Chapter 5

◀ A.R.I.23117/2 ▶

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Introduction

1. The A.R.I.23117/2 provides a means of V.H.F.-R/T communication. The frequency coverage is 118.00 M.c/s. to 135.95 M.c/s. in steps of 0.05 M.c/s. The main items of equipment are listed in Table 1 and the connector assemblies in Table 2.

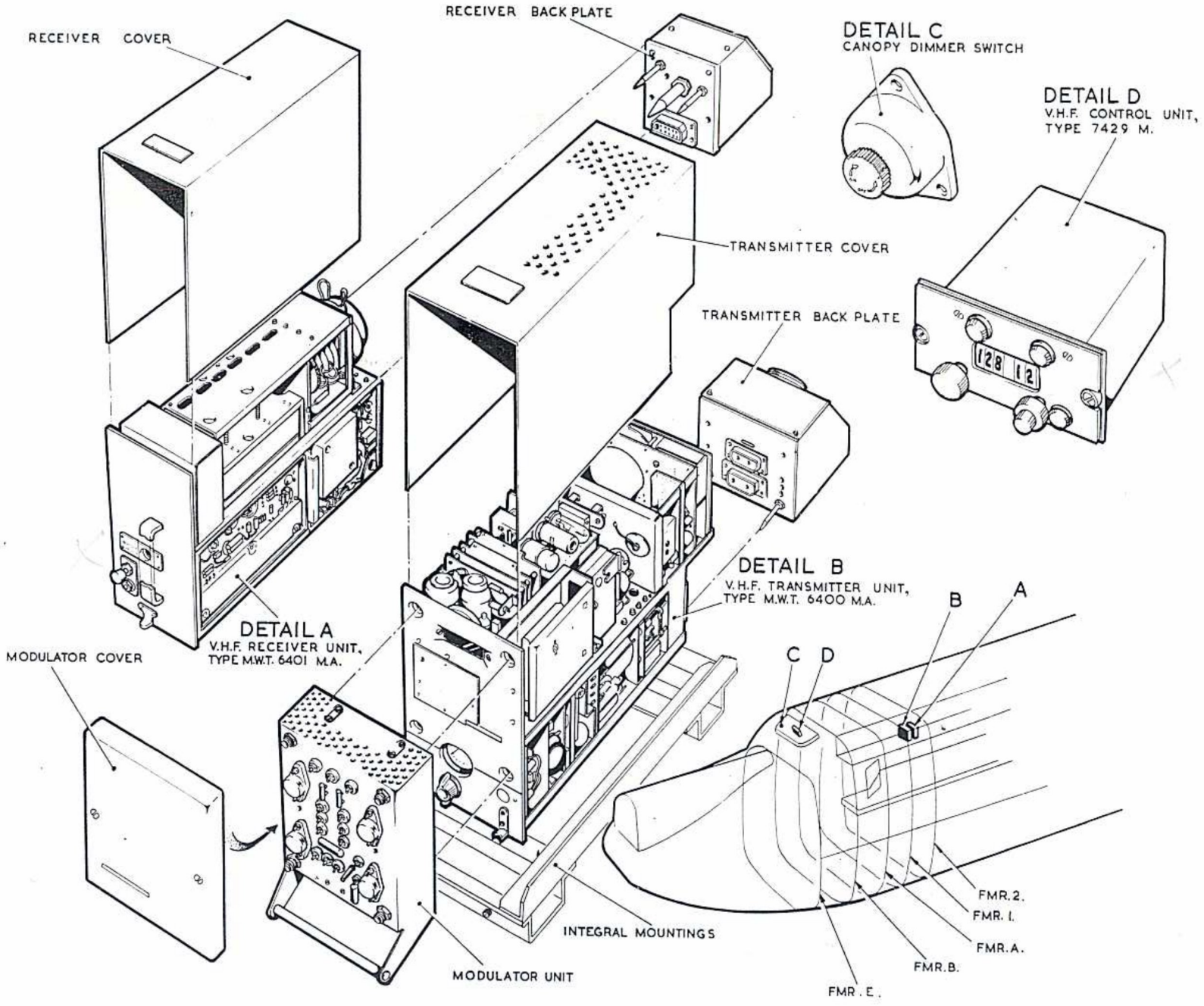

Fig. 1 Location of equipment

RESTRICTED

DESCRIPTION AND OPERATION

RECEIVER

2. The triple super-heterodyne receiver, Type 6401 M, is fully transistorised for operation on 560 crystal-controlled channels from 108.00 M.c/s. to 135.95 M.c/s.

NOTE...
The navigation channels (108.00 M.c/s to 117.95 M.c/s) are not used in this installation.

3. Tuning is carried out electrically by two Ledex electro-mechanical switches, controlled by the unit on the pilot's canopy panel.

