Group 10
LIGHTING

(Completely revised)

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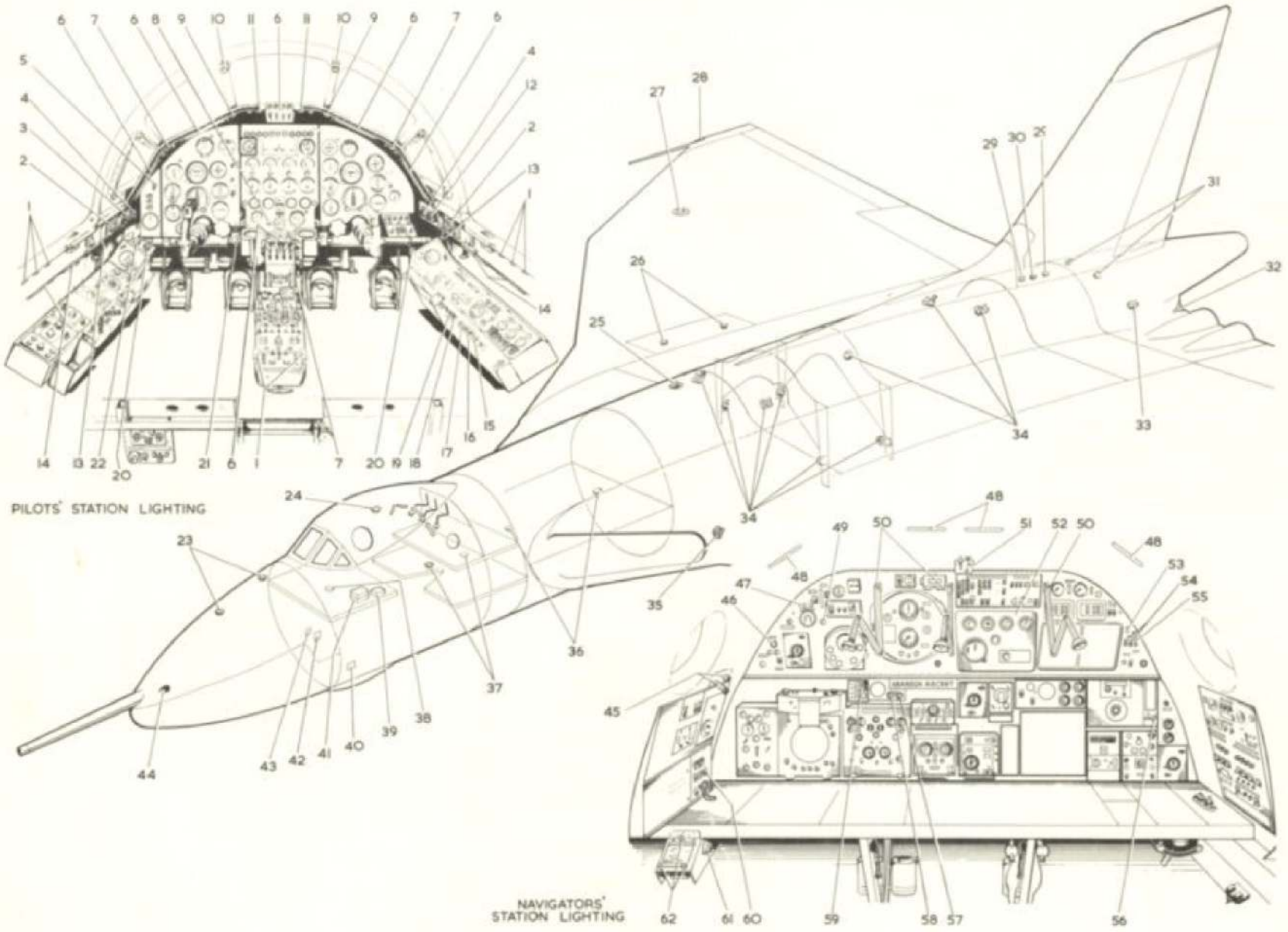

Fig. 1. Location of components.

KEY TO FIG.1

LOCATION OF COMPONENTS

1. RED FLOOD LAMPS
2. E2B COMPASS SWITCH AND DIMMER
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46. CHARTBOARD LAMP DIMMER, STB'D.
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53. MAIN CABIN LAMP SWITCH (2-WAY WITH SWITCH AT ENTRANCE DOOR)
54. RED FLUORESCENT LAMPS SWITCHES
55. LAMP UNDER TABLE SWITCH
56. CHARTBOARD LAMP DIMMER, PORT
57. CHARTBOARD LAMP DIMMER, CENTRE
58. PLOTTER'S PANEL LIGHTING DIMMER
59. ANTI-DAZZLE SWITCH (NAV.)
60. CABIN LAMP SWITCH (2-WAY WITH PRONE BOMBER)
61. DIMMER FOR CONTROL UNIT, TYPE 12580, LAMPS
62. CONTROL UNIT, TYPE 12580, LAMPS

Introduction

1. This group contains descriptive and servicing information for all lighting installations on the aircraft.

2. The lighting installations can be divided into two main sections, viz. INTERIOR LIGHTING and EXTERIOR LIGHTING. The interior installation includes ultra-violet lighting for panel instruments of the fluorescent type, red and white fluorescent lighting, general cabin illumination, and high intensity anti-dazzle lighting. The exterior installation consists of the normal wing and tail navigation lamps, upper and lower navigation lamps, landing/taxying lamps, a downward identification lamp, and high intensity lighting for the refuelling probe.

3. The location of the lamp assemblies and controls is illustrated in fig.1. Theoretical circuit diagrams of the u/v lighting and landing/taxying lamps are given in fig.2 and 3 respectively, and routing charts for all circuits are provided at the end of the text. The various types of filaments used are shown in Table 1.

DESCRIPTION AND OPERATION

INTERIOR LIGHTING

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

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

(2) Ultra-violet radiation - for pilots' instrument panels.

(3) Red floodlighting - for the pilots' systems control consoles and general red illumination.

(4) White fluorescent lighting - for white light illumination for the console.

(5) Red fluorescent lighting - for red floodlighting of the crew's stations.

(6) Concealed lighting - for the navigator plotter's instrument panel.

(7) Ground service lighting - for bomb bay, wheel bays, etc.

(8) High intensity, anti-dazzle lighting for occasional use in special circumstances.

(9) Emergency lighting at the pilots' station in the event of a power failure.

5. The u/v tubular, and white and red fluorescent lighting systems are operated from the aircraft a.c. supply at 115 volts, 3-phase, 400 c/s. All other lighting systems, including the u/v lighting for the oxygen panels, are fed from the aircraft 28-volt d.c. supply.

Cabin and general lighting

6. General purpose cabin lighting is provided by standard cabin lamps, and cockpit lamps, Mk.1A (Ref.No.5CX/446). Each cockpit lamp may be controlled by a switch built in to the lamp assembly, or by control switches at suitable positions in the aircraft, and is equipped with a 2-pole socket designed to accommodate the plug of a standard Mk.2 inspection lamp. Details of the cabin lamps and their associated control switches are contained in the following paragraphs.

Nose compartment

7. Two cockpit lamps, Mk.1A, are fitted to the roof of the nose compartment. These lamps are controlled by a single-pole switch, labelled LIGHT ON/OFF, located on the floor support structure below the pilots' floor, and supplied from fuse No.134 in panel 4P. The built-in control switches on the lamps are wire-locked in the ON position.

Pilots' floor lamp

8. A cockpit lamp, Mk.1A, fitted to the under surface of the pilots' floor structure provides general illumination for the prone bomb aimer's station. A 2-way switching system enables the lamp to be controlled both from the bomb aimer's panel and from the main panel at the navigation station. The lamp is served via fuse No.134 in panel 4P.

Navigator's floor lamps

9. Two cockpit lamps, Mk.1A, are installed on the under surface of the table structure at the navigation station and provide illumination for the equipment in that section of the aircraft. The forward lamp is controlled by a single-pole on-off switch on the navigator's panel. The aft lamp is controlled by the switch built in to the lamp assembly. Both lamps are served by fuse No.132 in panel 4P.

Cabin lamp

10. A cabin lamp, Avro Part No. 21/V4650, is installed in the fuselage roof, above the entrance door, and is provided with 2-way switching. One switch is located at the entrance door, and the other on the navigator's panel. The lamp is served by fuse No.132.

Sextant lamps

11. Two cockpit lamps, Avro Part No. 1/V8010, are installed, one adjacent to each sextant stowage on the port and starboard sides of the cabin. Local control single-pole switches are provided, one adjacent to each lamp assembly.

Power compartment

12. The aft power compartment is illuminated by a cockpit lamp, Mk.1A, fitted in the roof, the switch integral with the lamp providing the sole means of control. The lamp is served by fuse No.493 in panel 26P.

Pilots' station lighting

13. The lighting at the first and second pilots' stations is divided into five groups:-

(1) Ultra-violet radiation for those instruments on the pilots' panels and centre console having fluorescent markings.

(2) Red floodlighting to illuminate the controls on the panels and consoles.

(3) White fluorescent lighting for general illumination of the port and starboard consoles.

(4) High intensity anti-dazzle lighting.

(5) Emergency lighting on the main panel and centre console in the event of an electrical power failure.

Ultra-violet lighting

14. Two distinct forms of lighting are provided for u/v radiation. One, the conventional system using cockpit lamps, Type B, is for the illumination of the oxygen panels. The other is a tubular black-glass type and is employed for instrument panel illumination. Both systems radiate u/v rays which activate the fluorescent markings on the instruments to show an orange colour.

15. Two u/v cockpit lamps, Type B, are installed, one on each cockpit rail, and arranged such that they radiate over each pilot's oxygen panel. The lamps, which are connected in series, are controlled by a dimmer switch, Type R, fitted to the port cockpit rail, and served by a fuse in panel 3P.

16. The pilots' instrument panels and centre console u/v lighting system consists of six tubular type lamps fitted in suitable holders. Five lamps are fitted to the under surface of the coaming round the pilots' panel, and the sixth behind the throttle box to give adequate u/v radiation for the fuel contents gauges on panel 2P. The lampholders are secured inside spring clips which enable the lamps to be easily removed.

17. Alternating current at 115 volt, 3-phase, 400 c/s for the six u/v lamps is supplied from the No.3 inverter via fuse 243 (Red phase), fuse 244 (blue phase) and the earth busbar (yellow phase) in panel 11P.

18. The a.c. supply is directed to two control boxes, B.T.H. Type X2126730, mounted together on the port side of the pilots' floor. Each control box contains the necessary chokes and capacitors for striking and controlling three lamps, and for power factor correction. Two dimmer switches, each operating in conjunction with a control box to regulate three lamps, are installed one on the port console and the other on the starboard console.

19. A theoretical circuit diagram of the u/v control system is given in fig.2. Referring to this diagram, the circuit control is arranged so that the fuel panel lamp and the port inner and port outer lamps are supplied from No.1 control unit, and controlled by the dimmer switch on the port console (6P). The centre lamp, the starboard inner lamp and the starboard outer lamp are similarly supplied from No.2 control unit, and controlled by the dimmer switch on the starboard console (7P). The dimmer switches are of the 'ganged' type, and are wound so that the series resistance A is in circuit when the dimmer resistances B, C and D are out of circuit.

20. When the dimmer switch is moved from the OFF position, a.c. supply will be fed to the pair of filaments in each tube, via the resistance A and each lamp choke. Note that the resistances B, C and D are 'out' at this stage, and the filaments and chokes are in series. The filaments will commence 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 progressively, and resistances B, C and D will be placed in parallel with the lamp chokes. This will cause the filaments to glow brighter, and increased radiation will occur.

Red floodlighting

21. Red floodlighting is provided for the main instrument panel and the consoles at the pilots' station. The system is fed from the aircraft 28-volt supply and controlled by dimmer switches.

Instrument panel. The red floodlighting at the instrument panel consists of four lamp assemblies fitted to the undersurface of the panel coaming. The lamps are arranged as shown in the detail on fig.1. The double lampholders are Avro Part No. 1/V7649 and the single lampholders Avro Part No. 1/V7648. (It should be noted that each double type floodlamp contains one emergency lighting filament). The lamps are controlled by dimmer switches, Type R, located on the forward portion of the port and starboard cockpit rails.

Consoles. The red floodlighting on the port, centre and starboard consoles consists of the following lamps and controls:-

(1) Three single pattern red floodlamps, Avro Part No.1/V7648, fitted to the port console. These lamps are controlled by a dimmer switch,

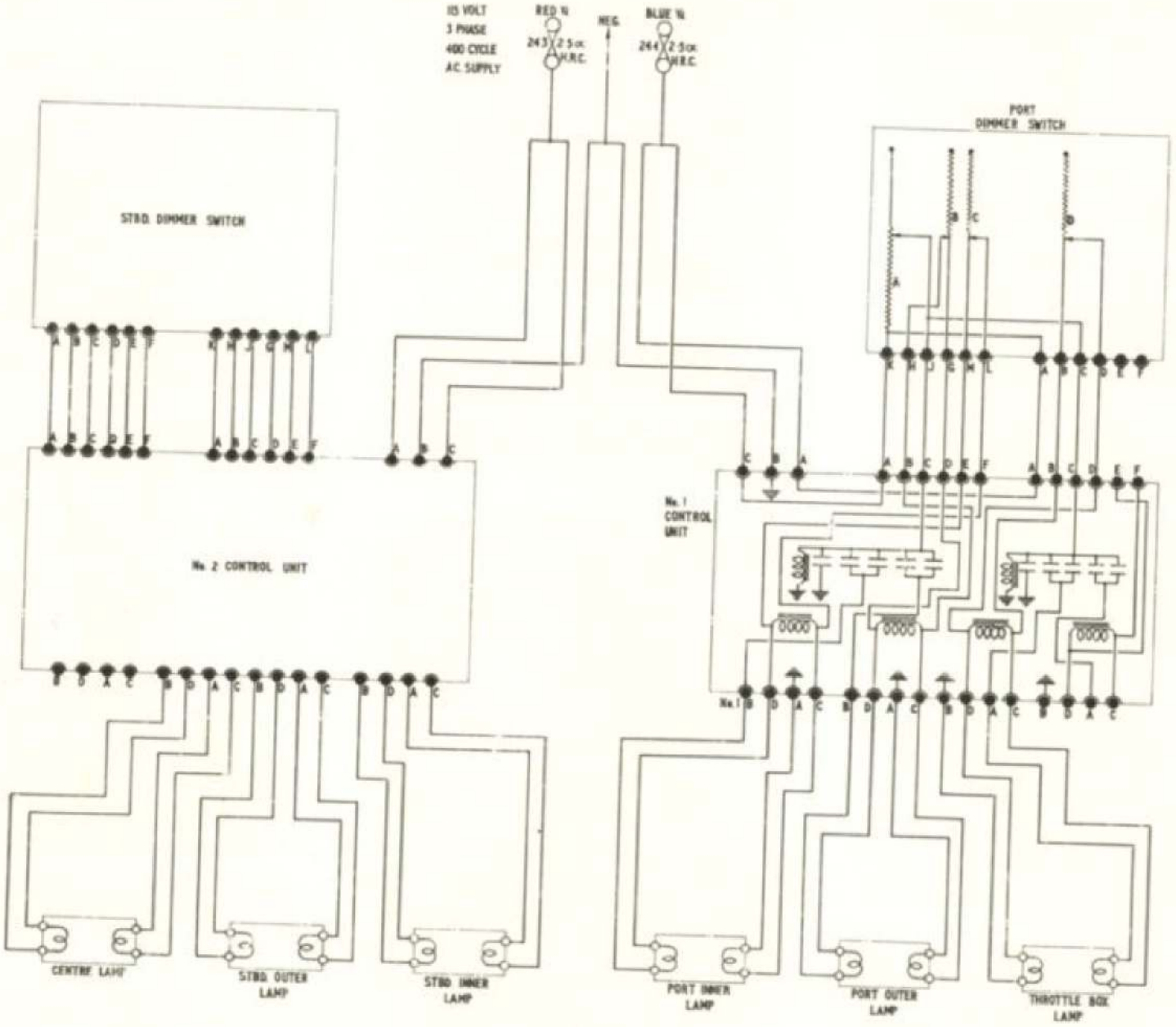

Fig. 2 U/V controls

RESTRICTED

Type R, on the forward face of the port cockpit rail.

