

Chapter 1

WIRELESS INSTALLATION

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Introduction

1. The wireless installation varies according to the modification standard of the aircraft, as follows:—

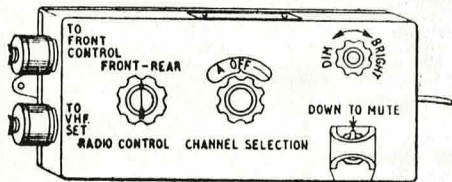
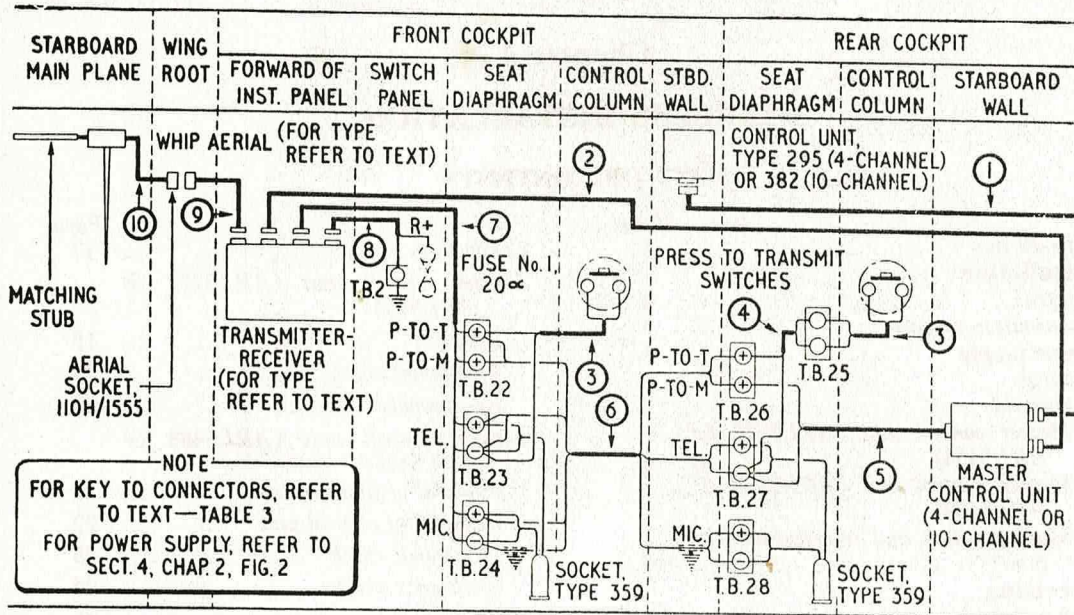
Mod. standard	Installation
Pre-Mod. H.39	ARI.5454
Post-Mod. H.39	ARI.5272
Mod. H.36 (with H.35 or H.37)	ARI.5489
Mod. H.111 (with H.35 or H.37)	ARI.5488

2. Only one of the installations listed in para. 1 will be fitted to individual aircraft,

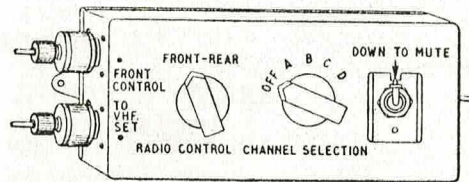
ARI.5454 and ARI.5272 are alternative four-channel installations, using the same connectors and control units. ARI.5489 and ARI.5488 are also alternative installations giving ten-channel facilities, but using different connectors and control units from those comprising the four-channel installations.

3. All installations provide V.H.F. communications, with two-way radio telephony on any one of the available frequencies; transmission and reception is on the same frequency, using one crystal per channel. Inter-communication facilities are also avail-

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**MASTER CONTROL UNIT
(10-CHANNEL)**



