Chapter 1

WIRELESS INSTALLATION

▶ (Includes Mods 1310, 1429 and 1480) ◀

CONTENTS

TABLE 1

Equipment type and Publication reference

Equipment Type	Air Publication
Main UHF - ARI 18124/1	
Transmitter-receiver, Type TR5/ARC 52	AP116D-0133-1
Mounting tray, Type MT 1477/ARC 52	
Control unit, Type C1607	
Mic-tel, Socket Type 359	
Blade aerials, McMichael wideband	
▶ Main UHF - ARI 23301/80 - Mod 1480	
As detailed in Appendix 2	AP116D-0154-1 ◀
VHF - ARI 23288 (AD 120) - Mod 1429	
Transmitter-receiver, Type AA1201-1	AP116D-0150-1
Amplifier, Type A01-5208-03	
Mounting tray, Type AA1205-1	
Control unit, Type AA1202-2	
Aerial, Type 226	
UHF-VHF selector relay box - Mod 1429	
Radio relay box	BAe Design
Stand-by UHF - ARI 23057	
Transmitter-receiver, Type TR 10056	AP116D-0110-16
Mounting tray, Type 1031	
Whip aerial, Type 11789	
Radio interference filter, 5915-99-97-0362	
Stand-by battery, Voltabloc or Varley	AP113C-0300 Series
Flasher unit, Type B	AP113D-1400 Series
Tele-briefing - ARI 18012	AP116N-0301-1

DESCRIPTION

Introduction

1. This chapter contains a description of the wireless installation of this aircraft including the servicing information necessary to maintain the installation in an efficient condition. Information on the removal of the various components, together with illustrations showing the location and interconnection of the equipment are also included. Technical information and detailed description of the standard equipment used will be found in the ▶ Air Publications listed in Table 1. For aircraft embodying Mod 1310 and Mod 1480 refer to Appendix 1 and Appendix 2 in this chapter. ◀

General

▶ 2. The wireless equipment consists of an ARI 18124/1, pre-Mod 1480, or an ARI 23301/80, post-Mod 1480, UHF communication installation, ◀ with which is associated an ARI 23057 UHF standby installation and an ARI 18012 tele-briefing system. A system to give the pilot audio warning of loss of hydraulic pressure is linked with the UHF installation. An auto-tone transmission facillity is also provided to operate at seat ejection. Most of the UHF equipment is carried in the radio bay in the front fuselage, being remotely controlled by a control unit and switches situated in the cabin. Mod 1429 introduces an ARI 23288 (AD120) VHF communication installation in addition to the UHF installations. The VHF system is remotely controlled by a control unit situated in the cabin which, when selected ON, automatically switches the mic-tel and press-to-transmit circuits from the UHF system to the VHF system. UHF is immediately available when the VHF control unit is switched off. The location of the wireless equipment is illustrated in fig. 1, 2, 3 and 4.

Radio bay and mounting structure

3. The radio bay is located in the front fuselage and extends aft from frame 16 to the forward transport joint. Apart from the UHF radio sets and their associated equipment, this bay also contains various electrical components, notably, the electrical supply panel, generator control panel and the batteries. Access to the bay may be obtained by opening the access doors in the undersurface of the front fuselage immediately in front of the forward transport joint.

4. The radio mounting structure is in two main parts, each carrying mounting plates and bearers for the UHF transmitter-receivers and their associated equipment. The upper structure consists of two angle-sectioned beams with a platform carried between them. The complete assembly extends across the radio bay and is bolted to frames 17A and 17B. Another platform is attached to the starboard side of the beam bolted to frame 17B and extends aft to brackets on frame 19. The lower structure extends along the port side of the radio bay and consists of a number of square tubes, bolted together through gusset plates, and arranged so as to form two platforms, one above the other. The forward end of the structure is in the form of a diaphragm and the complete assembly is bolted to brackets on frames 16 and 19.

ARI 18124/1

5. The ARI 18124/1 is a multi-channel UHF communication installation, which uses a transmitter-receiver carried in a mounting tray situated at the aft end of the bottom platform of the lower radio mounting structure described in para 4. The installation employs a wideband, blade type aerial, which projects upwards from the starboard side of the hood fairing above the radio bay. A mic-tel pull out socket for the pilot's ejector seat connection is located on the port side of the flying control casing.

6. The installation is remotely controlled by a control unit, normal and emergency press-to-transmit push-switches a tone transmit switch and a normal/standby set selector switch. The control unit, which incorporates two panel lamps to provide diffused illumination of the controls, is situated on the cabin port shelf. The normal press-to-transmit push-switch is incorporated in the throttle twist grip, and the tone transmission switch is situated on the cabin port shelf, just forward of the control unit. The normal/standby set selector switch, labelled ARC 52 and ST BY and the emergency press-to-transmit switch, labelled EMERGY P to T, are both situated on a mounting bracket attached to the glare shield on the port side of the cabin. The emergency press-to-transmit switch is provided for use should the normal switch in the throttle twist grip fail to function. The control unit's panel lamps are wired into the cabin lamps circuit *(Sect 5, Chap 1, Group F1)* and are controlled by the cabin shelf red lamps dimmer switch.

7. The automatic tone transmission is initiated, when the seat is ejected, through a switch unit mounted on the starboard longeron tie member forward of frame 13. The tone is generated by a resistor-capacitor feed-back loop between the microphone and telephone circuits, and is automatically pulsed on and off by a flasher unit mounted on the forward face of frame 14.

8. The installation is supplied through a circuit breaker, which is situated below the electrical supply panel in the radio bay, and fed from the aircraft's d.c. electrical system. Normal /standby set selection, mic-tel and press-to-transmit switching is accomplished by a number of relays contained together with the circuit fuses, in a readily detachable box, known as the UHF radio relay box, pre-Mod 1429, and the radio relay box, post-Mod 1429. This box is mounted to the underside of the top radio mounting structure, described in paragraph 4. The box is used to integrate all the radio installations and carries the control relays and fuses for the UHF standby set, tele-briefing and hydraulic pressure failure audio warning installations, together with two test sockets, one for the main and the other for the standby UHF transmitter-receiver. On post-Mod 1429 installations, the control inputs and audio outputs of the main UHF transmitter-receiver are also routed through a UHF-VHF selector relay box.

ARI 23057

9. The ARI 23057 is a UHF standby communication system for use should the aircraft's normal transmitter-receiver fail. It employs a pre-set, two channel transmitter-receiver, which is carried in a mounting tray situated just forward of the main UHF transmitter-receiver on the bottom platform of the lower radio mounting structure. The installation uses a whip aerial, which projects downwards from between frames 9 and 10 on the starboard underside of the front fuselage.

10. Switching from the main transmitter-receiver to the standby set is accomplished by operation of the normal/standby switch *(para 6)*. This switch also controls relays within the UHF radio relay box *(para 7)*, which switch the pilot's mic-tel socket and the press-to-transmit push-switches to the standby set.

11. The installation is supplied with power from the aircraft's main d.c. electrical system, but should this source fail, a 24-volt standby battery may be brought into service. The main d.c. supply is taken from a fuse in the UHF radio relay box and is reduced to the value required by the installation by a resistor carried in a box attached to the platform on the starboard side of the upper radio mounting structure *(para 4)*. The standby battery is carried in a readily detachable mounting crate attached to the forward undersurface of the lower radio mounting structure.

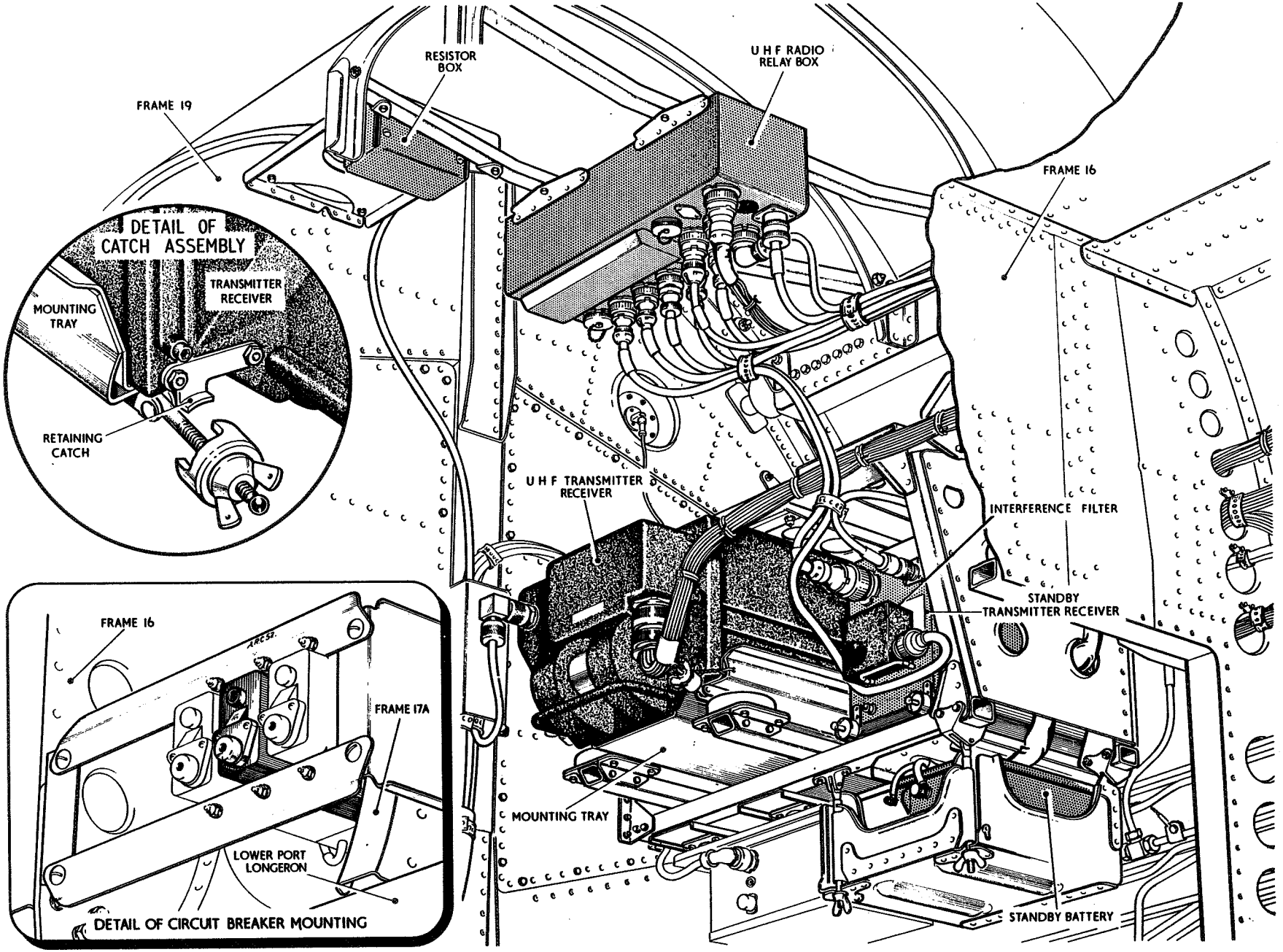

Fig. 1 Wireless installation — location (1)

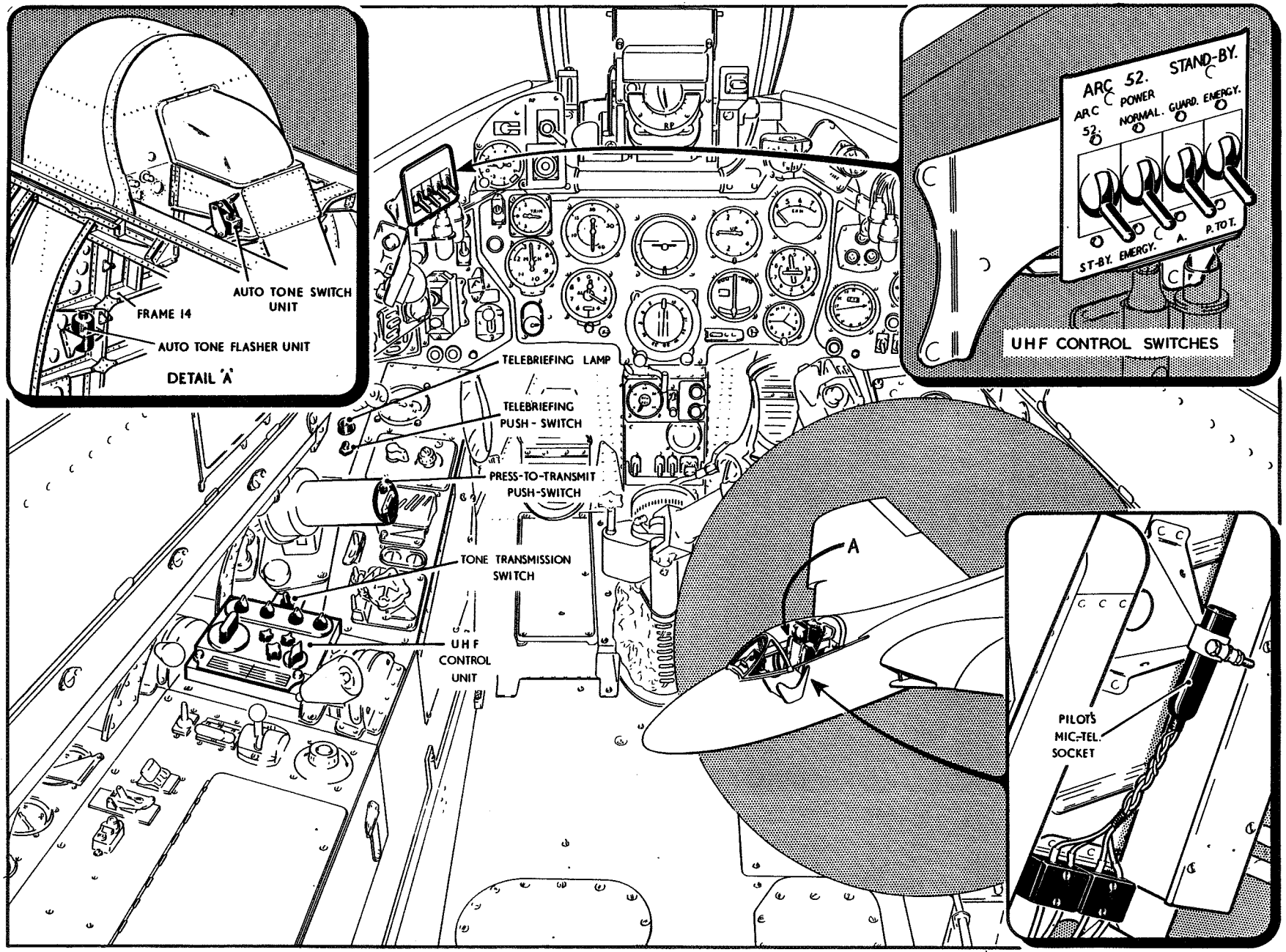

Fig. 2 Wireless installation – location (2)

