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SECTION 6

RADIO AND RADAR INSTALLATIONS

LIST OF CHAPTERS OVERLEAF

SECTION 6

RADIO AND RADAR INSTALLATIONS

LIST OF CHAPTERS

Note:- *A list of contents appears at the beginning of each chapter*

Chapter 1 RADIO INSTALLATION

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Note to Readers
The Radio installations in the individual T Mk.4 aircraft will differ in accordance with the aircraft role. To assist the user, these differences are shown in the following breakdown of applicable chapters. During servicing, all personnel should ensure that they are using the correct text, illustrations and wiring diagrams that are associated with the installation(s) being serviced.

Post Mod.5181 aircraft

Pre Mod.5181 aircraft

See AL 202

▶ ◀

Chapter 1 RADIO INSTALLATION

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GENERAL INFORMATION

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LIST OF ILLUSTRATIONS

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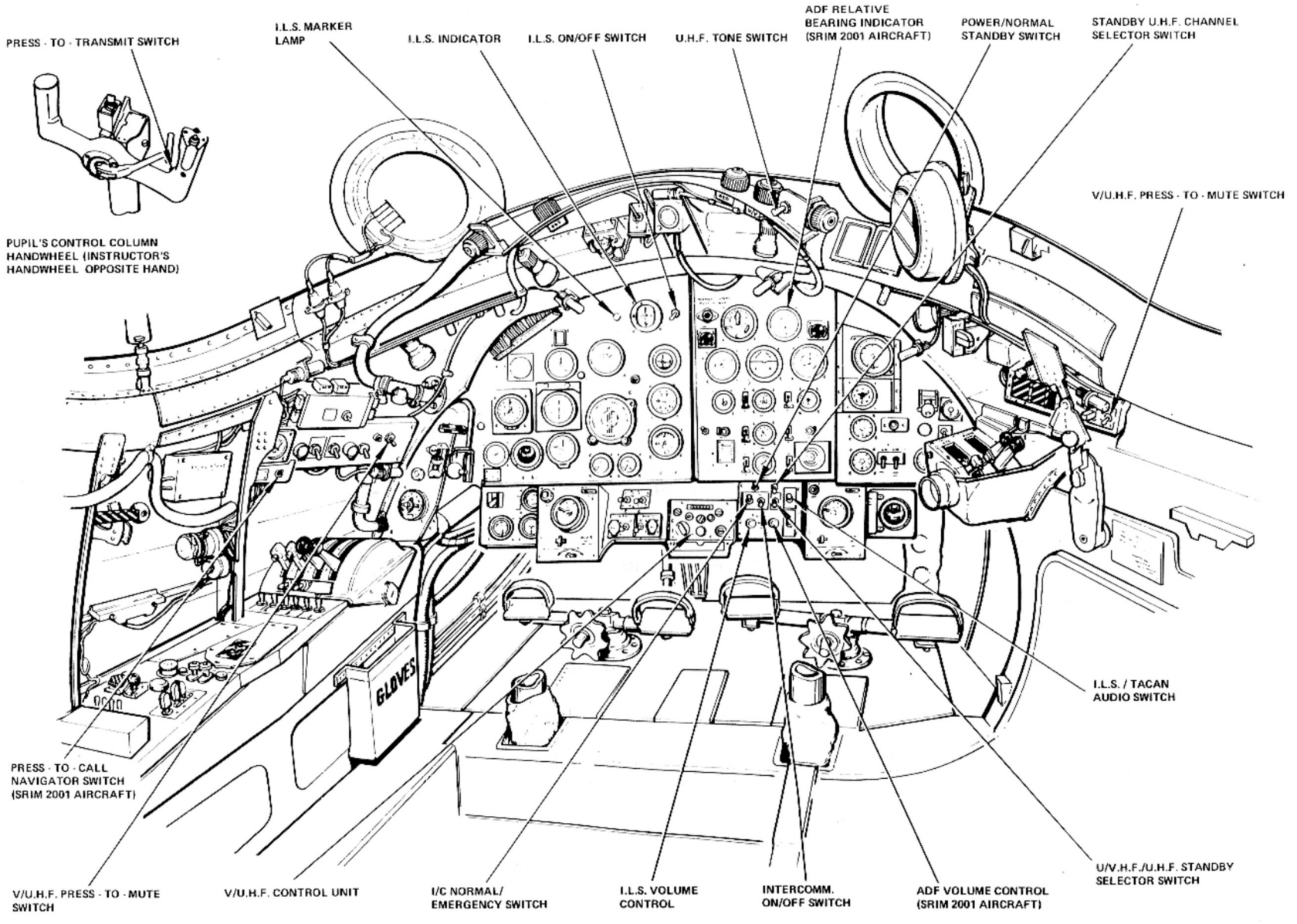

FIG. 1. RADIO INSTALLATION-PILOT'S STATION

◄ STI/CAN/586c INCORPORATED ►

DESCRIPTION

General

1. This chapter contains a description of the radio systems and information covering the servicing of the equipment. It is divided into the following parts:-

1 INTERCOMMUNICATION, V/U.H.F. AND STAND-BY U.H.F. INSTALLATIONS

2 – I.L.S. A.R.I.18011

3 – RADIO COMPASS (A.D.F.) A.R.I. 23023

2. A schematic diagram together with a table of cable assemblies accompanies the relevant text in each part, whilst the disposition of the major items of equipment is shown in the general location diagrams.

3. Fig.1, 2 and 3 illustrate the position of the various indicators, switches and control panels associated with the radio installation and fig.4 gives the internal wiring of the radio junction box.

Power supplies

4. The d.c. power supplies required to operate the radio equipment are supplied from busbar P10. The fuse allocations are as follows:-

	fuse
Intercomm.	63
V/U.H.F	158 (pre-mod. 5437)
V/U.H.F.	158 and 159 (post-mod. 5437)
Stand-by U.H.F.	11
I.L.S.	15 amp circuit-breaker
A.D.F.	82 and 104

Further information on power supplies can be found in Sect.5, Chap.1, Groups D and R & S.

Lighting

5. The V/U.H.F. control unit is the only unit which is integrally illuminated. The brilliance of the lighting is controlled by the pilot's starboard red lamps dimmer switch *(Sect.5, Chap.1, Group L).*

Projector Sonar A.R.I.23240/1

6. On naval aircraft only, embodying NSM 3004, a projector sonar A.R.I.23240/1 is mounted on the disused starboard navigator's ejection seat rail. The unit is self-contained and activated by water pressure. In the event of the aircraft ditching, the unit emits an ultra-sonic signal which enables the aircraft to be located.

SERVICING

General

7. Wiring faults should be investigated by referring to the schematic diagram and table of cable assemblies included in the appropriate part of this chapter and the theoretical and routeing diagrams in Sect.5, Chap.1, Groups D and R & S. Servicing information on the individual items of equipment is contained in the publications referred to in the text of each part.

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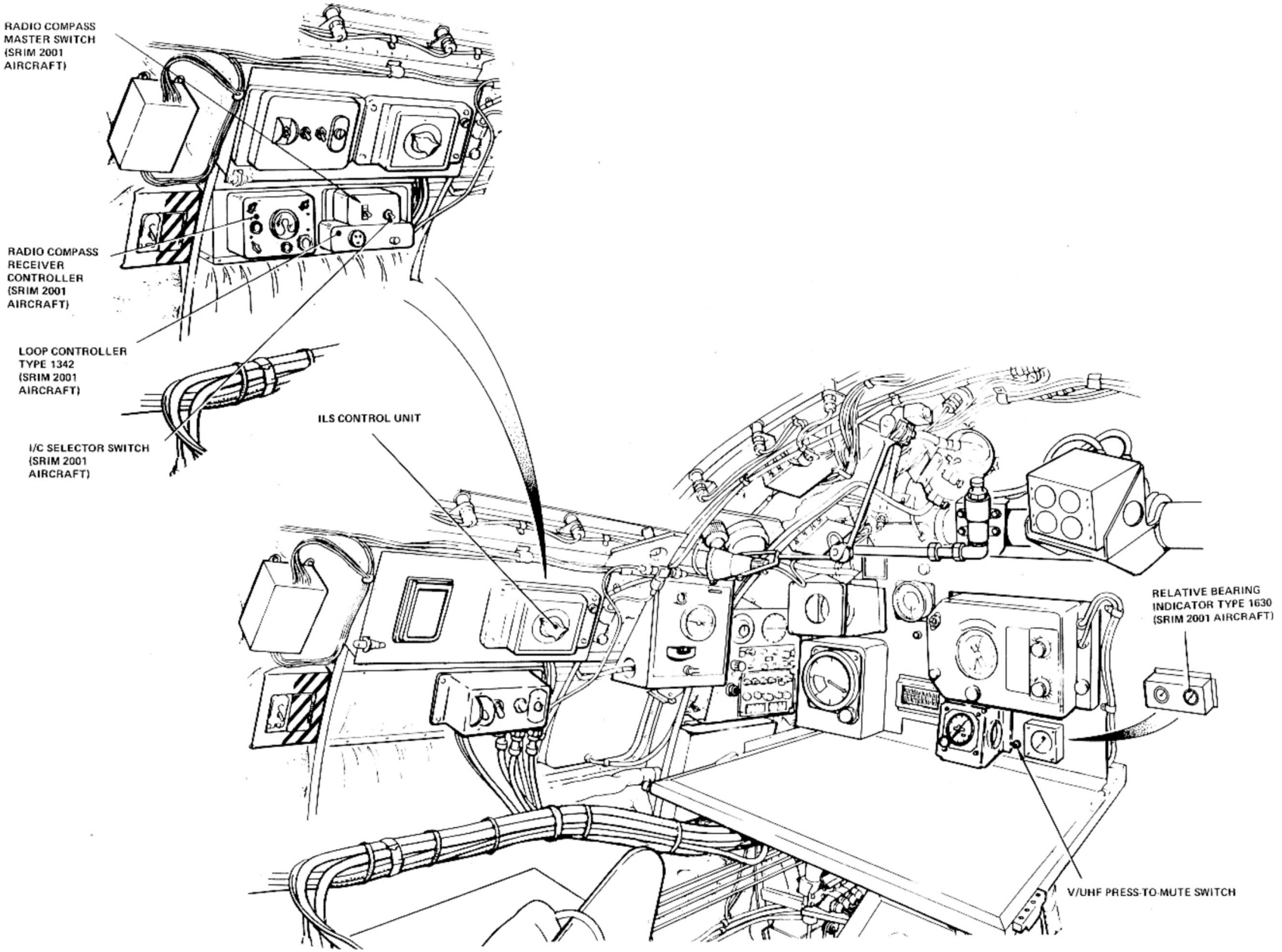

FIG. 2. RADIO INSTALLATION – NAVIGATOR'S PORT STATION

◄ STI/CAN/586c INCORPORATED ►

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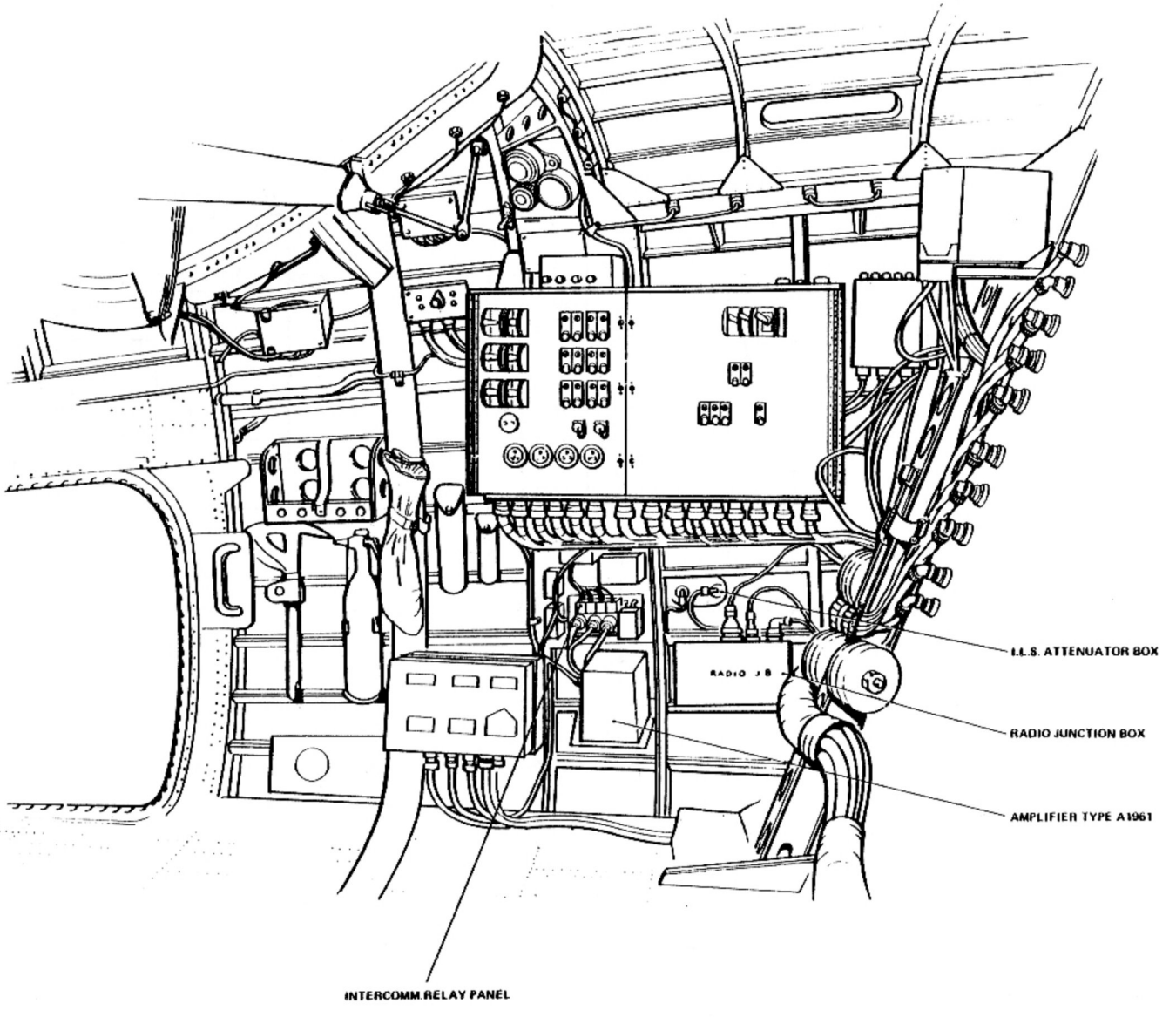

FIG.3. RADIO INSTALLATION - NAVIGATOR'S STARBOARD STATION

◀ E.C.P. AMENDED ▶

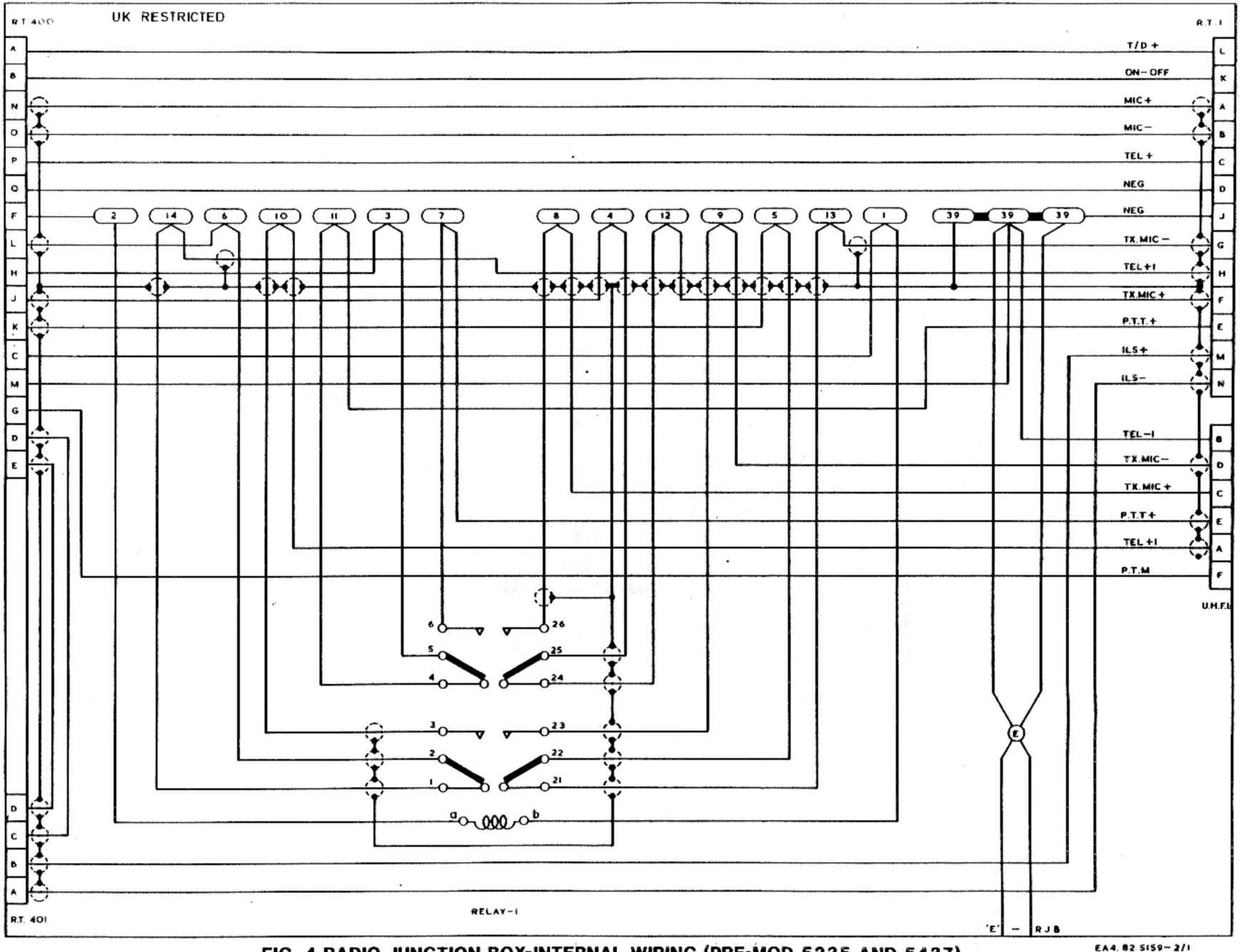

FIG. 4. RADIO JUNCTION BOX-INTERNAL WIRING (PRE-MOD. 5235 AND 5437)

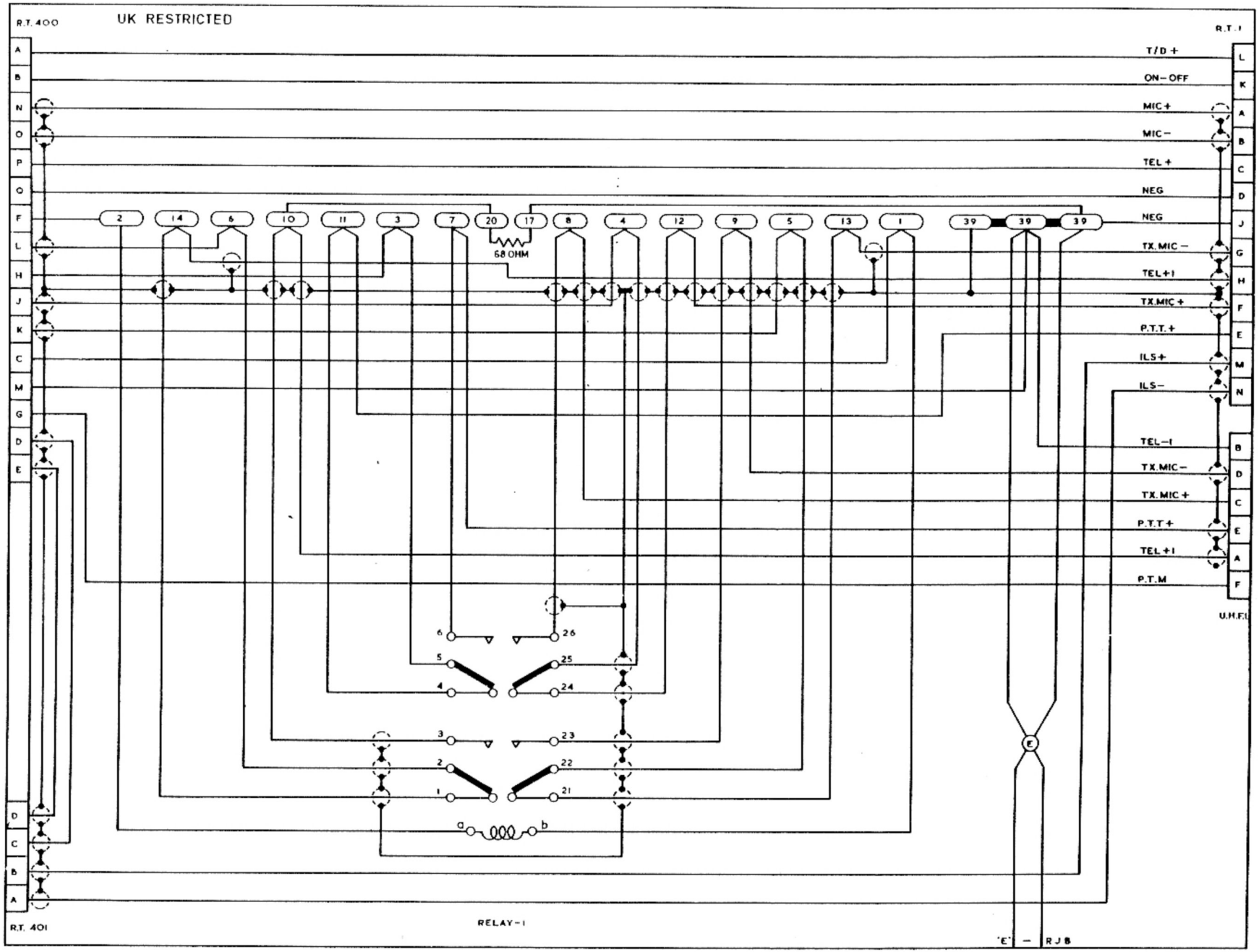

FIG. 5. RADIO JUNCTION BOX-INTERNAL WIRING (POST-MOD. 5235 AND 5437)

EA4. 82. 5159 – 2/1

◄ NEW FIGURE ►

◄ EA4. 82. 5429 – ISS. 1B ►

PART 1 INTERCOMMUNICATION SYSTEM AND V/U.H.F., U.H.F. STAND-BY INSTALLATION

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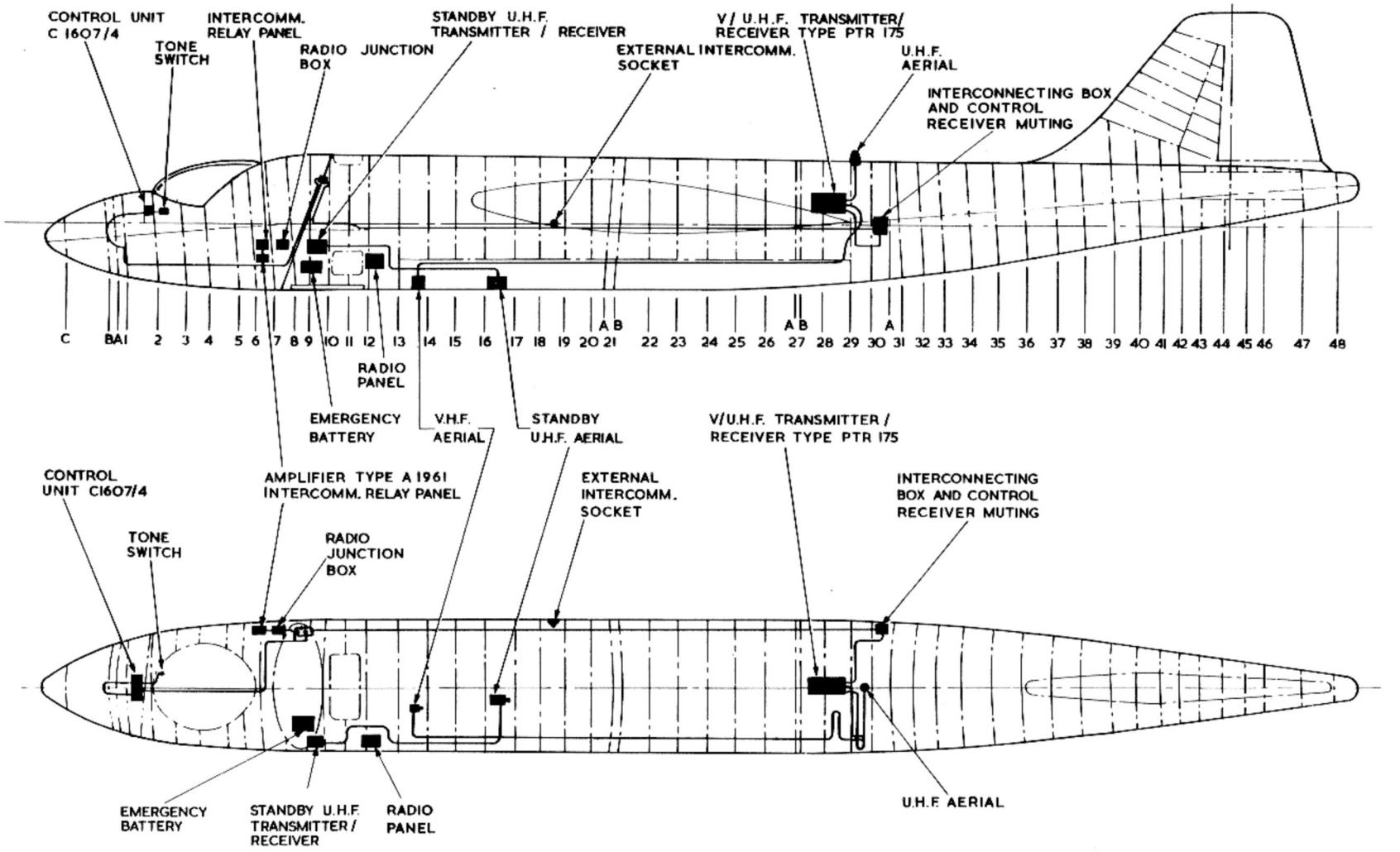

EA4 82 5349 1 8

FIG. 1. LOCATION DIAGRAM—INTERCOMM, V/U.H.F. AND U.H.F. STANDBY

◀ PLAN POSITION OF EMERGENCY BATTERY CORRECTED ▶

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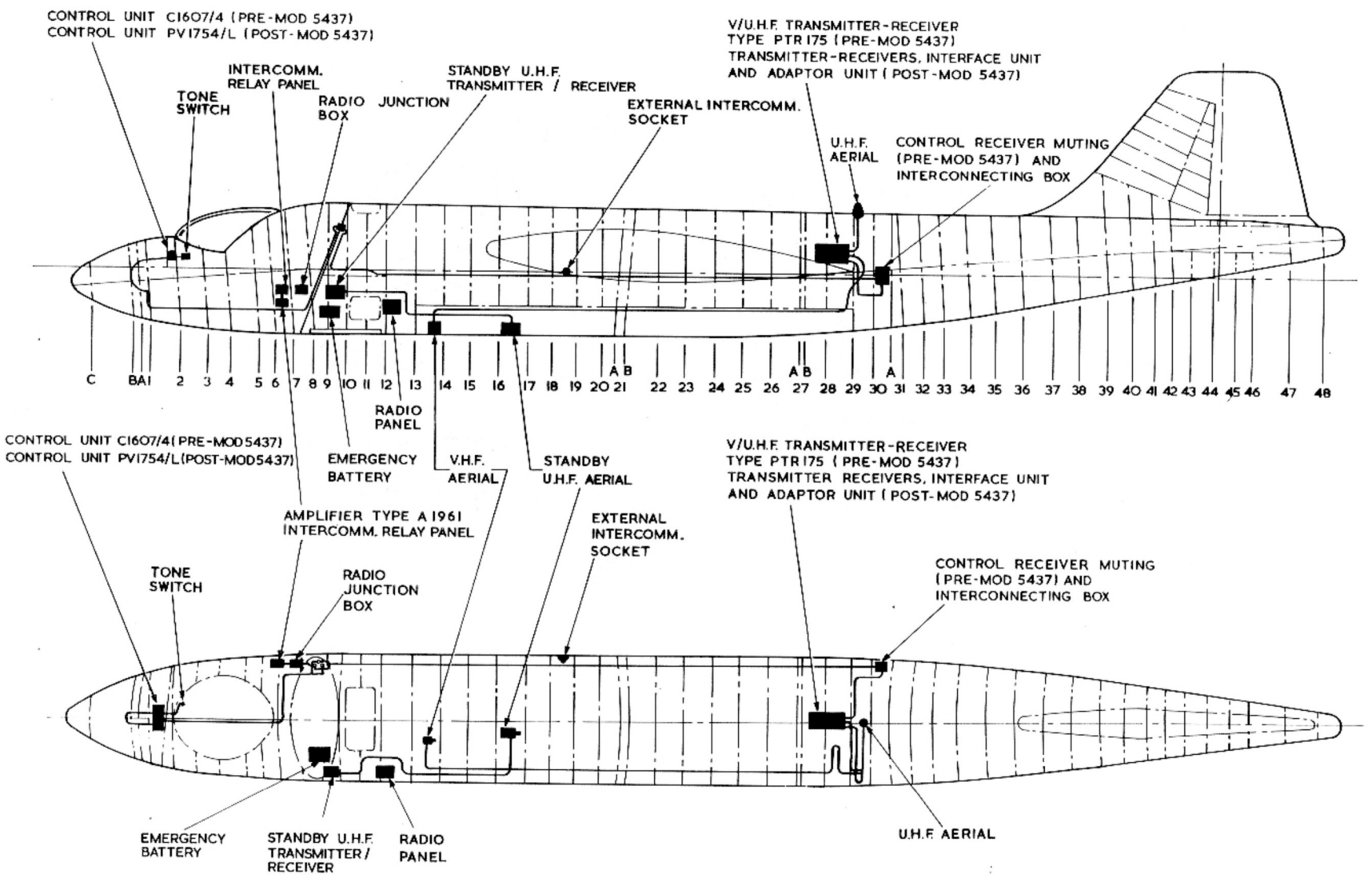