(2) Three red floodlamps, Ref.No. 5CX/4058, fitted to the starboard cockpit rail for illumination of the starboard console, are controlled by a dimmer switch, Type R, on the starboard cockpit rail. Each lamp is fitted with a mask, Ref.No. 5CX/3430.

(3) A red floodlamp assembly is attached to the engine control pedestal, and arranged so that the light is directed towards the controls on the centre console. The assembly contains two lampholders, (Standard Telephone Co. LP183328) one for emergency lighting only, and the other for normal conditions. The latter is controlled by the same dimmer switch as in sub-para.2 above.

(4) Two masked lamp assemblies, Avro Part No.1/V8120 and 2/V8120 respectively, are fitted to the aft portion of the retractable centre console. These lamps are fitted one to each side of the console to provide red floodlighting for that area of the console, and are controlled by the same dimmer switch as in sub-para.2 above.

(5) A red flood wander lamp assembly, Avro Part No.1/V7666, is installed on the pilots' canopy. This lamp enables either pilot to have local illumination for map reading, etc. The wander lamp assembly consists of a rectangular box housing a bungee-loaded extension lead, with a focusing wander lamp unit fitting into the forward end. The lamp unit is fitted with a built-in switch, a red filter, and a dimming iris for illumination control. A clip is provided on the lamp unit so that the lamp may be secured in any desired position.

White fluorescent lighting

22. A system of white fluorescent lighting is installed at the pilots' station for general white illumination of the port and starboard consoles. Two tubular pattern 115-volt, 4-watt fluorescent lamps are provided for each console, and are installed two on each cockpit rail. Two control switches, one for each pair of lamps, are fitted one to each side of the pilots' instrument panel. A control box, Type X2126730, containing the necessary chokes and capacitors, is located on the pilots' floor, below the starboard console 7P, and is supplied with a.c. at 115-volt 400 c/s from panel 11P. The circuit is similar to that for the u/v lamps except that the control is by means of the ON-OFF switches instead of dimmer switches.

High intensity anti-dazzle lighting

23. Two lamps, Ref.No.5CX/5128, are fitted on the pilots' coaming to enable essential instruments to be seen in certain circumstances as described in A.P. 4343E, Vol.1, Sect.7, Chap.36.

24. The lamps may be controlled from two positions. A switch, Ref.No.5CW/5515, fitted on the port side of the fuel contents panel permits control by either first or second pilot, the switch having two positions relative to off, namely DIM and BRIGHT. A further switch Ref.No. 5CW/6430 is fitted immediately to the left of the abandon aircraft sign on the navigators' panel. With this switch only the BRIGHT selection is possible. The switches are independently served, the pilots' by fuse No.175, and the navigator's by fuse No.168, both fuses being located panel 3P.

25. The dim condition is achieved by inserting resistances in series with the lamp filaments. Two resistances (Type A No.3) one for each lamp, are fitted under the port console.

Emergency lighting

26. In the event of a complete electrical failure, emergency lighting for the pilots' controls is provided by two red floodlights supplied from two 24-volt alkaline batteries (Ref.No.5J/3340) fitted in a container at the port side of the pilots' floor.

27. The lamps are provided for the instrument panel, these forming one side of the port and starboard double floodlamps. The third lamp forms part of the double red floodlamp on the engine control pedestal.

28. The three emergency lights are controlled by a single-pole switch, labelled EMERGENCY LIGHTING ON/OFF on the pilots' centre instrument panel, and are entirely independent of the aircraft electrical supply.

Stand-by compass lighting

29. With the introduction of Mod.383 the Type E2A stand-by compasses will be replaced by the Type E2B which incorporate direct lighting of the compass bowl, using a miniature 28-volt non-magnetic lamp. The intensity of illumination is controlled by a dimmer switch, Type R.

30. The two Type E2B compasses, one for each pilot, are fitted on the coaming. The dimmer switch and a change-over switch for the first pilot's compass are fitted on the port cockpit rail, the lamp being supplied from the 28-volt supply via fuse 62 in panel 3P for normal use, and from the emergency batteries should the aircraft supply fail. The dimmer switch and a change-over for the second pilot's compass are fitted on the starboard cockpit rail, the normal supply to the lamp being via fuse 125 in panel 4P, and from the emergency batteries should the aircraft supply fail.

31. Details of the E2B compass lamp fittings are contained in A.P.1275B, Vol.1, Sect.10, Chap.8.

NOTE . . .

It is important that only the special magnetic lamps Ref.No.5L/9959121, are used on the compass installations. The use of other types will introduce compass errors.

Navigation station lighting

32. The lighting at the navigation station can be divided into three main groups:-

(1) 115-volt red fluorescent lighting for general red lighting of the crew's station.

(2) Anglepoise chart lamps for the illumination of the controls and equipment on the panels at the station.

(3) Concealed lighting for instruments on the plotter's panel.

Red fluorescent lighting

33. Four tubular fluorescent lamps are fitted on the aft face of former 260 at the crew's station. The tubular lamps are fitted around the contour of the top section of the former to give even illumination at the station. Each lamp is attached to a white sprayed metal reflector by suitable spring clips.

34. The lamps are supplied at 115 volts, 400 c/s from No.3 inverter, and controlled by two single-pole switches on the navigator's panel, each switch controlling a pair of lamps. A control box, Type X2126730, containing the chokes and capacitor units, is installed on the forward face, port side, of the rear pressure bulkhead.

35. The circuit operation for the red fluorescent lighting is the same as for the u/v lighting system except that the dimmer switch is replaced by the ON-OFF switch.

Bomb bay temperature gauge lamp

36. An instrument lamp, Type No.1, (Ref.No.5CX/462) is fitted to a special bracket above the bomb bay temperature gauge. The lamp is fitted with a P.O. jack type filament, and a cowl is fitted for shading purposes. The lamp is controlled by a dimmer switch on the navigators' panel.

Bomb panel lamps

37. A cockpit lamp, Mk.2, and a dimmer switch (Ref.No.5CW/724) are fitted to a small bracket above the bomb panel 9P at the nav/bomber's station. The lamp is fed from fuse 132 in 4P. In addition two similar lamps are located at the prone air bomber's position, one lamp with its dimmer switch on 8P, and the other lamp and dimmer switch on the port side structure. These lamps at the prone position are fitted on the introduction of the T4 bombsight (Book 3, Sect.5, Chap.2, Group 6).

Anglepoise lamps

38. Three anglepoise lamps are fitted on the navigators' panel in the positions indicated on fig.1 and provide general instrument illumination. Each lamp is fitted with a chartboard lampshade and amber filter glass. Dimmer switches, Type R, one for each lamp, are fitted to the navigators' panel and are supplied from the aircraft 28-volt system.

Plotter's panel

39. Concealed lighting is employed to illuminate the instruments on the plotter's panel at the navigation station. Seven lampholder assemblies (Ref.No.5CW/2282) are suitably arranged on the panel to illuminate the edges of the transparent plastic sheet which is fitted over the front face of the panel. The front face of the transparent plastic sheet is painted matt black, and holes are cut in the sheet to correspond with the fronts of the instruments. The lamps are controlled by a dimmer switch, Type R, fitted to the navigators' panel, and supplied from the aircraft 28-volt system via a fuse in 3P.

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

40. Three pillar lamps, Ref.No.5CX/5364, are used to provide red illumination of the N.B.S. control unit, Type 12580, at the nav/bomber's station. The lamps are controlled by a dimmer switch, Type R, (Ref.No.5CW/725) fitted on the side of the control unit mounting bracket, and are fed from fuse 106.

A.V.S.U. lamp

41. When Mod.827 is embodied, an automatic variation setting unit and a navigation panel, Mk.1A, are fitted at the navigators' station. In addition, a red pillar lamp, Ref.No.5CX/5364, is provided to illuminate the A.V.S.U. The lamp and associated control switch, Ref.No. 5CW/6430, are fitted on a bracket at the top of the navigators' panel, and are fed from fuse 134 in 4P.

Ground service lighting

42. To facilitate inspection of the aircraft during ground servicing periods, a number of cabin lamps, Ref.No.5CX/701, and cockpit lamps, Mk.1A, are fitted to provide illumination in the bomb bay, wheel bays, power compartment and rear fuselage. The lamp assemblies are supplied under Avro Part Nos. and are installed in the following positions:-

Bomb bay (forward)	Lamp No.10 and 11 (21/V4650), 4 and 5 (1/V6798)
Bomb bay (aft)	Lamp No.8 and 9 (1/V6798), 6 and 7 (21/V4650)
Nose wheel bay	Lamp No.13 and 14 (1/V6798)
Port main wheel bay	Lamp No.15 and 16 (1/V6798)
Stb'd.main wheel bay	Lamp No.17 and 18 (1/V6798)

Power compartment	Lamp No.1 and 2 (38/V6355)
Rear fuselage	Lamp No.3 and 19 (Ref.No.5CX/446)

Note that lamp No.12 is not allocated.

43. A further lamp (1/V6798) is installed adjacent to the hydraulic reservoir in the bomb bay.

44. The ground service lamps are controlled from a single-pole control switch, Ref.No.5CW/6430, located in the power compartment adjacent to the external supply panel. The switch is connected to the 28-volt ground supply plug, and the circuit is fed from fuses 485 and 486 in 26P.

Inspection sockets

45. In addition to the ground service lighting in the bomb bay, two standard inspection sockets for use with Mk.2 inspection lamps, are fitted, one to the front spar bulkhead and the other to the rear spar bulkhead. The sockets are supplied from the aircraft 28-volt system via fuse 334 in 16P.

EXTERIOR LIGHTING

46. The external lamps form a group of circuits served from a common source on the 28-volt d.c. system via circuit breaker No.19 on 4P and master switch, labelled EXTERNAL LIGHTS ON/OFF, fitted on the starboard console 7P. Each circuit in the group is individually fused and switched, the fuses being located in 4P and the switches positioned on the starboard console. The master switch must be placed to ON before the individual switches are operated. A theoretical circuit diagram of the exterior lighting circuit is shown in fig.3.

Navigation lamps

Wing and tail

47. Two wing and two tail navigation lamps, which give steady indication, are fitted. The wing navigation lamps, Type A, are installed one on each tip, each lamp being protected by a transparent plastic window which forms part of the wing tip contour. The tail navigation lamps are installed, one on each side (port and starboard) of the wing trailing edge structure, inboard of the No.2 and 3 engine jet pipes, each lamp assembly consisting of a lampholder, Ref.No.5CW/2783, and a 10-watt filament. The lampholders are secured to suitable brackets, and lamp compartments are formed by shaped transparent plastic windows, which are shielded to give the correct angle of divergence. Further details of the navigation lamps are contained in A.P.4343E, Vol.1, Sect.7.

Upper and lower

48. In order to provide anti-collision warning to other aircraft, three additional navigation lamps, which give a white flashing light, are used. These lamps, Type FNL/50, (Ref.No.5CX/5315) are fitted, 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. Filaments, rated at 28 volts, 40 watts are employed, and the circuit is operated by a flasher unit, Type A, (Ref.No.5CZ/5448) fitted under the 2nd pilot's floor. A full description of the lamps is given in A.P.4343E, Vol.1, Sect.7, and of the flasher unit in A.P.4343C, Vol.1, Book 2.

Control switch

49. Both sets of navigation lamps are controlled from a double-pole, 3-position, centre-off switch, labelled FLASH-NAV, on the starboard console. When the switch is selected to NAV. a supply from fuse 154 is fed to the wing and tail navigation lights only, to give steady indication When the switch is selected to FLASH, the same supply is fed to both sets of lamps simultaneously. In the case of the upper and lower lamps, flashing indication is obtained by the intermittent operation of relay 711 controlled by the flasher unit. The circuit is shown pre Mod.613 in fig.13, and post Mod.613 in Appendix 1 to this group.

Downward identification lamp

50. A downward identification lamp, Type C, is fitted to the under surface of the rear fuselage, on the centre line of the aircraft, midway between formers 472.5 in. and 487.5 in. The lamp is fitted with an amber glass front, and the complete assembly is fitted to a shallow tray. The front of the lamp is covered by a transparent plastic window which forms part of the fuselage contour.

51. Supply to the downward identification lamp is controlled by a single-pole, centre-off switch, Ref.No.5CW/6432, located on the starboard console 7P. The switch, which is labelled STEADY-OFF-MORSE, enables the lamp to be used to give a steady light, or to signal a pre-arranged code. The lamp is described in A.P. 4343E, Vol.1, Sect.7, Chap.7.

Combined landing and taxying lamps

52. Two landing/taxying lamps, Type L, are fitted, one lamp in the under surface of each wing. The lamps, which are of the retractable type, are fitted so that when retracted they recess into the wing with the glass front aligned with the wing surfaces. A detailed description of the lamp is given in A.P.4343E, Vol.1, Sect.7, Chap.32.

Controls

53. Each lamp is controlled by a 3-position selector switch (Ref.No.5CW/4612). The switches are labelled RETRACT-LANDING-TAXI, and are mounted together on the starboard console 7P in

the pilots' compartment. In the RETRACT (upper) switch position, the lamps are retracted into the undersurface of the wings. With the control switches in the LANDING (central) position the lamps will be extended to the landing position. When the control switches are placed to the TAXI (lower) position, the landing lamps will be displaced beyond the landing position to the fully extended position.

54. The lamp circuit is so arranged that the filament will be switched on when the lamp has been displaced through about 45 degrees with the switch at either LANDING or TAXI, and will be switched off immediately the switch is placed to the RETRACT position.

Circuit operation

55. The circuit operation outlined in the following paragraphs should be read in conjunction with fig.3. Only the port landing/taxying lamp circuit is described, the circuit for the starboard lamp being similar. It should be noted that the EXTERNAL LIGHTS master switch must be in the ON position before the landing lamps can be operated.

56. Referring to fig.3, it will be seen that when the port landing/taxying lamp selector switch is placed from the RETRACT to the LANDING position, a positive supply from fuse 155 will be fed, via the switch terminals, 4-2, and normally closed relay contacts 349/1, to energise the coil of relay 240. The now closed contacts 240/1 will connect a supply from circuit breaker No.31 to terminal 2 of the lamp assembly. Meanwhile, the supply to lamp terminal 4 will be fed via the internal contacts B and A to the extend field of the actuator, and the lamp will commence to move to the LANDING position. When the lamp has been extended approx. 45 deg., the filament will light. As the lamp reaches the landing position contacts B will open, and contacts C will close. The lamp will remain at the landing position with the filament illuminated.

57. Operation of the selector switch from LANDING to TAXI will connect the supply from the fuse via switch terminals 4-1 to terminal 5 on the lamp. From terminal 5 the supply will be connected to the extend field of the actuator via the lamp contacts A. Note that the filament relay will still remain energised by the changeover action of the contacts of relay 349. As the lamp reaches the fully extended (taxi) position, contacts A will be operated to open, and the actuator micro switches will change over. The lamp circuit will now be prepared for either LANDING or RETRACT selection.

High intensity probe lighting

58. Two lamps, Ref.No.5CX/5128, are fitted forward of former 484 in the upper part of the nose section to provide high intensity illumination of the flight refuelling probe. The lamps are each secured by three bolts to a rounded bracket, and are set to light up the forward third of the probe through two plastic windows on the top of the nose. Adjustment of the lamps for focussing purposes is made by the securing bolts. Two dimmer switches, Type R, mounted on the starboard console and fed from fuses 151 and 152 respectively, control the operation of the lamps via the external lights master switch.

SERVICING

General

59. All wiring for the interior and exterior lighting circuits should be examined periodically for signs of abrasion, and security of connections. When unserviceable filaments are replaced, reference should be made to Table 1 to ensure the correct type and wattage. Detailed servicing of lamp assemblies is governed by the instructions laid down in A.P. 4343E, Vol.1, Sect.7 and 8.

INTERIOR LIGHTING

60. Functional tests of all cabin lamps, anglepoise lamps and panel floodlamps should be carried out at intervals laid down in the servicing schedule. Dimmer switches controlling the panel floodlamps, oxygen u/v lamps and anglepoise lamps should be handled with care to avoid forcing them past their stops.

