A.P.101B-0417-1B A.L.47, July 80

**SECTION 8** 

# **RADIO INSTALLATION**

LIST OF CHAPTERS OVERLEAF

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A.P.101B-0417-1B A.L.47, July 80

# **SECTION 8**

# **RADIO INSTALLATION**

# LIST OF CHAPTERS

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- 2 H.F. radio
- 3 V.H.F. radio
- 4 U.H.F. radio
- 5 V.O.R./I.L.S.
- 6 Radio compass
- 7 Radio altimeter

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# Chapter 1 INTERCOMMUNICATION ◄ PRE MOD. 5466 (SEE SUPPLEMENT FOR POST MOD. 5466) ►

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### DESCRIPTION

### General

1. The intercomm. system (A.R.I. 23099) is comprised of components of the Ultra UA60 system and provides facilities for intercomm. between the pilot, navigator and A.E.O., their use of the transmission and reception of the H.F., V.H.F. and U.H.F. 1 and 2 communications systems and reception of V.O.R./ I.L.S., radio compass and Tacan A.F. signals. A ground crew amplifier is also installed to permit intercomm. between the cabin and four mic/tel sockets. These are situated one adjacent to the Green Satin installation in the rear fuselage, one in the starboard wheel well and two in the port side of the bomb bay roof, one of these being just forward of frame 19 and the other just aft of frame 25.

### Station boxes

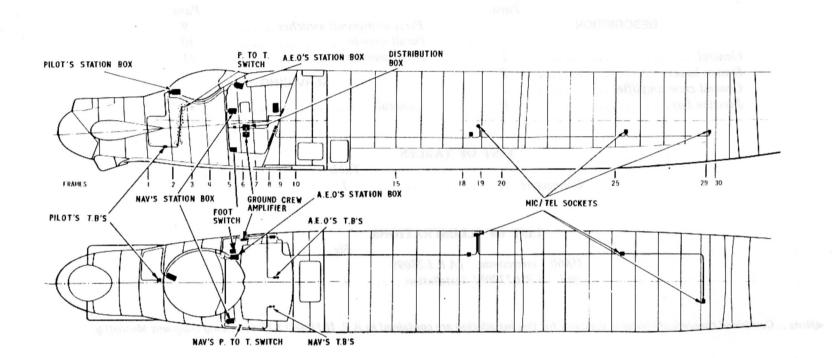
2. A UA6016-5F station box is fitted at each crew station. The pilot's box is located on the starboard coaming panel, the navigator's in the port lower corner of

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his instrument panel and the A.E.O. box is mounted at the starboard end of the navigator's coaming panel.

3. Each station box provides facilities for the mixing of eight inputs and the selection of the required transmitter/ receiver from the four fitted to the air craft. U.H.F. 1 and 2 V.H.F. and H.F. may be used separately or U.H.F. 1 or 2 and H.F. combined. The output from the crew member's microphone passes via a transistorized amplifier and the T/R selec-

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EG7-82-357 SHT. 1155. 11

### FIG. 1. UA60 INTERCOMM. (A.R.I. 23099 AND A.R.I. 23208) INSTALLATION

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tor switch to the T/R unit selected. Inputs from the H.F., V.H.F., U.H.F. 1 or 2, radio compass (A.D.F.) V.O.R./I.L.S., marker & Tacan receivers are selected as required by operating individual push-on, push-off switches which incorporate volume controls. To accommodate the U.H.F.2, A.D.F. and Tacan signals are controlled by the same push-on, push-off switch. Intercomm. signals from the other station boxes and fuselage mic/tel sockets are similarly selected and the mixed inputs are fed to the associated telephones via another transistorized amplifier, incorporated in the station box.

4. The T/R selection switch, in addition to switching the positive and negative microphone lines, directs the positive telephone and the press-to-transmit (P. TO T.) lines to whichever T/R unit is selected. When a T/R unit is selected, the pushswitch for that unit is by-passed and the receiver output passes directly to the input of the telephones amplifier.

5. An override facility is provided whereby the operator of a station box may, by operating the OVERRIDE switch on his box, feed the output of his microphone amplifier to the input of the telephone amplifier of both the other station boxes independent of any selection made at those boxes, via the contacts of a relay in the distribution box.

6. In the event of the failure of either of the amplifiers, selection of the NOR-MAL/EMERGY. switch to EMERGY. operates a relay in the station box. The

microphone output is fed direct to the T/R selector switch, as in the transmit condition, and via the modulator and sidetone circuits of the T/R unit selected to the other station boxes via the receiver output connections. To obtain reception of this emergency intercomm, signal, the other station boxes must select reception of the T/R unit selected by the box using the emergency facility. Also, all the services selected for reception by this box are fed in parallel, by-passing their individual volume controls, direct to the telephones connected to the box. This will result in crosstalk between the services selected so that if, for example, the box set to EMERGY. has U.H.F. 1 or 2 and Tacan selected. other boxes selecting U.H.F. 1 or 2 will receive Tacan also.

### Ground crew amplifier

7. The inputs from the four intercomm. points in the fuselage are fed in parallel to the UA6070 ground crew amplifier, mounted on the starboard wall of the cabin between frames 6 and 7 just below the distribution box. The amplifier unit contains two transistorized amplifiers, one for microphone inputs and the other for telephone outputs. These inputs pass into the microphone amplifier via the contacts of a relay mounted in J.B.14 when it is energized by the selection of the GROUND/FLIGHT switch to GROUND. When the GROUND CREW AMPL'R OFF/ON switch is set to ON, a relay is energized and its contacts connect the microphone amplifier output in parallel with the intercomm. microphone amplifier outputs from the station boxes. These latter outputs are also fed via a transformer in the distribution box and the ground crew

telephone amplifier to the telephone terminals of the fuselage intercomm. sockets, again via the relay in J.B.14.

### **Junction** box

8. The distribution box, UA6043-7, provides the interconnections between the various T/R units, receivers, station boxes, ground crew amplifiers and fuselage intercomm. sockets. It contains a filter for the 28V d.c. intercomm. power supply, the override relay, a matching transformer for the intercomm. microphone amplifier outputs and a terminating resistor for each receiver output. Connections are made by means of Cannon plugs and sockets.

### Press-to-transmit switches

9. The pilot's press-to-transmit switch is mounted on the right-hand grip of the control column and the navigator's switch is mounted on the forward end of the side table adjacent to his station box. The A.E.O. is provided with two switches, one switch is located on the navigator's coaming panel outboard of the A.E.O.'s station box and the other is a foot-operated switch located on the step forward of the A.E.O.'s position.Either switch may be switched in circuit depending upon the position of the HAND-FOOT-JAM switch on the radio fuse and relay box. Operation of these switches affects transmission by whichever T/R unit is selected by the TRANS & REC switch on the station box. Microphone signals are fed into the intercomm. system with the switch in the normal (un-operated)position

### Davall recorder

**10.** An audio recording system (A.R.I. 23208) comprising the Davall recorder and interface unit, provides automatic recording and replay facilities of the communication system. The

recorder is mounted on the navigator's instrument panel whilst the interface unit is mounted below the E.C.P. at the A.E.O.'s station.

### **Power supplies**

11. The installation is powered by a 28V d.c. supply. The main supply is fed from busbar PP8 via fuse No.174 and the I/COMM. MASTER switch on the radio fuse and relay box to the intercomm. junction box and this supply also feeds the ground crew amplifier via its own switch. The relay which isolates the fuselage mic/tel socket connections is supplied from PP8 via fuse No.176 and the ground crew isolating switch which is labelled GROUND/FLIGHT.

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The Davall recorder and interface unit are both supplied with 28 volts d.c. from busbar PP7 via fuse 171.

### SERVICING

### WARNING

1.1

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. Components and cables should be checked

### TABLE 1

### Connectors

periodically for damage. General Servicing is straightforward and the removal and assembly of equipment should not present undue difficulties. Servicing information on the equipment is contained in A.P.116N-0101 series.

■ 13. A.E.O.'s foot operated press-to-transmit switch (26NA/19371). The following instruction must be carried out before installing a new footoperated switch:

(1) Ensure that the foot-operated switch cables are 40 centimetres in length maximum. Cut to length as necessary.

(2) Sleeve the foot-operated switch cables using sleeve tubing, protective, (5F/9143294).

UA60 No.1 EG7.82.60	07		CONNECTOR			
	07		CONNECTOR	UA60 No.5 EG	1.82.615	
CABLE	TERMINATION	TERMINATION	PIN	CABLE	PIN	TERMINATION
X176180	Pilot's station box	Distribution	∏ A	N 20	С	
	UA60 No.1	box	C	NMS20	В.	and and a second
		Cannon socket	{ D	N 2 0	J	
		UA60 No.5	E	NMS20	А	JB14-UK-AN
1460 No 2 EG7 82 6	i 6 and 7 inst below on		L F	N 2 0	D	<pre>&gt; plug 10-way</pre>
		Pressure	A	NMS20	E	UA60 No.5A
			В	NMS20	Villou F ab	nation in the R
X1/0100		socket	) c	N20	G	point glorada
	0400 00.2	UA60 No.5B	LD	. N20	He se	anny dy aperat
			CONNECTOR	11460 No 50 F	67 82 617	
A60 No.3 EG7.82.61	ai i nadw MI.H.I m 1	TERMINATION	PIN	CABLE	PIN	TERMINATION
CABLE	TERMINATION	Pressure .	ΓA	NMS20	Mic +	1
X176180	A.E.O. station box	bulkhead	В	NMS20	Mic -	Mic/tel
	UA60 No.3	UK-AN plug	1 c	N20	Tel 🕇	socket
		UA60 No.5C	D	N20	Tel -	T.B. fwd.
		Mic/tel	Mic +		Earth	frame 19
1460 No 8 FG7 82 61		socket	(Screening)			UA60 No.5C
		T.B. forward	Mic -		Earth	no liquis con to
		frame 19	(Screening)			TORGARDAM
X110100		UA60 NO.5C	agearte (3) E note			
	UA60 No.2 EG7.82.6 CABLE X176180 VA60 No.3 EG7.82.61 CABLE X176180	UA60 No.1 UA60 No.2 EG7.82.609 CABLE TERMINATION X176180 No.2 EG7.82.611 CABLE TERMINATION X176180 A.E.O. station box UA60 No.3 UA60 No.3 CABLE TERMINATION A.E.O. station box UA60 No.3	UA60 No.1 box Cannon socket UA60 No.2 EG7.82.609 CABLE TERMINATION Pressure bulkhead UK-AN fixed socket UA60 No.2 UK-AN fixed socket UA60 No.3 EG7.82.611 CABLE TERMINATION Pressure X176180 A.E.0. station box UA60 No.3 UK-AN plug UA60 No.3 UK-AN plug UA60 No.5C Mic/tel socket T.B. forward frame 19 UA60 No.5C	UA60 No.1boxCUA60 No.2 EG7.82.609Cannon socketDCABLETERMINATIONPressureAX176180Nav. station boxUK-AN fixedBUA60 No.2UA60 No.2SocketCUA60 No.3 EG7.82.611TERMINATIONPressureACABLETERMINATIONPressureAX176180A.E.O. station boxUK-AN plugCUA60 No.3UA60 No.3UK-AN plugCUA60 No.4 EG7.82.613TERMINATIONNic/telMic +SocketT.B. forwardMic -(Screening)X176180Distribution boxUA60 No.5CMic -UA60 No.4 EG7.82.613TERMINATIONT.B. forwardMic -SocketSocketSocketT.B. forwardUA60 No.4 EG7.82.613Distribution boxUA60 No.5CMic -SocketSocketT.B. forwardMic -SocketSocketT.B. forwardMic -SocketSocketSocketT.B. forwardSocket </td <td>A FrontionUA60 No.1boxCNMS20UA60 No.2 EG7.82.609TERMINATIONPressure bulkheadANMS20CABLETERMINATIONPressure bulkheadANMS20X176180Nav. station box UA60 No.2UK-AN fixed socketCN20UA60 No.3 EG7.82.611TERMINATIONPressure UA60 No.58ANMS20CABLETERMINATIONPressure UA60 No.58ANMS20UA60 No.3 EG7.82.611TERMINATIONPressure UA60 No.58ANMS20CONNECTOR UA60 No.52DN20N20UA60 No.3UK-AN plug UA60 No.5CBNMS20JA60 No.4 EG7.82.613TERMINATIONT.B. forward frame 19Mic + (Screening)X176180Distribution boxUA60 No.5CMic - (Screening)</td> <td>A FrondUA60 No.1boxCNMS20B.UA60 No.2 EG7.82.609 CABLETERMINATION UA60 No.5Pressure bulkhead UK-AN fixed Socket UA60 No.5BAFNMS20EX176180Nav. station box UA60 No.2Pressure bulkhead UA60 No.5BANMS20FCONNECTOR UA60 No.5C EG7.82.611 DTERMINATION Pressure UA60 No.5BPINCABLE CONNECTOR UA60 No.5C EG7.82.617CABLE X176180TERMINATION UA60 No.3Pressure UA60 No.5CANMS20HCONNECTOR UA60 No.5C EG7.82.617 DN20HCONNECTOR UA60 No.5C EG7.82.617 DPINCABLE X176180TERMINATION UA60 No.3Pressure UK-AN flug UA60 No.5CANMS20Mic +JA60 No.4 EG7.82.613 CABLETERMINATION T.B. forward frame 19Mic -Earth (Screening)X176180Distribution box UA60 No.5CT.B. forward frame 19Mic -Earth (Screening)</td>	A FrontionUA60 No.1boxCNMS20UA60 No.2 EG7.82.609TERMINATIONPressure bulkheadANMS20CABLETERMINATIONPressure bulkheadANMS20X176180Nav. station box UA60 No.2UK-AN fixed socketCN20UA60 No.3 EG7.82.611TERMINATIONPressure UA60 No.58ANMS20CABLETERMINATIONPressure UA60 No.58ANMS20UA60 No.3 EG7.82.611TERMINATIONPressure UA60 No.58ANMS20CONNECTOR UA60 No.52DN20N20UA60 No.3UK-AN plug UA60 No.5CBNMS20JA60 No.4 EG7.82.613TERMINATIONT.B. forward frame 19Mic + (Screening)X176180Distribution boxUA60 No.5CMic - (Screening)	A FrondUA60 No.1boxCNMS20B.UA60 No.2 EG7.82.609 CABLETERMINATION UA60 No.5Pressure bulkhead UK-AN fixed Socket UA60 No.5BAFNMS20EX176180Nav. station box UA60 No.2Pressure bulkhead UA60 No.5BANMS20FCONNECTOR UA60 No.5C EG7.82.611 DTERMINATION Pressure UA60 No.5BPINCABLE CONNECTOR UA60 No.5C EG7.82.617CABLE X176180TERMINATION UA60 No.3Pressure UA60 No.5CANMS20HCONNECTOR UA60 No.5C EG7.82.617 DN20HCONNECTOR UA60 No.5C EG7.82.617 DPINCABLE X176180TERMINATION UA60 No.3Pressure UK-AN flug UA60 No.5CANMS20Mic +JA60 No.4 EG7.82.613 CABLETERMINATION T.B. forward frame 19Mic -Earth (Screening)X176180Distribution box UA60 No.5CT.B. forward frame 19Mic -Earth (Screening)

A.P. 101B-0417-1B, Sect. 8, Chap. 1 A.L.72, Dec. 88

	CONNECTOR	UA60 No.6 E	G7.82.619						
TERMINATION	PIN	CABLE	PIN	TERMINATION	TERMINATION	PIN	CABLE	PIN	TERMINATION
	1 1	NMS20	Mic +	03/4/00	Distribution		X1731222		Ground crew
	5	N20	Tel -	T.B. pilot	box UA60 No.9				amplifier
Pilot's	9	NMS20	Mic -	UA60 No.6A					UA60 No.9
station box	13	N20	Tel +	TERMINATION					
JA60 No.6	4	N20	I/C	T.B. pilot's		CONNECTOR L	1A60 No.10 E	G7.82.627	
	10	N20	28V -	press-to-	TERMINATION	PIN	CABLE	PIN	TERMINATION
	11	N20	RT	transmit	Mic/tel	Mic -	NMS20	Mic -	
	taladad - E.			switch	socket T.B.	Mic +	NMS20	Mic +	External
	0.6843			UA60 No.6B	UA60 No.10	Tel -	N 2 0	Tel -	I/C connecto
	L 7	N20	LL71	Pilot's dimmer	1.00	Tel +	N20	Tel +	Т.В.
				UA60 No.6C	External 1/C	Mic -		Earth	stbd.
					connector	(Screening)			wheel bay
		UA60 NO.7			T.B. stbd.	Mic +		Earth	UA60 No.10
TERMINATION	PIN	CABLE	PIN	TERMINATION	wheel bay	(Screening)			
	1	NMS20	Mic +	Nav. Mic/tel	UA60 No.10	ORA EN			
	5	N 20	Te1 -	socket T/B					
lav. station	9	NMS20	Mic -	UA60 No.7		CONNECTOR I	JA60 No.11 E	G7.82.629	
, xoc	12	N 2 0	Tel +		TERMINATION	PIN	CABLE	PIN	TERMINATION
1A60 No.7	4 4	N 2 0	ı/c	T.B. Nav.	External I/C	Mic -	NMS20	Mic -	
	10	N20	28V -	press-to-	connector	Mic +	NMS20	Mic +	
	11	N20	RT	transmit	T.B. stbd.	Tel -	N20	Tel -	Mic/tel
				switch	wheel bay	Tel +	N 20	Tel +	socket aft.
				UA60 No.7B	UA60 No.11	=			т.в.
	L 7	N 20	LL73	Nav. dimmer	Mic/tel	Earth		Mic -	UA60 No.11
				UA60 No.7C	socket aft			(Screening)	
					Т.В.	Earth		Mic +	
		UA60 NO.8 E			UA60 No.11	_		(Screening)	]
TERMINATION	PIN	CABLE	PIN	TERMINATION					
	1	NMS20	Mic +	A.E.O.		CONNECTOR I	JA60 No.12 E	G7.82.631	
	5	N20	Tel -	Mic/tel	TERMINATION	PIN	CABLE	PIN	TERMINATION
.E.O.	9	NMS20	Mic -	socket T/B	Mic/tel	Mic -	NMS20	Mic -	1
station box	13	N20	Tel +	UA60 No.8A	socket	Mic +	NMS20	Mic +	
JA60 No.8 *	4	N 20	I/C	A E.O. press-	Aft T.B.	Tel -	N 2 0	Tel -	Mic/tel
	10	N20	28V -	to-transmit	UA60 No.12	Tel +	N 20	Tel +	- socket
	11	N 20	RT	switch T/B	Mic/tel	Mic -		Earth	UA60 No.12
	-	1100		UA60 No.8B	socket	(Screening)			
	_ 7	N20	LL72	A.E.O. dimmer	UA60	Mic +		Earth	
		0 No 13B		UA60 No.8C				-	,

