

GROUP H.1

RADIO AND RADAR SUPPLIES (CODE RT, VR, RC & IF)

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Equipment employed

1. The major components employed in the radio and radar supplies circuits are listed in Table 1, together with the appropriate Air Publications to which reference should be made for detailed descriptions and information on the servicing required to maintain them in an efficient condition:-

DESCRIPTION

General

2. The radio equipment in this aircraft comprises both main and standby U.H.F. installations (*described in Section 6, Chapter 1 of this volume*), and incorporates tele-briefing, voice recorder, and

radio compass installations, these latter being linked with whichever radio installation is in use by equipment in the radio relay box. Power is supplied to these installations from the supply panel (*Group B.1*) when the battery master switch is on, and is taken through a circuit-breaker, marked U.H.F. services which is mounted

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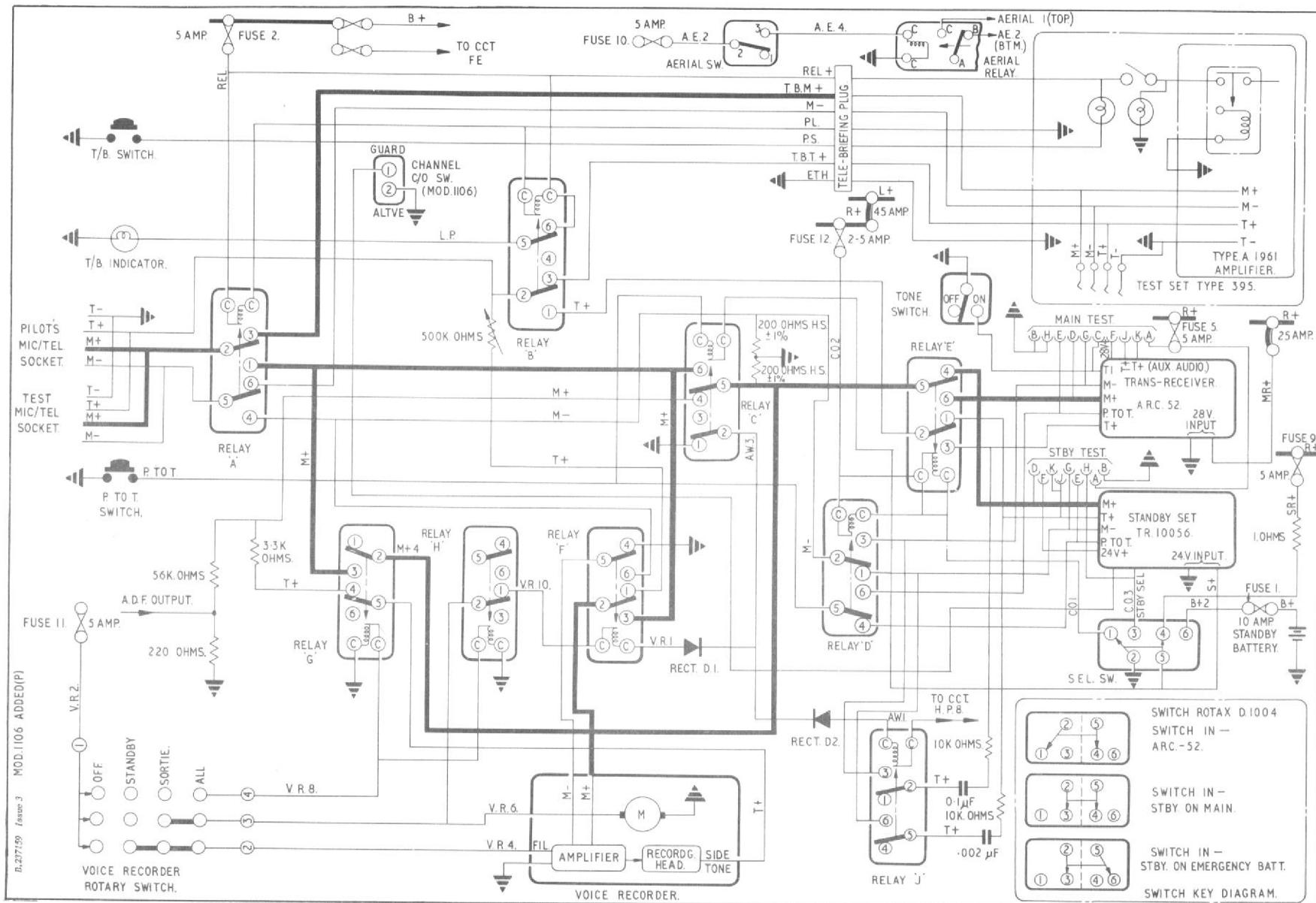