Ultra-violet and fluorescent lighting

61. The control boxes for the 115-volt, 400 c/s, 3-phase u/v and fluorescent lighting systems should be examined periodically for security of the plug and socket connections, and ingress of moisture into the boxes. Should any control box be suspected of fault, the unserviceable unit should be removed from the aircraft and replaced by a serviceable item. Broken fluorescent tubes should be handled with care, as the coating of fluorescent material on the inside of the tubes is of a poisonous nature.

Emergency lighting

62. The emergency lighting batteries should be checked periodically for cleanliness and security of connections. The battery containers should be examined for signs of spilt electrolyte and corrosion. The batteries should be removed from the aircraft for recharging and capacity tests at the intervals laid down in the Servicing Schedule. At each inspection before night flying, the operation of the emergency circuit should be checked for correct functioning by placing the emergency

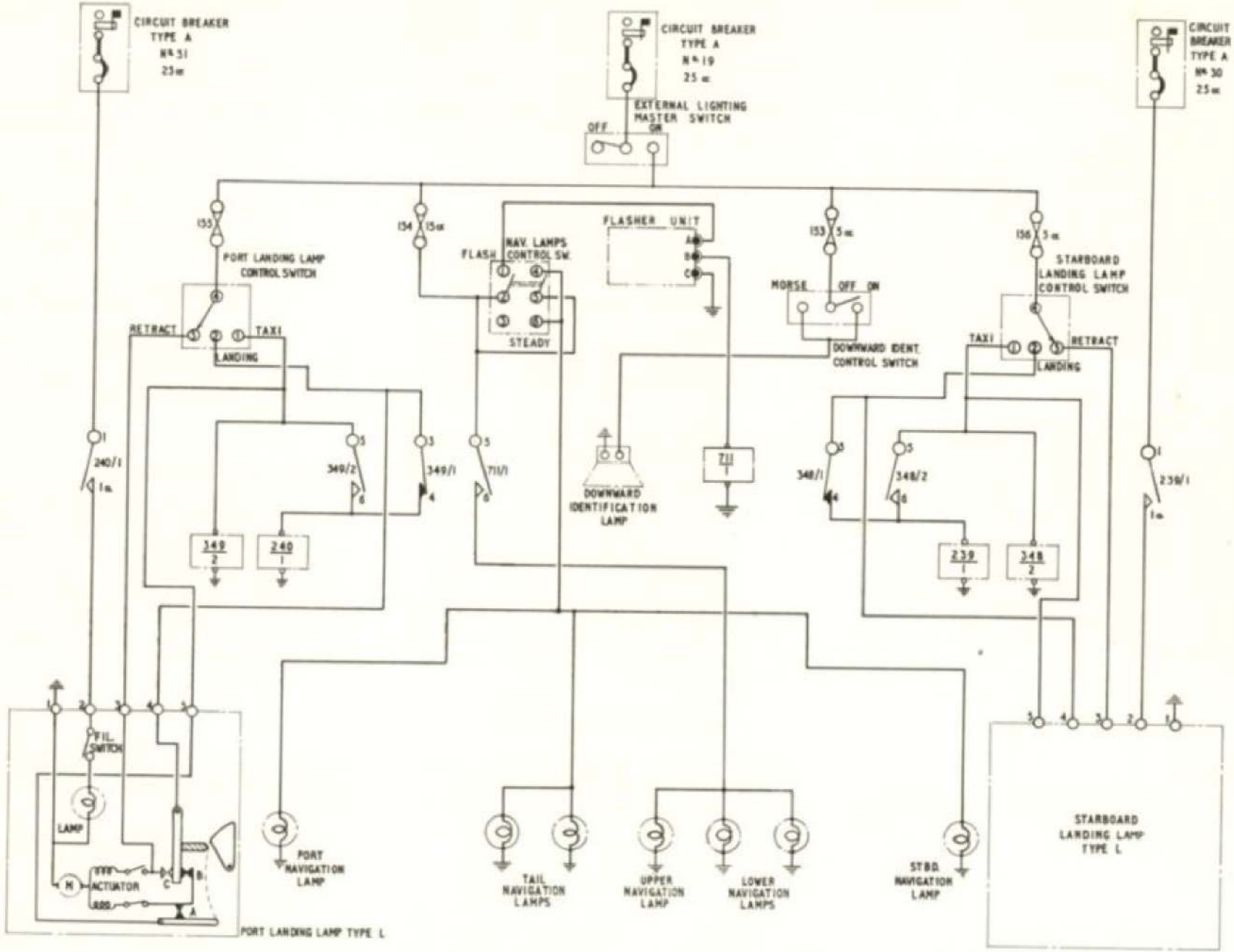

Fig. 3 Exterior lighting circuit

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lighting switch to the ON position, and observing that the lamps light.

EXTERIOR LIGHTING

Navigation lamps

63. All navigation lamps should be examined periodically for security of connections, and the lamp glasses and transparent plastic windows should be kept clean. At all inspections prior to night flying, the external lights master switch should be placed to 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

64. The downward identification lamp should be inspected periodically for general security of connections and cleanliness of the reflector and lamp glass assembly. At all inspections before night flying takes place, the external lights master switch should be placed to the ON position, and a functional test carried out with the downward identification lamp control switch at the STEADY and MORSE positions in turn, checking that the lamp operates correctly.

Combined landing/taxying lamps

65. The landing/taxying lamps, Type L, should be inspected periodically for general security of connections and signs of deterioration of the supply cables. At each inspection prior to night flying taking place, the following tests should be carfied out:-

(1) Place 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 is illuminated.

(3) Select the TAXI position, ensure that the lamp operates to the correct position, and that the filament is illuminated.

(4) Before selecting RETRACT, allow the filament to burn for a period of 5 to 10 seconds.

(5) As the bulb cools, check for air streaks, which will be indicated by white lines forming inside the glass envelope. If these marks appear, the sealing has failed and the bulb must be renewed. The bulb life is rated at 50 hours, and should be replaced after 30 hours' use or when undue blackening of the glass is evident.

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

(7) Examine as much of the filament supply cables as visible, for signs of deterioration through heat.

(8) Repeat the tests outlined in sub-para.(2) to (7) for the starboard lamp.

66. Full servicing details for the combined landing/taxying lamps, Type L, including bench testing and setting up instructions will be found in A.P.4343E, Vol.1, Sect.7.

High intensity probe lighting

67. The high intensity probe lamps should be examined periodically for security of connections, and the transparent plastic windows should be kept clean. At all inspections prior to night flying, the external lights master switch should be placed to ON, and a functional test of the lamps carried out by operating each dimmer switch in turn.

REMOVAL AND ASSEMBLY

General

68. The various lamp assemblies and control switches described in this group are easily removed 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

LAMPS, FILAMENT AND DISCHARGE

Service and Location	Type	Ref.No.	No.off
Ground service lamps - nose wheel bay	24-volt, 16 watt	5L/9953202	2
Ground service lamps - main wheel bays	24-volt, 16 watt	5L/9953202	4
Ground service lamps - bomb bay	28-volt, 18 watt	5L/9953278	9
Ground service lamps - power compartment	28-volt, 7 watt	5L/9953271	2
Ground service lamps - rear fuselage	24-volt, 6 watt	5L/9952254	2
Nose cockpit lamps	28-volt, 7 watt	5L/9953271	2
Cockpit lamp on 8P (prone bomber)	28-volt, 3·5 watt	5L/9951271	1
Cockpit lamp opposite 8P (prone bomber)	24-volt, 6 watt	5L/9952294	1
Cabin lamp in fuselage root	28-volt, 12 watt	5L/9952295	1
Cockpit lamp below pilots' floor	28-volt, 7 watt	5L/9953271	1
Cockpit lamps below navigators' table	28-volt, 7 watt	5L/9953271	2
Cockpit lamp in power compartment	28-volt, 7 watt	5L/9953271	1
Cockpit lamp above 9P	24-volt, 6 watt	5L/9952254	1
Sextant lamps	28-volt, 3·5 watt M.E.S.	5L/9951283	2
Plotter's instrument panel	28-volt, 3·5 watt M.E.S.	5L/9951283	7
Bomb bay temp. gauge lamp	24-volt, 2·4 watt P.O.	5L/9959211	1
Control unit, Type 12580	28-volt, 0·04 amp.	5L/9959118	3
A.V.S.U. lamp	28-volt, 0·04 amp.	5L/9959118	1
Anglepoise lamps - navigation station	28-volt, 18 watt	5L/9953273	3
Red floods port console	28-volt, 3·5 watt M.E.S.	5L/9951284	3
Red floods - stb'd. console	28-volt, 3·5 watt M.E.S.	5L/9951283	3
Red floods - centre console	28-volt, 3·5 watt M.E.S.	5L/9951284	2

TABLE 1 - (continued)

LAMPS, FILAMENT AND DISCHARGE

Service and Location	Type	Ref.No.	No.off
Red floods - pilots' panel	28-volt, 3·5 watt M.E.S.	5L/9951284	4
Red floods - throttle box	28-volt, 3·5 watt M.E.S.	5L/9951284	1
Emergency - pilots' panel	28-volt, 3·5 watt M.E.S.	5L/9951273	2
Emergency - throttle box	28-volt, 3·5 watt M.E.S.	5L/9951273	1
Wander lamp	28-volt, 3·5 watt M.E.S.	5L/9951273	1
Ultra violet - oxygen panels (d.c.)	12-volt, 7 watt	5L/9952261	2
Ultra violet - pilots' panel (a.c.)	115-volt, 4 watt	5L/9962237	5
Ultra violet - centre console (a.c.)	115-volt, 4 watt	5L/9962237	1
White fluorescent - port and stb'd. consoles (a.c.)	115-volt, 4 watt	5L/9962236	4
Red fluorescent - crew's roof (a.c.)	115-volt, 4 watt	5L/9962235	4
Navigation lamps - wing	28-volt, 18 watt	5L/9953283	2
Navigation lamps - tail	28-volt, 12 watt	5L/9953294	2
Navigation lamps - upper and lower	28-volt, 40 watt	5L/9952445	3
Downward identification lamp	24-volt, 80 watt	5L/9952604	1
Landing/taxying lamps	26-volt, 500 watt	5L/9959801	2
E2B compass lamps	28-volt, 0·04 amp. non magnetic	5L/9959121	2
High intensity anti dazzle	28-volt, 12 watt	5L/9951282	2
High intensity probe	28-volt, 12 watt	5L/9951282	2

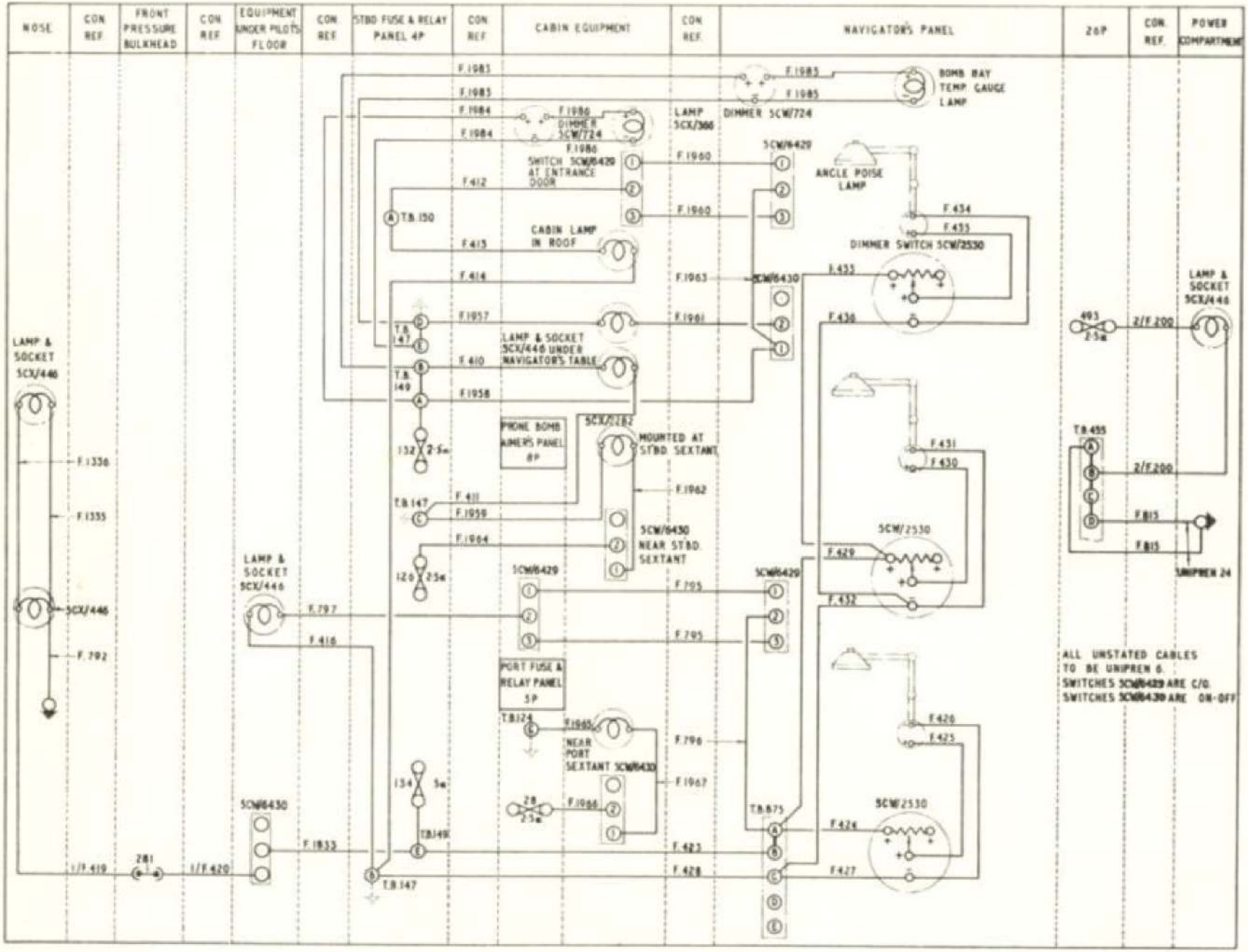

Fig. 4 Cabin and general lighting – Pre Mod 827

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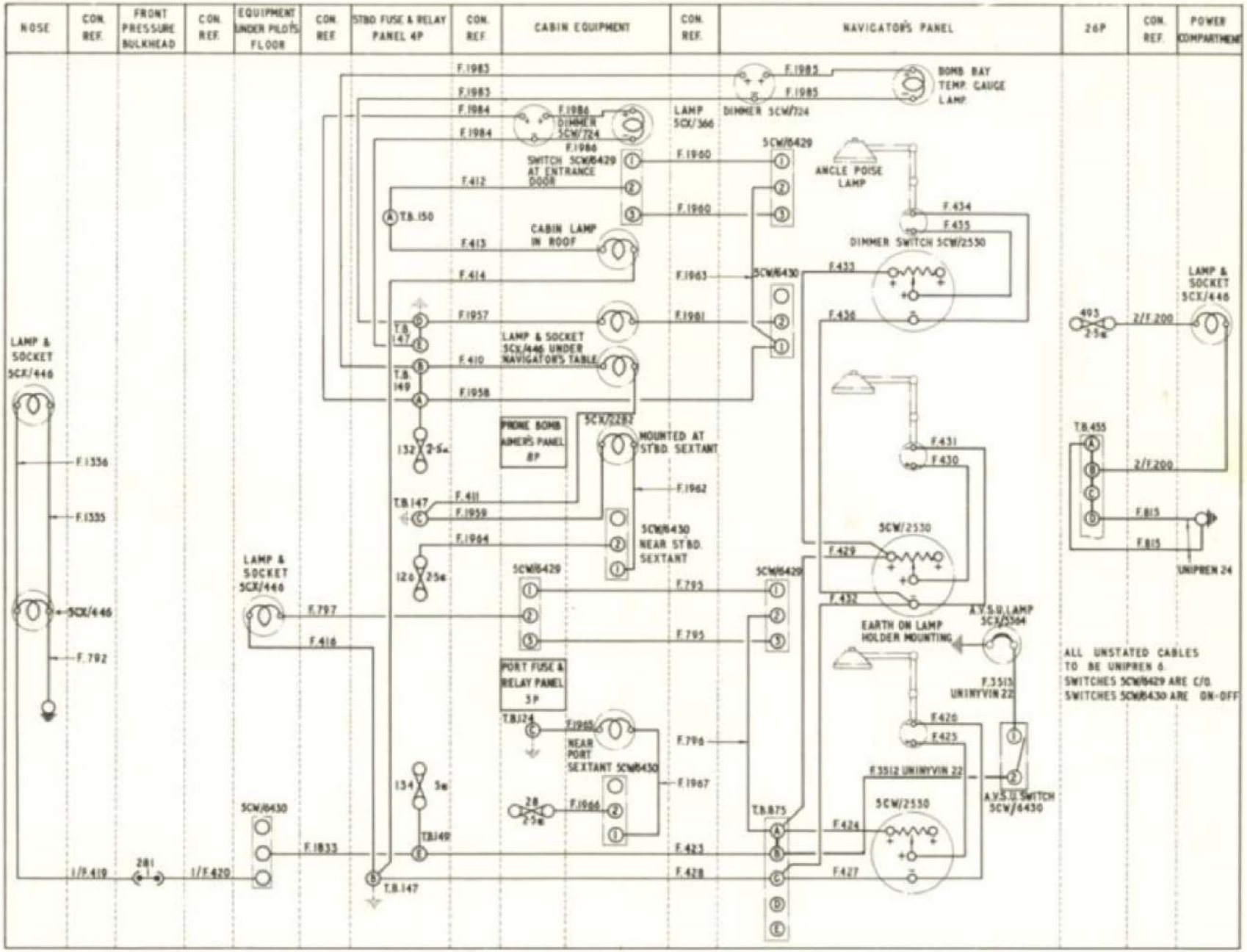