F.S./3

# CONNECTOR UA60 No 13 EG7.82.3025

A.C.Z.C. SNA. 22

# CONNECTOR UA60 No 14 EG7.82.3027

TERMINATION	PIN	CABLE	PIN TERM	INATION	TERMINATION	PIN C	CABLE PI	N TERMI	NATION
* 2011/06/2017	ГА	MN20	A A.E.O	. step	▲ A.E.O. step	ГА	MN20 1	] A.E.O.	foot-
	B	MN20	B – plug b		plug break -		MN20 2		d press-to-
	c	MN20		No 13D	UA60 No.14		MN20 3		t switch T.B.
	1.11			station	0/100/110.14			_	No. 14A ►
	D	MN20	3 - box pl					0/1001	
RADIO FUSE	1 N. 163			No 13B					
AND RELAY	4			press-to-					
BOX -	Е	MN20		it switch					
JA60 No.13				No. 13C					
	F	MN20	_	press-to-					
	G			it switch T.B					
	H	MN20		No 134			121.14		
	L	3,54,60							
	1 columba								

# Chapter 2 H.F. RADIO

# ◄PRE MOD. 5466 (SEE SUPPLEMENT FOR POST MOD.5466) ▶

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### LIST OF ILLUSTRATIONS

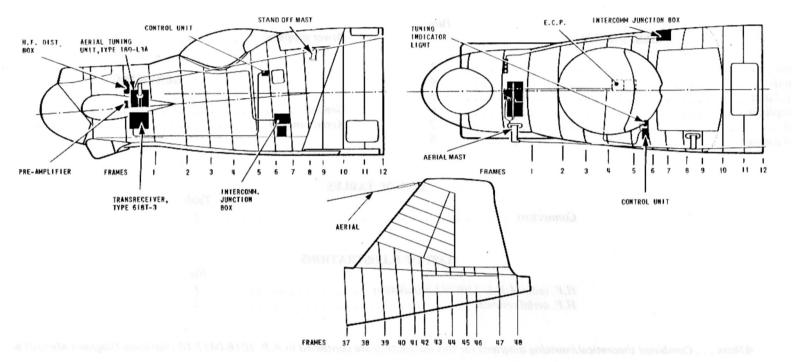
	Fig.
H.F. radio A.R.I. 23090/2 installation	1
H.F. aerial renewal	2

◆Note . . . Combined theoretical/routeing diagrams for this installation are contained in A.P. 101B-0417-10 (Servicing Diagrams Manual) ►

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### FIG. 1. H.F. RADIO A.R.I. 23090/2 INSTALLATION

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### DESCRIPTION

### General

1. Communication in the H.F. (2 to 25 MHz) band is achieved by a Collins 618T-3 (A.R.I. 23090/2) installation. This provides amplitudemodulated radio-telephony communication on any one of 28,000 channels spaced 1 kHz apart, using either a carrier-plus-upper-sideband mode, which is compatible with conventional A.M. communication, or a singlesideband (s.s.b.) suppressed-carrier mode, using the upper or the lower sideband. International standard practice is to use only the upper sideband for s.s.b. working. Detailed information on the equipment and the theory of s.s.b. operation is given in A.P. 116D-0102-1A.

2. The installation utilizes a Chelton long-wire aerial mounted on two stand-off insulating masts and terminating in a tension unit attached to the fin. Aerial tuning is achieved by a Type 180L-3A aerial tuning unit. Control of the operation and frequency selection is performed by a Type 714E-3 control unit.

3. Interconnections between the units of the installation are made via a distribution box mounted on the aft face of bulkhead B, to starboard of the aircraft centre line.

### T/R unit

4. The T/R unit is a Collins transmitter/receiver 618T-3, also known as radio transmitter/receiver Type M15 (Ref. No. 10D/23518). It is mounted on a resilient mounting tray (Ref. No. 5340-99-945-1643) located on the port side of the aircraft, between frames 1 and B. The unit has a self-contained power supply unit which is fed from the 28V d.c. and 115V 400 Hz single-phase a. c. busbars. The output of the transmitter is 125W carrier power on A.M. and 400W p.e.p. (peak-envelope -power) on s.s.b. transmission. The T/R unit is also capable of c.w. and data transmission but these facilities are not used in this particular installation. Aerial connections are carried on the front panel of the unit; all the other connections are brought out through a 60-pole Cannon plug which mates with a 60-way socket fitted to the mounting tray.

### **Control unit**

5. The control unit is a Collins Type 714E-3, also known as transmitter/receiver control Type M53 (Ref. No. 10L/16857). This unit contains switches for the selection of mode and frequency of operation and an R.F. gain control. The frequency selected is indicated on a digital display on the front panel. The unit is located at the port side of the navigator's instrument panel, immediately above the intercomm. station box. The other two crew members may receive the II.F. communications by selecting H.F. on their station boxes or use transmission and reception, on a frequency set up by the navigator, by setting their TRANS & REC selector to H.F. Selecting H.F./U.H.F. provides simultaneous operation on both bands.

### **Pre-amplifier**

6. A Type UA6002 microphone pre-amplifier, is mounted just above the junction box. It raises the level of the output of the intercomm. station box microphone amplifier to that required for the input to the modulator of the T/R unit.

### Aerial

The aerial comprises a single length of wire which is mounted above the fuselage and extends from an aerial mast on the port side of the front fuselage to an anchorage on the leading edge of the fin, via an aerial tensioner unit. A stand-off aerial support mast ensures clearance between the aerial and canopy in case of jettison. A spark gap is located adjacent to the base of the front aerial mast inside the fuselage. The purpose of the spark gap is to dissipate high radio frequency (R.F.) voltages and lightning strikes, thus preventing damage to the H.F. system.

### Aerial tuning

8. Tuning of the aerial to match the output of the T/R unit is carried out automatically by a Type 180L-3A antenna tuner (also known as radio frequency tuner Type M5, Ref. No. 10D/23525). The tuner is mounted on a resilient mounting tray (Ref. No. 5349-99-845-1644) located above the T/R unit. All the connections to the unit are brought out on the front panel.

9. The tuner operates when a change of frequency has been selected on the control unit. The setting of the selector knobs starts the tuning cycle of the T/R unit which continues for 8 seconds. When the tuned transmitter is keyed, the output from the transmitter initiates the operation of the servo-controlled aerial tuning circuits and these continue

for 22 seconds until the tuning elements are correctly adjusted. The II.F. TUNING INDICATOR lamp is mounted at the port side of the navigator's instrument panel adjacent to the ventilation louvre. This lamp is normally extinguished, but while aerial tuning is in progress the lamp is lit.

### **Power supplies**

10. The installation derives its 28V d. c. supply from busbar PP7 via fuses No. 169 and 219. The 115V a. c. supply originates at busbar 1XC and is fed via fuse No. 132 to busbar 1XC2 and thence via fuse No. 227 to the H.F. distribution box for distribution to the T/R and aerial tuning units.

### 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. Components and cables should be checked periodically for damage. General servicing is straightforward and the removal and assembly of equipment does not present undue difficulties. Servicing information is given in A.P. 116D-0102-1A.

### Aerial renewal

12. Approximately 55 ft of Chelton aerial wire, Part No. 5503, is required.

(1) Assembly of aerial to mast (fig. 2)

(a) Strip 4½ in. of insulation from the aerial wire.

(b) Remove the chuck cap and ball socket cap from the mast unit and assemble on the wire.

(c) Lift the 5/16 in. long securing pin locking the chuck unit, and unscrew the chuck unit counter-clockwise from the mast.

(d) Pass the stripped aerial wire through the chuck unit in the direction of the assembly to the full extent of  $4\frac{1}{2}$  in.; depress the collet arrangement if necessary to facilitate easier entry of bared aerial wire.

(e) Form the bared aerial wire back over a length of 1 in. and offer the chuck unit to the mast unit screwing clockwise until secure, ensuring that the slots on both mast and chuck units are aligned.

(f) Refit the 5/16 in. long securing pin locking the chuck unit to the mast unit.

(g) Fill the ball socket cap with silicone grease, XG-250; pass over the assembly and refit.

(h) Pass the aerial wire through the ferrule of the stand-off mast prior to assembling to fin anchorage at (2).

(2) Assembly of aerial to fin anchorage.

(a) Press the collet against the end of the plunger to free the tail rod from the tension unit; withdraw the tail rod completely and attach it to the fin anchorage. Check that the rod is free to move in both planes.

(b) Replace the tail rod in the tension unit leaving 4 in. of serrations exposed.

(c) Remove the taper chuck cap and pass it over the aerial wire.

(d) Tension the wire and cut opposite the rear end of the chuck ensuring that the tension unit and wire are in line; strip the insulation for  $1\frac{1}{2}$  in.

(e) Remove the tension unit from the tail rod and insert the wire into the chuck unit as far as it will go.

(f) Offer the tension unit to the tail rod, thereby connecting the tension unit to the fin anchorage.

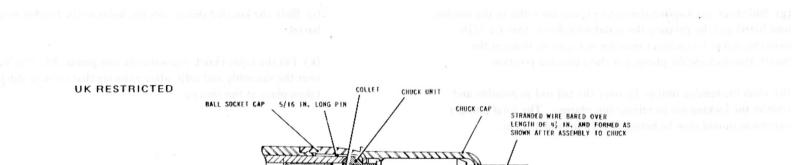
(g) Slide back the knurled sleeve to expose the holes in the tension unit barrel and, by pressing the aerial wire down, insert a 5/16 diameter rod or screwdriver into the rear pair of holes in the barrel, thus locking the plunger in the extended position.

(h) Push the tension unit as far over the tail rod as possible and remove the locking pin to release the plunger. The total plunger extension should now be between 1.75 in, and 1.85 in. (j) Slide the knurled sleeve over the holes in the tension unit barrel.

(k) Fill the taper chuck cap with silicone grease, XG-250; pass over the assembly and refit, after ensuring that no wire slip has taken place at the chucks.

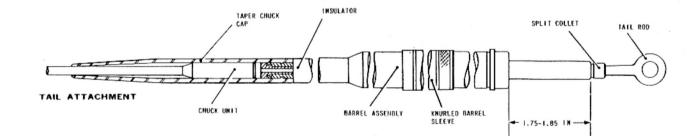
P. LONDERFEELE, Sept. J. Chap. 2 A. L. W.S. More 35

MAST UNIT



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continued ...

### TABLE 1

### Connectors CONNECTOR H.F.1 EG7.82.187 CONNECTOR H.F.1 EG7.82.187 - continued TERMINATION PIN CABLE TERMINATION PIN PIN TERMINATION CABLE PIN TERMINATION P N8 U N22 39 HF1C Ground plug H.F.1C ٧ A N22 40 N22 26 В N22 9 W N22 41 C N22 5 Х N22 49 D N22 10 Z N22 50 Ε N20 11 H.F. distribution' N22 51 Trans/receiver a F N22 7 box plug UK-AN b N22 52 Cannon socket H.F. distribution G N22 55 9000-28-21P H.F.1B N22 45 DPE-60-336 H.F.1 С box plug UK-AN H N22 22 N22 46 d 9000-32-6P H.F.1A N28 23 N22 47 e N22 8 J N22 48 Κ N22 6 N22 32 q N20 -L 56 h N22 33 М N20 27 i N22 34 Ν N20 16 N22 35 k N20 Ц 0 N22 36 \_ m S N20 17 Trans/receiver A N20 3 CONNECTOR H.F.2 EG7.82.189 Cannon socket B N20 2 TERMINATION CABLE TERMINATION DPE-60-336 H.F.1 С N20 1 Aerial tuning Uniradio Chelton aerial post D N20 15 unit Type 180L-3A crown end tag N20 14 E tail end H.F.2 H.F.2 N20 13 G N16 12 CONNECTOR H.F.3 EG7.82.191 H.F. distribution Н N22 58 TERMINATION CABLE TERMINATION box plug UK-AN N22 .1 57 Spark gap H.F.3 N12 Chelton aerial post 9000-28-21P H.F.1B К N22 54 H.F.3 L N22 18 N22 м 31 N22 1 30 Ν CONNECTOR H.F.4 EG7.82.193 Ρ N22 25 TERMINATION PIN CABLE PIN TERMINATION R N22 59 Trans/receiver End A Uniradio 67 End B Aerial tuning unit S N22 24 Type 618T-3 plug Type 180L-3A N22 T 38 Type 82.GB.553.2 plug Type 49195 H.F.4 (amphenol) H.F.4 continued...

### F.S./4

# TABLE 1Connectors - continued

	CONNECT	OR H.F.5 E	G7.82.19	5 A Product Manual			I.F.7 EG7.82.		
TERMINATION	PIN	CABLE	PIN	TERMINATION	TERMINATION	PIN		PIN	TERMINATION
rans/receiver	End A	Uniradio 4;	B End	Barial tuning unit		н	N20	8,00	
ype 6181-3 H.F.5				Type 180L-3A H.F.5		G	N22	14	
		1.1.5	_	3	H.F. distribution	F	N 20	13	
		OR H.F.6 E			box socket free	Ę	N20	11	Aerial tuni <b>ng</b> unit
TERMINATION	PIN	CABLE	PIN	TERMINATION	UK-AN 9000-20-295	D	N 2 2	2	Type 180L-34 H.F.7
	J.	N22	E		H.F.7	C	N22	9	
	h	N22	D			В	N22	3	
	g	N 22	С	1. C. 43 44 (Star Garage		_ A	N18	15	
	f	N22	В	NAC ALL DOLLS AND					
	e	N22	Α	84 3 3 TES #8 080P	,				
	d	N22	N			CONNE	CTOR H.F.B E	7 82 503	
	c	N22	м	1	TERMINATION	oonne	CABLE		TERMINATION
	b	N22	L		H.F. distribution t	oox	N22	In	tercomm. J.B. socket
	а	N22	к		UK-AN 9000-16-1P H.		1122		F.8
	Z	N 2 2	т		0K-M 7000-10-11 H			п.	r.0
	Y	N22	S						
	X	N22	R	· · · · · · · · · · · · · · · · · · ·					
F. distribution	W	N22	Р	Control unit 714E-3		CONNE	CTOR H.F.9 EG	7.82.595	
× UK-AN	N	N22	J	connector H.F.6	TERMINATION	PIN	CABLE PIN	IDENT	TERMINATION
00-32-75 socket	м	N22	н		Pre-amplifier	Mic +	19/0076 A	Yellow	H.F. distribution
sembly H.F.6	0.02	N22	G		H.F.9	Mic -	19/0076 B	Green	box H.F.9
	к	N22	F	185) S. T. A. M. & 200 (F. Y.		Tel +	19/0076 C	Red	
	L:	N22	i	Aerial tehing					
	1	N22	U						
	н	N22	v			CONNEC	TOR H.F.10 EG	7 82 597	
	G	N22	Z		TERMINATION	PIN	CABLE	PIN	TERMINATION
	F	N22	Р			A	N22	TL DC +	In line splice to
	E	N22	q			<u> </u>	1122	12 00 +	H F.11
	D	N16	r	1011A01M631	H.F. distribution				MA-SU pols yed
	С	N22	d	Враяки дар И.Т.Э	box plug H.F.10			LLL11	Termination block
	В	N22	e		box prug mirez	В	N22	LLLII	
	A	N16	m.						QR. tags Nav's
		1110							panel H.F.10
	CONNECT	DR H.F.7 E	37.82.59	L SACE AND A REPORT OF					
TERMINATION	PIN	CABLE	PIN	TERMINATION		1.00			
F. distribution	М	N22	10			CONNE	CTOR H.F.11 E	G7.82.243	3
ox socket free	L	N22	7	Aerial tuning unit	TERMINATION	PIN	CABLE	PIN	TERMINATION
-AN 9000-20-295	к	N22	12	Type 180L-3A H.F.7	In line splice	TL DC	+ N22	1	Tuning light
.F.7	J	N 2 2	4		to cable H.F.10	E25	N22	В.	
leventstyle i blev p	L			- continued					

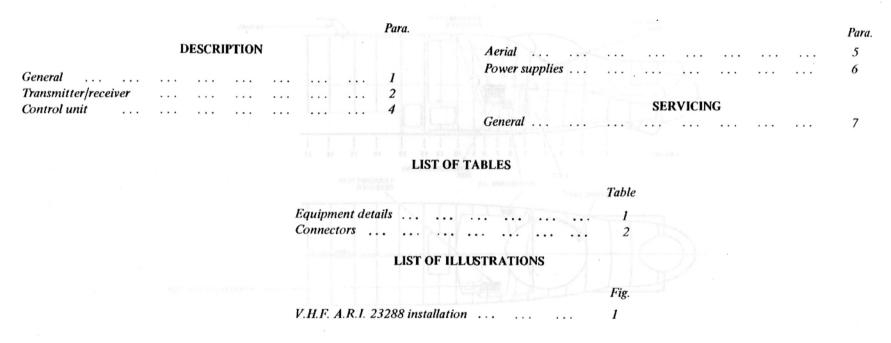
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# UK RESTRICTED

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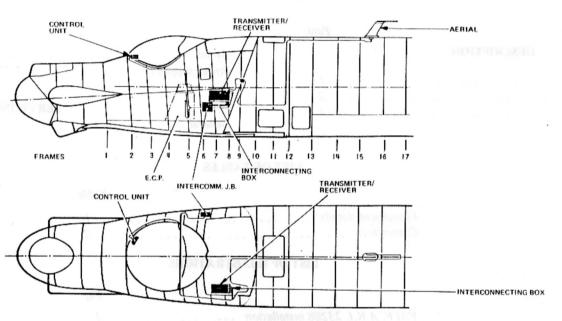
# Chapter 3 V.H.F. RADIO (A.R.I. 23288)

## LIST OF CONTENTS



◀Note...Combined theoretical/routeing diagrams for this installation are contained in A.P. 101B-0417-10 (Servicing Diagrams Manual).▶

REFELS AN AND AN ALL Y CONTRACT



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e Note ..., *Combined* theoretics/rectaing Asymptot **for this installation are contained** in **A**.P. (018-0410) and (Sub-Laboric Clauseric Claus

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# FIG. 1. V.H.F. A.R.I. 23288 INSTALLATION

# UK RESTRICTED

EG7-81-4055-1

### DESCRIPTION

### General

1. Communication in the V.H.F. (118 to 135.975 MHz) band is acheived by a Marconi AD 120 (A.R.I.23288) installation. This provides radiotelephone communication on any one of 720 channels spaced 25 KHz apart. Detailed information on the equipment is given in A.P.116D-0109-1 and in A.P.116D-0150-1.

