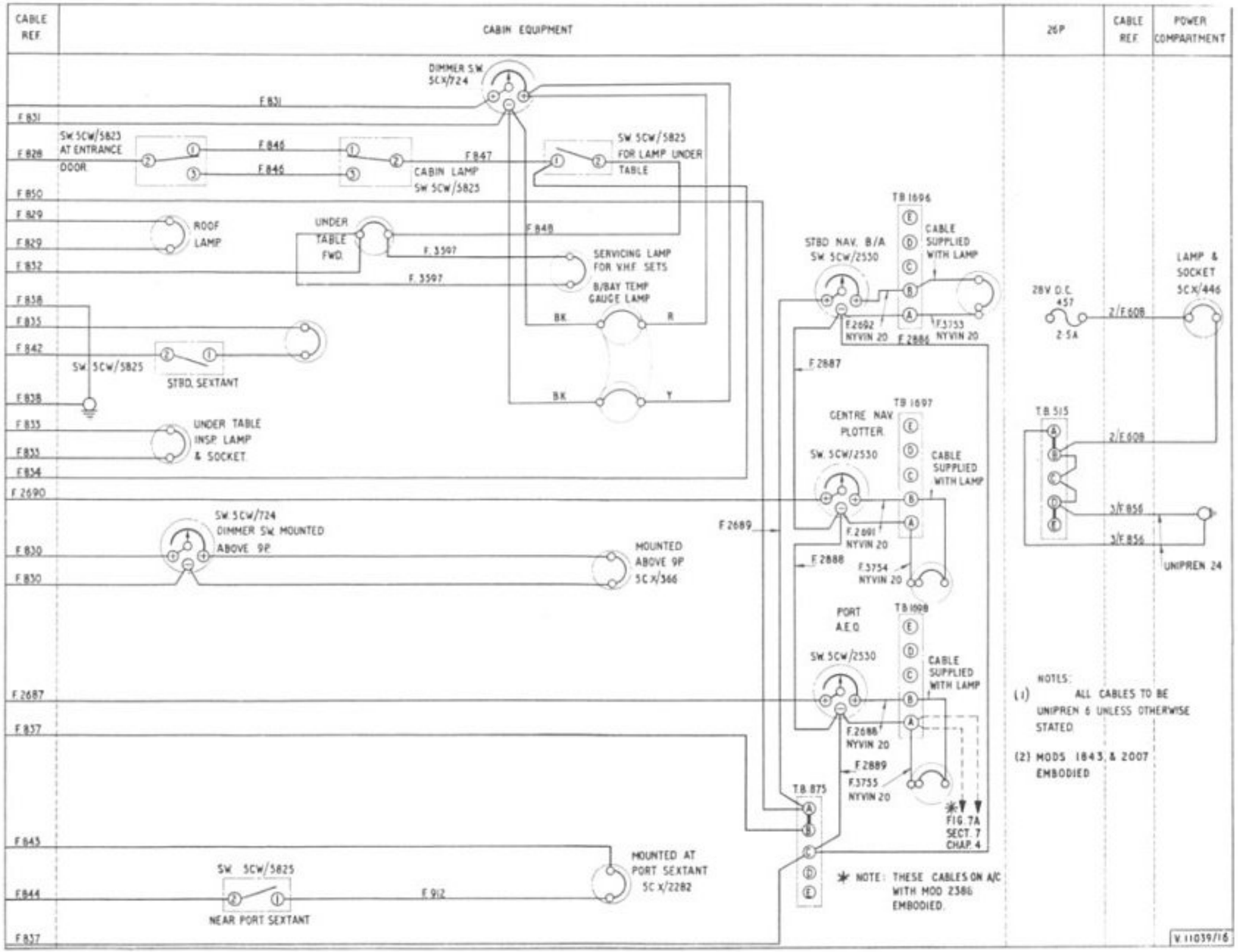

Fig 6 (2) Cabin lamps and inspection sockets - Pre Mod 2504

▶ *Title amended* ◀

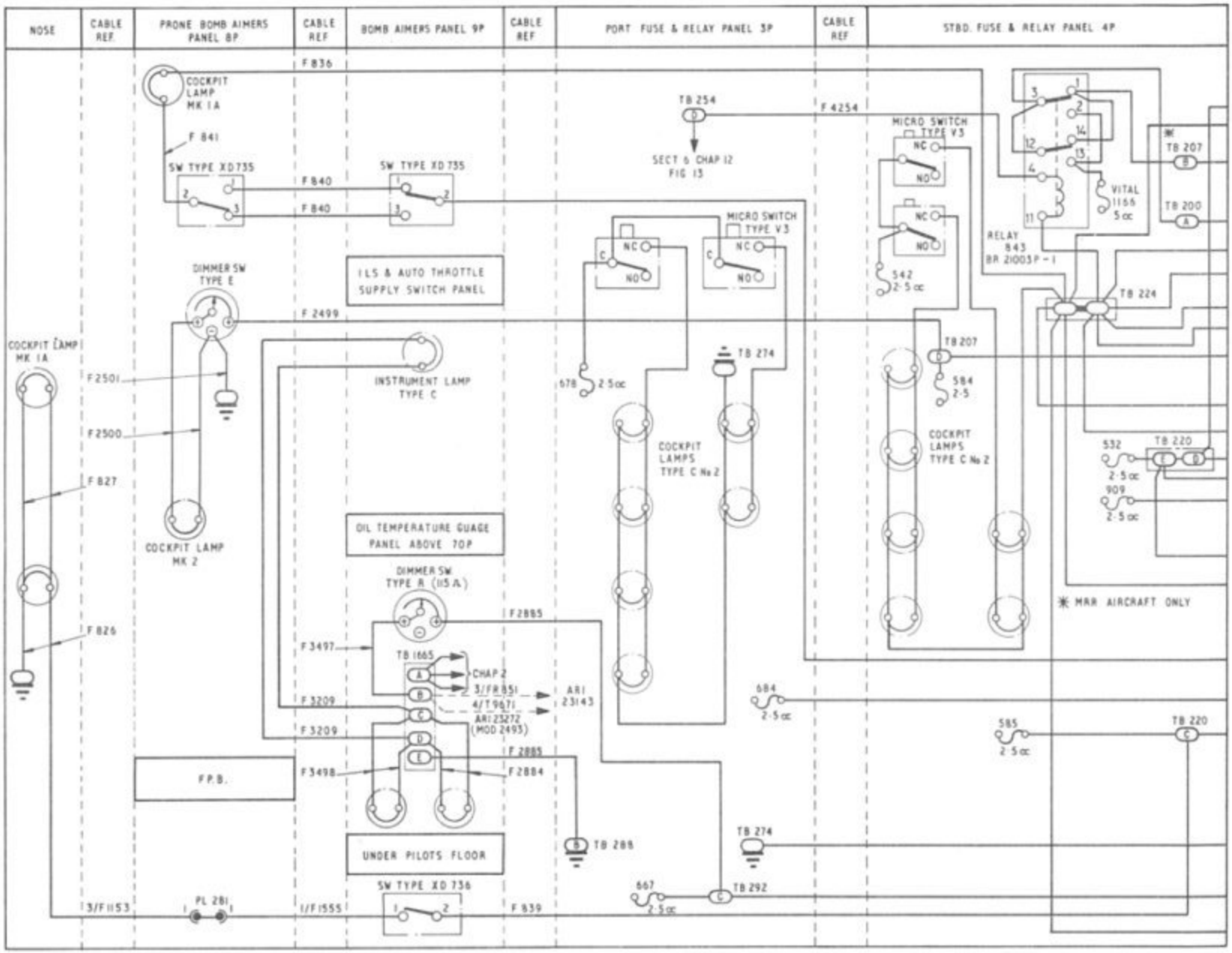

Fig 7 (1) Cabin lamps and inspection sockets – Post Mod 2504