4. All electrical connections to the receiver are made via a co-axial connector and a 28-way plug. Locating pins ensure correct mating of the plug to a socket on the receiver back plate.

Squelch circuit

5. The squelch, or muting circuit in the receiver operates in two modes. With strong carrier signals being received, the squelch is operated by the carrier level. However with a carrier below a pre-set level being received, the squelch operates on the signal to noise ratio. In this manner, weak interference free signals may be received, as long as a carrier of a pre-set minimum strength is present.

6. A squelch disable switch is mounted on the front panel of the receiver, above a telephone jack socket. With the equipment switch ON and the disable switch button depressed, the squelch circuit will be 'opened'. With a headset plugged into the jack socket, a background hiss in the telephones indicates that the receiver is operating.

TRANSMITTER

7. The transmitter, Type 6400 MA, covers the frequency band 118.00 M.c/s to 135.95 M.c/s in steps of 0.05 M.c/s thereby providing 360 channels. Apart from four valves in the R.F. output stages, transistors are employed in all the circuits.

8. Electrical connections to the transmitter are made via a 24-pole plug (22 normal and 2 high voltage) at the rear of the unit. The front panel carries a meter, a jack selection switch and a microphone jack socket. The meter is for checking the performance of the transmitter in the aircraft by monitoring the voltages or current at selected points in the transmitter circuit. The switch selections and typical meter readings are given in Table 3.

9. The frequency selection is controlled in a similar manner to the receiver. Two crystal controlled oscillator circuits provide basic frequencies, their outputs being mixed to provide a difference frequency. This difference frequency is then passed through a doubler stage to become the carrier frequency.

10. The transmitter requires only a 28-volt d.c. input. A d.c. power unit within the transmitter provides 470 and 270 volts for the output stages.

CONTROL UNIT

11. The control unit, Type 7429, provides remote control facilities for switching and tuning the transmitter and receiver. Three lamps mounted in the facia panel of the unit provide edge lighting. Electrical connections to the unit are via a 50-way Cannon plug at the rear.

INTERCONNECTING JUNCTION BOX

12. In addition to its function as a junction box, this unit forms the backplate for the transmitter and receiver mounting. Inside the junction box is a matching transformer for the telephone circuits and a pre-amplifier for the microphone circuit. An amplifier is also fitted to give intercomm. facilities on the V.H.F. channel.

AERIAL

13. The V.H.F. aerial, Type 8584, is mounted on the upper fuselage at formers 7 and 8, between stringers 3 - 4 on the port side. The aerial blade is fixed on the aerodynamically shaped plinth, pointing aft, parallel to the upper fuselage skin.

POWER SUPPLIES

14. One side of the coil of relay No.320, at the wireless operator's station, is connected to the 28-volt d.c. supply via fuse BT3 (Pre Mod.1425) or fuse BR9 (Post Mod.1452). With the equipment switched on at the control unit, Type 7429 the earth return to this relay is completed. With relay No.320 energised and its contacts closed, 28-volt d.c. will be fed to the transmitter via fuse BT4 and BT6 (Pre Mod.1452) or fuses BR10 and BR12 (Post Mod.1452). The receiver is supplied via fuse BT5 (Pre Mod.1452) or fuse BR11 (Post Mod.1452). It should be noted that due to the interconnections inside the junction box, fuses BT4 and BT6 (Pre Mod.1452) or fuses BR10 and BR12 (Post Mod.1452) will be connected in parallel.

15. The dual lamps on the control unit will light as soon as the equipment is switched on, being supplied from fuse BT5 (Pre Mod.1452) or fuse BR11 (Post Mod.1452). The panel lamp on the controller is controlled by the dimmer switch on the pilot's canopy panel.

