## Chapter 4

(Completely revised)

## AIRCRAFT INSTALLATIONS

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## INTRODUCTION

1. The ARI.23143 series installations provide facilities for amplitude modulated, radio telephony communication in the v.h.f. band of 117.5-135.95 MHz and in the u.h.f. band of 225-399.95 MHz. They are designed for aircraft use and are employed for operating between aircraft and ground, aircraft and ship or inter aircraft. There are four basic installations:—

ARI.23143/1—Includes PTR175 (d.c. version)
ARI.23143/2—Includes PTR175A (a.c. version)
ARI.23143/3—Comprises ARI.23143/1 with a
homing unit added
ARI.23143/4—Comprises ARI.23143/1 with a
control unit Type C1607/7 added

- 2. Typical installations are shown schematically in fig. 1, 2 and 3. Fig. 1 illustrates the use of separate u.h.f. and v.h.f. aerials and also includes the additional control unit used in ARI.23143/4; fig. 2 shows the basic installation using a combined u.h.f./v.h.f. aerial system while fig. 3 illustrates a typical homing installation ARI.23143/3. The items of equipment involved may be placed in three categories:—
  - (1) Fixed equipment (i.e. those items which

are normally supplied to the aircraft manufacturers for fitting into the aircraft before delivery).

- (2) Removable items.
- (3) Ancillaries such as connectors.
- 3. In addition to the above, the remainder of the wiring from the terminal blocks is completed with cable, unipren 6 (Ref. No. 5E/3038). The various items are listed in the subsequent tables, and it should be noted that the numbers indicating the various connectors in fig. 1, 2 and 3 correspond to the item numbers in Tables 4 and 5. Specific details will, of course, vary with different types of aircraft and the relevant aircraft handbook must be referred to in each case. Also, it should be noted that such items as connectors are usually produced specially for each aircraft type, therefore the supply catalogue numbers will differ accordingly.

#### Note . . .

Reference is made in Table 4 and elsewhere to phase 1, phase 2, and phase 3 of the a.c. supply; these numbers, which are in use in America, correspond with the letters A, B and C, respectively, which are in more general use in Great Britain.