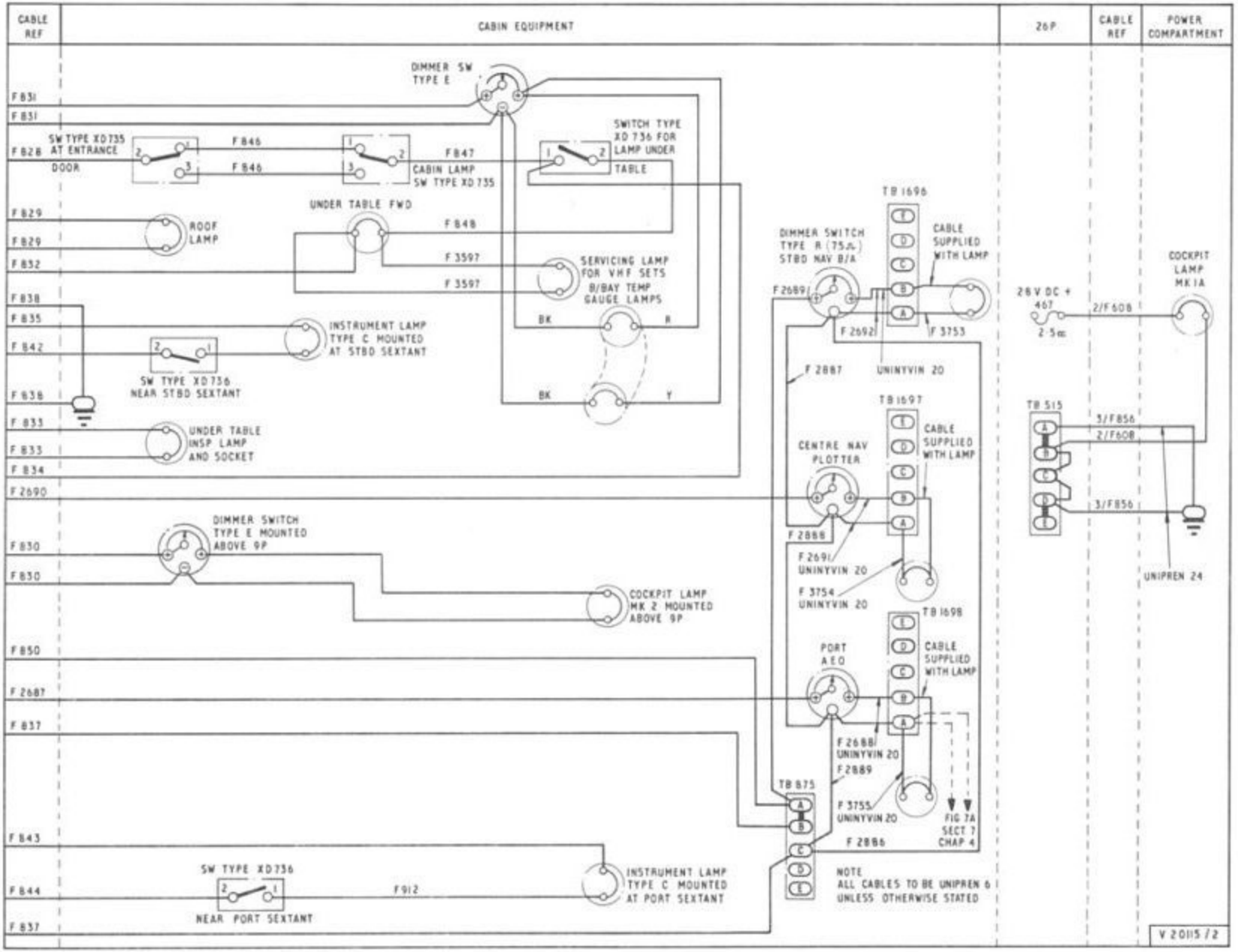

Fig 7 (2) Cabin lamps and inspection sockets – Post Mod 2504

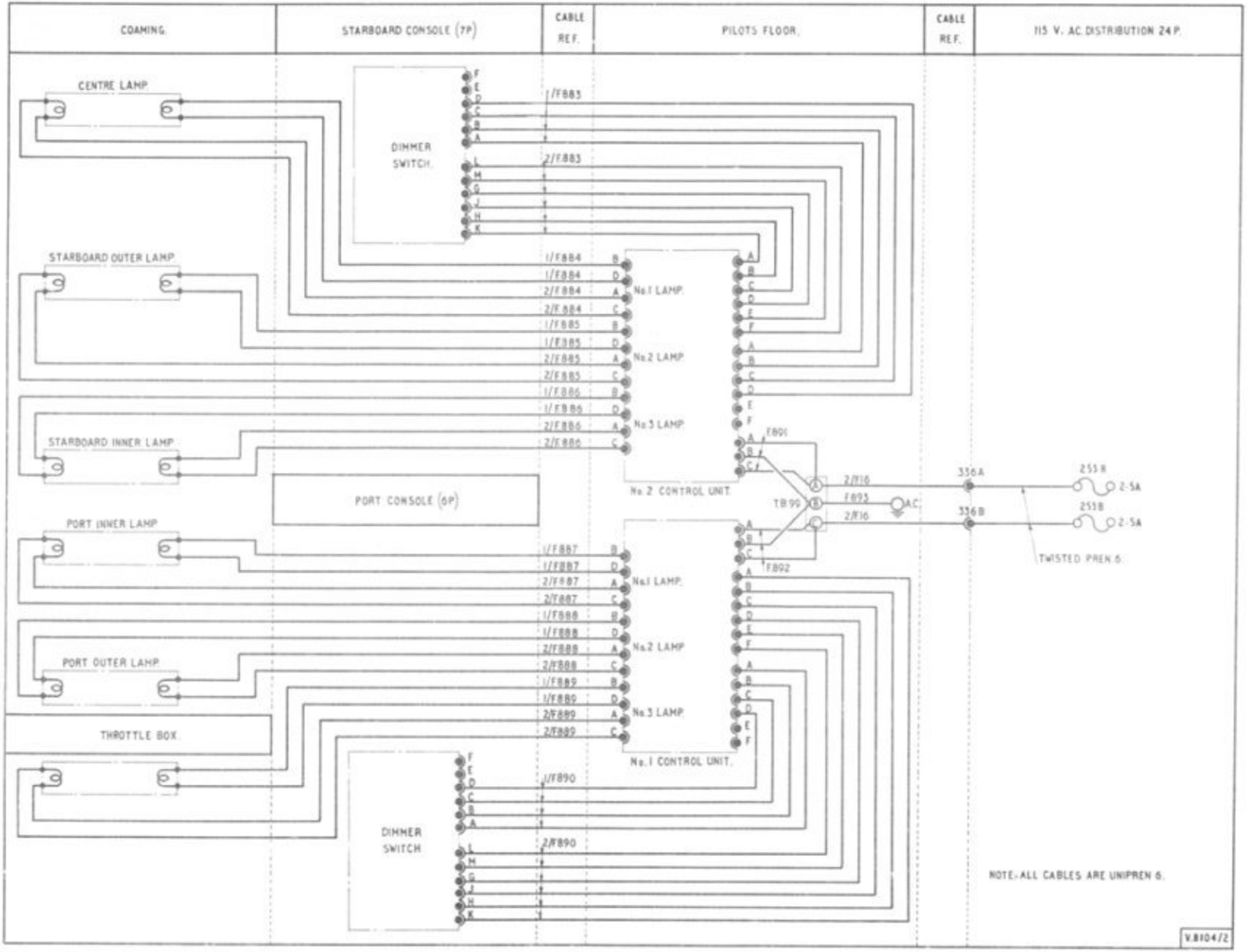

Fig. 8 Ultra-violet lighting.

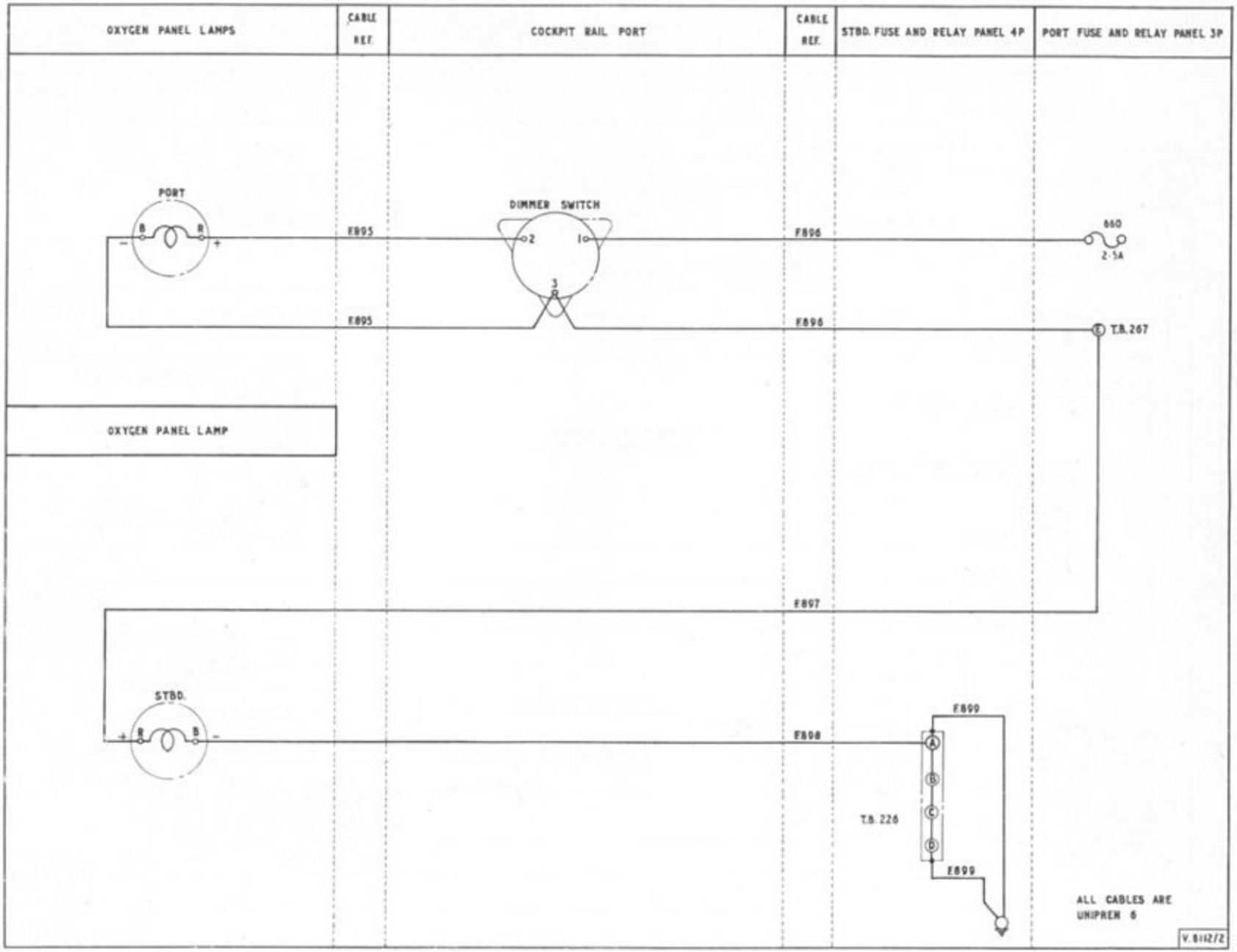

Fig. 9 Ultra-violet lighting for oxygen panels.