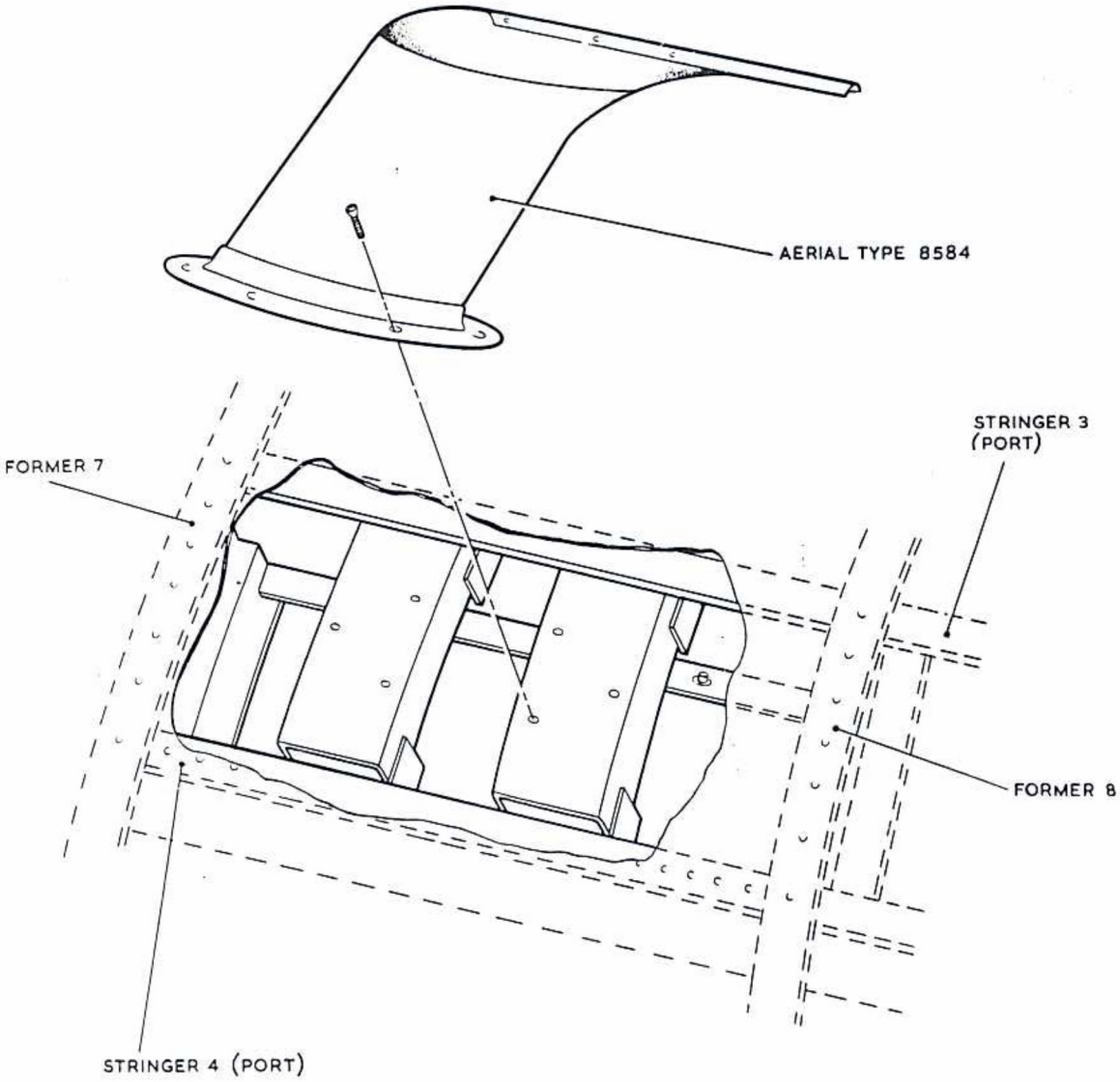

Fig.2 Aerial assembly

SERVICING

PRECAUTIONS

16. Before any servicing is attempted, the general servicing precautions outlined in Chap.1 should be noted.

RECEIVER

17. The receiver should be examined for security of attachment, damage, corrosion and bonding. When carrying out functional tests, the operation of the squelch disable switch should be checked. With the switch depressed, a background 'hiss' in the telephones indicates that the receiver is operating.

TRANSMITTER

18. The transmitter should be checked for security of attachment, damage, corrosion and bonding. The meter on the transmitter facia panel gives an indication of the performance of the unit.

CONTROL UNIT

19. The unit should be inspected for security of attachment. The controls should be checked for freedom of movement and correct operation.

REMOVAL AND INSTALLATION

GENERAL

20. Removal of the main items of equipment is straightforward, therefore detailed instructions are not considered necessary. Prior to re-fitting units however, ensure that the pins on the connecting plugs and sockets are not damaged.

21. The receiver and transmitter are provided with transport handles, and weigh 8.5 lbs. and 14.3 lbs. respectively.

TABLE 1

Major items of equipment

Equipment	Unit No.	Nato Cat. No.	A.P.reference
Receiver	6401M	5821-99-970-4803	A.P.116D-0111-1
Transmitter	6400MA	5821-99-970-4801	A.P.116D-0111-1
Control unit	7429M	5895-99-970-4802	A.P.116D-0111-1
Interconnecting box	EJ-B-21A-3	-	-
Aerial	8584	-	-

TABLE 2

Connectors for A.R.I. 23117/2

Item No.	Cable form	Connecting
2/T5682	Uniradio 67	Interconnecting box (SK.6) to VHF Aerial
3/T5682	Uninyvin 22 (34 off)	Interconnecting box (SK.1) to Control unit (Canopy)