Fig. 1 Radio supplies - U.H.F., telebriefing and voice recorder (theoretical)

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TABLE 1
Equipment type and Air Publication reference

Equipment Type	Air Publication
A.R.I.18124/1 - U.H.F. (Main)	
Set selector switch, Rotax Type	
D.10004	A.P.4343C, Vol.1, Book 1, Sect.1
Control relays, Type SM.5A-N. 25 and	
Type S1	A.P.4343C, Vol.1, Book 2, Sect.3
Press to transmit switch (<i>part of throttle twist grip</i>)... ...	A.P.1275E, Vol.1, Sect.7
A.R.I.23057 - U.H.F. (Standby)	
Channel c/o switch, Type C.W.C.XD778	
No.4 (<i>Mod.1106</i>)	A.P.4343C, Vol.1, Book 1, Sect.1
Standby battery, Type Voltabloc	
Ref. No.19-VO-7	A.P.113C-0202-1 ▶
A.R.I.18012 - Telebriefing	
Telebriefing push switch, Type 1290	A.P.4343C, Vol.1, Book 1, Sect. -
Telebriefing indicator lamp, Type A	A.P.4343E, Vol.1, Book 4, Sect. 18
A.R.I.5877 - Radio compass	
Control unit, Type 8283, M.W.T. Co.,	
Ref. No. 10L/16287	A.P.116B-0102-16 ▶
Voice recorder	
Control switch, three-pole, four-position	
rotary, Ref. No. 5D/1760	A.P.4343X, Vol.1, Sect.16
Variable resistor, 500K Ohms, Type R.C.V1-A	
Ref. No. Z.262542	A.P. Vol.1, Sect. -
A.R.I.5848 - I.F.F.	
I.F.F. circuit breaker, Type A.6	A.P.4343B, Vol.1, Book 2, Sect.10
Inverter, Type 200	A.P.4343B, Vol.1, Book 3, Sect.16
I.F.F. Master switch Type XD777, No.4	
I.F.F. I.P. switch Type XD781, No.4 } ...	A.P.4343C, Vol.1, Book 1, Sect.1

below the supply panel, in the radio bay. This circuit breaker feeds the main U.H.F. transmitter-receiver, via a further circuit breaker, which is marked ARC.52 and mounted adjacent to the U.H.F. services circuit breaker. The U.H.F. standby installations may, in addition, be operated by an auxiliary supply from a 24 volt standby battery which can be switched into use if the main supply fails. The standby battery is contained in a readily detachable crate, attached to the forward undersurface of the lower radio mounting structure. The radar equipment is an I.F.F. Mk.10 installation (*described in Section 6, Chapter 2*); this is likewise supplied from the supply panel, and protected by a circuit-breaker mounted below it. This supply operates a Type 200 inverter which provides the a.c. required by the installation. A further d.c. supply to this installation is taken from a fuse situated on the cabin starboard shelf.

Radio supplies

Radio relay box

3. The radio relay box is mounted on the underside of the top radio mounting structure, in the radio bay; it contains most of the fuses and the relays that integrate the various circuits of the U.H.F. installation. These are illustrated diagrammatically in fig.3. All the fuses in use except No.1 and No.2 are fed from the U.H.F. services circuit-breaker: No.1 fuse is fed from the standby battery, and No.2 from two linked fuses on the supply panel which are supplied from the fire extinguisher circuit (*Group C.2*). No.2 fuse supplies energizing current to relays A and B in the tele-briefing circuit. The