Minor alterations

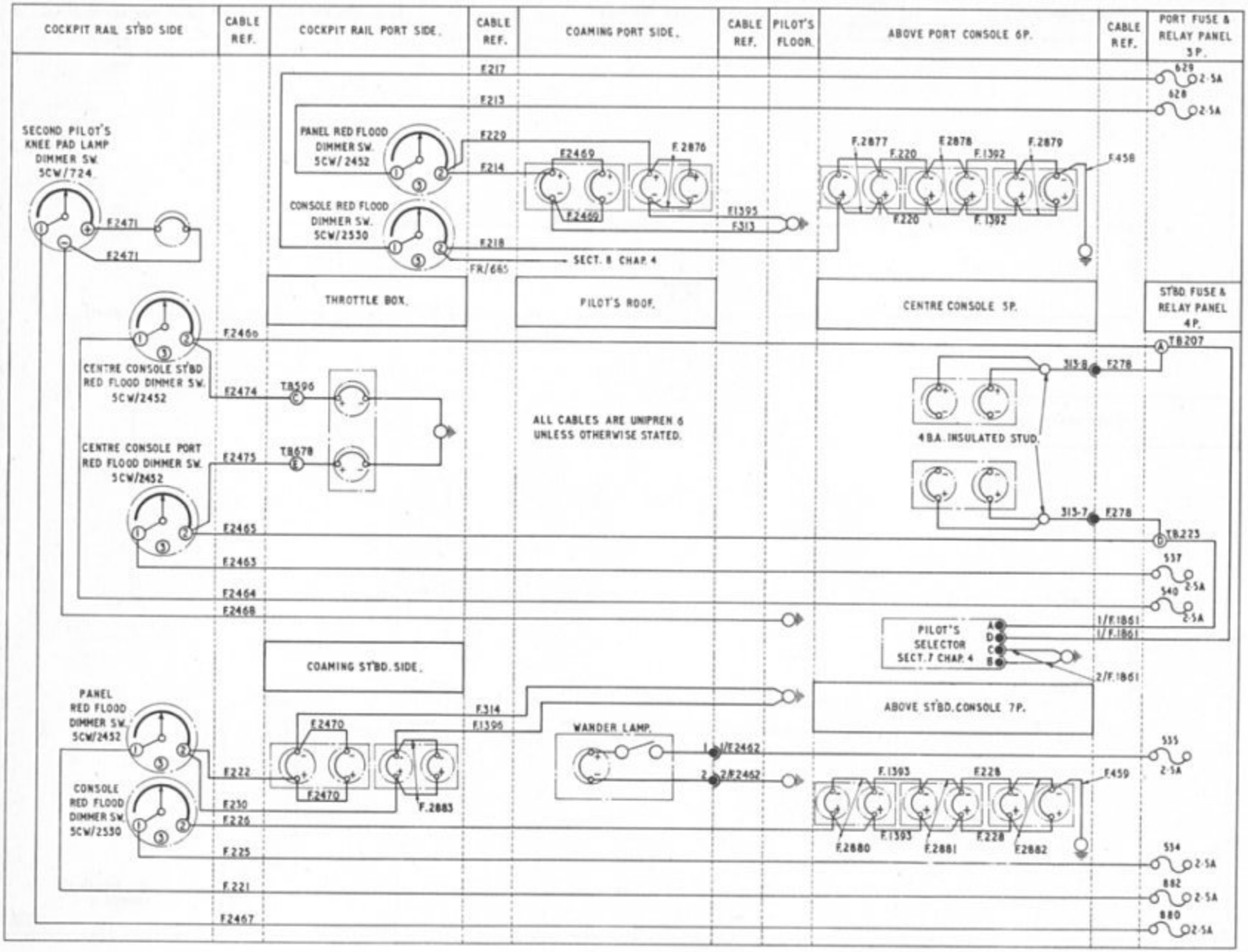

Fig.10 Red flood lights.

Minor alterations

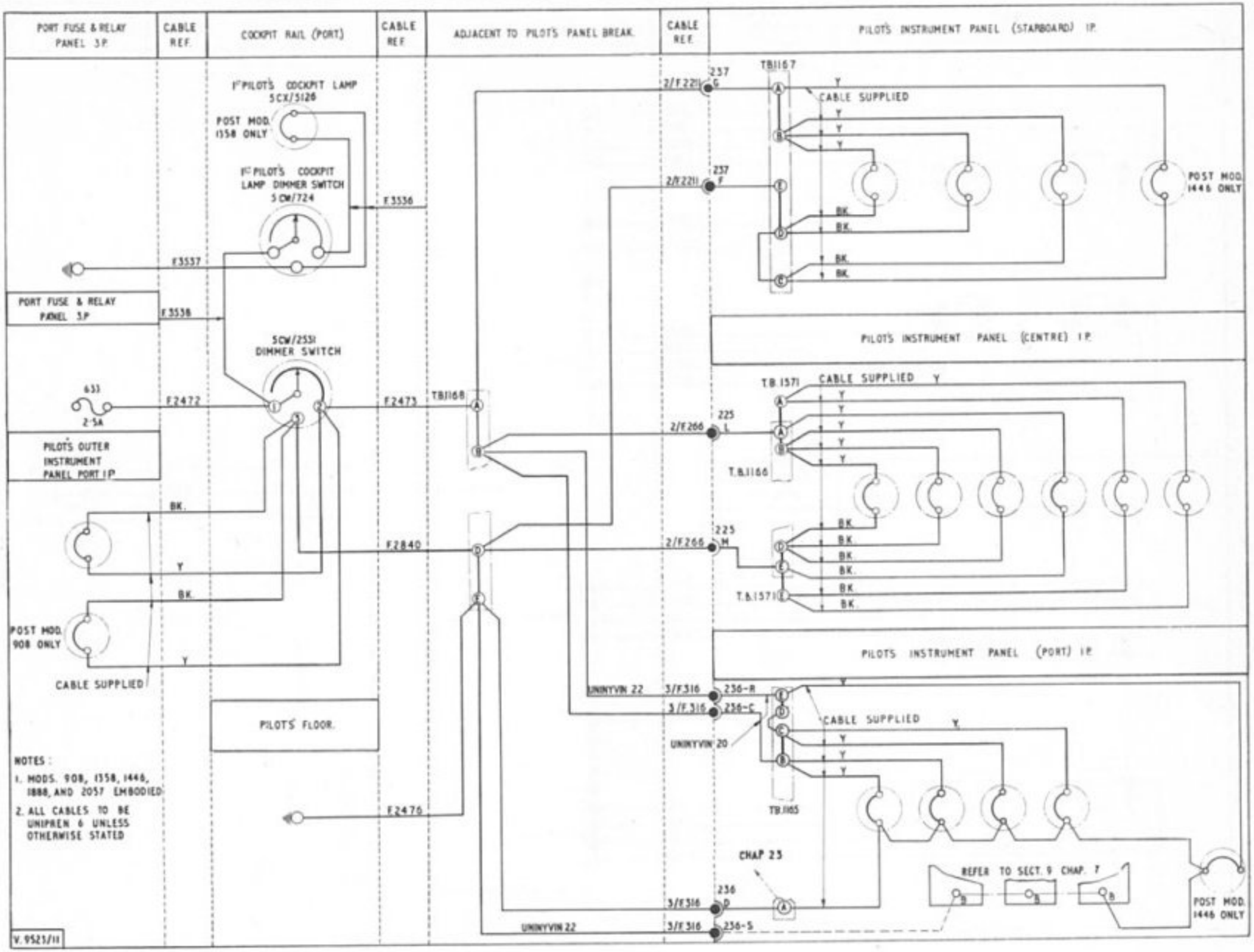

Fig. 11 Pilot's pillar lighting

« Note added »