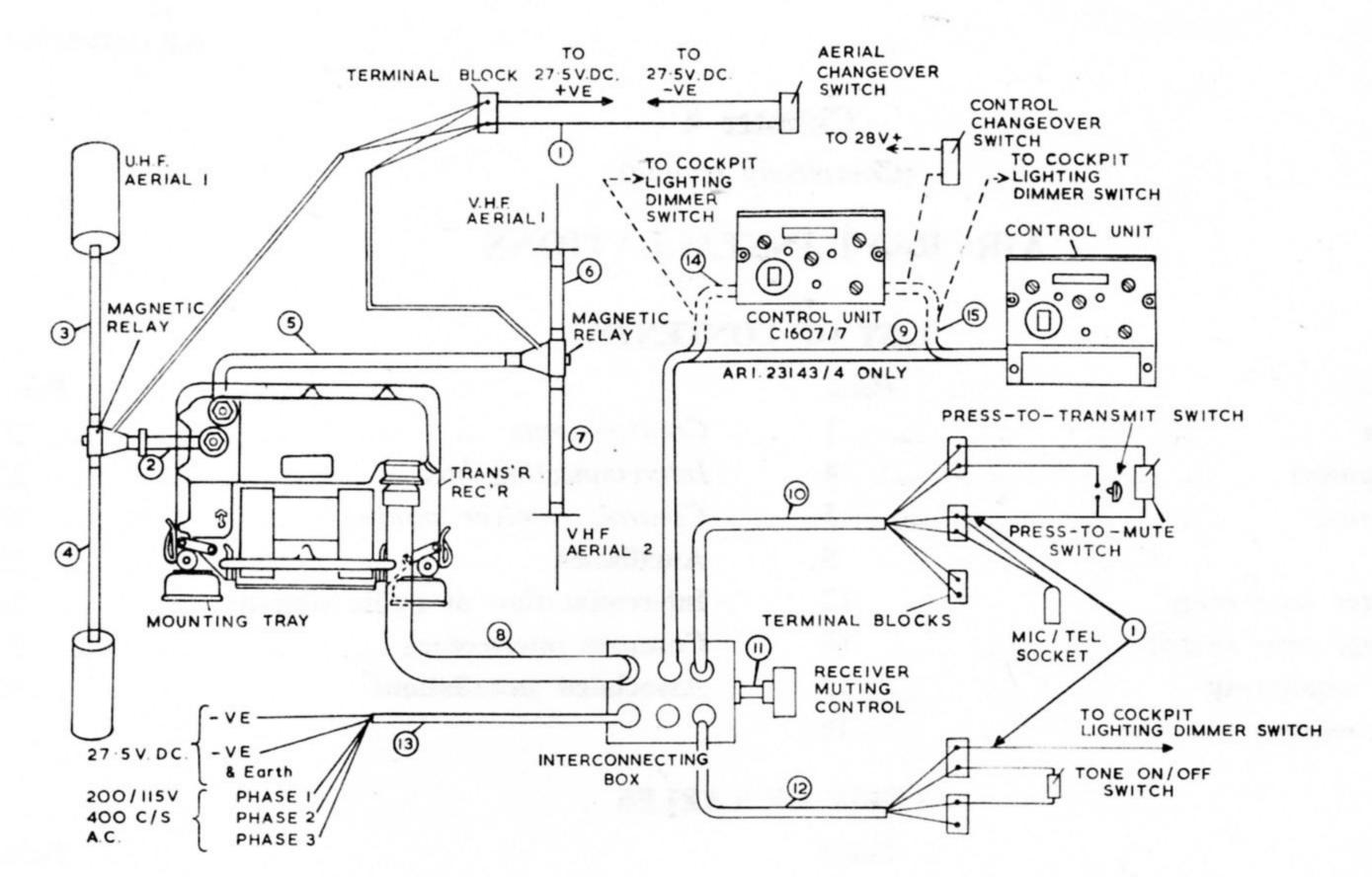


Fig. 1. Typical installation using separate v.h.f. and u.h.f. aerials

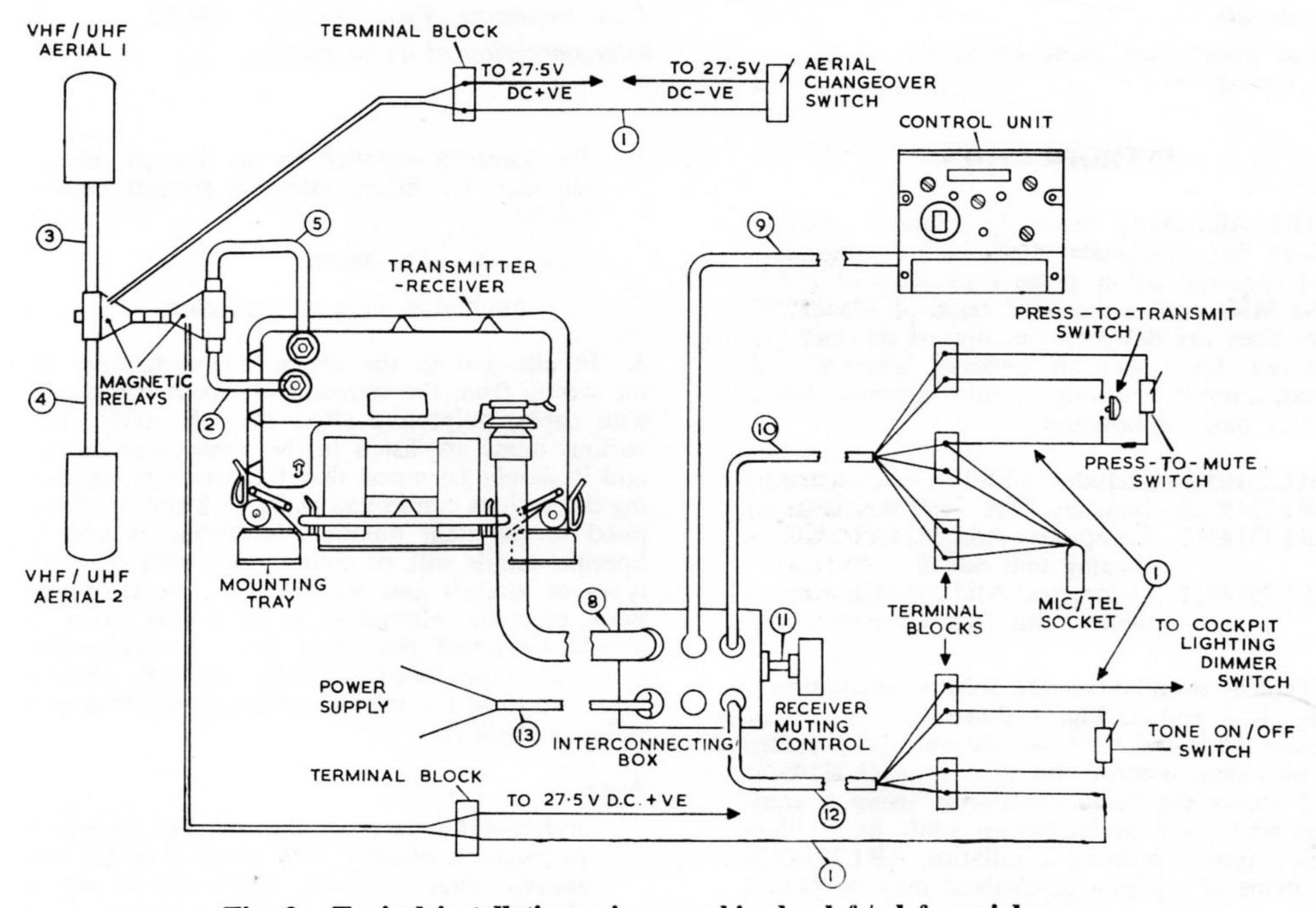


Fig. 2. Typical installation using combined v.h.f./u.h.f. aerials

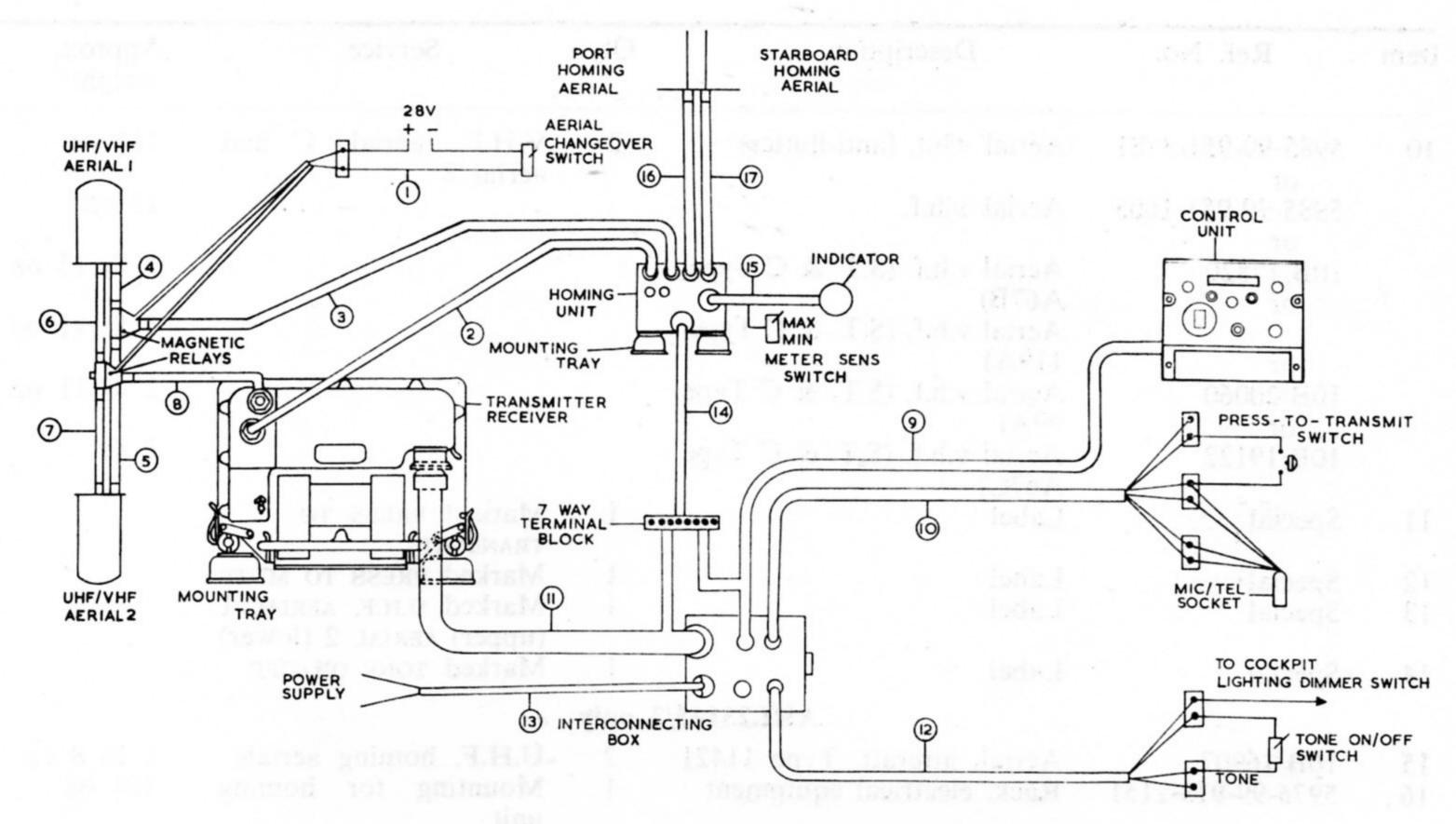


Fig. 3 Typical homing installation

TABLE 1
Fixed equipment

Item	Ref. No.	Description	Qty.	Service	Approx. weight
1	5821-99-942-8544	Tray, mounting, transmitter receiver, radio Type MT1477/ARC52	1	Mounting for transmitter- receiver	3 lb 4 oz
2	5CZ/430	Blocks, terminal, Type B, 2-way, No. 1	5	Terminations for mic/tel. press to transmit, and press to mute connectors	1 oz
3	10H/2206 or	Sockets, Type 359	1	Mic/tel socket	2 oz
	10H/18574	Sockets, Type 626	1	Mic/tel socket	1 oz
4	5930-99-051-0553	Switch, toggle, spring loaded	1	Tone on/off switch	$\frac{3}{4}$ OZ
5	5D/534	Switches, button (SP) firing bare, or similar press button switch	1	Press to transmit switch	i oz
6	5930-99-051-0553	Switch, toggle, spring loaded	1	Press to mute switch, required only when item 4 (Table 2) is used	3 OZ
7	5945-99-932-1487	Relay, armature	or 2	For aerial change over and u.h.f./v.h.f. change over	$10\frac{3}{4}$ oz
8	5930-99-051-0551	Switch, (SP) on-off	or 2	Switch in open position for aerial 1, or in closed position for aerial 2	3/4 OZ
9	10B/20860 or	Antenna (Derveaux Type AN134B)	2	U.H.F. aerial 1 and aerial 2	1 lb 3 oz
	5985-99-932-6363 or	Antenna (S.T. & C Type 140 LRU 101B)			1 lb 11½ oz
	5985-99-911-8266 or	Aerial, aircraft (McMichael EDC 18136)			1 lb 9 oz
	man Protein Issue :	Aerial (Dorne & Margolin Type DMC 7-3)			13 oz