EA4 81 7113 1 8

FIG. 1. LOCATION DIAGRAM - INTERCOMM. V/U.H.F. AND STANDBY U.H.F. (PRE AND POST MOD. 5437)

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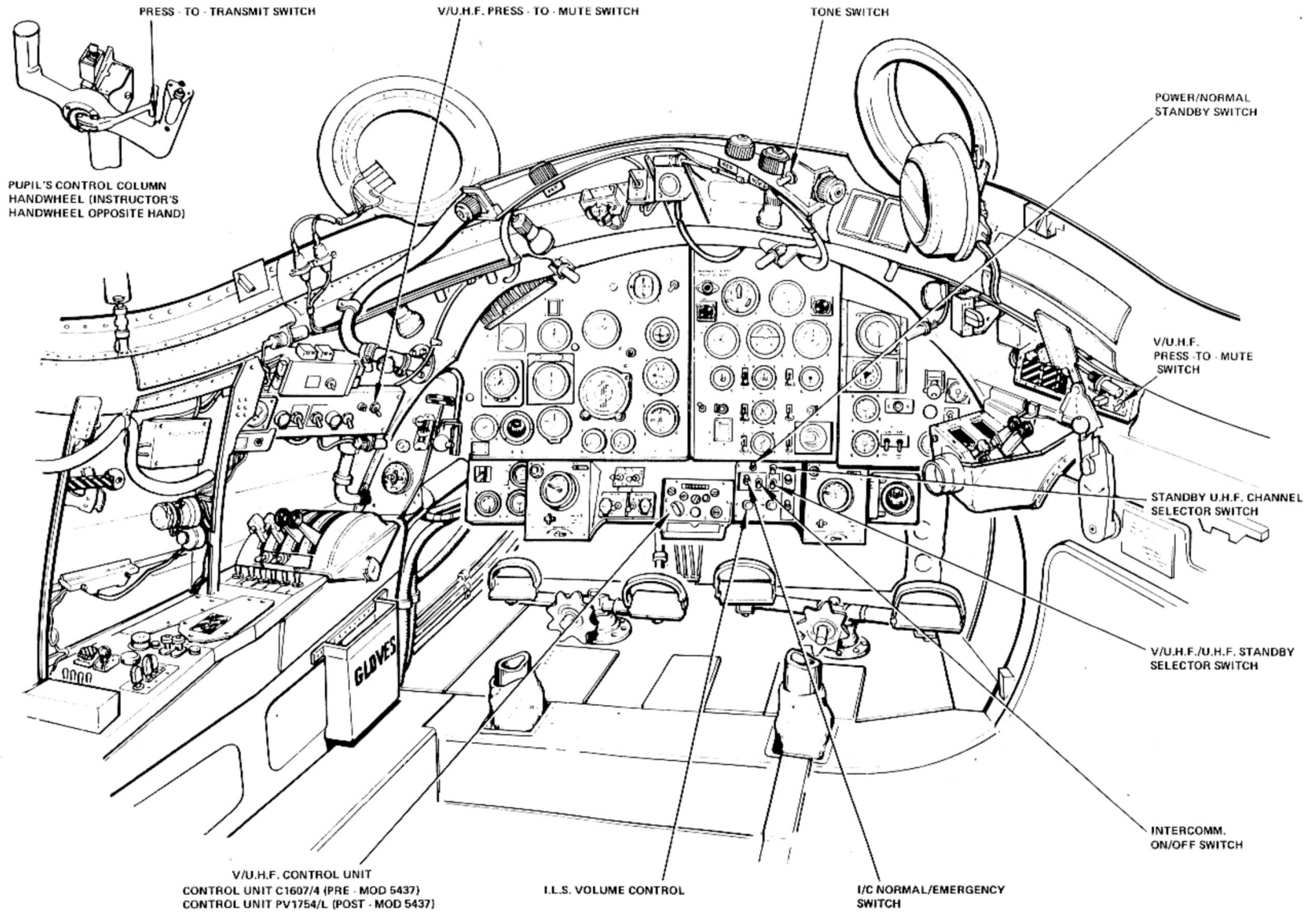

FIG. 1A. LOCATION DIAGRAM-INTERCOMM. V/U.H.F. AND STANDBY U.H.F. (PRE AND POST MOD. 5437)

◄ STI/CAN/586c INCORPORATED ►

DESCRIPTION

INTERCOMMUNICATION INSTALLATION

General

1. Normal intercommunication is provided by a Type A1961 amplifier installed at the starboard side of the navigator's station. The unit is a three stage audio-frequency amplifier operating directly from the aircraft 28 volt supply, incorporating a Type 103 rotary transformer to supply H.T. voltage for the anodes of the valves. The valve heaters are fed from a stabilized supply at 19 volts; this is also derived from the aircraft 28 volt supply, a Type 40 carbon pile regulator being used to stabilize the heater voltage. All the connections to the amplifier are made via miniature plugs and sockets.

2. Modification No. 5437, which is applicable to RAF aircraft only, introduces wiring changes to the intercomm. relay panel and replaces the existing connector between PL2 on the Type 154 junction box and the Type A1961 amplifier.

3. The locations of the main units are shown on fig.1-1A, fig.2-2A shows the interconnecting details pre-mod.5437 and fig.3-3A-3B shows the interconnecting details post-mod.5437. Table 1 lists main components, together with their A.P. references and Table 2 cable assembly details. Full technical information on the main units is contained in A.P.116N-0105-1.

Intercomm. relay panel

4. This panel is installed on the cabin wall immediately above the I/C amplifier and is the distribution point for the I/C wiring. Mounted on the panel is a Type 154 junction box, two Type S1 relays and a number of terminal blocks.

Control switches

5. The system is controlled by an ON/OFF switch and a NORMAL/EMERGENCY switch, mounted on the starter and auxiliary panel.

Intercomm. sockets

6. Each ejection seat is fitted with its own intercomm. wiring, a socket for making connection with a headset plug and a plug which connects to a socket in the fixed wiring of the aircraft. The latter connection is automatically broken when the seat is ejected. An external intercomm. socket is located on the fuselage side, access being via the starboard wheel well.

Emergency operation

7. Provision is made for the emergency operation of the intercomm. system in the event of the Type A1961 amplifier becoming unserviceable. Emergency intercomm. is provided by the aircraft's V/U.H.F. installation and is controlled by the NORMAL/EMERGENCY switch on the starter and auxiliary panel in association with the Type 154 junction box on the intercomm. relay panel.

V/U.H.F. AND STAND-BY U.H.F. INSTALLATIONS

General

8. The aircraft is equipped with two communication installations. Pre-mod.5437 aircraft are equipped with A.R.I. 23143/1 V/U.H.F. and A.R.I. 23159 U.H.F. stand-by while post-mod. 5437 aircraft are equipped with A.R.I.23300 V/U.H.F. and A.R.I. 23159 stand-by U.H.F. Full technical information on the main units is contained in A.P.116D-0116-1 (A.R.I. 23143/1), A.P.116D-0107-1 (A.R.I.23159) and A.P.116D-0154-1 (A.R.I. 23300).

9. The locations of the main units are shown in fig.1-1A and interconnections in fig 2-2A (pre-mod. 5437) or in fig.3-3A-3B (post-mod. 5437). Table 1 lists main components, together with their A.P. references and Table 2 cable assembly details.

V/U.H.F. INSTALLATION – A.R.I.23143/1 (PRE-MOD.5437)

Introduction

10. A.R.I.23143/1 provides the following facilities:-

3500 air-to-ground or air-to-air communication channels in the U.H.F. band of 225 to 399.95 MHz with a channel spacing of 50 KHz.

370 air-to-ground or air-to-air communication channels in the V.H.F. band of 117.5 to 135.95 MHz with a channel spacing of 50 KHz.

Constant monitoring of the guard (international U.H.F. distress) frequency of 243 MHz via an additional fixed tuned receiver incorporated in the main U.H.F. transmitter-receiver.

Transmission of a 1 KHz tone for emergency homing and direction finding.

Emergency intercomm. between crew members, using the A.F. amplifier section of the transmitter-receiver.

11. The installation comprises the following main items of equipment:-

Transmitter-receiver, Type PTR 175
Mounting tray
Control Unit, Type C1607/4
Control receiver muting
Interconnecting box
U.H.F. aerial
V.H.F. whip aerial

Transmitter-receiver

12. The transmitter-receiver unit is mounted on a shock-mount tray located in the rear fuselage between frames 27 and 29. Cooling air for the unit is provided by a double-ended blower motor assembly, mounted on the front panel, which circulates air between the inner and outer covers. Pressurization of the unit is maintained at 5 lb/in^2 through a Schraeder valve, using dry air or nitrogen. The valve and all electrical connectors are located on the front plate of the unit.

13. In conjunction with the control unit, the transmitter-receiver can be selected to operate on any one of 19 preset channels (one of which is tuned to the guard frequency) or manually tuned to any one of the 3500 U.H.F. and 370 V.H.F. frequencies available.

14. A self-contained receiver sub-assembly of the main unit functions as the guard receiver. Connected to the same U.H.F. aerial as the main unit, it has only one reception channel (238 MHz to 248 MHz) which is normally tuned to the international U.H.F. distress frequency of 243 MHz.

Control unit, Type C1607/4

15. The control unit is located on the starter and auxiliary panel. On the front plate of the unit are the following controls:-

(1) *Function switch.* A seven-position switch permitting selection of the following services:-

OFF	-	power supplies disconnected
T/R	-	equipment switched on for normal use
T/R + G	-	as for T/R but with the guard receiver switched on in addition to the main receiver
ADF		not used in this installation
DL		
DL/T		
TR ON DL OFF		

(2) *Channel selector switch.* A twenty-position switch idented CHAN. Positions 1 to 18 permit selection of any one of the preset frequencies as required, position M transfers the frequency selection to manual control and position G selects the guard channel preset to a frequency of 243 MHz.

(3) *Manual frequency selectors.* Three identical knobs, idented MANUAL control selection of the required U.H.F. or V.H.F. frequency. The left-hand knob controls the hundreds and tens MHz selection, the centre knob the units MHz selection and the right-hand knob the hundreds and tens KHz selection. The selected frequency is displayed in the read-out window above the switches.

(4) *Volume control.* This control, idented VOL, sets the level of the

audio signal fed to the telephone circuits of the crew.

16. Access to the frequency scale adjusters for setting-up the preset channels is obtained by pulling open the cover plate at the bottom of the front panel.

17. Two integral panel lamps are controlled by the pilot's starboard red lamps dimmer switch *(Sect.5, Chap.1, Group L).*

Interconnecting box

18. Located in the starboard rear fuselage between frames 30 and 30A, the interconnecting box permits connection of the following:-

(1) Microphone inputs and audio output circuits from the transmitter-receiver to the crew headsets via the radio junction box.

(2) Muting and tune facilities and panel lights to the appropriate switches and controls.

(3) Power supplies to the control unit and transmitter-receiver.

(4) Control unit to the transmitter-receiver.

Control, receiver muting

19. The control, receiver muting is located adjacent to the interconnecting box *(para.18)* and enables the V/U.H.F. receiver output to be muted as required. When any one of the press-to-mute switches is operated, a relay inside the unit is energized. Contacts of this relay close to apply a negative bias to the A.G.C. line of the V/U.H.F. receiver.

Tone switch

20. A tone switch, idented ON-OFF, is located on the cockpit coaming panel. When the switch is set to ON, the transmitter-receiver continuously transmits a 1 KHz note on the frequency selected, for homing or direction finding purposes.

Aerials

21. Three aerials are fitted to the aircraft; an upper U.H.F. aerial, a lower stand-by U.H.F. aerial and a lower V.H.F. aerial. The upper U.H.F. aerial is located between frames 29 and 30. The lower aerials are located in the port bomb-bay door, the U.H.F. stand-by aerial between ribs 7 and 8, stringers 4 and 5, the V.H.F. aerial between ribs 3 and 4, stringers 2 and 3. Care must be taken when replacing the V.H.F. aerial mounting box such that its movement is lateral.

Power supplies

22. The 28 volt d.c. supply for the transmitter-receiver is fed from fuse 158 in the main electrical panel (M.E.P.) via the interconnecting box.

V/U.H.F. INSTALLATION - A.R.I. 23300 (POST-MOD.5437)

Introduction

23. A.R.I. 23300 (V/U.H.F.) systems are based on a U.H.F. transmitter-receiver and a V.H.F. transmitter-receiver installed side-by-side on a common mounting tray. Both transmitter-receiver units are controlled from a V/U.H.F. control unit which is connected to them via an interface unit and in case of the V.H.F. transmitter/receiver, an adaptor unit.

24. A.R.I. 23300 provides the following facilities:-

3500 communication channels in the U.H.F. band of 220 to 399.95 MHz with a channel spacing of 50 KHz.

720 communication channels in the V.H.F. band of 118 to 135.975 MHz with a channel spacing of 25 KHz.

Constant monitoring of the guard (international U.H.F. distress) frequency of 243 MHz.

Emergency intercomm. between crew members using an emergency intercomm. amplifier.

Any sixteen of the available 4220 V/U.H.F. channels may be pre-set by the pilot for quick channel selection.

25. The installation comprises the following main items of equipment:-

U.H.F. transmitter-receiver, Type PTR 1751W

V.H.F. transmitter-receiver, Type AA1201-3

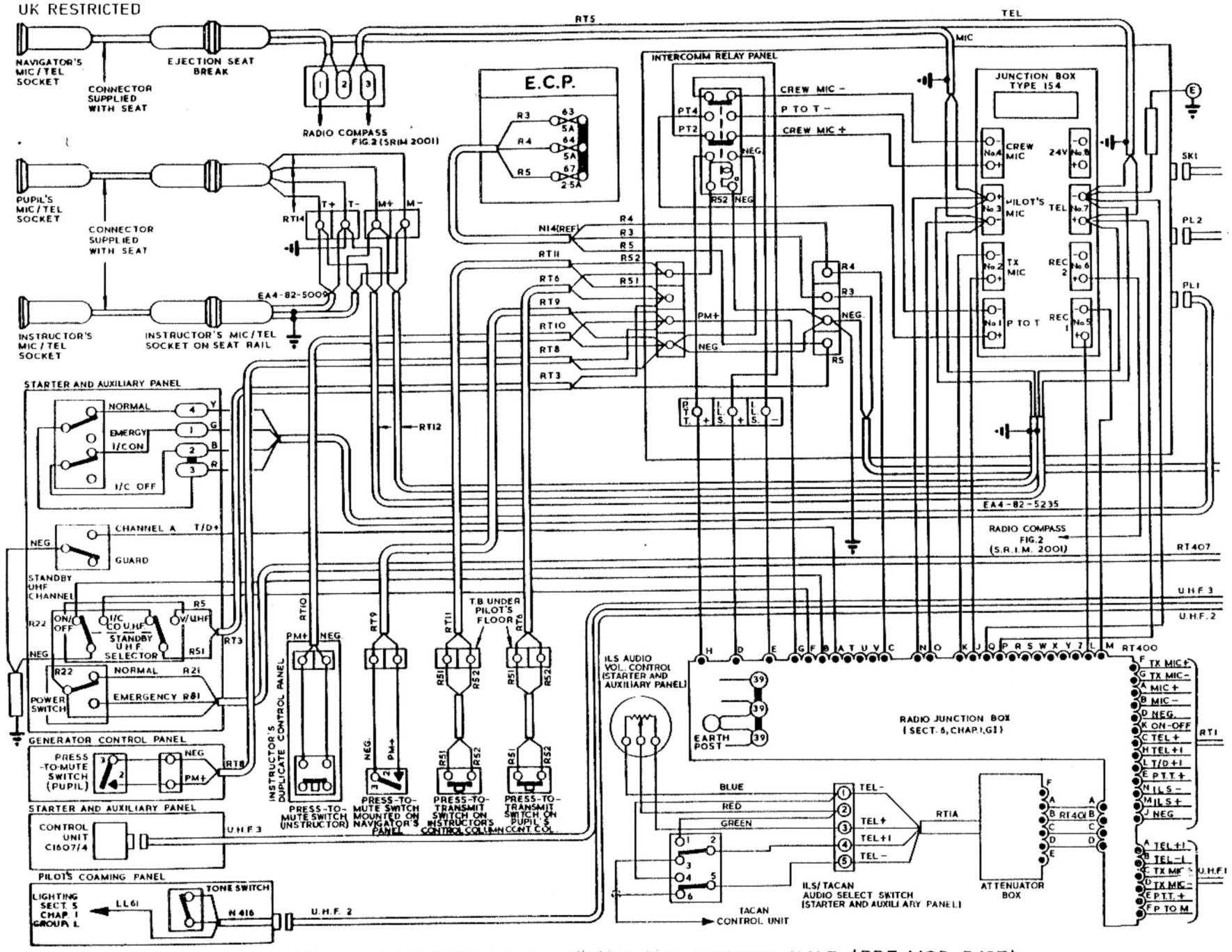

FIG.2. INTERCONNECTION DIAGRAM-INTERCOMM. V/U.H.F. AND STANDBY U.H.F. (PRE MOD. 5437)

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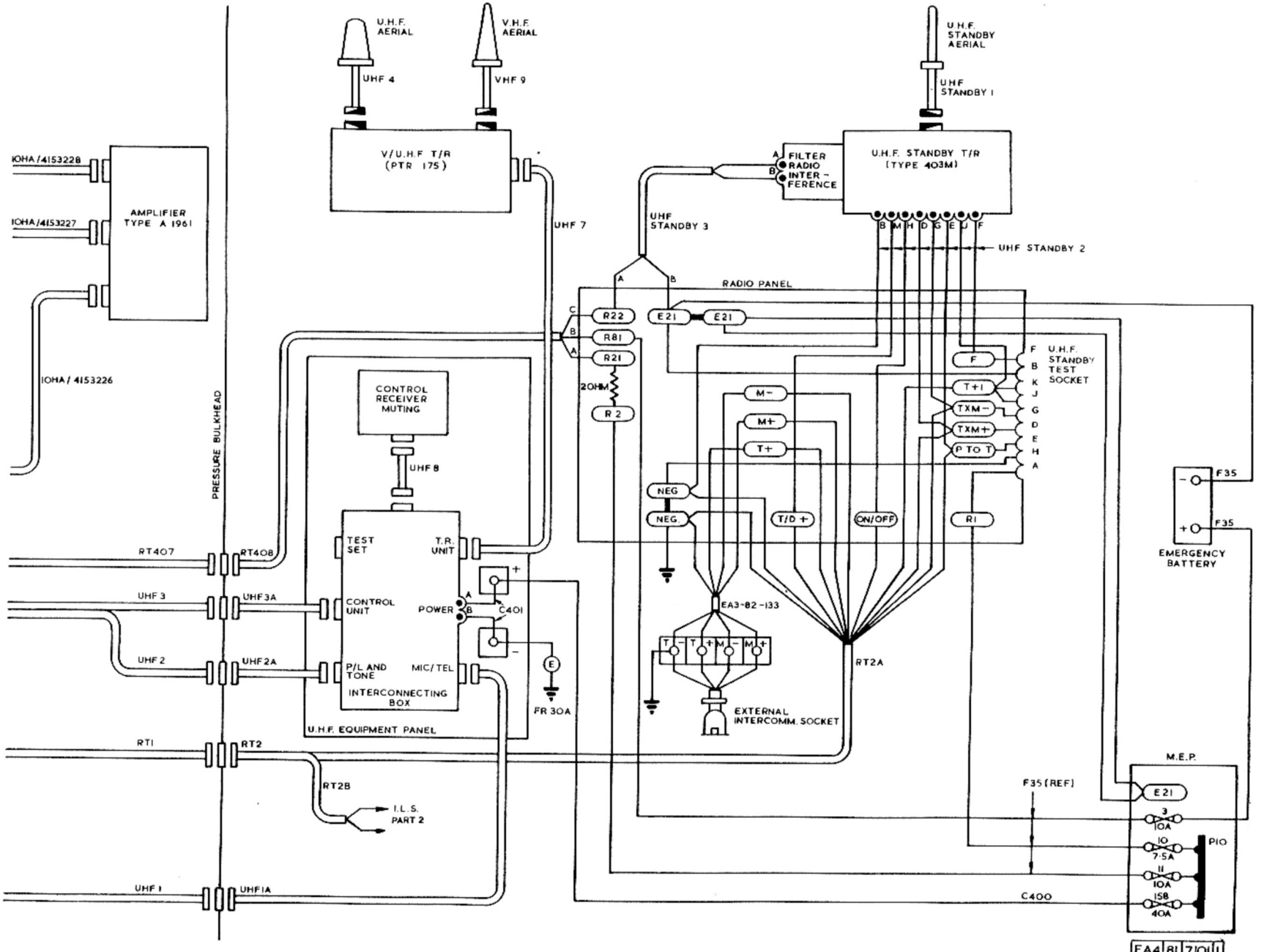

EA4	81	7101	1
EA4	82	5193	5

FIG. 2A. INTERCONNECTION DIAGRAM - INTERCOMM. V/U.H.F. AND STANDBY U.H.F. (PRE MOD. 5437)

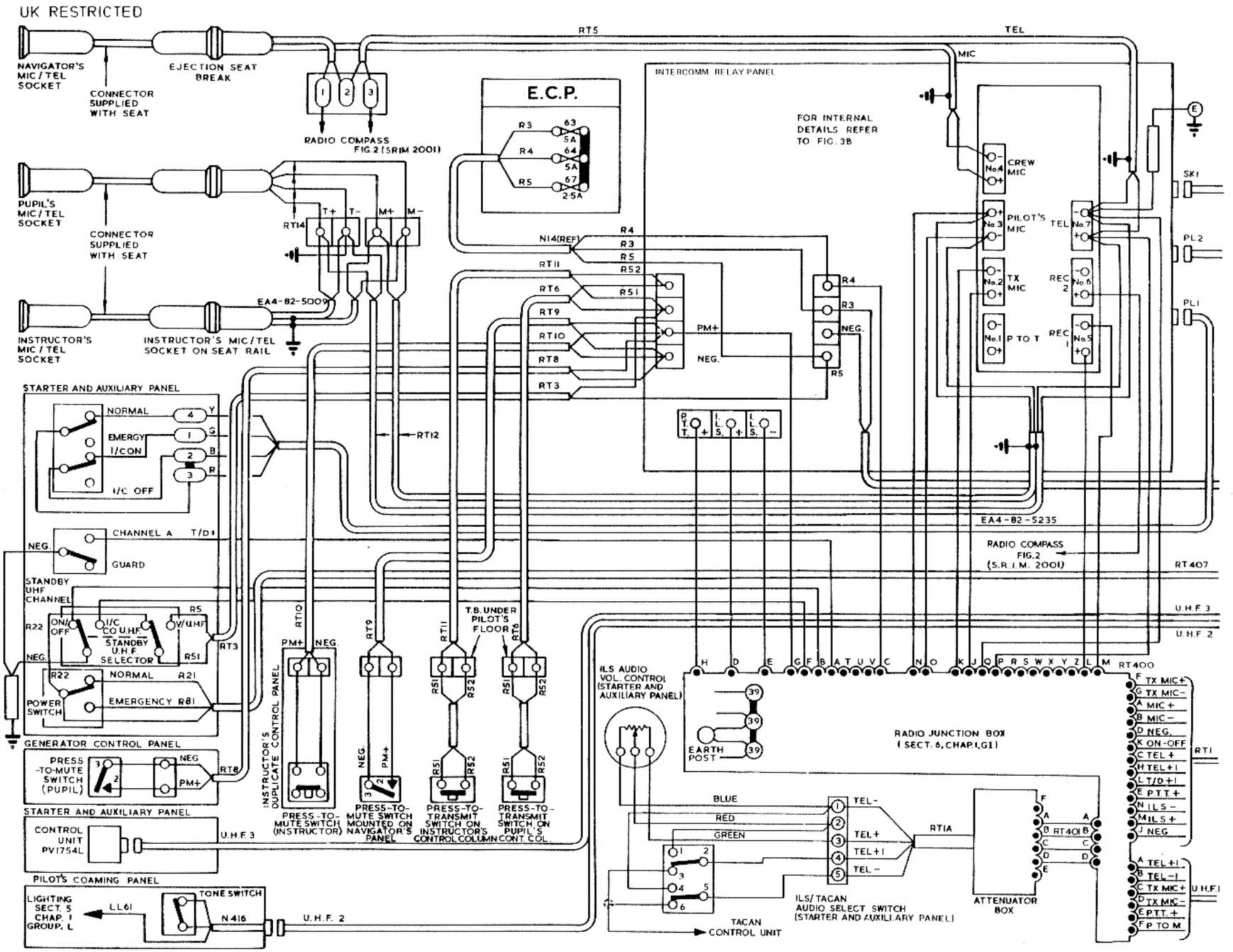

FIG. 3. INTERCONNECTION DIAGRAM - INTERCOMM. V/U.H.F. AND STANDBY U.H.F. (POST MOD. 5437)

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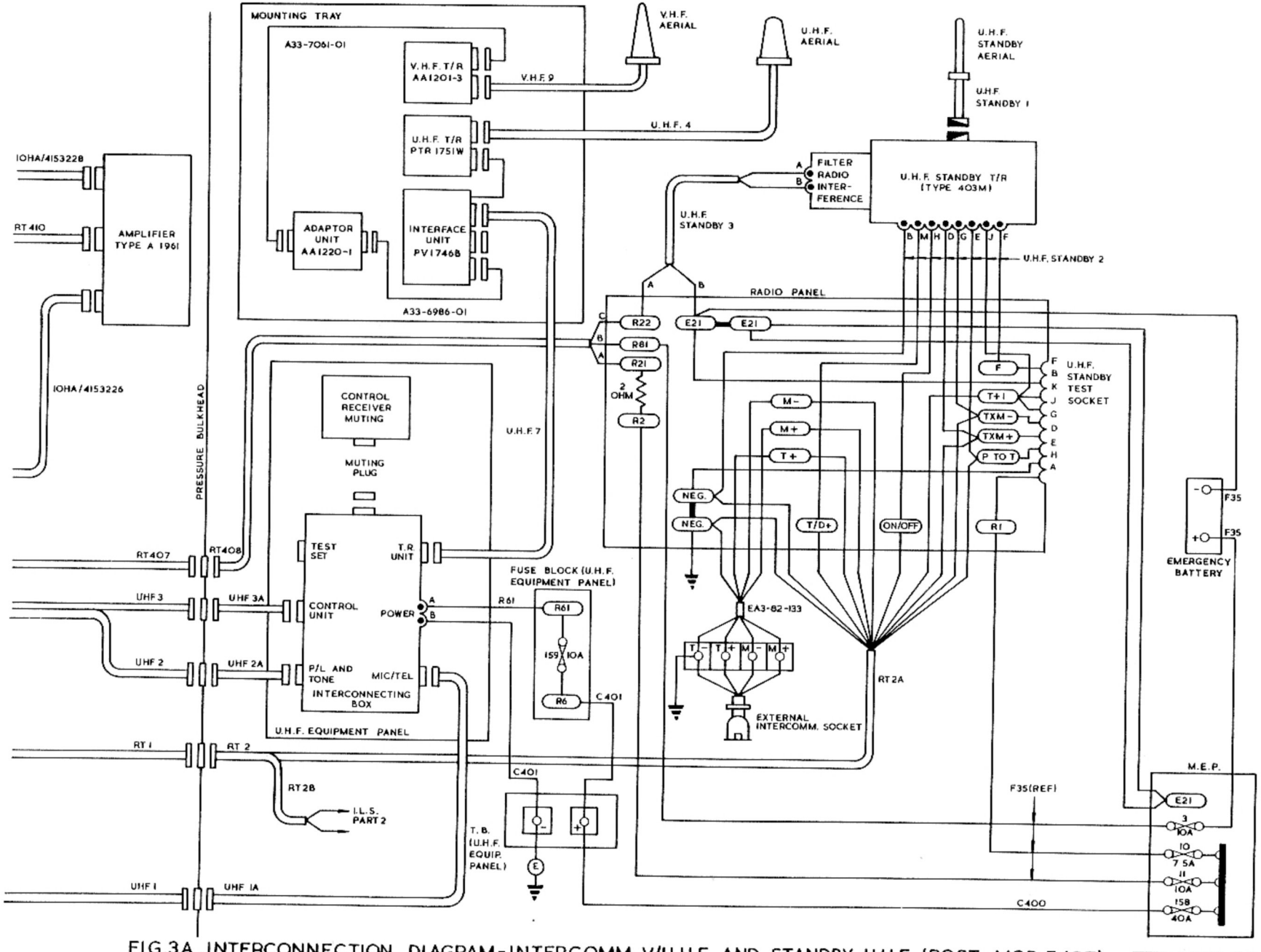