**MASTER CONTROL UNIT
(4-CHANNEL)**

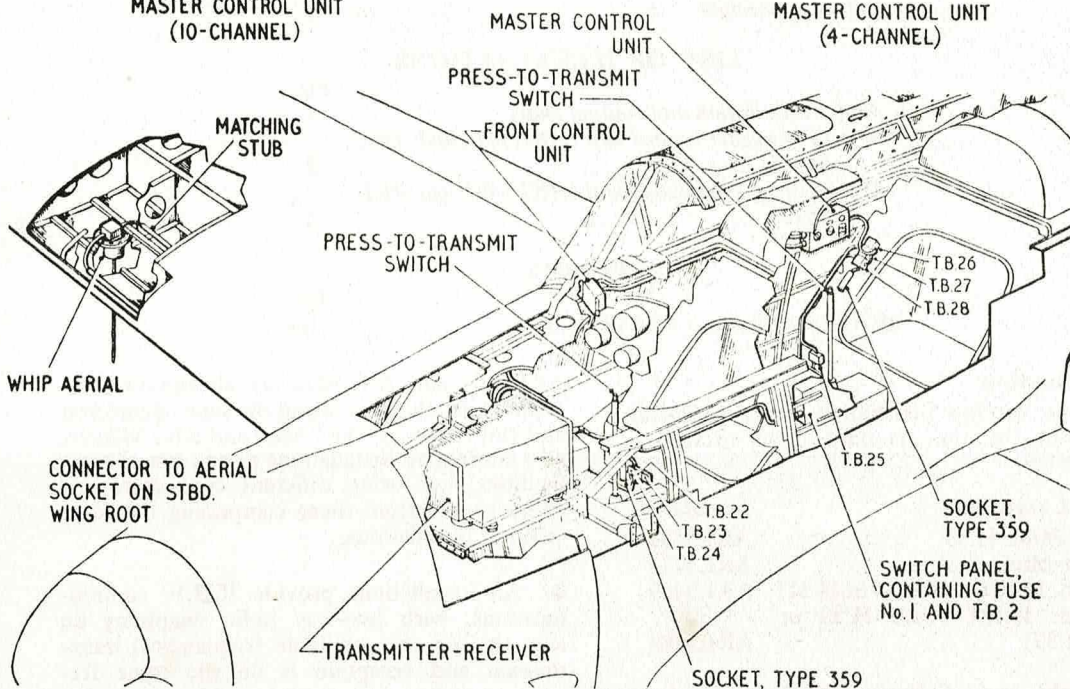


Fig. 1. Radio installation and routing chart

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able with each installation. The main features of the installations are summarized as follows:—

A.R.I.	T.R. unit	No. of channels	Frequency range Mc/s	Aerial Type
5454	1920	4	100—125	228
5272	1520	4	115—145	226
5489	1936	10	115—145	226
5488	1934 or 1985	10	100—125	228

From the above summary it will be seen that the T.R. 1936 and the T.R. 1934 are ten-channel versions of the T.R. 1520 and T.R. 1920 four-channel equipments respectively. The T.R. 1985 is a T.R. 1934 modified for 90 kc/s channel spacing, by the embodiment of an amplifier, Type 476 in place of the amplifier, Type 373. The associated publications are as follows:—

A.R.I. 5272 and		A.P.2538H, Vol. 1
A.R.I. 5454		(2nd edition)
A.R.I. 5488 and		A.P.2538HA, Vol. 1
A.R.I. 5489		

INSTALLATION

General

4. Connectors, terminal blocks and other equipment are located in the same positions for all installations, the arrangement being shown in *fig. 1*. The transmitter-receiver is mounted forward of the front instrument panel, with a control unit in each cockpit. The whip aerial is located in the leading edge of the starboard main plane, projecting downwards. For this aircraft the controller in the rear cockpit is a special unit (*para. 8 or 11*).

Transmitter-receiver

5. Access to the transmitter-receiver is obtained from the front cockpit. The mounting is located between the instrument panel and the firewall, on the aircraft centre line, and is hinged at the forward end to facilitate removal or fitting of the equipment. Lowering of the mounting is limited by two retaining straps at the rear, and is effected by pulling a release cable (also at the rear) to withdraw two spring-loaded plungers. A mounting tray, Type 873/1 (Stores Ref. 10AJ/52) for the main chassis of the T.R. 1520 or 1920, or Type 873/2 (Stores Ref. 10AJ/82) for the T.R. 1934, 1936 or 1985, is secured to the platform by four bolts and check washers. Bonding of the tray is effected by a flexible lead to the mounting.

WARNING...

IF THE VHF TRANSMITTER-RECEIVER IS CHANGED THE COMPASS MUST BE RESWUNG.

Power supply

6. The power supply is taken from the electrical system, through fuse No. 1 in the fusebox on the switch panel in the front cockpit. Details of the connections are given in Table 3, together with information on other connectors used in the installation.