tem	Ref. No.	Description	Qty.	Service	Approx. weight
10	5985-99-951-3781	Aerial v.h.f. (anti-flutter)	2	V.H.F. aerial 1 and	$11\frac{1}{2}$ oz
	or 5985-99-951-1603	Aerial v.h.f.		aerial 2	15 oz
	or 10B/17820	Aerial v.h.f. (S.T. & C Type			2 lb 13 oz
	or	A67B) Aerial v.h.f. (S.T. & C Type			2 lb 11 oz
	or 10B/20060 or	119A) Aerial v.h.f. (S.T. & C Type 99A)			2 lb 11 oz
	10B/19122	Aerial v.h.f. (S.T. & C Type A67C)			5 lb
11	Special	Label	1	Marked PRESS TO TRANSMIT	
12	Special	Label	1	Marked PRESS TO MUTE	
13	Special	Label	1	Marked U.H.F. AERIAL 1 (upper) AERIAL 2 (lower)	
14	Special	Label	1	Marked TONE ON/OFF	
		ARI.23143/	3 only		
15	10B/16907	Aerial, aircraft, Type 11421	2	U.H.F. homing aerials	1 lb 8 cz
16	5975-99-913-2151	Rack, electrical equipment	1	Mounting for homing unit	$10\frac{1}{2}$ oz
17	5821-99-970-5375	Mount, indicator	1	Mounting for indicator	6 oz
18		Block, terminal, 7-way	1	Interconnect transmitter- receiver and homing unit	
19	5930-99-051-0551	Switch, (SP) on-off	1	Indicator sensitivity switch	$\frac{3}{4}$ OZ
20	Special	Label	1	Marked INDICATOR SENSITIVITY MAX./MIN	
		ARI.23143/	4 only		
01	5020 00 051 0551	Switch, (SP) on-off	1	Change-over control,	$\frac{3}{4}$ OZ
21	5930-99-051-0551	Switch, (St ) On-On	•	pilot to observer	4
22	Special	Label	1	Marked U.H.F. CONTROL PILOT/OBSERVER	

**Note . . .**The total installed weight (including aerials, connectors, interconnecting box and muting unit) is approximately 75 lb.

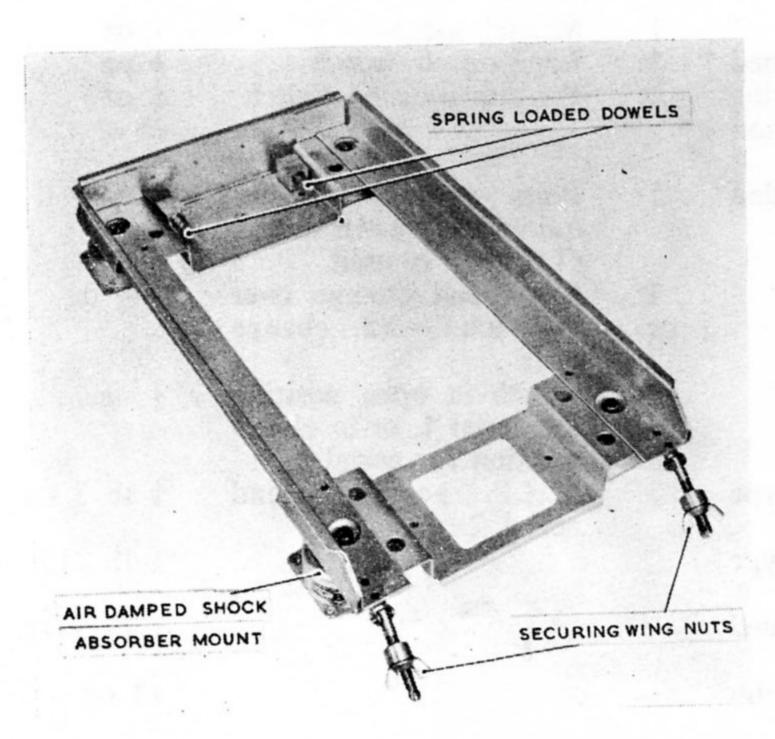


Fig. 4. Tray, mounting, Type MT1477/ARC52

## FIXED EQUIPMENT

4. A list of fixed equipment is given in Table 1 from which it can be seen that most of the items are standard aircraft equipment.

## Mounting trays

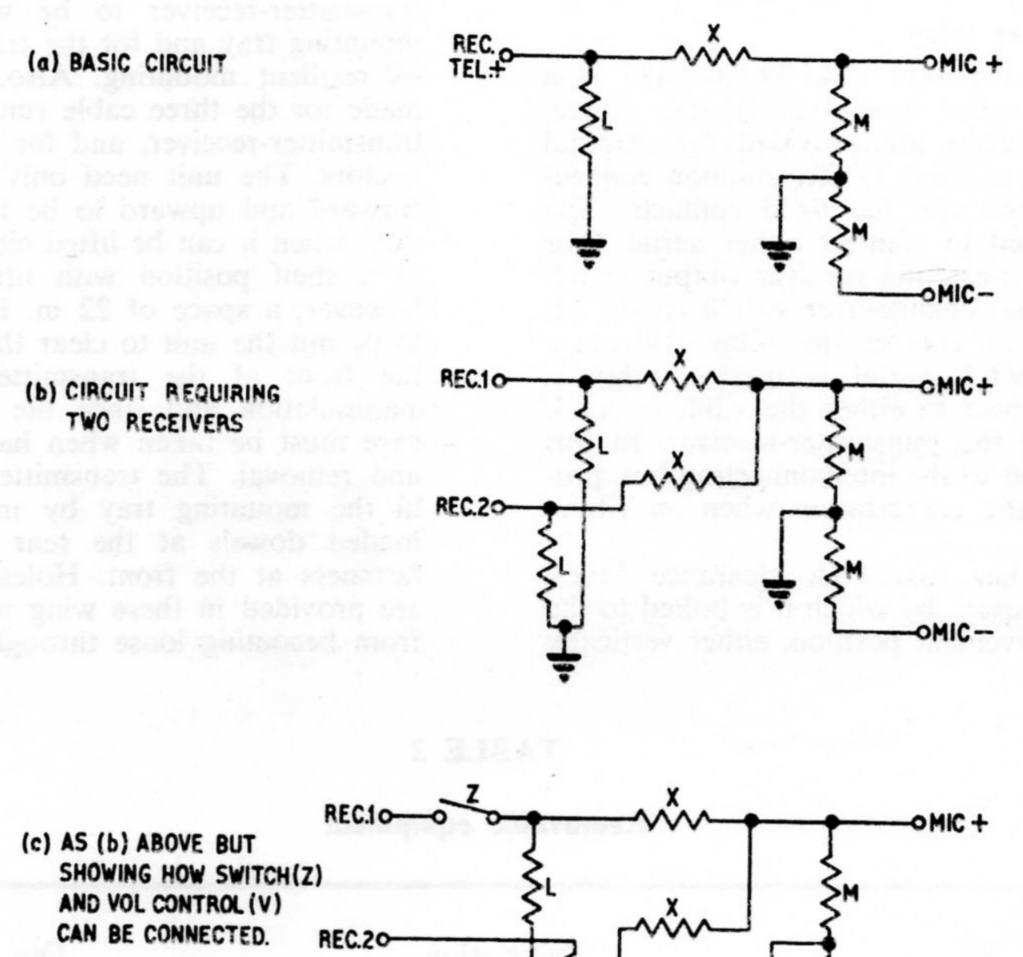
5. The transmitter-receiver mounting tray (fig. 4) consists basically of a cradle shaped aluminium carrier which is supported by four air-damped shock absorber mounts. The complete transmitter-receiver slides into the mounting tray and is held at the rear by the two spring loaded dowels and at the front by the two wing nut fasteners. The latter are attached to the front of the mounting tray for location with the fastener clips on the front panel assembly. The type of mounting used for the transmitter-receiver does not permit the equipment to be mounted in any attitude other than horizontal, i.e. level during normal level flight.

- 6. The four shock absorber mounts are each attached to the corners of the mounting tray by single \(\frac{1}{4}\) in. studs. Their function is to absorb shock and vibrations transmitted by the aircraft which might otherwise cause damage to the equipment. The bases of the shock absorber mounts each contain four mounting holes measuring 0.203 in. diameter to allow the mounting tray to be bolted to the airframe.
- 7. Four separate silver plated, beryllium copper earthing straps, each measuring  $3\frac{5}{8}$  in. long  $\times$   $\frac{3}{8}$  in. wide are provided on the mounting tray for connection to the airframe or aircraft bonding system. These straps are each provided with one securing hole of 0.375 in. diameter.
- 7a. A description and details of installing the homing unit mounting tray (used in ARI.23143/3) are given in A.P.116D-0106-1.