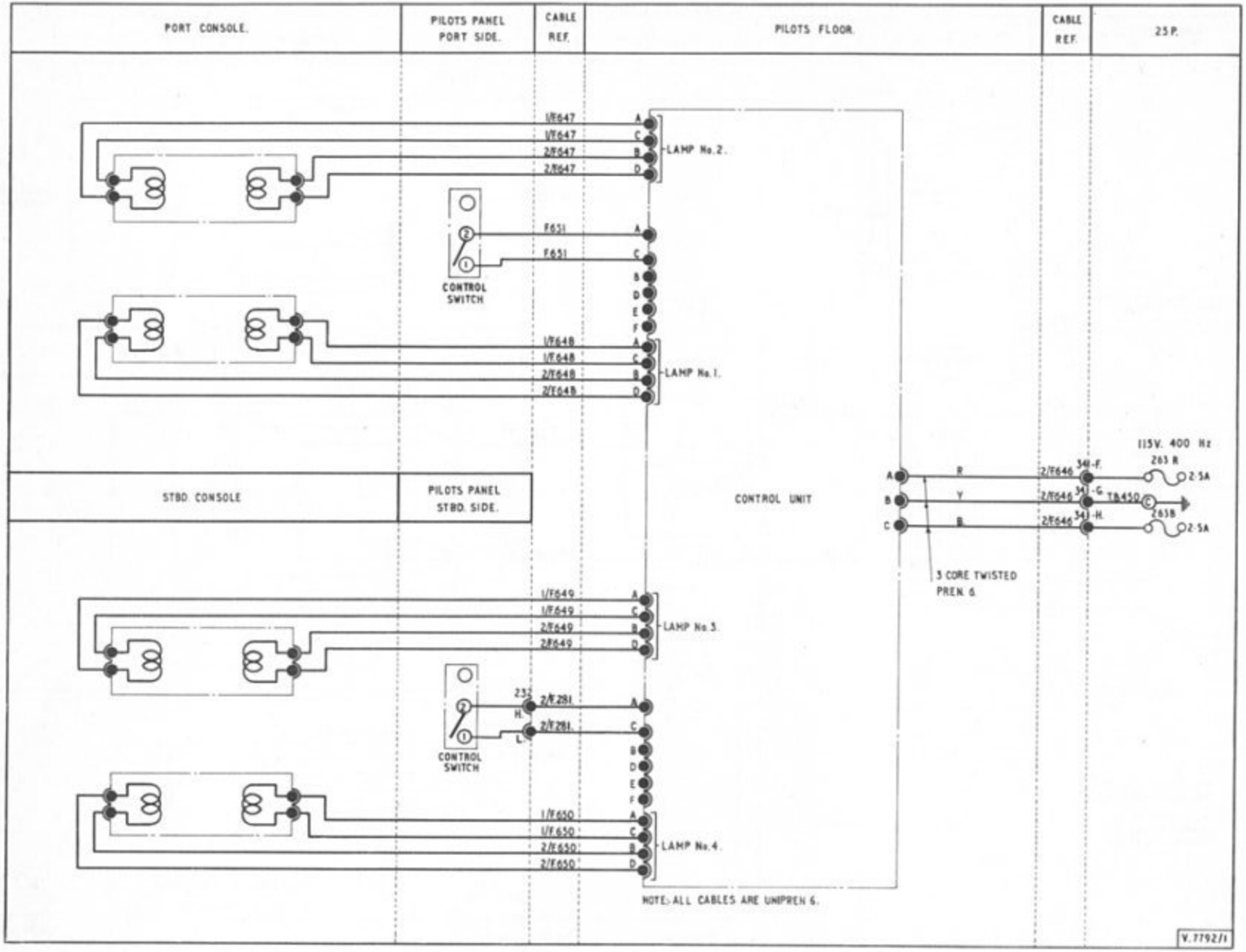

Fig. 12 White fluorescent lighting.

Minor alterations

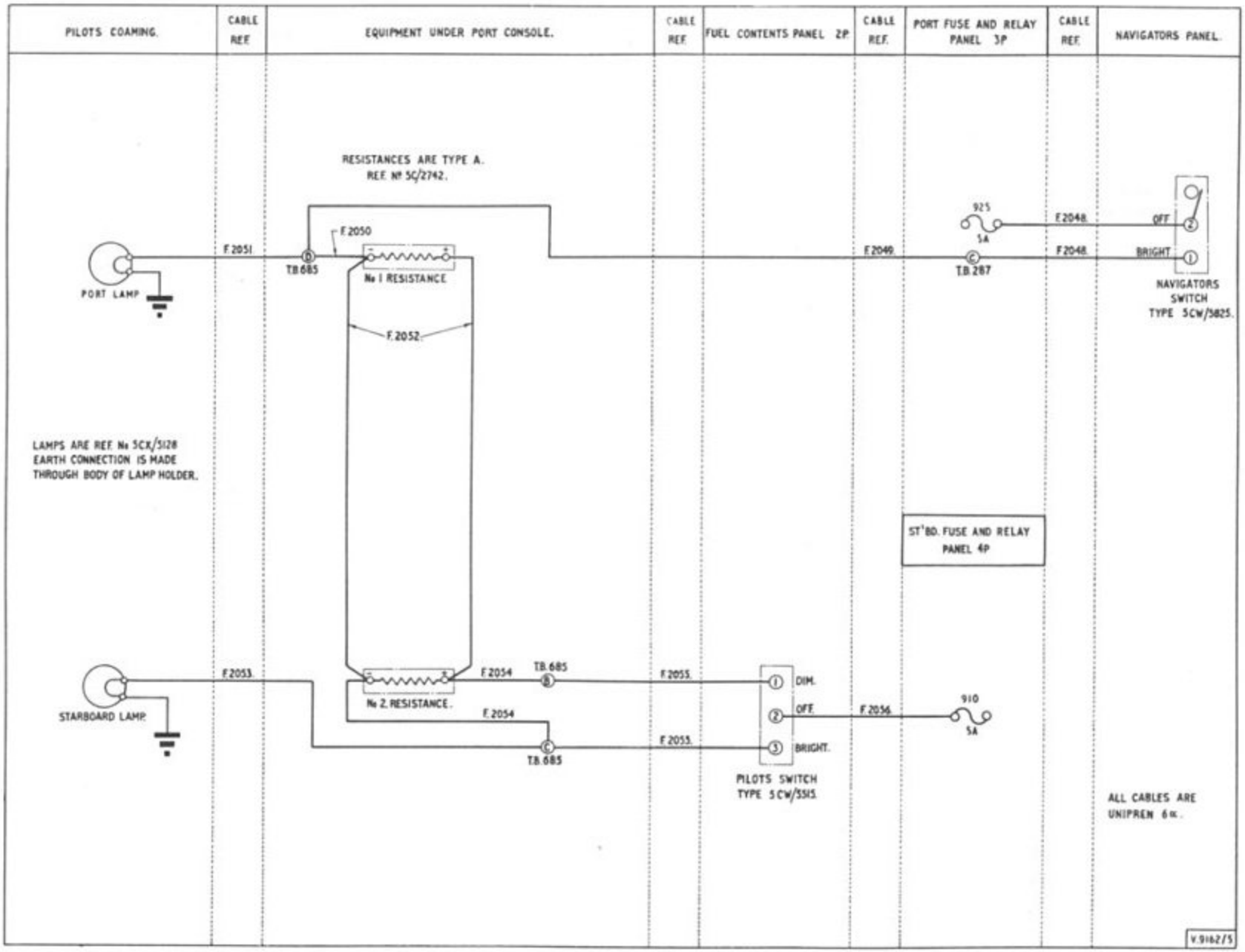

Fig. 13 High intensity anti-dazzle lighting.

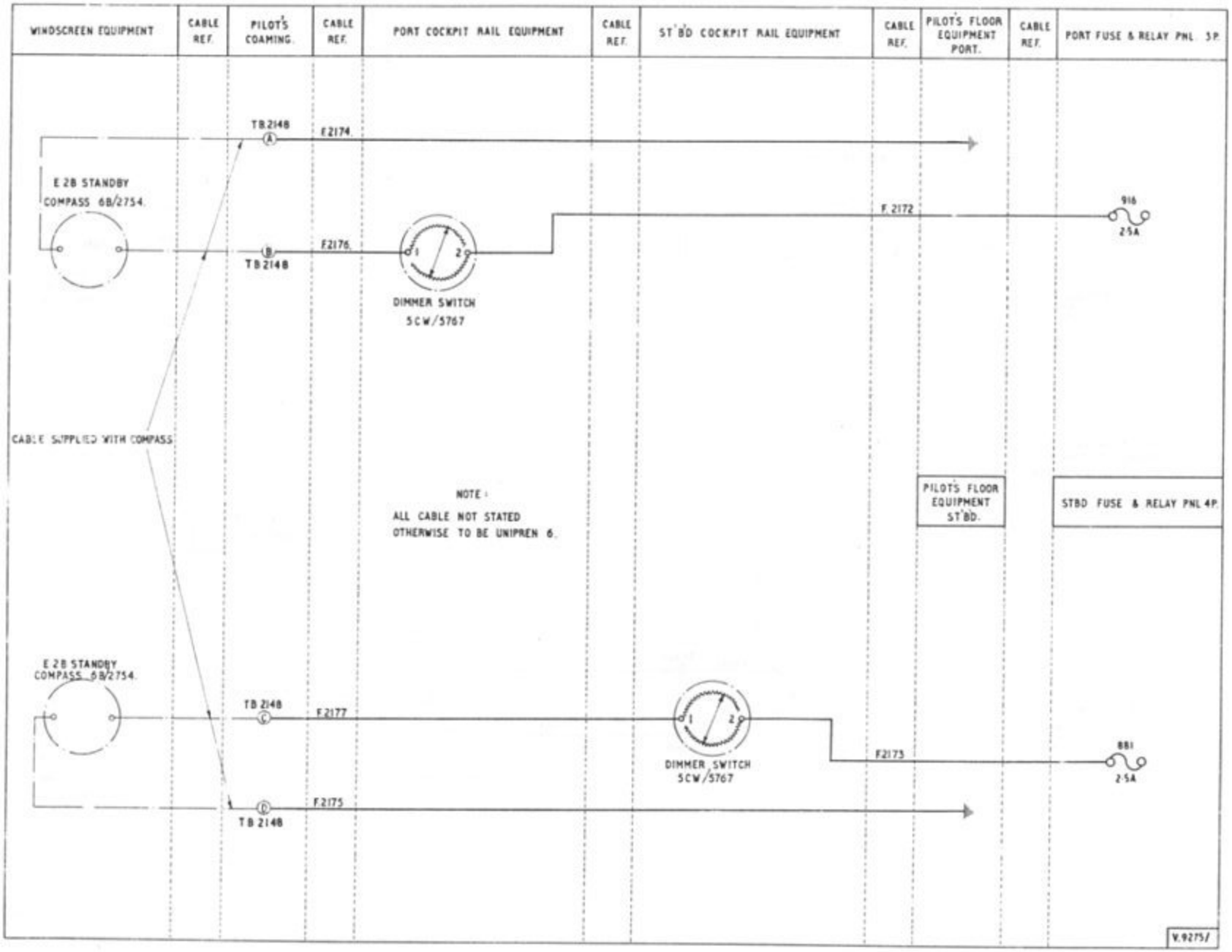

Fig. 14 E2B Stand-by compass lighting.