### Transmitter/Receiver

2. A Type AA1201-2 transmitter/receiver and its associated mounting tray Type AA1206-1 are located on an interconnecting box Type A37-0557-01 b to port of the navigator's seat. Electrical connections between the T/R and . its mounting tray are made via a multi-pin connector SKA and a co-axial connector PLC while those between the tray and the interconnecting box are made via two-fixed rectangular connectors PLA and PLB. Four connectors on the interconnecting box provide interconnection to the external wiring.

3. A dummy electrical plug Type AA1209-1 is connected to the unused socket on the inboard portion of the interconnecting box. A locating bush on the plug mates with the interconnecting box alignment pin, the former being secured to the latter by a set-screw on the bush.

### **Control unit**

4. A type AA1202-2 control unit mounted on the pilot's starboard coaming panel, provides control of the installation. Frequency selection is made via two knobs, located one on each side of the front face of the unit, the frequency being displayed in a window. Electrical power and volume are controlled by a switch and a knob marked ON and VOL respectively. A test push-button marked TST dissables the squelch circuit to increase the background noise thus providing a confidence check on the T/R. All crew members may use the system by making the appropriate selections on their intercomm. station boxes.

### Aerial

5. A Type 140-LRU-67C aerial, mounted on the top of the fuselage between frames 15 and 16, serves for both transmission and reception of V.JI.F. signals. The existing V.H.F. aerials in the canopy are bonded to the coaming tube.

### **Power supplies**

6. The installation is supplied with 28V d.c. from busbar PP8 via fuses No. 172 and 173 and a Type 20B relay which are located in the E.C.P.

### 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

7. Components and cables should be checked periodically for damage. General servicing is straight forward and the removal and assembly of equipment should not present difficulties. Servicing information is contained in the relevant A.P. as detailed in para.1. On replacement of the dummy electrical plug, the set-screw must be locked with an approved varnish.

### TABLE 1

### Equipment details

Equipment	Туре	Ref. No.	Location	A.P. Reference
Transmitter/receiver	AA1201-2	5821-99-6395428	1	LOC LORD IT T A M Distance
Mounting tray	AA1206-1	5821-99-6392480	Navigator's station	A.P.116D-0150-1
Dummy electrical plug	AA1209-1	5935-99-6392478	1-1 on in Interconnecting box Type A37.055.	
Interconnecting box	◀ A37-0557-01	5821-99-765006 ▶	Navigator's station	A.P.116D-0109-1
Control unit	AA1202-2	5821-99-6392496	· Pilot's coaming panel	A.P.116D-0150-1

3. A storage received plug Type AA1209-1 is connected to the noneal vectoril on the inheard portion of the inforconnecting box. A increasing busiconflict plug match with the interconnecting box alignment pin, the former balance we only be latter by a set-screw on the bush.

### tion louine 3

4. A type AA1202-2 control unit mounted on the pilot's starboard consting parel, provides control of the installation. Frequency selection is made via two knobs, located one on each side of the front face of the unit, the frequency being displayed in a window. Electrical power and volume are controlled by a switch and a knob marked ON and VOL respectively. A two push on two marked TST distables the squetch circuit to increase the background write this providing a confidence check on the T/R. All crew members may use the pratem by making the appropriate selections on their intercomm, station here.

7. Components and cables should be checked periodically for damage. General servicing is straight forward and the removal and assembly of equipment through not present difficulties. Servicing information is sontained in the relevant A.C. as detailed in parts 1. On registement of the dummy electrical plug, the set screw must be locked with an approaced metric.

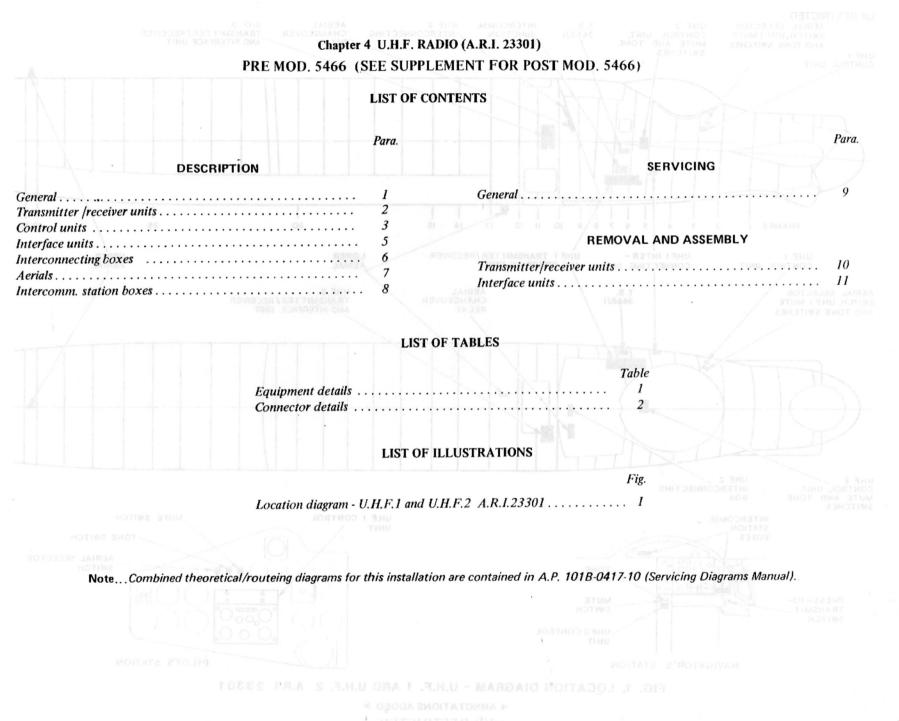
5 A Waye 140 LRU-6 X works, mounted on the top of the back