#### **Aerials**

- 8. The specifications for aerials suitable for use in ARI.23143 series installations are given in Specification No. R.A.E./R.S.P./3263 and No. R.A.E./R.S.P./1951 for u.h.f. types and in Specification No. R.A.E./R.S.P./3247 for v.h.f. types. Details of a number of u.h.f. and v.h.f. aerials and aerial equipment are given in A.P.116D-0133-1A. A description and installation details of the homing aerials (used in ARI.23143/3) are given in A.P.116D-0106-1.
- 9. The position at which aerials are fitted are such that the radiation characteristics and operational performance conform with the specifications quoted. Where one aerial does not provide adequate signal cover when the attitude of the aircraft changes, two aerials may have to be used

-OMIC-



#### NOTES:

- 1. Value for X not critical in any circuit but should be 10000 to 20000 ohms
- 2. L should be 150 to 200 ohms
- 3. Value of M critical at 200 ohms, Resistances of each pair should be equal to preserve balance.
- 4. Fixed resistors should be rated 4 W
- 5. Value of V can be 1000 ohms but when using 'Boxed up' potentiometer, volume control Type 11 (Ref. No. 10L/240) 2500 ohms S.I.S. 5627 to be used.
- Switch Z not normally required in single seat aircraft but may be necessary in larger types. In certain cases Z becomes a relay which opens on Press to transmit to avoid radiation of signals from REC.1.

Fig. 5. Interconnection of audio outputs

to give better all-round coverage. They are probably fitted one above and one below the fuselage, but the actual positions have previously been determined by polar diagram investigation. The position of the aerials are chosen with regard to the length of the connectors to the transmitter-receiver which must always be kept as short as possible.

- 10. If two aerials are used they would be referred to as aerial 1 and aerial 2 respectively. The one which gives the better signal cover is aerial 1, and this is connected to the transmitter-receiver when the aerial change over switch is set to the aerial 1 position, the relay armature then being in the non-energized position.
- 11. Wideband aerials capable of covering both the u.h.f. and v.h.f. bands may be employed, but these are normally designed for use with particular aircraft.

## Aerial change-over relay

- 12. The relay, armature 5945-99-932-1487 is a coaxial relay operated from a 27.5V d.c. source. Three coaxial sockets are provided for external connections; one of these is the common connection, the other two are the fixed contacts. The relay may be used to connect either aerial 1 or aerial 2 to the transmitter-receiver output (u.h.f. or v.h.f.), an aerial change-over switch (para. 14) being necessary to control the relay. Where a wideband u.h.f./v.h.f. aerial is used a relay is employed to connect to either the v.h.f. or u.h.f. output socket on the transmitter-receiver. In this event a connection to the interconnecting box provides for automatic energization when on v.h.f.
- 13. The relay has two 4BA clearance holes, spaced one inch apart, by which it is bolted to the airframe in a convenient position, either vertically

or horizontally with respect to the transmitterreceiver and the two aerials.

## Aerial change-over switch

14. The single pole on-off switch (5930-99-051-0551), which is used to operate the relay, armature must be labelled U.H.F. AERIAL 1 for the open (upper) position and AERIAL 2 for the closed (lower) position.

## Removable equipment

15. The removable items of equipment used in the installation are listed in Table 2.

#### Transmitter-receiver

- 16. The transmitter-receiver, Type PTR175 or PTR175A, is installed in a horizontal position so that it is level during level flight.
- 17. Sufficient clearance must be left to allow the transmitter-receiver to be withdrawn from the mounting tray and for the tray to move freely on its resilient mounting. Also, provision must be made for the three cable runs to the front of the transmitter-receiver, and for removal of the connectors. The unit need only travel a few inches forward and upward to be free of the mounting tray, when it can be lifted clear. Where it is fixed in a shelf position with little clearance above, however, a space of 22 in. must be left in front to permit the unit to clear the tray. A handle on the front of the transmitter-receiver facilitates manipulation and since the unit weighs 50 lb., care must be taken when handling during fitting and removal. The transmitter-receiver is secured in the mounting tray by means of two spring loaded dowels at the rear and two wing nut fasteners at the front. Holes for retaining wires are provided in these wing nuts to prevent them from becoming loose through vibration.

TABLE 2
Removable equipment

Item No.	Ref. No.	Description	Qty.	Approx. weight
1	5821-99-971-1781 or	Transmitter-receiver, radio, Type PTR175 (ARI.23143/1)	1	50 lb.
	5821-99-971-1778	Transmitter-receiver, radio, Type PTR175A (ARI.23143/2)	1	50 lb.
2	5821-99-945-5739	Control, radio set, Type C1607/4	. 1	3 lb. $3\frac{1}{2}$ oz.
3	5821-99-932-6361	Interconnecting box	1	1 lb. 4 oz.
4	5821-99-943-3247	Control, receiver muting	1	1 lb. 4 oz.
		ARI.23143/3 only		
5	5826-99-913-2160	Homing group, radio	1	3 lb. 14 oz.
6	10Q/9530909	Indicator Type 9024M	1	10¼ oz.
		ARI.23143/4 only		
7	5821-99-107-0030	Control, radio set, Type C1607/7	1	2 lb. 4 oz.

- 18. The transmitter-receiver should be pressurized to permit operation at altitudes of up to 70,000 feet. This pressurization is achieved by pumping dry air or nitrogen into the special case via a Schraeder valve on the front panel and maintaining this at about 4 lb. to 5 lb. per sq. in. above atmospheric pressure at sea level.
- 19. If the ambient temperature is liable to be outside the range of  $-55^{\circ}$ C to  $+55^{\circ}$ C, additional heating or cooling facilities must be provided accordingly. The cool air inlet duct must be situated in a position where the ingress of dust or moisture is unlikely.

#### **Control units**

- 20. The control unit Type C1607/4 is usually installed in the aircraft in such a position as to allow the operator access to the controls without moving from his station. Normally, this unit will be mounted in the cockpit, for operation by the pilot, and placed so that the frequency channel figures are visible and the control knobs are within easy reach. If this is not practicable, a remote visual indicator may be used in conjunction with the control unit to provide channel information. This may be installed in any convenient position or mounted on the instrument panel.
- 20a. The control unit Type C1607/7 is used only in the ARI.23143/4 and operates in conjunction with the control unit Type C1607/4 to provide the additional facility of control of the manual tuning from an alternative position, normally the observer's station. Manual control of the tuning is switched between the two stations by a toggle switch at the pilot's station.
- 21. No form of shock absorption is necessary for the control units, each of which is secured to the aircraft panel by four Dzus fasteners. Sufficient clearance must be allowed at the rear of the panel for the entry of the connectors at the back of the control unit, the actual amount depending on the shape of the connector terminations which may be an angle of 45°, a right-angle, or a straight fitting. If a remote visual indicator is installed, two connectors are required.

#### Interconnecting box

22. The interconnecting box 5821-99-932-6361 is illustrated in Chap. 1. It is a rectangular screened box of overall dimensions  $6\frac{1}{8}$  in.  $\times$   $4\frac{3}{8}$ in.  $\times$  2<sup>3</sup>/<sub>4</sub> in. and is normally mounted on the aircraft equipment shelf or panel, its base being provided with four mounting holes. This unit must be sited within 10 feet of the transmitterreceiver to avoid excessive voltage drop in the power supply cables. However, the distance between the control unit and the interconnecting box can be up to 100 feet, depending on the gauge of wire used in the connector. The interconnecting box must be mounted so that the test socket is accessible for daily servicing. It carries seven multipole connectors, with duties as follows:—

- (1) Electrical connection of the interconnecting box to the transmitter-receiver via a 42-way flexible conduit.
- (2) Electrical connection of the interconnecting box to the control unit via a 30-way flexible conduit.
- (3) Electrical connection to the nominal 27.5V d.c. power supply by means of a 2-way flexible conduit and also to the 115V, 400 Hz, 3-phase a.c. supply (used in ARI.23143/2) by means of a 3-way flexible conduit, via the 6-pole plug connector.
- (4) Electrical connection, via a 3-core flexible conduit, to a terminal block connecting to the cockpit lighting dimmer switch and the TONE ON/OFF switch.
- (5) Electrical test connection facilities by means of a 12-way connector.
- (6) Electrical connection to the PRESS TO TRANSMIT switch, the mic/tel socket and the PRESS TO MUTE switch, via a 6-core flexible conduit.
- (7) Electrical connection to the receiver muting control.