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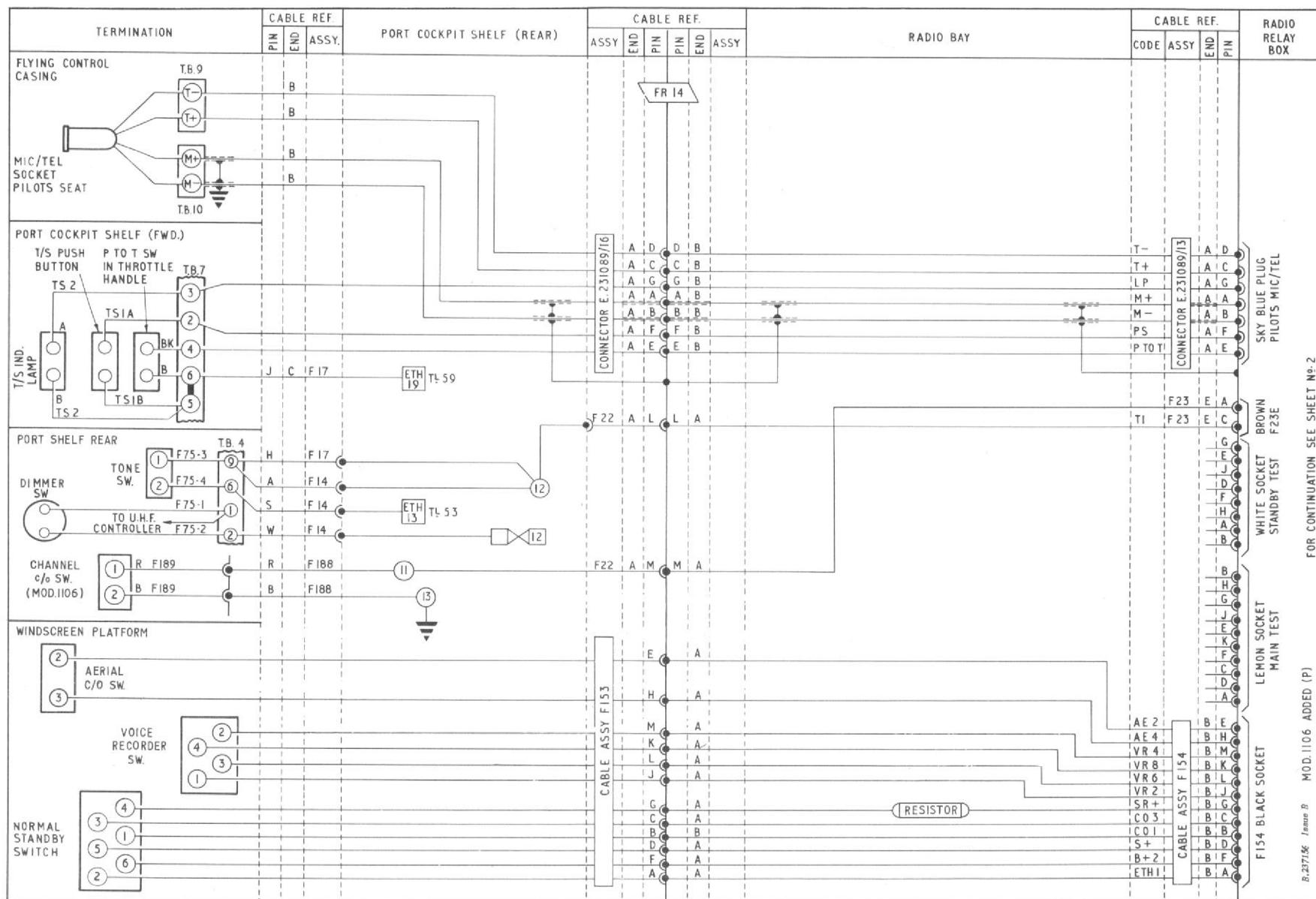


Fig. 2 Radio supplies - U.H.F., telebriefing and voice recorder (routeing sheet 1)