FIG.3A. INTERCONNECTION DIAGRAM - INTERCOMM. V/U.H.F. AND STANDBY U.H.F. (POST-MOD 5437)

EA4	81	7113	1	1
EA4	81	7113	2	1

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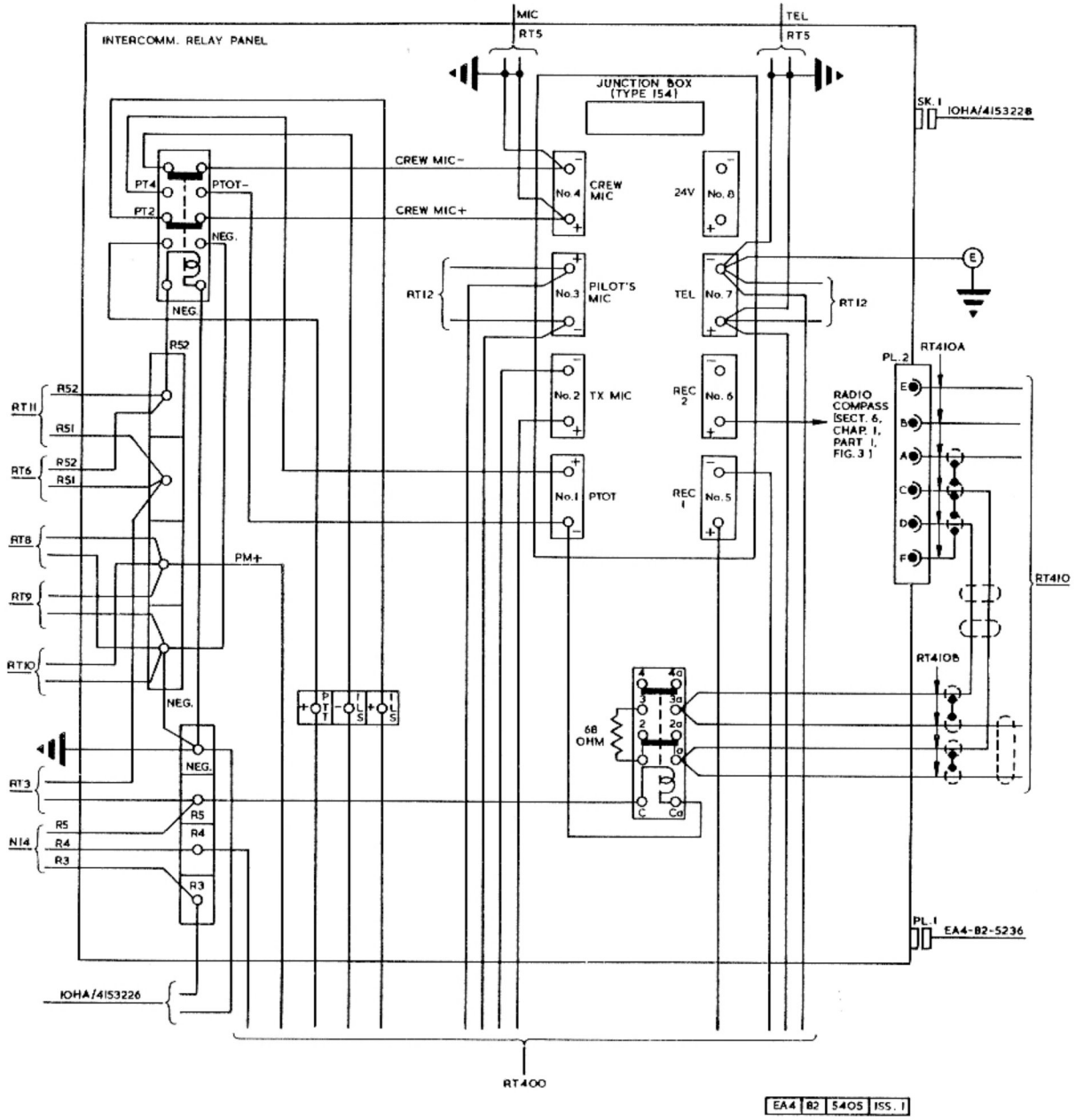


FIG.3B. INTERCONNECTION DIAGRAM - INTERCOMM., V/U.H.F. AND STANDBY U.H.F. (POST - MOD.5437)

V/U.H.F. control unit, Type PV1754L

Adaptor unit, Type AA1220-1

Interface unit, Type PV1746B

Interconnecting box

U.H.F. aerial

V.H.F. whip aerial

Mounting tray

V.H.F. transmitter-receiver

26. The V.H.F. transmitter/receiver is fitted in a shock-mounted tray which also carries the V.H.F. adaptor unit, U.H.F. transmitter/receiver and the interface unit, located in the rear fuselage between frames 27 and 29.

27. The transmitter-receiver can be selected to operate on any one of sixteen preset channels or manually tuned to any of the available 720 V.H.F. channels via the pilot's control unit.

U.H.F. transmitter-receiver

28. The U.H.F. transmitter-receiver can, in conjunction with the control unit, be operated on any one of sixteen preset channels or manually tuned to any of the available 3500 U.H.F. channels. A separate guard receiver enables the international U.H.F. distress frequency to be monitored.

Interface unit

29. The interface unit provides interfacing between the transmitter-receivers and the remaining system components. It contains links and preset controls for setting the modulation audio levels and an emergency intercomm. amplifier.

Adaptor unit

30. The adaptor unit converts the control unit frequency selection data into a form suitable for the V.H.F. transmitter-receiver and produces an inhibit signal if a frequency outside the range of the transmitter-receiver has been selected.

Pilot's control unit

31. A control unit, Type PV1754L, is located on the starter and auxiliary panel and provides the pilots with control of the system.

Control unit, Type PV1754L

32. The control unit, Type PV1754L, provides the pilots with the following facilities:-

(1) Manual frequency selection is effected by two pairs of concentrically-mounted knobs. The left-hand controls are used to select frequencies in 10 MHz and 1 MHz steps while the right-hand controls are used to select frequencies in 100KHz and 25KHz steps.

(2) A rotary function switch has the following positions:-

OFF - power supplies disconnected.

T/R - equipment switched on for normal use.

T/R+G - the guard receiver in the U.H.F. transmitter-receiver is switched on with retention of normal transmission-reception facilities on the selected channel.

T/R+H, T/R+G+H } not used in this installation.

(3) A rotary mode switch has the following positions:-

M - the installation operates on the manually selected frequency.

P - the installation operates on the preset frequency.

Gv - the installation operates at the V.H.F. distress frequency of 121.5 MHz.

Gu - the installation operates at the U.H.F. distress frequency of 243 MHz.

(4) A channel select rotary switch marked 1 to 16 selects one of the sixteen preset channels for use.

(5) A VOL control sets the level of the transmitter-receiver audio output.

(6) A frequency display shows the first five digits of the manually - selected frequency.

(7) A DIM control controls the brightness of the frequency display.

(8) A TEST push-button, when operated, provides a confidence check on the display and on the transmitter-receiver. With the mode switch set to M, pressing the TEST push-button causes the display to indicate 888.88 while with P, Gv or Gu selected, the display indicates the operating frequency.

(9) A SET CHANNEL button inserts the manually-set V.H.F. or U.H.F. frequency into the selected preset channel. This is achieved by rotating the button clockwise against spring tension and then depressing it.

Interconnecting box

33. The interconnecting box, located in the rear fuselage between frames 30 and 30A on the starboard side, enables the following connections to be made:-

(1) Microphone inputs and audio output circuits from the transmitter-receivers to the crew headsets via the radio junction box.

(2) Muting and tune facilities and panel lights to the appropriate switches and controls.

(3) Power supplies to the control unit and transmitter-receivers.

(4) Control unit to the transmitter-receivers.

A muting plug is fitted to the MUTING socket of the unit.

Press-to-mute

34. When operated, the press-to-mute switches mute the operational receiver. The guard receiver is not muted by operation of the switches.

Tone switch

35. A tone switch, idented ON-OFF, is located on the cockpit coaming panel. When the switch is set to ON, the transmitter-receiver continuously transmits a 1 KHz note on the frequency selected, for homing or direction finding purposes.

Aerials

36. Three aerials are fitted to the aircraft; an upper U.H.F. aerial, a lower U.H.F. stand-by aerial and a lower V.H.F. aerial. The upper U.H.F. aerial is located between frames 29 and 30. The lower aerials are located in the port bomb-bay door, the U.H.F. stand-by aerial between ribs 7 and 8, stringers 4 and 5, the V.H.F. aerial between ribs 3 and 4, stringers 2 and 3. Care must be taken when replacing the V.H.F. aerial mounting box such that its movement is lateral.

Power supplies

37. The V/U.H.F. installation operates on 28 volts d.c. supplied from busbar P10. The transmitter-receivers are supplied from fuse 158 in the main electrical panel (M.E.P.) via fuse 159 adjacent to the interconnecting box (frames 30 and 30A).

Radio junction box

37A. The radio junction box *(Sect.6, Chap.1, General Information)* is modified by the addition of a resistor between terminals 17 and 20. Connections from terminals 17 and 20 are further taken to terminals 39 and 10 respectively.

STAND-BY U.H.F. INSTALLATION - A.R.I.23159

Introduction

38. A.R.I. 23159 provides the following facilities:-

single channel air-to-ground or air-to-air communication on the guard frequency of 243 MHz.

single channel communication on a frequency within 1 MHz of the guard frequency for test purposes.

emergency intercommunication.

The system will operate from an emergency battery for up to 60 minutes if the main power supply fails.

Transmitter-receiver

39. The transmitter-receiver, on its mounting tray, is located in the port equipment compartment. A radio interference filter *(para 45)* is clipped to the carrying handle of the unit.

Controls

40. A channel change switch idented CHAN A - GUARD is located on the pilot's starter and auxiliary panel. The switch is normally retained in the GUARD position by a spring-loaded flap. Channel A is selected for test purposes only.

41. A two-pole, two-way switch, idented V/U.H.F. - U.H.F. STBY is located on the starter and auxiliary panel. When selected to U.H.F. STBY, the switch completes the earth return path for the power on/off relay in the transmitter-receiver. Simultaneously, the switch transfers the d.c. supply for the press-to-transmit facility from fuse 67 in the electrical control panel to either fuse 3 or fuse 11 in the M.E.P. *(para 43 and 44).*

Emergency intercommunication

42. When U.H.F. STBY is selected, a relay in the radio junction box is de-energized and the crew mic/tel circuits are disconnected from the main V/U.H.F. transmitter-receiver audio amplifier and connected to the stand-by transmitter-receiver audio circuits. When the transmitter - receiver is in the receive mode, the audio circuits provide an emergency intercomm. facility.

Power supplies

43. The d.c. supply to the transmitter-receiver is controlled by the POWER NORMAL-STAND-BY switch located on the starter and auxiliary panel. With the switch set to NORMAL, 28 volt d.c. is fed from busbar P10 (M.E.P.) via fuse 11 and a resistor to the power on/off relay in the transmitter-receiver.

44. With the POWER switch set to STAND-BY, 24 volt d.c. is fed from the emergency battery via fuse 3 (M.E.P.) to the transmitter-receiver. The switch is retained in the NORMAL position by a spring loaded flap. For further details refer to Sect.5, Chap.1, Group R & S.

Radio Interference filter

45. To prevent interference from the transistorized power supply in the transmitter-receiver being fed via the aircraft d.c. supply to other radio equipments, the d.c. supply is routed via the radio interference filter unit.

Test socket

46. A 12-pole socket located on the radio panel in the port equipment compartment, is provided for the connection of the first line test equipment.

SERVICING

WARNING

The relevant safety precautions detailed on the LETHAL WARNING marker card must always be observed before entering the cabin or performing any operations upon the aircraft.

General

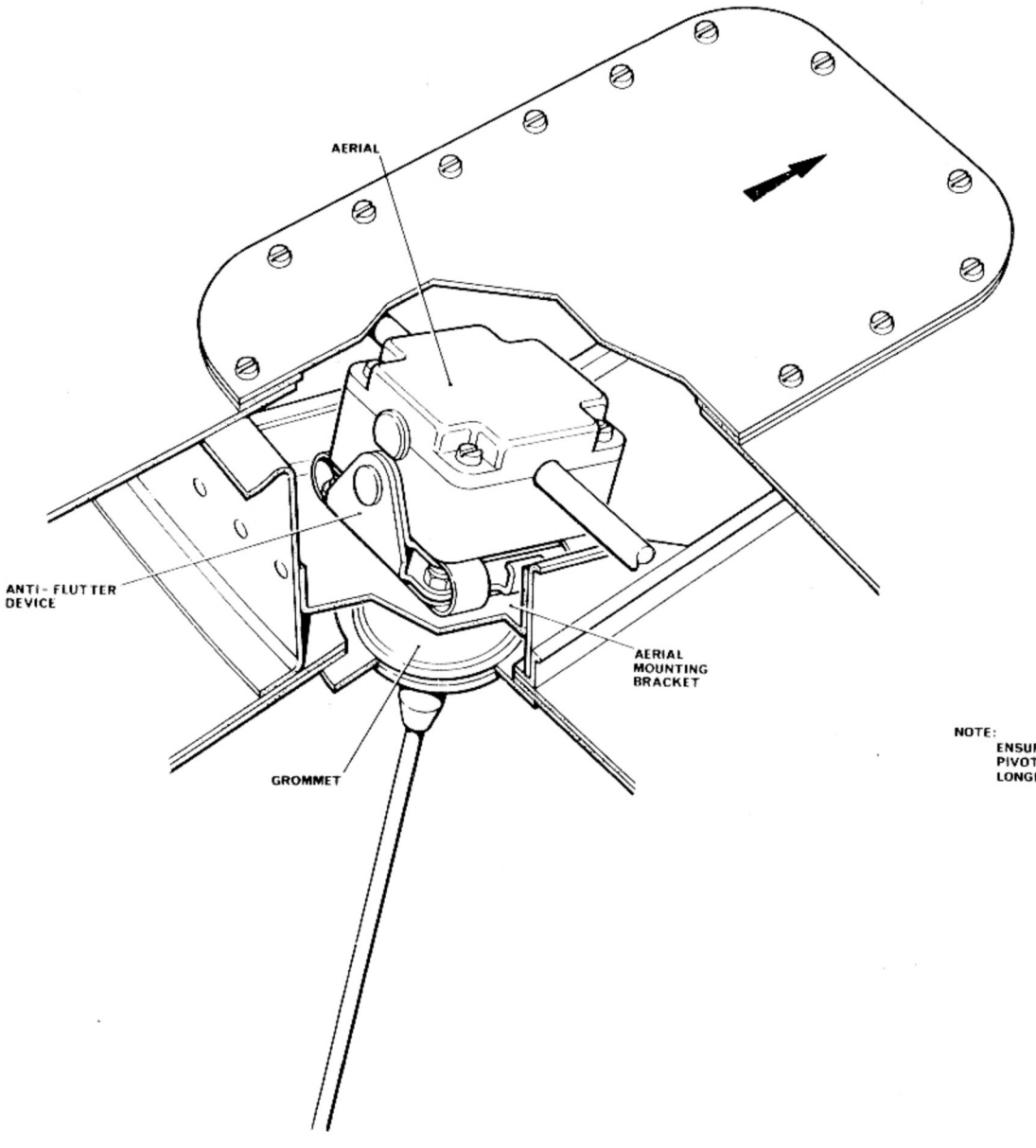
47. With the exception of checking all units and connectors for corrosion, damage and security of attachment, all servicing must be carried out in accordance with the instructions given in the Servicing Schedules and with reference to the information contained in A.P.116N-0105-1, A.P.116D-0116-1, A.P.116D-0107-1 and A.P.116D-0154-1.

48. During replacement of a press-to-transmit switch care must be taken to avoid trapping of the tailplane trim control cables by the shoulder of the press-to-transmit switch.

49. Wiring faults should be investigated by referring to the diagrams in this part and the routeing diagrams in Sect.5, Chap.1, Group R & S.

Interface unit

50. The interface unit fitted to post mod. 5437 aircraft contains pre-set controls and links which must be set up to suit the Canberra T.Mk 4 installation as detailed in A.P.116D-0154-1 prior to fitment of a replacement unit.



NOTE:
ENSURE ANTI-FLUTTER DEVICE PIVOT IS PARALLEL TO THE LONGITUDINAL AXIS.

FIG.4. V.H.F. AERIAL INSTALLATION DIAGRAM

TABLE 1

Equipment Details

Item	Type/Ref.No.	Location	A.P. reference
Intercommunication system			
Amplifier	A1961	Navigator's station - starboard	116N-0105-1
Intercomm. relay panel	-	Navigator's station - starboard	
Intercomm. control switch	-	Starter and auxiliary panel - pilot's station	-
NORMAL/EMERGENCY switch	-	Starter and auxiliary panel - pilot's station	-
External intercomm. socket	-	Starboard wheel well	
V/U.H.F. Installation - A.R.I. 23143/1 (PRE-MOD.5437)			
Transmitter-receiver	PTR 175	Rear fuselage, frame 28	116D-0116-1
Mounting tray	MT.1477	Rear fuselage, frame 28	
Interconnecting box	5821-99-932-6361	Rear fuselage equipment panel, frame 30-30A	
Control, receiver muting	5821-99-943-3247	Rear fuselage equipment panel, frame 30-30A	
Control unit	C1607/4	Starter and auxiliary panel	
U.H.F. upper aerial	EDC 18136	Rear fuselage, frame 29-30	116D-0105-1 (2nd. Ed.)
V.H.F. whip aerial	10B/4704596	Port bomb-bay door	
V.H.F. whip aerial mounting box	10AJ/4306014	Port bomb-bay door	
V/U.H.F. Installation - A.R.I. 23300 (POST MOD.5437)			
U.H.F. transmitter-receiver	PTR1751W	Rear fuselage, frames 27-29	116D-0154-1
V.H.F. transmitter-receiver	AA1201-3	Rear fuselage, frames 27-29	
Interface unit	PV1746B	Rear fuselage, frames 27-29	
Adaptor unit	AA1220-1	Rear fuselage, frames 27-29	
Control unit	PV1754L	Starter and auxiliary panel	
Mounting tray	AA13306-1	Rear fuselage, frames 27-29	
Muting plug	A34-3292-01	Rear fuselage, frame 30-30A	

continued. . .

TABLE 1 Equipment details - continued

Item	Type/Ref.No.	Location	A.P. reference
STAND-BY U.H.F. Installation - A.R.I. 23159			
Transmitter-receiver	D403M	Port equipment compartment	116D-0107-1
Mounting tray	1031	Post equipment compartment	
Resistor	10W/1070353 (2 ohm)	Port equipment compartment	
U.H.F. aerial	11789	Port bomb-bay door	116D-0113-1A
Battery, 24 volt	19/VO/7	Port equipment compartment	113C-0303-1

TABLE 2
Cable assembly details

RT1 – EA4.82.5237

Termination	Pin	Cable	Pin	Termination
Radio junction box socket 25-pole RT1	A	NMS20	A	Pressure bulkhead Mk.4 socket 25-pole RT1
	B	NMS20	B	
	C	N20	C	
	D	N20	D	
	E	N20	E	
	F	NMS20	F	
	G	NMS20	G	
	H	NMS20	H	
	J	N20	J	
	K	N20	K	
	L	N20	L	
	M	N20	M	
	N	N20	N	

RT1A - EA4.82.5301-1A

Termination	Pin	Cable	Pin	Termination
Attenuator Box	A	MNMS20	TEL-	T.B.3506/2
	B	MNMS20	TEL+	
	C	MNMS20	TEL +	
	D	MNMS20	TEL-	

RT2 – EA4.82.5239

Termination	Pin	Cable	Pin	Termination
Pressure bulkhead Mk.4 plug 25-pole RT2	A	NMS20	MIC+	Tails, Radio panel RT2A
	B	NMS20	MIC–	
	C	N20	TEL+	
	D	N20	NEG	
	E	N20	P-t	
	F	NMS20	TX MIC+	
	G	NMS20	TX MIC–	
	H	NMS20	TEL+1	
	J	N20	NEG	
	K	N20	ON/OFF	
	L	N20	T/D+	
	M	N20	A	I.L.S.J.B.157 Mk.4 socket 3-pole RT2B
	N	N20	B	

RT3 - EA4.82.5241-1A

Termination	Pin	Cable	Pin	Termination
Starter and auxiliary panel	R5	N20	R5	Intercomm. relay panel
	R51	N20	R51	

RT5 - EA4.82.119

Termination	Pin	Cable	Pin	Termination
Socket, Type 359	MIC+	DUPRENMET 6	+	Tails, intercomm. relay panel T.B.3 (PRE-MOD. 5437)
	MIC–	DUPRENMET 6	–	
	MIC+		+	T.B.4 (POST MOD 5437)
	MIC–		–	
Nav's seat break	TEL+	DUPREN 6	1	Tails, Nav's panel T.B.
	TEL–	DUPREN 6	2	
Tails, Intercomm. relay panel T.B.7	+	DUPREN 6	3	
	–	DUPREN 6	2	

RT6 – EA4.82.5257

Termination	Pin	Cable	Pin	Termination
Tails, Terminal block under pilot's floor	R51	N20	R51	Tails, Intercomm. relay panel
	R52	N20	R52	

RT8 – EA4.82.5335

Termination	Pin	Cable	Pin	Termination
Pupil press-to-mute switch, generator control panel	PM+	N20	PM+	Tails, Intercomm. relay panel
	NEG	N20	NEG	

continued. . .

TABLE 2 Cable assembly details – *continued*

RT9 – EA4.82.127

Termination	Pin	Cable	Pin	Termination
Tails, navigator's press-to-mute switch	–	DUPREN 6	PM+	Tails, Intercomm. relay panel
	–	DUPREN 6	NEG	

RT10 – EA4.82.129

Termination	Pin	Cable	Pin	Termination
Tails, Instructor's press-to-mute switch, duplicate control panel	PM+	DUPREN 6	PM+	Tails, Intercomm. relay panel
	NEG	DUPREN 6	NEG	

RT11 – EA4.82.5255

Termination	Pin	Cable	Pin	Termination
Tails, Terminal block under pilot's floor	R51	N20	R51	Tails, Intercomm. relay panel
	R52	N20	R52	

RT12 – EA4.82.5007

Termination	Pin	Cable	Pin	Termination
Tails, pupil's and instructor's T.B.	TEL+	UNIPREN 6	TEL+	Tails T.B.7
	TEL–	UNIPREN 6	TEL–	Tails T.B.3
	MIC+	UNIPRENMET	MIC+	Intercomm. relay panel
	MIC–	UNIPRENMET	MIC–	

RT400 – EA4.82.301

Termination	Pin	Cable	Pin	Termination
	A	N20	T/D+	HC294D terminals U/V.H.F. – U.H.F. STBY switch starter and auxiliary panel RT400
	B	N20	ON/OFF	
	F	N20	I/C C/O	
Radio Junction box Mk.4 socket 25-pole RT400	C	N20	R4	Tails Intercomm. relay panel RT400B
	D	NMS20	ILS+	
	E	NMS20	ILS–	
	G	N20	PM+	
	H	N20	P.TOT+	
	J	NMS20	TX MIC+	
	K	NMS20	TX MIC–	
	L	NMS20	REC 1+	
	M	N20	REC 1–	
	N	NMS20	MIC+	Tails, Intercomm. relay panel RT400C
	O	NMS20	MIC–	
	P	N20	TEL+	
	Q	N20	TEL–	

RT407 – EA4.82.299

Termination	Pin	Cable	Pin	Termination
HC 294 terminals, starter and auxiliary panel, POWER SWITCH RT407	R21	MN16	R21	Mk.4 plug, 4-pole, Pressure bulkhead RT407
	R81	MN16	R21	
	R22	MN16	R22	

RT408 – EA4.82.5245

Termination	Pin	Cable	Pin	Termination
Mk.4 socket, 4-pole, pressure bulkhead RT408	A	N20	R21	HC.500 Q.R. terminals radio panel T.B. RT408
	B	N20	R81	
	C	N20	R22	

continued. . .

TABLE 2 Cable assembly details – *continued*

RT410 - EA4.82.5407 (POST-MOD.5437)

Termination	Pin	Cable	Pin	Termination
Amplifier Type A 1961 PL2	E	N20	E	Intercomm. relay panel PL2 (R410A)
	B	N20	B	
	A	NMS20	A	
RT410	C	NMS20	1a	Intercomm. relay panel relay (RT410B)
	D	NMS20	3a	
RT410A	C	NMS20	1a	Intercomm. relay panel relay (RT410B)
	D	NMS20	3a	

CONNECTOR 10HA/4153226

Termination	Pin	Cable	Pin	Termination
Amplifier, Type A1961	A	–	R3	Intercomm. relay panel
	B		NEG	

CONNECTOR 10HA/4153227 (PRE-MOD.5437)

Termination	Pin	Cable	Pin	Termination
Amplifier, Type A1961 PL2	C	–	C	Intercomm. relay panel PL2
	D		D	

CONNECTOR 10HA/4153228

Termination	Pin	Cable	Pin	Termination
Amplifier, Type A1961 SK1	D	–	D	Intercomm. relay panel SK1
	E		E	

CONNECTOR EA4.82.5235

Termination	Pin	Cable	Pin	Termination
Starter and auxiliary panel T.B.	3	MIN 4C	A	Intercomm. relay panel PL1
	2		B	
	1		C	
	4		D	

U.H.F.1 EB7.82.5477

Termination	Pin	Cable	Pin	Termination
Radio junction box, Mk.4 socket 6-pole U.H.F.1	A	MIN 6D	A	Pressure bulkhead, Mk.4 plug 6-pole U.H.F.1
	B	MIN 6D	B	
	C	MIN 6D	C	
	D	MIN 6D	D	
	E	MIN 6D	E	
	F	MIN 6D	F	

U.H.F.1A – EA4.82.5055

Termination	Pin	Cable	Pin	Termination
Pressure bulkhead, Mk.4 socket 6-pole U.H.F.1A	A	MIN 6D	A	Interconnecting box, MIC/TEL socket Mk.4 plug 6-pole U.H.F.1A
	B	MIN 6D	B	
	C	MIN 6D	C	
	D	MIN 6D	D	
	E	MIN 6D	E	
	F	MIN 6D	F	

continued. . .

TABLE 2 Cable assembly details – *continued*

N.416 – EA4.81.6047

Termination	Pin	Cable	Pin	Termination
Dimmer switch	LL61	T20	A	Stbd. bracket fixed plug coupler 6-pole N416
Tone switch N416	Tone SW	T20	B	
	Tone SW	T20	C	

U.H.F.2 – EA4.82.5057

Termination	Pin	Cable	Pin	Termination
Stbd. bracket fixed plug coupler 6-pole U.H.F.2	A	MIN 3A	A	Pressure bulkhead, Mk.4 plug 6-pole U.H.F.2
	B	MIN 3A	B	
	C	MIN 3A	C	

U.H.F.2A – EA4.82.5059

Termination	Pin	Cable	Pin	Termination
Pressure bulkhead, Mk.4 socket 6-pole U.H.F.2A	A	MIN 3A	A	Interconnecting box P/L and tone socket, Mk.4 plug 6-pole U.H.F.2A
	B	MIN 3A	B	
	C	MIN 3A	C	

U.H.F.3 – EA4.82.5339

Termination	Pin	Cable	Pin	Termination
Control Unit Starter and auxiliary panel, Cannon socket K03-21-30SN U.H.F.3	A	DEF 12A-2	A	Pressure bulkhead, Amphenol socket 165-GB-91 U.H.F.3
	B	DEF 12A-2	B	
	C	DEF 12A-2	C	
	D	DEF 12A-2	D	
	E	DEF 12A-2	E	
	F	DEF 12A-2	F	
	H	DEF 12A-2	H	
	J	DEF 12A-2	J	
	K	DEF 12A-2	K	
	L	DEF 12A-2	L	
	M	DEF 12A-2	M	
	N	DEF 12A-2	N	
	P	DEF 12A-2	P	
	R	DEF 12A-2	R	
	S	DEF 12A-2	S	
	T	DEF 12A-2	T	
	U	DEF 12A-2	U	
	V	DEF 12A-2	V	
	W	DEF 12A-2	W	
	X	DEF 12A-2	X	
	Y	DEF 12A-2	Y	
	Z	DEF 12A-2	Z	
	a	DEF 12A-2	a	
	b	DEF 12A-2	b	
	c	DEF 12A-2	c	
	d	DEF 12A-2	d	
	f	DEF 12A-2	f	
	g	DEF 12A-2	g	
	h	DEF 12A-2	h	
	i	DEF 12A-2	i	

continued. . .