◄ Cross reference removed at T.B. 2148 ►

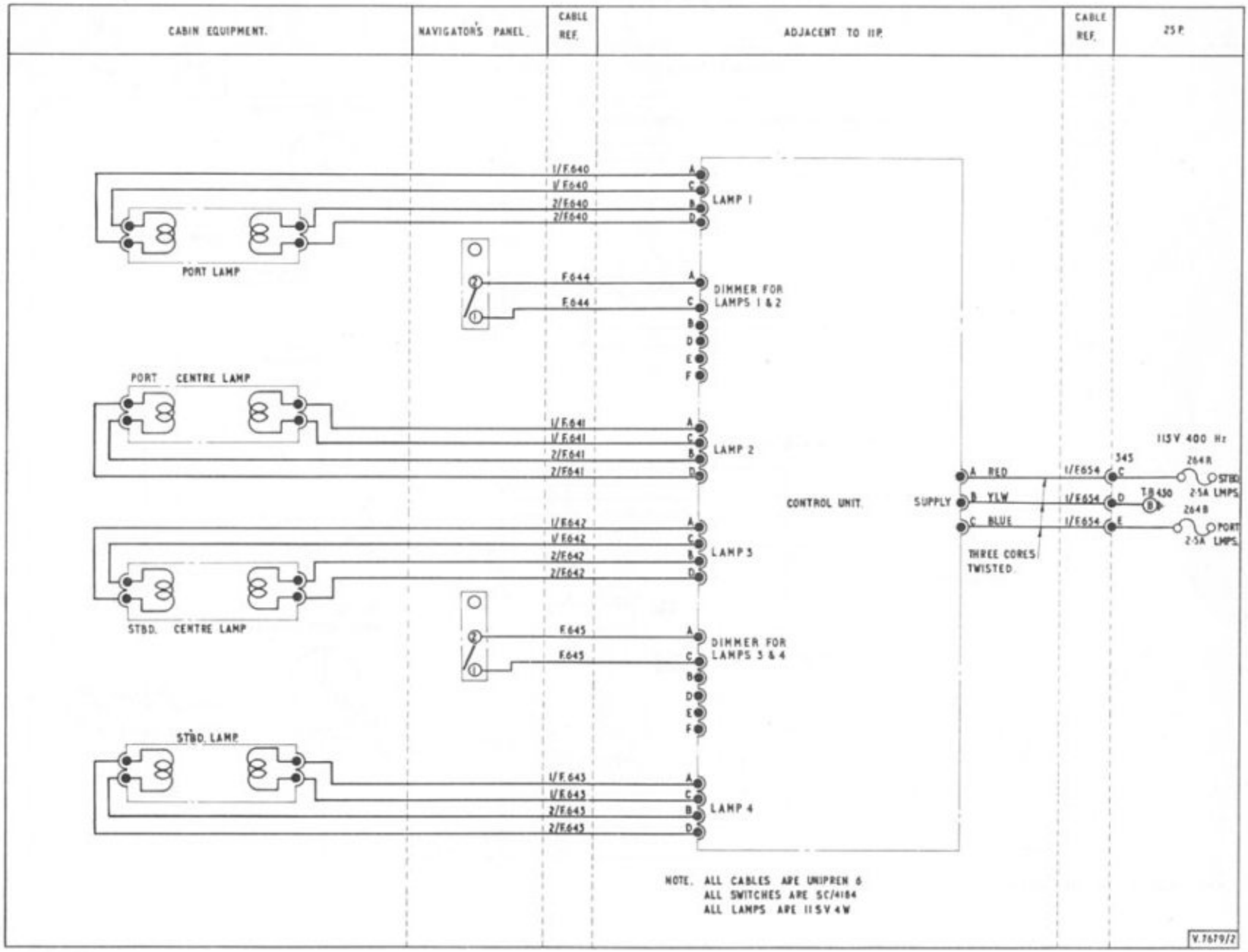

Fig. 15 Red fluorescent lighting.

Minor alterations

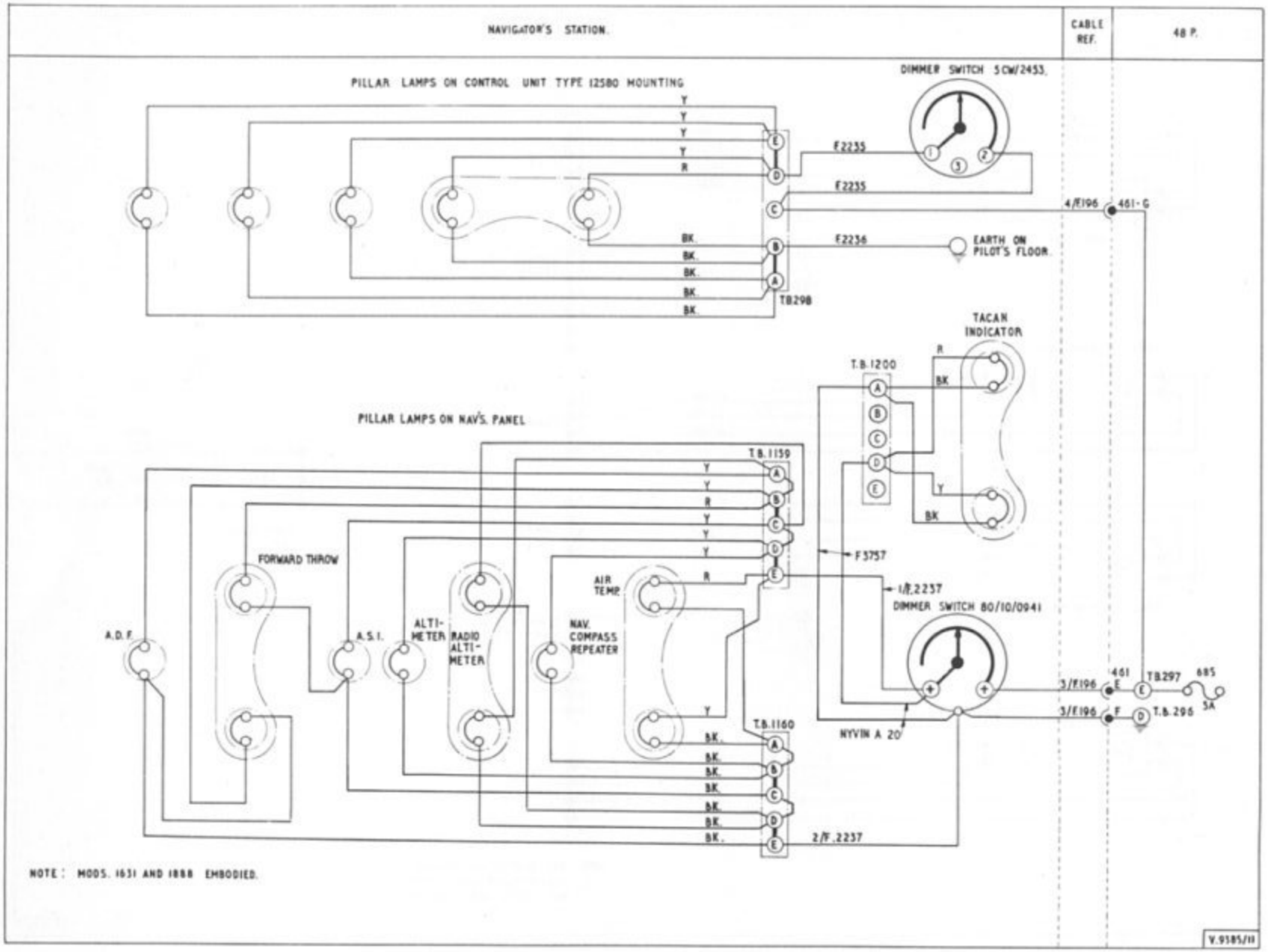

Fig. 16 Navigator's instrument lighting.