## Control, receiver muting

- 23. The control receiver muting, 5821-99-943-3247, an illustration of which appears in Chap. 1, may be used when press to mute facilities are required in the receive condition to eliminate unwanted signals or interference. It is capable of operation on either 27.5V d.c. or 115V, 400 Hz a.c., dependent on the adjustment of link wires on a panel inside the unit. These link wires should be adjusted, as shown on the panel, for d.c. operation when the unit is used in ARI.23143/1, or for a.c. operation when it is used in ARI.23143/2. A reversible label on the outside top face of the unit indicates whether the unit is wired for d.c. or a.c. operation. The unit is operated by a switch, normally a spring loaded toggle type (5930-99-051-0503) labelled PRESS TO MUTE, which will be mounted in a convenient position for operation by the pilot.
- 24. The unit is contained in a rectangular metal box  $4\frac{3}{4} \times 3\frac{11}{16}$  in.  $\times 3$  in. It is fitted with a 6-pole screened socket by which it is connected to the interconnecting box. Bolts fitted through four holes in the cover secure the unit to an aircraft equipment panel or shelf. Anti-vibration mountings are not required.

#### **ANCILLARIES**

25. Cable lengths and outlets vary from aircraft to aircraft, but the basic details of the connectors are given in Table 4 for ARI.23143/1, 2 and 4, and in Table 5 for ARI.23143/3. For the remaining wiring from the terminal blocks (fig. 1, 2 and 3), uninyvin 20 cable is used.

With the exception of item 13 of Table 4, which gives details of the separate power supply connectors for ARI.23143/2 and ARI.23143/1 respectively the other connectors are the same for each installation. Also the a.c. power supply connections to poles X, Y Z of item 8 and to pole B of item 8, are not employed when these connectors are used in ARI.23143/1 installations.

# INTERCONNECTION OF AUDIO OUTPUTS

- 26. In certain aircraft installations where various navigational aids are fitted, a common audio output is required for all services available to the crew members of the aircraft and, in cases where a separate intercommunication amplifier is not fitted, the usual practice is to use the u.h.f. equipment as an audio amplifier.
- 27. It is not satisfactory to parallel the telephone outputs of the various equipments because of marked variation in output impedances. It is, therefore, necessary to apply the audio outputs of other equipments to the microphone input terminals of the u.h.f. equiment at the correct level and impedance, so that all audio signals appear across the telephone output circuit, and some external form of mixing circuit is usually provided for this purpose.
- 28. Suitable methods of connecting the audio outputs into the microphone input circuit are given in fig. 5.

## COMPASS INTERFERENCE

29. Tests to determine the magnetic effect of the main items of equipment forming an ARI.23143 installation have been made, the results being given in Table 3.

TABLE 3

Magnetic effect of installed equipment

	Distance in inches for (a) 1° error (b) ½° error				
Transmitter-receiver	60	100			
Control unit Type C1607/4	8	15			
Interconnecting box	9	18			
Control, receiver muting	7	14			
Antenna (Derveaux Type AN134B)	No effect	at 9 inches			
Telephone headset	13	25			

#### ASSOCIATED INSTALLATIONS

30. The homing equipment ARI.18120 may be used in conjunction with the ARI.23143 to provide homing information on the u.h.f. channels. Where the ARI.18120 is fitted, the interconnecting box (para. 22) and control receiver muting (para. 23) are not required.

TABLE 4

Connectors for ARI.23143/1, 2 and 4

Item		_	En	d A	En	d B		
No. (fig. 1 & 2)	Type of cable or wire	Wire No.	Plug (P) or socket (S)	Cable outlet or pole	Plug (P) or socket (S)	Cable outlet or pole	Qty.	Service and remarks
1	Univin 20						As Reqd.	General and switch wiring.
2	Uniradio 67 6145-99-910-0295		P) Type UK-N2 935-99-999-0887	Straight or right- angle adaptor Type N 5935-99-932-2405	(P) Type UK-N2 5935-99-999-0887	Straight or right angle adaptor Type N 5935-99-932-2405	- 1	Transmitter-receiver to relay, magnetic.  Note  (1) Destination and identification sleeves 5970-99-932-3456 are coded as required.  (2) Where the connector is subjected to ambient temperature greater than 80 deg. C, cable, uniradio 73, 6145-99-910-0300 and plug Type UK-N1, 5935-99-999-0884 should be used in lieu of those shown.
3	Uniradio 67 6145-99-910-0295		7) Type UK-N2 035-99-999-0887	Straight, or right- angle adaptor Type N 5935-99-932-2405	(P) Type UK-N2 5935-99-999-0887	Straight, or right angle adaptor Type N 5935-99-932-2403		U.H.F. aerial 1 to relay, magnetic (see note in item 2).
4	Uniradio 67 6145-99-910-0295	3.70.00.00	Type UK-N2 35-99-999-0887	Straight, or right- angle adaptor Type N 5935-99-932-2405	(P) Type UK-N2 5935-99-999-0887	Straight, or right angle adaptor Type N 5935-99-932-2405		U.H.F. aerial 2 to relay, magnetic. (See note in item 2).
5	Uniradio 67 6145-99-910-0295		Type UK-N2 35-99-999-0887	Straight, or right- angle adaptor Type N 5935-99-932-2405	(P) Type UK-N2 5935-99-999-0887	Straight, or right angle adaptor Type N 5935-99-932-2405		Transmitter-receiver to relay, magnetic. (See note in item 2).

TABLE 4—(Contd.)

Item			E	End A	En	nd B	1101	
No. (fig. 1 & 2)	Type of cable or wire	Wire No.	• • •	Cable outlet or pole	Plug (P) or socket (S)	Cable outlet or pole	Qty.	Service and remarks
6	Uniradio 67 6145-99-910-0295	1	Dependent on typ	e of aerial fitted	(P) Type UK-N2 5935-99-999-0887	Straight, or right angle adaptor Type N 4935-99-932-2405		V.H.F. aerial 1 to relay, magnetic. (See note in item 2).
7	Uniradio 67 6145-99-910-0295		Dependent on typ	e of aerial fitted	(P) Type UK-N2 5935-99-999-0887	Straight, or right angle adaptor Type N 5935-99-932-2405		V.H.F. aerial 2 to relay, magnetic. (See note in item 2).
8	Wire, electrical equipment (Type 2, 14/0076 white) 6145-99-	1	(S) Amphenol 165GB-R44 5935-99-932-1250	Right angle	(P) Amphenol 165GB-72-1 5935-99-940-3390 or	Straight	1	Transmitter-receiver to inter- connecting box.  Note
	910-0180 (Type 2S, 14/·0076 pink, shielded) 6145-99-942-4163 (Type 3, 70/·0076 white) 6145-99-910-0232				(P) Amphenol 165GB-R72 5935-99-932-1246	Right angle		(1) Length of connector must not exceed 10 feet (para. 22). (2) Wire termination sleeves 5975-99-932-1417 to 5975-99-932-1458 are numbered 1 to 42 respective.
	conduit (p.v.c.) 5975-99-932-2939 Type 103/202/GY, twin (Rists Wires and Cables Ltd.) and union, elec- trical conduit							(3) Destination and identification sleeves 5970-99-932-3458 are coded as required.  (4) Where the connector is subjected to ambient
	5975-99-932-2943	1		es bois .	Contract Cold	bors A		temperatures greater than 70 deg. C, conduit (p.t.f.e.)
	3/white 3/white 2/white	2 3		Earthing ring and	В	Earthing ring and	B	5975 - 99 - 932 - 2893 and equipment wire (p.t.f.e.)
	2/white 2/white 2/white 2/white	4 5 6 7		D E F		E F H		to Spec. No. EL1930 should be used in lieu of those shown. (5) If the connector is
	2/white 2/white	8		JAVREE		Ĵ		liable to be affected by

TABLE 4—(Contd.)