Fig. 5 Cabin and general lighting – Post Mod 827

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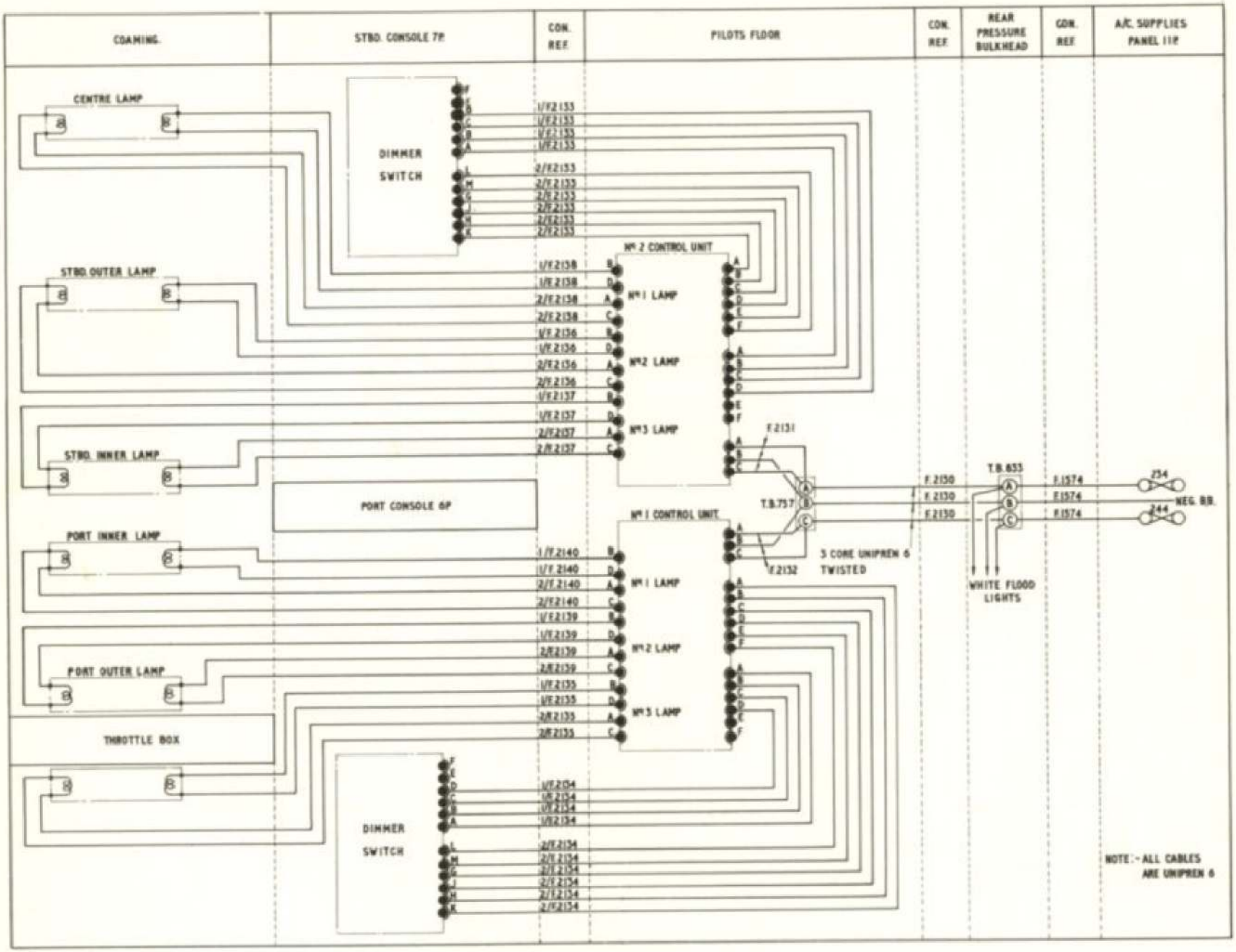

Fig. 6 Ultra-violet lighting

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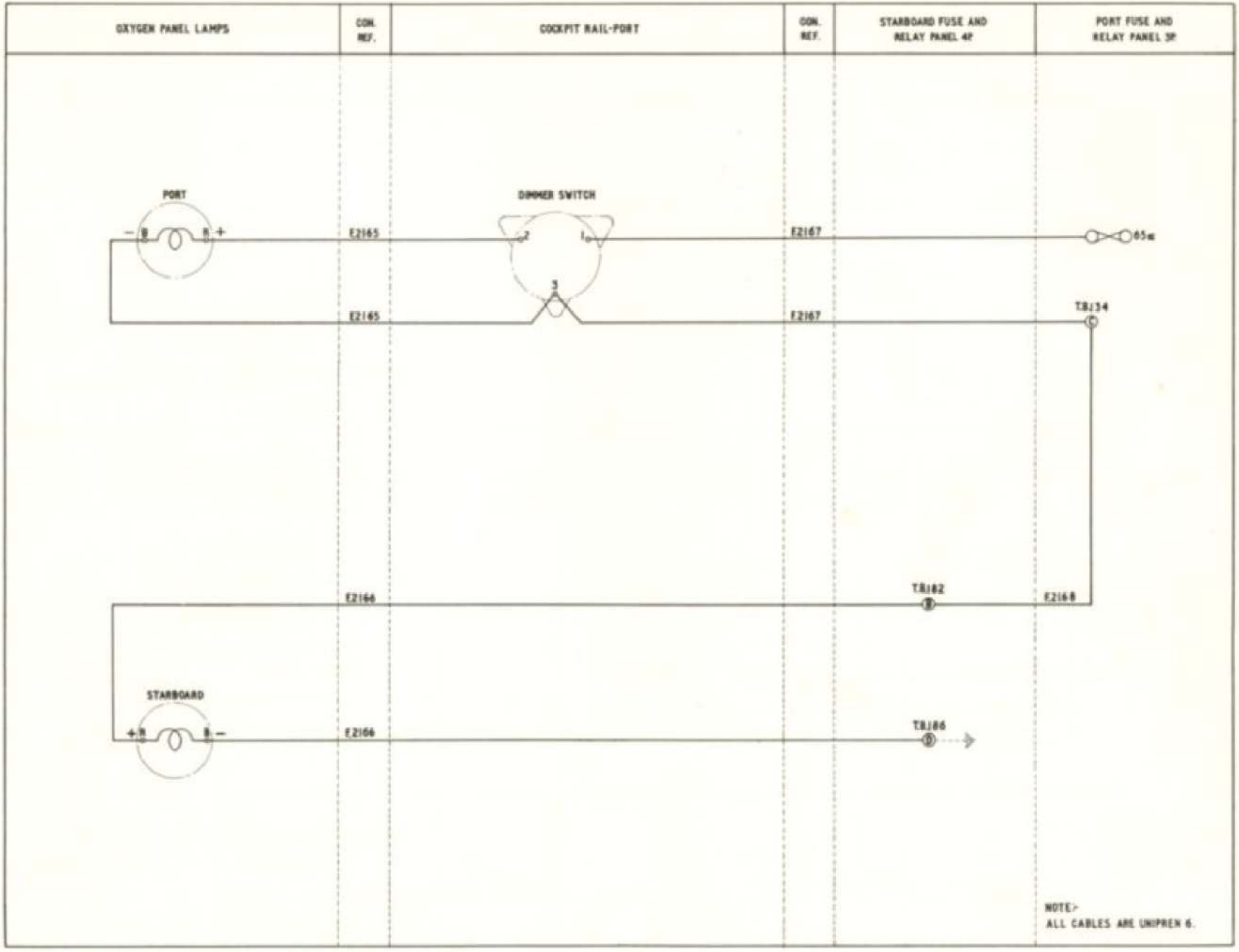

Fig. 7 Ultra violet lighting – oxygen panels

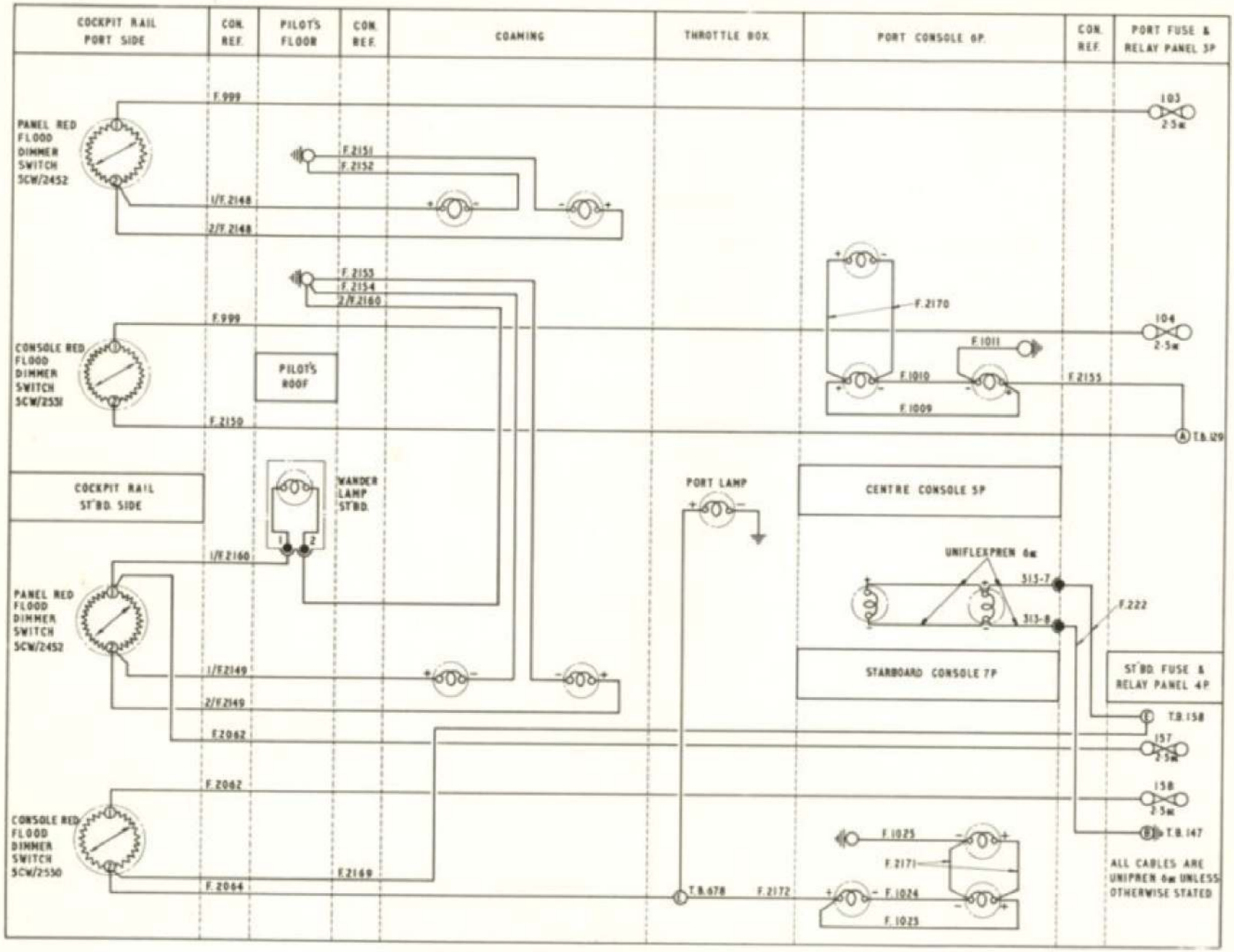

Fig 8 Red floodlights

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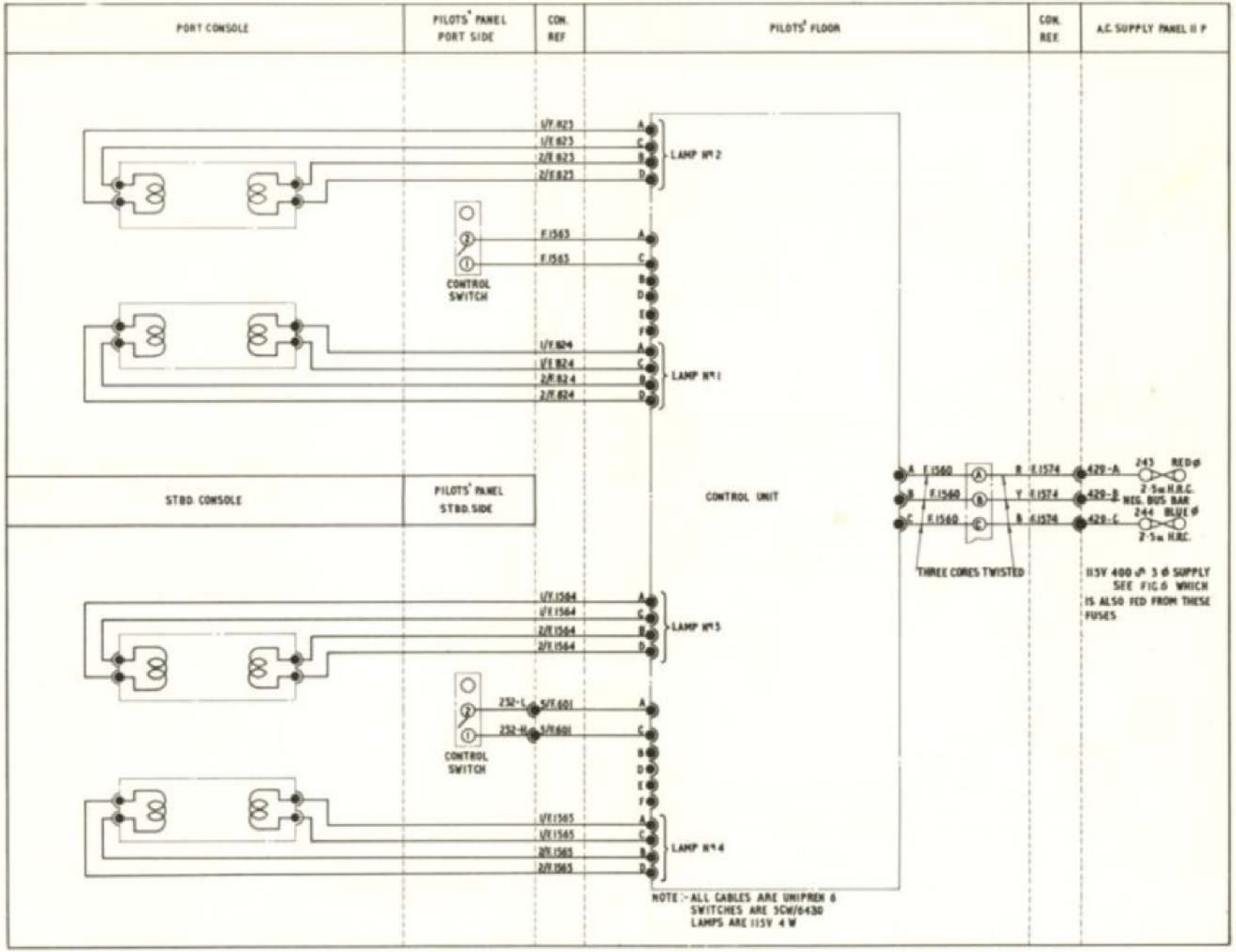

