

**PART I**

**LEADING PARTICULARS AND  
GENERAL INFORMATION**

**RESTRICTED**







## LEADING PARTICULARS

## Note . . .

The following details are equally applicable to the TR4/ARC52, TR5/ARC52, PTR175 and PTR175A, except where otherwise stated. All levels are e.m.f. values from a 50-ohm source, unless otherwise stated.

## General

**Function** ... Multi-channel R/T transmitter-receiver for simplex communication between aircraft and base and also between aircraft in flight. It can be used also in fixed ground installations and in mobile and transportable installations on land and water. Facilities are included for automatic selection of any one of 19 preset frequencies (including the guard frequency) and manual selection of any one of the available channels. M.C.W. is available for emergency and direction finding purposes. The transmitter-receiver incorporates facilities for use with automatic direction finding equipment. Airborne relay facilities can be made available using an identical transmitter-receiver. The equipment can be used for intercommunication between aircraft crew members.

**Range** ... Optical range at ground or sea level;  
100 miles at 20 000 feet;  
200 miles or more at 50 000 feet.

## Frequency bands

TR4/ARC52 and  
TR5/ARC52 ... U.H.F. only, 225.0 Mc/s–339.9 Mc/s.  
PTR175 and PTR175A ... V.H.F., ◀ 117.5 ▶ Mc/s–135.95 Mc/s.;  
u.h.f., 225 Mc/s–399.95 Mc/s.

**Frequency control** ... Crystal.

## Frequency stability (transmitter and receiver)

TR4/ARC52 and  
TR5/ARC52 ... U.H.F. only  $\pm 10$  kc/s.  
PTR175 and PTR175A ... U.H.F.  $\pm 7.5$  kc/s, V.H.F.  $\pm 6$  kc/s.

## Frequency channels

TR4/ARC52 and  
TR5/ARC52 ... U.H.F. only, 1750 at 100 kc/s intervals.  
PTR175 and PTR175A ... V.H.F. ◀ 370 ▶ at 50 kc/s intervals;  
U.H.F. 3500 at 50 kc/s intervals.

**Preset channels** ... 18 plus guard.

**Guard receiver frequency band** 238.0 Mc/s–248.0 Mc/s.

## Intermediate frequencies

TR4/ARC52 and  
TR5/ARC52 ... 20 Mc/s–29.9 Mc/s and 1.85 Mc/s.  
PTR175 and PTR175A ... 20 Mc/s–29.95 Mc/s, 1.8 Mc/s or 1.85 Mc/s, and  
500 kc/s.

**Temperature limits** ...  $-55^{\circ}\text{C}$  to  $+55^{\circ}\text{C}$ .

## Supply voltages and approximate power consumption

TR4/ARC52	...	27.5V d.c.		
		Receive	30W	1.1A
		Transmit	40W	1.5A
		Channel change	206W	7.5A
		115/200V, 400 c/s, 3-phase a.c. (phase to neutral)		
		Receive	275VA	
		Transmit	430VA	
		Channel change	275VA	
TR5/ARC52	...	27.5V d.c.		
		Receive	343W	12.5A
		Transmit	467W	17A
		Channel change	467W	17A

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## LEADING PARTICULARS (continued)

PTR175A	...	...	...	27.5V d.c.	u.h.f.	v.h.f.
				Receive	30.25W	33W
				Transmit	41.5W	44W
				Channel change	206W	206W
				115/200V, 400 c/s, 3-phase a.c. (phase to neutral)		
					u.h.f.	v.h.f.
				Receive	275VA	275VA
				Transmit	430VA	380VA
				Channel change	275VA	275VA
PTR175	...	...	...	27.5V d.c.	u.h.f.	v.h.f.
				Receive	◀290W▶	◀290W▶
				Transmit	◀385W▶	◀345W▶
				Channel change	415W	415W
Control, receiver muting	...	...	...	Not exceeding 0.4A at 27.5V d.c. or 5mA at 115V a.c. 400 c/s.		
Channel selection time	...	...	...	6 seconds (approx.)		
Transmit/receive time interval	...	...	...	300 milliseconds (maximum)		
NATO Stock Nos.						
5821-99-942-8541	...	...	...	Transmitter-receiver, radio, Type TR4/ARC52.		
5821-99-942-8542	...	...	...	Transmitter-receiver, radio, Type TR5/ARC52.		
5821-99-971-1778	...	...	...	Transmitter-receiver, radio, Type PTR175A.		
5821-99-971-1781	...	...	...	Transmitter-receiver, radio, Type PTR175.		
5821-99-942-8544	...	...	...	Tray, mounting, transmitter-receiver, radio, Type MT1477/ARC52.		
5821-99-942-8543	...	...	...	Control unit, transmitter-receiver, radio, Type C1607/ARC52.		
5821-99-932-2267	...	...	...	Control unit, transmitter-receiver, radio, Type C1607/1/ARC52.		
5821-99-999-0839	...	...	...	Control, radio set, Type C1607/2/ARC52.		
5821-99-945-5739	...	...	...	Control, radio set, Type C1607/4/ARC52.		
5821-99-947-0733	...	...	...	Control, radio set, Type C1607/5/ARC52.		
5821-99-932-6361	...	...	...	Interconnecting box.		
5821-99-943-3247	...	...	...	Control, receiver muting.		