TABLE 3

Transmitter performance check - typical meter readings

Switch Position	Function	Meter F.S.D.	Typical Reading (Meter Divisions)		Actual Reading
			Key up	Key Down	
OFF	OFF - (No reading)	-	-	-	-
H.T.	High tension voltage	1000 V	6.0	4.7	600 volts 470 volts
M.T.	Medium tension voltage	500 V	0	5.4	270 volts
DB-G	Frequency doubler grid current	2.0 mA	0	2.0	0.4 mA
DR-G	RF. driver amplifier grid current	2.0 mA	0	6.0	1.2 mA
PA-G	RF. power amplifier grid current	10.0 mA	0	4.0	4.0 mA
PA-I	RF. power amplifier anode current	200 mA	0	7.5	150 mA
AE	RF. output	-	0	6.0	-
MOD.1	Modulator power amplifier - 2VT9 Emitter current Modulator power amplifier - 2VT10 Emitter current	2.0 A	0	5.0 with 100% Mod.	1.0 A
D.C.	D.C. supply voltage	50.0 V	0	5.5	27.5 V
Z	Modulator pre-amplifier supply voltage (STAB)	25.0 V	7.5	7.5	18.75 V

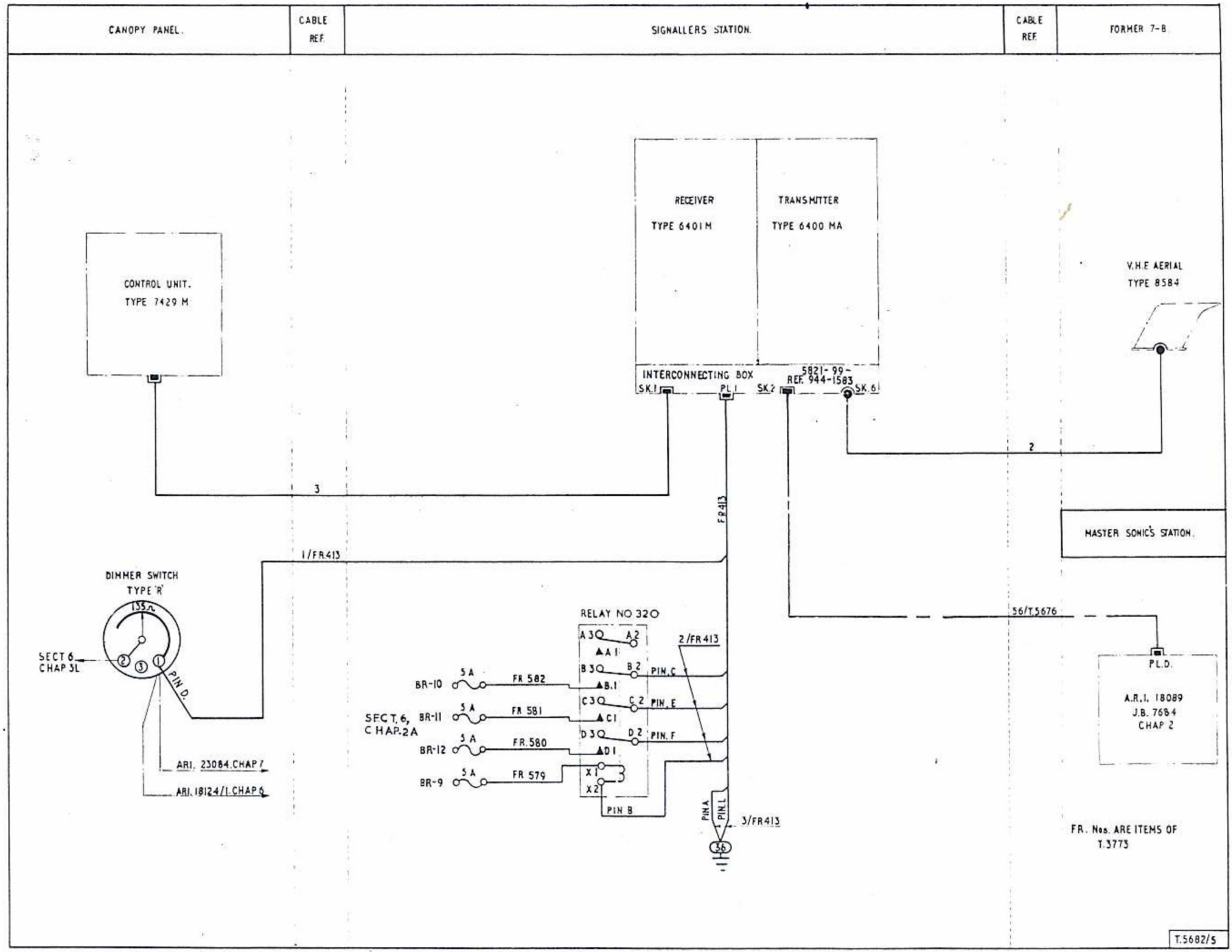

Fig. 3. A.R.I. 23117/2
◄ Mod. 1452 ►