Fig. 9 White fluorescent lighting

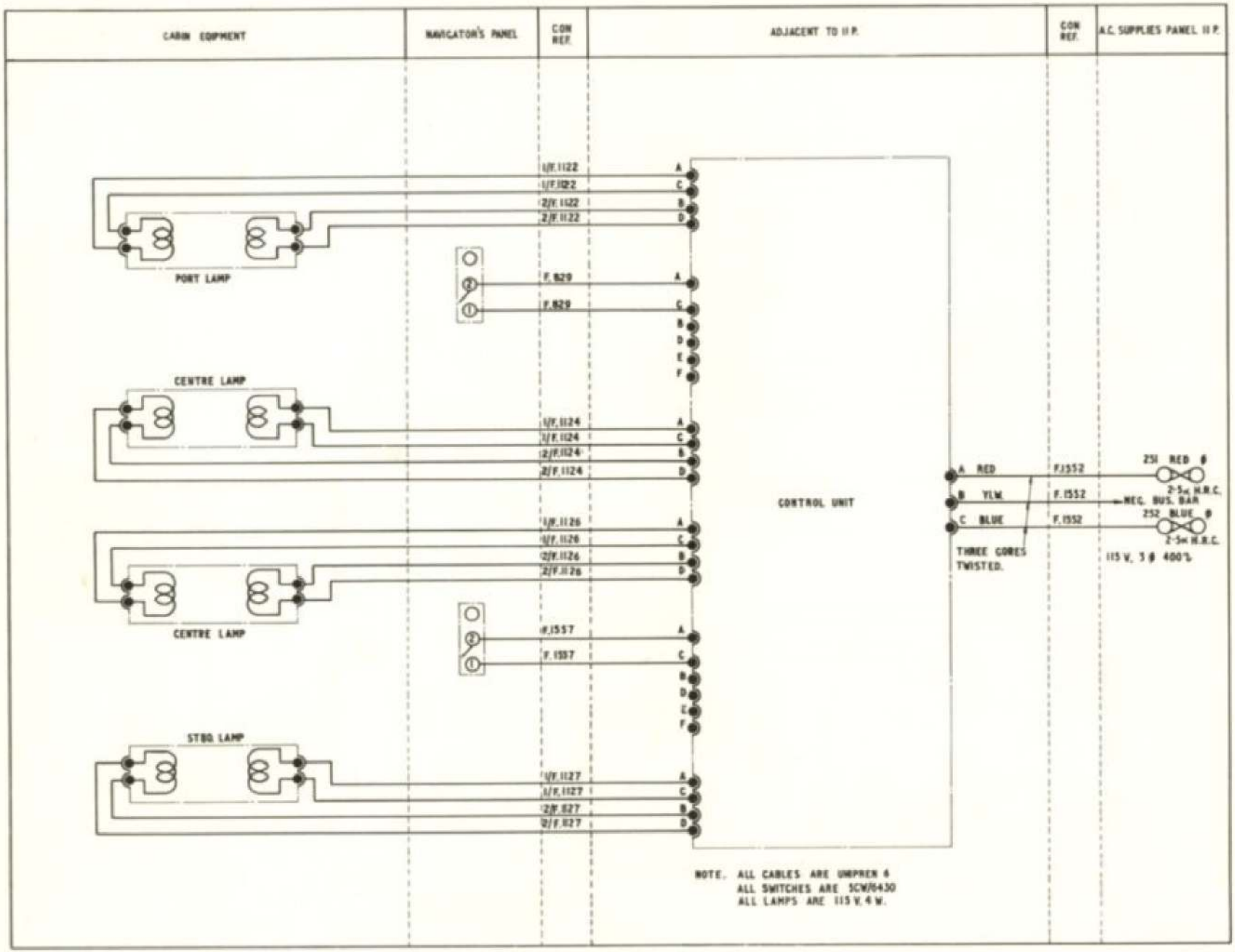

Fig. 10 Crew's red fluorescent lighting

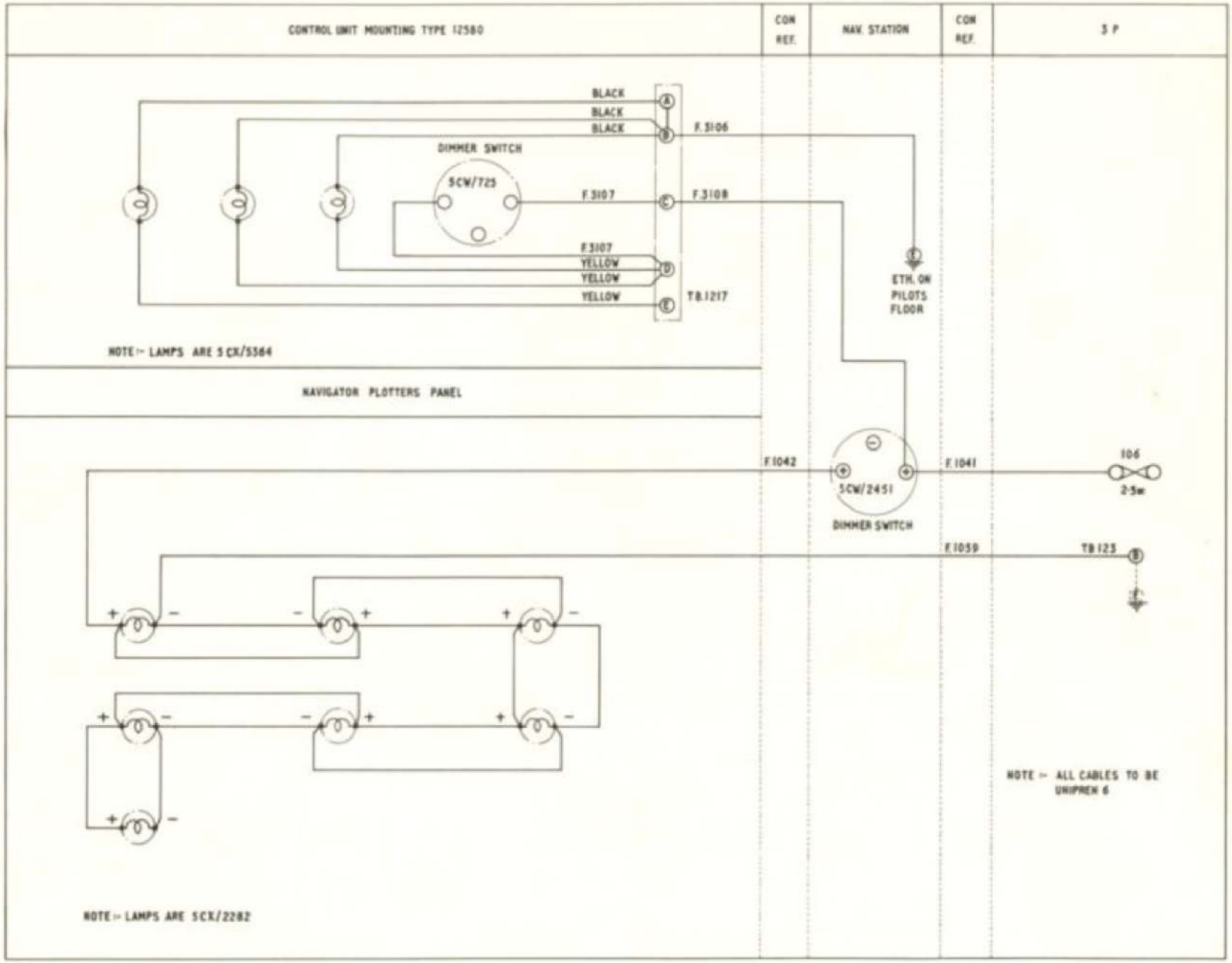

Fig. 11 Navigators' instrument lighting

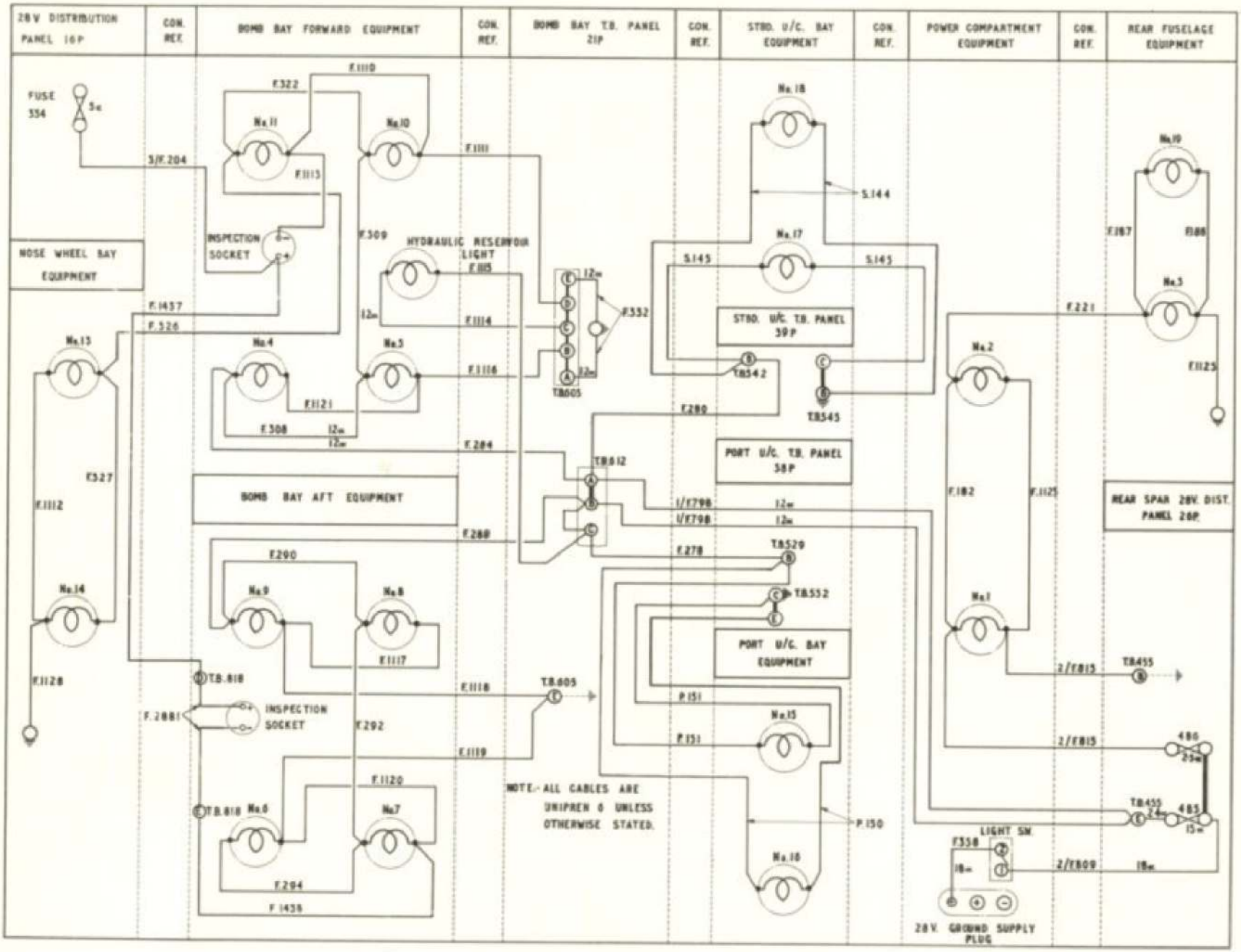

Fig. 12 Ground service lighting

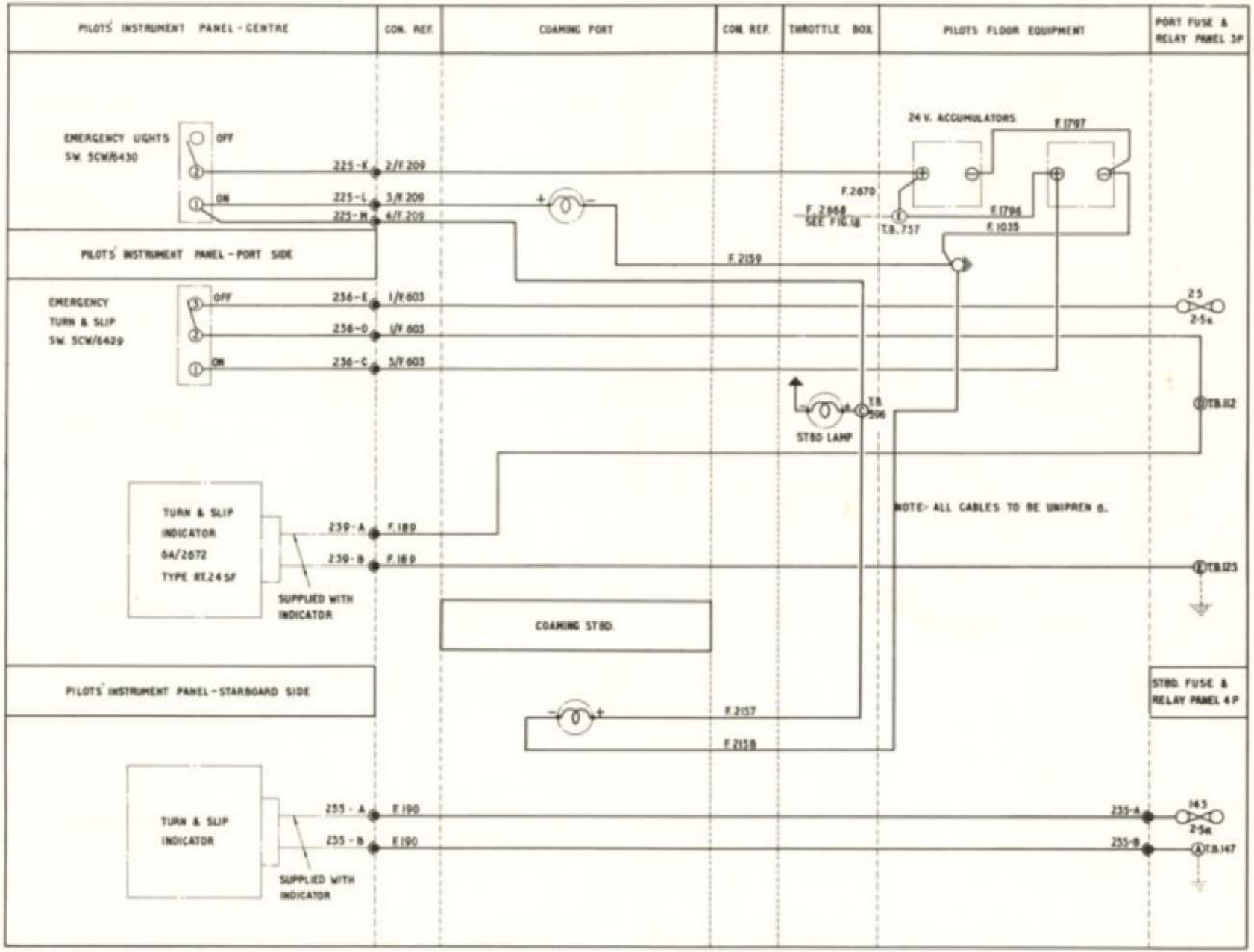