TABLE 2 Cable assembly details – *continued*

U.H.F.3A – EA4.82.5063

Termination	Pin	Cable	Pin	Termination
Pressure bulkhead, Amphenol plug 165-GB-72-1 U.H.F.3A	A	DEF 12A-2	A	Interconnecting box Control unit socket Cannon plug KO3-21-3OPN U.H.F.3A
	B	DEF 12A-2	B	
	C	DEF 12A-2	C	
	D	DEF 12A-2	D	
	E	DEF 12A-2	E	
	F	DEF 12A-2	F	
	H	DEF 12A-2	H	
	J	DEF 12A-2	J	
	K	DEF 12A-2	K	
	L	DEF 12A-2	L	
	M	DEF 12A-2	M	
	N	DEF 12A-2	N	
	P	DEF 12A-2	P	
	R	DEF 12A-2	R	
	S	DEF 12A-2	S	
	T	DEF 12A-2	T	
	U	DEF 12A-2	U	
	V	DEF 12A-2	V	
	W	DEF 12A-2	W	
	X	DEF 12A-2	X	
	Y	DEF 12A-2	Y	
	Z	DEF 12A-2	Z	
	a	DEF 12A-2	a	
	b	DEF 12A-2	b	
	c	DEF 12A-2	c	
	d	DEF 12A-2	d	
	f	DEF 12A-2	f	
	g	DEF 12A-2	g	
	h	DEF 12A-2	h	
	i	DEF 12A-2	i	

U.H.F.4 – EA4.82.5295

Termination	Pin	Cable	Pin	Termination
Transmitter-receiver	–	UR 67	–	U.H.F. aerial UKN-2 plug U.H.F.4

U.H.F.7 – EA4.82.5297

Termination	Pin	Cable	Pin	Termination
Interconnecting box T.R. unit socket Amphenol plug 165-GB-R72 U.H.F.7	A	Q16	A	Transmitter-receiver PTR175 (PRE-MOD.5437) Interface unit (POST-MOD.5437) Amphenol socket 165-GB-R44 U.H.F.7
	EARTH	Q16	EARTH	
	RING		RING	
	C	Q22	C	
	D	Q22	D	
	E	Q22	E	
	F	Q22	F	
	H	Q22	H	
	J	Q22	J	
	K	Q22	K	
	L	Q22	L	
	M	Q22M	M	
	N	Q22M	N	
	P	Q22	P	
	R	*	R	
	S	*	S	
	T	Q22	T	
	U	Q22	U	
	V	Q22	V	
	W	Q22	W	
	a	Q22	a	
	b	Q22	b	
	c	Q22	c	

continued. . .

TABLE 2 Cable assembly details –*continued*

U.H.F.7 – EA4.82.5297 – *continued*

Termination	Pin	Cable	Pin	Termination
Interconnecting box T.R. unit socket, Amphenol plug 165-GB-R72 U.H.F.7	d	Q22	d	Transmitter-receiver PTR175 (PRE-MOD.5437) Interface unit (POST-MOD.5437) Amphenol socket 165-GB-R44 U.H.F.7
	e	Q22	e	
	f	Q22	f	
	g	Q22	g	
	h	Q22	h	
	i	Q22	i	
	j	Q22	j	
	k	Q22	k	
	m	Q22	m	
	n	Q22	n	
	p	Q22	p	
	q	Q22	q	
	r	Q22	r	
	s	Q22	s	
	t	Q22	t	
	u	Q22	u	
	w	Q22	w	

*Twin equipment wire. Type 103/202/GY. Cores twisted together and screened. Green core connected to pin S, yellow core to pin R.

U.H.F.8 - EB7.82.5499 (PRE-MOD.5437)

Termination	Pin	Cable	Pin	Termination
Interconnecting box muting unit socket, Mk.4 plug 6-pole U.H.F.8	A	MIN 6D	A	Control, receiver muting, Mk.4 socket 6-pole U.H.F.8
	B	MIN 6D	B	
	C	MIN 6D	C	
	D	MIN 6D	D	
	E	MIN 6D	E	
	F	MIN 6D	F	

Cable assembly U.H.F.8 is removed by MOD.5437 and the interconnecting box muting unit socket is terminated by a muting plug - A34-3603-01.

V.H.F.9 - EA4.82.5345 (PRE-MOD.5437)

Termination	Pin	Cable	Pin	Termination
Transmitter-receiver PTR 175 UKN-2 plug V.H.F.9	–	UR 67	–	V.H.F. aerial cable eye V.H.F.9

V.H.F.9 - EA4.82.5345 (POST-MOD.5437)

Termination	Pin	Cable	Pin	Termination
V.H.F. Transmitter-receiver AA1201-3 via adaptor UG349A/U	-	UR67	-	V.H.F. aerial cable eye V.H.F.9

continued. . .

TABLE 2 Cable assembly details - *continued*

CONNECTOR A33-6986-01 (POST MOD.5437)

Termination A	Pin	Cable	Pin	Termination B
Adaptor unit	A	19/0.15	A	Interface unit
	B, C	2 x AWG 24 BRAIDED	B, C	
	D, E, F	19/0.15	D, E, F	
	G, H	2 x AWG 24 BRAIDED	G, H	
	J	19/0.15	J	
	K	19/0.2	K	
	L	19/0.2	L	
	M	19/0.2	M	
	N	19/0.15	N	
	P	19/0.15	P	
	R, S	2 X AWG 24 BRAIDED	R, S	
	T	BRAID	T	
	U, V, W	19/0.15	U, V, W	
	X	19/0.2	X	
	Y	19/0.2	Y	
	Z	19/0.2	Z	
	–	BRAID	a	
	b	19/0.15	b	
	c	19/0.15	c	

Braid from cores R and S connected to pin T at end B
Braid from cores B and C connected to pin T at end A
Braid from cores G and H connected to pin U at end B
Overall braid connected to pin a at end A

CONNECTOR A33-7061-01 (POST MOD.5437)

Termination A	Pin	Cable	Pin	Termination B
V.H.F. transmitter/ receiver	A	19/0.15	A	Adaptor unit
	B	19/0.15	B	
	C, D	2 x AWG 24 BRAIDED	C, D	
	E, G, H, J, K, L, M, N, P, R, S, T, U, V, W	19/0.15	E, G, H, J, K, L, M, N, P, R, S, T, U, V, W	
	X	AWG24 BRAIDED	X	
	Y	BRAID	Y	
	Z, b, c, d, e	19/0.15	Z, b, c, d, e	
	f, g, h, j	19/0.2	f, g, h, j	

Braids from cores C, D and X connected to pin Y at end A
Overall braid connected to pin Y at end B

continued. . .

TABLE 2 Cable assembly details – *continued*

U.H.F. STAND-BY 1 – EA4.82.5347

Termination	Pin	Cable	Pin	Termination
Stand-by T/R UKN-2 plug U.H.F. STBY 1	–	UR 67	–	Stand-by aerial, UKC-2 plug U.H.F. STBY 1

U.H.F. STAND-BY 2 – EA4.82.5197

Termination	Pin	Cable	Pin	Termination
	B	N20	NEG	
	E	N20	P TOT	
	F	N20	F	Radio panel
Stand-by T/R	D	NMS20	TX MIC+	T.B's tails
Mk.4 socket	G		TX MIC–	
12-pole U.H.F.	J	NMS20	TEL–	
STBY 2	H	N20	ON/OFF	Radio panel
	M	N20	T/D+	T.B HC.490
				Q.R. terminal
				U.H.F. STBY 2

U.H.F. STAND-BY 3 – EA4.82.5199

Termination	Pin	Cable	Pin	Termination
Filter unit	A	N14	R22	Radio panel
stand-by T/R	B	N14	E21	T.B HC510
Mk.4 socket				Q.R. terminal
2-pole				U.H.F. STBY 3
U.H.F. STBY 3				

101B-0404-1B/199/8233608/2-84/BAe/1307

PART 2 I.L.S. SYSTEM A.R.I. 18011

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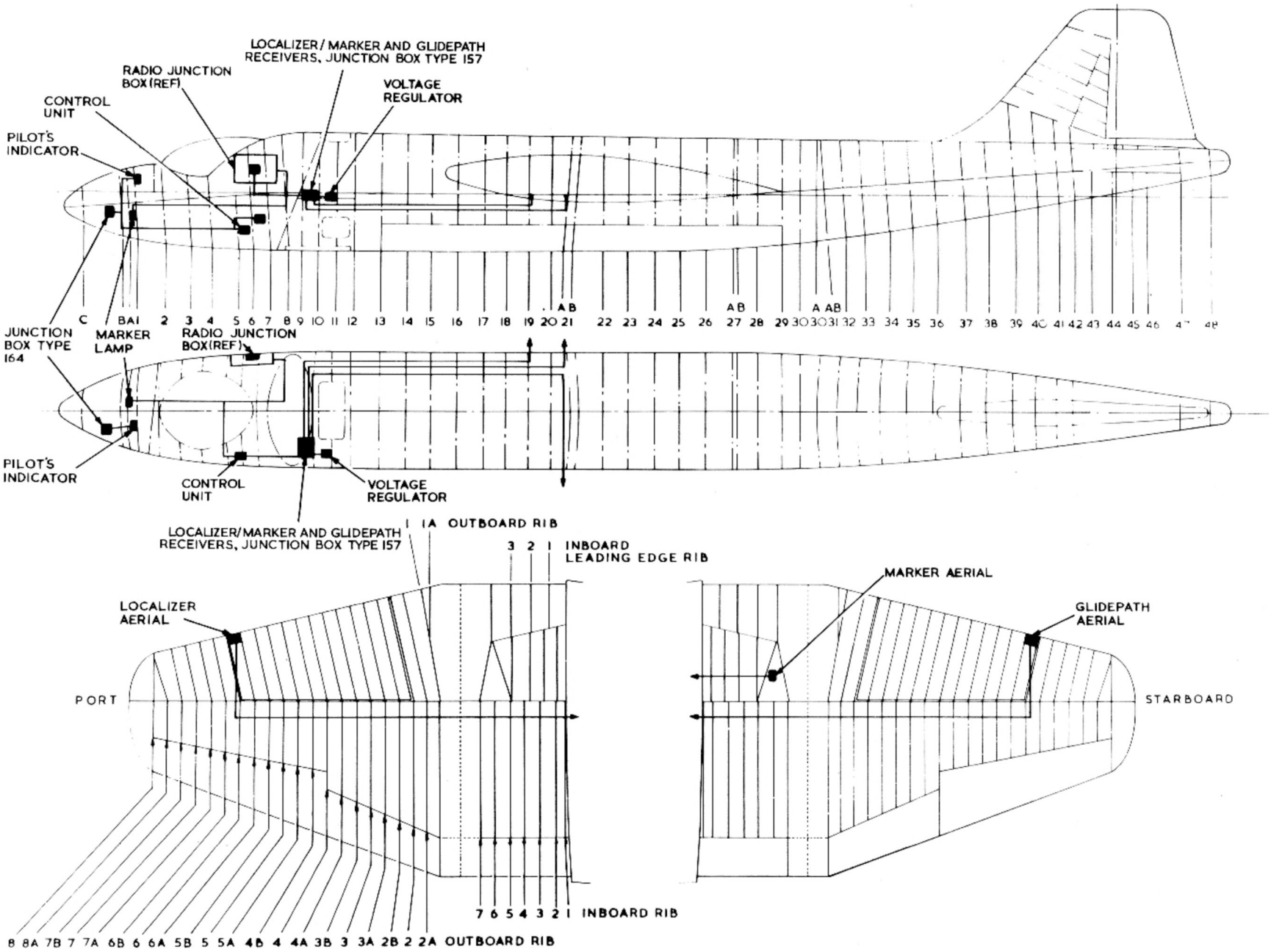

FIG.1. LOCATION DIAGRAM - I.L.S. SYSTEM

DESCRIPTION

Introduction

1. The I.L.S. is a flying aid, used in conjunction with ground transmitters, for correct glide angle and direction of flight runway approach. The installation mainly comprises localizer and glide path receivers, glide path, marker, and localizer aerials. Visual identification of three I.L.S. ground beacons is provided by a pilot's indicator and marker lamp, whilst audio signals are fed through the I/C system *(Part 1)*.

2. Signals transmitted from the localizer, marker, and glide path transmitters are picked up by the aircraft aerials and fed, via the receivers, to the pilot's indicator and marker lamp, as indications of aircraft position with respect to the runway. Detailed information on the description and operation of the equipment will be found in A.P.116B-0408-1.

Localizer/marker receiver, Type R.1964

3. This unit, located in the upper equipment compartment, comprises the localizer and marker receivers operating from common power supplies. The marker receiver operates on a fixed frequency of 75 MHz, whilst the localizer receiver has a frequency covering of 108-118 MHz. The localizer signals are transmitted to the vertical pointer of the pilot's indicator. The marker signals are transmitted to a marker lamp, which flashes in accordance with signals received from various marker beacons.

Glidepath receiver, Type R.1965

4. This receiver is mounted adjacent to the Type R.1964 receiver *(para.3)* in the upper equipment compartment and has a frequency covering of 329.6–335 MHz. The glide path signals are transmitted from receiver to the horizontal pointer of the pilot's indicator, to indicate the aircraft glide angle in respect to the runway.

Junction box, Type 157

5. This junction box, together with the two receivers Types R.1964 and R.1965, provides for interconnection of the installation equipment.

Control unit, Type 705

6. Channel selections are made by this control unit, mounted at the port side of the navigator's seat.

Indicator, Type 7

7. This indicator, fitted on the flight instrument panel, has a horizontal pointer operated by the glide path receiver and a vertical pointer operated by the localizer receiver. The indicator incorporates a flag which remains hidden whilst the system functions satisfactorily. Should the signal received by an indicator be below a certain value the flag will show and cover the ends of the pointers.

Marker lamp

8. The marker lamp, mounted on the flight instrument panel flashes in accordance with signals received from various marker beacons.

Glidepath and localizer aerials

9. The glidepath aerial is installed in the leading edge of the starboard outer main plane, whilst the localizer aerial is in the leading edge of the port outer main plane. The signals from both aerials being fed to their respective receivers.

Marker aerial

10. The marker aerial is installed in the starboard main plane forward of, and accessible from, the main wheel bay. A dielectric cover is fitted over the aerial flush with the main plane skin. A trimmer is fitted to facilitate adjustment, since the aerial must be turned to resonate at exactly 75 MHz.

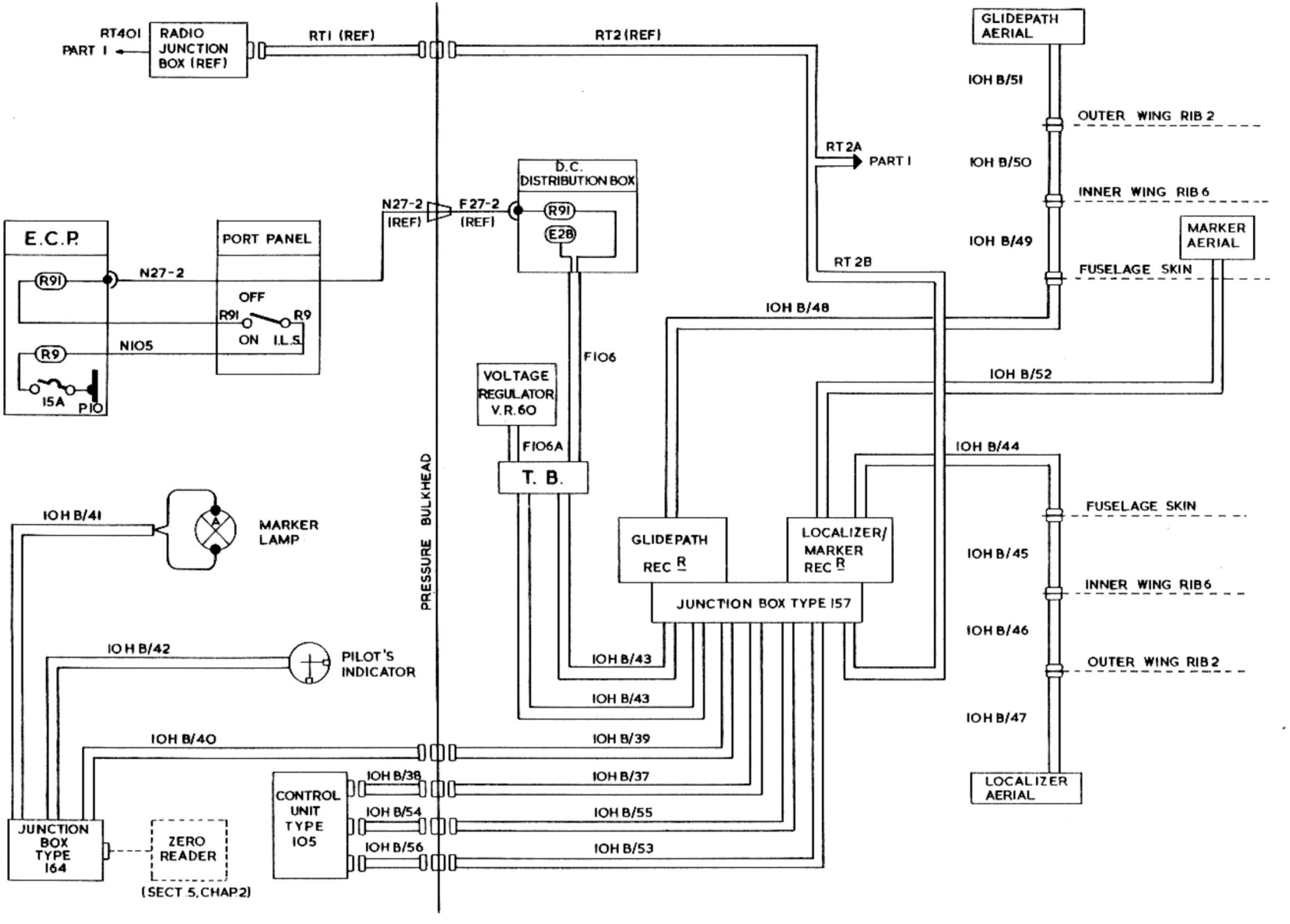

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FIG. 2 INTERCONNECTION DIAGRAM – I.L.S. SYSTEM

◀ DRAWING NUMBER ADDED ▶

Junction box, Type 164

11. This junction box, located forward of the pilot's instrument panel, connects the Type 7 indicator and the marker lamp into the system and provides for an additional indicator to be connected if required. The junction box also facilitates connection of the installation to the Zero reader system *(Sect.5, Chap.2, Group F).*

Volume control

12. This volume control, located on the starter and auxiliary panel, is provided for varying the level of the audio signals from the I.L.S. system *(Part 1 of this Chapter).*

Power supplies

13. The 28 volt supply for the installation is fed from a circuit-breaker in the E.C.P. via the d.c. distribution box, and is controlled by the I.L.S. ON/OFF switch mounted on the flight instrument panel. A Type 60 voltage regulator, located in the upper equipment compartment, controls the 19 volt supply for the valve heaters.

SERVICING

General

14. Wiring faults should be investigated by referring to the diagrams in this chapter and the routeing diagrams in Sect.5, Chap.1, Group R and ◀S. The I.L.S. system is fully described in A.P.116B-0408-1. For repair of I.L.S. aerial covers refer to A.P.101B-0400-6, Cover 1, Chap.3, para.12.

Note. . .

If rain erosion effects are such that the fibreglass base has been pitted and damaged then the aerial cover must be wholly replaced. ▶

TABLE 1

Equipment details

Item	Type/Ref.	Location	A.P. Reference
Localizer/marker receiver	R.1964	Upper equipment compartment	116B-0408-1
Glidepath receiver	R.1965	Upper equipment compartment	
Junction box	157	Upper equipment compartment	
Control unit	705	Navigator's station, port side	
Indicator (Pilot's)	7	Pilot's instrument panel	
Glidepath aerial		Starboard main plane	
Localizer aerial		Port main plane	
Marker aerial		Starboard main plane	
Junction box	164	Port side of nose fuselage	
Voltage regulator	VR60	Upper equipment compartment	

TABLE 2

Cable assembly details

CONNECTOR 10HB/37

Termination	Pin	Cable	Pin	Termination
Junction box Type 157		Refer below		Pressure bulkhead

Pins A to F are connected pin to pin.
Screens are connected to the shell at each end.

CONNECTOR 10HB/38

Termination	Pin	Cable	Pin	Termination
Control unit Type 705		Refer below		Pressure bulkhead

Pins A to F are connected pin to pin.
Screens are connected to the shell at each end.

CONNECTOR 10HB/39

Termination	Pin	Cable	Pin	Termination
Pressure bulkhead		Refer below		Junction box Type 157

Pins A to H and J to M are connected pin to pin.
Screens are connected to the shell at each end.

CONNECTOR 10HB/40

Termination	Pin	Cable	Pin	Termination
Junction box Type 164		Refer below		Pressure bulkhead

Pins A to H and J to M are connected pin to pin.
Screens are connected to the shell at each end.

CONNECTOR 10HB/41

Termination	Pin	Cable	Pin	Termination
Junction box Type 164	A		Lamp	Marker lamp
	B		Lamp	

CONNECTOR 10HB/42

Termination	Pin	Cable	Pin	Termination
Junction box Type 164		Refer below		Pilot's indicator Type 7

Pins A to H and J to M are connected pin to pin.
Screens are connected to the shell at each end.

CONNECTOR 10HB/43

Termination	Pin	Cable	Pin	Termination
5-way terminal block	E28		A	Junction box Type 157
	E28		B	
	R92		C	
	R91		D	

CONNECTOR 10HB/44

Termination	Pin	Cable	Pin	Termination
Wing root break (Port)				Localizer/marker receiver, R.1964

CONNECTOR 10HB/45

Termination	Pin	Cable	Pin	Termination
Wing root break (Port)				Engine rib break (Port)

CONNECTOR 10HB/46

Termination	Pin	Cable	Pin	Termination
Engine rib inner (Port)				Engine rib outer (Port)

continued . . .

TABLE 2 Cable assembly details – *continued*

CONNECTOR 10HB/47

Termination	Pin	Cable	Pin	Termination
Engine rib outer (Port)				Localizer aerial 239

CONNECTOR 10HB/48

Termination	Pin	Cable	Pin	Termination
Wing root break (Stb'd)				Glidepath receiver R.1965

CONNECTOR 10HB/49

Termination	Pin	Cable	Pin	Termination
Wing root break (Stb'd)				Engine rib break (Stb'd)

CONNECTOR 10HB/50

Termination	Pin	Cable	Pin	Termination
Engine rib inner (Stb'd)				Engine rib outer (Stb'd)

CONNECTOR 10HB/51

Termination	Pin	Cable	Pin	Termination
Engine rib outer (Stb'd)				Glidepath aerial 238

CONNECTOR 10HB/52

Termination	Pin	Cable	Pin	Termination
Marker aerial Type 237				Localizer/marker receiver R.1964

CONNECTOR 10HB/53

Termination	Pin	Cable	Pin	Termination
Junction box Type 157				Pressure bulkhead

CONNECTOR 10HB/54

Termination	Pin	Cable	Pin	Termination
Control unit Type 705				Pressure bulkhead

CONNECTOR 10HB/55

Termination	Pin	Cable	Pin	Termination
Junction box Type 157				Pressure bulkhead

CONNECTOR 10HB/56

Termination	Pin	Cable	Pin	Termination
Control unit Type 705				Pressure bulkhead

PART 3 RADIO COMPASS (A.D.F.) A.R.I.23023

(Aircraft embodying S.R.I.M.2001 and Mod.3912)

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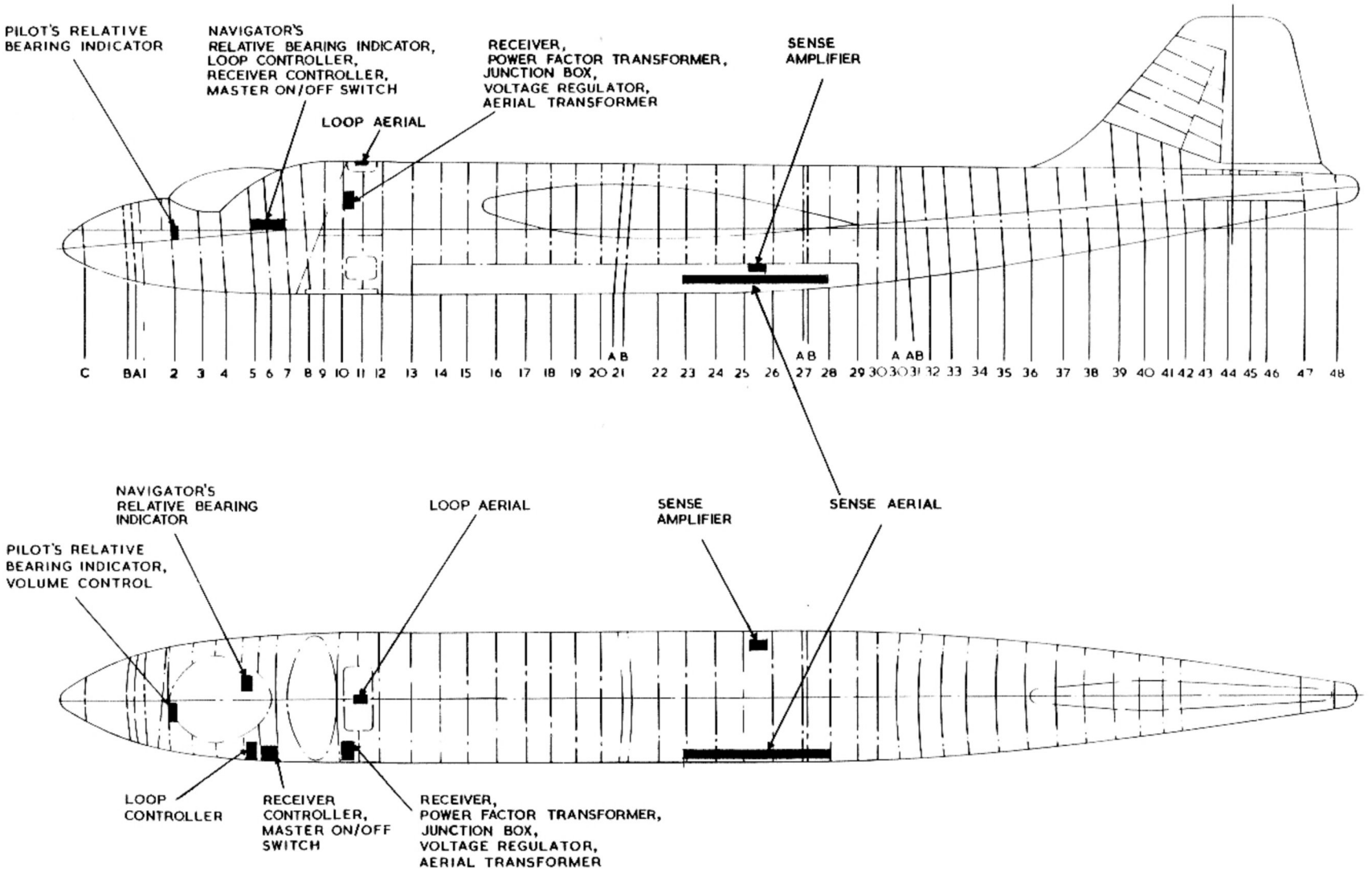

EA4 82 307 1 2

FIG.1. LOCATION DIAGRAM – RADIO COMPASS

DESCRIPTION

Introduction

1. Radio compass is a navigational aid used in conjunction with ground transmitters, for homing, position fixing, and automatic direction finding. The installation basically comprises, a receiver operating over a frequency range of 150 KHz to 2 MHz, served by loop and sense aerials, and controlled remotely by receiver and loop aerial controllers. Visual relative bearing indication is provided for both pilot and navigator, whilst audio signals are fed to the crew telephones via the I/C system.

2. Signals transmitted on a selected frequency are picked up by the aerials and amplified by the receiver to operate a loop motor. By this means the loop is continuously held at an angle of 'null signal'. Pointers in the indicators are electrically synchronized with the loop to indicate the relative bearing of the ground transmitter. The radio compass installation is fully described in A.P.116B-0107-1.

Receiver, Type A.D.7092D

3. The receiver unit is installed in the upper equipment compartment on the port side aft of the pressure bulkhead. On the rear of the receiver case is a small rotary transformer for H.T. supply. Motors for driving the receiver tuning condenser and control switches are mounted at the front of the unit and are accessible by removing covers on the front panel.

Receiver controller, Type 1274

4. The receiver is controlled by a Type 1274 controller, mounted at the port side of the navigator's seat. An illuminated tuning scale is incorporated, tuning being effected by means of a cranked handle which operates the receiver tuning condensers via a flexible mechanical drive. The remaining controls are all electrical and comprise the following:-

(1) System switch

(2) Frequency range switch

(3) RT/CW selectivity switch

(4) Gain control

(5) Height switch

Loop aerial, Type 1324A

5. This aerial is located in the upper equipment compartment hatch, and comprises an iron cored loop which can be rotated about its vertical axis to align the loop with the incoming signal. Automatic rotation is effected by a two-phase a.c. motor operating through reduction gears. An Aysynn system is incorporated to transmit azimuth signals to the bearing indicators. Provision is also made for the loop to be rotated manually. Electrical connection to the rotatable loop is by means of slip rings on the shaft, and brushes attached to the chassis.

Loop controller, Type 1342

6. The loop controller, mounted adjacent to the receiver controller at the port side of the navigator's seat, provides for the remote control of the loop aerial when using audio D.F. facilities.

Sense aerial

7. A centre fed T-aerial supported on insulators is mounted in the line of flight on the bomb bay port door, and is connected to the Type 1628 sense amplifier.

Sense amplifier, Type 1628

8. The sense amplifier is mounted on the starboard side in the bomb bay between frames 25 and 26. The amplifier, matches the input impedance of the sense aerial to the coaxial cable which connects the aerial to the receiver.