Controls

General

7. With the exception of the control unit in the rear cockpit (*para. 8 or 11*), and the connectors (*Table 3*) all the units are standard items. A PRESS-TO-TRANSMIT push-switch is fitted to each control column

Master control unit (A.R.I. 5272 & A.R.I. 5454)

8. Located in the rear cockpit (*fig. 1*), this unit is identified as Part No. C1.R.143A (Stores Ref. 10L/251). Early aircraft may have a control unit, Part No. C1.R.49A, but the only difference between the two types is that the latter has a connector plug marked TO V.H.F. SET whereas on the former it is marked T.R. 1920.

9. Units forming the controller are mounted in a light-alloy box having a detachable backplate. The main components in the box are listed in *Table 1*; *fig. 2* shows the wiring arrangement.

10. Referring to *fig. 2*, it should be noted that switch C1.R.41ND, when selected to FRONT, transfers channel-selection facilities to the control unit in the front cockpit and removes them from the rear cockpit. When switch C1.R.41ND is selected to REAR, the channel selector switch (10F/16769) functions to give precisely the same method of remote control as that described in A.P. 2538H, Vol. 1, (2nd Edition), Part 1, Chap. 4.

TABLE 1

A.R.I. 5272 and A.R.I. 5454—main units in master control unit,
Part No. C1.R.143A

Description	Part No.	Stores Ref.
Guard, muting switch	 C1.N.451	—
Knob, cockpit selector switch		
Type 76	 —	10A/12813

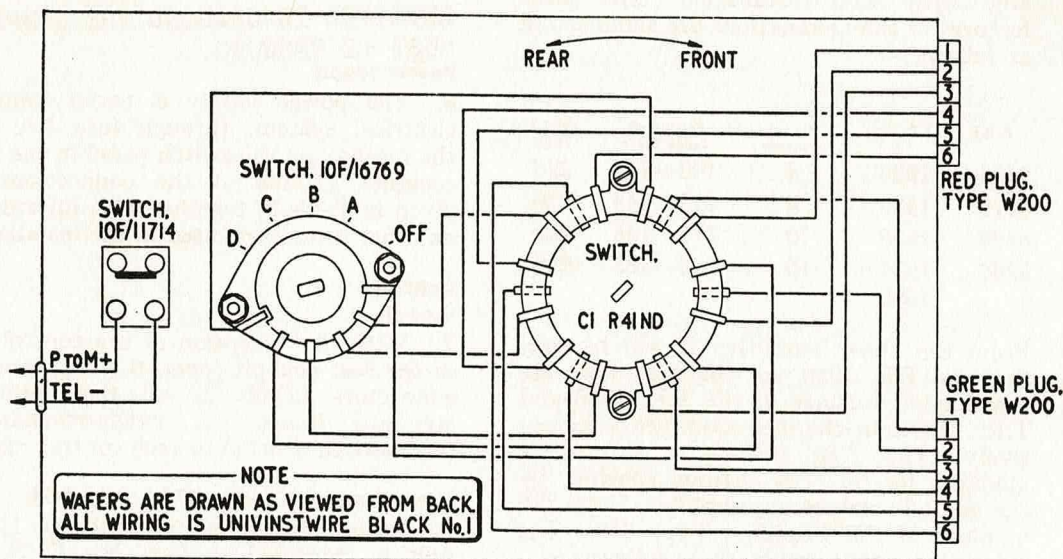


Fig. 2. Wiring of master control unit (A.R.I.5272 and A.R.I.5454)

TABLE 1—continued

Description	Part No.	Stores Ref.
Plug, 6-way, No. 2, open end, Type W. 200 (2 off)	—	10H/393
Switch, channel selector, 5-way, 1-pole, Type 1804 (wafer type)	—	10F/16769
Switch, muting, 1-pole, Type 170	—	10F/11714
Switch, cockpit selector, 2-way, 6-pole (wafer type)	C1.R.41ND	—

Master control unit (A.R.I. 5488 & A.R.I. 5489)

11. The same master control unit is used for both of these installations, being Part No. C1.R.1474 (Stores Ref. 10L/252) when the muting switch has no guard, or Part No. C1.R.1474A1 (N.I.V.) when a guard is fitted to Mod. H.92 requirements.

12. The main components comprising the controller are listed in Table 2, and are contained in a light-alloy box having a detachable backplate. The backplate carries a wiring diagram of the assembly (fig. 3).