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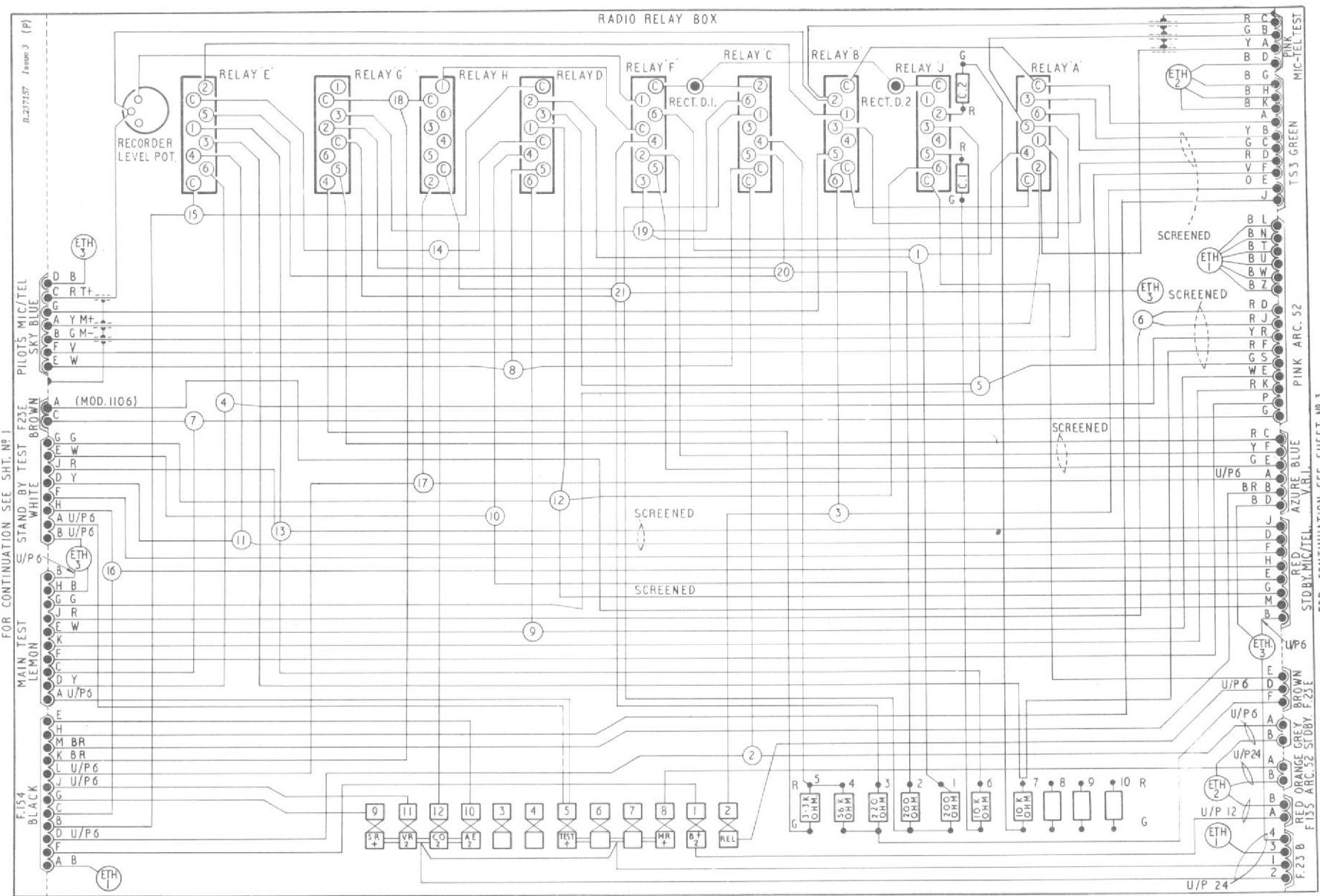


Fig. 3 Radio supplies-U.H.F.. telebriefing and voice recorder (routeing sheet 2)