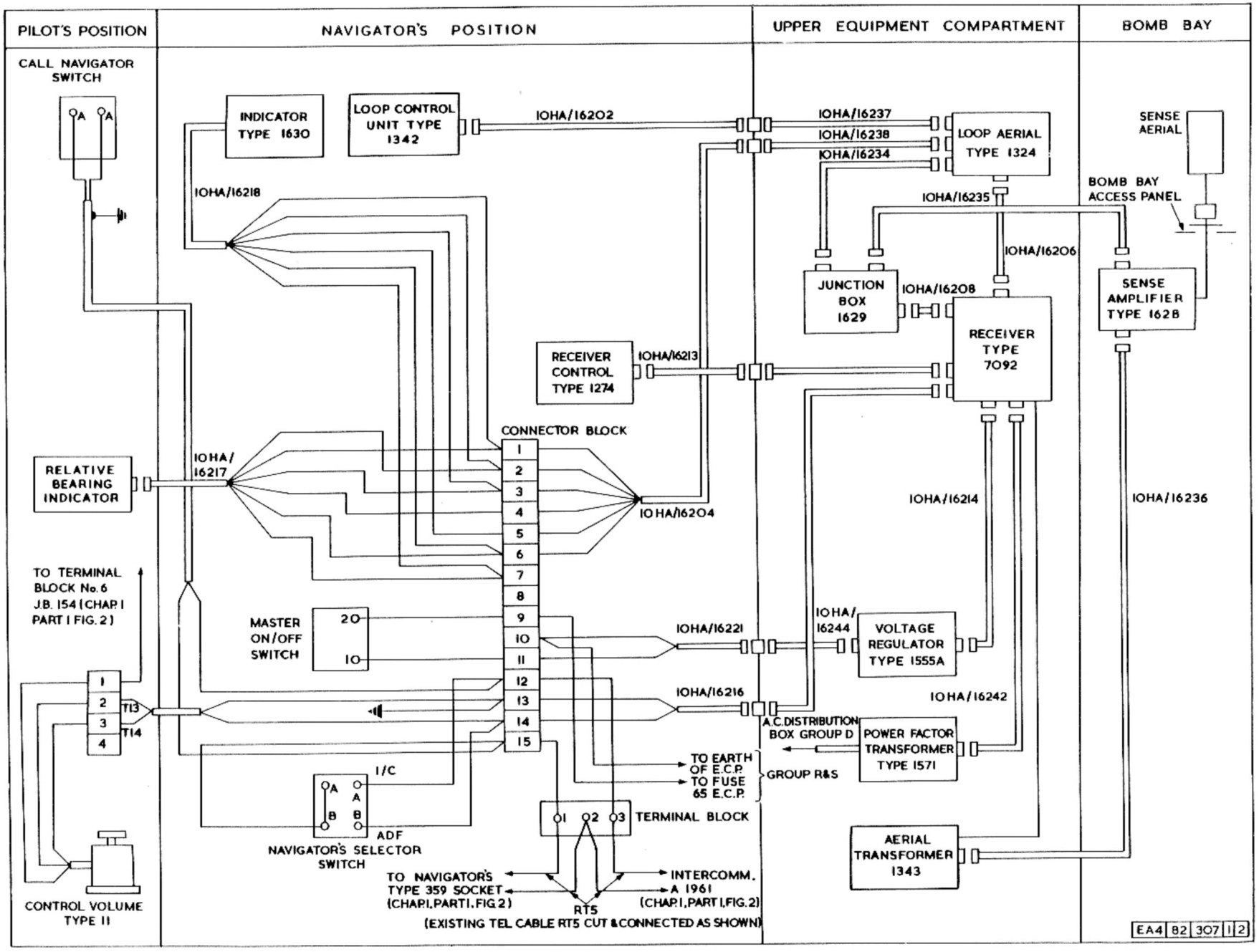

FIG. 2. INTERCONNECTION DIAGRAM—RADIO COMPASS

Power factor transformer, Type 1571

9. Power factor correction of the power supply is provided by a Type 1571 transformer, located in the upper equipment compartment on the aft face of the pressure bulkhead at the starboard side.

Relative bearing indicator, Type 1630

10. Two bearing indicators, one mounted on the pilot's instrument panel and the other on the navigator's instrument panel, provide indication of relative bearing, tuning, and receiver signal strength.

Volume control

11. A volume control, mounted on the starter and auxiliary panel, is used to vary the level of audio signals from the radio compass system.

Power supplies

12. The 24/28 volt supplies for the system are fed from fuse 65 in the E.C.P. to a Type 1555A voltage regulator, located in the upper equipment compartment. The regulator maintains the supply at 19 volts d.c. for the valve heaters. Control of the 24/28 volt supply is by means of the ADF ON/OFF switch on the panel at the port side of the navigator's seat. An a.c. supply of 26 volts, 400 Hz a.c. is provided by the Type 1571 power factor transformer via fuse 104 in the 400 Hz fuse box.

13. The Type 1629 junction box installed in the upper equipment compartment provides the means for connecting and distributing the power supplies to the system.

Navigator's selector switch

14. This switch mounted on a panel at the port side of the navigator's seat, provides selection of either the intercommunication or the radio compass system. Should the navigator be listening to the latter when the pilot wishes to speak to him, operation of the switch *(para.15)* caters for this requirement.

Pupil pilot's call navigator switch

15. This switch, located on the generator control panel above the console, enables the pilot to override the navigator whilst he is using the radio compass facility and speak to him via the intercomm. system.

SERVICING

General

16. Wiring faults should be investigated by referring to the diagrams in this chapter and the routeing diagrams in Sect.5, Chap.1, Group R and S. Servicing information on the system is included in A.P.116B-0107-4F.

TABLE 1

Equipment details

Item	Type/Ref.	Location	A.P. reference
Receiver	A.D.7092D	Upper equipment compartment	A.P.116B-0107-1
Receiver controller	1274	Navigator's station, port side	
Loop aerial	1324A	Upper hatch, upper equipment compartment	
Loop controller	1342	Navigator's station, port side	
Sense aerial		Lower side of port fuselage frames 23-27	
Sense amplifier	1628	Starboard fuselage frame 25-26	
Relative bearing indicator	1630	Pilot's instrument panel	
Relative bearing indicator	1630	Navigator's instrument panel	
Junction box	1629	Upper equipment compartment	
Voltage regulator	1555A	Upper equipment compartment	
Power factor transformer	1571	Upper equipment compartment	
Aerial transformer	1343	Upper equipment compartment	

TABLE 2

Cable assembly details

CONNECTOR 10HA/16217

Termination	Pin	Cable	Pin	Termination
Plug, Pilot's indicator, Type 1630			1	Tags, Connector block, Navigator's station
			2	
			3	
			4	
			6	
			7	

CONNECTOR 10HA/16218

Termination	Pin	Cable	Pin	Termination
Plug, Navigator's indicator, Type 1630			1	Tags, Connector block Navigator's station
			2	
			3	
			5	
			6	
			7	

CONNECTOR 10HA/16202

Termination	Pin	Cable	Pin	Termination
Plug, Loop control unit, Type 1342				Plug, Pressure bulkhead

CONNECTOR 10HA/16213

Termination	Pin	Cable	Pin	Termination
Plug, Receiver control, Type 1274				Plug, Pressure bulkhead

CONNECTOR 10HA/16204

Termination	Pin	Cable	Pin	Termination
Plug, Pressure bulkhead			1	Tags, Connector block, Navigator's station
			2	
			3	
			4	
			5	
			6	

CONNECTOR 10HA/16221

Termination	Pin	Cable	Pin	Termination
Plug, Pressure bulkhead			10	Tails, Connector block, Navigator's station
			11	

CONNECTOR 10HA/16216

Termination	Pin	Cable	Pin	Termination
Plug, Pressure bulkhead			13	Tails, Connector block, Navigator's station
			14	

CONNECTOR 10HA/16237

Termination	Pin	Cable	Pin	Termination
Pressure bulkhead	A		1	Loop aerial, Type 1324
	B		2	
	C		3	
	D		4	
	E		4	
	F		6	

continued . . .

TABLE 2 Cable assembly details – *continued*

CONNECTOR 10HA/16238

Termination	Pin	Cable	Pin	Termination
Pressure bulkhead	A		1	Loop aerial, Type 1324
	B		3	
	C		2	
	D		5	
	E		6	
	F		11	

Pins G, H, J, K, L and M and pins 4 and 7 to 10 are not used.
Pins 2 and 12 are linked together.

CONNECTOR 10HA/16234

Termination	Pin	Cable	Pin	Termination
Loop aerial, Type 1324				Junction box, Type 1629

CONNECTOR 10HA/16244

Termination	Pin	Cable	Pin	Termination
Pressure bulkhead				Voltage regulator, Type 15554

CONNECTOR 10HA/16242

Termination	Pin	Cable	Pin	Termination
A.C. distribution box (ref. Sect.5, Chap.1, Group D)				Power factor transformer, Type 1571

CONNECTOR 10HA/16235

Termination	Pin	Cable	Pin	Termination
Junction box Type 1629	1		A	Sense amplifier, Type 1628
	2		B	
	3		C	
	4		D	

CONNECTOR 10HA/16208

Termination	Pin	Cable	Pin	Termination
Junction box Type 1629				Receiver, Type 7092

CONNECTOR 10HA/16214

Termination	Pin	Cable	Pin	Termination
Voltage regulator, Type 1555A				Receiver, Type 7092

CONNECTOR 10HA/16242

Termination	Pin	Cable	Pin	Termination
Power factor transformer, Type 1571				Receiver, Type 7092

CONNECTOR 10HA/16206

Termination	Pin	Cable	Pin	Termination
Loop aerial, Type 1324				Receiver, Type 7092

Two co-axial cables in one sheath.

continued . . .

TABLE 2 Cable assembly details – *continued*

CONNECTOR 10HA/16236

Termination	Pin	Cable	Pin	Termination
Sense amplifier, Type 1628				Aerial transformer, Type 1343

CONNECTOR 10HA/16239

Termination	Pin	Cable	Pin	Termination
Receiver, Type 7092				Pressure bulkhead

CONNECTOR 10HA/16240

Termination	Pin	Cable	Pin	Termination
Receiver, Type 7092				Pressure bulkhead

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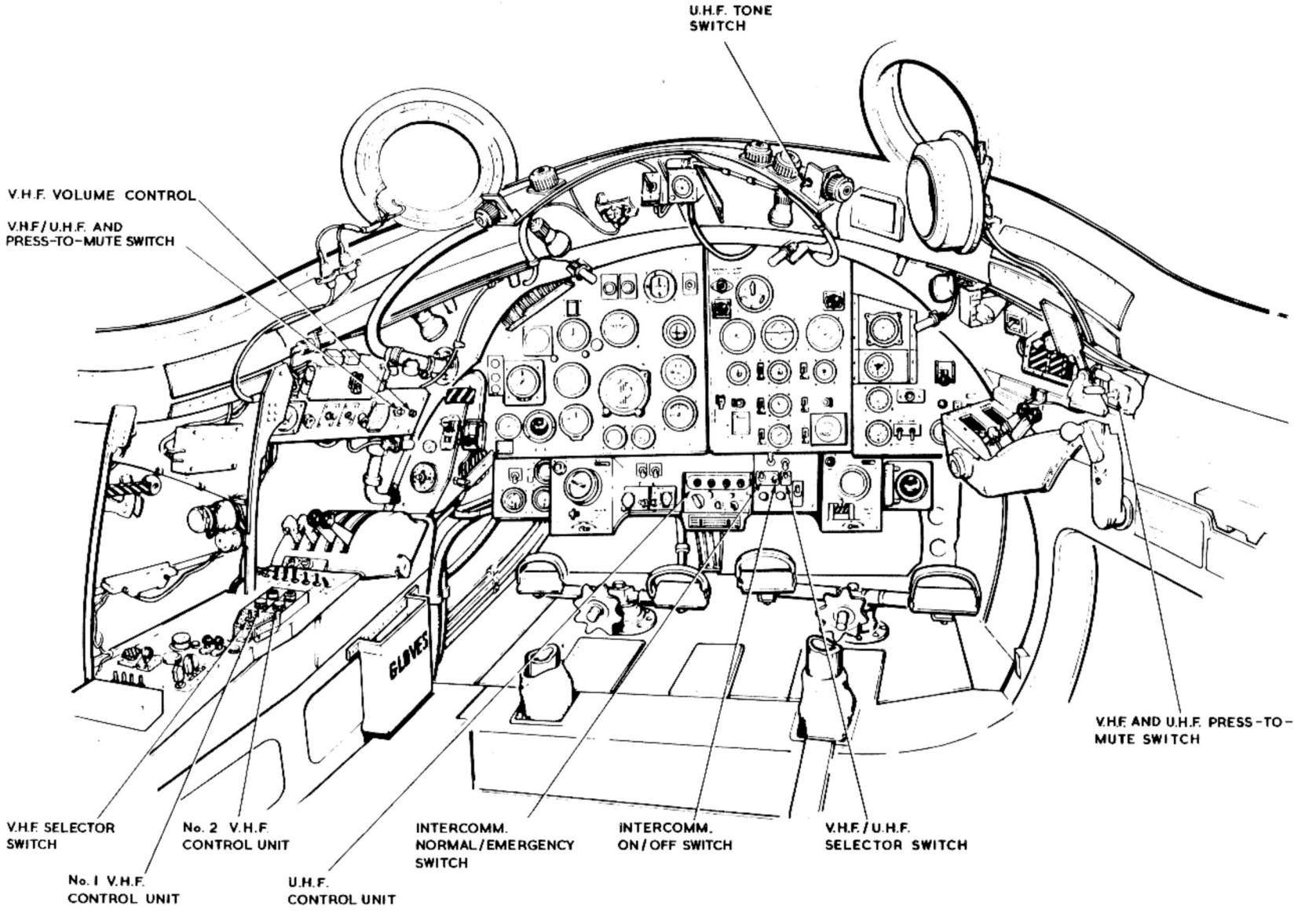

FIG. 1. RADIO INSTALLATION – PILOT'S STATION

◀ SWITCHES CHANGED ▶

DESCRIPTION

General

1. This General Information Appendix and the following Appendices cover the radio installations on Mk.4 aircraft in a pre Mod.5181 state. Illustrations show the locations of the equipment at both the pilot's and the navigator's port station. The associated appendices are as follows:-

Appendix 1 V.H.F. Communication A.R.I.18064

Appendix 2 U.H.F. Communication A.R.I.18124/1

▶ ◀

2. Wiring diagrams are given in each appendix and are accompanied by an associated Table which gives the details of each cable assembly.

Power supplies

3. The d.c. power supplies required to operate the radio equipment are supplied from busbar P10. The fuse allocations are as follows:-

	Fuse
V.H.F.	10 and 11
U.H.F.	158

▶ ◀

◀Further information on power supplies can be found in Sect.5 ▶ Chap.1, Groups D and R & S.

Lighting

4. The U.H.F. control unit is the only unit which is integrally illuminated. The brilliance of the lighting is controlled by the pilot's starboard red lamps dimmer switch *(Sect.5, Chap.1, Group L).*

SERVICING

General

5. Wiring faults should be investigated by referring to the schematic diagram and table of cable assemblies included in the appropriate appendix, and the theoretical and routeing diagrams in Sect.5, Chap.1, Groups D and R & S. Servicing information on the individual items of equipment is contained in the publications referred to in the text of each part.

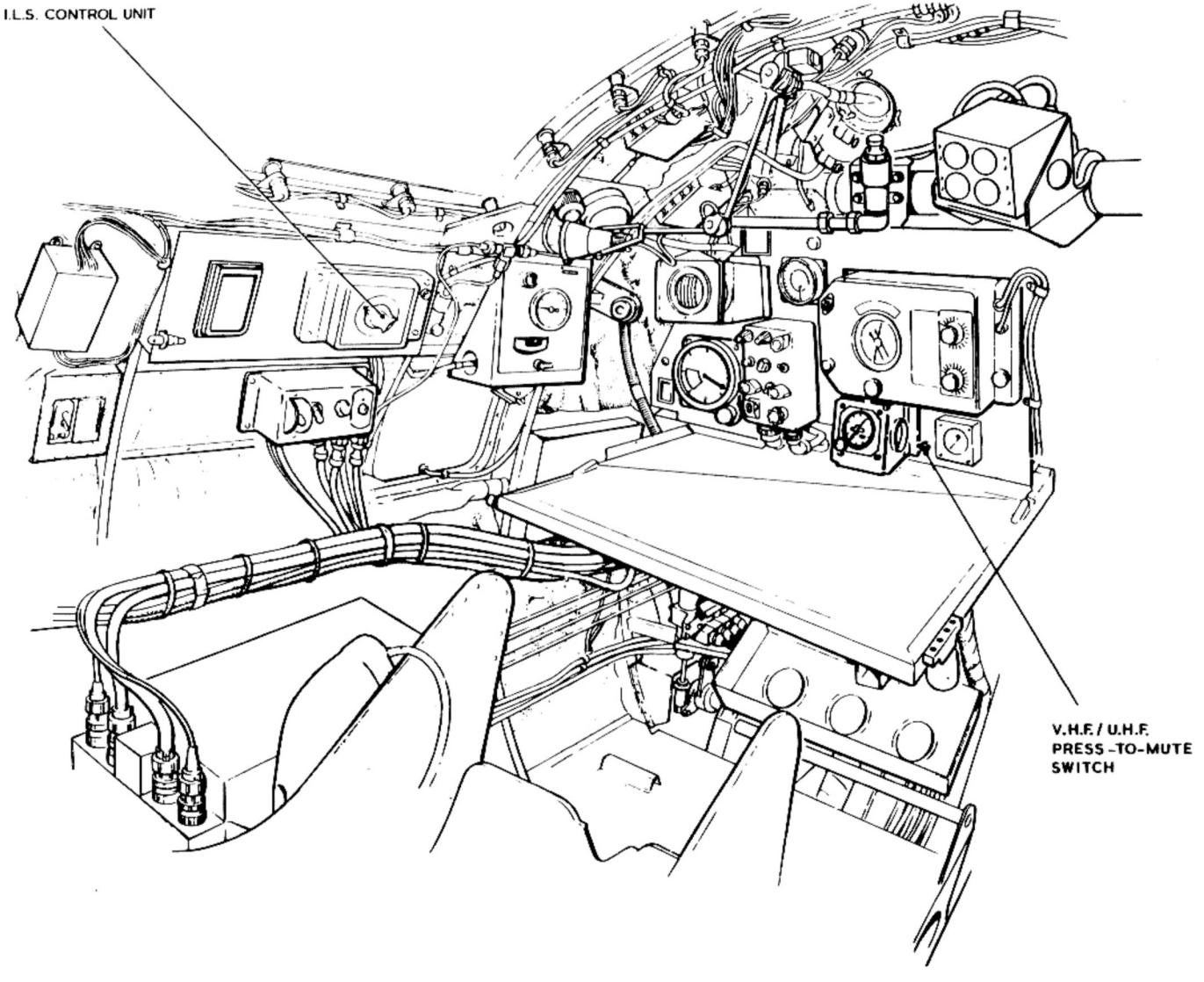

FIG. 2. RADIO INSTALLATION – NAVIGATOR'S STATION (PORT)

◄ PICTORIALLY AMENDED ►

Appendix 1 V.H.F. COMMUNICATION A.R.I.18064

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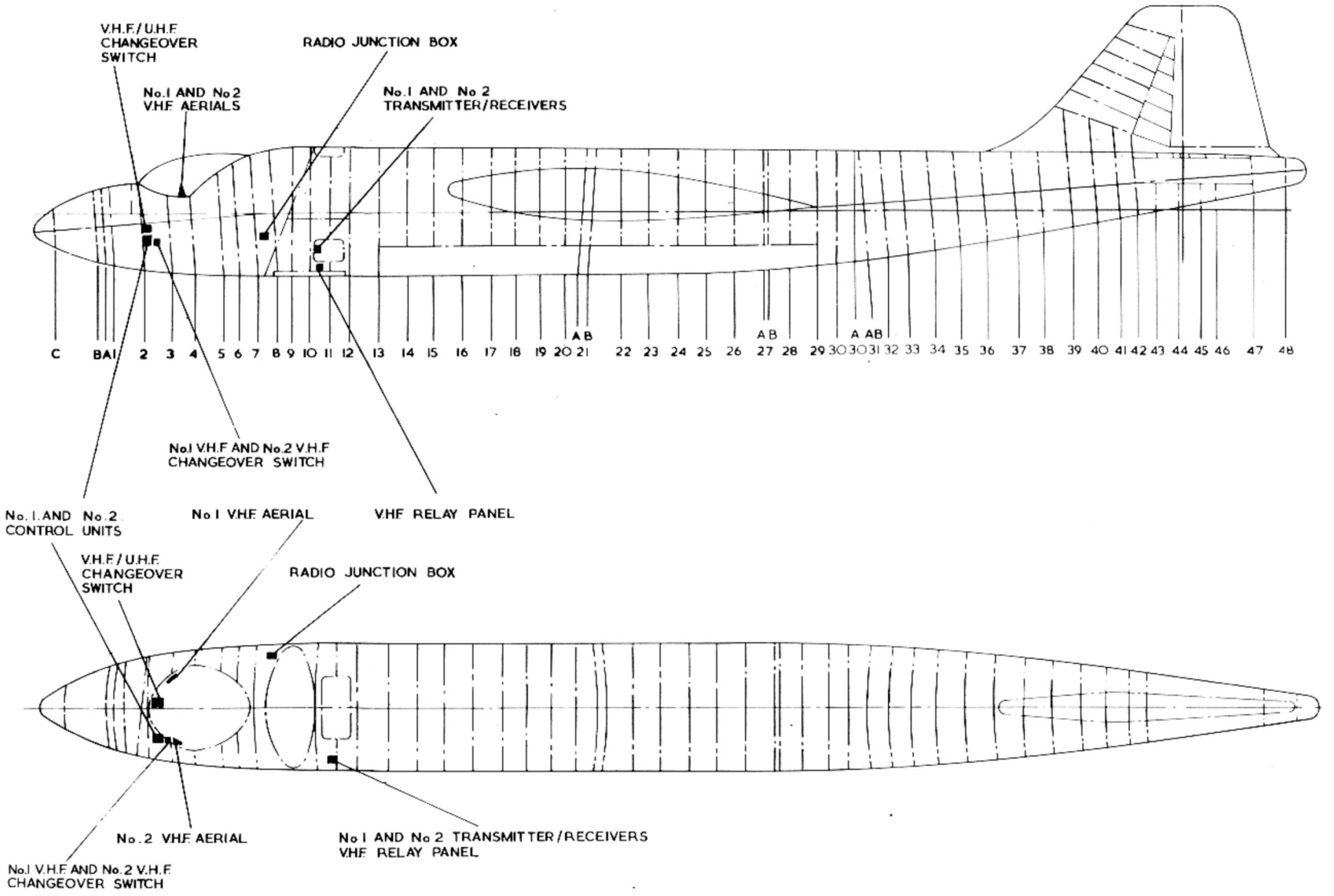

FIG.1. LOCATION DIAGRAM - V.H.F. COMMUNICATION

DESCRIPTION

Introduction

1. The V.H.F. communication system comprises twin transmitter/receivers operating over the frequency range of 100 MHz to 150 MHz. The installation incorporates two canopy aerials sandwiched between the inner and outer skins of the plastic canopy.

Transmitter/receivers, Types T.R.1985 and T.R.1986

2. The two V.H.F. sets, Types T.R.1985 (No.1) and T.R.1986 (No.2) are 10 channel transmitter/receivers having a frequency coverage of 100 MHz to 125 MHz and 124.5 MHz to 150 MHz respectively. The sets are mounted on anti-vibration trays in the port equipment compartment.

V.H.F. relay panel

3. This panel is located in the port equipment compartment below the transmitter/receivers and carries a Type S No.2 relay, a Type 102 relay, an assembly of terminal blocks, an intercomm. socket, and a press-to-transmit push switch. Both relays operate in conjunction with a No.1/No.2 change-over switch on the pilot's console, the relays being de-energized when the switch is set to the No.1 (switch open) position. In this condition a power supply is fed to T.R.1985 via the normally-closed contacts of the Type S No.2 relay. By setting the switch to the No.2 position, both relays become energized resulting in the power supply to T.R.1985 being broken and that for T.R.1986 being completed via the Type S No.2 relay. Simultaneously, the energized Type 102 relay transfers the transmitter circuit and the mic/tel circuits to the No.2 T.R. unit.

Intercomm. stand-by

4. The amplifier section of each V.H.F. set may be used for emergency intercomm. purposes by selection of the I/C NORMAL/EMERGENCY switch to EMERGENCY.

V.H.F. control equipment

5. Two Type 382 control units (No.1/No.2), and a switch, are mounted on the pilot's console. The switch, labelled No.1/No.2, is used for selecting the appropriate Type 382 control unit for the V.H.F. set then in use. With the switch in the No.1 position selection of any channel on the No.1 control unit brings the T.R.1985 into operation; similarly T.R.1986 is brought into operation with the switch set to the No.2 position and the channel selected on the No.2 control unit.

Suppressed aerials

6. Each V.H.F. set uses an aerial manufactured from thin copper strip sandwiched between the inner and outer skins of the plastic canopy. The two aerials are positioned on the port and starboard sides of the canopy and are used for No.2 and No.1 sets respectively. Connection to each aerial is made via a terminal bolt projecting through the inner skin of the canopy into the cockpit. To each terminal bolt is connected one end of a beryllium copper strip. At the other end of each strip is fitted a plug which is arranged to mate with a Type 684 socket bracketed to the canopy coaming tube. At the lower end of the socket assembly is a Type 358 tee-piece to the forward end of which is connected an aerial matching stub. From the aft end of each tee-piece a co-axial cable is run to each V.H.F. set via plugs and sockets at the pressure bulkhead.

Volume control

7. A volume control, fitted on the generator control panel above the console, is provided for varying the level of audio volume from the V.H.F. set then in use.

V.H.F./U.H.F. change-over switch

8. This switch, located on the starter and auxiliary panel labelled V.H.F./U.H.F. is provided to change from the V.H.F. to the U.H.F. system. When the switch is selected to U.H.F., the transmitter circuits and the mic/tel circuits are connected via the relays in the radio junction box to the U.H.F. system.

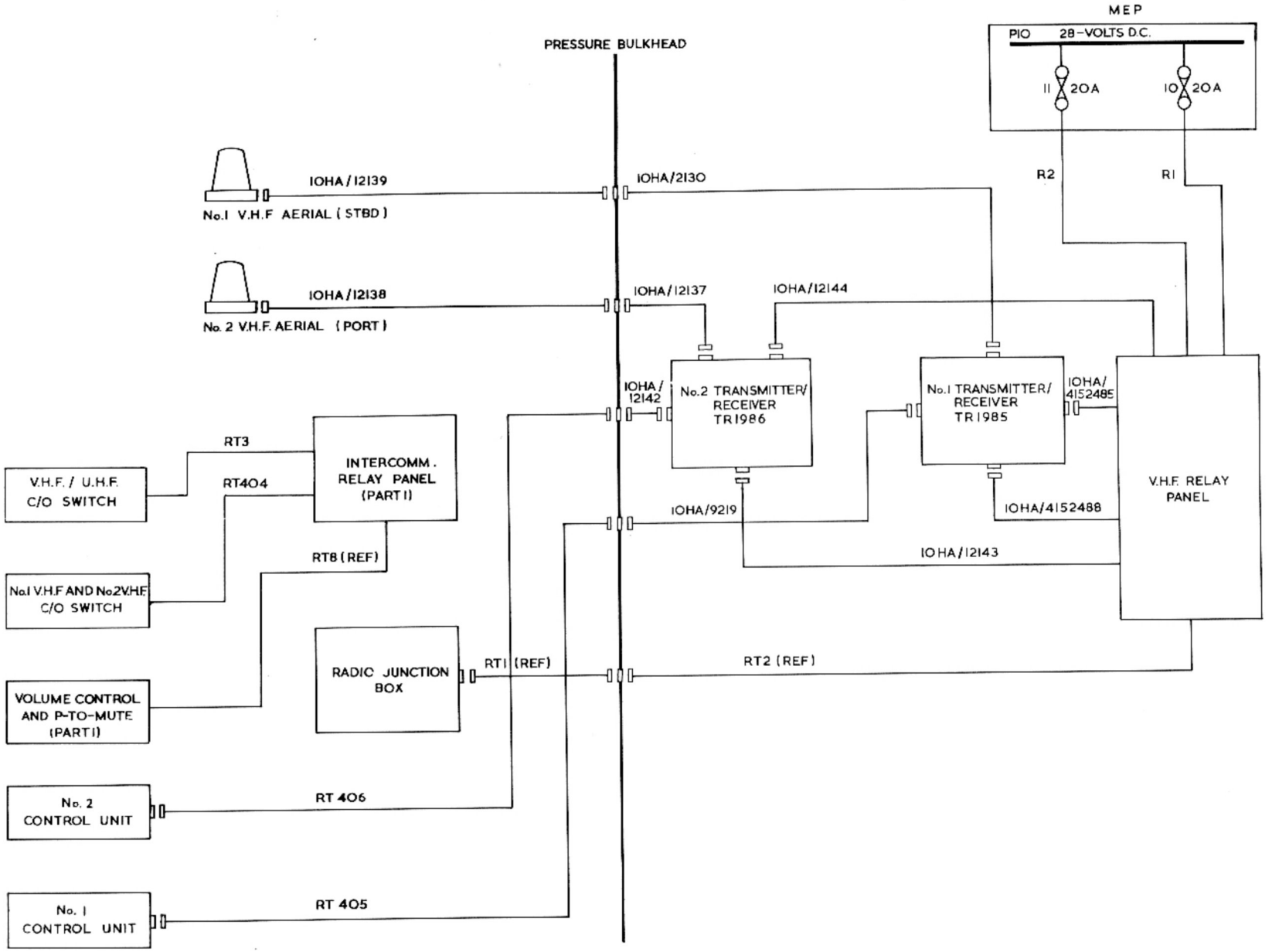

FIG.2. INTERCONNECTION DIAGRAM - V.H.F. COMMUNICATION

Press-to-transmit switches

9. The pilot's and pupil's press-to-transmit switches are embodied in the right, and left-hand grips of their respective control columns.