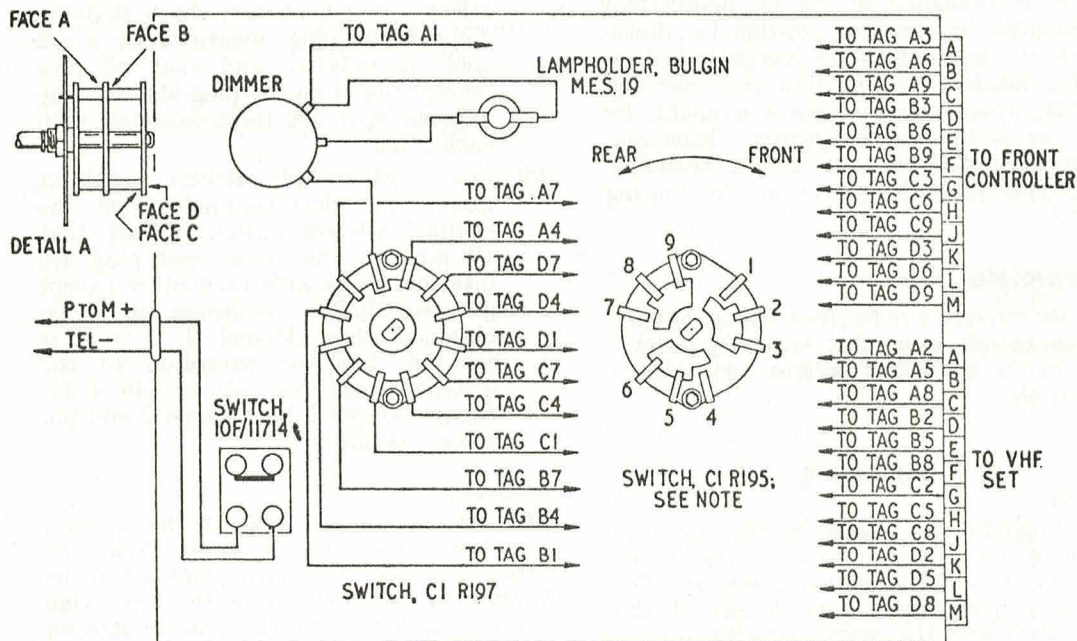
13. The dial, coupled to the channel

selector switch, is engraved to indicate ten positions, A to J inclusive, with an eleventh position marked OFF. In any of the ten positions the transmitter-receiver is switched on and one of the channels selected. At the same time a dial illumination lamp circuit, with dimmer control, is made. The channel selector switch arrangement is similar to that described in A.P.2538HA, Vol. 1, Part 1, Sect. 1, Chap. 4, and functions in the same manner.

14. When reference is made to fig. 3 it will simplify interpretation if it is remembered that faces A, B, C and D of the cockpit-selector switch (C1.R.195) are identical in arrangement and that the tag numbering is the same on all faces (as identified in the diagram of C1.R.195). The switch is a two-way selector switch (depicted in the front selection on the diagram) and it will be seen that, for example, tags 8 and 9 on all faces are in individual paired contact through the appropriate switch segment on those faces. Continuing with tags 8 and 9, pin M on the plug (10H/19101) and on the socket (10H/19155) are thus interconnected; so, individually paired, are pins J, F and C. The other pins are similarly interconnected as pairs through the other switch segments on the selector, so that the channel selector switch in the control unit is by-passed and control is transferred to the front cockpit control unit. On selecting REAR at the cockpit selector,

tags 7 and 8, and 5 and 4 and 2 and 1, are put in paired contact on each of the faces; this cuts out the front control unit and

connects the rear channel-selector to the transmitter-receiver via the cockpit-selector switch.



NOTE

AS YAXLEY SWITCHES ARE UNCODED THEY MUST BE WIRED AS SHOWN PICTORIALLY ABOVE. WAFERS ARE DRAWN AS VIEWED FROM BACK OF BOX, C1 R197 BEING IN 'OFF' POSITION AND C1 R195 BEING IN 'FRONT' POSITION. TO ASSIST WIRING TO C1 R195 EACH WIRE HAS A DESTINATION, EG. 'TO TAG A1', WHERE 'A' DENOTES SWITCHFACE AS SHOWN IN 'DETAIL A', AND '1' IS TAG No. AS SHOWN ON BACK VIEW OF SWITCH.

ALL WIRING TO BE UNIVINSTWIRE BLACK No.1 TO SPEC. EL 1052, STORES REF. 5E/2504.