Note added

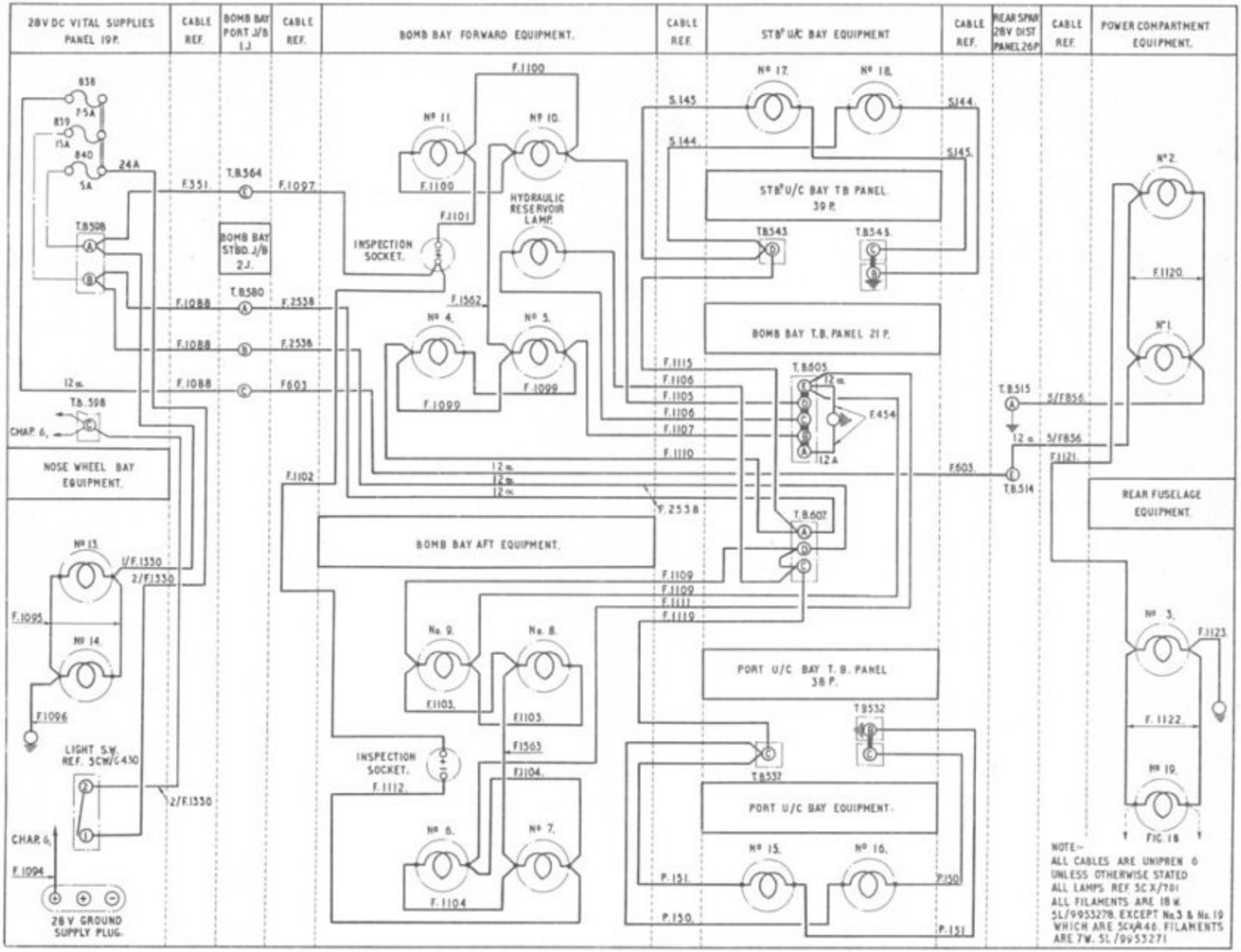

Fig.17 Ground service lighting

Minor alterations

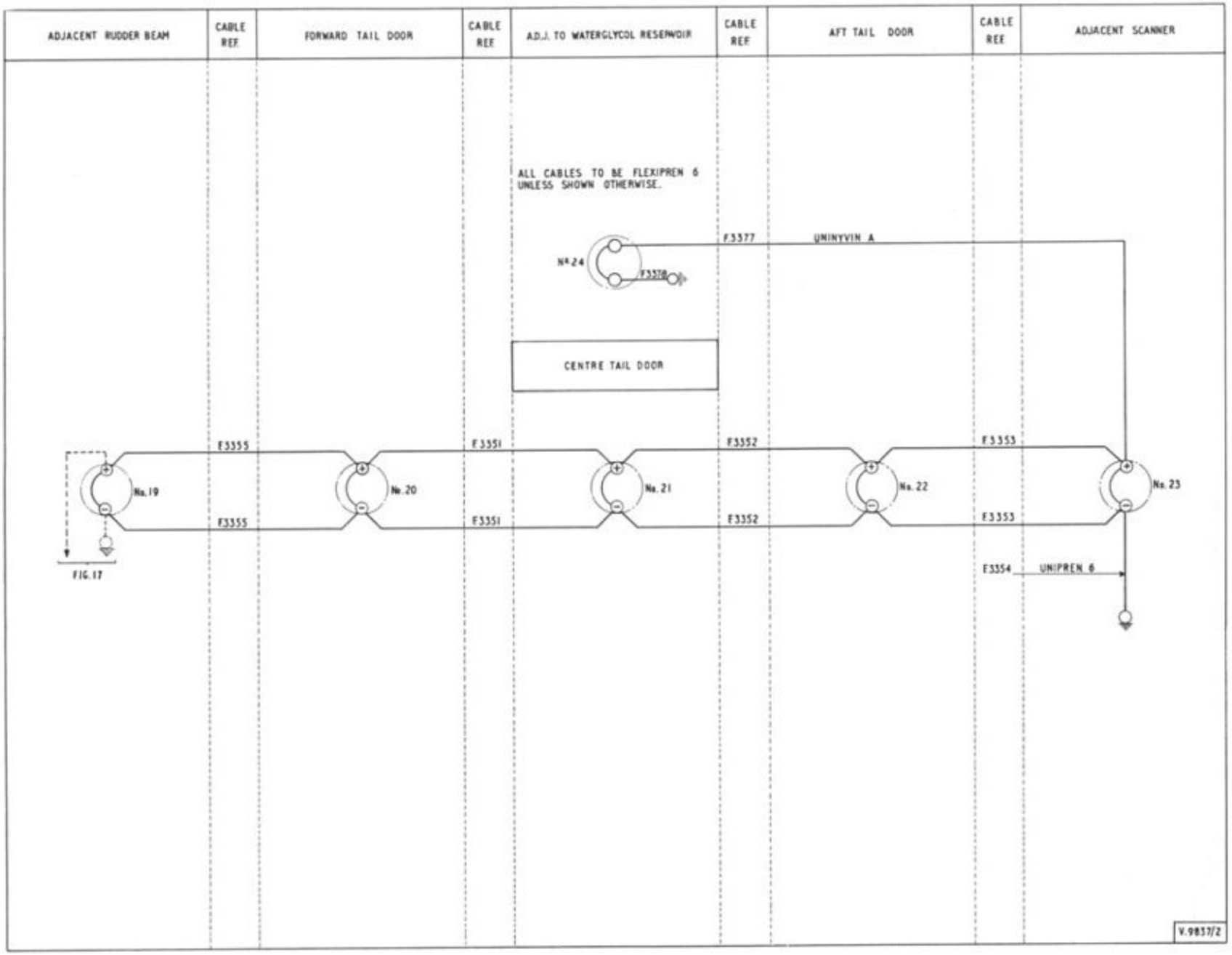

Fig. 18 E.C.M. Ground service lighting.