Press-to-mute switches

10. Three parallel connected switches, installed one above the entrance door, one on the generator control panel, and one on the navigator's instrument panel, are provided for muting the V.H.F. or U.H.F. systems depending on which is in use at that time.

SERVICING

General

11. Wiring faults should be investigated by referring to the diagrams in this chapter and the routeing diagrams in Sect.5, Chap.1, Group R and S, App.1. Servicing information on the system is contained in A.P.116D-0118-1.

TABLE 1

Equipment details

Item	Type/Ref.	Location	A.P. reference
No.1 transmitter/receiver	T.R.1985	Port equipment compartment	A.P.116D-0118-1
No.2 transmitter/receiver	T.R.1986	Port equipment compartment	
No.1 control unit	382	Pilot's port console	
No.2 control unit	382	Pilot's port console	
V.H.F. relay panel		Port equipment compartment	
No.1 aerial		Starboard side of canopy	
No.2 aerial		Port side of canopy	

TABLE 2

Cable assembly details

RT 405-EA4.82.5107

Termination	Pin	Cable	Pin	Termination
	A		A	
	B		B	
	C		C	
Socket Mk.4	D		D	Plug Mk.4
10H/0560180	E		E	10H/0560360
No.1 Control	F		F	Pressure
unit, pilot's	G		G	bulkhead
console	H		H	RT 405
RT 405	J		J	
	K		K	
	L		L	
	M		M	

RT 406-EA4.82.5105

Termination	Pin	Cable	Pin	Termination
	A		A	
	B		B	
	C		C	
Socket Mk.4	D		D	Plug Mk.4
10H/0560180	E		E	10H/0560360
No.2 Control	F		F	Pressure
unit, pilot's	G		G	bulkhead
console	H		H	RT 406
RT 406	J		J	
	K		K	
	L		L	
	M		M	

CONNECTOR - 10HA/2130

Termination	Pin	Cable	Pin	Termination
Pressure bulkhead				T.R.1985 Set No.1

CONNECTOR - 10HA/9219

Termination	Pin	Cable	Pin	Termination
Pressure bulkhead				T.R.1985 Set No.1

CONNECTOR - 10HA/12137

Termination	Pin	Cable	Pin	Termination
Pressure bulkhead				T.R.1986 Set No.2

CONNECTOR - 10HA/12138

Termination	Pin	Cable	Pin	Termination
Pressure bulkhead				V.H.F. aerial No.2 (port side of canopy)

CONNECTOR - 10HA/12139

Termination	Pin	Cable	Pin	Termination
Pressure bulkhead				V.H.F. aerial No.1 (starboard side of canopy)

continued . . .

TABLE 2 Cable assembly details – *continued*

CONNECTOR – 10HA/12142

Termination	Pin	Cable	Pin	Termination
Pressure bulkhead				T.R.1986 Set No.2

CONNECTOR – 10HA/12143

Termination	Pin	Cable	Pin	Termination
T.R.1986 Set No.2				V.H.F. relay panel

CONNECTOR – 10HA/12144

Termination	Pin	Cable	Pin	Termination
T.R.1986 Set No.2				V.H.F. relay panel

CONNECTOR – 10HA/4152485

Termination	Pin	Cable	Pin	Termination
T.R.1985 Set No.1				V.H.F. relay panel

CONNECTOR – 10HA/4152488

Termination	Pin	Cable	Pin	Termination
T.R.1985 Set No.1				V.H.F. relay panel

Appendix 2 U.H.F. COMMUNICATION A.R.I.18124/1

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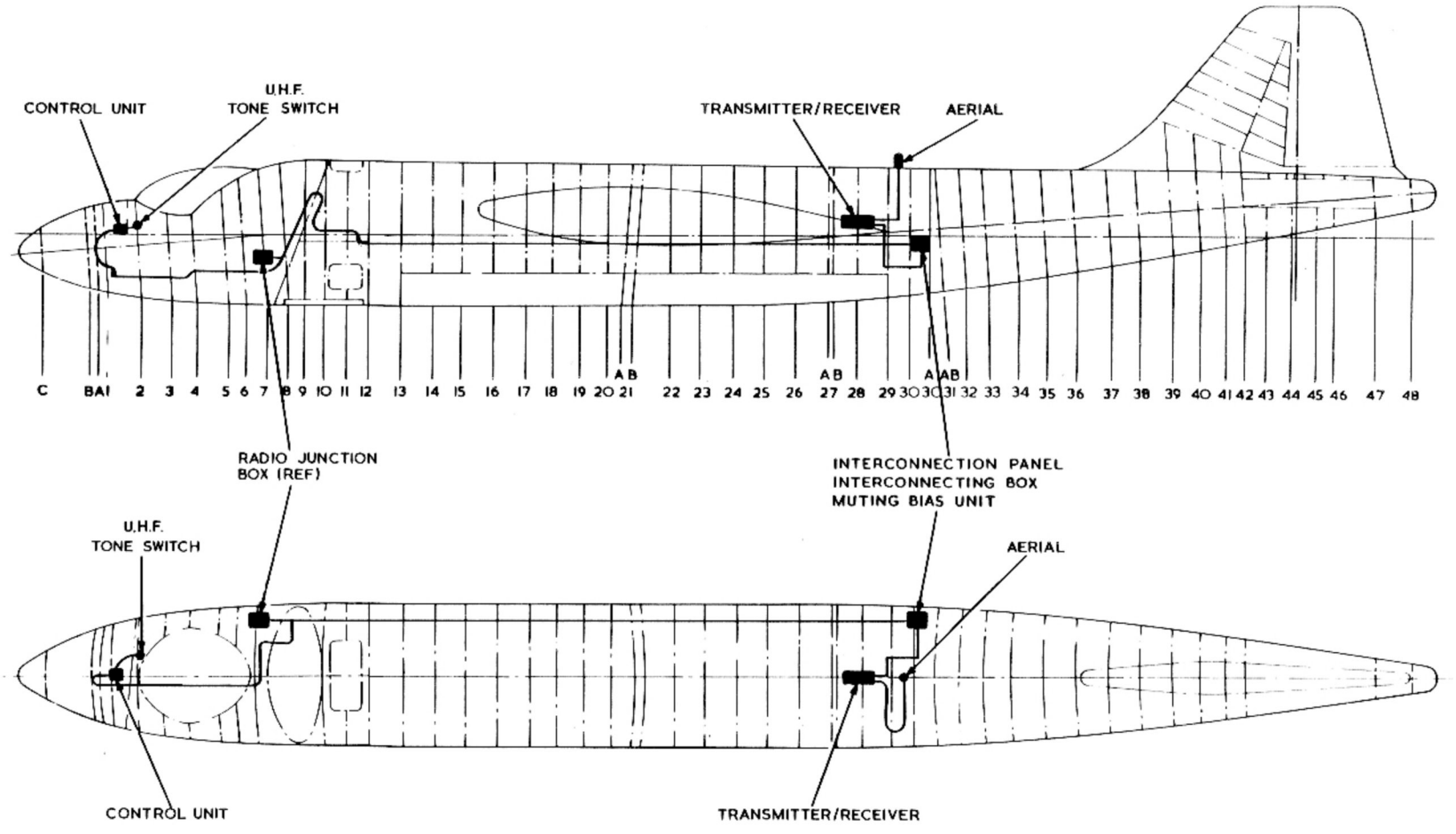


EA4 82 5101 6

FIG.1. LOCATION DIAGRAM-U.H.F. COMMUNICATION A.R.I. 18124/1

◀ DRAWING NUMBER ADDED ▶

DESCRIPTION

Introduction

1. The U.H.F. communication system incorporates a pressurized multi-channel transmitter/receiver operating over the frequency range of 225 MHz to 399.9 MHz. Connection of the U.H.F. system to the intercomm. installation is via the radio junction box. For detailed information on the operation and description of the equipment used in the installation, reference should be made to A.P.116D-0105-1.

Transmitter/receiver, Type TR5/ARC.52

2. The crystal controlled transmitter/receiver, in conjunction with a Type C1607/ARC.52 control unit, can be selected to operate at any one of eighteen automatically preset frequencies, 1,750 manually selected channel frequencies, and one guard channel frequency between 238 and 248 MHz.

3. The transmitter/receiver is mounted on a tray located on the centre line of the aircraft in the rear fuselage between frames 27 and 29. The unit is pressurized to between 4 and 5 lb/in^2 air being introduced, when necessary, through a Schrader valve on the outer casing.

Muting bias unit

4. The muting bias unit, located on a panel at the starboard side of the rear fuselage between frames 30 and 30A, is controlled by PRESS-TO-MUTE switches on the starboard coaming panel (instructor), generator control panel (pupil) and the navigator's instrument panel.

Interconnecting box, Type ARC.52

5. Located with the muting bias unit *(para.4);* the interconnecting box facilitates connection of the microphone input and audio output circuits from the transmitter/receiver to the intercomm. system, via the radio junction box.

Control unit, Type C1607/ARC.52

6. The control unit, mounted on the engine starting panel incorporates all the operational controls and provides the following facilities:

(1) Function switch. This has four positions which provide one of the following services:-

OFF	–	In this position the equipment is inoperative.
T/R	–	In this position the equipment is switched on for operational purposes.
T/R + G	–	In this position the guard receiver is available in addition to the transmitter/receiver.
ADF	–	In this position an automatic direction facility is provided.

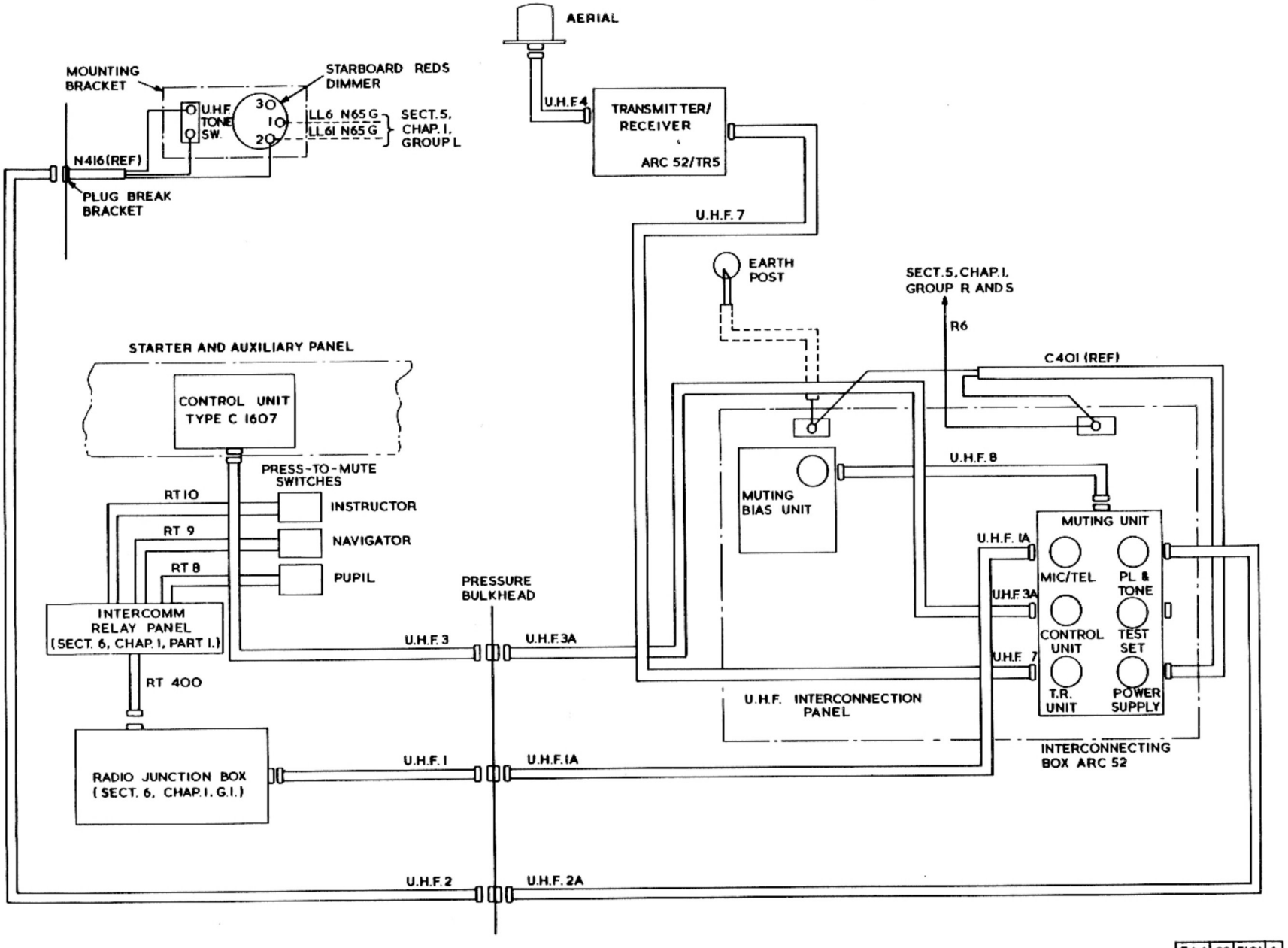
(2) CHANnel selector switch. This has 20 positions; those numbered 1 to 18 are for selecting the required preset frequency channel. The two remaining positions are labelled M and G.

M	–	This position is used to switch the selection of frequency to manual control.
G	–	This position enables the transmitter/receiver to be used on the guard frequency independently of the guard receiver.

(3) MANUAL. Four controls are incorporated in the manual service. Each control is provided with an aperture in which a series of numbers appear, the controls being used to select any one of 1,750 channels as required.

(4) VOLume. This control is used to vary the level of audio in the telephones.

Two panel lamps integral with the unit are controlled by the pilot's starboard red lamps dimmer switch *(Sect.5, Chap.1, Group L).*



EA4 | 82 | 5101 | 6

FIG. 2. INTERCONNECTION DIAGRAM-U.H.F. COMMUNICATION ARJ. 18124/1

◀ CABLE CODE N65G CORRECTED ▶

Aerial

7. The aerial used in the installation is a broadband type having a characteristic impedance of 50 ohms. It is installed on the upper surface of the fuselage between frames 29 and 30.

Power supplies

8. The d.c. power supplies required to operate the system are fully described in Sect.5, Chap.1, Group R and S.

SERVICING

General

9. Wiring faults should be investigated by referring to the schematic diagram in this chapter and the routeing diagrams in Sect.5, Chap.1, Group R and S. Servicing information on the system is contained in A.P.116D-0105-4F.

TABLE 1

Equipment details

Item	Type/Ref.	Location	A.P. reference
Transmitter/receiver	TR5/ARC.52	Port fuselage between frames 27 and 29	A.P.116D-0105 series
Muting bias unit		Starboard fuselage between frames 30 and 30A	
Interconnecting box	ARC.52		
Control unit	C1607/ARC.52	Starter and auxiliary panel, pilot's station	
Aerial		Top fuselage between frames 29 and 30	

TABLE 2

Cable assembly details

U.H.F.1 – EB7.82.5477

Termination	Pin	Cable	Pin	Termination
Socket Mk.4 CZ49017 Radio J.B. U.H.F.1	A	DEF 10-6D	A	Plug Mk.4 CZ49222 Pressure bulkhead U.H.F.1
	B		B	
	C		C	
	D		D	
	E		E	
	F		F	

U.H.F.1A – EA4.82.5055

Termination	Pin	Cable	Pin	Termination
Plug Mk.4 CZ49222 Interconnecting box U.H.F.1A	A	DEF 10-6D	A	Socket Mk.4 CZ49017 Pressure bulkhead U.H.F.1A
	B		B	
	C		C	
	D		D	
	E		E	
	F		F	

◀ U.H.F.2 - EA4.82.5057 ▶

Termination	Pin	Cable	Pin	Termination
Socket Mk.4 CZ49017 Plug break forward of instrument panel U.H.F.2	A	DEF 10-3A	A	Plug Mk.4 CZ49222 Pressure bulkhead U.H.F.2
	B		B	
	C		C	

U.H.F.2A – EA4.82.5059

Termination	Pin	Cable	Pin	Termination
Plug Mk.4 CZ49222 Interconnecting box U.H.F.2A	A	DEF 10-3A	A	Socket Mk.4 CZ49017 Pressure bulkhead U.H.F.2A
	B		B	
	C		C	

U.H.F.3 – EA4.82.5061

Termination	Pin	Cable	Pin	Termination
	A	Type 2	A	
	B		B	
	C		C	
	D		D	
	E		E	
	F		F	
	H		H	
	J		J	
	K		K	
Socket K03-21-30SN Control unit U.H.F.3	L		L	Socket 165-GB-91 Pressure bulkhead U.H.F.3
	M		M	
	N		N	
	P		P	
	R		R	
	S		S	
	T		T	
	U		U	
	V		V	
	W		W	
	X		X	
	Y		Y	
	Z		Z	

continued . . .

TABLE 2 Cable assembly details – *continued*

U.H.F.3 – EA4.82.5061 – *continued*

Termination	Pin	Cable	Pin	Termination
Socket K03-21-30SN Control unit U.H.F.3	a	Type 2	a	Socket 165-GB-91 Pressure bulkhead U.H.F.3
	b		b	
	c		c	
	d		d	
	f		e	
	g		f	
	h		g	
	i		h	

U.H.F.3A – EA4.82.5063

termination	Pin	Cable	Pin	Termination
Plug K03-21-30PN Interconnecting box U.H.F.3A	A	Type 2	A	Plug 165GB-72-1 Pressure bulkhead U.H.F.3A
	B		B	
	C		C	
	D		D	
	E		E	
	F		F	
	H		H	
	J		J	
	K		K	
	L		L	
	M		M	
	N		N	
	P		P	
	R		R	
	S		S	
	T		T	
	U		U	
	V		V	

U.H.F.3A – EA4.82.5063 – *continued*

Termination	Pin	Cable	Pin	Termination
Plug K03-21-30PN Interconnecting box U.H.F.3A	W	◀ Type 2 ▶	W	Plug 165GB-72-1 Pressure bulkhead U.H.F.3A
	X		X	
	Y		Y	
	Z		Z	
	a		a	
	b		b	
	c		c	
	d		d	
	f		e	
	g		f	
	h		g	
	l		h	

◀ **U.H.F.4 - EA4.82.5065** ▶

Termination	Pin	Cable	Pin	Termination
Plug UKN.2 Transmitter/ receiver		UNIRADIO 67		Plug UKN.2 Aerial between frames 29 and 30

continued . . .

TABLE 2 Cable assembly details – *continued*

U.H.F.7 – EA4.82.5067

Termination	Pin	Cable	Pin	Termination
	A	Type 3	A	
	C	Type 3	C	
	D	Type 2	D	
	E	Type 2	E	
	F	Type 2	F	
	H	Type 2	H	
	J	Type 2	J	
	K	Type 2	K	
	L	Type 2	L	
	M	Type 2S	M	
	N	Type 2S	N	
	P	Type 2	P	
Angle plug	R	Type 103	R	Angle socket
165GB-R72	S	Type 103	S	165GB-R44
Interconnecting	T	Type 2	T	Transmitter/
box	U	Type 2	U	receiver
U.H.F.7	V	Type 2	V	U.H.F.7
	W	Type 2	W	
	Y		Y	
	Z		Z	
	a	Type 2	a	
	b	Type 2	b	
	c	Type 2	c	
	d	Type 2	d	
	e	Type 2	e	
	f	Type 2	f	
	g	Type 2	g	
	h	Type 2	h	
	i	Type 2	i	
	j	Type 2	j	
	k	Type 2	k	

U.H.F.7 – EA4.82.5067 – *continued*

Termination	Pin	Cable	Pin	Termination
	m	Type 2	m	
	n	Type 2	n	
	p	Type 2	p	
Angle plug	q	Type 2	q	Angle socket
165GB-R72	r	Type 2	r	165GB-R44
Interconnecting box	s	Type 2	s	Transmitter/receiver
U.H.F.7	t	Type 2	t	U.H.F.7
	u	Type 2	u	
	v	Type 2	v	
	w	Type 2	w	

U.H.F.8 – EB7.82.5499

Termination	Pin	Cable	Pin	Termination
	A	DEF 10-6D	A	
Plug Mk.4	B		B	Socket Mk.4
CZ49222	C		C	CZ49017
Interconnecting box	D		D	Muting bias unit
U.H.F.8	E		E	U.H.F.8
	F		F	

Note . . .

For details of cable assemblies RT8, RT9, RT10 and RT400, refer to Sect.6, Chap.1, Part 1.

Chapter 2 RADAR INSTALLATION

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Note . . .

A detailed list of contents will be found at the beginning of each part.

GENERAL INFORMATION

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LIST OF ILLUSTRATIONS

General

1. Information covering the aircraft radar systems is contained in this section. The installations covered are as follows:-

Part 1 I.F.F./S.S.R.1520 (A.R.I.23134/3)

Part 2 Tacan (A.R.I.18107/18)

2. A location diagram, an interconnection diagram, a table giving cable assembly pin connections and a table giving equipment details, covering type, location, reference number and publication reference, is included in each part.

3. Figs 1, 2 and 3 show the positions of the various indicators and control units at the pilot's and navigator's stations.

Power supplies

4. The radar installations require both a.c. and d.c. power supplies for their operation. Individual equipment power supplies are covered in each part. Detailed information on power supplies is given in Sect.5, Chap.1, Group R and S.

Lighting

5. The integral lamps in the Tacan and I.F.F./S.S.R. control units are supplied with 28 volts d.c. via a dimmer switch mounted on the panel on the navigator's port wall adjacent to the control units.

Servicing

6. Servicing information on individual items of equipment is given in the associated publications referred to in Table 1 of each part.

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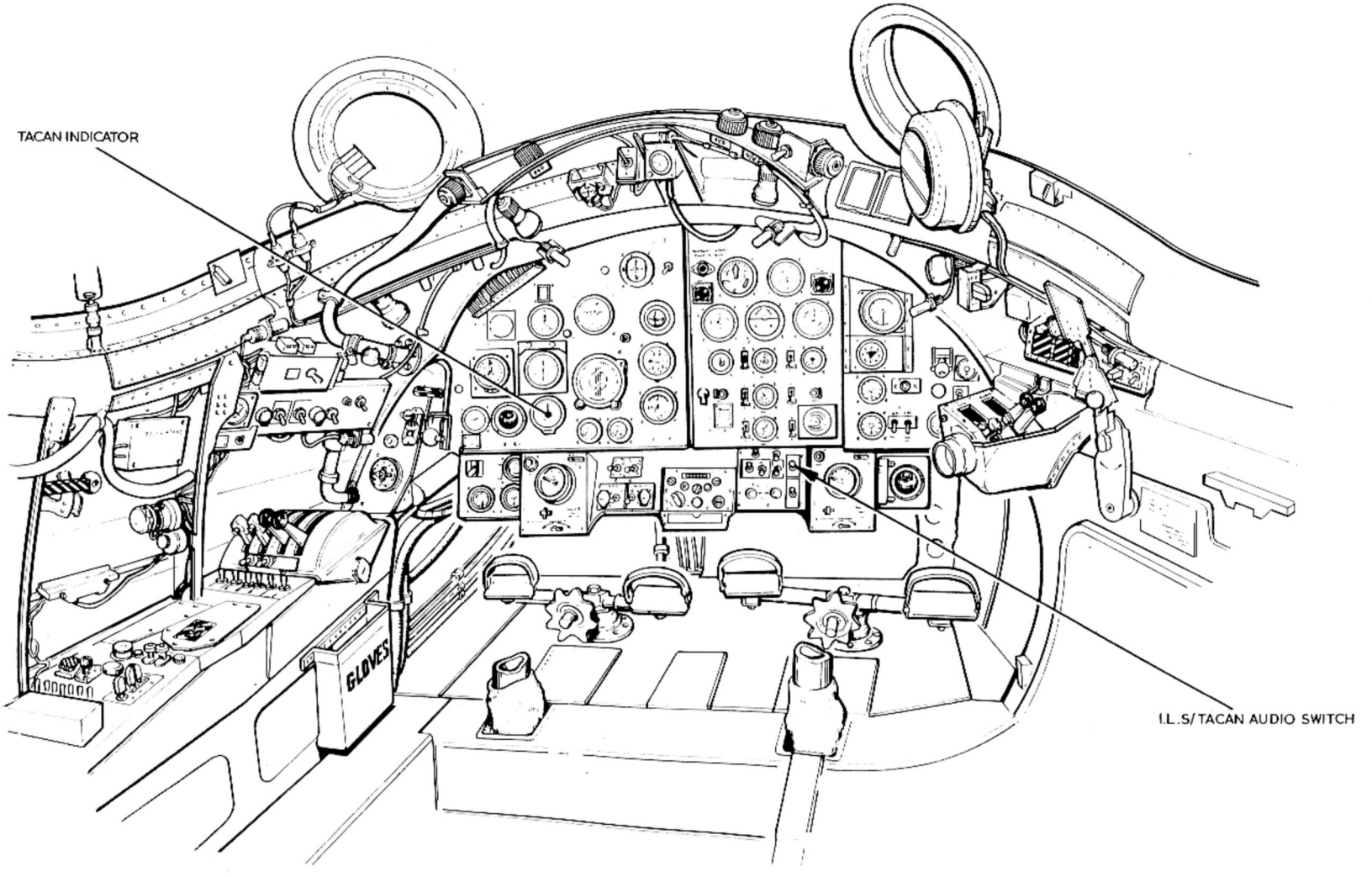