# TABLE 2

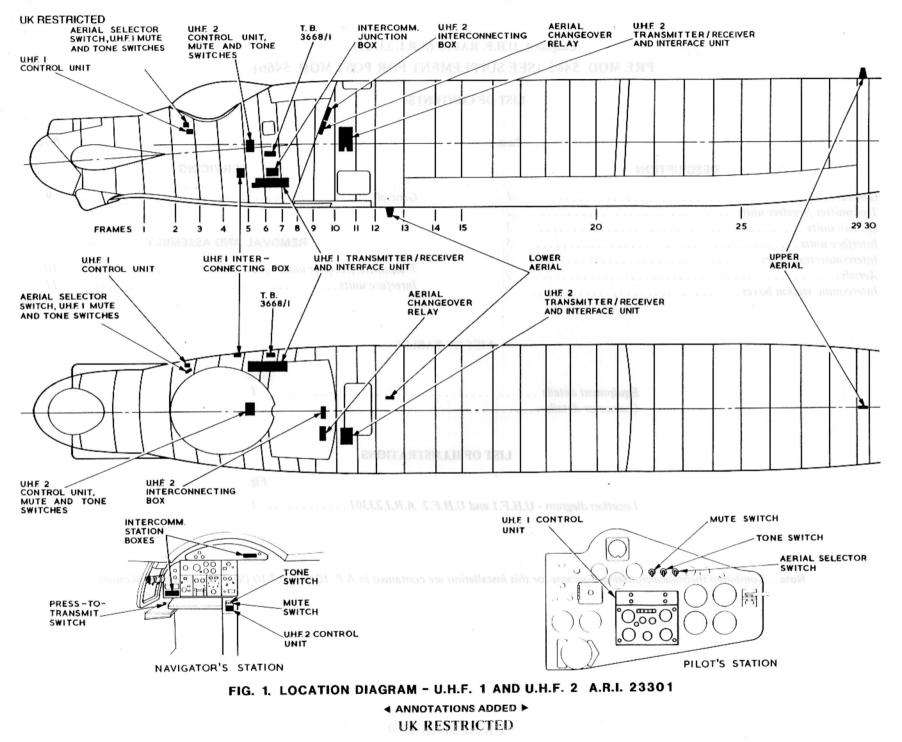
# Connectors

TERMINATION     FIN     CABLE     FIN     CABLE     FIN     TERMINATION       1     8/20     0     Interconnection     N     <		CONNECTO	R VHF 1 EC	37.82.459			CONNE	CTOR VHF 2 EG	7.82.461	
<ul> <li>Interconnecting</li> <li>Marce Marce Mathematical Science Mathematical Scien</li></ul>	TERMINATION	PIN	CABLE	PIN	TERMINATION	TERMINATION				
Interconnecting         N22         9         V.H.F. control         n         NHS22         C         box UM6013/7           1         N22         5         N22         5         N22         0         Cannon socket Type           6         N22         6         N22         6         MC112/C10-5%         N         N         MC112/C10-5%         N <td></td> <td>1</td> <td>N 2 2</td> <td>1</td> <td></td> <td>Interconnecting</td> <td>٨</td> <td>N 2 2</td> <td>E</td> <td></td>		1	N 2 2	1		Interconnecting	٨	N 2 2	E	
<ul> <li>M15 Cannon plug</li> <li>M22</li> <li>M3</li> <li>M32</li> <li>M45 Cannon plug</li> <li>M5 Cannon plug</li> <li>M45 Cannon plug</li> <li>M42</li> <li>M32</li> <li>M33</li> <li>M32</li> <li>M32</li> <li>M32</li> <li>M32</li> <li>M32</li> <li>M32</li> <li>M33</li> <li>M32</li> <li>M32</li> <li>M34</li> <li>M42</li> <li>M42</li> <li>M42</li> <li>M42</li> <li>M410</li> <li></li></ul>		2	N22	2		▲ box Type A37-0557-01				,
interconnecting V.H.E.1 $6$ $N22$ $5$ $V,H,E,2$ $C$ $N22$ $B$ $MC11E/1-10-65N$ 1 $N22$ $7$ $N22$ $7$ $N22$ $R$ $V,H,E,2$ $E$ $N22$ $A$ $V,H,E,2$ 1 $N22$ $R$ $V,H,E,2$ $R$ $V,H,E,2$ $R$ $V,H,E,2$ $R$ 1 $N22$ $R$ $N22$ $R$ $V,H,E,2$ $R$ $V,H,E,2$ $R$ 1 $N22$ $R$ $N22$ $R$ $V,H,E,2$ $R$ $V,H,E,2$ $R$ 1 $N22$ $R$ $N22$ $R$ $V,H,E,3$ $V,$		И	N22	21		. 5	D			
Interconnecting         6         N22         6         CONNECTOR         VHF 3         CONNECTOR         VHF		5	N 22	5			с	NZ2	В	, , , , , , , , , , , , , , , , , , , ,
Interconnecting         7         N22         7           Interconnecting         11         N22         10           11         N22         12         CONNECTOR         VHF 3         EG7.82.463           13         N22         13         CONNECTOR         VHF 3         EG7.82.463           13         N22         14         CONNECTOR         VHF 3         EG7.82.463           14         N22         18         CONNECTOR         VHF 3         EG7.82.463           14         N22         16         VH.F.3         VH.F.3         V.H.F.3           15         N22         16         V.H.F.3         V.H.F.3         V.H.F.3           16         N22         16         V.H.F.3         V.H.F.3         V.H.F.3           16         N22         10         unit, Type         V.H.F.3         V.H.F.3           17         N22         20         AA1202-2 V.H.F.1         CONNECTOR VHF 3A EG7.92.465           18         N22         23         AA1202-2 V.H.F.3         Unitadio 67         V.H.F. 3A           18         N22         25         V.H.F. 3A         Unitadio 67         V.H.F. 3A           19         N22         26		6	N22	6		V.H.F.2	E	N22	٨	
Interconnecting         Interconnecting         CONNECTOR         WHF 3 EG7.82.463           Interconnecting         13         N22         13         TERMINATION         CABLE         Uniradio 67         Pressure bulkhead           Interconnecting         13         N22         13         M16         Dug Type 047055701>         Uniradio 67         Pressure bulkhead           Interconnecting         14         N22         17         VLLF.         VLLF.3		7	N22	7						
Interconnecting         Interconne		8	N22	8						
Interconnecting         12         N22         12         TERMINATION         CONNECTOR VHF 3 EG7.82.463           13         N22         13         TERMINATION         CABLE         TERMINATION           14         N22         13         M120         14         Pressure bulkhead           15         N22         15         M15 plog.705701         M15 plog.705701         Plog.705701           16         N22         16         V.H.F.3         V.H.F.3         V.H.F.3         V.H.F.3           19         N22         19         unit. Type         V.H.F.3         V.H.F.3         V.H.F.3           20         N22         19         unit. Type         V.H.F.3         V.H.F.3         V.H.F.3           21         N22         20         AA1202.2 V.H.F.1         CONNECTOR VHF 3 & EG7.82.465         V.H.F. 3A           23         N22         20         AA1202.2 V.H.F.1         V.H.F.3         V.H.F. 3A           24         N22         23         CONNECTOR VHF 3 & EG7.82.465         V.H.F. 3A           25         N22         24         Pressure bulkhead         Uniradio 67         V.H.F. 3A           31         N22         38         V.H.F. 3A         V.H.F. 3A <tr< td=""><td></td><td>10</td><td>N22</td><td>10</td><td></td><td></td><td></td><td></td><td></td><td></td></tr<>		10	N22	10						
Interconnecting         Interconnecting         Unif all         CABLE         TERMINATION           Interconnecting         Interconnecting         Unif all         Pressure bulkhead           Interconnecting         Unif all         N22         15         Pressure bulkhead           Interconnecting         Unif all         V.H.F.3         V.H.F.3         V.H.F.3           Interconnecting         Interconnecting         Unif all         V.H.F.3         V.H.F.3           Interconnecting         Interconnecting         V.H.F.3         V.H.F.3         V.H.F.3           Interconnecting         V.H.F.3         V.H.F.3         V.H.F.3         V.H.F.3           Interconnecting         V.H.F.3         V.H.F.3         V.H.F.3         V.H.F.3 <td></td> <td>11</td> <td>N22</td> <td>11</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>		11	N22	11						
Interconnecting         Interconnecting         Unitadio         Pressure bulkhead           Interconnecting         14         N22         13         M2         M2<		12	N 22	12		TERMINATION	CONNE		7.82.463	
Interconnecting         N22         13         Image: Normal Section Sectin Section Sectin Section Section Section Sectin Section Section Se		13	N22	13						
Interconnecting (box Type A37-0557-01)         15         N22         15         M15 plug Type UKN2 V.H.F.3         V.H.F.3           Interconnecting (box Type A37-0557-01)         17         N22         18         V.H.F. ontrol         V.H.F.3           19         N22         19         unit, Type AA1202-2 V.H.F.1         V.H.F.3         V.H.F.3           20         N22         20         AA1202-2 V.H.F.1         V.H.F.3         V.H.F.3           21         N22         21         CONNECTOR VHF 3A EG7.82.465         V.H.F. acrial plug, Uniradio 67         V.H.F. acrial plug, Paton No.A.P.1696           24         N22         23         Pressure bulkhead Plug Type, UKN2         V.H.F. 3A         V.H.F. 3A           25         N22         25         Plug Type, UKN2         V.H.F. 3A         V.H.F. 3A           36         N22         30         V.H.F. 3A         V.H.F. 3A         V.H.F. 3A           37         N22         31         N22         30         V.H.F. 3A         V.H.F. 3A           38         N22         39         V.H.F. 3A         V.H.F. 3A         V.H.F. 3A           39         N22         39         Interconnecting CONNECTOR NA21         R           40         NNS22         43 <td< td=""><td></td><td>14</td><td>N22</td><td>14</td><td></td><td></td><td></td><td>Uniradio 67</td><td></td><td></td></td<>		14	N22	14				Uniradio 67		
interconnecting         16         N22         16         V.H.F.3         V.H.F.3           Interconnecting         17         N22         17         N22         18         V.H.F. of the second of the sec		15	N 2 2	15						
Interconnecting box Type A37-0557-01         19         N22         19         V,H,F, control unit, Type           4         M22         19         unit, Type         AA1202-2 V,H,F, 1         Concon plug         V,H,F,1         Concon plug         V,H,F,1         AA1202-2 V,H,F, 1         CONSECTOR VHF 3A EG7-82.865           21         N22         21         CONSECTOR VHF 3A EG7-82.865         V,H,F, acrial plug, V,H,F, acrial plug, V,H,F, acrial plug, Plug Type, UKN2         V,H,F, acrial plug, Plug Type, UKN2         V,H,F, acrial plug, Plug Type, UKN2         V,H,F, 3A           26         N22         26         V,H,F, 3A         V,H,F, 3A         V,H,F, 3A           30         N22         30         Socket Nt,F, 3A         V,H,F, 3A         V,H,F, 3A           30         N22         30         Socket Nt,F, 3A         V,H,F, 3A         V,H,F, 3A           4         NR52         31         32         33         Socket Nt,F, 3A         V,H,F, 3A           4         NR52         33         Socket Nt,F, 3A         V,H,F, 3A         V,H,F, 3A         V,H,F, 3A           30         N22         33         Socket Nt,F, 3A         V,H,F, 3A         V,H,F, 3A           4         NR522         19         Socket Nt,F, 3A         V,H,F, 3A         K,H,F,		16	N22	16						V.H.F. 3
Image: space		17	N 22	17						
Cannon plug         19         N22         19         unit, Type           V.H.F.1         20         N22         20         AA1202-2 V.H.F.1           21         N22         21         Connon plug         Connot plug           21         N22         21         Connot plug         Connot plug           23         N22         23         Centre bulkhead         Unit adio 67         V.H.F. aerial plug,           24         N22         25         plug Type, UKN2         Paton No.A.P.1696           25         N22         26         V.H.F. 3A         V.H.F. 3A         V.H.F. 3A           30         N22         30         CONNECTOR N#21           31         N22         31         ECONNECTOR N#21           43         N22         33         Connection No.A.P.1696           43         N22         31         Connection No.A.P.1696           43         N22         30         Connection No.A.P.1696           43         N22         31         Connection No.A.P.1696           43         N22         39         Connection No.A.P.1696 <td>-</td> <td>18</td> <td>N22</td> <td>18</td> <td>V.H.F. control</td> <td></td> <td></td> <td></td> <td></td> <td></td>	-	18	N22	18	V.H.F. control					
V.H.F.1       20       N22       20       AA1202-2 V.H.F.1         21       N22       21       CONNECTOR VHF 3A EG7.82.465         23       N22       23       TERMINATION       CABLE       TERMINATION         24       N22       23       Pressure bulkhead       Uniradio 67       V.H.F. aerial plug.         24       N22       25       Plug Type, UKN2       Uniradio 67       V.H.F. aerial plug.         25       N22       26       V.H.F. 3A       V.H.F. 3A       V.H.F. 3A         30       N22       30       V.H.F. 3A       V.H.F. 3A       V.H.F. 3A         31       N22       31       TERMINATION       V.H.F. 3A       V.H.F. 3A         38       N22       33       TERMINATION       PIN       TERMINATION         43       N22       39       TERMINATION       A       Uninyvin 20       A         44       NMS22       44       TERMINATION       B       Uninyvin 20       A         45       N22       45       TERMINATION       B       Uninyvin 20       A         46       N22       48       Socket NU21       E       Uninyvin 20       D       UK-AN         48 <td< td=""><td></td><td></td><td>N22</td><td>19</td><td>unit, Type</td><td></td><td></td><td></td><td></td><td></td></td<>			N22	19	unit, Type					
TERMINATIONCABLETERMINATION24N2224Pressure bulkheadUniradio 67V.H.F. aerial plug,25N2225plug Type, UKN2Paton No.A.P.169626N2226V.H.F. 3AV.H.F. 3A30N2230V.H.F. 3AV.H.F. 3A31N2231V.H.F. 3AV.H.F. 3A39N2238V.H.F. 3AV.H.F. 3A39N2239V.H.F. 3AV.H.F. 3A31N2291TERMINATIONA33N2213V.H.F. 3A34N2213V.H.F. 3A35N2213V.H.F. 3A36N2213V.H.F. 3A37NKS214TERMINATION38N2213V.H.F. 3A39N2214CABLE14NKS21415N221516N221617NKS221718N221819NK221819NK221819NK221919NK221919NK221919NK221919NK221919NK221919NK221919NK221919NK221919NK221919NK2219191010191010 </td <td></td> <td>20</td> <td>N22</td> <td>20</td> <td>AA1202-2 V.H.F. 1</td> <td></td> <td></td> <td></td> <td></td> <td></td>		20	N22	20	AA1202-2 V.H.F. 1					
24       N22       24       Pressure bulkhead       Uniradio 67       V.H.F. acrialug,         25       N22       25       plug Type, UKN2       Paton No.A.P.1696         26       N22       26       V.H.F. 3A       V.H.F. 3A         30       N22       30       V.H.F. 3A       V.H.F. 3A         31       N22       30       V.H.F. 3A       V.H.F. 3A         38       N22       33       CONNECTOR N421       V.H.F. 3A         39       N22       39       CONNECTOR N421       V.H.F. 3A         43       N22       43       TERMINATION       PIN       CABLE       PIN         44       NMS22       44       A       Uninyvin 20       A         45       N22       45       B       Uninyvin 20       B         46       N22       46       Interconnecting       C       Uninyvin 20       C         46       N22       48       socket N421       E       Uninyvin 20       E       plug. N421         49       N22       19       F       Uninyvin 20       F       VK-AN		21	N22	21			CONNE	CTOR VHF 3A EC	G7.82.46	5
25       N22       25       Plug Type, UKN2       Paton No.A.P.1696         26       N22       26       V.H.F. 3A       V.H.F. 3A         30       N22       30       V.H.F. 3A       V.H.F. 3A         31       N22       31       State       State         38       N22       39       State       State         39       N22       39       State       State         413       N22       43       State       State         414       NMS22       44       A       Uninyvin 20       A         415       N22       45       B       Uninyvin 20       B         416       N22       46       Interconnecting       C       Uninyvin 20       C         416       N22       48       Socket N421       E       Uninyvin 20       D       UK-AN         416       N22       48       Socket N421       E       Uninyvin 20       E       plug. N421         417       NMS22       48       Socket N421       E       Uninyvin 20       E       plug. N421         419       N22       49       N22       16       Socket N421       F       Uninyvin 20		23	N22	23		TERMINATION		CABLE		TERMINATION
26       N22       26       V.H.F. 3A       V.H.F. 3A         30       N22       30       31       N22       31         31       N22       31       38       Secondary       Secondary         39       N22       39       Secondary       Secondary       Secondary         43       N22       43       TERMINATION       PIN       CABLE       PIN       TERMINATION         41       NMS22       44       Termination       A       Uninyvin 20       A         415       N22       45       B       Uninyvin 20       B         416       N22       46       Interconnecting       C       Uninyvin 20       C       E.C.P.         416       N22       47       box Cannon       D       Uninyvin 20       D       UK-AN         418       N22       48       socket N421       E       Uninyvin 20       E       plug. N421         40       N22       49       Socket N421       F       Uninyvin 20       F		24	N22	24		Pressure bulkhead		Uniradio 67		V.H.F. aerial plug,
30       N22       30         31       N22       31         38       N22       38         39       N22       39         43       N22       43         43       N22       43         44       Uninyvin 20       A         45       N22       45         46       N22       46         46       N22       47         47       NMS22       47         48       N22       48         8       N22       48         9       N22       49         9       N22       49         9       N22       49         9       N22       49		25	N22	25		plug Type, UKN2				Paton No.A.P. 1696
31       N22       31         38       N22       38         39       N22       39         43       N22       39         43       N22       43         44       NMS22       44         45       N22       45         46       N11erconnecting       C         47       NMS22       47         48       N22       48         N22       48       socket N421         49       N22       49		26	N22	26		V.H.F. 34				V.H.F. 3A
38       N22       38         39       N22       39         43       N22       43         13       N22       43         14       NMS22       44         15       N22       45         16       N22       46         17       NMS22       47         18       N22       48         19       Socket N421       E         10       N22       48         11       NMS22       48         12       14       Socket N421       E         14       NMS22       49		30	N22	30						
39       N22       39       CONNECTOR       N421         13       N22       13       TERMINATION       PIN       CABLE       PIN       TERMINATION         14       NMS22       14       A       Uninyvin 20       A         145       N22       15       B       Uninyvin 20       C       E.C.P.         16       N22       16       Interconnecting       C       Uninyvin 20       C       E.C.P.         17       NMS22       17       box Cannon       D       Uninyvin 20       D       UK-AN         18       N22       18       socket N421       E       Uninyvin 20       E       plug. N421         19       N22       19       F       Uninyvin 20       F       F		31	N22	31						
43N2243TERMINATIONPINCABLEPINTERMINATION43NMS2243AUninyvin 20A45N2245BUninyvin 20B46N2246InterconnectingCUninyvin 20C47NMS2247box CannonDUninyvin 20D48N2248socket N421EUninyvin 20E49N2249FUninyvin 20F		38	N22	38						
13N2213TERMINATIONPINCABLEPINTERMINATION141NMS2244AUninyvin 20AA15N2215BUninyvin 20B16N2246InterconnectingCUninyvin 20CE.C.P.17NMS2247box CannonDUninyvin 20DUK-AN18N2248socket N421EUninyvin 20Eplug. N42119N2249FUninyvin 20FF		39	N22	39					21	
1/11       NMS22       1/1       A       Uninyvin 20       A         1/15       N22       1/5       B       Uninyvin 20       B         1/6       N22       1/6       Interconnecting       C       Uninyvin 20       C       E.C.P.         1/7       NMS22       1/7       box Cannon       D       Uninyvin 20       D       UK-AN         1/8       N22       1/8       socket N421       E       Uninyvin 20       E       plug. N421         1/9       N22       1/9       F       Uninyvin 20       F		. 113	N22	43		TERMINATION	PIN			TERMINATION
45       N22       45       B       Uninyvin 20       B         46       N22       46       Interconnecting       C       Uninyvin 20       C       E.C.P.         47       NMS22       47       box Cannon       D       Uninyvin 20       D       UK-AN         48       N22       48       socket N421       E       Uninyvin 20       E       plug. N421         49       N22       49       F       Uninyvin 20       F		11	NMS22	11.11						CATRATION
46       N22       46       Interconnecting       C       Uninyvin 20       C       E.C.P.         47       NMS22       47       box Cannon       D       Uninyvin 20       D       UK-AN         48       N22       48       socket N421       E       Uninyvin 20       E       plug. N421         49       N22       49       F       Uninyvin 20       F		45	N22	45				,		
#7         NMS22         #7         box Cannon         D         Uninyvin 20         D         UK-AN           #8         N22         #8         socket N#21         E         Uninyvin 20         E         plug. N#21           #9         N22         #9         F         Uninyvin 20         F		46	N22	46		Interconnecting				FCP
#8         N22         #8         socket N421         E         Uninyvin 20         E         plug. N421           49         N22         49         F         Uninyvin 20         F		117	NMS22	47		0		,		
49 N22 49 F Uninyvin 20 F		48	N22	48				,		
F0 H32 F0		ध व	N22	49						
		50	N22	50			Ĺ	Uninyvin 20	G	

### A.P.101B-0417-1B, Sect.8, Chap.4 A.L.73, Apr.89



### LP 1918 0417 18, Soct.8, Chap.4 A.L.73, Apr.89



### DESCRIPTION

### General

1. Communications in the U.H.F. range are provided by two A.R.I. 23301 installations referred to as U.H.F.1 and U.H.F.2. The locations of the main items are shown in fig.1. Connector and cable assembly details are given in Table 2.

# ▲ Transmitter/receiver units

2. Two transmitter/receiver units, Type PTR1751W (pre Mod.5543) or Type PTR1751WW (post Mod. 5543) are fitted in the aircraft. The U.H.F.1 unit is mounted on a tray located beneath the floor at the A.E.O.'s station and is supplied with 28 volts d.c. derived from busbar PP7 via fuse 218 in the E.C.P. The U.H.F.2 unit is mounted on a tray located in the upper equipment compartment and is supplied with 28 volts d.c. derived from busbar P10 via fuse 13 on the M.E.P. Provision is made for the automatic selection of 16 preset frequencies, plus the guard frequency, or the manual selection of any one of the 3500 frequency channels spaced 50 kHz apart or 7000 frequency channels spaced 25 kHz apart (post Mod.5543) within the range of 220 MHz to 399.95 MHz.

### **Control units**

3. Two Type PV1754L (pre Mod.5544) or Type PV1754W (post Mod.5544) control units are fitted in the aircraft, U.H.F.1 on the pilot's miscellaneous instrument panel and U.H.F.2 above the E.C.P. to the right of the navigator's table. The U.H.F.1 PRESS-TO-MUTE and TONE switches, together with the U.H.F.1 LOWER UHF2 UPPER/UHF1 UPPER UHF2 LOWER aerial changeover switch are situated above the U.H.F.1 control unit, also on the miscellaneous instrument panel. The MUTE and TONE switches for the U.H.F.2 system are situated above the U.H.F.2 control unit.

4. Each control unit provides the following facilities:-

(1) Selection of any one of 16 pre-set channels is effected by a rotary switch idented 1 to 16.

(2) Manual frequency selection is effected by two rotary switches, the left-hand switch controlling 100, 10 and 1 MHz selections and the right-hand switch controlling 100 and 25 KHz selections enabling any one of 3500 or 7000 (post Mod.5544) manually selected frequencies to be set.

(3) A digital display shows the frequency set in (2) above.

(4) A function switch idented OFF/TR/TR+G/TR+H/TR+G+H controls power to the associated installation. The switch has five positions as follows:-

(a) OFF - power supplies disconnected.

- (b) TR power applied for normal transmitter/receiver operation.
- (c) TR+G power applied for normal transmitter/receiver operation and to its guard receiver.
- (d) TR+H and TR+G+H provide similar facilities to (b) and (c) and to homing equipment - not used in this installation.

(5) A mode switch idented Gu/Gv/P/M determines the mode of operation of the installation; when set to Gu, operation is at the guard frequency while at P and M, the installation operates at the pre-set and manually-selected frequencies respectively. Gv is not used in this installation.

(6) A SET CHANNEL button inserts the manually-selected frequency into the selected pre-set channel. The button can only be operated when rotated against spring tension.

(7) A TEST button controls the built-in test facility to check transmitter/receiver and display serviceability; with the button operated, the display shows the first five digits of the frequency set by the mode switch at P or Gu. With the mode switch set to M, the display shows 888.88.

(8) VOL and DIM controls adjust the volume of the transmitter/ receiver audio output and the display intensity respectively. Panel lighting is controlled by dimmer switches at the crew's stations.

System facilities are available to crew members by making the appropriate selection on their intercomm. station boxes.

### Interface units

5. An interface unit is fitted on each of the transmitter/receiver mounting trays. Their purpose is to match the transmitter/receiver operating parameters with those of the intercomm, installation.

### Interconnecting boxes

6. Two Type 5821-99-932-6361 interconnecting boxes are fitted in the aircraft. The U.H.F.1 box is mounted on a bracket on the starboard side of the cabin between frames 4 and 5. The U.H.F.2 box is mounted at the rear of the pressure bulkhead in the upper equipment compartment. The boxes carry six multi-pole connectors which provide electrical connections to the various units and a test socket while a muting plug is connected to a seventh connector.

### Aerials

7. Two Type 5985-99-911-8266 aerials are fitted to the aircraft; the upper aerial is mounted on the centre line of the upper fuselage between frames 29 and 30 and the lower aerial is mounted on the underside of the fuselage between frames 12 and 13 slightly to starboard of the centre line. Selection of the required aerial is made by UHF 1 LOWER UHF 2 UPPER/UHF 1 UPPER UHF 2 LOWER switch mounted on the pilot's miscellaneous instrument panel. Operation of the switch controls an assembly of four aerial change-over relays. The aerial change-over relay is mounted at the rear of the pressure bulkhead on the port side.

### Intercomm. station boxes

8. Each intercomm. station box is modified to bring the Tacan and A.D.F. facilities together in one receive selector button. Individual audio outputs are controlled by the respective gain controls on the Tacan and A.D.F. control units. The intercomm. station box selector button varies both Tacan and A.D.F. audio outputs together. The U.H.F.2 facility is controlled by the spare push button and the rotary transmit/receive switch has a U.H.F.2 position.

(8) VOL and DIM controls adjust the volume of the transmitter receiver audio output and the display intensity respectively. Panel light ing is controlled by dimmer switches at the crew's stations.

System facilities are available to crew members by making the appropriate selection on their interportmunistation bokes.

### Interface suit

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 An interface unit is fitted on each of the transmitter/receiver mounting trays. Their purpose is to match the transmitter/receiver operating parameters with these of the intercomm. installation.

# 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

9. All components and cables should be checked periodically for damage. General servicing of the equipment is self-evident and detailed servicing information including test equipment will be found in A.P. 116D-0154-1.

### REMOVAL AND ASSEMBLY

### Transmitter/receiver units

10. The U.H.F.1 transmitter/receiver on its mounting tray is located beneath the floor just forward of the A.E.O.'s station. To gain access to the unit it is necessary first to unscrew and remove the floor panel. The removal and assembly of the unit is then self-evident. The U.H.F.2 transmitter/receiver on its mounting tray is located in the upper equipment compartment. Removal and assembly of the unit is self-evident.

### Interface units

11. The interface units contain links and preset controls which must be set up to suit the Canberra T Mk.17 installation as detailed in A.P. 116D-0154-1 prior to fitment of a replacement unit.

are situated above the U.H.F.1 control unit, also on the miscenareo instrument panel. The MUTE and TONE switches for the U.H.F system are situated above the U.H.F.2 control unit.

Each control unit provides the following facilities:

 Selection of any one of 16 pre-set channels is effected by a rotary switch idented 1 to 16.

(2) Manual frequency relection is effected by two rotary switches the left-hand switch controlling 100, 10 and 1 MHz selections and the right-hand switch controlling 100 and 25 KHz selections enabling soy one of 3500 or 2000 (post Mod.5544) manually selected frequencies to be set

# TABLE 1

# Equipment details

Equipment	Туре	Ref. No.	Location			A.P. Reference formaliup
		<b>∢</b> PR	E MOD. 5543 and 5544	•		
•						
Transmitter/receiver U.H.F.1	PTR1751W	5821-99-6496	in the second of the second seco	ation, below floor	- PIRT251W	fransmitter/receiver U.H.F.2
Transmitter/receiver U.H.F.2			Upper equi	ipment compartment	t (	
Interface unit U.H.F.1	PV1746B	5821-99-65202	A.E.O.'s st	ation, below floor		Interface unit U.H.F.1
Interface unit U.H.F.2	]		Upper equi	ipment compartment	t r	C.H.H.U.Mad.sochem - A.P.116D-0154-1B
Control unit U.H.F.1			Miscellaneo	ous instrument panel		Control Unit U.H.F.)
Control unit U.H.F.2	PV1754L	5821-99-64903	Aft face of	E.C.P.		Control Unit U.H.F.2
Mounting tray (2 off)	PV1748B	5821-99-6499	755 A.E.O.'s st	ation, below floor		Mounting tray (2 off)
			Upper equi	ipment compartment		
Interconnecting box U.H.F.1	ames & and 5	5021 00 0226		age between frames 4	4 and 5	
Interconnecting box U.H.F.2		0021-00-0020	Upper equi	pment compartmen	it .	A.P.116D-0105-1
			Lipper			
Upper aerial	16 - 1	5985-99-2222	ADDITION AND ADDITION AND ADDITION ADDITIONAL	lage between frames	29 and 30	A.P.116D-0133-1166 1996
Lower aerial	ween frames 12 and		Underside	of fuselage between f	frames 12 and 13	Lower acrisi

continued ...