Item			En	d A	Enc	l B		
No. fig. 1 & 2)	Type of cable or wire	Wire No.	Plug (P) or socket (S)	Cable outlet or pole	Plug (P) or socket (S)	Cable outlet or pole	Qty.	Service and remarks
	2/white	9		K		K		ester based fluids, p.t.f.e
	2/white	10		L		L		conduit should be used
	2S/pink	11		M		M		with p.v.c. equipmen
	2S/pink	11 12		N		N		wire.
	2/white	13		P		P		(6) When aircraft wire in
	2S/yellow	14		R		R		open loom is employed
	2S/green	15		S		S		socket 5935-99-999-082
	Twisted pair in	10						(Amphenol 165GB-44
	single screen							1001) and plug 5935-99
	103/202/GY Rists							999-0696 (Amphenol 165
	Wires and Cables							GB-72-1001) must be used
	2/white	16		T		T		in lieu of those shown
	2/white	17		Ū		U		These terminations and
	2/white	18		$\tilde{\mathbf{v}}$		v		alternative ones having
	2/white	19		w		W		sealing facilities, and all
	2S/pink	20		x		X		right angle terminations
	2S/pink	21		Ÿ		Ŷ		are to be sealed using
	2S/pink	22		Ź.		Z		compound PR1201Q o
	2/white	23		a		a		other approved com
	2/white	24		b		b		pound.
	2/white	25		C		c		(7) Where the connecto
	2/white	26		d		d		is required to be taken
	2/white	27		e.		e		through a bulkhead, thi
	2/white	28		f		f		can be achieved by usin,
	2/white	29		ø		g		a cable   panel mountin
	2/white	30		ĥ		ĥ		socket 5935-99-932-312
	2/white	31		i		i		(Amphenol 165GB - 91
	2/white	32		i		1 1 2 2		straight) or 5935-99-932
	2/white	33		k		k		3125 (Amphenol 165GE
	2/white	34		m		m		R91, right angle) in con
	2/white	35	Mark Transfer	n		n		junction with plug 5935
	2/white	36		n		n		99-940-3390 (Ampheno
	2/white	37		O O		O P		165GB-72-1, straight) of
	2/white	38		r r		r		5935-99-932-1246 (An
	2/white	39		S In Assert		S		phenol 165GB-R72, righ
	2/white	40		t		ť		angle).
	2/white	41		11		11		ungie).
	2/white	42		W		w		

Item			End	1 A	End	i B	
No. (fig. 1 & 2)	Type of cable or wire	Wire No.	Plug (P) or socket (S)	Cable outlet or pole	Plug (P) or socket (S)	Cable outlet Qty or pole	Service and remarks
	Wire, electrical equipment (Type 2, 14/·0076 (white) 6145-99-910-0180, conduit (p.v.c.) 5975-99-932-2940 and union, electrical conduit 5975-99-932-2944	K	P) Cannon (03-21-30PN 935-99-940-3381	Straight K06-21-5/8 5935-99-940-3395 or right angle K08-21-5/8 5935-99-940-3396 or 45 deg. angle K45-21-5/8 5935-99-940-3397  A B C D E F H J K L M N P R S T U V W X Y Z a b c d f g h i	(S) Cannon K03-21-30SN 5935-99-940-3382	Straight K06-21-5/8 5935-99-940-3395 or right angle K08-21-5/8 5935-99-940-3396 or 45 deg. angle K45-21-5/8 5935-99-940-3397  A B C D E F H J K L M N P R S T U V W X Y Z a b c d f g h i	Interconnecting box to control unit Type C1607/4.  Note (1) Coupling, electrical conduit 5975-99-932-2945 should be used to couple lengths of conduit, where the connector is more than 15 feet long.  (2) Wire termination sleeves 5975-99-932-1417 to 5975-99-932-1446 are numbered 1 to 30 respectively.  (3) Destination and identification sleeves 5970-99-932-3456 are coded as required.  (4) Where the connector is subjected to ambient temperatures greater than 70 deg. C, conduit (p.t.f.e.) 5975-99-932-2947 and equipment wire to Spection.  (5) If the connector is liable to be affected by ester based fluids, p.t.f.e. conduit should be used with p.v.c. equipment wire.  (6) All terminations are to be sealed using compound PR1201Q or other approved compound.  (7) Through bulkhead.

TABLE 4—(Contd.)

Îtem			End	A	En	d B			
No. (fig. 1 & 2)	Type of cable or wire	Wire No.	Plug (P) or socket (S)	Cable outlet or pole	Plug (P) or socket (S)	Cable outlet or pole	Qty.	Service and remarks	
								fittings are not available at present in the Cannon KO series, but the cable/panel mounting sockets and plugs mentioned in item 8 note (7) can be used, where the connector is required to be taken through a bulkhead.	
10	Miniature cable 6D 6145-99-9,10-0023	6 5 5 7 5 7	P) Mk. IV -pole 5A 935-99-056-0300 Outlet gasket 935-99-097-0058 Cable sleeve 975-99-097-0114 Compression ring 975-99-097-0102 Union gasket 935-99-097-0108 Thrust ring 9310-99-097-0096	Straight 5935-99-097-0242 or right angle 5935-99-097-0249	Cable ends		1	Interconnecting box to terminal blocks Type B, 2-way No. 1.  Note  (1) Insulation sleeving 5970-99-932-1465 is used to terminate the leads.  (2) Destination and identification sleeves 5970-99-932-3457 are coded as required.	
	Red (screened) Blue (screened) Green (screened) Yellow (screened) White (screened) Black (screened)	3	310-99-097-0096	A B C D E F				Tel +ve Tel -ve and earth Mic -ve (dynamic) Mic +ve (carbon/dynamic) Press to transmit Press to mute	
	Wire, electrical equipment (Type 2, 14/·0076, white) conduit (p.v.c.) 5975-99-914-3334 Wire, electrical equipment, twin, screened, 13	5 0 5	P) Mk. IV 3-pole 5A 935-99-056-0300 Outlet gasket 935-99-097-0058 Cable sleeve 975-99-097-0114 Compression ring	Straight 5935-99-011-9116 or right angle 5935-99-011-9123	Cable ends Sealing grip SCF 276F-,10		. 1	Interconnecting box to terminal blocks Type B, 2-way.  Note  (1) Insulation sleeving 5970-99-932-1465 is used to terminate the leads.  (2) Destination and iden-	

Item		End	Α	End	d B	
No. (fig. 1 & 2)	Type of cable or wire	Wire Plug (P) or No. socket (S)	Cable outlet or pole	Plug (P) or socket (S)	Cable outlet Qt or pole	y. Service and remarks
	Red Blue Green Yellow  Screenee	5935-99-097-0102 Conduit union SCF 1402-10	A B C D			tification sleeves 5970-99- 932-3457 are coded as required.  Tel +ve Tel -ve and earth Mic -ve dynamic Mic +ve (carbon/dynamic) Press to transmit
	White Black		F			Press to transmit Press to mute
11	Miniature cable 6D, 6145-99-910-0023  Yellow (screened) White (screened) Red (screened) Black (screened) Blue (screened) Green (screened)	(P) Mk. IV 6-pole 5A 5935-99-056-0303 Outlet gasket 5935-99-097-0058 Cable sleeve 5975-99-097-0114 Compression ring 5975-99-097-0102 Union gasket 5935-99-097-0108 Thrust ring 5310-99-097-0096	Straight 5935-99-097-0242 or right angle 5935-99-097-0249  A B C D E F	(S) Mk. IV 6-pole 5A 5935-99-056-0120 Outlet gasket 5935-99-097-0058 Cable sleeve 5975-99-097-0114 Compression ring 5975-99-097-0102 Union gasket 5935-99-097-0108 Thrust ring 5310-99-097-0096	Straight 5935-99-097-0242 or right angle 5935-99-097-0249  A B C D E F	<ul> <li>Interconnecting box to receiver muting control. Required only when item 4 (Table 2) is fitted.</li> <li>Note  (1) Insulation sleeving 5970-99-932-1465 is used to terminate the leads.  (2) Destination and identification sleeves 5970-99-932-3457 are coded as required.</li> <li>A.G.C. muting 115V, 400 Hz, phase 1 27.5V +ve (switched) Press to mute Earth Not used</li> </ul>
12	Miniature cable 6A, 6145-99-910-0020	(P) Mk. IV 6-pole 5A 5935-99-056-0301 Outlet gasket 5935-99-097-0058 Union gasket 5935-99-097-0108 Thrust ring 5310-99-097-0096	Straight 5935-99-097-0242 or right angle 5935-99-097-0249	Cable ends		<ol> <li>Interconnecting box to terminal blocks Type B, 2-way No. 1.</li> <li>Note</li> <li>(1) Insulation sleeving 5970-99-932-1465 is used to terminate the leads.</li> <li>(2) Destination and identification sleeves 5970-99-</li> </ol>

TABLE 4—(Contd.)