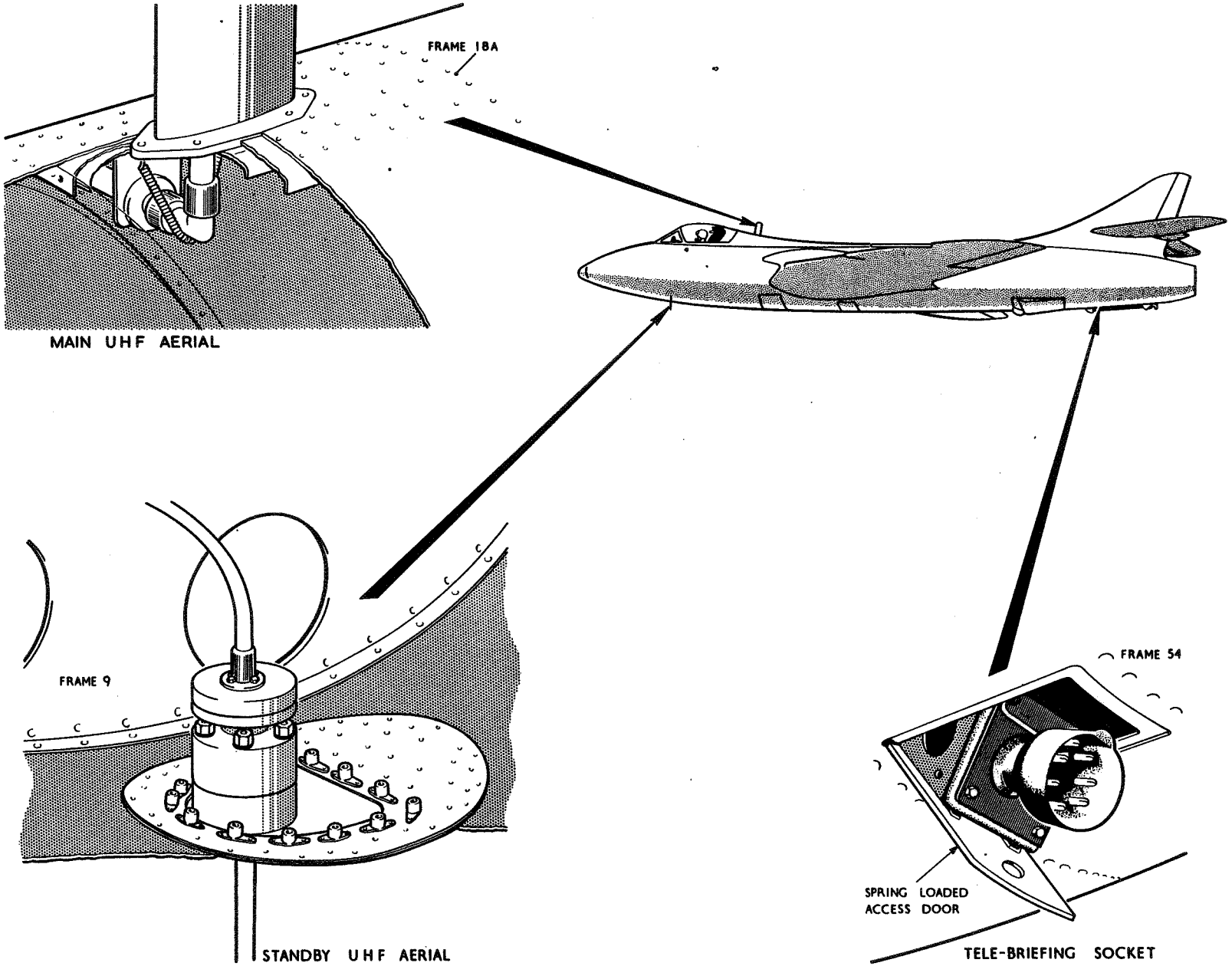

Fig. 3 Wireless installation — location (3)

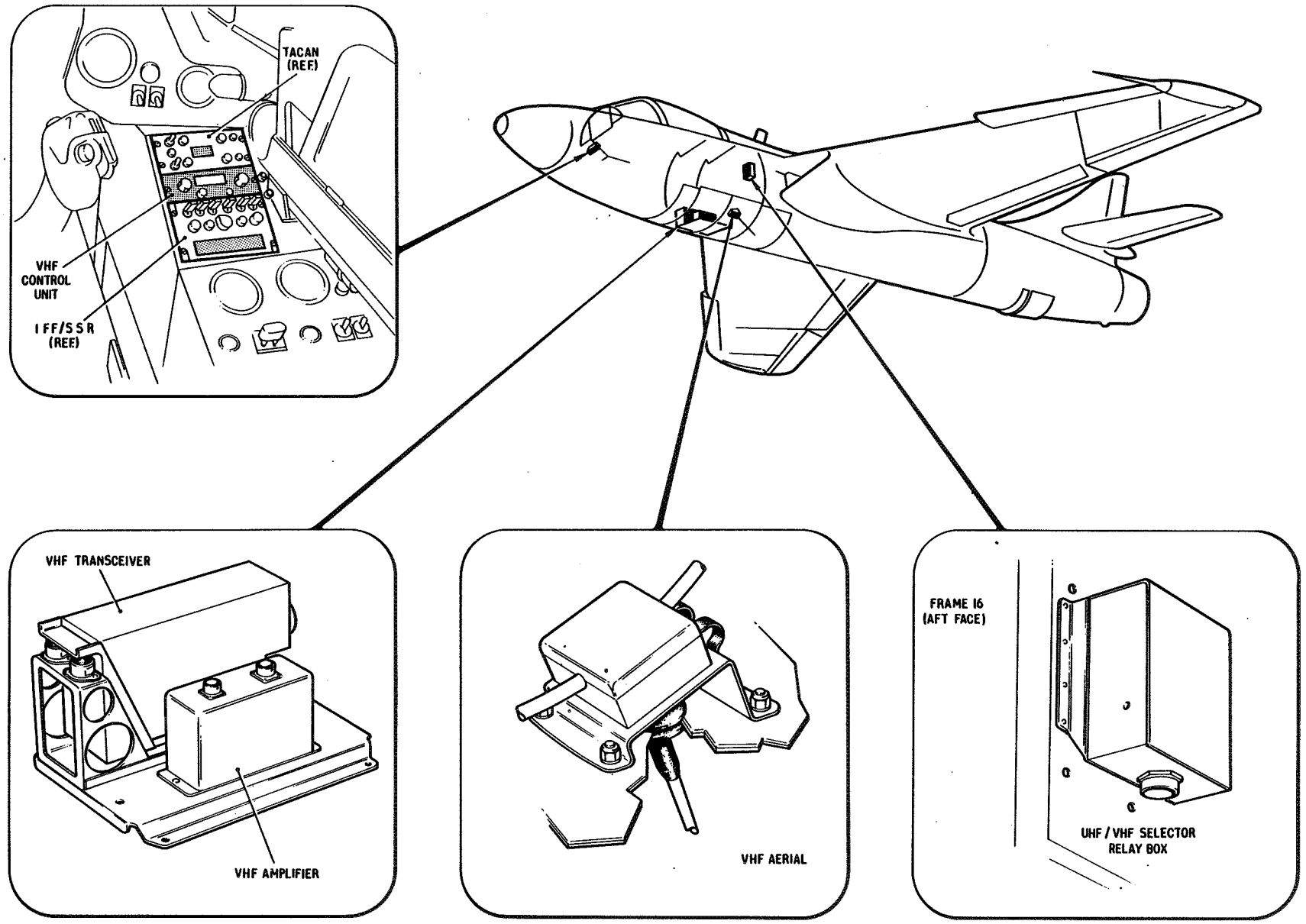

Fig. 4 Wireless installation – location (4)

12. Switching the standby set from the main d.c. supply to the standby battery is accomplished by the operation of a change-over switch, which is labelled POWER NORMAL and EMERGY and situated on the switch bracket attached to the port glare shield in the cabin. Two channel working is provided for by use of a further change-over switch, which is labelled GUARD and A and mounted adjacent to the power change-over control switch.

12A. A radio interference filter unit is introduced *(Mod 1226)* to limit interference caused by the converter in the radio transmitter-receiver. The unit is secured by spring-tension clips to the front of the receiver.

ARI 18012

13. A push-switch and an indicator lamp for the tele-briefing installation are mounted on the forward end of the cabin port shelf. Provision for the connection of the tele-briefing cable, is made by a plug mounted on a spring-loaded access door between frames 53 and 54 in the under-surface of the rear fuselage. The control relays and a fuse for this installation are contained in the UHF radio relay box located in the radio bay.

ARI 23288 - Mod 1429

14. The ARI 23288 (AD120) is a solid state VHF (AM) communication system which provides two way voice communication. The system consists of a transmitter-receiver, an audio amplifier, a control unit and a whip aerial. The transmitter-receiver and audio amplifier are secured to a mounting situated on the access door between frames 12 and 16. An associated type 226 whip aerial projects downwards from the port side of the access door. The system is remotely controlled by a VHF control unit and the normal or emergency press to transmit switches. The control unit, which incorporates panel and dial lighting, is situated on the cabin starboard shelf. Press-to-transmit and mic-tel switching is accomplished through the radio relay box the UHF-VHF selector relay box and the audio amplifier. The UHF-VHF selector relay box is situated in the radio bay on the port side of frame 16. Power to the installation is supplied from the supply panel in the radio bay, through a circuit breaker mounted below the panel.

Power supplies and operating frequencies

15. The electrical supply circuits for the radio installations and the operation of the control relays in the UHF radio relay box, pre-Mod 1429, and the radio relay box and UHF-VHF selector relay box, post-Mod 1429, are described in Sect 5, Chap 1, Group H1. Information on the hydraulic pressure failure audio warning system is given in Sect 5, Chap 2, Group 5A. The frequency range of the main UHF transmitter-receiver extends from 225.0 to 399.9 MHz and the installation provides for the automatic selection for any one of 19 preset frequency channels *(including the guard frequency),* and manual selection of any one of 1750 frequency channels spaced 100 kHz apart. The UHF standby transmitter-receiver operates on a frequency of 243.0 MHz or on an alternative channel, spaced by 1 MHz above or below this frequency. The VHF transmitter-receiver operates within a frequency range of 118.0 MHz to 135.975 MHz in 25 kHz increments which provides for 720 channels.

Interconnection

16. The various components of the wireless installations are interconnected as shown in fig. 5 and 5A by connectors, strapped and clipped to the aircraft's structure. These connectors are metal-braided and non-braided types fitted with standard and miniature plugs and sockets; the metal braided connectors being bonded where necessary by the clips holding them in position. Wiring diagrams of the radio relay box are given in fig.6, 6A, and 6B.

OPERATION

General

17. For the guidance of servicing personnel, a brief description of the operating procedure for the various radio installations will be found in the following paragraphs.

ARI 18124/1

18. The setting-up and operating instructions of the ARI 18124/1 installation are given in detail in AP116D-0133-1. All control of the installation is achieved by the use of the UHF control unit, normal/standby set selector switch, tone switch and the press-to-transmit push-switches. The installation is supplied from the aircraft's main d.c. electrical system and may be used whenever the aircraft's battery master switch is placed in the ON position.

19. The UHF control unit incoporates all the operational controls and provides the following facilities.

(1) *Function switch.* This is a four-position rotary switch engraved OFF, T/R, T/R + G and ADF. In the OFF position, the installation is inoperative, as the power supply relay within the transmitter-receiver is not energized. In the T/R position, the power supply relay is energized and the main transmitter-receiver is switched on for operational purposes. With the switch in the T/R + G position, the guard receiver in addition to the main transmitter-receiver is available. In the ADF position, the transmitter-receiver is switched for automatic direction finding operations with the appropriate airborne equipment and also permits normal communication facilities.

(2) *Channel selector switch.* This is engraved CHAN and has 20 positions. Those positions numbered 1 to 18 are used to select the required preset frequency channels. The two remaining positions are annotated M and G. The M position is used to switch the frequency selection to manual control and the G position is normally set to the guard frequency, thus enabling the main transmitter-receiver to be used on the guard frequency independently of the guard receiver. The frequencies of the pre-set channels are marked on an ivorine tablet below the channel selector switch.

(3) *Manual frequency control.* The MANUAL control consists of four control knobs, each of which is associated with numbers appearing in an aperture above each knob. The controls are manipulated to set the numbers to correspond with the required frequency channel, thus enabling any one of the 1750 channels to be selected as required. This selection is overriden whenever the channel selector switch is moved from the M position.