# TABLE 1

# Equipment details

Equipment somethins .9.A	Туре	Ref. No. noitsoo.l	Location	A.P. Reference
	under Andreas (1997) - Constanting of Constanting o	POST MOD.5	543 and 5544	
Transmitter/receiver U.H.F.1		5001 00 2002045	A.E.O.'s station, below floor	]
Transmitter/receiver U.H.F.2	- PTR1751WW 👦	5821-99-7667945 —	Upper equipment compartment	rangnitter/reneivar U.H.F.
Interface unit U.H.F.1			A.E.O.'s station, below floor	vansmitter/moeiver/U.H.F.B
Interface unit U.H.F.2	- PV1746BB 🕬	5821-99-7683993 -	Upper equipment compartment	– A.P.116D-0154-1B
Control Unit U.H.F.1	, hierri	Umper equipment company	Miscellaneous instrument panel	nterface unit U.H.F.2
Control Unit U.H.F.2	– PV1754W	5821-99-6598964 -	Aft face of E.C.P.	<ul> <li>F.P.H.D time leaded</li> <li>S.P.H.U time to those</li> </ul>
Mounting tray (2 off)			A.E.O.'s station, below floor	Joneon more 0.2017 2
	PV1784B	5821-99-6499755 -	Upper equipment compartment	
Interconnecting box U.H.F.1	mes 4 and 5		Stbd. fuselage between frames 4 and 5	1 H.U xod galtseonoosem
Interconnecting box U.H.F.2	tment	5821-99-9326361	Upper equipment compartment	- A.P.116D-0105-1
Upper aerial	ames 29 and 30		Upper fuselage between frames 29 and 30	Joper aerial
Lower aerial	-Do 16-1 zement neer	5985-99-2222399 –	Underside of fuselage between frames 12 and 1	3 A.P.116D-0133-1

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# TABLE 2

# Connector details

Cable Symbols:- Uniradio = U.R., Equipment wire = Q, Uninyvin = UN, Uninyvinmetsheath = UNMS, Miniature cable = Min.

# CONNECTOR CS 5411/1

# CONNECTOR CS 5411/1 - continued

Termination	Pin	Cable	Ident	Pin	Termination	Termination	Pin	Cable	Ident	Pin	Termination
	[A	Q3	1 White	A			F1	Q2	32 Pink	Л	
	в	Q3	2 White	в		. t.	k	Q2	33 Pink	ĸ	
	C	Q2	3 White	C			m	Q2	34 Pink	m	
	D	Q2	4 White	D			n	Q2	35 Pink	n	
	E	Q2	5 White	E			р	Q2	36 Pink	p	
	F	Q2	6 White	F		No.2	q	Q2	37 Pink	q	U.H.F.2
	н	Q2	7 White	H		interface	-17	Q2	38 Pink		Interconnecting
	J	Q2	8 White	J		unit	s	Q2	39 Pink	s	box (TR unit)
	ĸ	Q2	9 White	ĸ			t	Q2	40 Pink	t	
	L	Q2	10 White	L			u	Q2	41 Pink	u l	
	M	Q25	11 Pink	M			Lw	Q2	42 Pink	w	
	N	Q25	12 Pink	N						·	
	P	Q2	13 White	P		metric environmente -					
	R	Q25	14 Pink	R							
No.2	S	Q25	15 Pink	s	U.H.F.2						
interface	Т	Q2	16 White	т							
unit	U	Q2	17 White	U	Interconnecting				• (c)		
	V	Q2	18 White	v	box (TR unit)						
	w	Q2	19 White	w							
	X	Q25	20 Pink	x							
	Y	Q25	21 Pink	Y							
	Z	Q25	22 Pink	z							
	a	Q2	23 Pink	a							
	b	Q2	24 Pink	b			C	ONNECTO	R CS 5411	/3	
	c	Q2	25 Pink	c							
	d	Q2	26 Pink	d		Termination	Pin	Cable	Ident	Pin	Termination
	e	Q2	27 Pink	e			Wire	capital lo	tents pin to	pin	
	f	Q2	28 Pink	f	,		Га	Q2		a]	κ.
	g	Q2	29 Pink	g		Pressure	b	Q2		b	U.H.F.2
	h	Q2	30 Pink	h		bulkhead	- c	Q2		c	Control
	1.1	Q2	31 Pink	1							
	11	42	STEIN			U.H.F.2/1	d	Q2		d	unit

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# TABLE 2 Connector details - continued

	CONNEC	TOR CS	<b>5411/3</b> - c	ontinued		с	ONNECT	OR CS 5411	/6 – continu	red
Termination	Pin	Cable	Ident	Pin	Termination	Termination	Pin	Cable	Pin	Termination
Pressure bulkhead U.H.F.2/1	-[f g h	Q2 Q2 Q2		g h i	U.H.F.2 Control unit	Pressure buikhead U.H.F.2/2	H J K	UN20 UN20 UN25	Term 1 Term 2 T.B. LL 72	Mute switch - Tone switch
							CON	NECTOR CS	5411/9	
						Termination	Pin	Cable	Pin	Termination
						Intercomm. junction box PL10 (orange/ red)	A B C	UN20 UN20 not used	Term 3 Term 4	- T.B.3668/1
	co	NNECTO	R CS 5411	/5			со	NNECTOR 54	11/10	
Termination	Pin	Cable	Ident	Pin	Termination	Termination	Pin	Cable	Pin	Termination
	Wire	capital id	ents pin to	pin		U.H.F.2				Aerial change-
U.H.F.2	a b	Q3 Q3 Q3		a b		Transmitter/ receiver		U.R.67		over relay SKT D
Interconnecting	- d	Q3		c d	Pressure bulkhead		co	NNECTOR 54	11/11	
box (control unit)	f g	Q3 Q3		e f	U.H.F.2/1	Termination	Pin	Cable	Pin	Termination
	h	Q3 Q3		g h			A B C	UN20 UN20 UNMS	A B	U.H.F.2
	co	NNECTO	R CS 5411	/6		-	D	UNMS	D C	Interconnecting box (mic/tel) B1
Pressure bulkhead U.H.F.2/2	Pin A B C D E	Cable UN20 UN20 UNMS UNMS UN20	ident	Pin A B C D E	Termination Intercomm. junction box plug 5	Pressure bulkhead U.H.F.2/2	E F G H J K	UN20 Braid Braid UN20 UN20 UN20	E _ Shell F _ C _	Interconnecting box (mic/tel) U.H.F.2 Interconnecting box (PL & tone) B2
	F	Braid of C Braid of E		Earth ring	(yellow)					continued

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.

# TABLE 2 Connector details - continued

# CONNECTOR 5411/12

# CONNECTOR U.H.F.4 EG7.82.117

-									
Termination	Pin Cable	Pin	Termination	Termination	Pln	Cable	Ident	Pin	Termination
T.B.3668/2	Term 1 UN8	Fuse 13	- Main electrical		TA.	DEF 12B-3	White	Α	
	Term 2 UN8	EG.	panel		В	DEF 12B-3	White	в	
				18142	C	DEF 12B-2	White	С	
	CONNECTOR U.H.F.	1 EG.82.109			D	DEF 12B-2	White	D	
Termination	Pin Cable Ide	nt Pin	Termination		E	DEF 12B-2	White	E	
	THE STATE OF ATA STO	TOSMA00.			F	DEF 12B-2	White	F	
Plug break	A M3A Red		U.H.F.1		н	DEF 12B-2	White	н	
(miscellaneous	B M3A Blu		Interconnecting		J	DEF 12B-2	White	J	
instrument	C M3A Gre	en C	box PL & tone		ĸ	DEF 12B-2	White	K	
panel) U.H.F.1					L	DEF 12B-2	White	L	
	Mandal	M. at M. S.			M	DEF 12B-2S	Pink	M	
	CONNECTOR U.H.F.2	EG7.82.111			N	DEF 12B-2S	Pink	N	
Termination	Pin Cable	Pin	Termination		P	DEF 12B-2	White	Р	
		0.000000			R	103/202/GY	Yellow	R	
U.H.F.1	12B-2		U.H.F.1		S	103/202/GY	Green	S	
Control unit		In	terconnecting box	No.1	Т	DEF 12B-2	White	т	U.H.F.1
(miscellaneous	A		(control unit)	interface	- U	DEF 12B-2	White	U	- interconnecting
instrument panel	)			unit	V	DEF 12B-2	White	v	box plug
	CONVERTOR UNES				W	DEF 12B-2	White	W.	(T.R. unit)
	CONNECTOR U.H.F.3	EG7.82.113			а	DEF 12B-2	White	а	ere d'here beroen T
Termination	Cable		Termination		۶b	DEF 12B-2	White	b	
U.H.F.1	University Of	, ,			С	DEF 12B-2	White	C	
Transmitter/	Uniradio 67	r P	ressure bulkhead		d	DEF 12B-2	White	d	14 · · · · · · · · · · · · · · · · · · ·
receiver unit			UKN2 plug		e	DEF 12B-2	White	θ	
receiver unit			U.H.F.3		11	DEF 12B-2	White	f	
Sec. Sec. 5.					g	DEF 12B-2	White	9	
					h	DEF 12B-2	White	h	
						DEF 12B-2	White	1	
	CONNECTOR U.H.F.3A	E07 00 115			1	DEF 12B-2	White	i	
	CONNECTOR O.H.F.JA	EG7.82.115			k	DEF 12B-2	White	k	
Termination	Cable		Termination		ſm	DEF 12B-2	White	m	
Pressure bulkhea	d Uniradio 67		arial abana aver		n	DEF 12B-2	White	n	
plug UKN2		А	erial changeover	4	p	DEF 12B-2	White	рј	
U.H.F.3A			relay 'A' plug UKN2 U.H.F.3A						
0.11.1.0A			UNINE U.H.F.3A						

continued . . .

# TABLE 2 Connector details - continued

# CONNECTOR U.H.F.4 EG7.82.117 - continued

## CONNECTOR U.H.F.7 EG7.82.603

Termination	Pin	Cable	Ident	Pin	Termination	Termination	Cable	Termination
No.1 interface unit	q r s t w	DEF 12B-2 DEF 12B-2 DEF 12B-2 DEF 12B-2 DEF 12B-2 DEF 12B-2	White White White White White White	q r s t w	U.H.F.1 Interconnecting box plug (T.R. unit)		Uniradio 67 ECTOR RT430 EG7.82.121	Upper aerial plug UKN2 U.H.F.7

# CONNECTOR U.H.F.6 EG7.82.605

Termination	Cable	Termination			
Aerial change-over relay U.H.F.6	Uniradio 67	Lower aerial plug UKN2 U.H.F.6			

Termination	Pin	Cable	Pin	Termination
Terminal block miscellaneous	P-to-M	ай <sub>с</sub> 44	P-to-M	3-way T.B. on U.H.F.
instrument panel	P-to-M		P-to-M	equipment panel
QR Tag RT 430	NEG		NEG	QR Tag RT430

# CONNECTOR RT431 EG7.82.123

Termination	Pin	Cable	Pin	Termination		
U.H.F.1 Interconnecting box plug 6-way RT 431A	A B C D E	N20 N20 NMS20 NMS20 N20	A B C D E	Intercomm. junction box UA6043 socket RT 431		
	F	N20	P-to-M	3-way T.B. on U.H.F. equipment panel RT 431B		

Note: For details of cables F25, N25, N427, N512 and 2F135 refer to Sect.6, Chap.11.

# Chapter 5 V.O.R./I.L.S.

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V.O.R./I.L.S. A.R.I.23118

installation ... 1

■Note...Combined theoretical/routeing diagrams for this installation are contained in A.P. 101B-0417-10 (Servicing Diagrams Manual).

### DESCRIPTION

### General

1. A Marconi A.D. 260 V.O.R./I.L.S. installation (A.R.I.23118) is fitted. This is a navigation and landing aid using a V.H.F. omni-range system and a V.H.F./U.H.F. instrument landing system. Details of the equipment and a description of the principles of V.O.R. and I.L.S. are given in A.P.116B-0407-1.

2. The installation consists of a Type 6401-M V.H.F. receiver, a Type 6402-MA navigation unit, a Type 6404 ME glide slope receiver, a Type 7430-M control

unit, a Type RL 7003-184B omni bearing selector and deviation indicator, a Type 6403 M marker receiver, and their associated aerials. The V.H.F. and glide slope receivers and the navigation unit are mounted on a Type EJB-21B-1 backplate junction box, located under the navigator's table. The marker receiver is mounted on its Type EJB-21C backplate junction box, located adjacent to the other junction box.

### V.H.F. receiver

**3.** The V.H.F. receiver's frequency range (from 108 to 135 MHz) covers the V.O.R., I.L.S. and V.H.F. communication channels. Tuning

of the receiver is carried out by two automatic tuning mechanisms controlled by the control unit, which also makes the circuit changes in the navigation unit necessary for V.O.R. or I.L.S. operation.

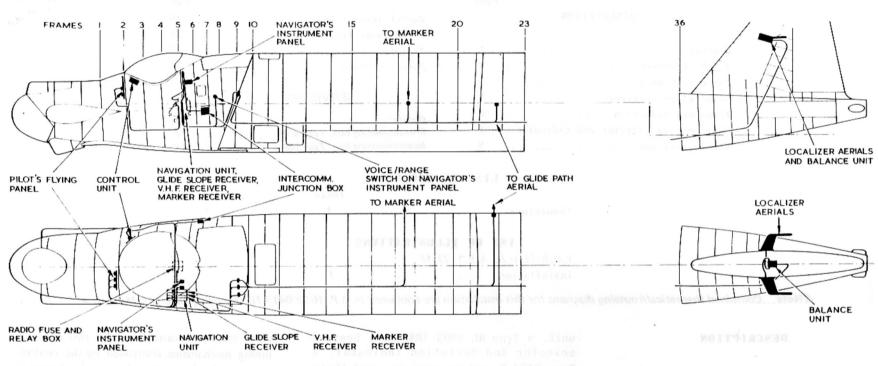
### Navigation unit

4. This unit receives navigational data from the V.H.F. receiver and processes it in different ways according to the mode of operation selected. In the V.O.R. mode, it receives compass

# P. 1918 0417-10, Sect 9, Chap. 5

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### i scontrola

EG7-82-355-10

1. A Marcell A.D. 260 V.O.R./I.L.S. instatiation (A.B.1.23118) is fitted. This is a mavigation and landing aid using a V.H.F. consi-range system and a V.J.P. W.B.F. instranest landing system in the set of the remainment and a description o

associated serials. The V.R.F. and glifte alone receivers while anvigation and are southed on a True E18-218-1 backplate junction hav, located under the navigator a table. The earker receiver is monted on its True E18-210 backplate survive by Juncted achiever to the other from here.

### FINE SEALERSTAN

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### FIG. 1. V.O.R./I.L.S. A.R.I. 23118 INSTALLATION

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data from the GM4B compass system (Sect. 7, Chap. 4) and provides an output to the pilot's and navigator's radio magnetic indicators (R.M.I.). These give an indication of the magnetic bearing of the V.O.R. transmitter from the aircraft position and the bearing of the V.O.R. transmitter relative to the aircraft heading. In the I.L.S. mode the unit supplies an output to the deviation indicator to give left and right indications or to actuate the OFF flag when these indications become unreliable.

### Glide slope receiver

5. The glideslope receiver is tuned to the channel appropriate to the I.L.S. channel selected on the control unit. The operational frequencies lie between 329.15 MHz and 335 MHz with a channel spacing of 150 KHz. The output from this receiver drives the horizontal (high/low) pointer of the indicator and its associated flag.

### Frequency selection

6. Selection of the frequency of operation of the V.O.R./I.L.S. installation is made on the Type 7430M control unit mounted on the pilot's starboard coaming panel directly beneath the V.H.F. communication control unit. These two control units are identified NAV. and COMM. respectively. The front panel of the control unit carries a combined volume control and on/off switch, and whole and fractional MHz selection switches. The frequency selected is indicated by a digital display.

7. Odd 100 KHz frequency channels in

the range 108.1 to 111.9 MHz are allo-

cated to I.L.S. localizer use. Each of these is 'paired' with a glide slope channel frequency. The even 100 KHz channels up to and including 111.8 MHz and all channels from 112 to 117.95 MHz are allocated for V.O.R. use.

(Text deleted)

PPT via fuse No. 157. The stanty to

### Omni-bearing selector and indicator

8. The omni-bearing selector (O.B.S.) and an indicator is mounted on the flight instrument panel above the R.M.I. The instrument combines the functions of V.O.R. bearing selector and a crossedpointer deviation indicator. The deviation indicator has a vertical pointer which gives deviation indications in the V.O.R. mode and left and right of localizer beam indications in the I.L.S. mode. The horizontal pointer gives indications of being high or low with

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respect to the glide slope beam in the I.L.S. mode. Flags are provided for both pointers to show when their indications are unreliable. A TO/FROM indicator is also incorporated; this gives an indication of the direction in which the aircraft is flying with respect to the V.O.R. transmitter whose bearing has been selected using the O.B.S. control knob and shown on the scale of the indicator. The R.M.I., which displays the bearing of the V.O.R. transmitter relative to the aircraft, is also used for a similar purpose in the radio compass system.

### Marker receiver

9. The marker receiver operates on a fixed frequency of 75 MHz and receives 'signals from ground marker beacons. The power supply is controlled by an ON/OFF switch mounted on the pilot's starboard coaming panel, just outboard of the V.H.F. COMM. control unit.

### Marker indications

10. Three coloured lights flash when the aircraft passes over the marker beacons. These are situated on the pilot's flying panel, adjacent to the O.B.S. The blue light indicates the outer marker, the amber the middle and the white indicates airways marker or the inner marker if still installed. The sensitivity of the marker receiver may be varied by the operation of a switch adjacent to the three lights, annotated SENS. SWITCH HIGH/LOW. Audible signals from the marker beacons may be heard by selecting MARKER on the crew's intercomm. station boxes.