### Note . . .

The control units are interchangeable but the facilities available depend upon the unit type and the type of transmitter-receiver.

### Dimensions and weight (approx.)

			Height	Width	Depth	Weight
T/R unit	...	...	7 $\frac{3}{8}$ in.	10 $\frac{1}{8}$ in.	21 in.	50 lb.
Mounting tray	...	...	3 in.	11 $\frac{1}{4}$ in.	21 in.	3 $\frac{1}{4}$ lb.
Control unit	...	...	5 $\frac{5}{8}$ in.	4 $\frac{7}{8}$ in.	5 $\frac{3}{4}$ in.	3 $\frac{1}{4}$ lb.
Interconnecting box	...	...	2 $\frac{3}{4}$ in.	4 $\frac{3}{8}$ in.	6 $\frac{1}{8}$ in.	1 $\frac{1}{4}$ lb.
Control, receiver muting	...	...	3 in.	3 $\frac{3}{4}$ in.	4 $\frac{3}{4}$ in.	1 $\frac{1}{4}$ lb.

### Aerials

TR4/ARC52 and	A number of broad-band aerials are available (Part 1, Sect. 2).				
TR5/ARC52					
PTR175 and PTR175A					
	Separate or dual-band aerials may be employed to give v.h.f. and u.h.f. coverage.				

### Receiver

Sensitivity	...	...	...	An r.f. input of 5uV (open circuit) modulated 30% at 1000 c/s produces an audio output of at least 50mW.		
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### Signal plus noise-to-noise ratio (r.f. input conditions as for "sensitivity")

TR4/ARC52 and	8dB or more.				
TR5/ARC52					
PTR175 and PTR175A					
	8dB or more over the u.h.f. band and 10dB or more over the v.h.f. band.				

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## LEADING PARTICULARS (continued)

A.G.C. characteristics ...	...	With a 1000 $\mu$ V r.f. input signal modulated by 1000 c/s to 30%, the audio output is between 107mW and 144mW. The audio output remains within $\pm 3$ dB of this level when the input is varied from 10 $\mu$ V to 10mV; also it remains within $\pm 5$ dB of this output level when the input is increased up to 100mV.
Input impedance (r.f.) ...	...	50 ohms (nominal).
Output impedance (a.f.) ...	...	may be set for either 300 ohms or 50 ohms, resistive.
Modulation ...	...	Amplitude.
Audio frequency response		
TR4/ARC52 and		
TR5/ARC52 ...	...	+1dB to -4dB from 300 c/s to 3000 c/s.
PTR175 and PTR175A	...	+1dB to -4dB from 300 c/s to 3000 c/s.
Harmonic distortion ...	...	Less than 10%.
Noise limiting ...	...	Instantaneous peak limiting.
Audio output ...	...	At least 250mW (normally set at 125mW) with a 1mV input modulated 30% at 1000 c/s.
Auxiliary audio output	...	1.75V, with a 1mV input modulated 30% at 5000 c/s

(For use with certain automatic direction finding equipment, e.g. ARI.18120.)

Auxiliary audio output impedance 20 000 ohms, resistive.

**Transmitter**

R.F. power output		
TR4/ARC52 and		U.H.F. only, 16W nominal, under standard conditions.
TR5/ARC52		
PTR175 and PTR175A	...	U.H.F. 16W, V.H.F. 3.5W (nominal levels), measured under standard conditions.
Output impedance (r.f.)	...	50 ohms (nominal).
Modulation ...	...	R/T not less than 80%, with a 1000 c/s signal at either:— 1V e.m.f. for 82 ohms carbon microphone, or 25mV e.m.f. for 82 ohms dynamic microphone, or 10mV e.m.f. for 200 ohms dynamic microphone. (with the modulator set appropriately).
Tone modulation...	...	M.C.W. approximately 80% to 100% from 920 c/s to 1120 c/s.
Input impedance	...	82 ohms (unbalanced) carbon microphone, or 200 ohms (balanced) dynamic microphone, or 82 ohms (balanced) dynamic microphone.
A.F. bandwidth		
TR4/ARC52 and		
TR5/ARC52 ...	...	150 c/s to 20 000 c/s.
PTR175 and PTR175A	...	150 c/s to 20 000 c/s for u.h.f. reception; 150 c/s to 10 000 c/s for v.h.f. reception.
Sidetone ...	...	Alternative systems are available, viz.:— (1) By rectified carrier (u.h.f. only). (2) From modulator. Level 250mW when carrier is 80% modulated at 1000 c/s.

**Note . . .**

Leading particulars of the power unit (AC), which is used for fixed ground installations, are given in Part 1, Sect. 2, Chap. 2 of this Volume; those of the dynamotor power supply, which is used for mobile and transportable installations, are included in Chap. 3 of the same Section.

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