(4) *Volume control.* This is a potentiometer, engraved VOLUME, and is used to adjust the level of the audio signal to the telephones.

20. The normal/standby set selector switch is a three-position, without centre off, toggle switch labelled ARC 52 and ST BY. The switch controls the change-over from the main transmitter-receiver to the standby set as follows:-

(1) When the switch is in the ARC 52 position, the pilot's mic-tel socket and press-to-transmit push-switches are connected to the main transmitter-receiver via the relays in the UHF radio relay box.

(2) When the switch is in the ST BY position, the relays in the UHF radio box switch the pilot's mic-tel socket and press-to-transmit push-switches to the standby transmitter-receiver.

21. The tone switch is a single-pole, two-position, spring return to off, toggle switch labelled TONE-OFF and ON. When this switch is held in the ON position, the main transmitter is automatically tone modulated at between 920 Hz and 1120 Hz for direction finding or emergency purposes.

22. The normal press-to-transmit push-switch is a push-button incorporated in the throttle twist grip and is engraved PRESS TO TRANSMIT. It must not be confused with the air brake control switch, which is also fitted in the twist grip. The push-switch is used for both the main and standby transmitters, being switched to the set in use by relays within the UHF radio relay box. When pressed, the switch makes the earth return for a switching relay within the transmitter-receiver in use, and this relay, when energized, switches the set from receive to transmit.

23. The emergency press-to-transmit switch is a single-pole, two-position, spring return to off, toggle switch labelled EMERG P to T. The switch, which operates in a manner similar to the normal press-to-transmit push-switch *(para 22)*, is provided for use should the normal switch fail to function.

24. By rotating the function switch from OFF to any one of the other three positions, the transmitter-receiver is switched on and warms up ready for operation. When switched on, the transmitter-receiver is automatically in the "receive" condition, thus signals on the frequency selected by the channel selector switch will be heard. The audio level of these signals may be adjusted by use of the volume control. To transmit on the selected channel, it is necessary for the operator to press the press-to-transmit push-switch for as long as transmission is required. Release of the press-to-transmit push-switch automatically restores the transmitter-receiver to the"receive" condition.

25. When the function switch is rotated to the T/R + G position, the guard receiver is brought into operation, and, if the channel selector switch is set to any channel other than G, watch can be maintained on both the guard and the frequency at which the main transmitter-receiver is being operated. Should it be necessary to operate the main receiver at the guard frequency, or to transmit and receive at this frequency, the function switch should be set to T/R and the channel selector switch set to G. The guard receiver is thereby cut off and the installation operated as described in para 24.

ARI 23057

26. Operating and setting-up instructions for the ARI 23057 installation are given in detail in AP116D-0110-16. The installation may be supplied either from the aircraft's main d.c. electrical system, or from the standby battery. The standby transmitter-receiver is brought into use by operation of the normal/standby set selector switch *(para. 20)* and its power supply selected by use of the POWER NORMAL/EMERGY switch. The set is switched from the "receive" to transmit condition by operation of the press-to-trasmit push-switch *(para. 22)*.

27. The standby transmitter-receiver may be operated on either of two pre-set channels, channel selection being made by operation of a toggle switch, which is labelled GUARD and A and situated adjacent to the power selector switch. To prevent unnecessary discharge, the standby battery should only be brought into service *(power selector switch in EMERGY position)* if the aircraft's main d.c. electrical supply fails.

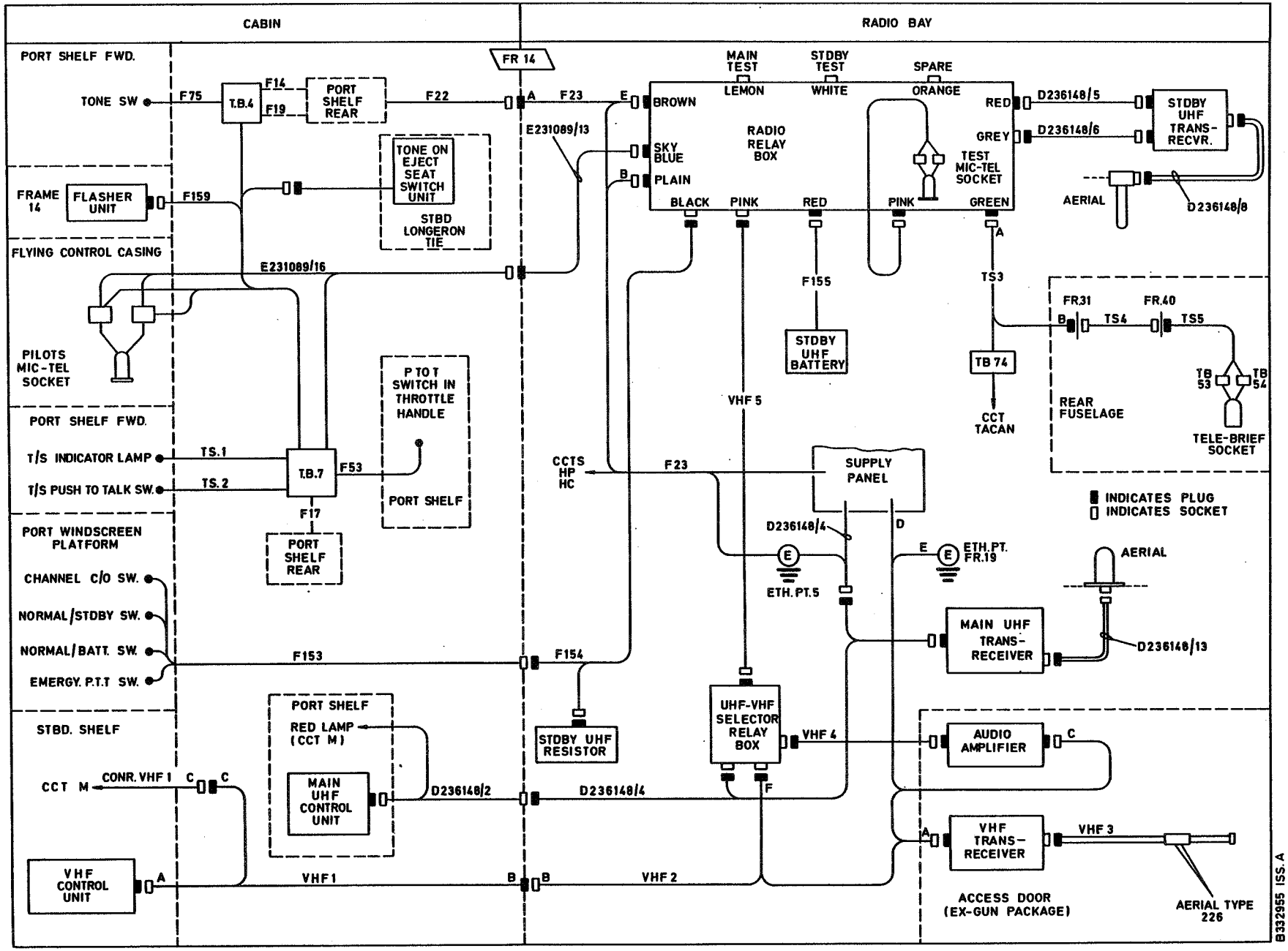

Fig.5 Wireless installation — interconnection

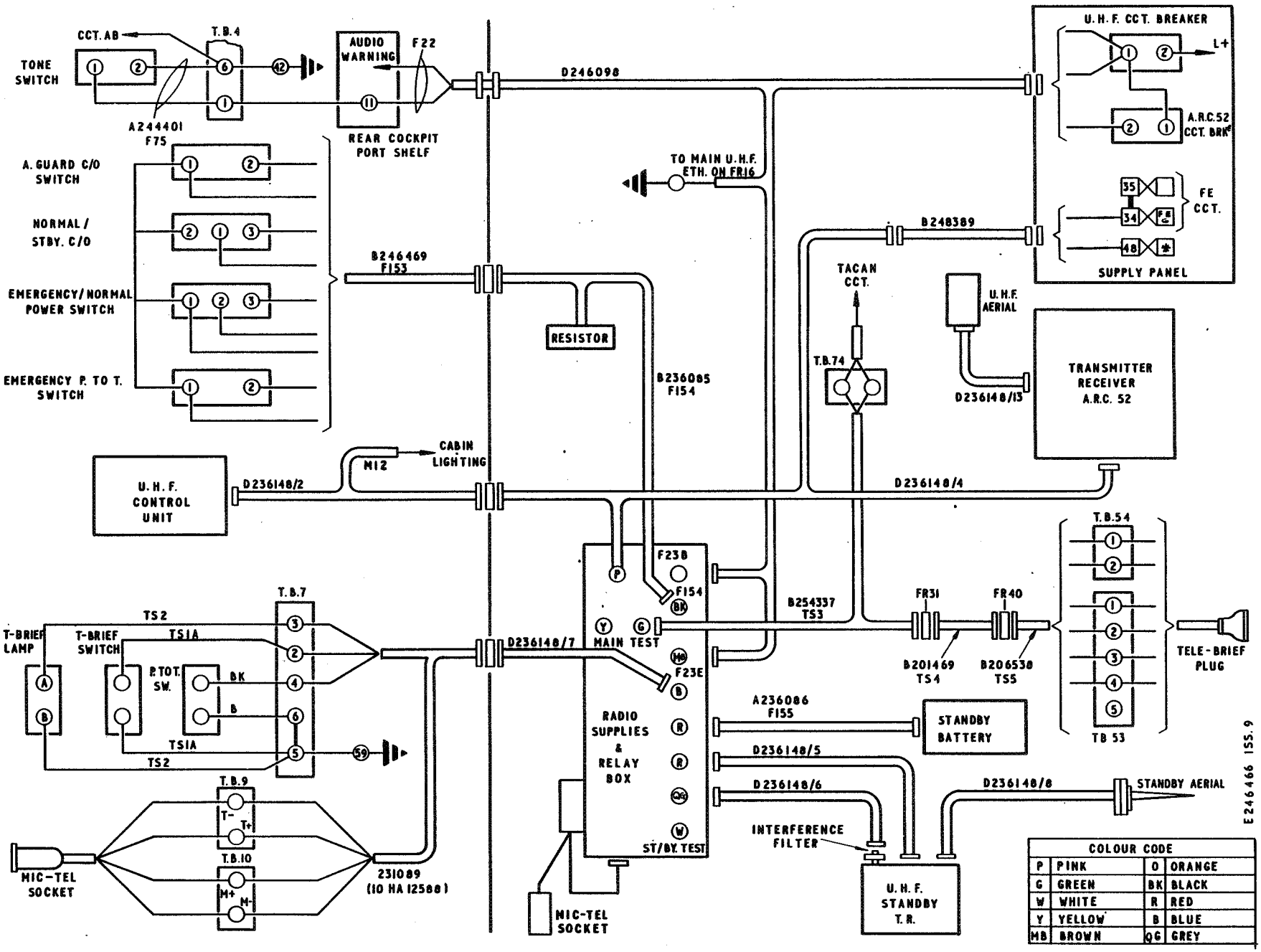

Fig.5A Wireless installation — interconnection — pre-Mod 1429

ARI 18012

28. The operation of the ARI 18012 system is described in detail in AP116N-0301-1. The system is brought into operation automatically, by relays within the UHF radio relay box, whenever the external cable is connected with the aircraft's tele-briefing plug. These relays transfer the pilot's mic-tel socket from the UHF installation to the tele-briefing cable, and at the same time, the aircraft's tele-briefing lamp is lit to indicate that briefing information may be received over the system.

29. When it is required to speak back over the system, the aircraft's tele-briefing push-switch must be pressed. This action energizes a relay in the tele-briefing building and connects the pilot's microphone to the land-line, via an amplifier also located in this building. At the same time, a lamp lights in the building to indicate that the microphone is in circuit.

ARI 23288 - Mod 1429

30. The ARI 23288 system is described in detail in AP116D-0150-1. Operation of the system is achieved by use of the VHF control unit *(para 31)*, the normal or emergency press-to-transmit switches and the mic-tel circuits. The system is available for use immediately the control unit is switched ON. Switching the control unit ON, enables the power switching circuit in the transmitter-receiver to operate. The output from the switching circuit supplies power to the audio amplifier and energizes the two relays in the UHF-VHF selector relay box. With the relays energized the press-to-transmit and mic circuits are connected to the transmitter via the audio amplifier, and the audio output from the receiver is connected to the tel circuits via the volume control in the control unit and the audio amplifier.

Note...

The press-to-transmit and mic-tel to the VHF system are interconnected with the main UHF circuits. To enable operation of the VHF system, therefore, the UHF normal/standby switch must be selected to normal.

VHF control unit

31. The control unit provides the following controls:

(1) *On/Off switch.* This is a two way switch annotated ON. In the ON position the switch connects a 28 V supply to illuminate the dial lamps, and completes a return path to the power circuits in the transmitter-receiver to enable switching of 28V to the VHF system.

(2) *Frequency selection controls.* Frequency selection is controlled by two knobs, each having twenty positions, located either side of a frequency display window. The left hand knob selects MHz and the right hand knob selects kHz. The selected frequency is displayed in the central window, with the three left hand digits indicating MHz and the three right hand digits indicating kHz. The MHz and kHz digits are separated by a central decimal point.

(3) *Volume control.* This is a potentiometer annotated VOL, which is used to adjust the level of the audio signals in the telephones.

(4) *Test button.* This is a push button switch annotated TST, which provides a built-in test facility to check the operation of the receiver. When pressed, an increase in level of background noise should be heard in the telephones.