### Voice/range filter

11. A filter is incorporated in the junction box to permit reception of Morse Code or voice-modulated identification signals radiated by V.O.R. transmitters. A Type 8820/B/125 three-position toggle switch, annotated V.O.R./I.L.S. is located at the bottom of the control panel on the port wall of the navigator's station. The switch has positions marked V/R, VOICE, and RANGE for selection of the signals to be received. Audible signals from V.O.R. and I.L.S. transmitters may be heard by selecting V.O.R./I.L.S. on the intercomm. station boxes, provided that the A.E.O.'s SELECTOR SWITCH is also set to its MARKER position. If this switch is set to other position signals any from A.R.I.23165 (Sect.9, Chap.4) will be heard.

### Aerials

12. Three separate aerials are required for the V.O.R./I.L.S. system. The V.O.R. and I.L.S. localizer signals are received by a pair of Type 140-LRU-A99A V.H.F. aerials, mounted one on each side of the fin. The signals received by these are combined in a Type 133-LRU-14A balance unit, located in the fin and then passed via the backplate junction box to the receiver.

A circular area on each side of the fin, centred on the aerial base, is covered in copper gauze bonded to the fin structure to provide a ground plane. These areas are connected to the metal leading edge and the base of the fin by sprayed zinc strips. A removable panel is located to the rear of the port aerial to give access to the aerial connectors and the balance unit.

13. Marker signals are received by a Type 237 marker aerial mounted just outboard of the starboard wheel well. The

aerial is tuned to resonate at 75 MHz and provision is made for access to use a trimming tool, Ref.No.10C/749, for this purpose.

14. The glide slope aerial is a Type 238 suppressed aerial mounted in the leading edge of the starboard main plane, between ribs 6B and 7A.

### **Power supplies**

15. The 28V d.c. supplies required for the operation of the V.O.R., I.L.S. and marker receivers is derived from busbar PP7 via fuse No.167. The supply to the marker receiver is controlled by the ON/OFF switch on the pilot's starboard coaming panel. The supplies to the junction box for the V.H.F. and glide slope receivers and the navigation unit are switched by a relay in the E.C.P. This relay is controlled by the on/off switch of the VOL. control on the NAV. control unit. One of the contacts on this relay switches the 26V 400 Hz a.c. supply for the synchros in the R.M.I.'s (Sect.6, Chap.4 and 11). A test socket for the 28V d.c. supply is located adjacent to the forward upper corner of the cabin entrance door. This socket is energized when the relay contacts are closed (Sect.6, Chap.11). This socket also serves as a power source for the V.O.R./I.L.S. 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. 16. Components and cables should be checked periodically for damage. General servicing is straightforward and the removal and assembly of equipment should not present undue difficulties. Servicing information on the equip-∢ ment is contained in A.P.116B-0407-1. For repair of 1.L.S. aerial covers refer to A.P.101B-0400-6, Cover 1, Chap.3, para.12.

### Note . . .

General

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

### Interconnecting box, Type M7A

17. The following modification must be carried out before installing a new I/C box of this type. At the resistor card inside the box:-

(1) Fit and solder a 1 k-ohm resistor Ref. No. 5905-99-012-8491 at positions R1 and R4.

(2) Fit and solder a 200-ohm resistor Ref. No. 5905-99-012-8474 at position R2.

(3) Fit and solder a 240-ohm resistor Ref. No. 5905-99-012-8476 at position R3.

(4) Label the box in a similar manner to the unserviceable item.

### Interconnecting box, Type M8

18. The following modification must be carried out before installing a new I/C box of this type. At the tag board inside the box:-

(1) Fit and solder a 33-ohm resistor at positions R1, R2 and R3.

(2) Label the box in a similar manner to the unserviceable item.

# house to set TABLE 11 anno 3 1 St. E. E. E. E.

Connectors

CONNECTOR V.O.R./I.L.S. No.1 EG7.82.1433         CONNECTOR V.O.R./I.L.S. No.2 EG7.82.1435         continued           TERMINATION         PIN         CABLE         PIN         CABLE         PIN         CABLE         PIN         Cambra Cable         PIN						COMMECTOR							
Item indicatorInMissonAMaster indicator CL $11$ MissonB $31$ MissonC $23$ MissonC $23$ MissonC $23$ MissonC $23$ MissonC $24$ MissonC $24$ MissonC $24$ MissonC $24$ MissonC $24$ MissonC $24$ MissonC $25$ MissonC $25$ MissonC $25$ MissonC $25$ MissonC $24$ MissonC $24$ MissonC $24$ MissonC $25$ MissonC $25$ MissonC $26$ MissonC $26$ MissonC $27$ MissonC $28$ MissonC $28$ MissonC $10$ MissonC $11$ MissonC $12$ MissonC $13$ MissonC $14$ MissonC $16$ MissonC $16$ MissonC $16$ MissonC $16$ </th <th>CONNECTOR</th> <th>v.0</th> <th>.R./I.L.S. No.</th> <th>.1 EG</th> <th>7.8</th> <th>2.1433</th> <th>CONNECTOR V.O.F</th> <th></th> <th>L.S.</th> <th></th> <th></th> <th></th> <th></th>	CONNECTOR	v.0	.R./I.L.S. No.	.1 EG	7.8	2.1433	CONNECTOR V.O.F		L.S.				
$\begin{array}{ c c c c c c c c c c c c c c c c c c c$	TERMINATION	PIN	CABLE	PIN		TERMINATION	TERMINATION	PIN			PIN	1	TERMINATION
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	not be a stable of the stable	21	NMS20	А	٦		Γ	н			А		Master indicator CL
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $		34	NMS20	В	1			S			B		Type 'E' G4B Mk.7
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$	East and a manufacture of a	33	NMS20	С	. 1			К			С	}	
2     NMS20     E     Radio fuse and relay box.     relay box.     relay box.     M     MMS20     E     J       Backplate junction box EJR-21R-1 Cannon plug     27     N20     J     V.O.R./I.L.S. 1A     B     NHS20     C     T     Master indicator CL Type 'E' GB Mk.7       Backplate junction box EJR-21R-1 Cannon plug     27     N20     J     V.O.R./I.L.S. 1A     V.O.R./I.L.S. 2C     Master indicator CL Type 'E' GB Mk.7       Cannon plug     28     N20     L     V.O.R./I.L.S. 1A     V.O.R./I.L.S. 1A     NMS20     E     Plug V.O.R./I.L.S. 2C       0. B.S. and devia- 113     NMS20     C     NMS20     C     NMS20     C       16     NMS20     F     V.O.R./I.L.S. 1B     Radio fuse and relay box UK-AN     MMS20     F       0. B.S. and devia- 113     NMS20     F     V.O.R./I.L.S. 1B     Radio fuse and relay box UK-AN     B     NMS20     C       0. B.S. and devia- 13     NMS20     F     N     N/O.R./I.L.S. 3A     Radio fuse and relay box UK-AN     B     NMS20     C       0. B.S. and devia- 13     NMS20     F     N     N/O.R./I.L.S. 3B     Radio fuse and relay box UK-AN     B     N/S20     C       0. R.S. and devia- tion indicator     N     N/O.R./I.L.S. 1B     Radio fuse and relay box UK-AN<	Sec. 2. (1997) - 1997	23	NMS 20	D			Radio fuse and	R		N20	D		
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$		2	NMS20	Ε	i	Radio fuse and	relay box UK-AN	М		NMS20	E	J	
Backplate junction box EJB-21B-1 Cannon plugN20G 27WA20WA	至此尽道。5	1	NMS20	F	1.1	relay box.		в		NMS20	Δ	٦	Master indicator Cl
Backplate junction box EJB-21B-1 Cannon plug $25$ N 20.H.V.0.R./I.L.S. 1A $17$ NMS20C $17$ N20D $17$ N20D $17$ N20D $17$ N20D $17$ N20D $17$ NMS20E $17$ NMS20A $10$ NMS20B $18$ NNS20C $138$ NMS20C $110$ NMS20B $18$ NMS20C $138$ NMS20 $10$	NOTTANTNET	3	N 20	G	naľ	UK-AN socket	V.O.R./I.L.S.2	11			В		
Backplate junction       27       N20       J         bx EJB-21B-1       32       N20       K         cannon plug       28       N20       K $4$ socket 4 //       29       N20       M         v.o.r./1.t.s.1       17       NMS20       A         10       NMS20       B       0.8.S. and devia-       F       H       N20       1         13       NMS20       C       0.8.S. and devia-       F       H       N20       1         14       NMS20       E       15       NMS20       E       F       NMS20       1         15       NMS20       E       15       NMS20       E       F       NMS20       1       Rédio magnetic         16       NMS20       E       15       NMS20       E       F       NMS20       2       Cannon socket       V.o.R./1.L.S. 3       Cannon plug       Cannon plug       Cannon plug       Cannon plug       NMS20       F       No.R./1.L.S. 3       Radio fuse and relay box UK=AN       J       N20       1       Radio magnetic       indicator       indicator       indicator       indicator       indicator       indicator       indicator       indicator       indicat		25	N20.	Н.	.6.	V.O.R./I.L.S. 1A		-			C	- 41	) F
box EJB-21B-1 Cannon plug $\triangleleft$ socket $4 \rightarrow$ v.o.r./i.t.s.1 17 NMS20 A 10 NMS20 B 10 NMS20 C 13 NMS20 C 13 NMS20 C 14 NMS20 F 16 NMS20 g 20 N20 T 19 N20 U 0.B.S. and devia- tion indicator $20$ N20 T 19 N20 U 0.B.S. and devia- $19$ N20 U 0.B.S. and devia- $19$ N20 U 19 N20 U 0.B.S. and devia- $19$ N20 U 19 N20 U 0.B.S. and devia- $19$ N20 U 19 N20 U 10 N20 E 10 N20 C 10 N20 C 119 N20 U 19 N20 V 0.R./1.L.S. 10 19 N20 V 0.R./1.L.S. 10 19 N20 V 0.R./1.L.S. 3H 19 N20 N2 H 19 N20 H 19	Backplate junction		N20	J	8			Т				11	1 - 3
Cannon plug 4 socket $4v.o.r./I.L.S.117$ NMS20 A 10 NMS20 B 18 NMS20 C 13 NMS20 C 13 NMS20 C 14 NMS20 E 15 NMS20 F 16 NMS20 F 16 NMS20 G 20 N20 T 19 N20 U 0.B.S. and devia- tion indicator $20$ N20 T 19 N20 U 0.B.S. and devia- tion indicator $19$ N20 U 0.B.S. and devia- $19$ N20 U 10 NMS20 Z 10 NMS20 Z 			N 20	К	3			F				- 51	V.O.R./1.L.S. 20
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	Cannon plug		N20	L	8		-			420	-	11	
V.O.R./I.L.S.117 10 NMS20 NMS20 13 NMS20 13 14 15 16 0.R.S. and devia- 16 1917 NMS20 RNMS20 R 10 13 16 16 17 1917 NMS20 R 16 1717 NMS20 R 16 16 17 1917 NMS20 R 16 16 17 1917 NMS20 R 16 16 17 1917 NMS20 R 16 16 17 1917 NMS20 R 16 16 17 1917 NMS20 R 16 16 17 1917 NMS20 R 16 16 17 1917 NMS20 R 16 16 17 1917 NMS20 R 16 16 17 1918 NMS20 R 16 16 17 19 17 1918 NMS20 R 16 16 17 19 17 1918 10 10 10 10 10 10 10 10 10 11 11 11 12 11 12 13 14 14 14 14 14 14 14 15 16 <b< td=""><td></td><td>29</td><td>N 20</td><td>м</td><td>1</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></b<>		29	N 20	м	1								
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	V. O. R. / L. L. S. 1				-								
$\begin{array}{c c c c c c c c c c c c c c c c c c c $					18		CONNECTOR	V.0.	.R./	1.L.S. N	10.3 E	G7.8	32.1437
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$										CABLE	PIN		TERMINATION
$\begin{array}{c c c c c c c c c c c c c c c c c c c $						0.B.S. and devia-	0.R./1.L.S.5A	н		N 2 0	1	1	Radio magnetic
$\begin{array}{c c c c c c c c c c c c c c c c c c c $					1	tion indicator		А		NMS20	2	345	indicator
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	0.042				ì	Cannon socket		С		NMS20	3	}	(navs)
$\begin{bmatrix} 16 & NMS20 & g \\ 20 & N20 & T \\ 19 & N20 & U \end{bmatrix} = \begin{bmatrix} Radio fuse and \\ relay box UK-AN \\ plug V.O.R./I.L.S.3 \end{bmatrix} = \begin{bmatrix} N & N20 & C \\ P & N20 & D \\ J & N20 & E \\ K & N20 & F \\ Cannon socket \\ V.O.R./I.L.S. 1B \end{bmatrix} = \begin{bmatrix} N & N20 & C \\ P & N20 & D \\ J & N20 & E \\ K & N20 & F \\ R & N20 & J \\ R & N20 & K \\ R & R & R \\ R & R & R \\ R & R & R \\ R & R &$		_		F	- 11	V.O.R./I.L.S. 18		G		N 20	4	10	Cannon plug
$\begin{bmatrix} 20 & N20 & 1 \\ 19 & N20 & U \end{bmatrix} \xrightarrow{relay box UK-AN}{plug V.0.R./I.L.S.3} \xrightarrow{J}{D} \underbrace{N20 & 1}{D & NMS20 & 2} \\ plug V.0.R./I.L.S.3 \xrightarrow{D} NMS20 & 2 \\ NMS20 & 3 \\ NMS20 & 3 \\ NMS20 & 3 \\ NNS20 & 3 \\ NNS20 & 3 \\ NNS20 & 3 \\ Cannon plug \\ Socket 3 \\ V.0.R./I.L.S. 1C \\ V.0.R./I.L.S. 1C \\ F & NMS20 & 3 \\ Cannon plug \\ Socket 3 \\ V.0.R./I.L.S. 1C \\ F & NMS20 & 3 \\ Cannon plug \\ Socket 3 \\ V.0.R./I.L.S. 1C \\ F & NMS20 & 5 \\ U.0.R./I.L.S. 3B \\ F & NMS20 & 5 \\ V.0.R./I.L.S. 3B \\ F & NMS20 & 5 \\ Cannon plug \\ Socket 3 \\ V.0.R./I.L.S. 1C \\ F & NMS20 & 5 \\ V.0.R./I.L.S. 3B \\ F & NMS20 & 5 \\ V.0.R./I.L.S. 3B \\ F & NMS20 & 5 \\ Cannon plug \\ F & NMS20 & 5 \\ V.0.R./I.L.S. 3B \\ F & NMS20 & 5 \\ V.0.R./I.L.S. 3B \\ F & NMS20 & 5 \\ V.0.R./I.L.S. 3B \\ F & NMS20 & 5 \\ V.0.R./I.L.S. 3B \\ F & NMS20 & 5 \\ V.0.R./I.L.S. 3B \\ F & NMS20 & 5 \\ F & NMS$							Radio fuse and	в		NMS20	5	_ ·	V.O.R./I.L.S.3A
$\begin{bmatrix} 19 & N20 & U & 1 & plug V.0.R./I.L.S.3 & D & NMS20 & 2 \\ Radio magnetic indicator (navs) & F & NMS20 & 3 \\ D & N20 & E & Backplate junction box EJB-21B-1 & K & N20 & 4 \\ Cannon plug & E & NMS20 & 5 & V.0.R./I.L.S.3B \\ Cannon socket & M & N20 & H \\ V.0.R./I.L.S. 1B & L & N20 & J \\ R & N20 & K & V.0.R./I.L.S. 1C & V.0.R./I.L.S. 1C \\ \end{bmatrix}$							relay box UK-AN	1		N 20	1	1	
NN20CPN20D0.B.S. and devia-JN20V.0.R./1.L.S. 1BN20FNN20FKN20KFKN		19	N20	U			plug V.O.R./I.L.S.3	D			2	0	Radio magnetic
PN20Dbackplate junction0.B.S. and devia-JN20Ebox EJB-21B-1KN204Cannon indicatorKN20FKN20FSocket 3Cannon socketMN20HV.O.R./I.L.S. 1BLN20JRN20K	Г	N	N 2 0	С	٦	Destable in the line line line line line line line lin		F				10	
0.B.S. and devia- tion indicatorJN20ECannon plugENMS205V.O.R./I.L.S. 3Btion indicatorKN20FCannon plugENMS205V.O.R./I.L.S. 3BCannon socketMN20HV.O.R./I.L.S. 1CV.O.R./I.L.S. 1CV.O.R./I.L.S. 1CV.O.R./I.L.S. 1BLN20KV.O.R./I.L.S. 1CV.O.R./I.L.S. 1C		P	N20	D	- 1			ĸ				-sfi	
tion indicator $K$ N20 F Cannon socket $M$ N20 H V.O.R./I.L.S. 1B $L$ N20 J R N20 K R N20 K	0 B S and devia-	J	N20	Ε	1.1			E				8.0	
Cannon socket M N20 H V.O.R./I.L.S. 1C V.O.R./I.L.S. 1C R N20 K	AND'S & ST A. ARM WARTED	К	N20	F	ł			1				-84	V. 0. 8.71. E. S. 70
V.O.R./I.L.S. 1B R N20 K R N20 K	the trees of the barrent of the	M	N20	н			-	L			0	51.15	
R N20 K double a down on		1			1	V.O.R./I.L.S. 10							
		R	N20	к		a share							
	L	S		L				vo	P /		0 H F	67 9	1 1139

# CONNECTOR V.O.R./I.L.S. No.2 EG7.82.1435

TERMINATION	PIN	CABLE	PIN	TERMINATION
	Гс	NMS20	A	Muterray and Land and
	E	NMS20	В	Backplate junction
Radio fuse and	J	NMS20	D	box EJB-21B-1
relay box UK-AN	L	NMS20	Ε	Cannon Plug
socket	A	NMS20	N. H.o.	socket 5
V.O.R./I.L.S.2	G	NMS20	J	V.O.R./I.L.S. 24
	N	N20	К	
	P	N 20	L.	1.00 \$00,000

continued...