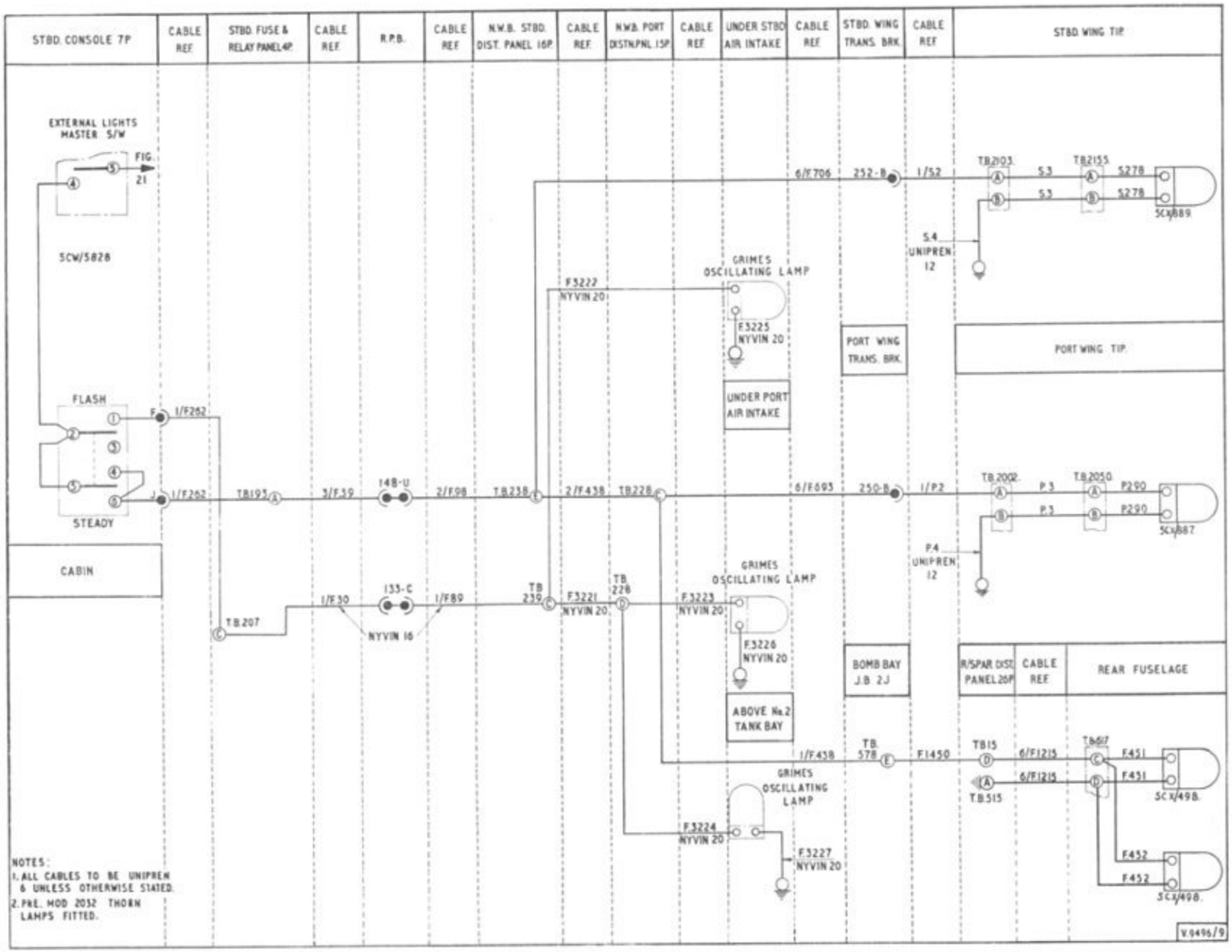

Fig 19 Navigation lights

▶ *Title and cross reference amended* ◀

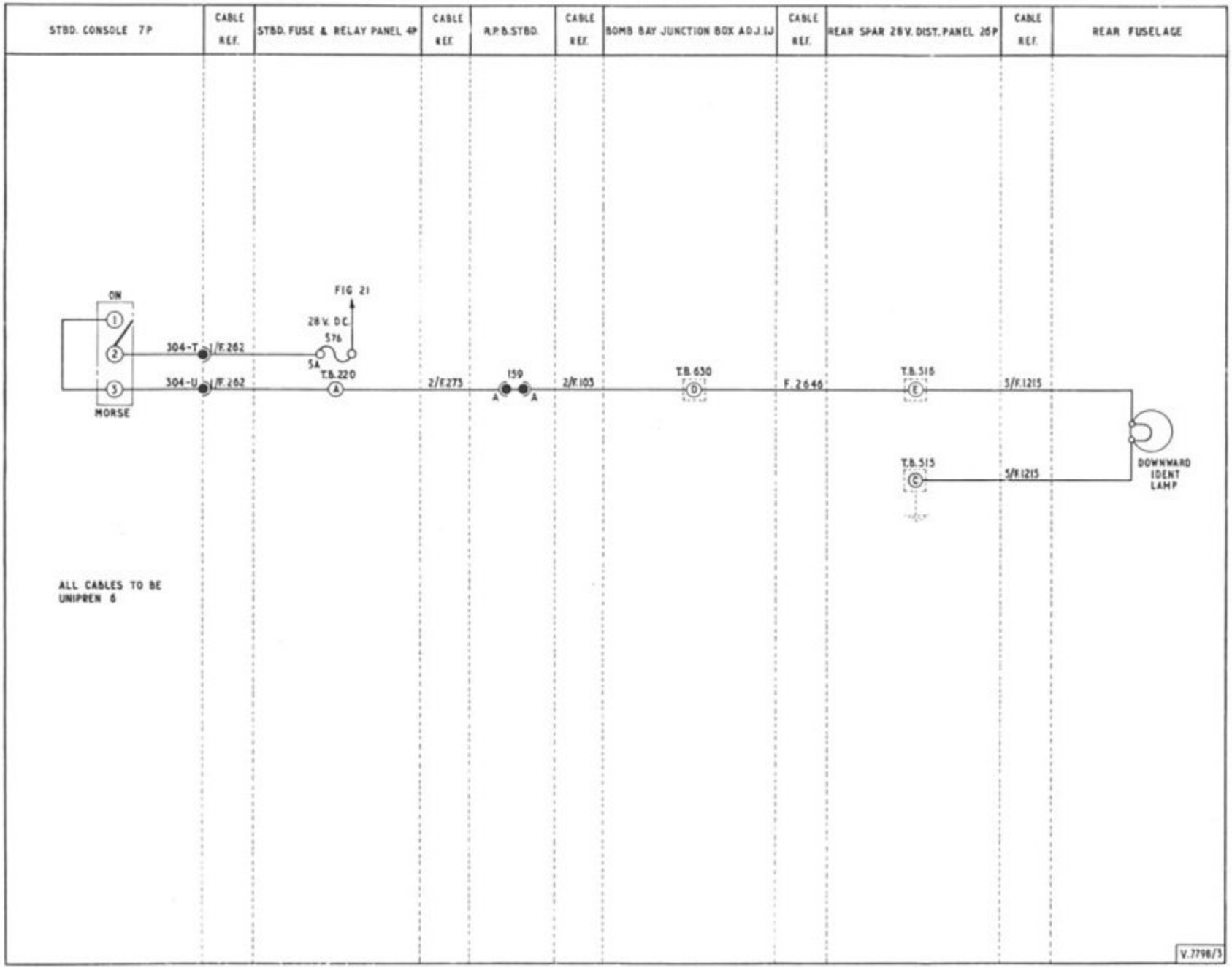

Fig. 20 Downward identification lamp.

▶ Fig No and cross reference amended ◀

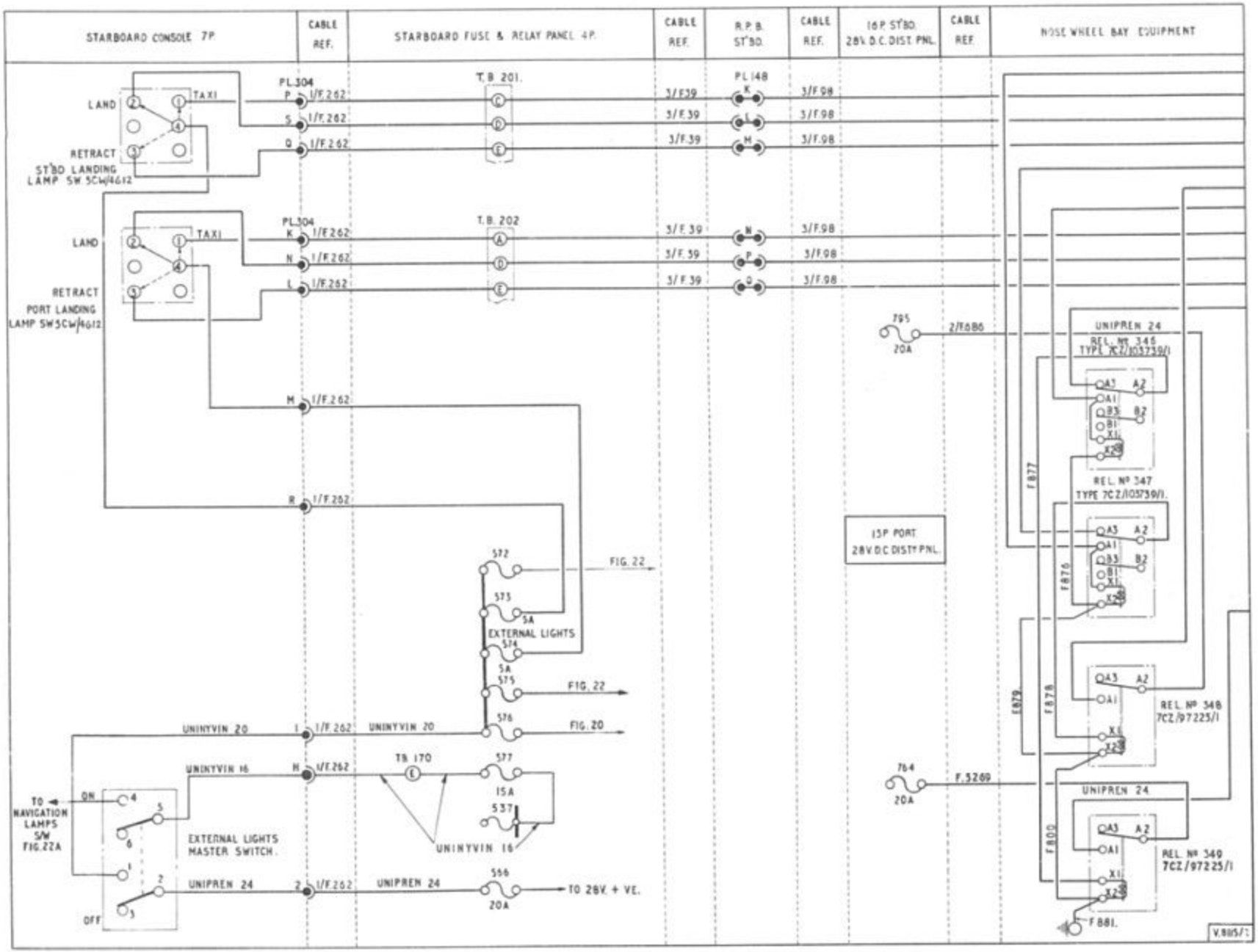

Fig. 21 (1) Combined landing /taxying lamps.