SERVICING

General

32. Servicing of the wireless equipment is covered in the appropriate Air Publications listed in Table 1, but any unit suspected of being unserviceable should be carefully checked in-situ, and, if found to be faulty, removed from the aircraft and taken into the workshop for rectification action as necessary. The location of components is illustrated in fig. 1, 2, 3 and 4, the interconnections are given in fig. 5 and 5A and a wiring diagram of the power supplies will be found in Sect 5, Chap 1.

Power supplies

33. If a fault is reported in a wireless installation, the power supplies should first be checked, in conjunction with the appropriate routeing and theoretical diagram in Sect 5, Chap 1, to ensure that the trouble is not in the aircraft's electrical system. The voltages, both on and off load, must be tested, and a check made to ensure that the connectors carrying the supply to the equipment are correctly assembled.

Cables and connectors

34. Servicing of the cables and connectors consists of the standard continuity and insulation resistance tests, together with a periodical examination throughout their entire length for signs of damage to, or deterioration of the insulation. If any defects are found, the complete cable or connector must be replaced. The Part numbers of the connectors are given in fig. 5 and 5A. All the clips securing the cables and connectors to the aircraft's structure must be examined for signs of looseness, and any insecure clips tightened as necessary to prevent chafing. Plug and socket connections must be checked to ensure that they are fitting properly, and that the fixings are screwed fully home.

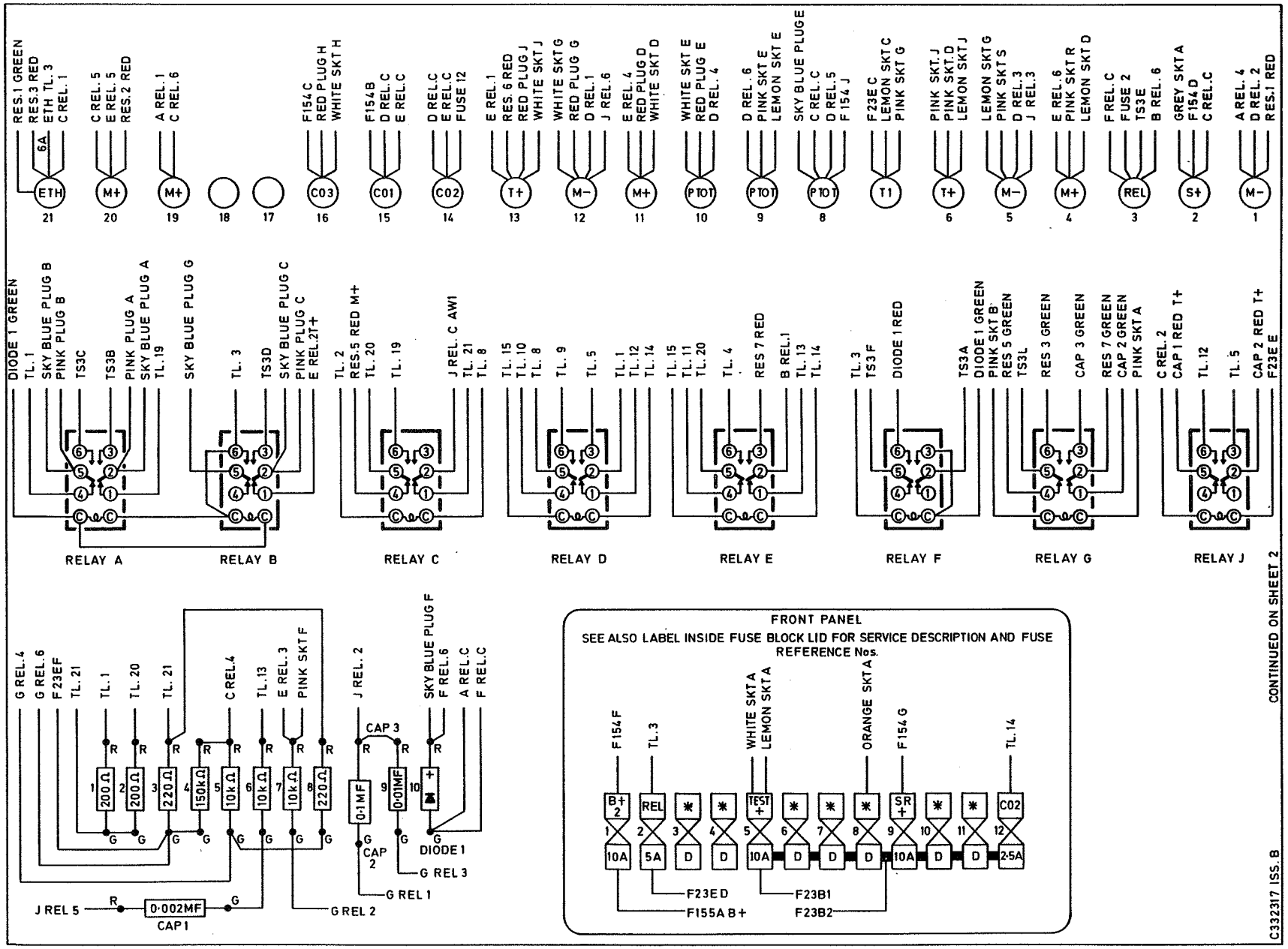

Fig. 6 Wiring of radio relay box (sheet 1)
(Illustration divided for clarity)

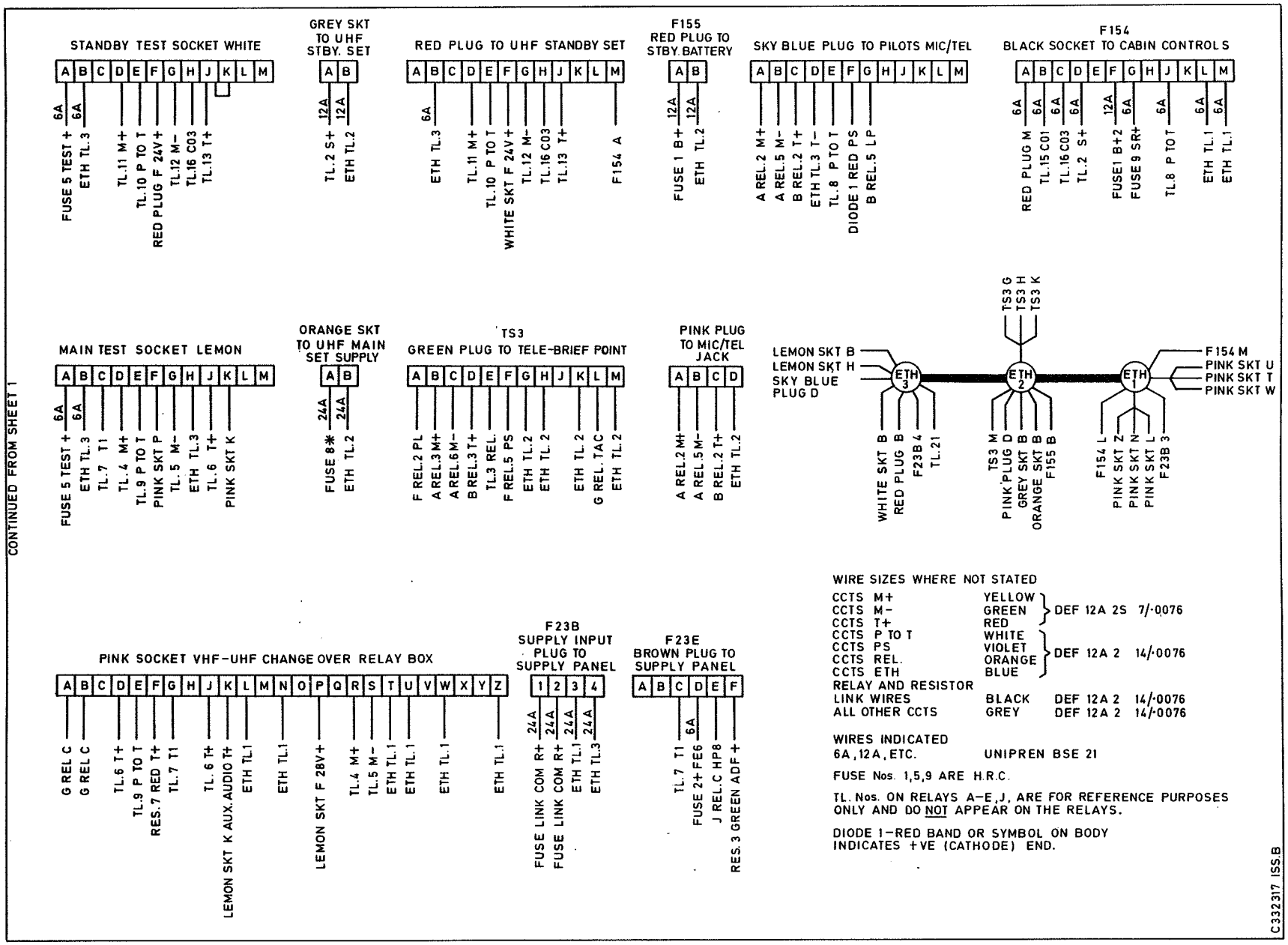

Fig. 6 Wiring of radio relay box (sheet 2)
(Illustration divided for clarity)

Security checks

35. The following security checks must be made to ensure that all the wireless equipment is properly installed and secure:-

(1) Ensure that all the units are secure in their mounting racks and that the clamping devices are tightened sufficiently to prevent movement or vibration. Check that locking wire is fitted where necessary.

(2) Inspect all mounting bolts for security, ensure that the anti-vibration mounts are undamaged, and check that the fixed mounting structure is secure.

(3) Check that the control units and all switches are securely mounted. With electrical power switched off, operate all the controls and ensure that they are undamaged and serviceable.

(4) Check the security of the aerials.

(5) Ensure that the radio relay box, the UHF-VHF selector relay box *(Mod 1429)* and the standby battery crate are securely mounted.

(6) Examine all the plugs and sockets for correct mating and security.

(7) Check that any strain on the Pilot's mictel socket is taken up by the check-cord, and not by the cable attached to the socket.

Functional checks

36. To ensure that the wireless installations are set up and operating correctly, the functional checks given in the appropriate Air Publications listed in Table 1 must be made, using the test sets and equipment provided. To enable the UHF installation to be ground tested and adjusted in-situ, two test sockets, one for the main and the other for the standby transmitter-receiver, are provided on the UHF radio relay box in the radio bay. These test sockets are used in conjunction with the UHF test set as described in the appropriate Air Publication.

37. Test the VHF installation as follows:-

(1) Switch ARC 52 ON. Select an active channel on ARC 52 control unit and set volume control to comfortable level.

(2) Switch VHF T/R ON and select an un-used channel. Press TEST button and confirm that squelch circuit is disabled, ie excessive signal noise/hiss apparent in headset. Release button, turn ARC 52 volume fully up and check for cross-talk (breakthrough) of audio signals from ARC 52; any signals present should be at least 60 dB down on VHF signals being received at the same time, ie the spurious signal is only just audible but not necessarily legible.

(3) Switch ARC 52 OFF. Function VHF T/R in accordance with relevant publications, checking for correct operation of PTT, modulation level and squelch threshold level.

(4) Switch off the VHF T/R.

Fault finding

38. If a fault is reported, an attempt should be made, in-situ, to locate the faulty unit. Before any other tests are made, the low tension source should be checked, the voltage, both on and off load, tested and the tightness of the connectors ensured. Any unit found to be faulty should be taken to the workshop for testing and repair. For full details of the fault finding and testing procedure, reference should be made to the Air Publications listed in Table 1.

39. If the radio relay box or the UHF-VHF selector relay box *(Mod 1429)* is found to be faulty, it should be removed from the aircraft for Bay servicing and replaced by a fully serviceable item. When the aircraft is undergoing its Minor Servicing, these boxes should be removed from the aircraft for a thorough check and adjustment to ensure that they are fully serviceable.

Final check

40. After servicing the wireless installations, ensure that all the equipment is switched off, and that all access doors removed to give access to the equipment are correctly replaced and secured.

REMOVAL AND ASSEMBLY

General

41. The recommended procedures for removing the main components of the wireless installations are given in the following paragraphs. The method of assembly is, in general, a reversal of the removal sequence, but when there is any special assembly feature it is covered by a note in the appropriate paragraph. Before removing or replacing any component, the aircraft must be rendered electrically safe, as described in Sect 5, Chap 1, Group A1.

UHF main transmitter-receiver

42. The recommended method of removing this transmitter-receiver is as follows:-

(1) Render the aircraft electrically safe as described in Sect 5, Chap 1, Group A1.

(2) Disconnect the two connectors from the transmitter-receiver, fit approved caps and covers to the plugs and sockets, and stow the connectors clear of the set.

(3) Remove the locking wire from the two wing-nuts at the front of the mounting tray and unscrew these nuts until they drop clear of the retaining catches on the set.

(4) Disengage the rear of the transmitter-receiver from the spring loaded dowels on the mounting tray by using the handle to withdraw the set along the tray. Still using the handle, carefully remove the set from the aircraft.

UHF main aerial

43. The method of removing this aerial is as follows:-

(1) Render the aircraft electrically safe as described in Sect 5, Chap 1, Group A1.

(2) Remove the hood fairing sufficiently to gain access to the aerial connector, and, after disengaging the retaining spring from the aerial connector plug, disconnect the aerial connector from the aerial socket. Fit an approved cap and cover to the plug and socket.

(3) The aerial may now be removed from the hood fairing by removing the eight bolts, nuts and washers securing the aerial base to the mounting plate. The lugs holding the aerial connector plug retaining spring are also secured by two of these bolts; care must be taken to retain these with the hood fairing when the aerial is removed.

Note ...