Fig. 3. Wiring of master control unit (A.R.I.5488 and A.R.I.5489)

TABLE 2
A.R.I. 5488 and A.R.I. 5489—main units in master control unit,
Part No. C1.R.147A/I

Description	Part No.	Stores Ref.
Dial, channel selection	C1.E.175A	—
Door, access, complete with lamp holder	C1.R.183A	—
Filament lamp, 2.5 volt, 0.5 watt	—	5L/X951122
Guard, muting switch (Mod. H. 192)	C1.R.333A	26AE/1505
Knob, channel selector	C1.R.263	—
Knob, dimmer	K.111	—
Knob, cockpit selector	C1.R.174	—
Plug, Mk. 4, 12-way	—	10H/19101
Resistance, variable, wire wound, 17 ohm, 0.5 watt	CLR/110629	—
Socket, Mk. 4, 12-way	—	10H/19155
Switch, muting, 1-pole, Type 170	—	10F/11714
Switch, channel selector 12-way (wafer type)	C1.R.197	—
Switch, cockpit selector, 2-way (wafer type)	C1.R.195	—

Muting switch and intercommunication

15. The muting switch (Stores Ref. 10F/11714) on the master control unit, eliminates unwanted interference or signals, when the installation is on *receive*, and ensures free intercommunication between cockpits. The switch is protected by a guard when Mod. H.192 is embodied to prevent inadvertent movement into the MUTE position, i.e., down. With the transmitter-receiver switched on and a headset plugged into each mic.-tel. socket, intercommunication is available by the use of the headset switch. Intercommunication facilities are always available, regardless of the position of the muting switch.

WARNING

If the aircraft is to be flown solo, from the front cockpit, ensure that the muting switch is in the non-muting position (up) before take-off.

SERVICING

General

16. Procedure for setting-up, adjusting and servicing the installations are given in the appropriate Air Publication (*para.* 3). The following paragraphs give details of the connectors and the master control unit in the rear cockpit.

Connectors

17. A routing chart for the installation is shown in *fig.* 1. Each connector is allocated a number which when referred to *Table* 3 will enable the connector details to be established for the appropriate installation.

Master control unit (A.R.I. 5272 & A.R.I. 5454)

Removal

18. Removal of this unit is effected by unscrewing and withdrawing the two connectors at the forward end, disconnecting the other connector at the terminal blocks, then removing the three screws securing the control unit. The unit will thus be withdrawn with one connector attached. Dismantling procedures should prove obvious after a visual examination.

Functional check

19. Wiring of the control unit is shown in *fig.* 2. After any general checks, or rectification of faults, functional correctness of the control unit should be proved as follows:—

- (1) With the cockpit selector (RADIO CONTROL) switch, C1.F41.ND, selected to

FRONT, check that the pins on the plugs, Type W200, are numerically interconnected (pin 1 to pin 1 and pin 2 to pin 2, etc.), and that the channel selector switch is isolated.

- (2) With the cockpit selector switch selected to the REAR position and the channel selector switch at OFF, check that the Type W200 plug, identified by a red spot, is isolated, and that all pins (except pin 1) on the plug identified by a green spot are interconnected with each other.
- (3) Leave the cockpit selector switch at REAR, and select channel A on the channel selector switch. Check that all pins on the green spot plug are interconnected with each other except pin 3. Similar conditions must be obtained when channel B, C or D is selected, but the exception to the interconnected pin will be pin 4 for channel B, pin 5 for channel C and pin 6 for channel D.

Re-assembly

20. Assembly is a reversal of the removal and dismantling procedure. It should be noted, however, that both plugs are to be fitted with their keyway at the top. One of the plugs is marked with a green spot on the face of the control unit, and the other plug with a red spot. The connectors to the plugs are coloured to suit.

Master control unit (A.R.I. 5488 & A.R.I. 5489)

Renewal of filament lamp

21. Access to the filament lamp is obtained by removing two screws securing a small plate at the top of the control unit; the plate, when lifted out, will bring the lamp-holder with it. The filament lamp is 2.5 volt. 0.5 watt (Stores Ref. 5L/X951122).