FIG.1. RADAR INSTALLATION—PILOT'S STATION

◀ STI/CAN/586c INCORPORATED ▶

UK RESTRICTED

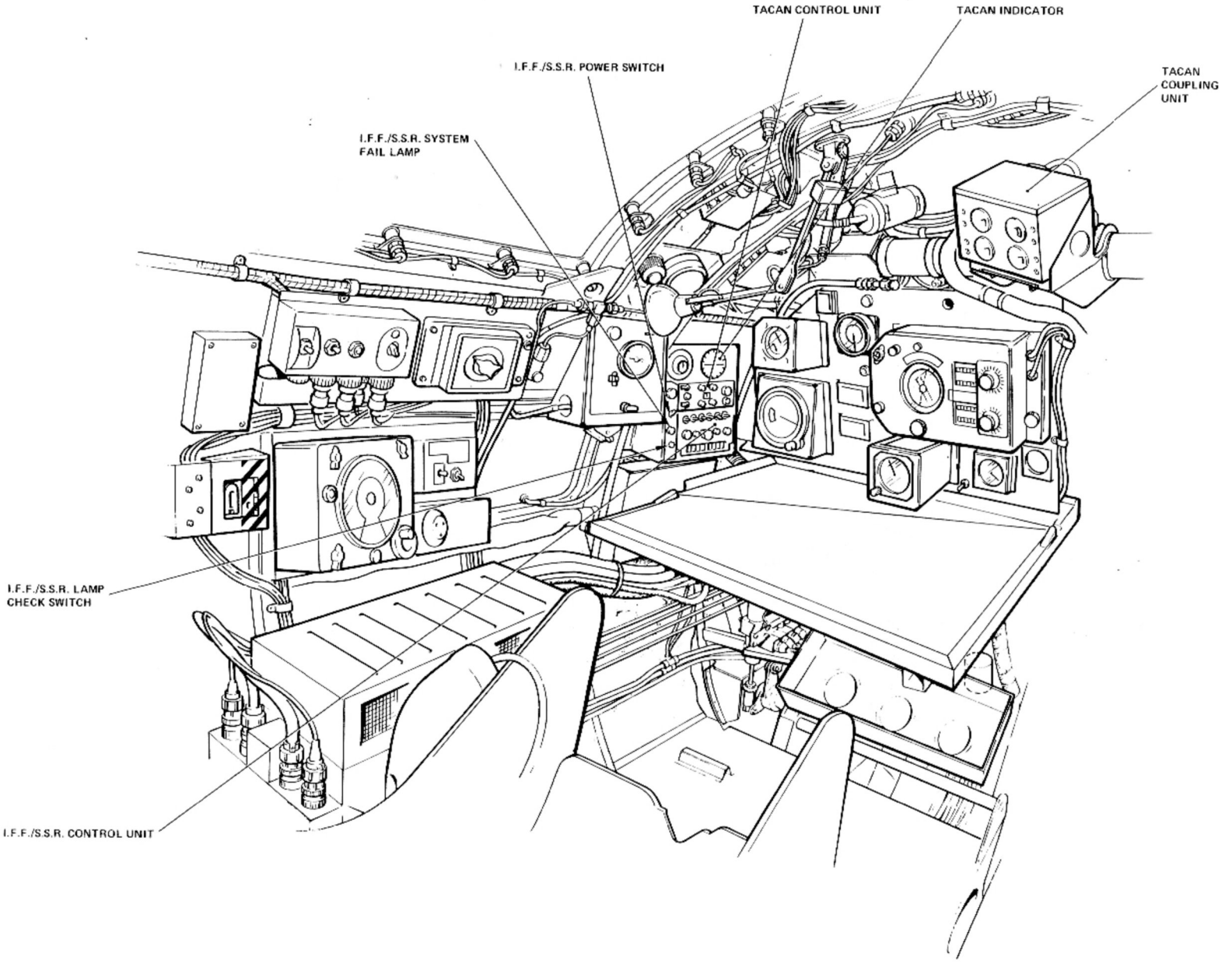

FIG.2. INSTALLATION - NAVIGATOR'S PORT STATION

◄ STI/CAN/586c INCORPORATED ►

UK RESTRICTED

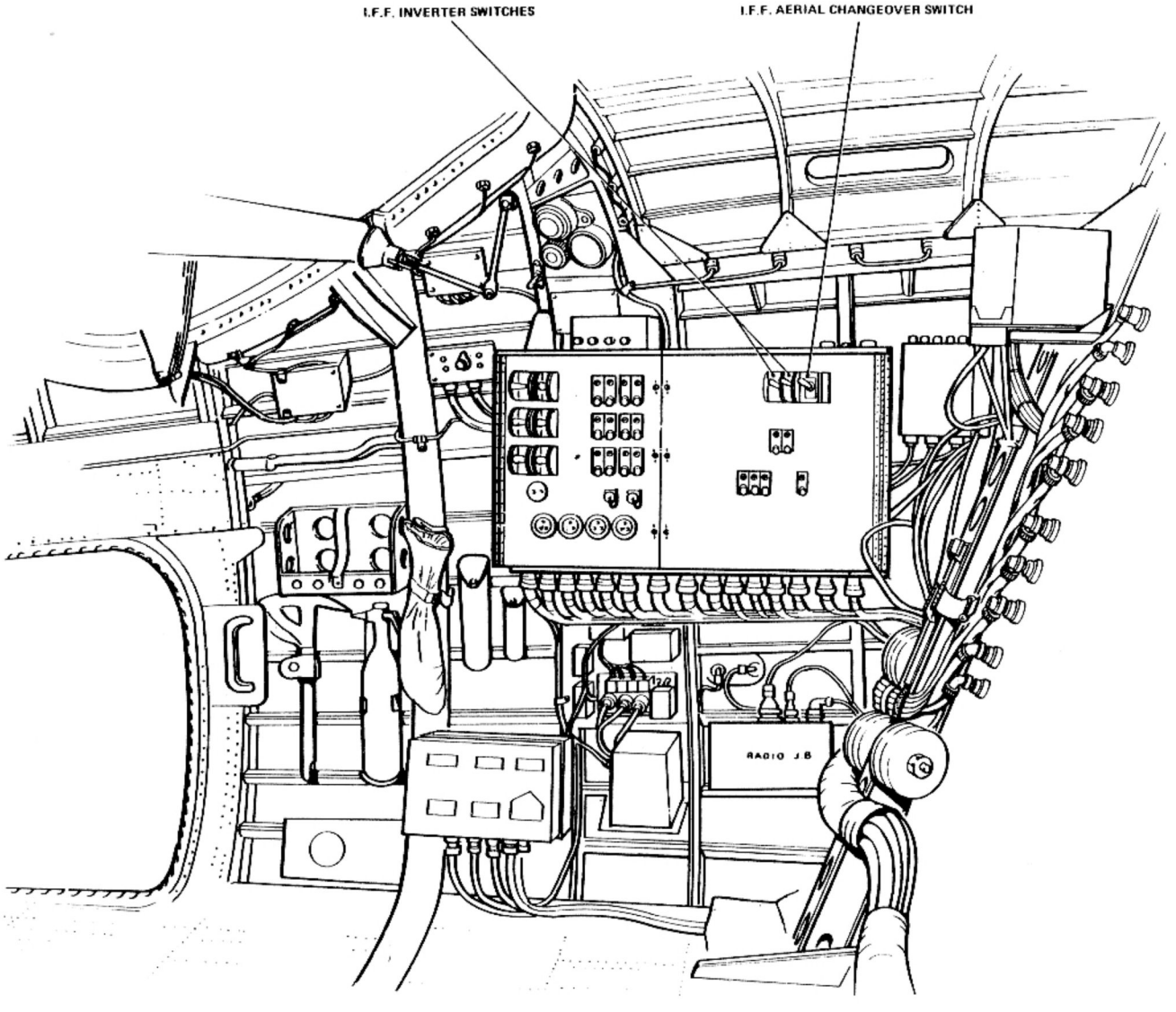

FIG.3. RADAR INSTALLATION - NAVIGATOR'S STARBOARD STATION

◀ E.C.P. AMENDED ▶

Part 1 I.F.F./S.S.R.1520 (A.R.I.23134/3)

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DESCRIPTION

General

1. A.R.I.23134/3 (I.F.F./S.S.R.1520) is the airborne part of an I.F.F. Mk.10 secondary surveillance radar system. This Part also includes information associated with the automatic height encoding installation. The I.F.F. Mk.10 system identifies, as friendly or hostile, an aircraft detected by the interrogating ground radar. The aircraft transponder reacts to an interrogatory challenge by radiating one of four replies, each consisting of a train of pulses. The reply transmitted is dependent on the interrogation mode and the operation of the I/P and EMGY (emergency) switches on the control unit.

2. The four replies are as follows:-

NORMAL - given in answer to an interrogation on any mode (I/P and EMGY switches not operated).

CIVIL I/P - given in answer to an interrogation on modes 2, 3/A, B or D (not used at present) when the I/P switch is depressed. A mode C (automatic altitude reporting) interrogation also generates a civil I/P reply with no operation of the I/P switch, provided that the D4 information pulse is selected.

MILITARY I/P - given in answer to an interrogation on mode 1 when the I/P switch is depressed.

EMERGENCY - given in answer to an interrogation on modes 1, 2, 3/A or B when the emergency facility is selected. On modes 3/A and B, the coding of the information pulses depends upon the setting of the CIVIL/MIL switch on the control unit and is 7700 (civil) or as selected (MIL).

3. A full description of the I.F.F. Mk.10 system and details of the main units are contained in A.P.114J-0101-16. The locations of the main units are given in fig.1 and interconnection details in fig.2. Table 1 gives details of the main units, Table 2 the connectors and cable assemblies.

Transponder

4. The transponder, on its shockmount tray, is located on the floor of the upper equipment compartment. The unit is pressurized to 4 lb/in^2 with dry air or nitrogen. Four code selector switches on the front panel of the unit permit the setting up, before flight, of the reply code to mode 2 interrogations. Also located on the front panel are the aerial socket and the pressurization charge purge valves. Electrical connection to the transponder is made via a 98-pole connector on the mounting tray. The aerial socket is connected via coaxial cable to the aerial switching unit.

Control unit

5. The control unit is located at the navigator's position on the port side of the aircraft, between frames 5 and 6. All electrical connections to the unit are made at the rear via a 55-pole connector. Ten integral lamps provide illumination of the controls and code selector switches. Operation of the transponder is controlled from the front panel of the unit via the following:-

(1) Four toggle switches providing ON (down)/OFF (up) selection modes 1, 2, C or D (not used at present)

(2) A CIVIL/MIL emergency code toggle switch

(3) A spring-loaded I/P toggle switch

(4) A three-position rotary switch, with a centre OFF position, for selection of either mode 3/A or mode B

(5) A five-position rotary switch for selection of the OFF, SBY, LOW, NORM or EMGY functions. The switch must be depressed to select EMGY.

(6) A push-to-operate combined lamp and switch assembly, identified TEST, which initiates the operation of the internal self-test circuits in the transponder. If the transponder is serviceable, the green (O.K.) lamp is illuminated.

(7) Two banks of code selection switches, four in each bank. One bank is identified MODE 1, the other MODE 3/A/B.

Aerials

6. Two omni-directional vertically polarized unipole aerials are mounted on the aircraft skin. The forward (upper) aerial is located on top of the centre fuselage between frames 12 and 13, aft of the upper equipment compartment hatch. The aft (lower aerial) is located on the underside of the rear fuselage between frames 33 and 34. Both aerials are connected to the aerial switching unit via coaxial cable.

Aerial switching unit

7. The aerial switching unit is located in the upper equipment compartment, on the starboard side of the fuselage aft of frame 11. The unit is a solid state coaxial switch which connects the transponder to each aerial alternately at a switching rate of 40 ± 4 Hz. The three r.f. connectors of the unit are identified UPPER, LOWER and TRANSPONDER. If the +28V d.c. supply to the unit fails or the internal oscillator/amplifier fails, the transponder is connected automatically to the upper aerial. If either one or both of the internal switching diodes fail, the transponder is connected automatically to the lower aerial.

WARNING

It is essential that the aerial terminals of the switching unit are both correctly terminated by either a radiating aerial or a matched load whenever r.f. power is applied to the unit.

Aerial change-over switch

8. The aerial change-over switch is a guarded, three-position toggle switch, identified AERIAL POSN. UPPER-FLIGHT-LOWER. The switch is located adjacent to the I.F.F. inverter control switch

on the electrical control panel. The switch is used during ground functional tests of the installation and must be returned to the guarded FLIGHT (centre) position on completion of the tests.

I.F.F. failure warning lamp

9. The warning lamp, identified SYSTEM FAILURE, is located adjacent to the control unit. An amber lamp, it is illuminated under the following conditions:-

(1) When the rotary function switch is set to OFF

(2) When a fault occurs on the receiver sensitivity, transmitter power or mode networks.

When the function switch is set to SBY and the transponder receives correct interrogation signals, the lamp flashes intermittently.

Lamp check switch

10. A toggle switch, identified LAMP CHECK, is located adjacent to the control unit. The switch enables the filaments of both the O.K. lamp and the system failure lamp to be checked for continuity.

Note...

A system failure indication obtained when the system is first switched on can be cleared by operating the TEST switch on the control unit, provided that the indication is not due to a fault condition.

Power supplies

11. 28V d.c. and 115V, 400 Hz, single-phase a.c. supplies are required for the I.F.F./S.S.R. system. The main components of the power supply installation are mounted on an equipment tray, located on the floor of the upper equipment compartment. The inverter is cooled by ram air via a scoop on the starboard side of the centre fuselage between frames 9 and 10. The further details of the I.F.F./S.S.R. power supplies and an alternative supply of a.c. from a static inverter in the event of a busbar or inverter failure, refer to Sect.5, Chap.1, Group R & S.

SERVICING

WARNING

The relevant safety precautions detailed on the LETHAL WARNING marker card must always be observed before entering the cockpit or performing any operations upon the aircraft.

General

12. All equipment and cables should be examined for security and damage at the intervals laid down in the master Servicing Schedule. Functional tests should be carried out at the prescribed intervals, if the serviceability of the installation is suspect, and after rectification of a defect. The instructions for setting up, servicing and testing of the installation, along with the test equipment required, can be found in A.P. 114J-0101-16.

Transponder

13. The pressure inside the unit, should be checked periodically with a low-reading pressure gauge. The unit should be pressurized, with dry air or nitrogen, to 4 lb/in^2.

TABLE 1

Equipment details

Component	Type No.	Location	Publication Reference
Transponder	16928	Upper equipment compartment	A.P.114J-0101-16
Mounting tray	16946	Upper equipment compartment	
Control unit	16929	Navigator's position, port	
Aerial switching unit	16941	Upper equipment compartment, starboard	
Aerial (upper)	100B	Centre fuselage between frames 12 and 13	
Aerial (lower)	100B	Rear fuselage between frames 33 and 34	

TABLE 2

Cable assembly details

◀ CONNECTOR SPECIAL EA4.81.6973 ▶

◀ TERMINATION A	PIN	CABLE	PIN	TERMINATION B ▶
Transponder 16928 Cannon DPJM-98-33S-B	13	MN22	B	Control unit 16929 KPTM-06F-22-55S
	14	MN22	C	
	15	MN22	D	
	17	MN22	E	
	18	MN22	F	
	19	MN22	G	
	24	MN22	S	
	26	MN22	H	
	27	MN22	J	
	28	MN22	K	
	29	MN22	L	
	30	MN22	M	
	31	MN22	N	
	32	MN22	P	
	33	MN22	R	
	34	MN22	S	
	35	MN22	T	
	38	MN22	◀ U	
	39	MN22	V	
	40	MN22	W	
	41	MN22	X	
	43	MN22	Z ▶	
	45	MN22	b	
	46	MN22	c	
	47	MN22	d	
	48	MN22	e	
	49	MN22	f	
	50	MN22	g	
	51	MN22	h	
	52	MN22	i	
	53	MN22	j	
	54	MN22	k	
	55	MN22	m	
	56	MN22	n	
	57	MN22	p	

◀ CONNECTOR SPECIAL EA4.81.6973— *continued* ▶

◀ TERMINATION A	PIN	CABLE	PIN	TERMINATION B ▶
Transponder 16963 Cannon DPJM-	70	MN22	q	Control unit 16929 KPTM-06F-22-55S
	71	MN22	r	
	88	MN22	A	
	42	MN22	TERM 1	Lamp check switch
	96	MN22	TERM 2	
	44	MN22	+ve	System failure lamp
	22	MN22	TERM 7	Relay 20B No.3 Power supply tray
	23	MN22	EARTH	Terminal ET
Transponder 16928 Cannon DPJM-98-33S-B	93	MN22	EARTH	Power supply tray
	86	MN20	A	Power supplies tray socket free HD 466-14-19S-059 1F 2D
	85	MN20	B	
	84	MN20	C	
	83	MN20	D	
	82	MN20	E	
	81	MN20	F	
	80	MN20	G	
	79	MN20	H	
	78	MN20	J	
	92	MN20	K	
	25	MN20	L	
	91	MN20	M	

CONNECTOR CS 5323/2 (10HB/21040)

Lower aerial (frames 33-34) — Plug Type 119	UR 67	Lower Aerial switching unit UKC-2 plug

CONNECTOR CS 5323/3 (10HB/21041)

Upper aerial (frames 12-13) — Plug Type 119	UR 67	Upper Aerial switching unit UKC-2 and adapter UG 567 A/U

continued . . .

TABLE 2 Cable assembly details - *continued*

CONNECTOR CS 5323/4 (10 HB/21042)

TERMINATION	PIN	CABLE	PIN	TERMINATION
Transponder 16928 UKC-2 and adapter UG 567 A/U	–	UR 67	TRANSPONDER	Aerial switching unit UKC-2 plug

CONNECTOR CS 5323/5 (10HB/21043)

TERMINATION	PIN	CABLE	PIN	TERMINATION
Aerial switching unit (frames 11-12) End A	A	MN22	EARTH	Terminal ET
	B	MN22	TERM 1	Relay 20B No.3
				Power supply tray End B2
	C	MN22	TERM 3	Aerial change-over switch End B
	D	MN22	TERM 1	

MISCELLANEOUS CABLES

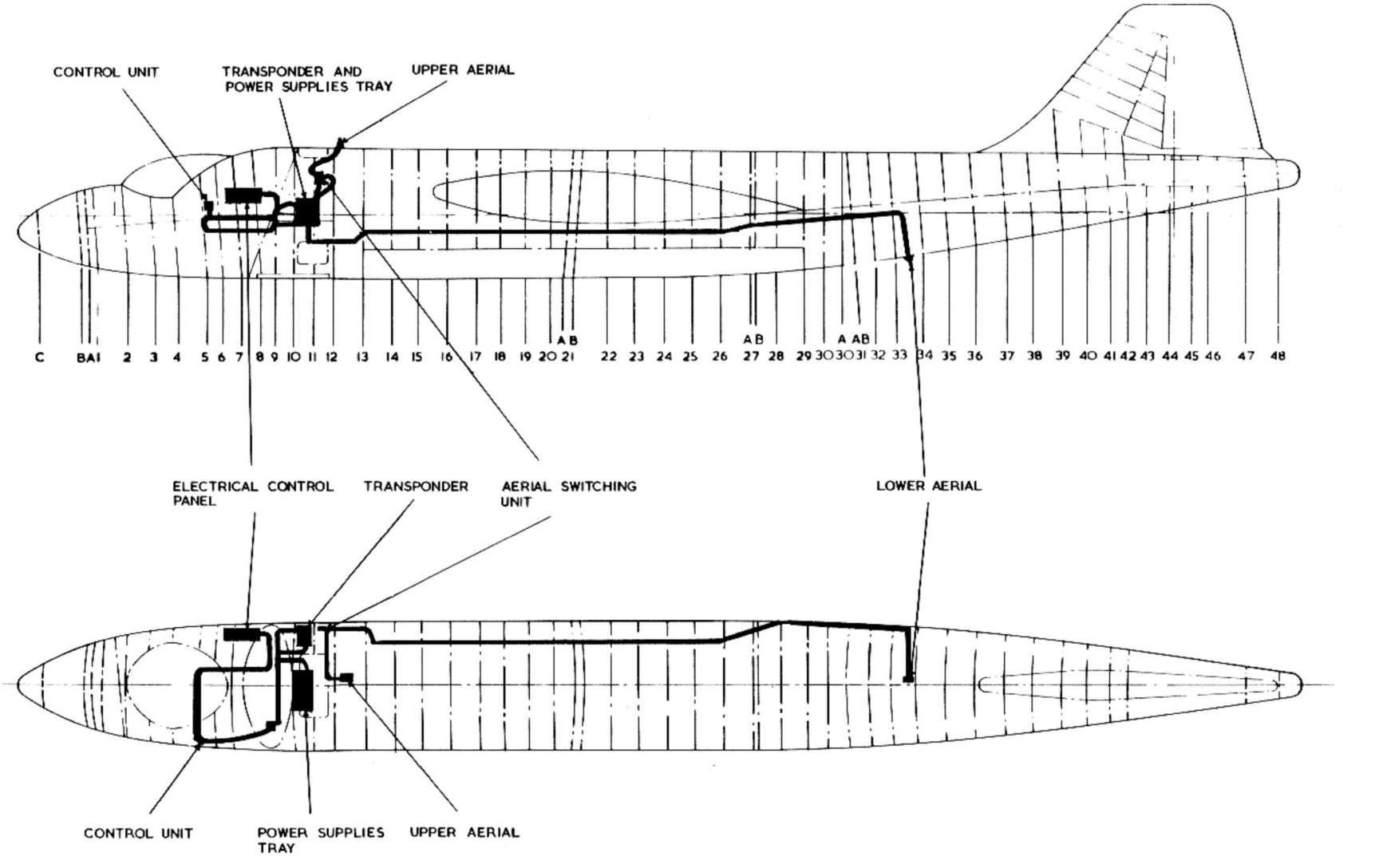
TERMINATION	PIN	CABLE	PIN	TERMINATION
Control unit 16929	W	MN22	TERM 2	Dimmer switch
Lamp check switch	TERM 2	MN22	FUSE 142	E.C.P.

MISCELLANEOUS CABLES - *continued*

TERMINATION	PIN	CABLE	PIN	TERMINATION
System failure lamp	–ve	MN19	E27	Earth terminal frame 4
Aerial change-over switch	TERM 2	MN20	E25	Earth terminal E25 electrical control panel

PART OF CONNECTOR F504

TERMINATION	PIN	CABLE	PIN	TERMINATION
Power supplies tray wall mounting plug HD 460.14.19P. 059	A	MN20	A	
	B	MN20	B	
	C	MN20	C	Pressure bulkhead
	D	MN20	D	Free plug Mk.7 (T4)
	E	MN20	E	Plessey
	F	MN20	F	CPL.01.04.1.11.2.4.0
	G	MN20	G	
	H	MN20	H	
	J	MN20	J	
	K	MN20	K	
F504C	L	MN20	L	F504



EA4 82 315 1 1

FIG. 1. LOCATION DIAGRAM - I.F.F./S.S.R. 1520

◀ CONTROL UNIT POSITION CORRECTED ▶

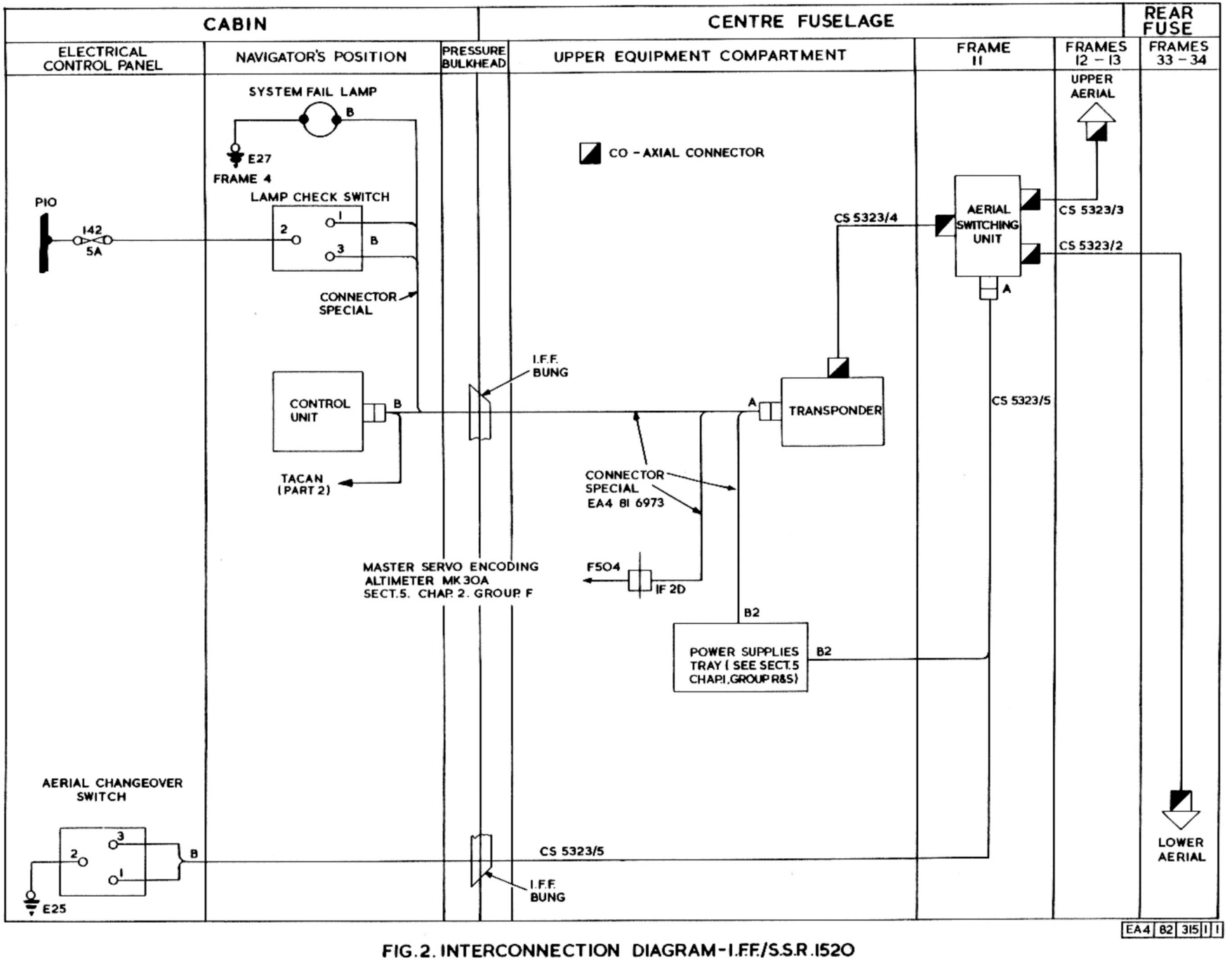


FIG. 2. INTERCONNECTION DIAGRAM-I.F.F./S.S.R. 1520

◀ DRAWING NUMBER ADDED ▶

Part 2 TACAN (A.R.I.18107/18)

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DESCRIPTION

General

1. A.R.I. 18107/18 is an airborne navigational system operating in the frequency band of 962 to 1213 MHz. It works in conjunction with complementary ground beacons or similarly equipped aircraft. The following indications are available to the crew:-

Continuous meter indication of the bearing of the aircraft with respect to the beacon.

Continuous meter indication of the distance of the beacon.

Aural indication of the identity of the beacon to which the equipment is channelled.

Flag alarm indication in the absence of correct distance signals.

2. The locations of the main items are given in fig.1 and interconnection details in fig.2. Equipment details are given in Table 1 and cable assembly details in Table 2. Full technical information on the Tacan equipment is contained in A.P.116B-0304-1.

3. The installation comprises the following main items of equipment:-

Transmitter/receiver
Control unit
Indicator electrical (2)
Coupling unit
Aerial

Transmitter/receiver

4. The transmitter/receiver is posi-

tioned at the rear and to port of the navigator's position. It is mounted on a tray the rear of which forms a junction box connecting the T/R to the power supplies, coupling unit and the control unit. Connection is made by the mating of a fixed 45-way plug at the rear of the T/R with a socket on the junction box. The aerial and suppression pulse output connections are made at the front panel of the unit.

Control unit

5. The control unit is positioned on the navigator's port instrument panel directly above the I.F.F./S.S.R. control unit. Electrical connection to the control unit is via a 14-way cable connector at the rear of the unit. The following controls and indications are provided:-

Channel selection. Four push buttons, arranged centrally, perform this function. The left-hand pair of buttons control the tens part of the channel number, the right-hand pair the units. Each time a button is pressed, the number displayed in the central window alters by one. The upper buttons increase the number and the lower ones decrease it.

Power control switches. Two, 2-way, toggle switches control the operation of the T/R unit. In the OFF position of the lower OFF/ON switch, all power supplies to the unit are disconnected; in the ON position, the unit operates in the mode selected by the upper A/G-A/A switch. In the A/G position of this switch, both range and bearing are displayed relating to the ground beacon selected. In the A/A position of the switch, only range is displayed relating to another aircraft fitted with a similar Tacan system.

◀ *Volume control.* Volume of Tacan signals is controlled by the I.L.S. VOL. CONTROL switch when the I.L.S./TACAN switch is set to TACAN. Both switches are mounted on the starter/auxiliary panel. ▶

Indicator units

6. The installation includes two indicator units, one mounted on the pilot's instrument panel, the other on the navigator's panel directly above the Tacan control unit. Both indicators display the slant distance and bearing of the Tacan beacon. Distance information is displayed on a three-digit counter unit and bearing information by a pointer and circular calibrated dial.

Unreliability indicator

7. When the transmitter is switched off, searching, or operating unreliably, a bar partially obscures the tens and unit digits. Correct searching is indicated when the bar is showing and the tens and unit digits are seen revolving behind the bar. When lock is achieved, a 28V d.c. signal removes the bar to disclose the tens and unit digits. The closing of the 100-mile switch in the coupling unit causes the extra digit, figure 1, to appear before the tens digit.

Coupling unit

8. The coupling unit is positioned on the navigator's main instrument panel on a quick-release anti-vibration mounting. The unit, electrically connected to the transmitter/receiver, comprises two servo systems, one for range and the other for bearing, which drive the displays. Four indicators provide course and fine readings of both range and bearing.

Aerial

9. An omni-directional aerial is used for the reception and transmission of Tacan signals. It is mounted on the underside of the nose section at frame B.

Power supplies

10. Power supplies for the Tacan installation are as follows:-

115V, 400 Hz, single-phase a.c. to the transmitter/receiver via fuses 172 and 173 on the 108 inverter panel rack, and via fuse 171 to the Tacan 115V test socket.

28V d.c. supply from busbar P10 via fuse 66, on the electrical control panel, to the transmitter/receiver.

For further details of the power supplies refer to Sect.5, Chap.1, Group R & S.

Test set socket

11. Test set power supplies are taken from a socket mounted on the electrical control panel.

SERVICING

WARNING

The relevant safety precautions detailed on the LETHAL WARNING marker card must always be observed before entering the cabin or performing any operations upon the aircraft.

General

12. All cable assemblies and units of equipment should be periodically examined for security and freedom from damage. A detailed description of the construction and functioning of the system components, together with instructions for servicing operations, is given in A.P.116B-0304-1. The cable assembly details given in Table 2 are for use during routine continuity checking and fault diagnosis.