When assembling the aerial, ensure good electrical bonding by checking that all mating surfaces are absolutely clean and making perfect contact. Ensure that the aerial connector retaining spring is re-fitted and seal the aperture around the aerial base with Bostik compound to prevent the entry of water. During assembly ensure attachment lugs point to starboard to give maximum clearance between retaining spring and elevator control rod.

UHF control unit

44. The UHF control unit should be removed as follows:-

(1) Render the aircraft electrically safe as described in Sect 5, Chap 1, Group A1.

(2) Disengage the four Dzus fasteners on the face of the control unit and withdraw the unit sufficiently to gain access to the electrical connector.

(3) Disconnect the connector from the control unit, and remove the unit from the aircraft.

Radio relay box

45. This box is designed for easy removal, being supported on quick-release mountings. The recommended method of removing the box is as follows:-

(1) Render the aircraft electrically safe as described in Sect 5, Chap 1, Group A1.

(2) Disconnect all the connectors from the relay box, fit approved caps and covers to the plugs and sockets and stow the connectors clear of the box.

(3) Remove the two bolts passing through the mounting lugs on the right hand side of the box casing. Release the box from its attachment brackets by swinging it downwards and to starboard to disengage the locating hooks.

(4) Remove the box from the aircraft.

UHF standby transmitter-receiver

46. To remove the standby transmitter receiver, proceed as follows:-

(1) Render the aircraft electrically safe as described in Sect 5, Chap 1, Group A1.

(2) Disconnect the three connectors from the transmitter-receiver, fit approved caps and covers to the plugs and sockets and stow the connectors clear of the set.

(3) Unscrew the two knurled nut fasteners at the front of the mounting tray and allow them to drop clear of the retaining catches on the set.

(4) Disengage the spring-loaded spigots at the rear of the transmitter-receiver from the mounting tray by using the handle to withdraw the set along the tray. Still using the handle, carefully remove the set from the aircraft.

UHF standby aerial

47. The recommended method of removing this aerial is as follows:-

(1) Render the aircraft electrically safe as described in Sect 5, Chap 1, Group A1.

(2) Remove the fourteen countersunk headed bolts from around the periphery of the aerial access panel in the starboard skin of the front fuselage.

(3) Withdraw the aerial and access panel sufficiently to gain access to the aerial connector and disconnect this connector from the aerial socket. Fit an approved cap and cover to the plug and socket.

(4) Remove the aerial from the access panel by unscrewing the five nuts from the bolts securing the aerial base to the access panel, taking care to retain the washers.

Note...

When assembling the aerial, ensure good electrical bonding by checking that all mating surfaces are absolutely clean. Pay particular attention to the door landing.

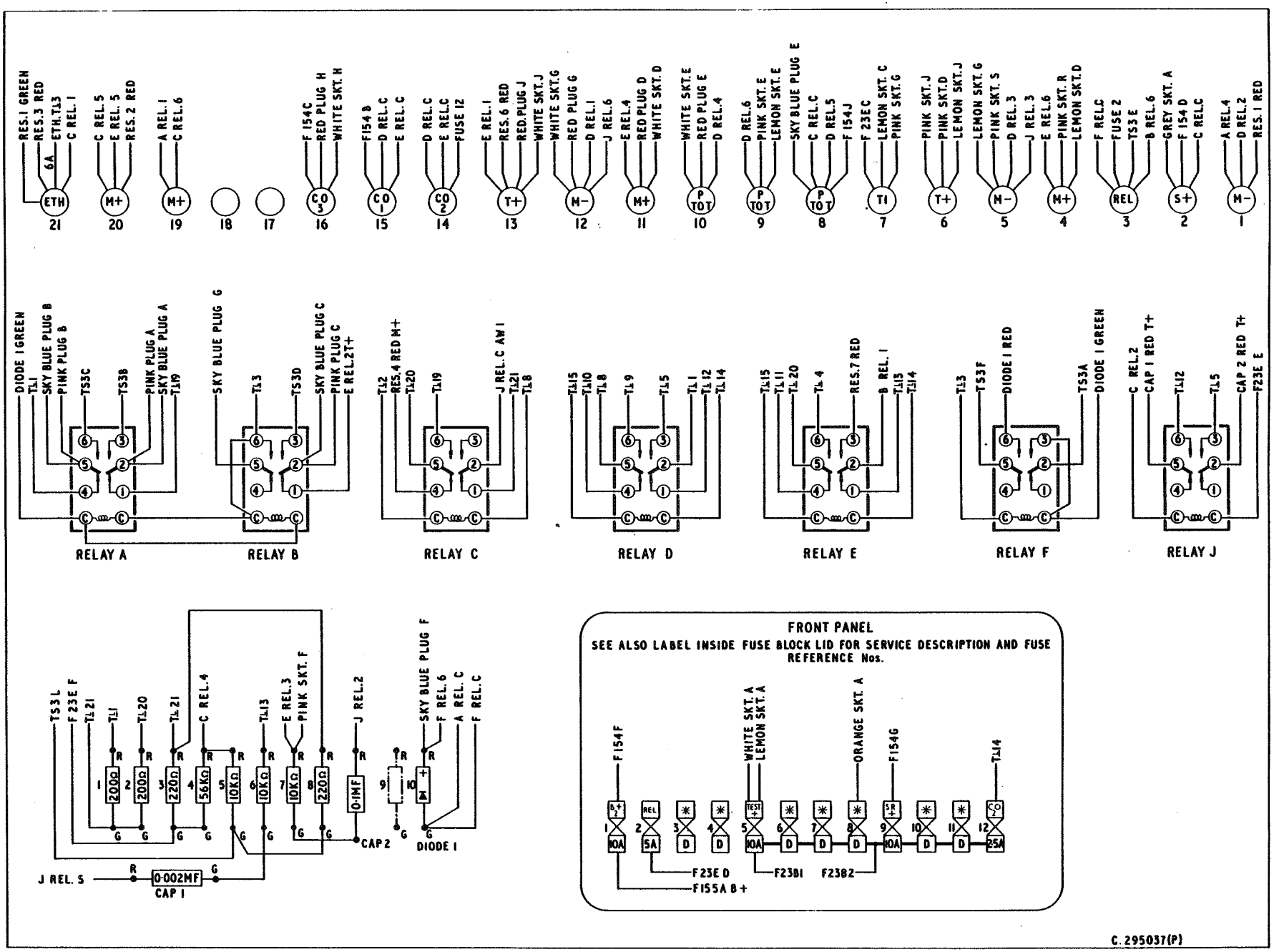

Fig.6A Wiring of radio relay box (1) — pre-Mod 1429

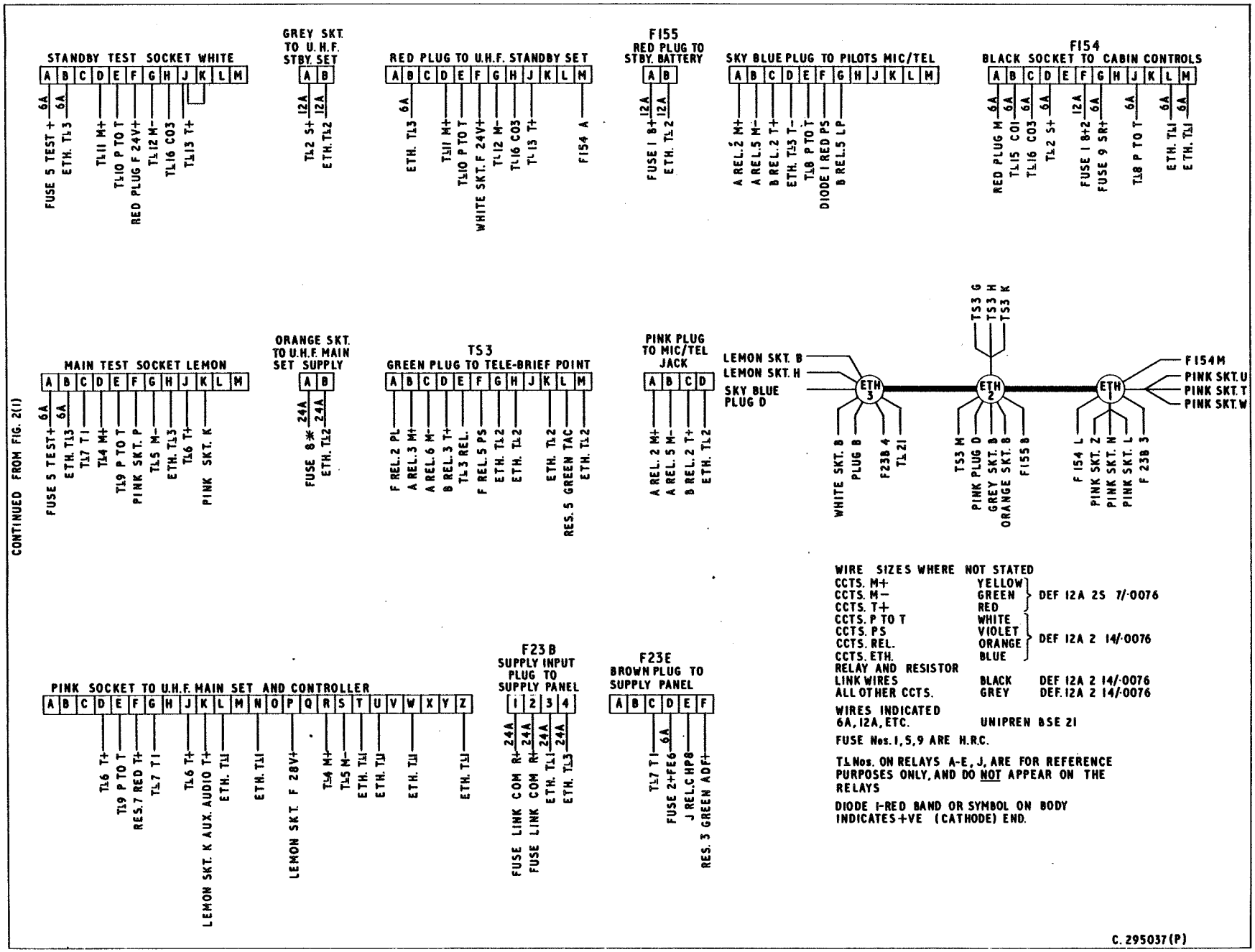

Fig.6B Wiring of radio relay box (2) — pre-Mod 1429

UHF standby battery

48. The standby battery is carried in a crate, which is readily detachable from the aircraft, and should be removed in its crate as follows:-

(1) Render the aircraft electrically safe as described in Sect 5, Chap 1, Group A1.

(2) Disconnect the two leads of cable assembly F155 from the terminals on the standby battery. Insulate the bare ends of these leads, and stow clear of the battery.

(3) Remove the locking wire from the wing-nuts below the battery crate, and, supporting the crate, slacken off the wing-nuts until the tie-rods clear the locating pads on the bottom of the crate.

(4) Swing the crate downwards and inboard to disengage the retaining hooks. Remove the crate and battery from the aircraft.

Note...

After assembly of the battery and crate, lock the wing-nuts to the lugs on the mounting crate with 22 swg stainless steel wire to Spec 189 or 161.

VHF transmitter-receiver

49. The method of removing the transmitter-receiver is as follows:-

(1) Render the aircraft electrically safe as described in Sect 5, Chap 1, Group A1.

(2) Disconnect the two connectors from the transmitter-receiver, fit approved caps and covers to the plugs and sockets and stow the connectors clear of the set.

(3) Unscrew the retaining lock and withdraw the set from the mounting tray. Remove the set from the aircraft.

Amplifier

50. The method of removing the amplifier is as follows:-

(1) Render the aircraft electrically safe as described in Sect 5, Chap 1, Group A1.

(2) Disconnect the two connectors from the amplifier, fit approved caps and covers to the plugs and sockets and stow the connectors clear of the amplifier.

(3) Remove the two securing bolts and washers.

(4) Lift the amplifier from the mounting and remove from the aircraft.

VHF aerial

51. The method of removing the aerial is as follows:-

(1) Render the aircraft electrically safe as described in Sect 5, Chap 1, Group A1.

(2) Remove the moulded cover from the base of the aerial.

(3) Unscrew the top retaining nut from the end of the aerial rod and remove the aerial connector from the rod.

(4) Unscrew and remove the two screws and washers securing the bonding strips to the aerial mounting.

(5) Unscrew the four bolts securing the aerial to the mounting bracket then carefully withdraw the aerial from the rubber grommet and remove from the aircraft.

Note...

When assembling the aerial, ensure the surfaces between the aerial bonding strips and mounting bracket are thoroughly clean to ensure a good electrical contact.

VHF control unit

52. The method of removing the control unit is as follows:-

(1) Render the aircraft electrically safe as described in Sect 5, Chap 1, Group A1.

(2) Release the two Dzus fasteners on the front of the control unit and withdraw unit sufficiently to gain access to the connector.

(3) Disconnect the connector from the control unit, fit approved cap and cover to the plug and socket and remove the control unit from the aircraft.

UHF-VHF selector relay box

53. The method of removing the box is as follows:-

(1) Render the aircraft electrically safe as described in Sect 5, Chap 1, Group A1.

(2) Disconnect the four connectors from the box, fit approved caps and covers to the plugs and sockets and stow the connectors clear of the box.

(3) Remove the four securing bolts and washers and remove the box from the aircraft.

Radio mounting structure

54. The lower radio mounting structure extends from frame 16 to frame 19, being bolted to these two frames, thus, when breaking down the aircraft at the front transport joint as described in Sect 3, Chap 1, it is necessary to remove this structure. The recommended procedure is as follows:-

(1) Render the aircraft electrically safe as described in Sect 5, Chap 1, Group A1.