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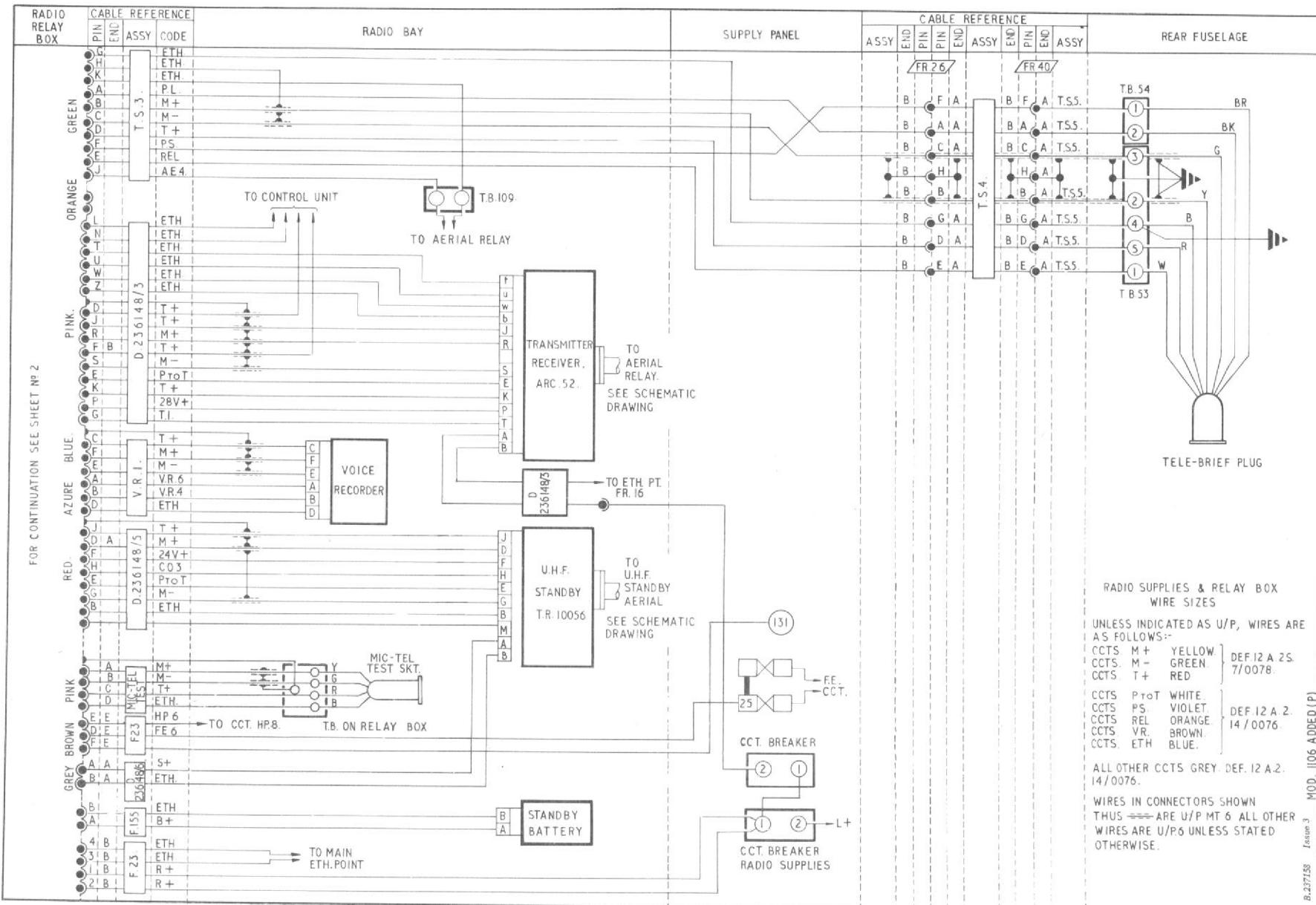


Fig. 4 Radio supplies-U.H.F. telebriefing and voice recorder (routeing sheet 3)

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other fuses in the relay box, i.e. those fed by the U.H.F. services circuit-breaker, supply the voice recorder and aerial change-over switches and their associated relays, all of which (*with the exception of the aerial relay*) are contained in the radio relay box. Relay J receives an energizing supply from outside the relay box, i.e. from the hydraulic pressure failure circuit (Group D.2). The resistors and capacitors which form the feed-back loop that is switched by relay J are contained in the relay box. The box also contains a potentiometer associated with the voice recorder circuit, and three resistors associated with the radio compass circuit.

A.R.I.18124/1 - U.H.F. (main)

4. The transmitter-receiver A.R.C.52 is supplied via the ARC.52 circuit-breaker, located below the supply panel in the radio bay. With the Normal/Standby set selector switch at A.R.C.52, this set becomes operative when the function switch of the Type 1607/2 control unit is placed to either of its ON positions. Relays D and E (fig.1) which are supplied from fuse No.12, are energized, and connect the set, in the "receive" condition, to the pilot's mic.-tel. socket. If the function switch is set to include the radio compass (A.D.F.) facility the A.D.F. output will be fed via contacts on relay C to the transmitter-receiver, and from thence to the pilot's telephone. The set may be switched to the "transmit" condition by operation of the press-to-transmit switch, thereby energizing relay C. Relay C's operating

coil is supplied from fuse No.9, via contacts 4-5 of the set selector switch. With this relay energized, the A.D.F. connection is broken at contacts 5-4, and the pilot's microphone is connected to the transmitter-receiver via contacts 5-6. ▶

5. The aerial change-over switch, which controls the aerial relay, is supplied from fuse No.10 in the radio relay box. With the switch in the No.1 aerial position, the relay is energized, and its contacts A-C connect the top aerial to the set; with the switch in the aerial No.2 position, the aerial relay is not energized and its contacts A-B connect the bottom aerial. The change-over switch is mounted near the set selector switch, on a bracket attached to the windscreens platform on the port side of the cabin. The aerial relay is attached to the starboard fuel tank access door on frame 19.

6. The hydraulic failure warning circuit (Group D.2) supplies the operating coil of relay J, which is connected to earth via a rectifier and contacts 2-1 of relay C. When relay J is energized, its contacts 2-3 or 5-6 connect a resistor-capacitor feed-back loop between the microphone and telephone circuits of the transmitter-receiver in use, thereby providing an audio signal in the pilot's telephone. The audio warning cannot operate during transmission, i.e. while relay C is energized, since its contacts 2-1 are then broken hence relay J cannot be

energized.