TABLE 1

Equipment details

Component	Type No.	Location	Publication Reference
Transmitter/receiver	RT636/ARN 72	Navigator's position, rear	A.P.116B-0304-1
Mounting	9274	Navigator's position, rear	
Control unit	9273A	Navigator's instrument panel	
Indicator electrical (2)	9547	Pilot's instrument panel (1) Navigator's instrument panel (1)	
Coupling unit	9546	Navigator's panel	
Mounting	9545	Navigator's panel	
Aerial	100B	Frame B, underside of nose section	

TABLE 2

Cable assembly details

CONNECTOR CS 5372/1 (10HB/21377)

TERMINATION A	PIN	CABLE	PIN	TERMINATION B
Control unit	A	MN20	A	SKT 2 Transmitter/receiver
	B	MNMS20	H	
	C	MN20	B	
	D	MN20	G	
	E	MN20	I	
	F	MN20	J	
	G	MN20	C	
	H	MN20	D	
	J	MN20	E	
	K	MN20	F	
	M	MN20		Dimmer switch
	N	MNMS20		Audio switch

Pins M and N screen connected to pin J termination A

CONNECTOR CS 5372/2 (10HB/21378)

TERMINATION A	PIN	CABLE	PIN	TERMINATION B
J110 Transmitter/ receiver	–	UR 67	–	Aerial

CONNECTOR CS 5372/3 (10HB/21379)

TERMINATION A	PIN	CABLE	PIN	◀TERMINATION B▶
PL3 Coupling unit	A	MIN 12C white	A	Indicator (Navigator)
	B	MIN 12C black	B	
	C	MIN 12C yellow	C	
	D	MIN 12C red	N	
	E	MIN 12C blue	E	
	F	MIN 12C brown	O	
	G	MIN 12C grey	G	
	H	MIN 12C light green	H	
	J	MIN 12C green	J	
	K	MIN 12C violet	K	
	L	MIN 12C pink	L	
	M	MIN 12C orange	M	

CONNECTOR CS 5372/4 (10HB/21380)

TERMINATION A	PIN	CABLE	PIN	TERMINATION B
PL1 Coupling unit	A	MIN 12C white	A	Indicator (pilot)
	B	MIN 12C black	B	
	C	MIN 12C yellow	C	
	D	MIN 12C red	N	
	E	MIN 12C blue	E	
	F	MIN 12C brown	O	
	G	MIN 12C grey	G	
	H	MIN 12C light green	H	
	J	MIN 12C green	J	
	K	MIN 12C violet	K	
	L	MIN 12C pink	L	
	M	MIN 12C orange	M	

CONNECTOR CS 5372/5 (10HB/21381)

TERMINATION A	PIN	CABLE	PIN	TERMINATION B
PL4 Coupling unit	H	◀ MIN 18J	A	SKT 3 Transmitter/receiver
	O	MIN 18J	B	
	G	MIN 18J	C	
	W	MIN 18J	D	
	Y	MIN 18J	J	
	L	MIN 18J	K	
	K	MIN 18J	M	
	N	MIN 18J	N	
	U	MIN 18J	R	
	Z	MIN 18J	S	
	J	MIN 18J	T	
	M	MIN 18J	U	
	A	MIN 18J	TERM 1 T.B. 3506/1	
	B	MIN 18J ▶	TERM 2 T.B. 3506/1	

Braid to be connected to pin J at termination A only

continued . . .

TABLE 2 Cable assembly details - *continued*

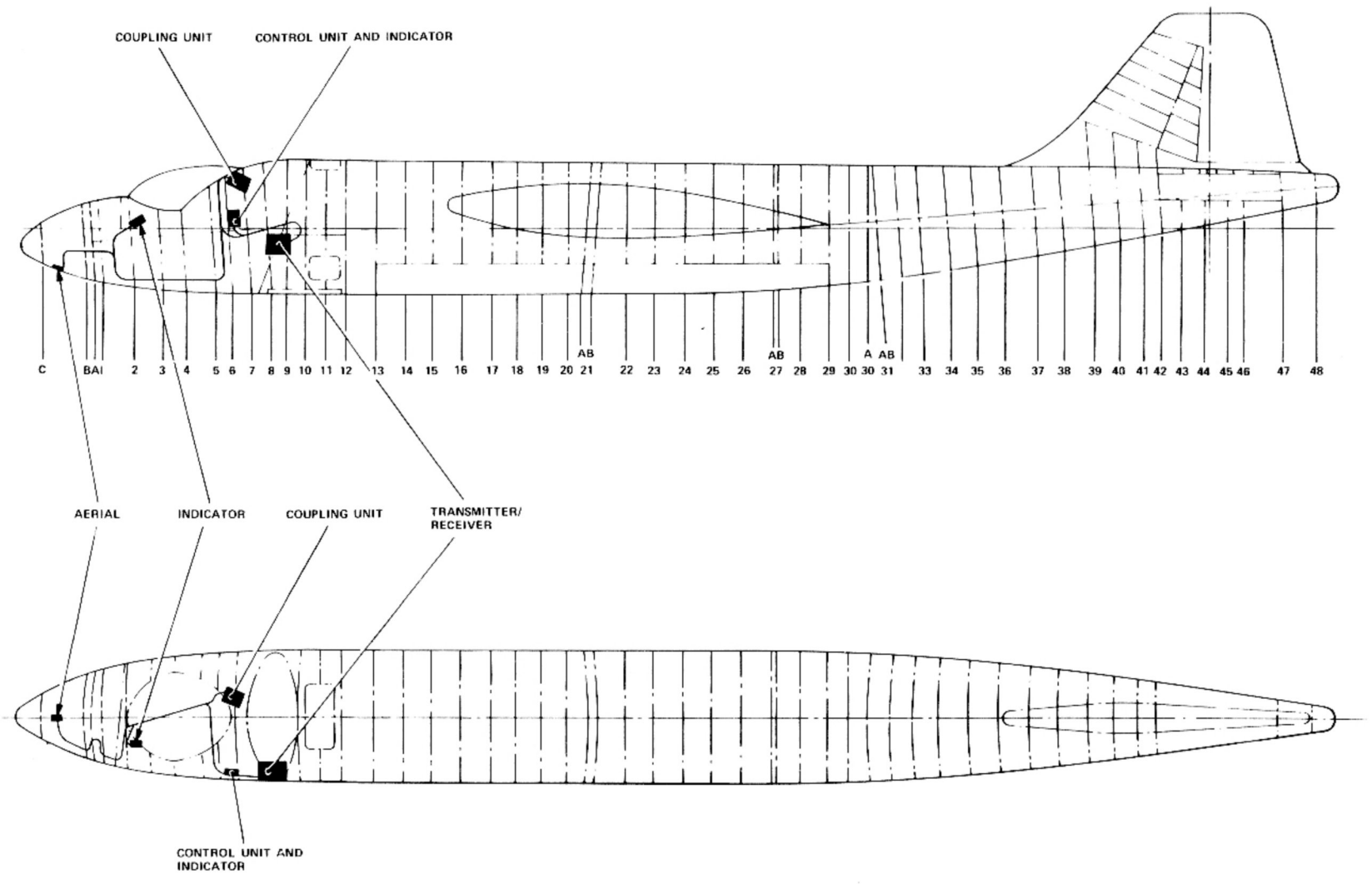
CONNECTOR CS 5372/6 (10HB/21382)

TERMINATION A	PIN	CABLE	PIN	TERMINATION B
	Y	◀ MIN18J	C	
	Z	MIN18J	E	
	T	MIN18J	F	
	W	MIN18J	G	
	J	MIN18J	H	
	B	MIN18J	K	
	C	MIN18J	L	
PL2	E	MIN18J	M	PL1
Coupling unit	H	MIN18J	P	Transmitter/receiver
	M	MIN18J	R	
	S	MIN18J	T	
	A	MIN18J	U	
	G	MIN18J	J	
	K	MIN18J	S	
	U	MIN18J	B	
	O	MIN18J ▶	D	

CONNECTOR CS 5372/7 (10HB/21383)

TERMINATION A	PIN	CABLE	PIN	TERMINATION B
	A	MN20	TERM 2	T.B. 3506/1
	B	MN20	TERM 1	T.B. 3506/1
PL2	C	MN20	g	inverter break
Transmitter/receiver	D	MN20		E.C.P. fuse 66
	E	MN20		link
	G	MN20	b	inverter break

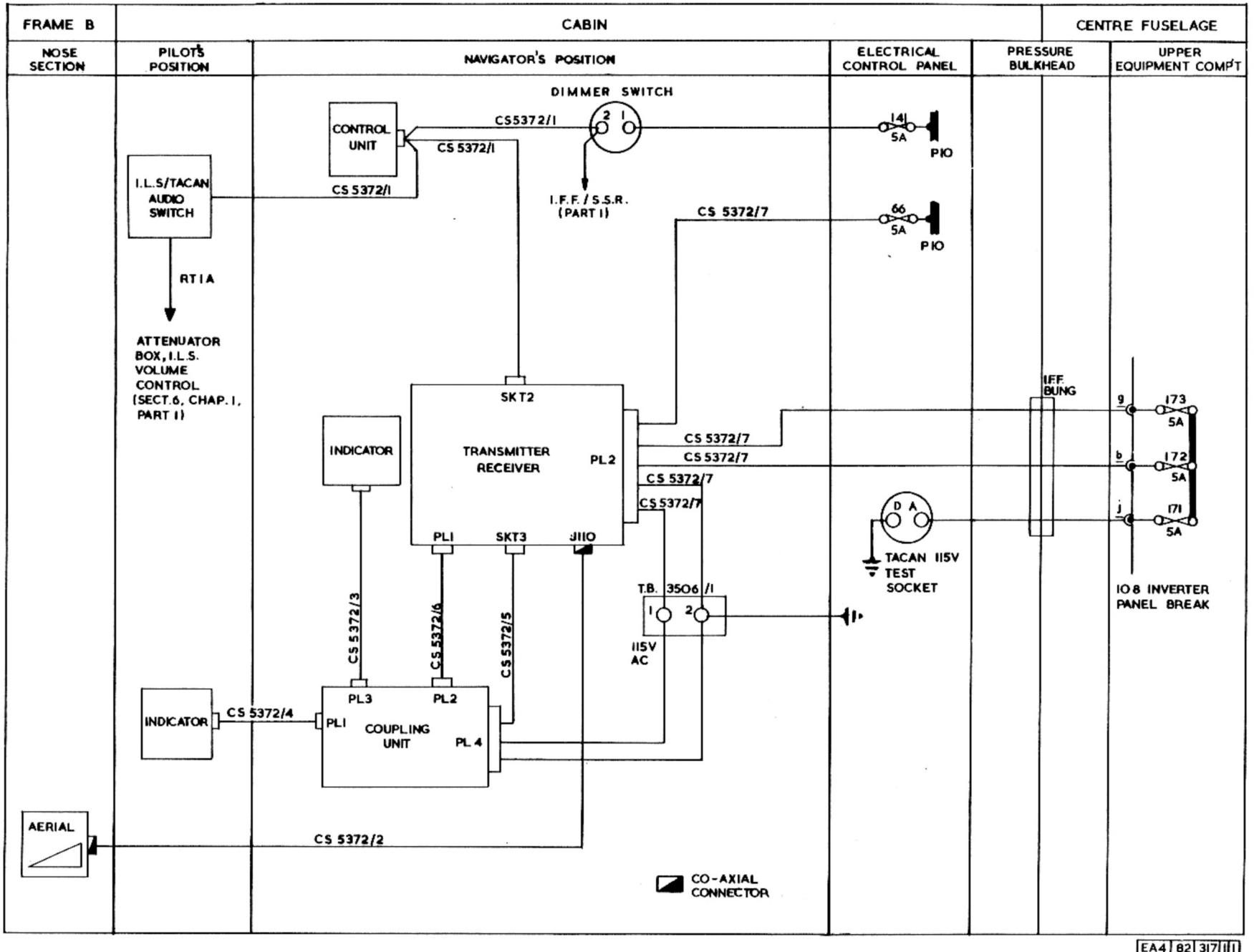
Pin E is linked to Pin C.



[EA4|82|317|1|1]

FIG. 1. LOCATION DIAGRAM–TACAN

◀ DRAWING NUMBER ADDED ▶



EA4 82 317 1 1

FIG. 2. INTERCONNECTION DIAGRAM–TACAN

◀ DRAWING NUMBER CHANGED ▶

Part 3 REBECCA MK.4 (A.R.I.5610)

◀ *(Pre Mod.5181 aircraft only)* ▶

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DESCRIPTION

General

1. Rebecca is a pulse-operated interrogator system used for homing and, when working with B.A.B.S., for blind approach. It operates in the frequency band 174 to 240 MHz in conjunction with ground beacons. The main items of equipment used comprise a transmitter/receiver, control unit, indicator, aerial switch unit and four aerials. The Rebecca Mk.4 system is fully described in A.P.114J-0600-1.

Transmitter/receiver

2. This unit is cylindrical in shape and divided into sections housing the transmitter, receiver, timebase and waveform generator. It is carried by resilient mountings and installed on the floor in the upper equipment bay aft of the pressure bulkhead. Two d.c.-operated blowers, one fitted internally to circulate the air round components and the other on the top of the housing, are provided for cooling. With the exception of that to the external blower all connections to the unit are made to its circular front panel. The joint between the front panel and the housing is provided with special means of sealing which permit the unit to be lightly pressurized for high altitude operation. A Schrader valve is fitted on the front panel for connecting a hand pump when it is necessary to introduce air for pressurizing. The pressurized air is maintained in a dry condition by a desiccator and a small window for viewing its crystals is fitted at the centre of the front panel.

Control unit

3. The manual and preset controls for operating the system in the air and for servicing on the ground are incorporated in the control unit, installed on the navigator's instrument panel.

Indicator

4. Indications of the operation of the Rebecca system are shown on the C.R.T. screen of the indicator mounted above the Rebecca control unit on the navigator's instrument panel. The indicator is fitted with a visor and magnifier to make the indicator more easily read.

Aerials

General

5. The four aerials installed consist of two receiving aerials, one each side of the nose fuselage, a transmitter aerial below the pilot's floor and a B.A.B.S. aerial in the rear fuselage.

Transmitter aerial

6. This aerial is positioned in the lower section of the fuselage below the pilot's floor and consists of a straight slot athwart the aircraft with, behind it, another slot shaped like an arrow head pointing forward. The section of the aircraft in the vicinity of the slots comprises a cavity which is energized by a probe mounted on the rear face of frame 4 diaphragm. The feeder cable to the probe is taken through a grommet where it passes through the cabin floor. An access panel is provided for servicing the probe and its connection.

Receiving aerials

7. The receiving aerials consist of longitudinal slots, one at each side of the nose, backed by two cavities. Each aerial is fed by a coaxial cable which connects to a coaxial socket on the top of each cavity. The latter are each fitted with an access panel for servicing the connections within. The aerial feeder cables are run to the port side of the nose and then along the port side of the fuselage to sockets on the pressure bulkhead; from the aft side of the bulkhead the cable run continues, via the aerial switch unit, to the T.R. unit. As a precaution against possible damage, the aerial cables in the vicinity of the nose fuselage hinge are clipped to form a slack hoop.

B.A.B.S. aerial

8. This aerial is a slot type similar in shape to the transmitter aerial and is incorporated in the rear fuselage access door on the underside of the fuselage between frames 32 and 33. The door assembly forms a cavity which is energized by a probe within it.

Aerial switch unit

9. The change-over of the aerial system from Rebecca to B.A.B.S. is effected by an aerial switch unit installed in the upper equipment bay. The switch unit is electrically operated and controlled by the function switch on the control unit. Setting the switch to BA causes the nose receiving aerials to be isolated and the B.A.B.S. aerial to be connected into circuit with the T.R. unit.

Power supplies

10. The installation operates from a 28-volt d.c. and an 80-volt a.c. supply the latter being obtained via a step-down transformer in the upper equipment compartment. For further details of the power supplies, refer to Sect.5, Chap.1, Group R & S.

SERVICING

WARNING

The relevant safety precautions detailed on the LETHAL WARNING marker card must always be observed before entering the cabin or performing any operations upon the aircraft.

General

11. Wiring faults should be investigated by referring to the diagrams in this chapter and the routeing diagrams in Sect.5, Chap.1, Group R & S. Servicing information on the system is contained in A.P.114J-0600-1.

Transmitter/receiver

12. The crystals in this unit should be examined periodically, and, if found to be coloured pink, should be renewed or dried if facilities are available. The pressure in the unit should be checked by connecting a pressure gauge to the Schrader valve on the front panel. If the pressure is found to be lower than 5 lb/in^2 air should be introduced to bring it up to this figure. To ensure that only dry air is introduced into the unit, it is essential that the hand pump used is fitted with a desiccator.

TABLE 1

Equipment details

Component	Type No.	Location	Publication Reference
Transmitter/receiver	3624	Upper equipment compartment	◀A.P.114J-0600-1▶
Mounting	814	Upper equipment compartment	
Control unit	526	Navigator's main instrument panel	
Indicator	208	Navigator's main instrument panel	
Receiving aerial (port)	-	Nose	
Receiving aerial (starboard)	-	Nose	
Transmitter aerial	-	Lower fuselage frame 4	
B.A.B.S. aerial	-	Rear fuselage frame 32/33	
Aerial switch unit	78A	Upper equipment bay	

TABLE 2

Cable assembly details

CONNECTOR NO.3 (10HA/8848)

TERMINATION A	PIN	CABLE	PIN	TERMINATION B
Switch unit (red)	—	UR 67	—	Pressure bulkhead (red)

CONNECTOR NO.3A (10HA/8849)

TERMINATION A	PIN	CABLE	PIN	TERMINATION B
Pressure bulkhead (red)	—	UR 67	—	access door break (red)

CONNECTOR NO.3B (10HA/8850)

TERMINATION A	PIN	CABLE	PIN	TERMINATION B
access door break (red)	—	UR 67	—	B.A.B.S. aerial

CONNECTOR NO.4 (10HA/8839)

TERMINATION A	PIN	CABLE	PIN	TERMINATION B
Switch unit (white)	1	2C	D	Transmitter/ receiver (white)
	2	2C	F	

CONNECTOR NO.17 (10HA/8844)

TERMINATION A	PIN	CABLE	PIN	TERMINATION B
Transmitter/ receiver (red)	—	UR 43	—	Switch unit (red)

CONNECTOR NO.17A (10HA/8842)

TERMINATION A	PIN	CABLE	PIN	TERMINATION B
Switch unit (red)	—	UR 43	—	Pressure bulkhead (red)

CONNECTOR NO.17B (10HA/12487)

TERMINATION A	PIN	CABLE	PIN	TERMINATION B
Pressure bulkhead (red)	—	UR 43	—	Top skin break (port)

CONNECTOR NO.17C (10HA/12489)

TERMINATION A	PIN	CABLE	PIN	TERMINATION B
Top skin break (port)	—	UR 43	—	Receiving aerial (port)

CONNECTOR NO.18 (10HA/8847)

TERMINATION A	PIN	CABLE	PIN	TERMINATION B
Transmitter/ receiver (green)	—	UR 43	—	Switch unit (green)

CONNECTOR NO.18A (10HA/8845)

TERMINATION A	PIN	CABLE	PIN	TERMINATION B
Switch unit (green)	—	UR 43	—	Pressure bulkhead (green)

CONNECTOR NO.18B (10HA/12488)

TERMINATION A	PIN	CABLE	PIN	TERMINATION B
Pressure bulkhead (green)	—	UR 43	—	Top skin break (starboard)

CONNECTOR NO.18C (10HA/12490)

TERMINATION A	PIN	CABLE	PIN	TERMINATION B
Top skin break (starboard)	—	UR 43	—	Receiving aerial (starboard)

continued . . .

TABLE 2 Cable assembly details - *continued.*

CONNECTOR NO.19 (10HA/12433)

TERMINATION A	PIN	CABLE	PIN	TERMINATION B
Transmitter/ receiver (blue)	–	UR 43	–	Pressure bulkhead (blue)

CONNECTOR NO.19A (10HA/12488)

TERMINATION A	PIN	CABLE	PIN	TERMINATION B
Pressure bulkhead (blue)	–	UR 43	–	Transmitter aerial.

CONNECTOR NO.21 (10HA/12452)

TERMINATION A	PIN		CABLE		PIN	TERMINATION B
	2		yellow	HV	S	
	3		green	HV	R	
	4		brown	HV	C	
	5		blue	HV	Q	
	6	18J	green	LV	P	Pressure
Indicator	7		black	HV	F	bulkhead
	8		white	HV	H	(orange)
	9		black	LV	J	
	10		pink	LV	B	
	11		white	LV	D	
	12		red	HV	A	

Connect screens to pin 9.

CONNECTOR NO.21A (10HA/11183)

TERMINATION A	PIN		CABLE	PIN	TERMINATION B
	S		HV	2	
	R		HV	3	
	C		HV	4	
	Q		HV	5	
Pressure	P		LV	6	Transmitter/
bulkhead	F	18H	HV	7	receiver
(orange)	H		HV	8	(orange)
	J		LV	9	
	B		LV	10	
	D		LV	11	
	A		HV	12	

CONNECTOR NO.22 (10HA/9555)

TERMINATION A	PIN	CABLE	PIN	TERMINATION B
Transmitter/ receiver (red)	–	25C	–	Pressure bulkhead (red)

Wire pin to pin

CONNECTOR NO.22A (10HA/12453)

TERMINATION A	PIN	CABLE	PIN	TERMINATION B
Pressure bulkhead (red)	–	25C	–	Control unit (red)

Wire pin to pin

CONNECTOR NO.23 (10HA/8837)

TERMINATION A	PIN	CABLE	PIN	TERMINATION B
Transmitter/receiver (red)	–	6H	–	Pressure bulkhead (red)

Wire pin to pin

CONNECTOR NO.23A (10HA/12484)

TERMINATION A	PIN	CABLE	PIN	TERMINATION B
Pressure bulkhead (red)	–	6J	–	Control unit (red)

Wire pin to pin
Connect screens to pin E and to earth.

CONNECTOR NO.F88
(Aircraft general services)

TERMINATION A	PIN	CABLE	PIN	TERMINATION B
Transmitter/receiver fan (black)	E	2C blue	E28	1600 Hz. distribution box
	F	2C red	S43	

CONNECTOR NO.F90
(Aircraft general services)

TERMINATION A	PIN	CABLE	PIN	TERMINATION B
	A	4C blue	SG33	
	B	4C red	TG33	1600 Hz.
Transmitter/receiver (black)	E	4C green	E28	distribution box
	F	4C yellow	S43	

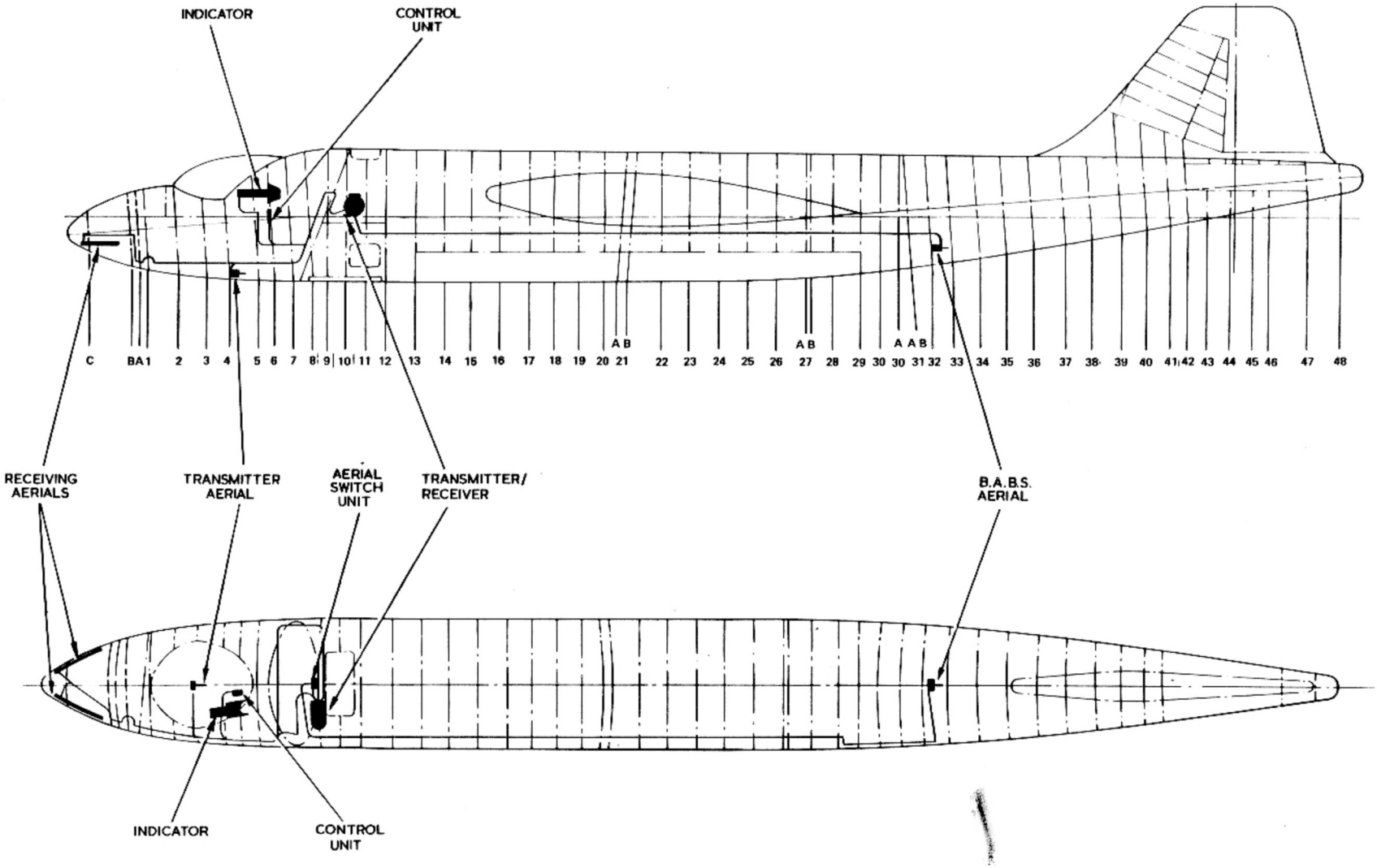

FIG. 1. LOCATION DIAGRAM – REBECCA MK. 4

◂PICTORIALLY AMENDED▸

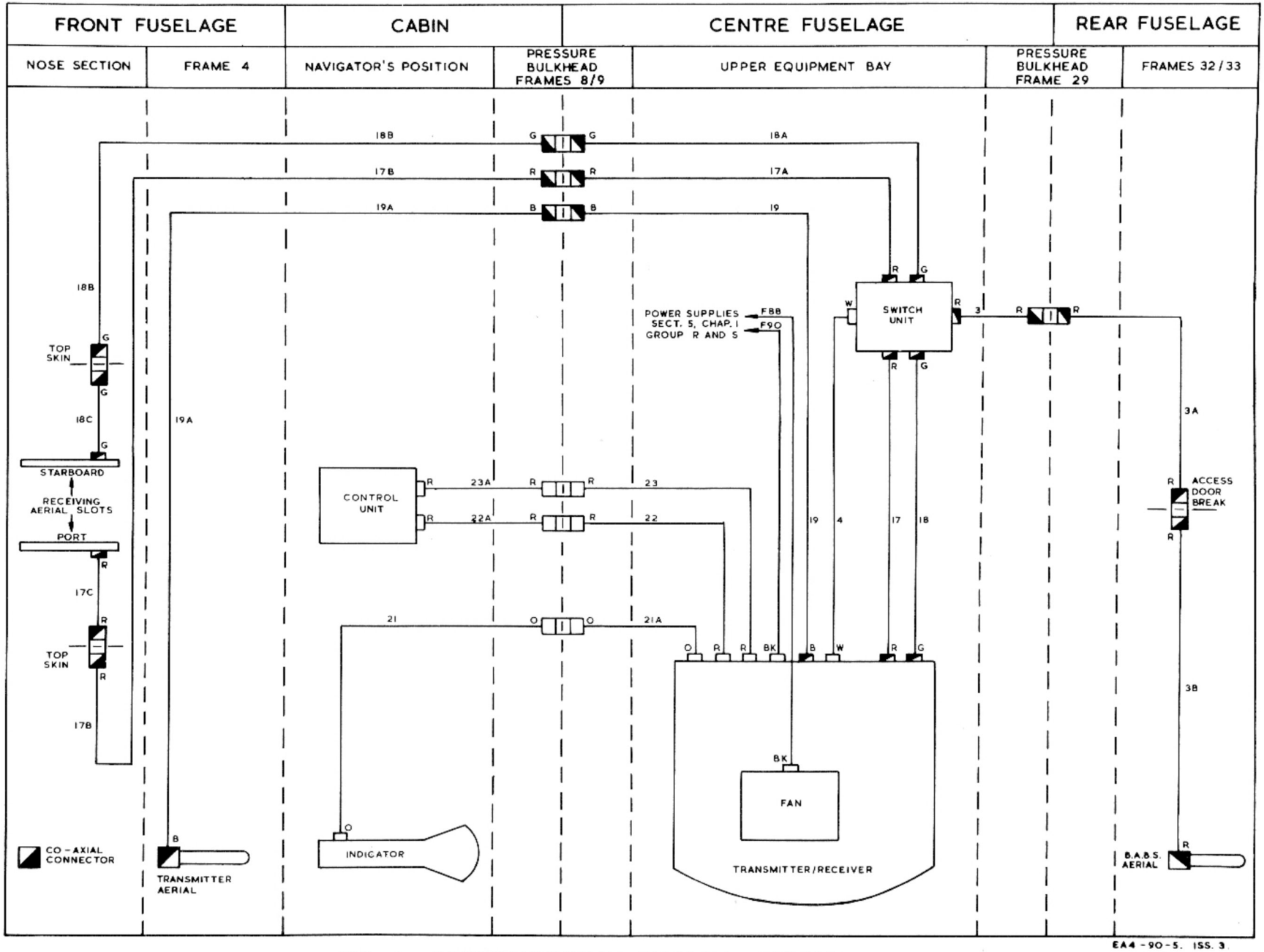

FIG. 2. INTERCONNECTION DIAGRAM – REBECCA MK. 4