Fig. 13 Emergency lamps and turn and slip indicators

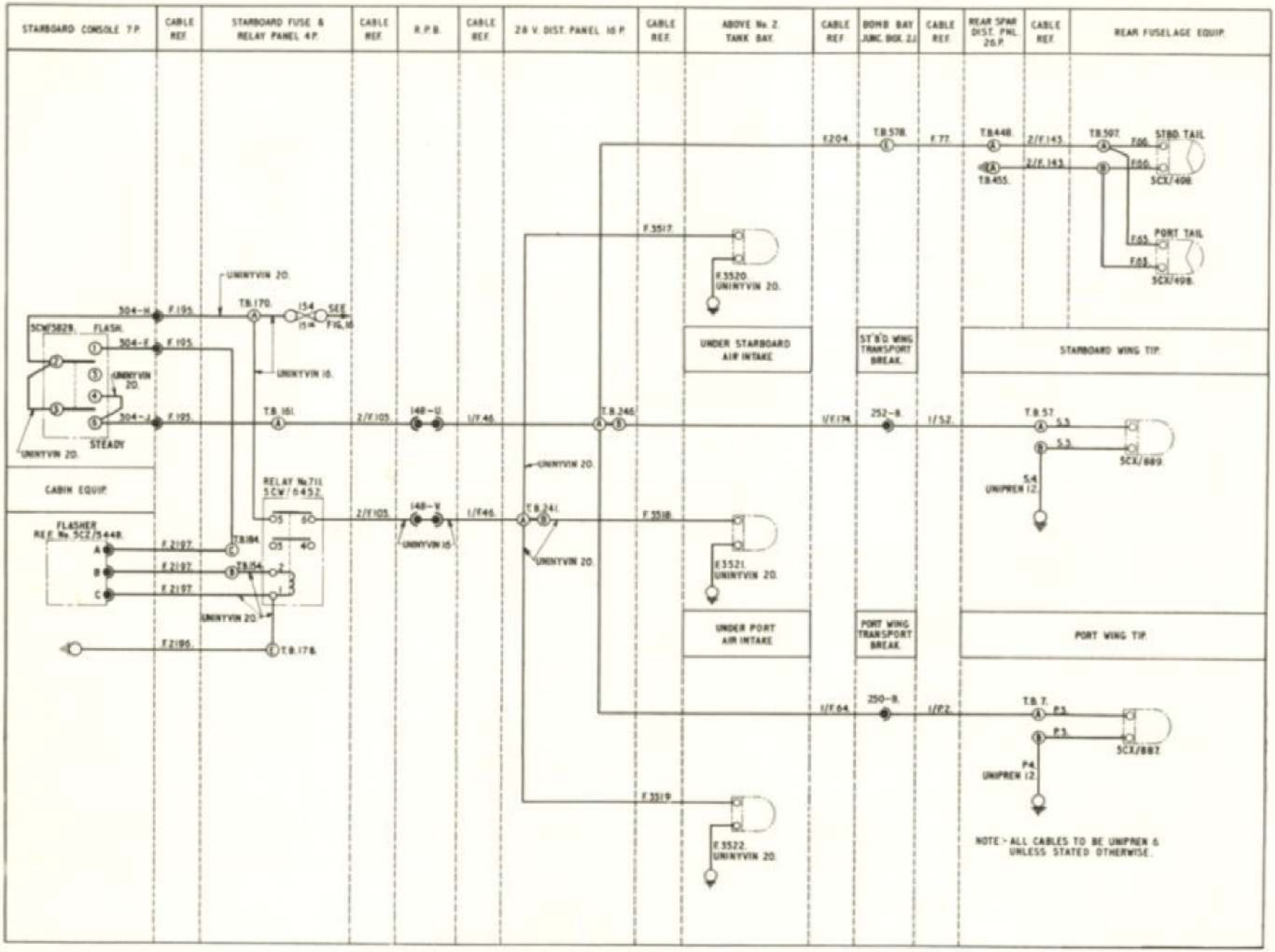

Fig. 14 Navigation lamps

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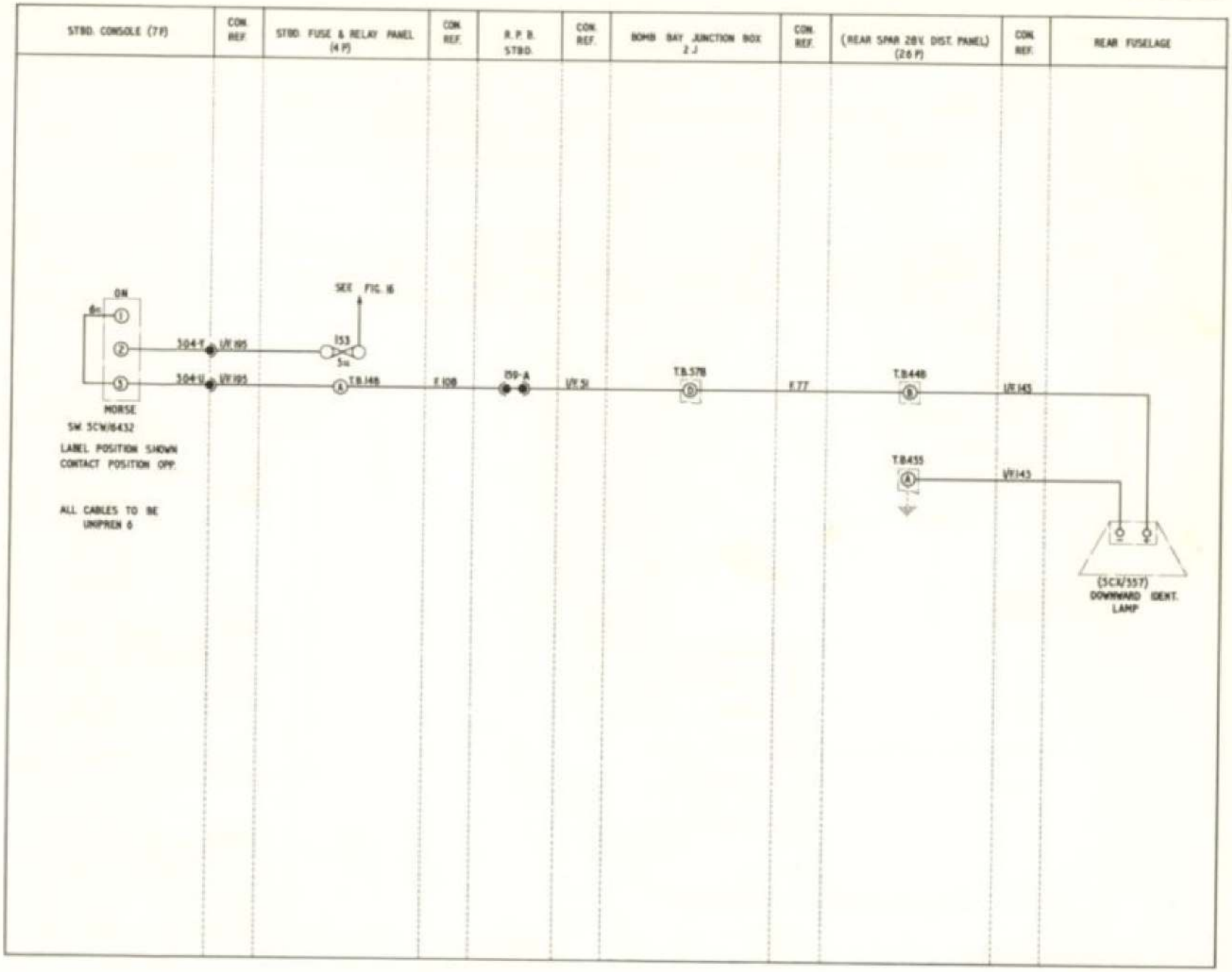

Fig.15 Downward identification lamp

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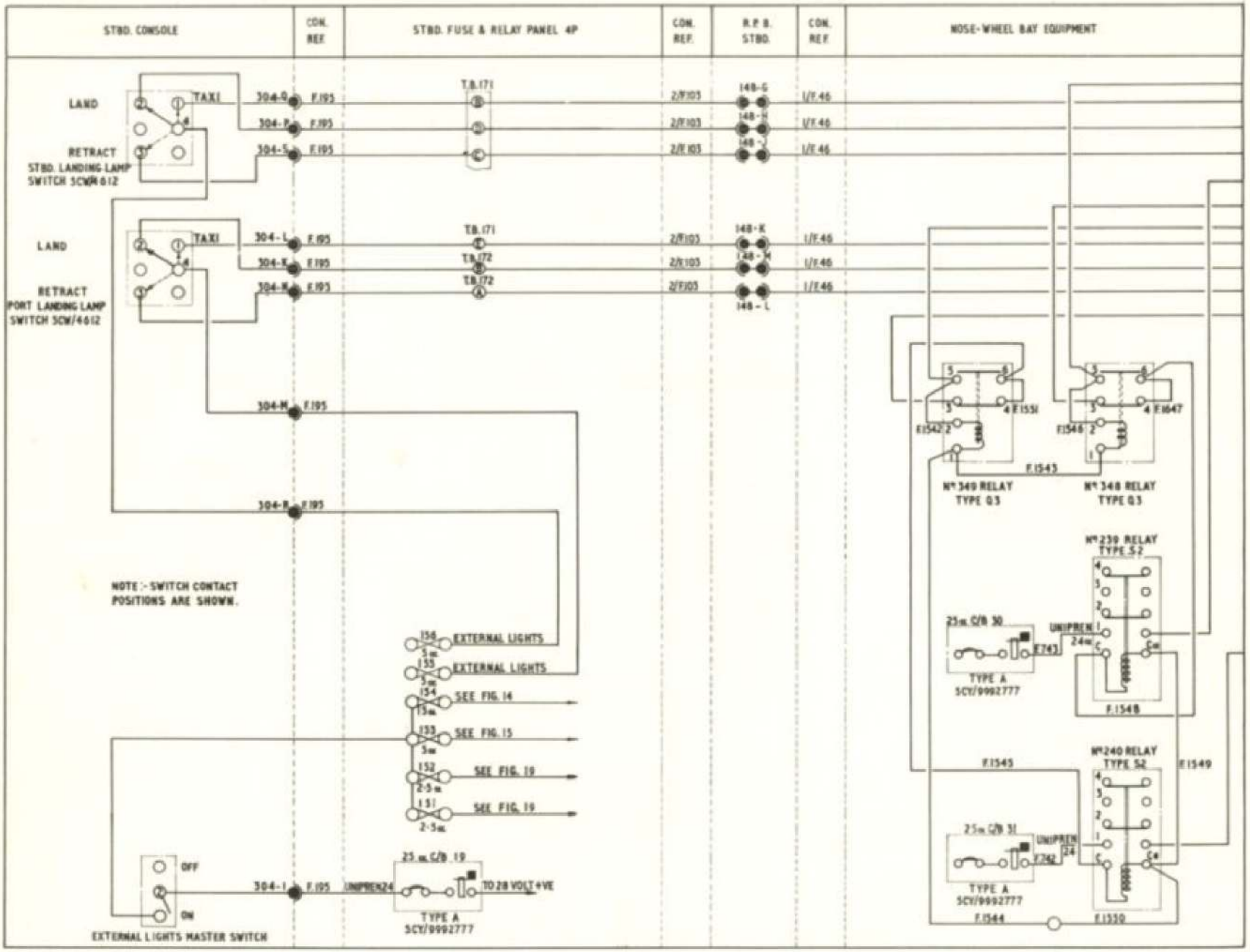