▶ Title and cross references amended ◀

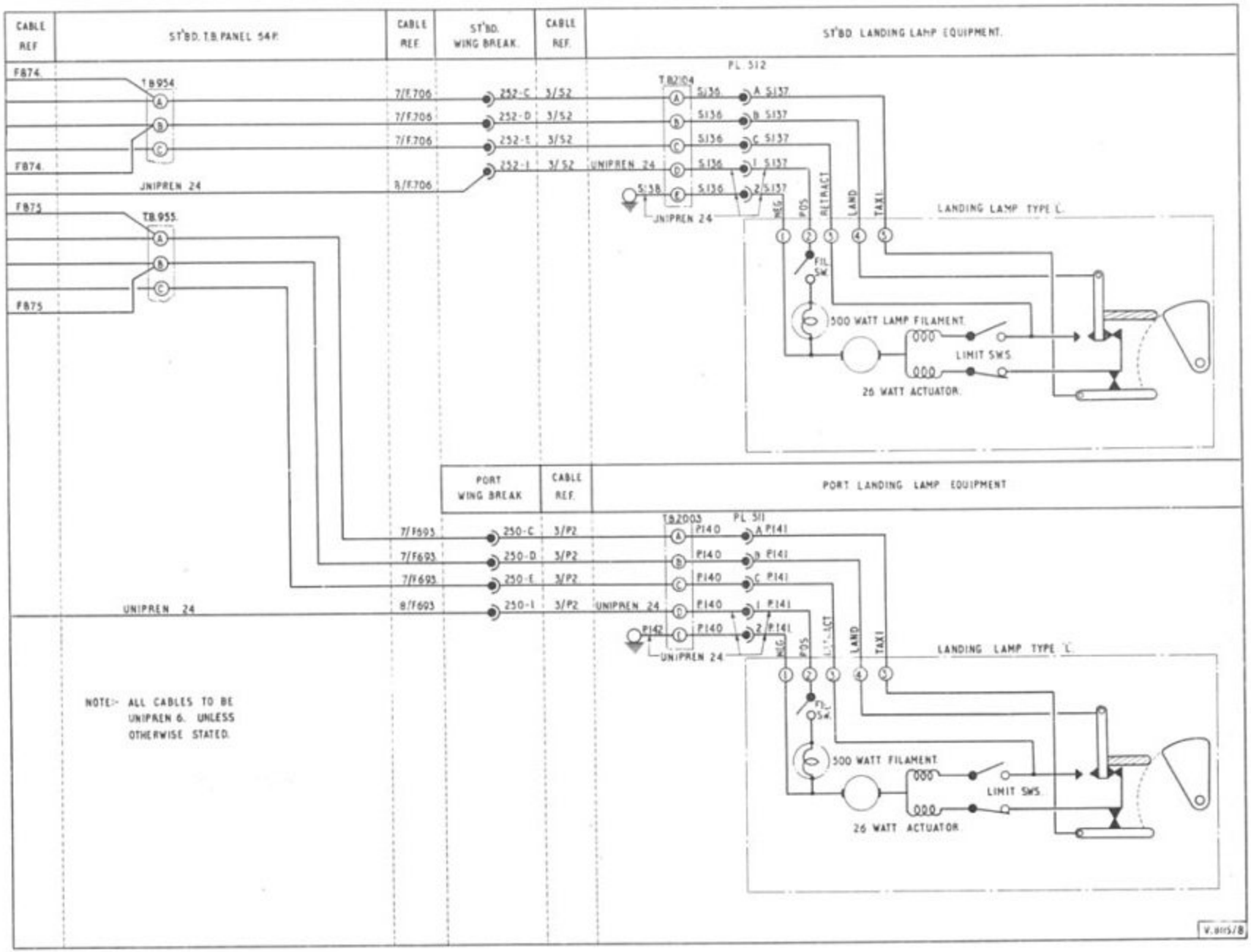

Fig. 21 (2) Combined landing / taxying lamps.

▶ *Figure number and title amended* ◀

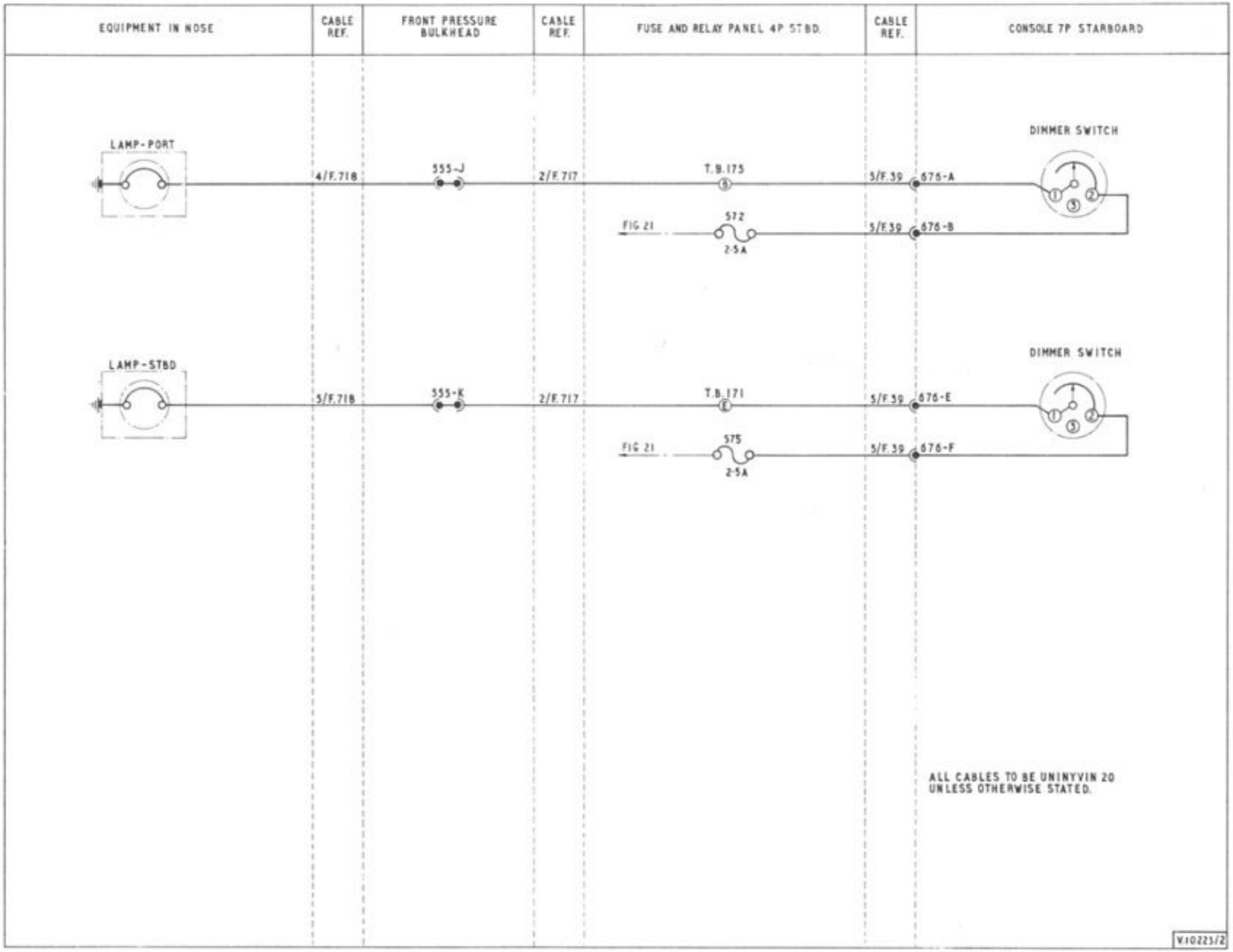

Fig. 22 High intensity probe lighting
▶ *Title and cross reference amended* ◀

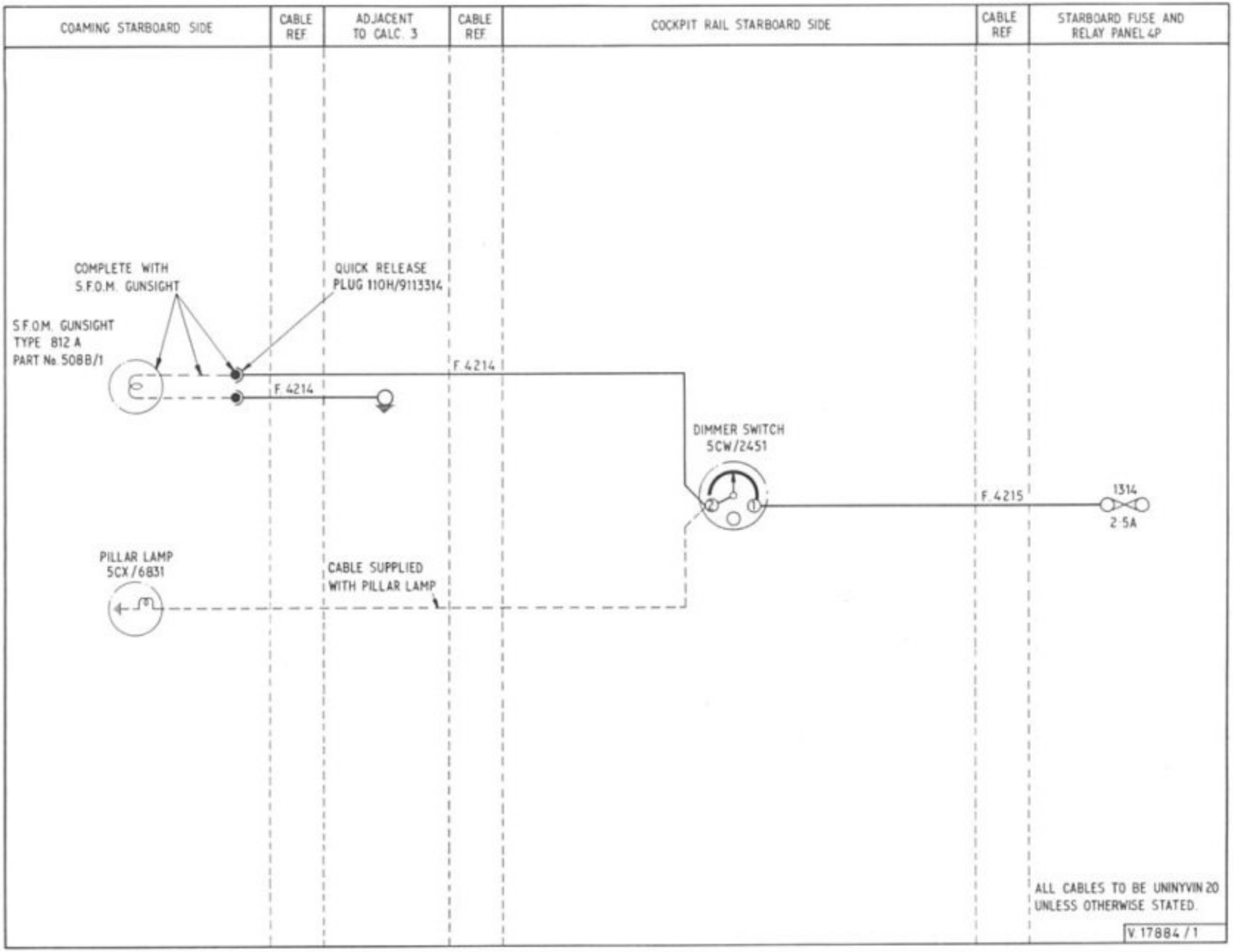

Fig 23 S.F.O.M. gunsight lighting

▶Fig number amended◀