(2) Remove the standby battery *(para 48).*

(3) Remove the UHF transmitter-receivers *(para 42 and 46)*

(4) Remove the IFF transmitter-receiver, inverter coder unit *(Sect 6, Chap 2).*

(5) Stow all the disconnected cables clear of the mounting structure, releasing any clips and strapping as found necessary.

(6) Release all clips and strapping from the cables attached to the mounting structure to ensure that the removal of the structure will be unobstructed.

(7) Release the mounting structure from frames 16 and 19 by removing the nuts, bolts and washers securing it to the brackets on these frames.

(8) Remove the lower radio mounting structure from the aircraft.

(9) The aft platform of the upper radio mounting structure, which supports the resistor box, is also attached to brackets on frame 19 and must be released from frame 19 when breaking down the aircraft. It is not, however, necessary to remove the upper radio mounting structure.

APPENDIX 1 – (MOD.1310)
A.R.I. 18012

LIST OF CONTENTS

LIST OF ILLUSTRATIONS

Introduction

1. This appendix describes the effect of Mod.1310 on the Tele-briefing Installation, A.R.I. 18012, which is described briefly in Chap. 1 and in detail in A.P.2876G, Vol.1, A.R.I.18012 provides direct communication between pilot and ground control by land line connected into the aircraft through the tele-brief plug in the rear fuselage. Interconnection of the pilot's mic./tel. head set to A.R.I. 18012 is through the Radio Supplies and Relay Box.

2. Mod.1310 is essentially concerned with the Radio Supplies and Relay Box and is described in Sect.5, Chap.1, Group H 1, App.2.

DESCRIPTION

General

3. After embodiment of this mod., circuit switching to complete tele-brief communication ceases to be automatic when the land line is connected. The energizing circuits for the switching relays contained in the Relay Box are completed by momentary operation of the cockpit T/B push switch. The relay energizing circuits are self retaining and the relays remain energized when the switch is released. The cockpit T/B indicator lamp is illuminated to show that interconnection is complete. Pilot to tele-brief control call up is by again depressing the cockpit T/B push switch which completes the ground installation call-up indicator lamp circuit.

4. Fig. 1 shows the effect of this mod. on the aircraft cable assemblies with all assemblies identified by part numbers. Fig. 2 shows the internal wiring of the Relay Box.

SERVICING

General

5. This modification has no effect on servicing, which remains as described in Sect.6, Chap.1 of this A.P. Interconnection of components is shown in fig.1 of this appendix.

REMOVAL AND ASSEMBLY

General

6. This modification has no effect on removal and assembly which remains as described in Sect.6, Chap.1

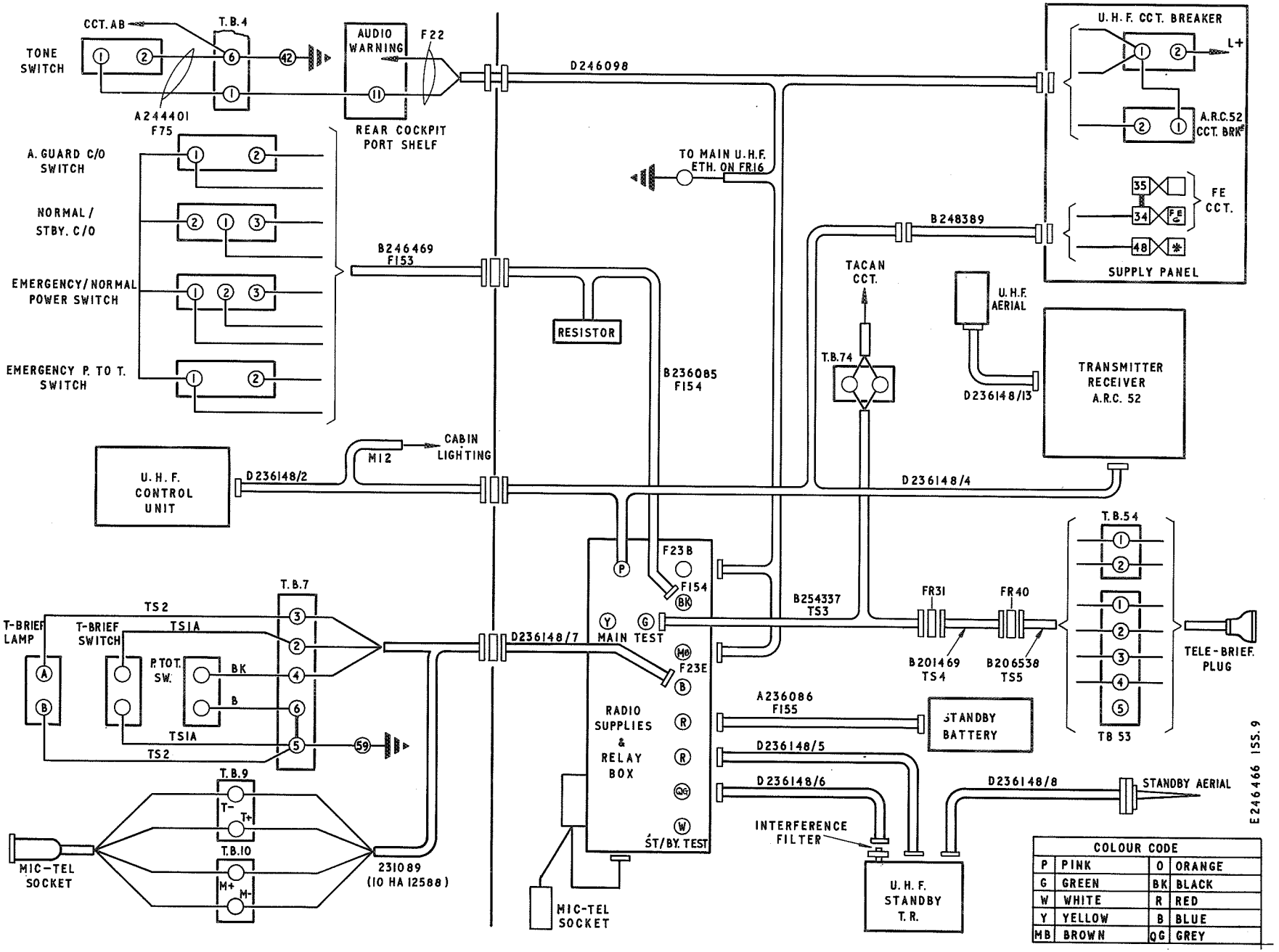

Fig. 1 Wireless installation interconnection (Mod.1310)

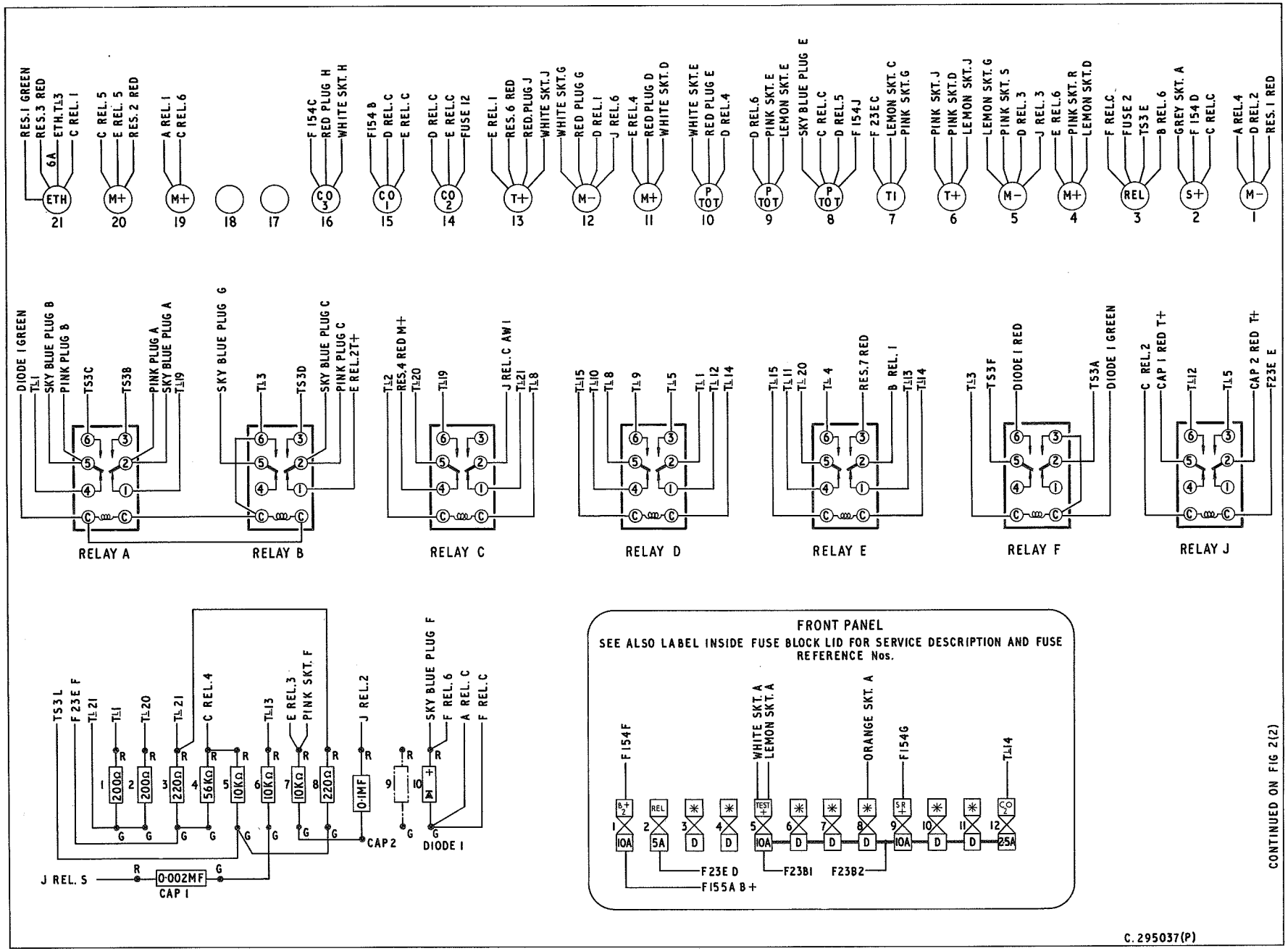

Fig.2 (1) Wiring of radio relay box

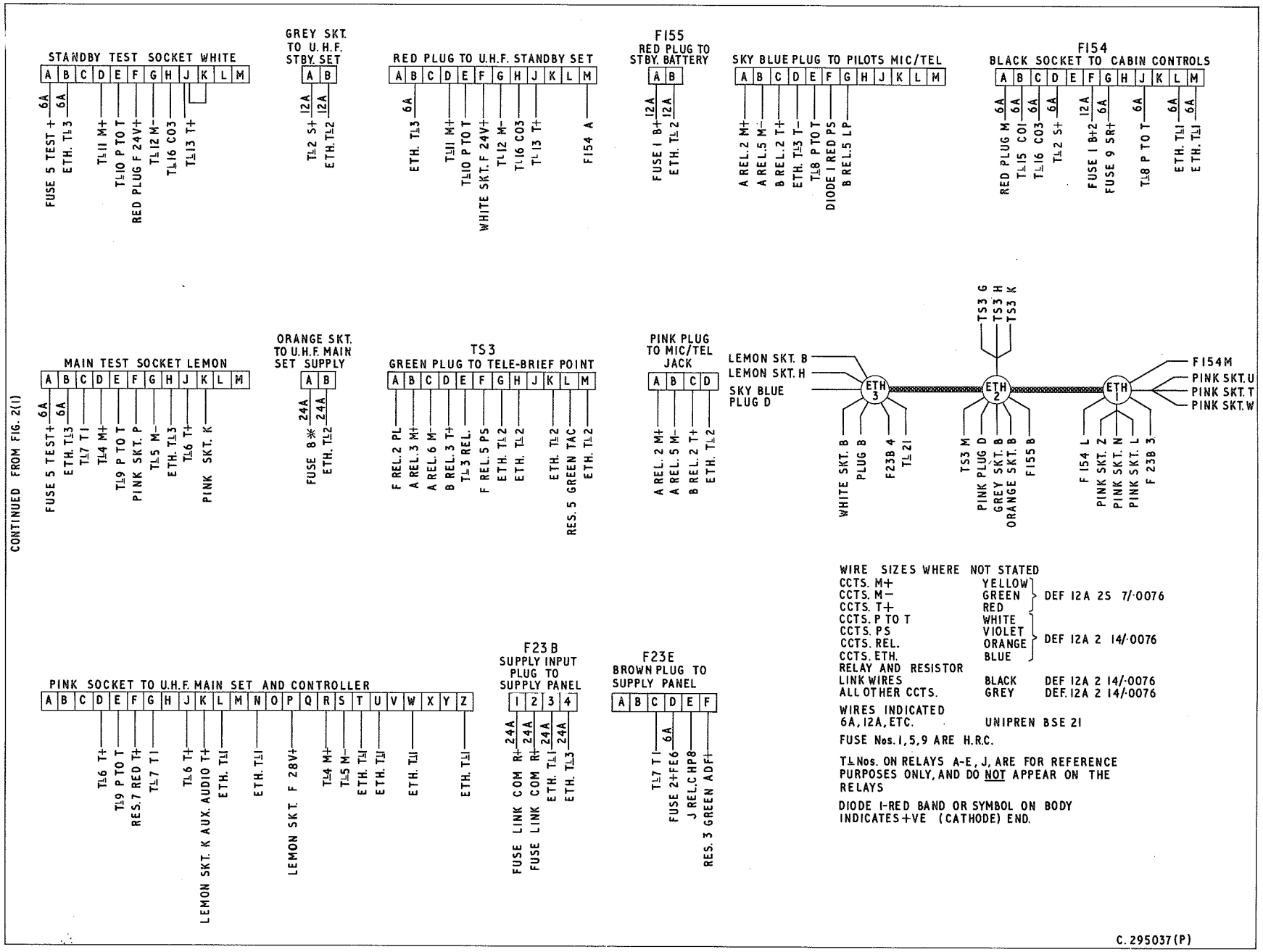

Fig.2 (2) Wiring of radio relay box

APPENDIX 2 - MOD 1480

MAIN UHF - ARI 23301/80

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TABLE 1

Equipment type and Air Publication reference

Equipment Type	Air Publication
Main UHF - ARI 23301/80	
Transceiver, UHF, PTR1751WW	AP 116D-0154-1
Interface unit, PV1746BB	
Control unit, PV1754AA	
Mounting tray, PV1748B	
Filter unit, dc, PV1757A	
Tone generator, W691/2	

Introduction

1. This appendix contains a description of the equipment and modifications introduced by Mod 1480 to replace the obsolete ARC 52 UHF transmitter-receiver and control unit fitted in the main UHF system (ARI 18124/1). With the exception of this modification the main UHF system remains as described in the existing ARI 18124/1 UHF system (refer Sect 6, Chap 1). When the modification is embodied the main UHF system is re-designated ARI 23301/80. Detailed information on the ARI 23301/80 system is contained in AP 116D-0154-1.