Fig 16 (1) Combined landing and taxying lamps

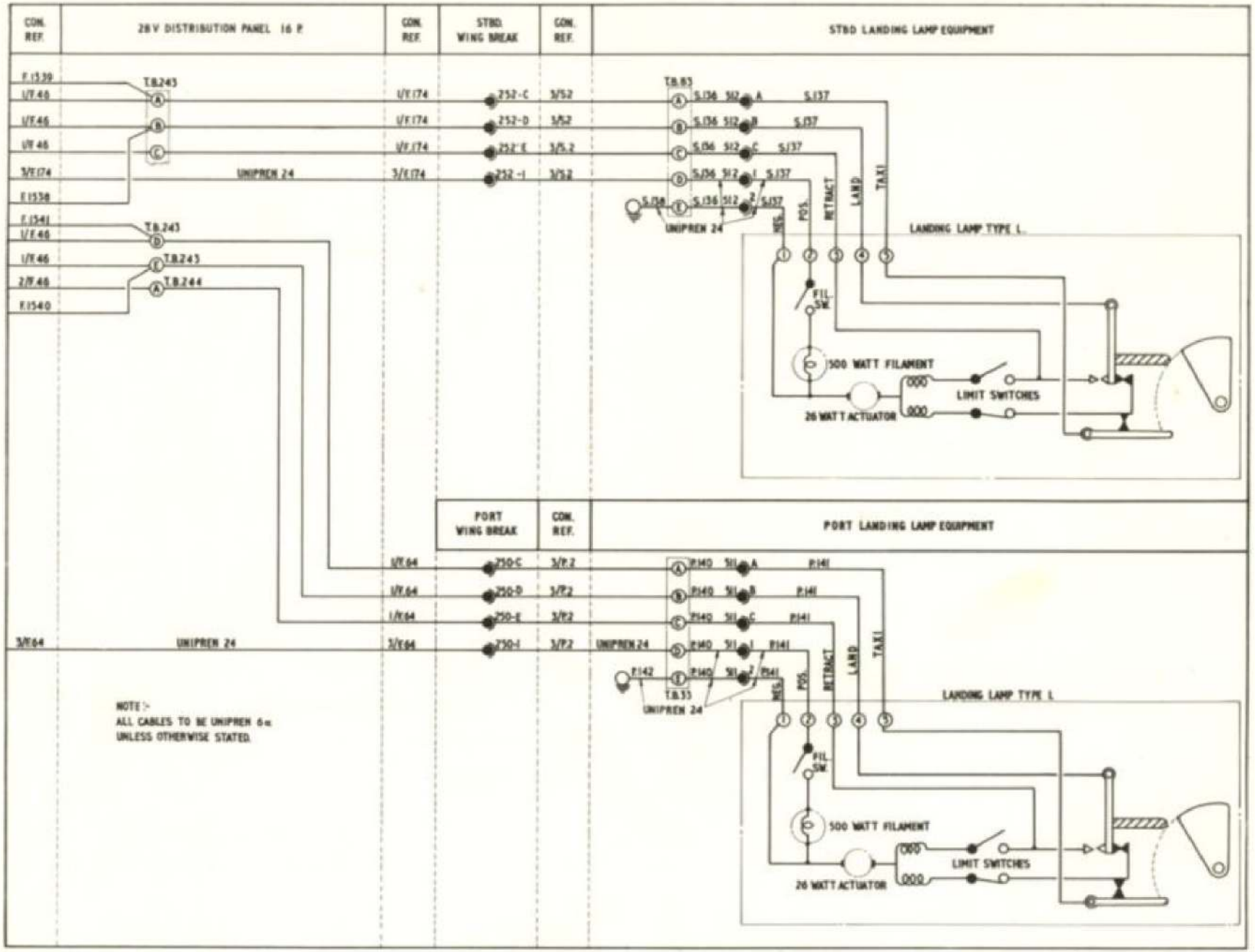

Fig 16 (2) Combined landing and taxying lamps

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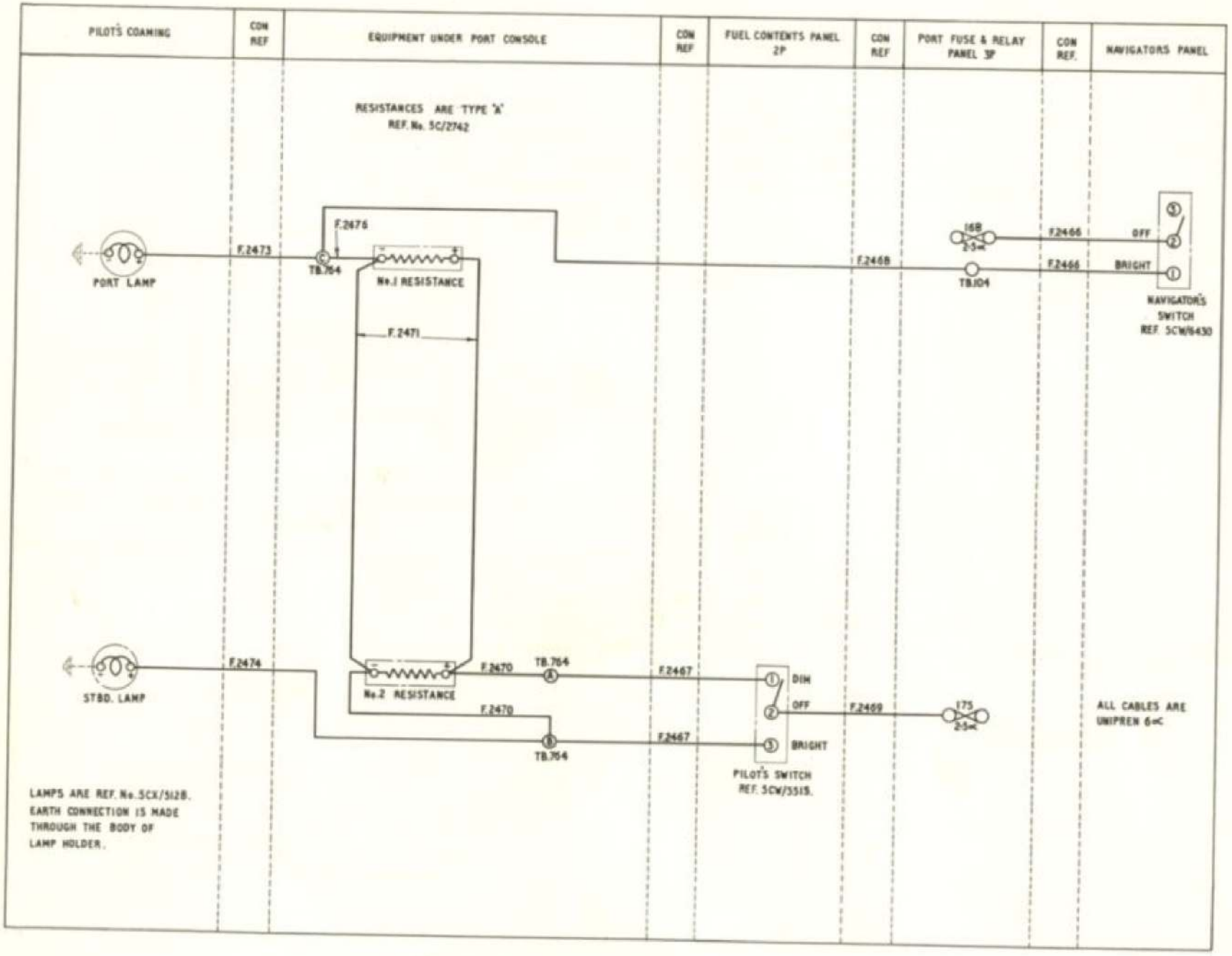

Fig 17 High intensity anti-dazzle lamps

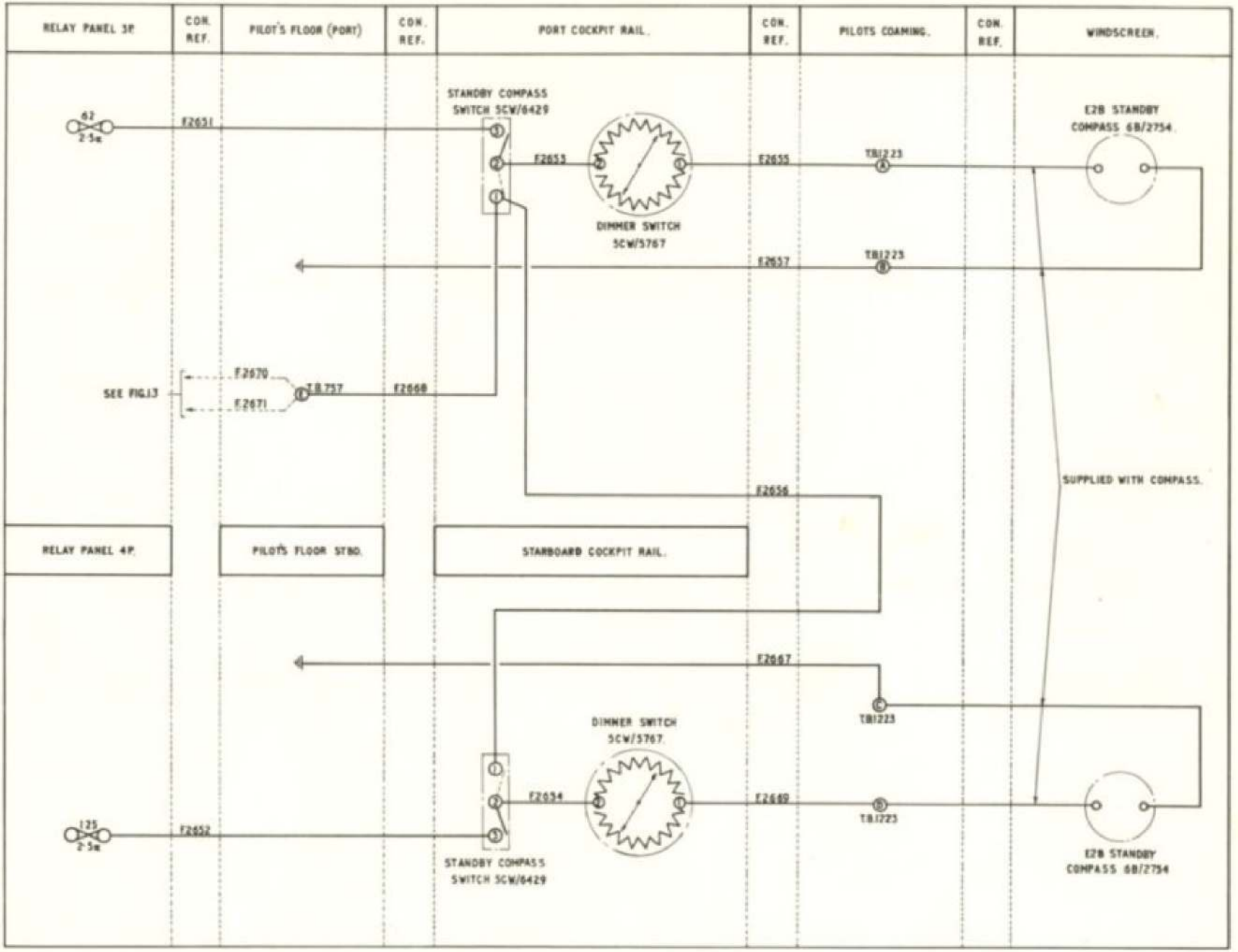

Fig. 18 Standby compass lighting

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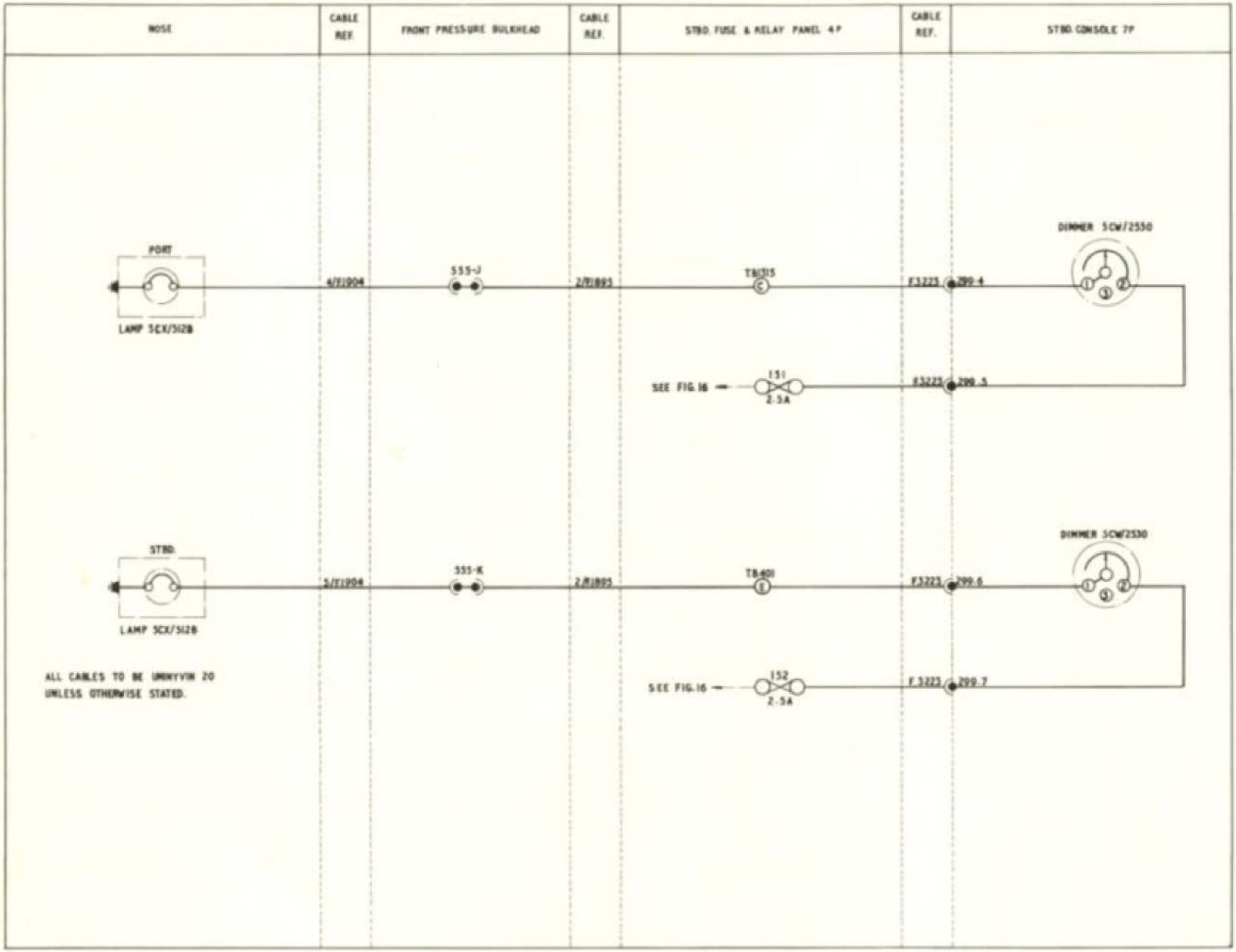

Fig 19 High intensity probe lighting

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Appendix 1 MOD.613 - INTRODUCTION OF E.C.M.

LIST OF CONTENTS

LIST OF ILLUSTRATIONS

LIST OF TABLES

Introduction

1. This appendix contains information on the changes made to the aircraft's interior and exterior lighting circuits by the introduction of Mod.613. A location illustration is provided, along with the associated routing charts, and also a table giving the types of filaments used.

DESCRIPTION AND OPERATION

Red floodlighting

2. Additional to the existing red floodlighting circuit, a knee pad lamp (cockpit lamp Mk.2) is provided for the 2nd pilot, and is positioned below the starboard cockpit rail. The knee pad lamp and its controlling dimmer switch, Type E, are fitted on a small panel, which is attached to the starboard red flood dimmer switch panel. The circuit is fed from fuse 1149 in panel 4P.

U.H.F. control unit lighting

3. A supply for the concealed dial lighting in the U.H.F. control unit (Book 3, Sect.6, Chap.1, App.1) is taken from the console red flood dimmer circuit. Connection is made at T.B.129A, the circuit being fed from fuse 104 via the existing dimmer switch.

E.C.M. ground service lighting

4. The E.C.M. compartment is lit by four cabin lamps, Avro Type 1/V6798, for ground servicing purposes. The lamps, numbering 20 to 23, are fitted with 18 W filaments and are connected from the existing ground service lamp No.19 (fig.3 and 4). Each fitting is a modified form of lamp, Ref.5C/701, in that the integral control switch has been removed, and the switch terminals bridged.

5. One lamp is fitted to each of the

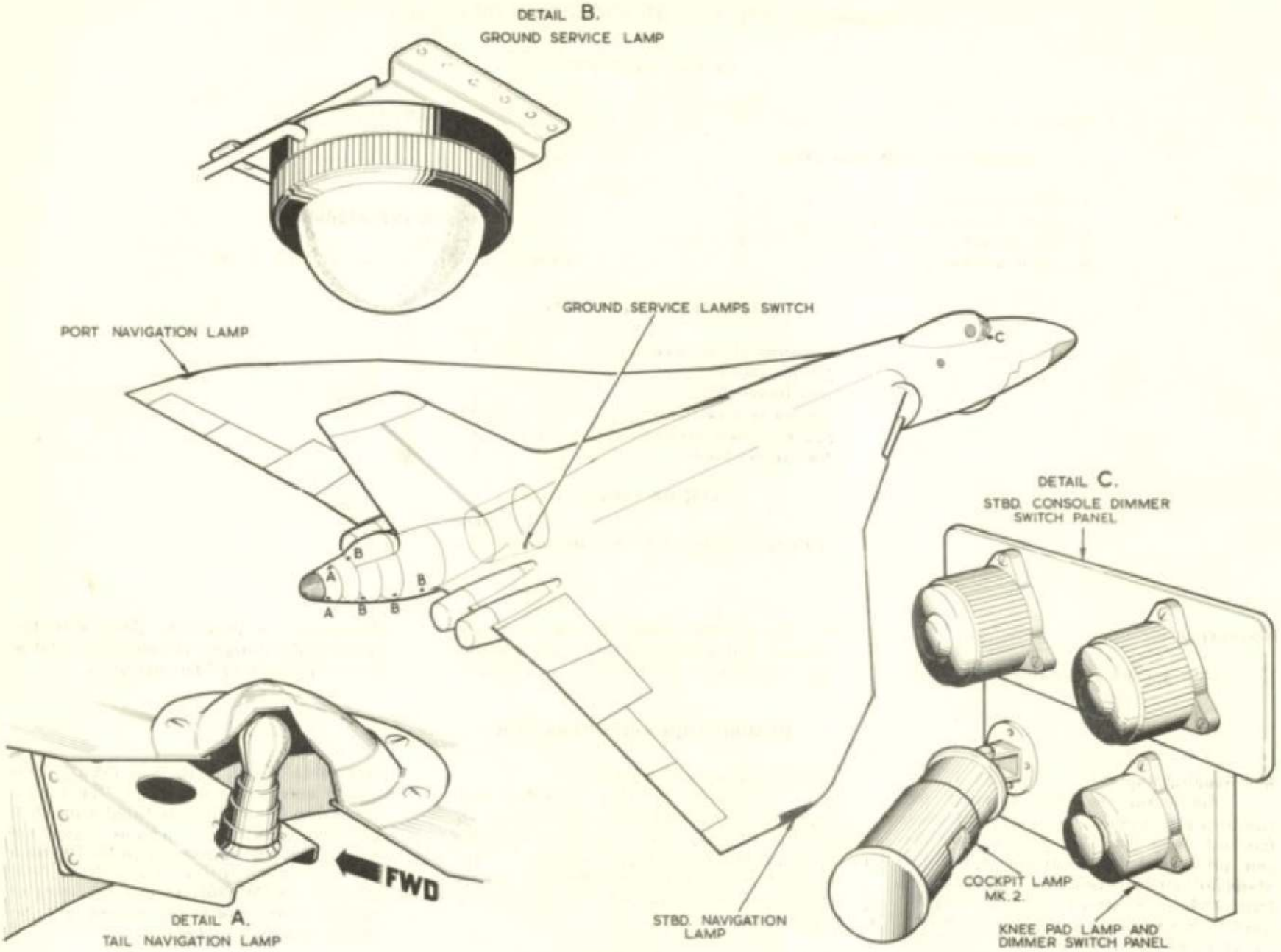

Fig.1 Location of components

E.C.M. compartment access doors, while the fourth is positioned adjacent to the A.R.I.5919 scanner. The circuit is controlled by the ground service lighting master switch in the power compartment and is fed from fuse 486, which has been uprated from 2·5 to 10 amp.

Navigation lamps

6. The two wing navigation lamps are located in the extended wing tips of the Mk.1A aircraft and are connected from additional terminal blocks as indicated in fig.5. In the case of the two tail navigation lights, reference to fig.1 will show that these are fitted at the aft end of the E.C.M. compartment. The remainder of the circuit is unchanged except for certain terminal block connections in 4P (fig.5).