				TABLE	<b>4</b> —(Contd.)			
Item			End	A	End	В		
No. (fig. 1 & 2)	Type of cable or wire	Wire No.	Plug (P) or socket (S)	Cable outlet or pole	Plug (P) or socket (S)	Cable outlet or pole	Qty.	Service and remarks
	Red Blue Green Yellow			A B C D E F				932-3459 are coded at required. Panel lights Earth Tone on/off Not connected Not used Aerial changeover relay (when combined v.h.f./u.h.f. aerial fitted).
13	Miniature cable, electric, 2P, 6145-99-910-0006 and miniature cable, electric, 3D, 6145-99-910-0012	6-j 59 Oi 59 Ca	Mk. IV pole 19A 35-99-940-3430 utlet gasket 35-99-097-0060 able sleeve 75-99-097-0116	Straight 5935-99-097-0247 or right angle 5935-99-097-0254	Cable ends		1	Interconnecting box to a.c. and d.c. power supplies (ARI 23143/2).  Note  (1) Insulation sleeving 5970 - 99 - 932 - 1465 and 5970-99-932-3119 is used
		59 Ur 59 Th	ompression ring 75-99-097-0104 nion gasket 35-99-097-0240 nrust ring 10-99-097-0098					to terminate the leads.  (2) Destination and identification sleeves 5970-99  932-3456 are coded a required.
	2P/red /blue 3D/red (screened) /blue /green			A B C D E F				27.5V +ve 27.5 -ve and earth 115V, 400 Hz, phase 1 115V, 400 Hz, phase 2 115V, 400 Hz, phase 3 Not used
	or Miniature cable 2P 6145-99-910-0006	6-j 59	) Mk. IV pole 19A 35-99-940-3430 utlet gasket	Straight 5935-99-097-0247 or right angle 5935-99-097-0254	Cable ends		1	Interconnecting box to d.c power supply (ARI.23143/1)  Note
		59 Ca 59 Ca 59 Ui	35-99-097-0060 able sleeve 75-99-097-0116 ompression ring 75-99-097-0104 nion gasket 35-99-097-0240					(1) Insulation sleeving 5970-99-932-3119 is used to terminate the leads. (2) Destination and identification sleeves 5970-99 932-3457 are coded a required.

Item		End A			End			
No. (fig. 1 & 2)	Type of cable or wire	Wire No.		Cable outlet or pole	Plug (P) or socket (S)	Cable outlet or pole	Qty.	Service and remarks
			Thrust ring 310-99-097-0098					
	Red			A				27.5V + ve
	Blue			C, D, E, F				27.5V —ve and earth Not used
14	As for item 9 exc panel light operat	Interconnecting box to control unit Type C1607/7 (ARI. 23143/4) (See notes in item 9).						
15	As for item 9 except that the lead from pole P at end A is connected to the pilot's dimmer control for panel light operation; the lead from pole P at end B is connected to the pilot's control changeover switch.							Control unit Type C1607/7 to control unit Type C1607/4 (ARI.23143/4). (See notes in item 9).

TABLE 5

Connectors for ARI.23143/3

		End A		d A	End			
Item No. (fig. 3)	Type of cable or wire	Wire No.	Plug (P) or socket (S)	Cable outlet or pole	Plug (P) or socket (S)	Cable outlet or pole	Qty.	Service and remarks
1	Unitersil 22 Ref. No. 5E/3823		-			F	As Req'd	General and switch wiring
2	Uniradio 67 6145-99-910-0295		P) Type UK-N2 935-99-999-0887	Straight or right angle adaptor Type N 5935-99-932-2405	(P) Type UK-N2 5935-99-999-0887	Straight or right angle adaptor Type N 5935-99-932-240:		Transmitter-receiver to homing unit.  Note  (1) Destination and identification sleeves 5970-99-932-3456 coded as required.  (2) Where the connector is subjected to ambient temperature greater than 80 deg.C, uniradio 73-6145-99-910-0030 and plug Type UK-N1, 5935-99-999-0884 should be used in lieu.
3	Uniradio 67 6145-99-910-0295		P) Type UK-N2 935-99-999-0887	Straight or right angle adaptor Type N 5935-99-932-2405	(P) Type UK-N2 5935-99-999-0887	Straight or right angle adaptor Type N 5935-99-932-240:		Homing unit to u.h.f. aerial relay (See notes in item 2).
4	Uniradio 67 6145-99-910-0295		P) Type UK-N2 935-99-999-0887	Straight or right angle adaptor Type N 5935-99-932-2405	(P) Type UK-N2 5935-99-999-0887	Straight or right angle adaptor Type N 5935-99-932-2405		Aerial 1 to u.h.f. aerial relay (See notes in item 2).
5	Uniradio 67 6145-99-910-0295	(I 59	P) Type UK-N2 935-99-999-0887	Straight or right angle adaptor Type N 5935-99-932-2405	(P) Type UK-N2 5935-99-999-0887	Straight or right angle adaptor Type N 5935-99-932-2405	1	Aerial 2 to u.h.f. aerial relay (See notes in item 2).

Item No. (fig. 3)		End A		Α	End		
	Type of cable or wire	Wire No.	Plug (P) or socket (S)	Cable outlet or pole	Plug (P) or socket (S)	Cable outlet Qty. or pole	Service and remarks
6	Uniradio 67 6145-99-910-0295		P) Type UK-N2 935-99-999-0887	Straight or right angle adaptor Type N 5935-99-932-2405	(P) Type UK-N2 5935-99-999-0887	Straight or right 1 angle adaptor Type N 5935-99-932-2405	Aerial 1 to v.h.f. aerial relay (See notes in item 2).
7	Uniradio 67 6145-99-910-0295		P) Type UK-N2 935-99-999-0887	Straight or right angle adaptor Type N 5935-99-932-2405	(P) Type UK-N2 5935-99-999-0887	Straight or right 1 angle adaptor Type N 5935-99-932-2405	Aerial 2 to v.h.f. aerial relay (See notes in item 2).
8	Uniradio 67 6145-99-910-0295	•	P) Type UK-N2 935-99-999-0887	Straight or right angle adaptor Type 5935-99-932-2405	(P) Type UK-N2 5935-99-999-0887	Straight or right 1 angle adaptor Type 5935-99-932-2405	Transmitter receiver to v.h.f aerial relay (See notes in item 2).
9	Unitersil 22 Ref. No. 5E/3893	Ì	P) Cannon K03-21-30PN 5935-99-940-3381	Straight K06-21-5/8 5935-99-940-3395 or right angle K08-21-5/8 5935-99-940-3396 or 45 deg. angle K45-21-5/8 5935-99-940-3397  A B D E F H J K L M N	(S) Cannon K03-21-30SN 5935-99-940-3382	Straight K06-21-5/8 1 5935-99-940-3395 or right angle K08-21-5/8 5935-99-940-3396 or 45 deg. angle K45-21-5/8 5935-99-940-3397  A B C D E F H J K L M N	Interconnecting box to controunit Type C1607/4 and 7-way terminal block.  Note  (1) Pole C of end B is connected to terminal Note 1 of the 7-way terminal block (end C); this is the a.d.f. on/off line.  (2) Wire termination sleeves 5975-99-932-141 to 5975-99-932-1446 are numbered 1 to 30 respectively.  (3) Destination and identification sleeves 5970-99 932-3456 are coded as required.  (4) All terminations are to be sealed using compound PR1201Q or other approved compound.

TABLE 5—(Contd.)