A.R.I. 23057 - U.H.F. (standby)

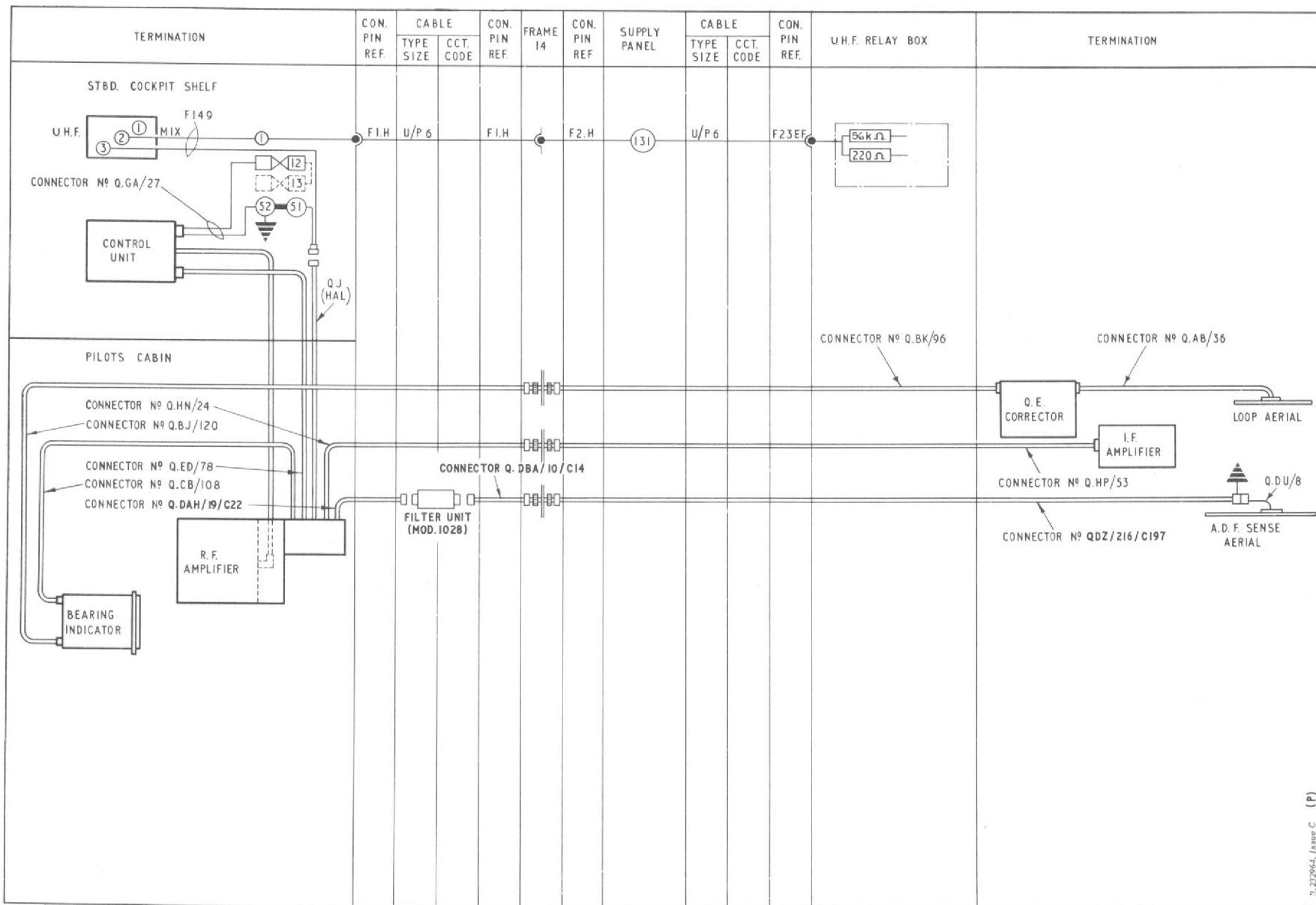
7. With the set selector in the S'BY NORMAL position, the supply to T.R.10056 from fuse No.9 is completed, being taken through a resistor which reduces the voltage to 24 volts, and via contacts 4-5 of the selector switch. Contacts on relays D and E (*which remain unenergized*) connect the transmitter-receiver in the "receive" condition, to the pilot's mic.-tel. socket. The set may be switched to the "transmit" condition in the same manner as that already described, i.e. by energization of relay C. When the set selector switch is in the S'BY ON ENERGY BATT position, T.R.10056 is supplied by the standby battery through fuse No.1 in the radio relay box, via contacts 6-5 of the selector switch. Connection of the telephone and microphone circuits is the same as for the