### CONNECTOR V.O.R./I.L.S. No.4 EG7.82.1439

TERMINATION	PIN	CABLE	PIN	TERMINATION
	Гн	N 2 0	1	Radio magnetic
	Α	NMS20	2	indicator (pilot's)
	С	NMS20	3	Cannon plug
	G	N20	11.4.0.1	V.O.R./1.L.S.4A
Radio fuse and	B	NMS20	5 11.	TERMINATION
relay box UK-AN	1 1	N 2 0	1 7	
plug V.O.R./I.L.S.4	D	NMS20	2	Radio magnetic
atercom cunction	F	NMS20	3	, indicator (pilots)
T=6808 52, xo	ĸ	N20	Ц	Cannon plug
	F	NMS20	5	V.O.R./I.L.S.#B
	LL	N 2 0	6 _	

### TABLE 1 Connectors - continued

00005070		R./I.L.S. N	. 5 567	82 1881	CONN	ECTOR	V.O.R.	/I.L.S.	No.7 EG7.	82.1445
TERMINATION	R V.O. PIN	CABLE	PIN	TERMINATION	TERMINATION		PIN	CABLE	PIN	TERMINATION
TERMINATION		N20	1 ]	9 8017A01MR3T	Intercomm. J.B.	1	A	N 20	3624/4]	
	2	N20	2		V.O.R./I.L.S.7	ŀ		1 1 - 3.70		A.E.O. Selector switch
1.1. RU 601 000 191 201	3	N20	3		Marker backplale	1	٨	N 20	362473	
star te mer a sar A	4	N20	4		J.B. Common plug	-		11.323	S 8 5	Intercemm. J.S.
	5	N20	5		Secket 1	1	C,	N20	D .	V.0. P. /1. L.S. 7
a dan sata	6	N20	6		V.O.E./1.L.S.7					
	7	N20	7		CON	NECTO	R V.O.R.	/1.L.S.	No.8 EG7.	82.1447
the production of the product of the	8	N20	8		TERMINATION		PIN	CABLE	PIN	
A REPORT OF A REPORT	10	N20	10				ΓA		Com	
000	11	N20	11				в	N20	BL-L	<ul> <li>Best and shell a star</li> </ul>
(3) S. U. B. C. S. D. B. S.	12	N20	12		Marker backplate		C	N20	AM-L	
1	14	N20	14		junction box		D	N20		Pilot's flying panel
Backplate	15	N20	15	Navigation	Type EJB-21C		E	NMS20	MED	guick-release tags
junction box	27	N20	27	control unit	Cannon plug socke	1 2	F	NMS20	SEN-E	V.O.R./I.L.S.8
EJB-21B-1	28	N20	28	Туре 7430м	V.O.R./I.L.S.8		н	N20	E25	1.
Cannon plug	29	N20	29	Cannon socket	1.0.1.7 112.010		J	NMS20	SEN-HI	
socket 2	33	N20	33	V.O.R./I.L.S.5A			к	N20	TEST .	
V.O.R./I.L.S.5	34	N20	34	nd gebeng werg an eine gedanne werde noche			- N	052M	0.00	
	35	N20	35		n sockel			MS20		00 4880
polio nonmell	36	N20	36			NECTO			No.9 EG7.	
ALC: NO REPORT OF A	37	N20	37		TERMINATION			CABLE	31	TERMINATION
	38	N20	38		Backplate junction			oaxial		essure bulkhead free
is former in the	39	N20	39		Type EJB-21B-1 Car				SO	ocket V.O.R./I.L.S.9
the state of the state of	41	N20	41		socket 7 V.O.R./I		6 3			
terlet correction	42	N20	42							
	43	N20	43		CONN	ECTOR	V.O.R.	1.L.S. 1	Ho.10 EG7	.82.1451
	44	NMS20	44		TERMINAT	ION		CABLE		TERMINATION
	48	N20	48		Marker backplate	junct	ion box		Pressure	bulkhead free socket
	49	N20	49		Type EJB-21C Cann	on pl	ug	coaxial	V.O.R./1	.L.S. 10 .
	11.7	NMS20	A	V/R switch	V.O.R./I.L.S.10					
	47	NM320	11 0 0	007128402						
Navigation control	47	NMS20	В	UK-AN socket	CON	FCTOR	V. O. R.	1.1.S. 1	NO.11 EG7	.82.1453
unit Type 7430M				V.O.R./I.L.S. 5B	TERMINATION			CABLE		TERMINATION
V.O.R./I.L.S. 5A					Backplate junctio	n box		coaxial	Pre	ssure bulkhead free
<ul> <li>bet eit with stream</li> </ul>					Type EJB-21B-1 st			i da la		ket V.O.R./I.L.S.11
CONNECTO	R V.O.	R./I.L.S. N	0.6 EG7	.82.1443	plug socket 6	, ai gii	A A			
TERMINATION	PIN	CABLE	PIN	TERMINATION	V.O.R./I.L.S. 11	83.030				
Backplate junction	Α	NMS20	A	Voice/range switch	3B-21B-1					
box E.IB-21B-1	в	NMS20	В	UK-AN socket				03,234		RALES DON DREAM
Cannon plug socket			_	V.O.R./I.L.S.6A		ECTOR	V.O.R.		No.9A EG7	
1 V.O.R./I.L.S.6	С	N20	в	Intercomm. junction	TERMINATION			CABLE		TERMINATION
Voice/range switch	С	NMS20	A	box UA 6043-7	Pressure bulkhead			coaxial		starboard wing
V.O.R./I.L.S.6A				Cannon socket	free socket					free socket
			_	V.O.R./I.L.S. 68	V.O.R./I.L.S. 9A					V.O.R./I.L.S. 9A

TERMIN ATION

Inner starboard

V.O.R./I.L.S.16

V.O.R./I.L.S. 17

wing rib 6

free socket

CONNECTOR V.O.R./I.L.S. No.15 EG7.82.901

CONNECTOR V.O.R./I.L.S. No.16 EG7.82.902

CABLE

coaxial

#### TABLE 1 **Connectors** - continued

#### CONNECTOR V.O.R./I.L.S. No.10A EG7.82.899

CONNECTOR V.O.R/I.L.S. No.11A EG7.82.895

TERMINATION	CABLE	TERMINATION	TERMINATION	CABLE	TERMINATION
Pressure bulkhead	coaxial	Marker aerial	Inner starboard wing	coaxial	Starboard wing
free socket		free socket	rib 6 free socket		root free socket
V.O.R./I.L.S. 10A	,	V.O.R./I.L.S. 10A	V.O.R./I.L.S. 15		V.O.R./I.L.S. 15

V.O.R./I.L.S. 11C

TERM IN AT I ON	CABLE	TERMINATION	
Pressure bulkhead	coaxial	Frame 29 bulkhead	CC
free socket		free socket	TERMINATION
V.O.R./I.L.S. 11A		V.O.R./I.L.S. 11A	Outer starboard
CONNECTOR	V.O.R./I.L.S. No. 1	L1B EG7.82.896	wing rib 2

TERMINATION	CABLE	TERMINATION				
Frame 29 bulkhead	coaxial	Balance unit				
free socket		Type 133-LRU-14A				
V.O.R./I.L.S. 11B		V.O.R./I.L.S. 11B				

CONNECTOR	VAD	/1 1	C N	440	E07 00	007	
LUNNELIUK	¥ . U. R	-/   -	.a. No.	110	r (s/ . n/	. 07/	

.R./I.L.S. No. 11	C EG7.82.897	CONNECTOR	R V.O.R./I.L.S. No.17 EG7	7.82.903
CABLE	TERMINATION	TERMINATION	CABLE	TERMINATION
coaxial	Localizer	Glide path aerial	coaxial	Outer starboard
	aerials free	Type 238 free		wing rib 2
	socket	socket		free socket

V.O.R./I.L.S. 17

free socket

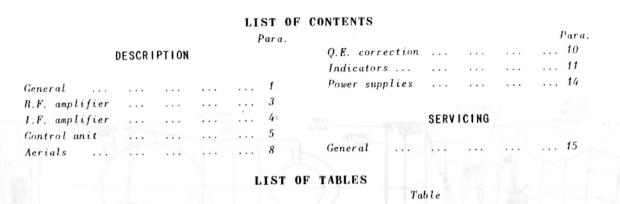
V.O.R./I.L.S. 16

TERMINATION Balance unit Type

V.O.R./I.L.S. 11C

133-LRU-14A free socket

#### 



Connectors ... ... ... ... ...

LIST OF ILLUSTRATIONS

1

Fig.

Radio Compass A.R.I. 5877 installation 1

▲Note...Combined theoretical/routeing diagrams for this installation are contained in A.P. 101B-0417-10 (Servicing Diagrams Manual).

#### DESCRIPTION

#### General

1. A Marconi Type AD722 sub-miniature radio compass (A.R.I.5877) is fitted to the aircraft. The installation is also known as Automatic Direction Finding (ADF) and is identified thus on the intercomm.station boxes. The system is a navigational aid which gives an indication of the bearing of a radio transmitter to whose frequency the receiver is tuned. The receiver operates on frequencies in the range from 200 kHz to 1700 kHz. 2. The installation comprises a Type A8281 R.F. amplifier, a Type A8282 I.F. amplifier, a Type 8283 control unit, a loop aerial, a sense aerial and three indicator units. Detailed information on the equipment is given in A.P. 116B-0102-16.

#### R.F. amplifier

3. The R.F. amplifier is located on a Type 8288 mounting tray, fitted on a bridge over the I.F. amplifier, under the navigator's table. The amplifier contains the R.F. circuits and balanced modulator sections of the receiver. Tuning of the receiver is effected by a flexible cable drive from the control unit which transmits the operation of the tuning handle on the control unit to the permeability-tuning system in the R.F. amplifier. Changes of frequency band are made by a motor-driven switch which is controlled by the selector switch in the control unit. The connecting cables and the flexible drive are terminated on the mounting tray and connect to the amplifier when it is installed on the tray by two mating plugs and sockets and a drive coupling.

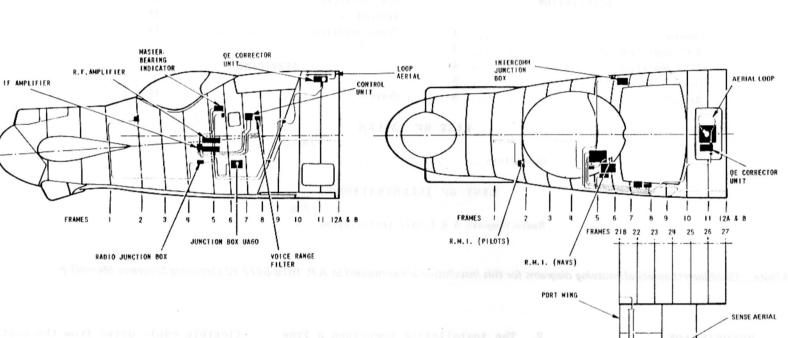
#### I.F. amplifier

4. The I.F. amplifier is located on a

4.P. (018-0412-18, Sect.6, Gap 6 a.C.56 March

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The second second

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8281 R.F. sepilifies: a free 88582 1 F. mplifier, a Type 8283 control unit, a oop merial, a sense anital and three adicator units. Becalled technication in the equipment is given in 5 F 1169-102-16.

R.F. amplific

(a) The R.F. mephilies is invoiced on a Syne 8288 mounting trac. [350 of on a bridge over the L.F. amplifies, ander the navigator's table. En amplifies contains the R.F. currents and brighted.

Electible calls drive the control and which transmits the operative of the function build control which to the accuracial free and his control which the k C angle of a sector drive set of band are water as a metalocal time is a tremation in the routed and the drive set of the tail ender of a set of the set of the set of the angle of the state of the set of the angle of the set of the set of the set of the set of the tail endered of the state of the set to be set of the state of the set of the tail of the set of the state of the set of the set of the set of the state of the set of the set of the set of the state of the set of the set of the set of the state of the set of the set of the set of the state of the set of the set of the set of the state of the set of the set of the set of the state of the set of the set of the set of the set of the state of the set of the

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### FIG. 1 RADIO COMPASS A.R.I. 5877 INSTALLATION

Type 8289 mounting tray, fitted on a shelf under the navigator's table, inboard of the V.O.R./I.L.S. receivers. The amplifier contains the I.F. amplifier stages, detector and A.F. amplifier and output stages. Connections to the unit are made via the mounting in a similar manner to that on the R.F. amplifier, using a single plug and socket. An additional socket, normally fitted with a blanking plug, is provided for the connection of test equipment to the installation.

### Control unit

5. The control unit is mounted on a panel on the port wall at the navigator's station. Tuning of the receiver is achieved by turning the cranked handle below the tuning scale; this is coupled to a flexible drive cable which is connected via the mounting tray to the R.F. amplifier to actuate its permeability-tuning mechanism. The fre-✓ quency bands of 200 to 415 kHz. 415 to 840 kHz and 840 to 1700 kHz are selected by operation of a switch lever which projects through the panel above the tuning scale. When the lever is operated, the appropriate scale is displayed (calibrated in decimals of MHz) and the band-selector switch in the R.F. amplifier set as required.

6. The GAIN control operates on the A.F. output from the detector in the I.F. amplifier before it is introduced to the A.F. output stage. In operation, the ADF volume controls on the station boxes should be set to their maximum positions and the volume of the output

### RESTRICTED

adjusted, as required, by means of the GAIN control. The TUNE meter is incorporated to give an indication of signal strength; the tuning control is adjusted to give maximum deflection of the needle. When the ADF/REC switch is set to ADF, the receiver will function as an automatic direction finding equipment. When REC is selected, the equipment functions as a conventional receiver and no bearing information is displayed. The C.W./R.T. switch selects reception of keyed C.W. signals or telephony signals. A Marconi Type 1275 filter unit is incorporated to permit the selection of voice or range signals or both signals from a radio range transmitter. This unit is mounted adjacent to the control unit.

7. The tuning scale and panel engravings are illuminated by a single lamp situated below the tuning scale window. Control of the intensity of illumination is effected by the setting of a push-button annotated DIM PUSH. A spare lamp is provided and housed in a holder marked SPARE.

#### Aerials

8. Two aerials are fitted as part of the installation. A Type 8280 loop aerial is housed in the access hatch of the upper equipment compartment. It is a fixed crossed-coil loop aerial, wound on a ferrite core and enclosed in an insulating case. Connections to the ends and commoned centre-tap of the loops are brought out via a six-pole plug in the centre of the case.

9. The sense aerial is located on the

upper surface of the port main plane between the fuselage and the engine. The aerial is a rod mounted parallel to the longitudinal axis of the aircraft on three fibreglass insulators. Connection to the aerial is fed through the forward insulator.

#### Q.E. correction

10. Correction of quadrantal errors (Q.E.), i.e. errors in the polar response of the loop aerial due to circulating R.F. currents in the aircraft structure, is made by the use of a Q.E. corrector unit (Ref.No.10D/20169). This is mounted adjacent to the loop aerial in the access hatch. It consists of a preset balanced-L inductive attenuator which is inserted in the leads from one of the aerial loops. The connector between the Q.E. corrector unit and the master bearing indicator must not be reduced in length under any circumstances.

#### Indicators

11. Three indicators are included in the system. A Type 9551 electrical indicator and a Smiths Type 21 RNA/CP/1radio magnetic indicator (R.M.I.) (Ref. No.6A/18460) are fitted on the navigator's instrument panel. A similar

R.M.I. is fitted at the bottom lefthand of the pilot's flight instrument panel, below the omni-bearing selector.

12. The Type 9551 indicator operates as the master bearing indicator. It displays the bearing of the radio transmitter relative to the aircraft heading. This bearing information is relayed to the R.M.I.'s by means of a synchro transmission system.

13. The R.M.I. has two pointers which move over the face of a rotating compass card. The compass card is driven by an integral servo system which is supplied with information from the G4B compass system (Sect. 7, Chap. 4) and gives an indication of the magnetic heading of the aircraft against a fixed lubber mark at the top of the bezel. The magnetic bearing of the transmitter to which the radio compass is tuned is indicated by a red single-bar pointer. The bearing of a V.O.R. transmitter is shown by a green two-bar pointer. Magnetic bearings of these transmitters are indicated with respect to the com-

pass card; relative bearings are shown by the relationship of the pointers to the lubber mark.

#### Power supplies

14. The 28V d.c. power supply required for radio compass is obtained from busbar PP8 in the E.C.P. via fuse No.175. The supply is controlled by the ON/OFF switch on the control unit. The 26V 400 c/s a.c. supply for operation of the indicators' synchro systems is obtained from a transformer in the radio fuse and relay box (Sect.6, Chap.4 and 11).

#### 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

15. Components and cables should be checked periodically for damage. General servicing is straightforward and the removal and assembly of equipment should not present undue difficulties. Detailed servicing of individual units is contained in A.P. 116B-0102-16.

## TABLE 1

### Connectors

CONNECT	OR	Q.A.	EG7.	82.429

Termination	Pin	Cable	Pin	Termination
Q.E. corrector unit plug Q.A.	$ \left\{\begin{array}{c} 1\\ 2\\ 4\\ 5 \end{array}\right. $	RPC1533 RPC1533 RPC1533 RPC1533	1 2 4 5	Aerial loop socket Q.A.

Pin 3 is connected to screening of pins 1 & 2. Pin 6 is connected to screening of pins 5 & 4.

### CONNECTOR Q.B. EG7.82.431

Termination	Pin	Cable	Pin	Termination
Pressure bulkhead plug Q.B.	A B D E	RPC1533 RPC1533 RPC1533 RPC1533	1 2 4 5	Q.E. corrector unit socket Q.B.
Pin C is connected to screening of pins A & Pin F is connected to screening of pins D &	screenin Pin 6 is	connected to g of pins 1 & 2. connected to g of pins 4 & 5.		

### CONNECTOR Q.B.1 EG7.82.433

Termination	Pin	Cable	Pin	Termination
Bearing indicator Type 9551 socket - Q.B.1	1 2 3 4	RPC1533 RPC1533 RPC1533 RPC1533	E D B A	Pressure bulkhead socket Q.B.1

Pin 5 is connected to screening of pins 1, 2, 3 & 4.