τ.			End A			Eı	nd B	
Item No. (fig. 3)	Type of cable or wire	Wire No.	Plug (P) or socket (S)	Cable outlet or pole	Plug (P) or socket (S)	Cable outlet or pole	Qty.	Service and remarks
		13		P		P		
		14		R		R		
		15		S		S		
		16		T		T		
		17		U		U		
		18		V		V		
		19		W		W		
		20		X V		Ŷ		
		22		7		7		
		23		2		2		
	•	24		b		b		
		25		c		c		
		26		d		d		
		27		f		f		
		28		g		g		
		29		h		h		
		30		i		i		
10	Unitersil 22 Ref. No. 5E/3893		P) Mk. IV, 5-pole, 5A, 5935-99-056-0300 Outlet gasket 5935-99-097-0058 Cable sleeve 5975-99-097-0114 Compression ring 5975-99-097-0102	Straight 5935-99-097-0242 or right angle 5935-99-097-0249	Cable ends		1	Interconnecting box to terminal blocks Type B, 2-way No. 1.  Note  (1) Insulation sleeving 5970-99-932-1465 is used to terminate the leads.  (2) Wire termination sleeves 5975-99-932-1417
		5	Jnion gasket 5935-99-097-0108 Thrust ring 5310-99-097-0096					to 5975-99-932-1422 are numbered 1 to 6 respectively.  (3) Destination and identification sleeves 5970-99-932-3456 coded as required.

			Enc	l A	End	В	
Item No. (fig. 3)	Type of cable or wire	Wire No.		Cable outlet or pole	Plug (P) or socket (S)	Cable outlet Qty. or pole	Service and remarks
		1 2 3 4 5 6		A B C D E F			Tel +ve Tel -ve and earth Mic -ve Mic +ve Press to transmit Press to mute
11	Unitersil 14 Ref. No. 5E/3897 Unitersil 22 Ref. No. 5E/3893	1	S) Amphenol 165GB-R44 5935-99-932-1250	Right angle	(P) Amphenol 165GB-72-1 5935-99-940-3390 or	Straight 1	Transmitter-receiver to inter- connecting box and 7-way terminal block.
	Unitersil met-sheath	1			(P) Amphenol 165GB-R72 5935-99-932-1246	Right angle	(1) Length of connector (end A to end B) must not exceed 10 feet (see
	14	1		Α		A	para. 22).
	14	2		Earthing ring and B		Earthing ring and B	(2) Wire termination
	22	3		C		C	sleeves 5975-99-932-1417
	22	4		D		D	to 5975-99-932-1458 are
	22	5		E		E	numbered 1 to 42 respec-
	22	6		F		T .	tively. (3) Destination and iden-
	22	/	the state of the s	n T		I	tification sleeves 5970
	22	0		V V		K	99-932-3458 coded as
	22	10		I		Î.	required.
	22	11		M		M	(4) All terminations are
	Metsheaf 22	12		N		N	to be sealed using com-
	22	13		P		P	pound PR1201Q or other
	Metsheath 22	14		R		R	approved compound.
	Metsheath 22	15		S		S	The 7-way terminal block (end
	22	16		T		T	C) is connected as follows:
	22	17		U		U	Terminal No. 2 to poles A of
	22	18		V		V	ends A and B.
	Metsheath 22	19		W		W	Terminal No. 3 to earthing
	Metsheath 22	20		X		X	ring and poles B of ends A
	Metsheath 22	21		Y		7	and B.
	22	22		Z		2	Terminal No. 4 to poles E of
	22	23		a		a	ends A and B.

required.

	Type of cable or wire	End A			End B			
Item No. (fig. 3)		Wire No.	Plug (P) or socket (S)	Cable outlet or pole	Plug (P) or socket (S)	Cable outlet or pole	Qty.	Service and remarks
		1 2 3		A B C D, E, F				Panel lights Earth Tone on/off Not used
В	Unitersil 22 Ref. No. 5E/3893	5 C 5 C 5 C 5 C 5 C 5 C 5 C 5 C 5 C 5 C	S) Mk. IV, 3-pole 19A 935-99-940-3430 Outlet gasket 935-99-097-0060 Cable sleeve 975-99-007-0116 Compression ring 975-99-097-0104 Union gasket 935-99-097-0240 Chrust ring 310-99-097-0098	Straight 5935-99-097-0247 or right angle 5935-99-097-0254 A B C, D, E, F	Cable ends		1	Interconnecting box to d.c. power supply.  Note  (1) Insulation sleeving 5970-99-932-1465 is used to terminate the leads.  (2) Wire insulation sleeves 5975-99-932-1417 and 5935-99-932-1418 are numbered 1 and 2 respectively.  (3) Destination and identification sleeves 5970-99-932-3456 are coded as required.  27.5V + ve 27.5V - ve and earth Not used
14	Unitersil Ref. No. 5E/3893		(S) Mk. IV, 12-pole 5A, 1935-99-056-0181 Outlet gasket 1935-99-097-0059 Cable sleeve 1975-99-097-0115 Compression ring 1975-99-097-0105 Union gasket 1935-99-037-0111 Thrust ring 19310-99-012-0204	Straight 5935-99-011-9119 or right angle 5935-99-011-9126	Cable ends		1	Homing unit to 7-way terminal block.  Note  (1) Insulation sleeving 5970-99-932-1465 is used to terminate the leads.  (2) Wire termination sleeves 5975-99-932-1417 to 5975-99-932-1423 are numbered 1 to 7 respectively.  (3) Destination and identification sleeves 5970-99-932-3456 coded as re-

TABLE 5—(Contd.)

T4				Er	nd A	End	В	
Item No. (fig. 3)	Type of cable or wire	Wire No.	Plug (P) or socket (S)	Cable outlet or pole	Plug (P) or socket (S)	Cable outlet Qty. or pole	Service and remarks	
		1 2 3 4 5 6 7		A B H J K L M			7-way terminal block terminations:—  2 3 5 6 7 4 1	
	Unitersil 22 No. 5E/3893	1 5 5 7 7	P) Mk. IV, 2-pole, 5A 3935-99-056-0363 Outlet gasket 3935-99-097-0059 Cable sleeve 3975-99-097-0115 Compression ring 3975-99-097-0105 Union gasket 3935-99-097-0111 Chrust ring 310-99-012-0204	Straight 5935-99-011-9119 or right angle 5935-99-011-9126	(S) Mk. IV, 12-pole, 5A, 5935-99-056-0180 Outlet gasket 5935-99-097-0059 Cable sleeve 5975-99-097-0115 Compression ring 5975-99-097-0105 Union gasket 5935-99-097-0111 Thrust ring 5310-99-012-0204	Straight 1 5935-011-9119 or right angle 5935-99-011-9126	Homing unit to indicator and sensitivity switch.  Note  (1) Wire termination sleeves 5975-99-932-1417 to 5975-99-932-1422 are numbered 1 to 6 respectively.  (2) Destination and identification sleeves 5970-99-932-3458 are coded as required.  (3) All terminations are to be sealed using compound PR1201Q or other approved compound.	
		1 2 3 4 5 6	A B J K E F		A B J K		Sensitivity switch Sensitivity switch	

TABLE 5—(Contd.)

		End A		End	В	
No. (fig. 3)	Type of cable or wire	Wire Plug (P) or No. socket (S)	Cable outlet or pole	Plug (P) or socket (S)	Cable outlet Que or pole	ty. Service and remarks
16	Uniradio 81 6145-99-942-4561	(P) Type UK-C3 5935-99-913-3535	Straight or right angle adaptor Type C 5935-99-920-9000	(P) Type UK-C3 5935-99-913-3535	Straight or right angle adaptor Type C 5935-99-920-9000	1 Homing unit to port aerial (forms matched pair with item 17).  Note  (1) Destination and identification sleeves 5970-99-932-3456 coded as required.  (2) Where the connector is subjected to ambient temperature greater than 80 deg.C, uniradio 102, 6145-99-943-3961 and plug Type UK-C1, 5935-99-913-3533 should be used in lieu.
17	Uniradio 81 6145-99-942-4561	(P) Type UK-C3 5935-99-913-3535	Straight or right angle adaptor Type C 5935-99-920-9000	(P) Type UK-C3 5935-99-913-3535	Straight or right angle adaptor Type C 5935-99-920-9000	1 Homing unit to starboard aerial (forms matched pair with item 16). (See notes in item 16).