◀ S'BY NORMAL position. When a Type M.6 standby transceiver is installed, its power supply is taken through an interference filter mounted on the front of the set (Mod.1226), and with Mod.1106 incorporated, an additional test channel facility is provided for the standby set through the medium of the GUARD/ALTVE switch mounted on the port rear shelf adjacent to the U.H.F. dimmer switch. ▶

A.R.I.18012 - Telebriefing

8. The tele-briefing plug is connected to the pilot's mic.-tel. socket by relays A and B. These relays are supplied through

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3.232964, Issue C (P)

Fig. 5 Radio supply - radio compass

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fuse No.2 in the radio relay box; this fuse being supplied from the supply panel as described in para.3. The relays are energized when, by making the tele-briefing plug connection, the earth return of the circuit through the operating coil is completed. The contacts on relay A connect the microphone circuit, while on relay B contacts 2-3 connect the telephone circuit, and contacts 5-6 supply the tele-briefing indicator lamp from the energizing circuit. This circuit also supplies a relay in the tele-briefing building which operates when the tele-briefing switch in the aircraft is pressed, thereby enabling the pilot to talk back.

Voice recorder

9. The voice recorder system is controlled by a rotary switch which is supplied from fuse No.11 in the radio relay box. The switch is mounted adjacent to the U.H.F. set selector switch, and is marked OFF, S'BY, SORTIE, and ALL. When it is in the S'BY position, power is supplied to the valve heater in the recorder amplifier, and bias current is passed to the recording head. In the SORTIE position, power is supplied to the motor, and also, via contacts 2-1 of the unoperated relay H, to the coil of relay F, the circuit being completed via the rectifier and contacts 2-1 of relay C. With relay F energized, the pilot's microphone is connected via the contacts of the unoperated relay A, and contacts 6-5 and 3-2 of relay F, direct to the recorder amplifier. When the switch is in the position ALL, relays G and H are energized,

contacts 2-3 of relay G connect the pilot's microphone positive line direct to the transmitter-receiver in use via the contacts of relays A and E, at the same time, contacts 2-1 of relay H break the energizing supply to relay F, whose contacts 2-1 and 5-4 then connect the pilot's telephone to the recorder amplifier.

A.R.I.5877 - Radio compass

10. The radio compass installation is supplied from a fuse situated on the cabin starboard shelf, adjacent to the control unit to which the supply is connected. The supply is available when the battery master switch is on, and the radio compass becomes operative when the ON/OFF switch on its control unit is put to ON. Signals from the installation are fed via resistors and relays either to the audio stage of the transmitter-receiver in use, or to the recording head of the voice recorder as side tone. In the latter instance the signal is routed via contacts 4-5 of the unoperated relay G to the recording head; in the former, it is fed via contacts 4-5 of the unoperated relay C, and contacts 5-4 or 5-6 of relay E, according to whether the main or the standby set is in use.

Operation

General

11. If the foregoing descriptions of the switching operations of individual relays are read in conjunction with Section 6, Chapter 1, the operation of the U.H.F.

installation as a whole should be clear. The operation of the aircraft's electrical supply system is described in Group B.1, Section 5, Chapter 1.

Radar supplies

A.R.I.5848 - I.F.F.

12. The I.F.F. installation is fed from the aircraft's supply panel in the radio bay and is protected by a circuit-breaker situated below this panel. A further d.c. supply is taken from a fuse on the cabin starboard shelf. As there is no electrical switching of the power supply, further explanation is unnecessary.

Operation

I.F.F.

13. The A.R.I.5848 is switched on and controlled by two switches and a control unit, situated on the cabin starboard shelf. The function of these items is described in Section 6, Chapter 2, and the operation of the power supply will be obvious.