DESCRIPTION

General

2. When Mod 1480 is embodied the ARC 52 transmitter-receiver and mounting tray, located in the radio bay, are replaced by mounting tray PV1748B and transceiver PTR 1751WW. The new interface unit PV1746BB is also mounted on the tray and connected between the transceiver and the main UHF control circuits. The ARC 52 control unit, located on the cabin port shelf, is replaced by control unit PV1754AA. All the existing UHF cabin control switches are retained by the modification and annotated PTR1751 instead of ARC 52. The hydraulic failure audio warning circuit in the existing radio relay box is disconnected and replaced by a tone generator unit, W691/2, mounted externally on the box. Mod 1480 also introduces a dc filter unit PV1757A and a replacement circuit breaker into the UHF power supply. Details of the UHF installation locations and interconnections, with Mod 1480 embodied, are shown in figs. 1, 2 and 3. Details of the radio relay box are shown in fig. 4.

UHF transceiver

3. The transceiver, PTR1751WW, provides simplex AM communications over 7000 channels with 25 kHz channel spacing in the frequency range of 225.00 MHz to 399.975 MHz. Up to 30 channels may be preset in the transceiver as selected from the control unit.

4. The transceiver is connected to the UHF antenna system using the existing antenna feeder and to the interface unit with fly leads from the unit.

Control unit

5. The control unit, PV1754AA, is mounted on the cabin port shelf and is connected to the UHF system using the existing ARC 52 cableform. The unit controls the operation of the transceiver and has the following front panel displays and controls:

(1) Frequency display
The frequency display is a 6 digit display providing an indication of any selected frequency in MHz and BIT results.

(2) Channel display
The channel display is a 2 digit display and indicates the number of a selected preset channel which may be from 1 to 30.

(3) DIM control
Controls the brilliance of the frequency and channel number display.

(4) Manual frequency select switches
These are five centre biased toggle switches which control the selection of the required frequency in incremental steps. Indication of each step is provided on the frequency display in hundreds, tens, units and decimals. The up position of a switch decreases the frequency and the down position increases the frequency. When a switch is held operated, the display increments continuously at approximately 2 Hz.

(5) Channel switch
This switch is used to select any one of the preset channels in the transceiver with the selected channel number indicated on the display. Up to 30 preset channels are available.

(6) Mode switch
This switch has six positions and selects the required system operating mode as follows:

GU	System operates at a UHF frequency of 243.000 MHz.
GV	Not used.
PRE	System operates at the preset frequency selected by the channel switch.
MAN	System operates at the manual frequency selected by the five toggle switches.
READ	Installation operates at the manually selected frequency but the frequency display can be changed by operation of the manual select switches.
LOAD	The frequency indicated in the READ position is transferred to the memory location selected by the preset channel switch.

(7) Function switch
This switch has six positions and selects the required system operational functions as follows:

OFF	System off.

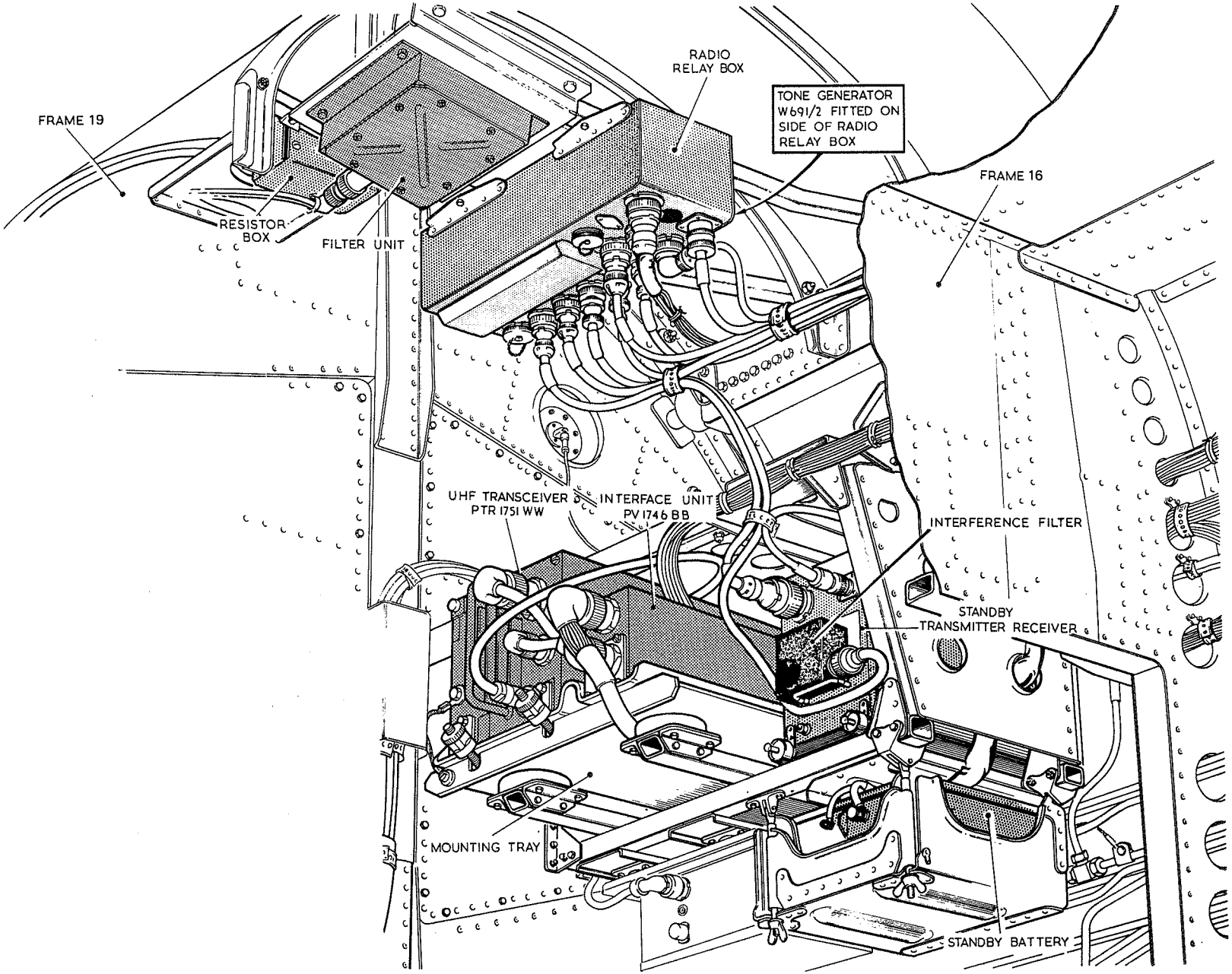

Fig. 1 UHF installation – location (1)

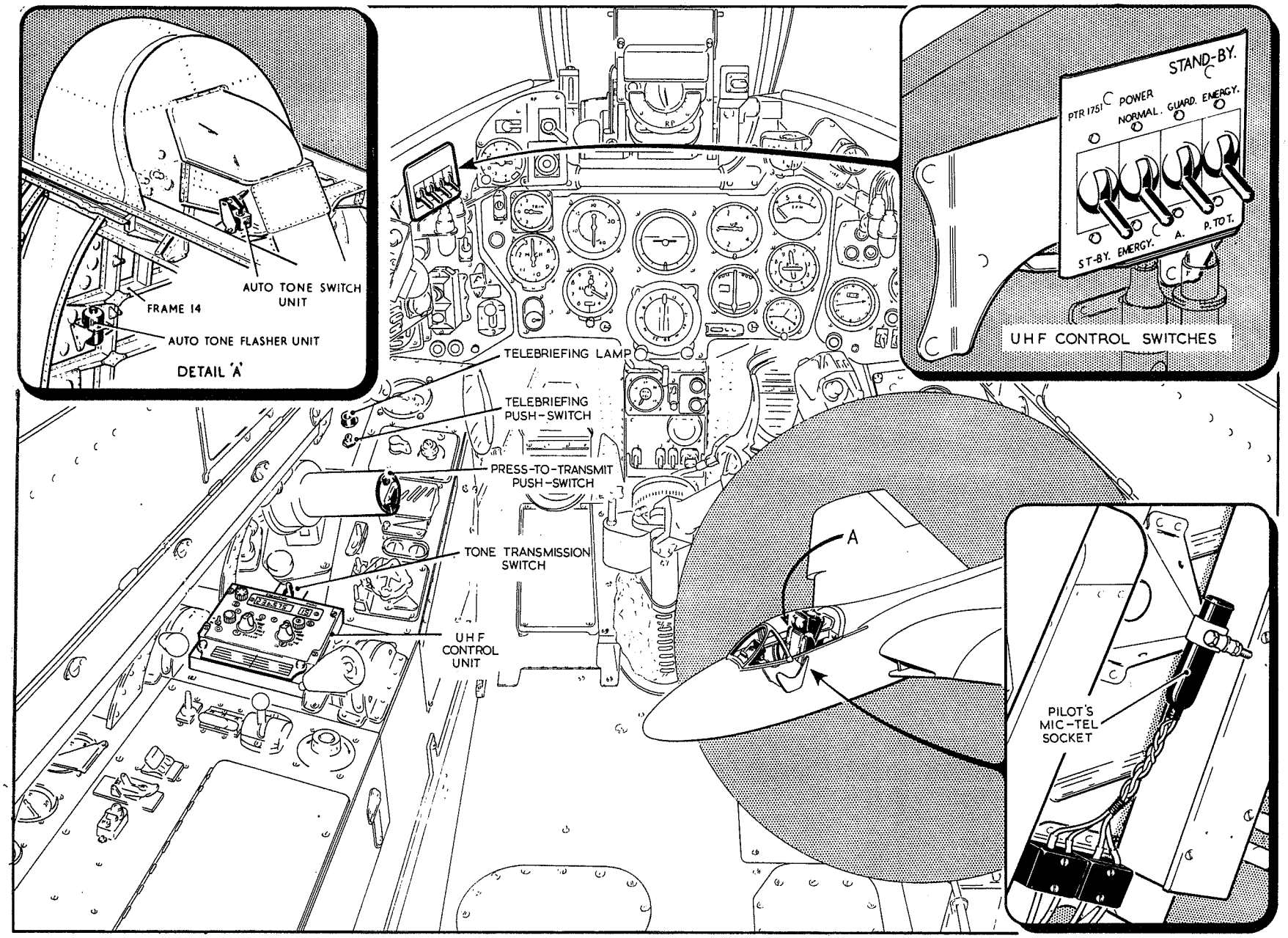

Fig. 2 UHF installation – location (2)

TEST Initiates BIT facility. With the mode switch in the PRE or GU positions, causes the frequency display to show the operating frequency. With the mode switch in the MAN position, all display elements show the figure 8. A 1 kHz tone will be audible in this position.

TR Main transceiver operative. UHF Guard receiver off.

TR+G Main transceiver and UHF guard receiver operative.

TR+H Main transceiver and ADF operative.

TR+G+H Main transceiver, UHF guard receiver and ADF operative.

(8) AJ/NORM switch
The AJ position of the switch is not used and the switch must be used with the NORM position selected.

(9) TIME S/R switch
Not used.

(10) VOL control
Controls the level of the transceiver audio output.

Interface unit

6. The interface unit, PV1746BB, provides interconnections between the transceiver and the main UHF control circuits and power supplies. Connection to the transceiver is via fly leads terminated with two plugs and connection to the control circuits and power supplies is via the existing 42-way cableform.

Filter unit, dc

7. The dc filter unit, PV1757A, is fitted on a new mounting bracket located adjacent to the existing radio relay box. The filter unit is connected in series between the UHF Services circuit breaker (45A) and the UHF circuit breaker (7.5A) to reduce the effects of interference from the aircraft inverters. The 7.5A circuit breaker is a replacement breaker for the existing 25A breaker and is annotated PTR1751. With the exception of this modification the power supply circuits remain as described in Sect 6, Chap 1.

Tone generator

8. The tone generator, W691/2, is mounted on the side of the radio relay box. The tone generator provides an audio warning of hydraulic failure and replaces the existing hydraulic audio warning circuit in the relay box.

SERVICING

General

9. Servicing and function tests of the equipment embodied by this modification are detailed in AP 116D-0154-1. Any unit suspected of being unserviceable should be checked in situ for power supplies and security of connectors before removal to the servicing bay.