### CONNECTOR Q.C. EG7.82.435

Termination	Pin	Cable	Pin	Termination
Mastar	1	BICC1534	QC/B	R.F. amplifier coax. socket yellow Q.C.B.
Master bearing indicator Type 9551 socket Q.C.	2 3 4	BICC1534 BICC1534 BICC1534	24 15 25	R.F. amplifier Q.C.A.
	_ 5	BICC1534	QC/C	R.F. amplifier coax. socket red Q.C.C.

CABLE	ASSEMBLY	0.0	SCSHO	127000/1
CADLE	ASSEMDLT	Q.D.	acana	12/090/1

Termination	Pin	Cable	Pin	Termination
R.F. amplifier Type A8281	-	UR64	-	Pressure bulkhead break Q.D.

### CABLE ASSEMBLY Q.D. SCSHQ 127090/2

Termination	Pin	Cable	Pin	Termination
Pressure bulkhead break Q.D.	-	UR64	-	Sense aerial

### CONNECTOR Q.E. EG7.82.439

Termination	Pin	Cable	Pin	Termination
Termination Control unit plug Q.E.	1       2       3       4       5       6       7       8	N20 N20 N20 N20 N20 NMS20 N20 NMS20 NMS20	1 2 3 4 14 18 6 8	Termination R.F. amplifier Q.E.
piug Q.E.	9 10 11 12 13 14 15	N20 N20 N20 N20 N20 N20 N20 N20	19 22 4 14 12 21 20	Q.E.

Pin 9 is connected to screening of pin 18. Pin 17 is connected to screening of pin 8.

### CONNECTOR Q.G. EG7.82.441

Termination	Pin	Cable	Pin	Termination
	6	N20	E25	
	7	N20	E25	
Control unit free	8	N20	E25	Electrical control
socket Q.G.	9	N20	R5 [	panel Q.G.
	10	N20	R5	
	11	N20	R5	

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### TABLE 1 Connectors - continued

# CONNECTOR Q.H. EG7.82.443

Termination	Pin	Cable	Pin	Termination
	[ 1	QMS20	10	10 A 10 A
	2	Q22	9	and the second
	3	Q22	9	enterna a cherc
	4	QMS20	7	allerand Add - Constantia
	5	Q22	24	States and the second
	6	Q22	25	
	7	Q22	13	
	9	Q22	20	
	10	Q22	12	
I.F. amplifier	11	Q22	21	R.F. amplifier
free socket <	12	Q22	15	> ring-tongue tags
Q.H.	15	Q22	5	Q.H.
	16	Q22	5 5	
	17	Q22	19	
	18	Q22	22	
	19	QMS20	8	
placethrow T	20	QMS20	18	
	21	Q22	23	
	22	Q22	4	
	23	Q22	4	
	25	QMS20	16	

Pin 14 is connected to screening of pin 1. Pins 4, 19, 20 & 25 are connected to screening of pin 24. Pin 11 is connected to screening of pin 10.

### CABLE ASSEMBLY CS5411/13 10HB/22132

Termination	Pin	Cable	Pin	Termination
1.2	1	N22	1 ]	T.B.3668/1
Voice range	4	N22	2	1.0.3000/1
filter 1	2	N22	14 1	R.F. amplifier
La construction de la constructi	. 3	N22	23	Type A8281
	Pins 2	and 4 are	linked	•

### CONNECTOR Q.K. EG7.82.447

Termination	P	in	Cable	Ident	Pin	Termination
Junction box tails Q.K.		3	14/.0076 14/.0076 14/.0076 14/.0076 14/.0076	White White White White White	1 2 3 4 6	Radio compass bearing indicator Cannon socket Q.K.

### CABLE ASSEMBLY Q.L. EG7.82.451

Termination	Pin	Cable	Ident	Pin	Termination
[	A	14/.0076	White	1]	R.M.I.
Junction	E	14/.0076	White	2	Nav's panel
box tails 4	C	14/.0076	White	3 }	free
Q.L.	в	14/.0076	White	4	Cannon socket
	D	14/.0076	White	5	Q.L.

### CABLE ASSEMBLY Q.L./144 EG7.82.449

Termination	Pin	Cable	Ident	Pin	Termination
	Α	14/.0076	White	1]	R.M.I.
Junction	E	14/.0076	White	2	Pilot's panel
box tails	С	14/.0076	White	3 }	free Cannon
Q.L./144	В	14/.0076	White	4	socket
L	D	14/.0076	White	5	Q.L./144

it is compared with the signal being trans-

mitted at that instant. The difference in frequency between the transmitted signal

and the signal being transmitted at the

time of reception is an indication of the

height of the aircraft above the ground.

The frequency of operation is in the 4200

to 4400 MHz band. The deviation of fre-

quency is 100 MHz on the 0 to 500 ft

range and 10 MHz on the 0 to 5000 ft

#### **RADIO ALTIMETER** Chapter 7

	LIST OF C Para.	CONTENTS	Para.
DESCRIPTION		Junction boxes	
General	1	SERVICING	
T/R unit Aerials	2 4	General	13
Control unit	5 8	REMOVAL AND ASSEMBLY	
Test facility Power supplies	9 10	Amplifier, Type 16089 T/R unit and waveguide horns	

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LIST OF ILLUSTRATIONS

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1

Table 1

Radio altimeter A.R.I.23172 installation .....

▲ Note ... Combined theoretical/routeing diagrams for this installation are contained in A.P. 101B-0417-10 (Servicing Diagrams Manual).

### DESCRIPTION

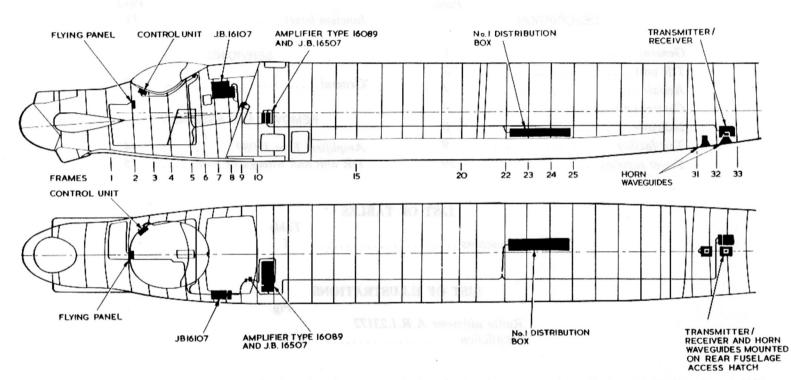
#### General

Mk.7 1. A radio altimeter (A.R.I.23172) installation is fitted to the aircraft. It gives an indication of the height of the aircraft above the ground in two range, i.e. 0 to 500 ft and 0 to 5000 ft. The installation comprises a T/R unit with associated aerials, an indicator and an amplifier coupling unit. Detailed information on the equipment is given in A.P.116B-0203-1.

### T/R unit

2. The T/R unit is mounted, together with the aerial system, on the rear fuselage access hatch. The unit transmits a frequency modulated signal downwards from the aircraft. The signal is reflected from the ground and enters the receiver where

range. UK RESTRICTED



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DESCRIPTION

Service and The

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nition read . Still a reaction a

tion on the equipment is given [] A P 116B-1207-1

### FIG. 1. RADIO ALTIMETER A.R.I. 23172 INSTALLATION

< CIRCUIT DELETED >

it is concerned with the signal being transmitted at this instant. The difference in frequency further by formation signal and the signal being transmitted signal time of recention is an indication of the versible of the aircraft above the ground. The frequency of operation is in the 4200 to 4604 Mife band. The deviation of frequency is 100 Mife or the 0 to 500 ft

The unit is located on a mounting ◀ 3. tray attached to the rear fuselage access hatch at frame 32. The T/R unit is an assembly of a chassis, a waveguide incorporating the transmitter, a receiver unit, and amplifying unit and a power unit, all assembled in a sealed cylindrical container. The container is pressurized with dry air or inert gas to a pressure of 5 lb/in<sup>2</sup> via two Schrader-type valves on the front panel. Connections to the aerials and external circuits are brought out via six plugs and sockets on the front panel. The panel also carries a further socket identified MONITOR for connection to a test set, and a desiccator.

#### Aerials

4. Both aerials are Type 16088 waveguide horns and are mounted on the rear fuselage access hatch. Connections are made to the T/R unit via coaxial cables. The aerials also incorporate switch and coupling units for connecting the delay cable used for test purposes.

### **Control unit**

5. This unit is mounted on the pilot's starboard coaming panel, outboard of the COMM. and NAV. control units.

6. An ON/OFF switch is located on the front panel and this controls the operation of relays in the T/R unit which switch the 28V d.c. and 115V a.c. power supplies. It also energizes a relay in the Type 16089 amplifier to control its power supply. The range switch, identified RANGE 500/5000, initiates the circuit changes necessary to the indicator and T/R unit for operation in the two range.

7. A limit selector switch is provided to select the height at which the warning lamp operates. The height selected is displayed in a window adjacent to the LIMIT SELR switch and may be 50, 100, 200, 300, 400, 500, 1000, 2000, 3000, 4000 or 5000 ft. The associated red warning lamp is mounted on the starboard edge of the pilot's flying panel, adjacent to the indicator. The lamp is lit when the aircraft height is 5 per cent less than that selected.

### Indicator

8. The Type 16094 height indicator is located in the lower starboard corner of the pilot's flying panel. It is a circular instrument, scaled from 0 to 500 ft, and having a pointer to indicate the height reading. At the end of each number of the scale there is a window through which an additional zero is visible when the 5000 ft range is selected. An OFF flag is also visible when the installation is not functioning correctly.

### Test facility

9. The TEST switch, when set to the TEST position, connects a 28V d.c. supply to the switch and coupling units in the T/R aerials. This causes solenoids to operate actuators which isolate the transmitter and receiver from the aerials and to connect a delay unit between the transmitter and receiver. The Type 16119 delay unit consists of a length of coaxial cable wound on a drum, mounted between the two aerials. When connected, this introduces a known delay in the system which results in an indication of 65 ft being given on the indicator.

### **Power supplies**

10. The 28 V d.c. supply is obtained from busbar PP4 via fuse No.250. The 115V 400 Hz a.c. supply is derived from ▶ busbar 1XB via fuse No.295. Both fuses are in the No.1 distribution box in the centre fuselage.

#### Junction boxes

11. Two junction boxes are incorporated in the installation; a Type 16107 in the cabin on the rearward face of the navigator's port control panel and a Type 16507 mounted on the floor at the port side of the upper equipment bay. The Type 16107 junction box serves as a distribution point for connections to and from the T/R unit and the other junction box with those from the control unit indicator and warning lamp. Dummy plugs, Type 106 and 107, are fitted to the junction box. The Type 106 plug is fitted to socket B and the Type 107 plug to socket H.

12. The Type 16507 junction box is fitted to a Type 16097 mounting and provides a means of a connection into the installation for the Type 16089 amplifier. The amplifier incorporates a counter and converts the frequency difference information from the T/R unit into a d.c. output proportional to aircraft height. This d.c. output is then transmitted to the indicator to provide height indication.

#### 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

13. Components and cables should be

(1) The base of point one accepted at balance is the second term of the deindex is the second term of the interpret of an second term of the first matter of an second term of the first of the second term of the term of the second term of the term of the second term of the second term of matter terms term in which there from the solution term interpret with the term of the solution term of the second term of the solution term of the solution terms of the solution term of the solution terms of the solution term of the solution term of the solution term of the solution terms of the solution term of the solution terms of the solution term of t

42. The Depter (4000) justicities equications as a state of an analysis of the state of the s

checked periodically for damage. General servicing is straightforward and the removal and assembly of equipment fitted in the cabin should not present undue difficulties. Servicing information is contained in A.P. 2533J.

#### **REMOVAL AND ASSEMBLY**

### Amplifier, Type 16089

14. To gain access to the amplifier re-

han di Gérardi Kana Kana Garangan

move the upper equipment bay access panel. The removal and assembly of the amplifier is then straightforward.

#### T/R unit and waveguide horns

15. To gain access to the T/R unit and waveguide horns open the rear fuselage access hatch. The removal and assembly of the unit is then straightforward.

(1) Sector assists and Prop. (2008) waves golds. (2008) and are meanined on the faulticatings groups barets. Commettions are reade to the U.S. and via cooxid gebins, Place sectain also paragonate switch and tractings while for paragonate states. Sector and for the paragonates.

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 This and is mounted on the platcurrented comming panel, publicated of the CO.MM. and NAV control active.

An OMOFF switch is located on the locat panel and this controls the operation of relays in the T/R unit which weites the locat end 1137 a.c. power supplies in the receptors a relay in the Type 16030 mapping to control by power supply. The operation statuted is power supply. The operation the control by post for operatory is over the control denotes because in the control of T/R with for operation is located.

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### TABLE 1

### Connectors

TERMINATION		CONNECTO	R R.A.1 EG7.8 CABLE	2.525 PIN	1	TERMINATION	TERMINATION	CONNE PIN	CTOR R.A.2A CABLE	EG7.82.531 - co	ntinued PIN	TERMINATION
	ſ	A	N20	Α -	1			Гĸ	M18C	Red/black	κ 🗌	
	·	В	N20	В	Jur	nction box		L	M18C	Black	L	
Distribution		С	N20	D		be 16507	Junction box	м	M18C	White	м	Pressure
box No.1		D	N 20	E		A.1A.	Type 16107	N	M18C	Yellow	N	bulkhead
UK-AN plug	ń	E	N20	В	Rac	dio altimeter	Mk.7 socket	10	M18C	Red/blue	0	Mk.7 plug
R.A.1		F	N20	А	tra	ans/rec Mk.7	R.A.2A	P	M18C	Grey	Р	R.A.2A
	10000	G	N20	D	fre	ee socket		Q	M18C	Red/whjte	Q	
		н	N20	E .	R./	A.1B		R	M18C	Red/yellow	R	
	5-6-6-6	- second and the						LS	M18C	Red/dark green	S	
		CONNECTOR	R.A.2 EG7.8	2.529								
TERMINATION	PIN	CABLE	IDENT		PIN	TERMINATION						
	A B	M18C M18C	Violet Orange		A B				CONNECTOR	R.A.3 EG7.82.533		
		M18C	Pink		č		TERMINATIO	N .		CABLE	т	ERMINATION
	D	M18C	Brown		D		Junction box 1	Гуре	Un	iradio 72	Transm	itter/receiver
	E	M18C	Red		E		16507 R.A.3				Type 1	6098 R.A.3
	F	M18C	Blue		F							
	G	M18C	Green		G							
Junction	н	M18C	Light gree	en	н	Pressure						

TERMINATION

TERMINATION

Pressure bulkhead

Mk.7 plug

R.A.5

PIN

A

В

С

D

### CONNECTOR R.A.2A EG7.82.531

Red/brown

Red/black

Black

White

Grey

Yellow

Red/blue

Red/white

Red/yellow

Red/dark green

TERMINATION	PIN	CABLE	IDENT
	A	M18C	Violet
	В	M18C	Orange
Junction box	С	M18C	Pink
Type 16107	D	M18C	Brown
Mk.7 socket	1 E	M18C	Red
R.A.2A	F	M18C	Blue
	G	M18C	Green
	н	M18C	Light green
	LJ	M18C	Red/brown

M18C

J

Κ

L

М

Ν

0 P

Q R S

32.531		
	PIN	TERMINATION
	Α	7
	В	
	С	Pressure
	D	bulkhead
	E	Mk.7 plug
	F	R.A.2A
	G	
	Н	
	J	

J

К

L

М

Ν

0

Ρ

Q

R

S

bulkhead

R.A.2

Mk.7 socket

#### Yellow M12C Red

White

Black

CONNECTOR R.A.4 EG7.82.535

CABLE

M12C

M12C

M12C

Junction box,	E	M12C	Blue	Ε		Control unit
Type 16107	F	M12C	Brown	, F		Type 16095
Mk.7 plug	G	M12C	Grey	G	7	Mk.7 socket
socket 2G R.A.4	н	M12C	Light green	н		R.A.4
	J	M12C	Green	J		
	к	M12C	Violet	К		
	Ŀ	M12C	Pink	L		
	м	M12C	Orange	М		

IDENT

PIN

Α

В

С

D

TERMINATION

TERMINATION

#### CONNECTOR R.A.5 EG7.82.537 PIN CABLE IDENT PIN

	OADEE	IDENI		LENGTHATION
Γ A	M4C	Red	A	Transmitter/
В	M4C	Yellow	В	receiver
] C	M4C	Blue	сſ	Mk.7 socket
D	M4C	Green	D	R.A.5

continued...

### RESTRICTED

box, Type

16507 Mk.7

plug R.A.2

### TABLE 1Connectors - continued

	.5A EG7.82	.539		CONNECTOR R.A.9 EG7.82.543						
TERMINATION	PIN	CABLE	IDENT	PIN	TERMINATION	TERMINATION	PIN	CABLE	PIN	TERMINATION
Junction box	Γ A	M4C	Red	ΑŢ	Pressure	Junction box	Γ A	мзс	271+	Termination block
Type 16107	В	M4C	Yellow	В	bulkhead	Туре 16107 -	B	M3C	earth	on flying panel
Mk.7 plug	1 c	M4C	Blue	C	Mk.7 socket	Mk.7 plug R.A.9	L C	M3C	low light	Q.R. tags R.A.9
socket 2F R.A.5A	D	M4C	Green	D	R.A.5A					
	CONN	ECTOR R.A	.7 EG7.82.	541						
TERMINATION	PIN	CABLE	IDENT	PIN	TERMINATION					
Series	Γ A	M6C	red	A 7			CONNECTOR	R.A.28	EG7.82.549	
	В	M6C	blue	В	Indicator	TERMINATION	PIN	CABLE	PIN TER	MINATION
Junction box	С	M6 C	black	С	Туре 16094	Radio altimeter	Γ A	N20	B ] Fwd. aeri	al switch and
Type 16107 R.A.7	1 D	M6C	green	D	Mk.7 socket	transmitter/receiver	в	N 2 0	A ∫ coupling	unit R.A.28A
	E	M6C	white	E	R.A.7	Mk.7 free plug R.A.2	28 C	N20	B ] Aft aeria	1 switch and
	F	M6C	yellow	F 🚽			D	N20	A _ coupling	unit R.A.28B

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