SERVICING

General

7. All wiring for the interior and exterior lighting circuits should be examined periodically for signs of abrasion and security of connections. When unserviceable filaments are replaced, reference should be made to Table 1 to ensure correct type and wattage. Detailed servicing of lamp assemblies is governed by the instructions laid down in A.P.4343E, Vol.1, Sect.7 and 8.

REMOVAL AND ASSEMBLY

General

8. Access to the components is straightforward and therefore no detailed instructions are required. When it is necessary to remove or replace any components, secure all loose connectors to the adjacent aircraft structure to prevent damage.

TABLE 1

FILAMENT LAMPS - TYPE AND RATING

Service and location	Type	Ref.No.	No.off.
Ground service lamps - E.C.M. compartment	28-volt, 18 watt.	5L/9953278	4
Knee pad lamp - second pilot	28-volt, 6 watt.	5L/9952254	1
Navigation wing tip lamps	28-volt, 18 watt.	5L/9953283	2
Navigation tail lamps	24-volt, 10 watt.	5L/9952276	2

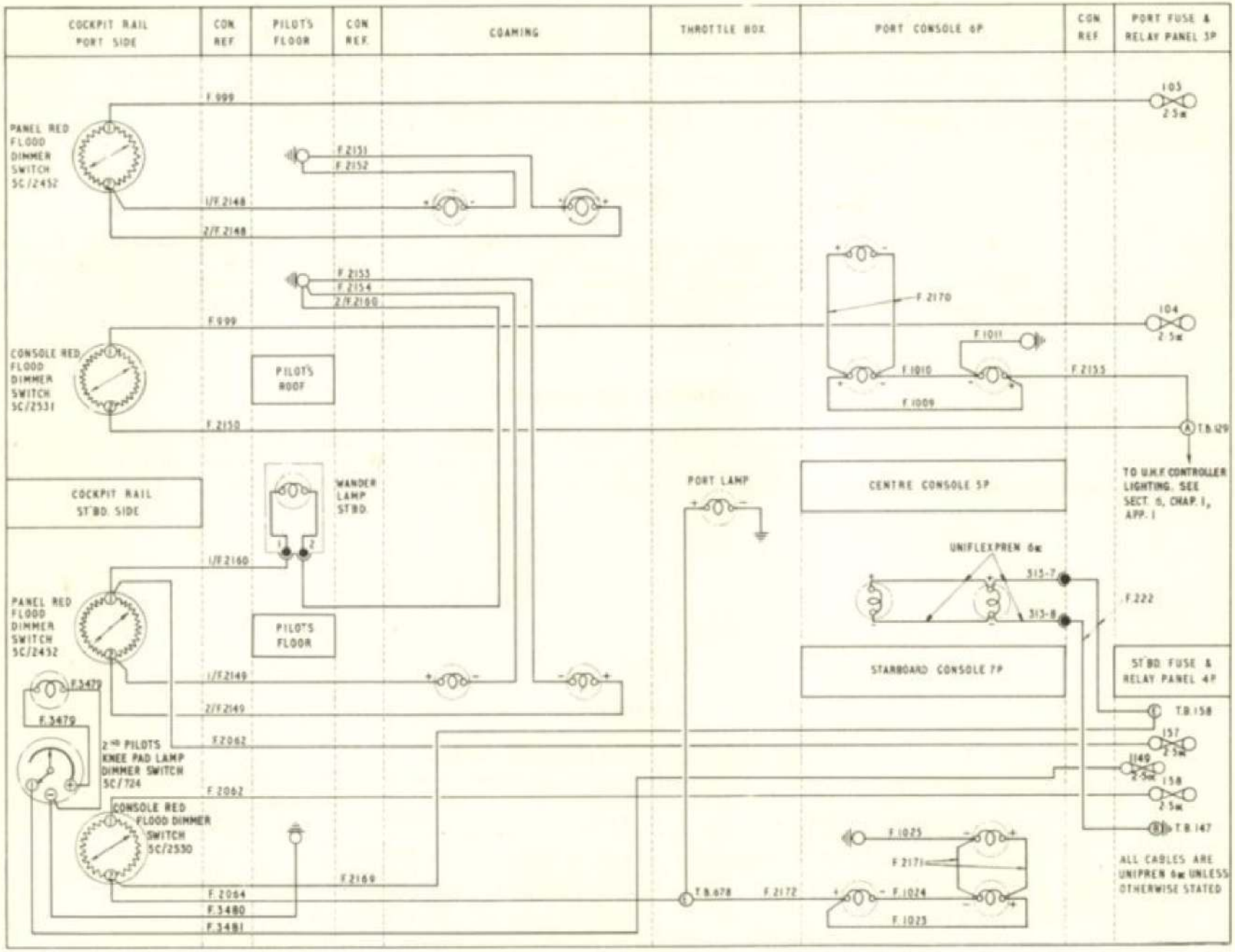

Fig.2 Red floodlights

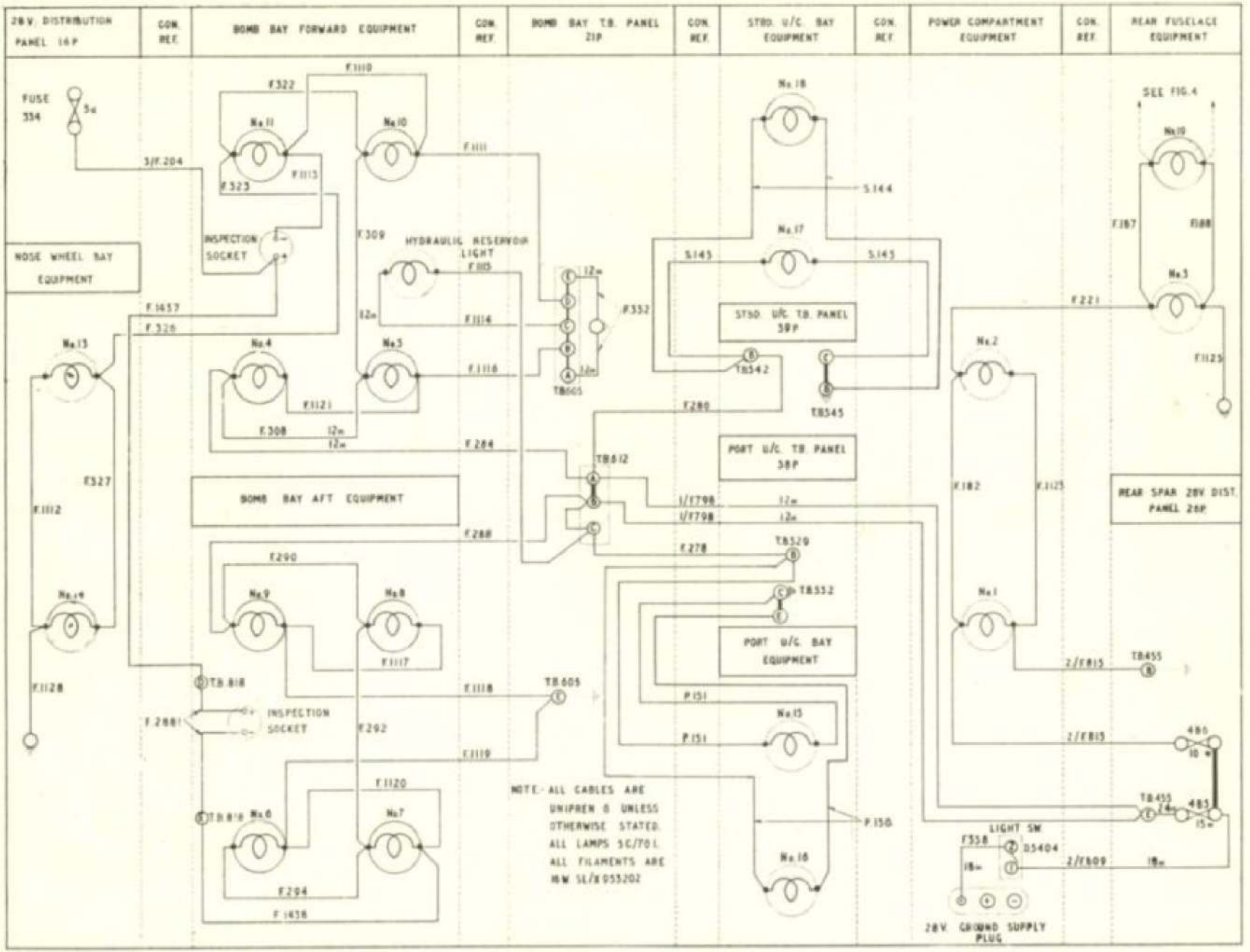

Fig.3 Ground service lighting

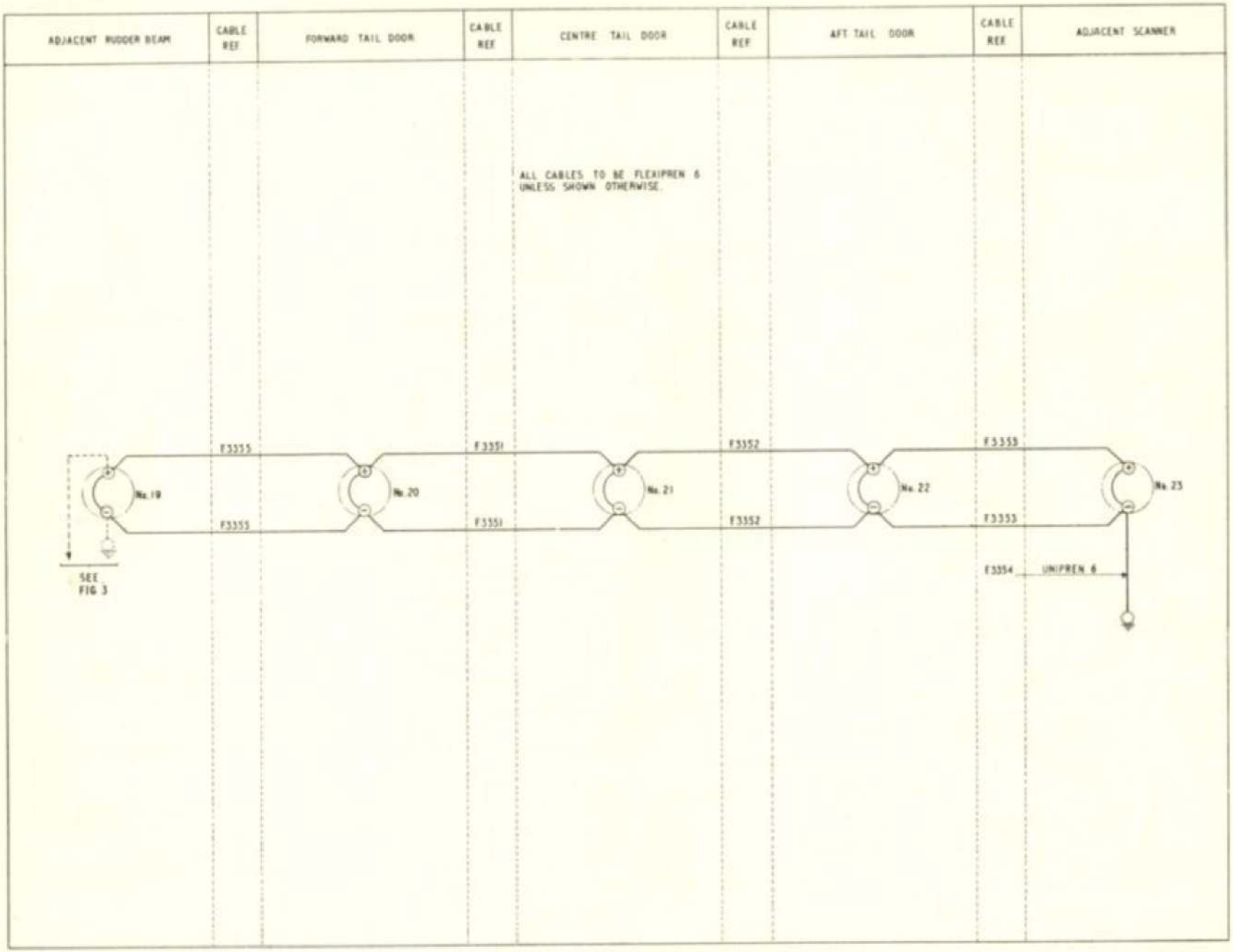

Fig.4 E.C.M. ground service lighting

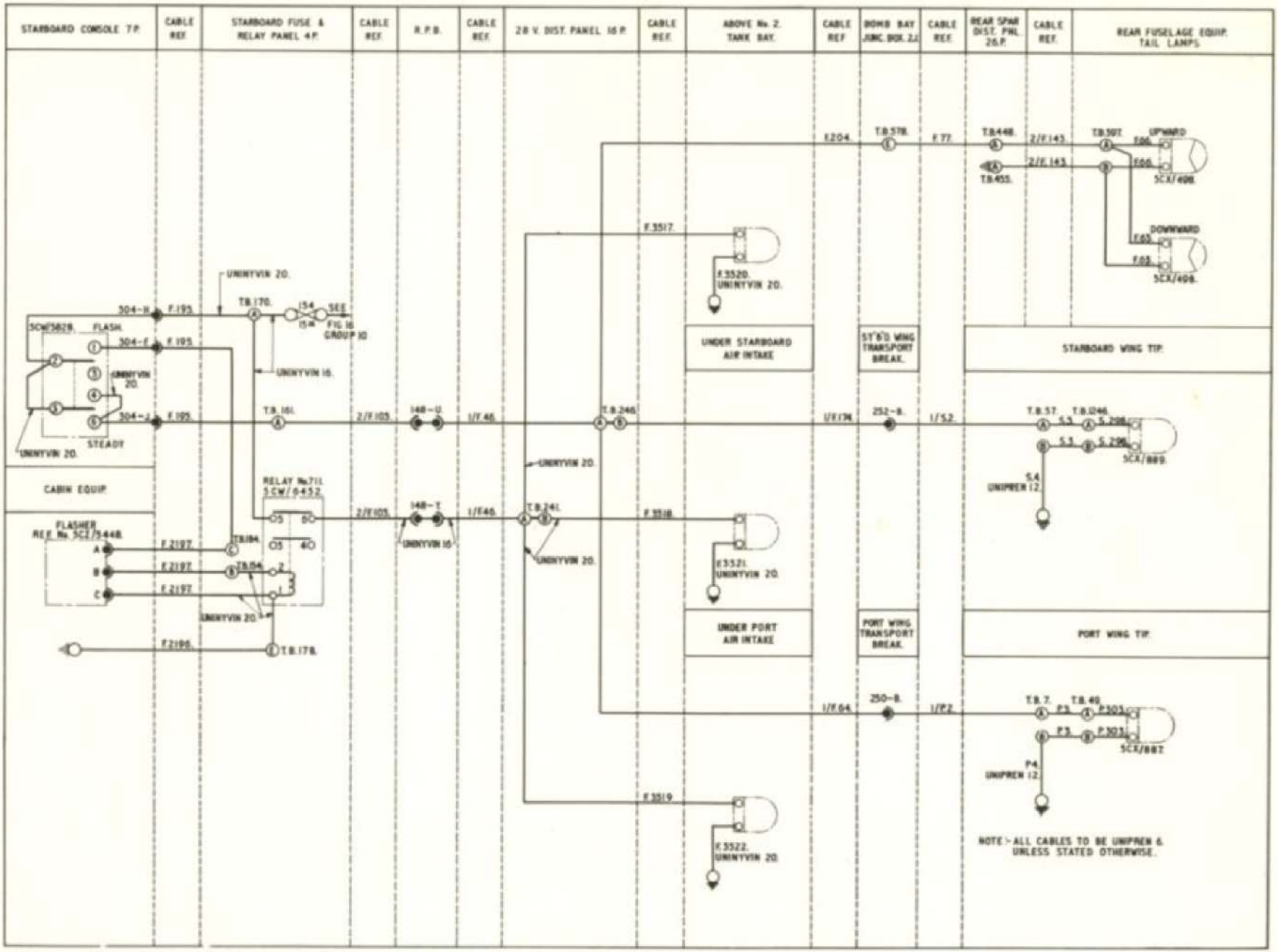

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Fig. 5 Navigation lamps

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