REMOVAL AND ASSEMBLY

General

10. The procedures for removing the main components are detailed in the following paragraphs. Assembly of the components is a reversal of the removal procedures. Before removing or replacing any component the aircraft must be rendered electrically safe as described in Sect 5, Chap 1, Group A1.

Transceiver

11. The procedure for removing the transceiver is as follows:-

(1) Render the aircraft electrically safe.

(2) Disconnect the two connectors, antenna feeder and earthing strap from the transceiver. Fit approved blanking caps to the plugs and sockets and stow connectors clear of unit.

(3) Release the catches securing the transceiver to the mounting tray and carefully withdraw the unit from the tray. Remove unit from aircraft.

Note...

On transceiver assembly the self locking nuts on the catches should be hand tightened only.

Control unit

12. The procedure for removing the control unit is as follows:-

(1) Render the aircraft electrically safe.

(2) Release the four Dzus fasteners on the front of the control unit. Carefully withdraw and support the unit.

(3) Disconnect the connector from the rear of the unit, fit blanking caps to the plug and socket and remove unit from aircraft.

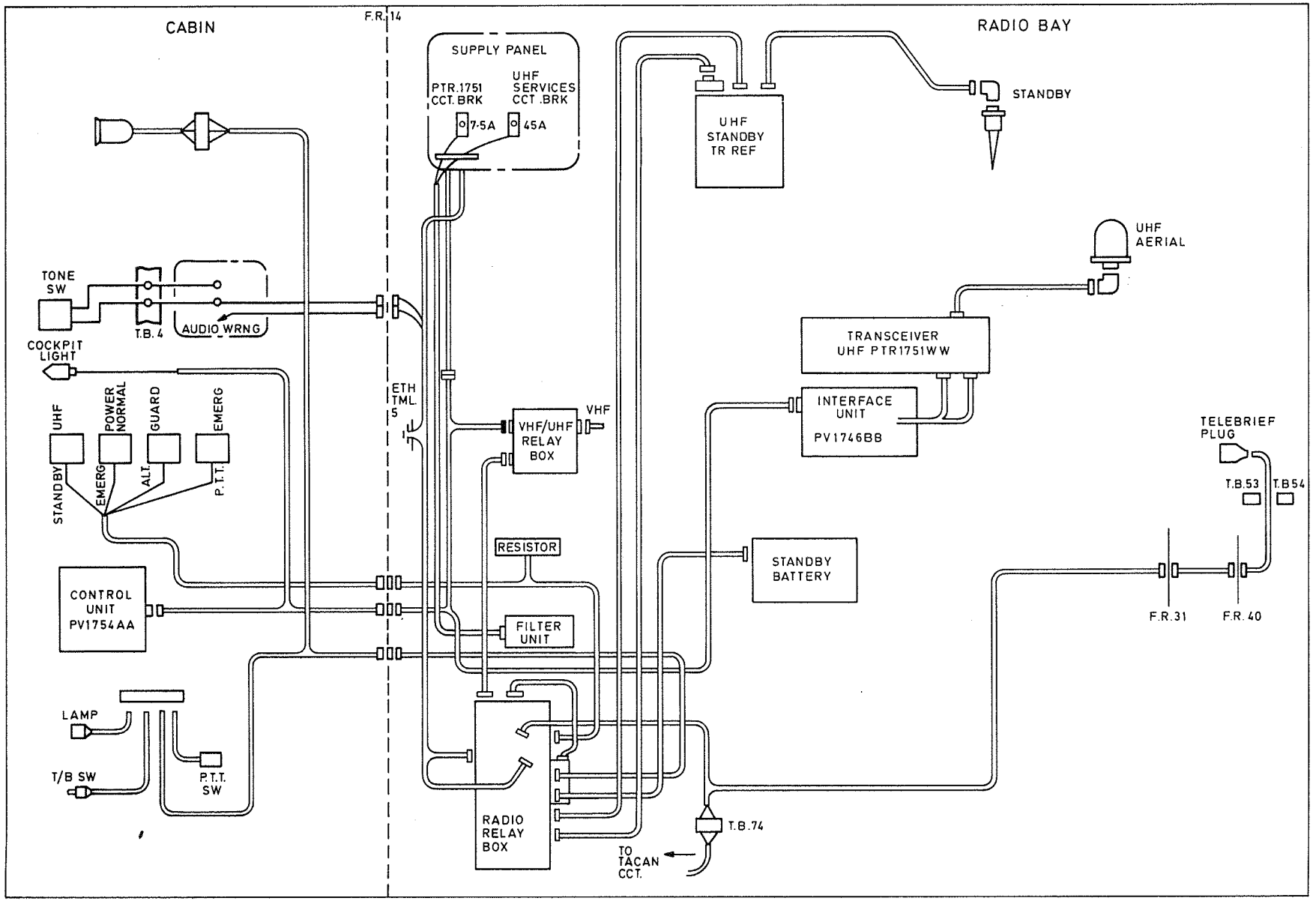

Fig. 3 UHF installation - interconnection

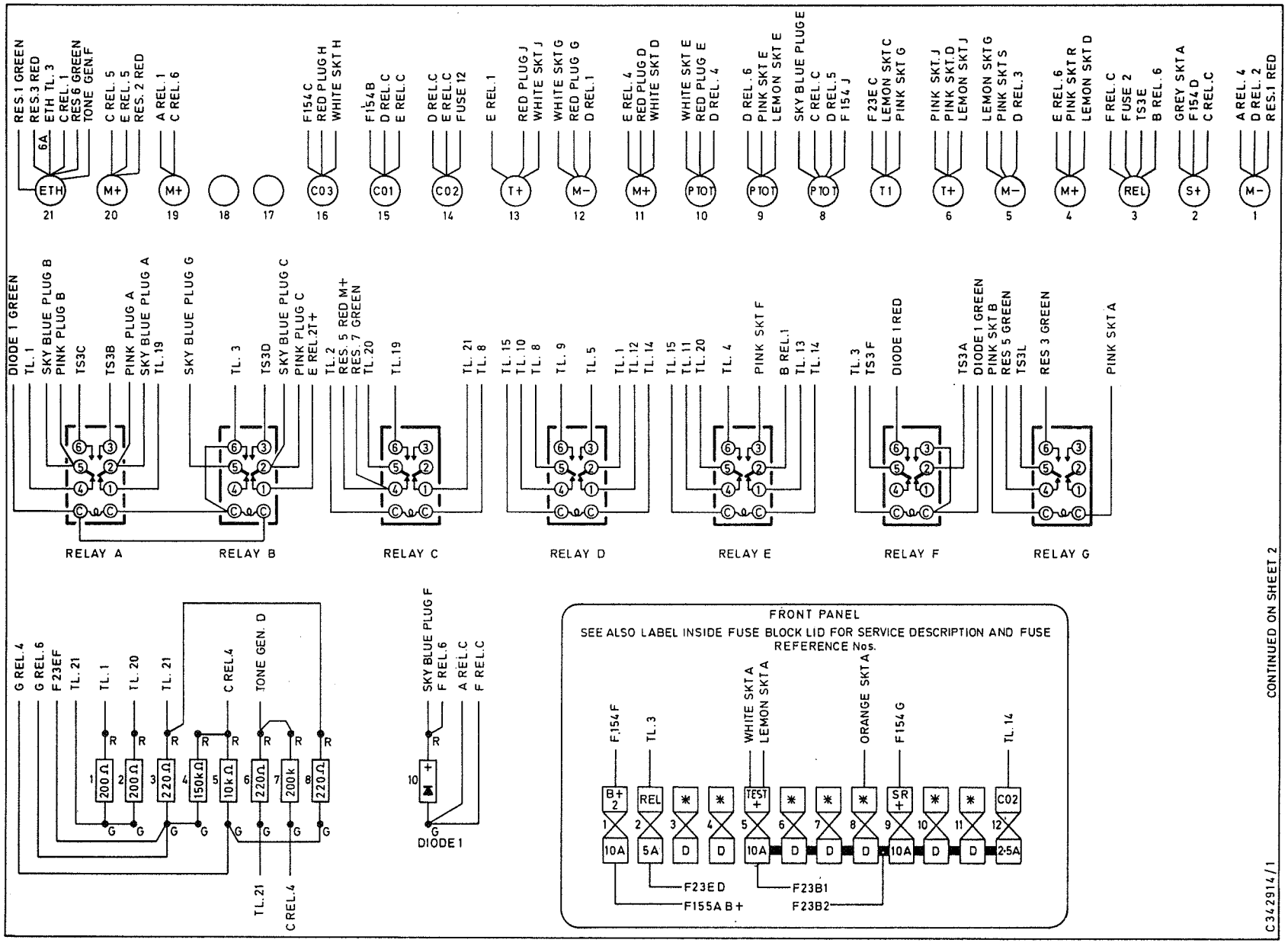

Fig. 4 Wiring of radio relay box (sheet 1)
(Illustrations divided for clarity)

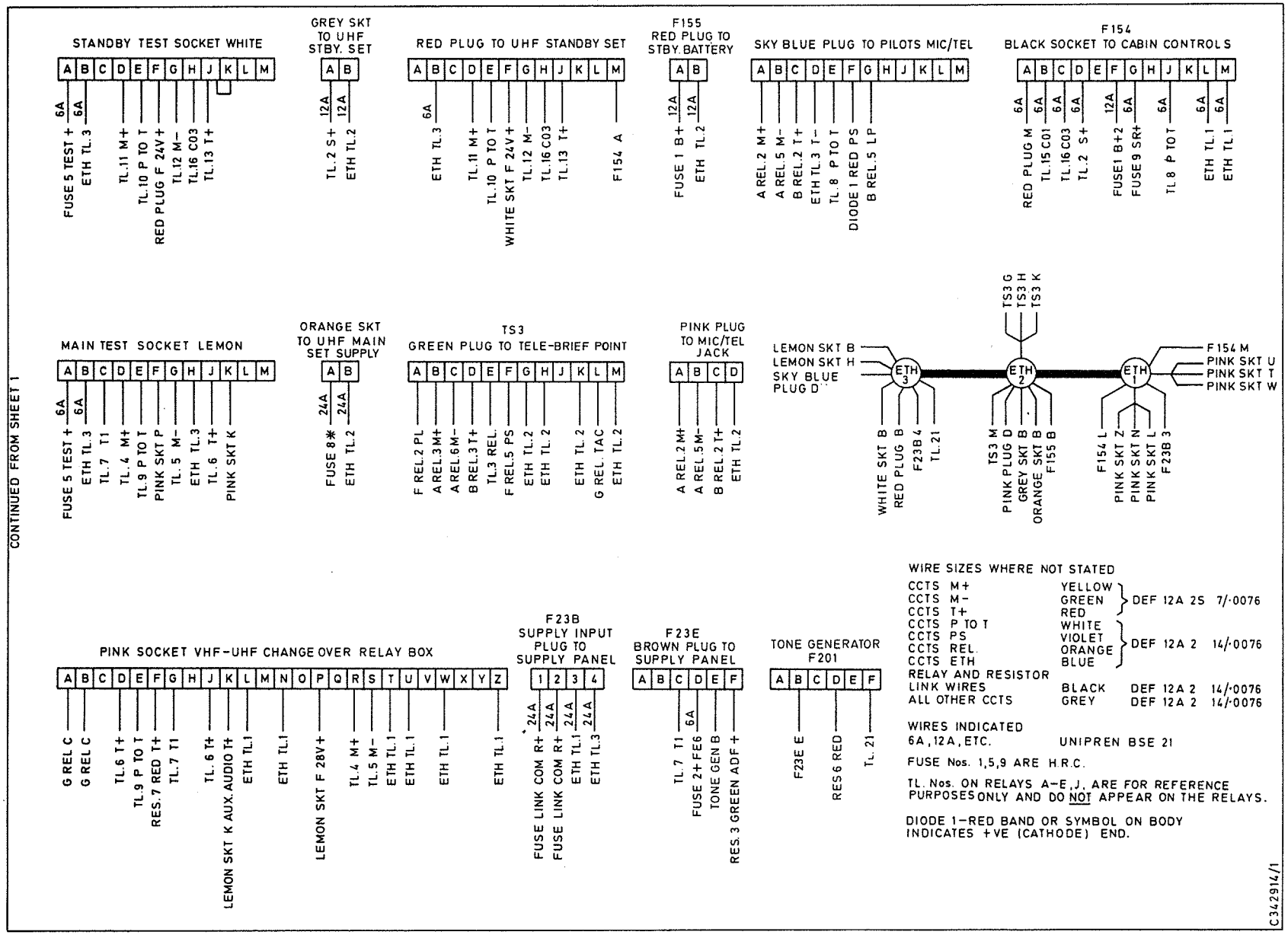

Fig. 4 Wiring of radio relay box (sheet 2)
(Illustrations divided for clarity)

Interface unit

13. The procedure for removing the interface unit is as follows:-

(1) Render the aircraft electrically safe.

(2) Disconnect the connector from the unit and the connectors from the transceiver. Fit blanking caps to the plugs and sockets.

(3) Release the catch securing the interface unit to the mounting tray and carefully withdraw the unit from the tray. Remove unit from aircraft.

Filter unit, dc

14. The procedure for removing the filter unit is as follows:-

(1) Render the aircraft electrically safe.

(2) Disconnect the connector from the unit and fit blanking caps to the plug and socket.

(3) Remove and retain the four screws, locknuts and washers securing the unit to the mounting plate. Remove unit from aircraft.

Tone generator

15. The procedure for removing the tone generator is as follows:-

(1) Render the aircraft electrically safe.

(2) Disconnect the connector from the unit and fit blanking caps to the plug and socket.

(3) Remove and retain the three bolts and six washers securing the unit to the relay box. Remove unit from aircraft.