SERVICING

General

14. Testing and servicing of the U.H.F. standby battery should be carried out periodically, in accordance with the instructions given in A.P.4343A, Section 11. In addition, all components of the installation should be kept clean, and

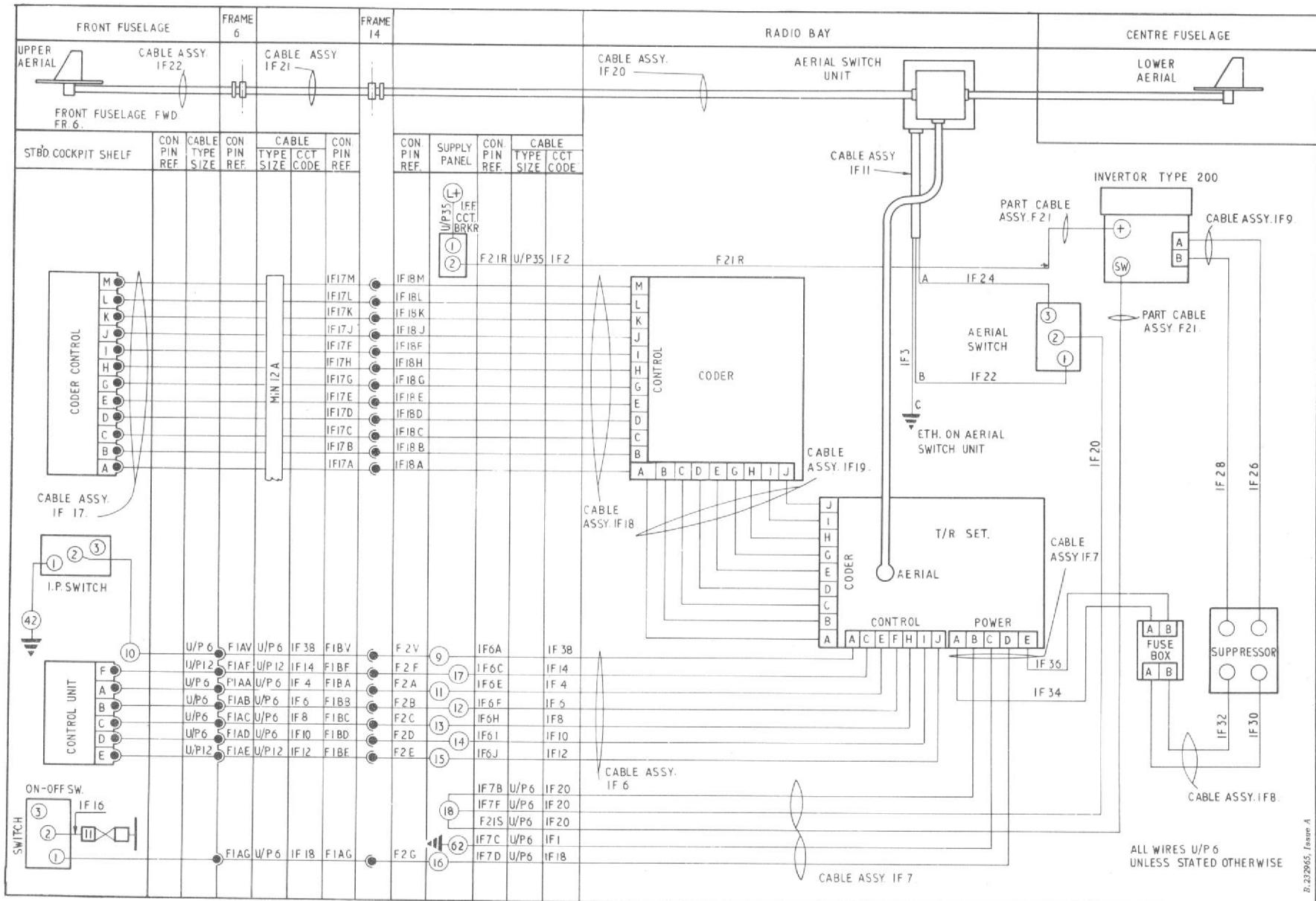


Fig.6 Radar supplies - I.F.F.

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the standard routine tests for security and serviceability as described in the appropriate Air Publications listed in para. 1, should be applied. When a fault is reported in either the radio or radar installations, the supply circuits should first be checked, to ensure that the fault does not lie in these circuits. Ensure also that all connectors are correctly mated, and test the voltage, both on and off load. General servicing of the electrical system is

described in Group A.1.

REMOVAL AND ASSEMBLY

General

15. Once access has been obtained, the removal and assembly of the electrical

components forming the radio and radar supply circuits should present no difficulties. The removal of the Type 200 inverter is described under the removal of the gun firing panel in Group A.2 and the removal of the U.H.F. relay box, which carries the majority of the radio supply equipment, is covered in Section 6, Chapter 1. Removal of the U.H.F. standby battery is also described in Section 6, Chapter 1.



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