Removal of control unit

22. The procedure for removing the control unit is as given in *para.* 18.

Functional check

23. Wiring of the control unit is shown in *fig.* 3, and on a diagram affixed to the control unit backplate. After any fault rectification, or general checks, functional correctness of the control unit should be proved as follows:—

- (1) With the cockpit selector (RADIO CONTROL) switch, C1.R.195, selected to FRONT, check that the pins on the plug, Mk. 4, (marked TO V.H.F. SET)

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Table 3

LIST OF CONNECTORS

Key No. (fig. 1)	A.R.I.	Stores Ref.	Cable	Length	Markings		Fittings	
					End A	End B	End A	End B
7	5488-9	10HA/8407	—	—	—	(a) (b) (c)	—	Open end
7	5272 5454	10HA/8592	—	—	—	(a) (b) (c)	—	Open end
10	All	10HA/8595	Uniradio 4	10 ft. 9 in.	AERIAL TUNE	AERIAL	Plug (10H/1257)	Cable eye (5K/2595)
9	All	10HA/8596	Uniradio 4	3 ft. 9 in.	T.R.	AERIAL JUNCT.	Socket (10H/3931)	Plug (110H/1257)
2	5272 5454	10HA/8591	Sextomet 4	6 ft. 3 in.	T.R.	CONTROL UNIT	Socket (10H/411)	Socket (10H/411)
2	5488-9	10HA/9055	12 Univinmet small 2·5	6 ft. 6 in.	T.R.	CONTROL UNIT	Socket (10H/Z. 560180)	Socket (10H/Z560180)
8	5272 5454	10HA/8593	—	—	—	POWER SUPPLY	Socket (—)	Open end
8	5488-9	10HA/9056	Dumet 19	4 ft. 0 in.	T.R. 1936	POWER SUPPLY	Socket (10H/419)	Open end
1	5272 5454	10HA/8594	—	—	CONTROL UNIT	CONTROL UNIT	Socket (—)	Socket (—)
1	5488-9	10HA/9057	12 Univinmet small 2·5	4 ft. 0 in.	CONTROL UNIT	CONTROL UNIT	Socket (10H/Z500180)	Plug (10H/Z560360)
4	All	—	Dupren 6 (or *Duvin 4)	2 ft. 0 in.	(a) P to T (b) T —	(a) P to T (b) T —	Open end	Open end
6	All	—	(1) Dupren 6 (or *Duvin 4)	5 ft. 8½ in.	(a) P to T + (b) P to M +	(a) P to T + (b) P to M +	Open end	Open end
			(2) Dupren 6 (or *Duvin 4)	5 ft. 7 in.	(a) TEL + (b) TEL —	(a) TEL + (b) TEL —		
			(3) Duprenmet 6 (or *Dumet 4)	5 ft. 6 in.	(a) M + (b) M —	(a) M + (b) M —		
3	All	—	Dupren 6 (or *Duvin 4)	2 ft. 10 in.	(a) P to T (b) T —	(a) P to T (b) T —	Open end	Open end
5	All	—	Dupren 6 (or *Duvin 4)	1 ft. 0½ in.	(a) P to M (b) TEL —	(a) P to M (b) TEL —	Open end	Open end

*Denotes cable Pre-Mod. No. H105.

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(AL. 46, Jan. 57)

and the pins on the socket, Mk. 4, (marked TO FRONT CONTROL) are interconnected in alphabetical pairs (A to A, B to B, etc.), and that the channel selector switch C1.R.197 is isolated.

- (2) With the cockpit selector switch to REAR, and the channel selector switch to OFF, check that the socket (marked TO FRONT CONTROL) is isolated, and that all pins on the plug (marked TO V.H.F. SET), except pin A, are interconnected with each other.
- (3) Leave the cockpit selector at REAR, and select channel A on the channel selector switch. Check that all pins on the plug (marked TO V.H.F. SET), except pin C, are interconnected with each other. Similar conditions must be obtained when the other channels are selected, but the exception to the interconnected pins will be as follows:—

CHANNEL		A B C D E F G H I J
PIN		C D E F G H J L K M

Continuity check

24. Before attempting any continuity check, ensure that all switch connections are adequately protected by a coat of shellac varnish, and that soldered connections to the plug, socket, dimmer switch and lampholder are covered by sleeves (Stores Ref. 5K/2576 for the plug and socket, and 5K/2577 for the other connections). Also check that contacts and clips on each wafer face of the cockpit selector switch are adequately insulated from similar fittings on the other faces.

25. When testing for continuity, with a channel having been selected, a resistance of 17.5 ohms should occur between pin A on the plug and all other pins on the plug except that which is open-circuited (*para.* 23, *sub para.* (3)). This applies for all channel selections.

Re-assembly

26. For re-assembly the procedure is a reversal of removal and dismantling operations. There are no peculiarities involved.

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