

AIR PUBLICATION

116D-0116-1

ARI. 23143

**U.H.F./V.H.F. TRANSMITTER-RECEIVER
(PLESSEY PTR.175)**

GENERAL AND TECHNICAL INFORMATION

BY COMMAND OF THE DEFENCE COUNCIL



Ministry of Defence

FOR USE IN THE
ROYAL AIR FORCE

(Prepared by the Ministry of Technology)

FOR OFFICIAL USE ONLY

AMENDMENT RECORD SHEET

To record the incorporation of an Amendment List in this publication, sign against the appropriate A.L.No. and insert the date of incorporation

A.L. No.	AMENDED BY	DATE
1		
2		
3		
4		
5		
6		
7		
8	AL's 1 to 8 inc.	9.74
9	<i>g. l. white</i>	3-10-75
10	<i>g. l. white</i>	3-5-76
11	<i>g. l. white</i>	8-11-76
12	<i>[Signature]</i>	26.1.81
13	<i>O. Green</i>	2 May 85
14		
15		
16		
17		
18		
19		
20		
21		
22		
23		
24		
25		
26		
27		
28		
29		
30		
31		
32		
33		

A.L. No.	AMENDED BY	DATE
34		
35		
36		
37		
38		
39		
40		
41		
42		
43		
44		
45		
46		
47		
48		
49		
50		
51		
52		
53		
54		
55		
56		
57		
58		
59		
60		
61		
62		
63		
64		
65		
66		

CONTENTS

Chap.

- Leading particulars
- 1 General information
- 2 Theory of operation
- 3 Setting-up and operating instructions
- 4 Aircraft installations
- 5 General servicing and fault finding information
- 6 Overall performance tests
- 7 Bench testing and adjustments of preset controls

ASSOCIATED PUBLICATIONS

	<i>A.P.</i>
<i>ARI.18124 series and ARI.23182 U.H.F. transmitter-receiver ARC52</i>	116D-0105-1
	(2nd Edn.)
<i>ARI.23141 U.H.F./V.H.F. transmitter-receiver (Plessey PTR177)</i>	116D-0134-1
<i>ARI.23199 U.H.F./V.H.F. transmitter-receiver (Plessey PTR374)</i>	116D-0129-1
<i>U.H.F. transmitter-receivers (ARC52 and derivatives)</i>	
<i>Module assemblies and ancillaries</i>	116D-0133-1A
<i>Special test equipment for second-line-servicing</i> ...	116D-0133-1B
<i>Servicing diagrams manual</i>	116D-0133-10
<i>Test set (U.H.F.) Type 15056</i>	117M-0101-1
<i>U.H.F. Ground installations FGRI.23065</i>	116E-0102-1
<i>U.H.F. Mobile installations MGRI.23073</i>	116E-0101-1
<i>U.H.F. Transportable installations TGRI(AT)26005</i> ...	116K-0402-1

LEADING PARTICULARS

Note . . .

The following details are equally applicable to the 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. 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 inter-communication 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	...	...	...	...	V.H.F. 117.5 MHz-135.95 MHz U.H.F. 225 MHz-399.95 MHz
Frequency control	...	...	...	...	Crystal
Frequency stability (transmitter and receiver)	...	...	...	...	V.H.F. ± 6 kHz U.H.F. ± 7.5 kHz
Frequency channels	...	...	...	...	V.H.F. 370 at 50 kHz intervals; U.H.F. 3500 at 50 kHz intervals.
Preset channels	...	...	...	...	18 plus guard
Guard receiver frequency band	...	...	...	...	238.0 MHz-248.0 MHz
Intermediate frequencies	...	...	...	...	20 MHz-29.95 MHz, 1.8 MHz or 1.85 MHz and 500 kHz
Temperature limits	...	...	...	...	-55°C to $+55^{\circ}\text{C}$
Supply voltages and approximate power consumption					
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 Hz, 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 at 400 Hz

Channel selection time	...	...	...	...	6 seconds (approx.)
Transmit/receive time interval	...	...	...	...	300 milliseconds (maximum)
NATO Stock Nos.					
5821-99-971-1781	...	...	...	...	Transmitter-receiver, radio Type PTR 175
5821-99-971-1778	...	...	...	...	Transmitter-receiver, radio Type PTR 175A
5821-99-942-8544	...	...	...	...	Tray, mounting, transmitter-receiver, radio, Type MT1477/ARC52
5821-99-932-6361	...	...	...	...	Interconnecting box
5821-99-943-3247	...	...	...	...	Control, receiver muting
5821-99-945-5739	...	...	...	...	Control, radio set, Type C1607/4
◀5821-99-107-0030	...	...	...	...	Control, radio set, Type C1607/7
5821-99-223-8189	...	...	...	...	Control, radio set, Type C1607/9▶

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	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 5 μ V (open circuit) modulated 30% at 1000 Hz produces an audio output of at least 50mW
Signal plus noise-to-noise ratio (r.f. input conditions as for "sensitivity")	...	...	...	...	8dB or more over the u.h.f. band and 10dB or more over the v.h.f. band.
A.G.C. characteristics	...	...	...	...	With a 1000 μ V r.f. input signal modulated by 1000 Hz to 30%, the audio output is between 107mW and 144mW. The audio output remains within ± 3 dB of this level when the input is varied from 10 μ V to 10mV; also it remains within ± 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 500 ohms, resistive
Modulation	...	...	...	...	Amplitude
Audio frequency response	...	...	...	...	+1dB to -4dB from 300 Hz to 3000 Hz
Harmonic distortion	...	...	...	...	Less than 10%
Noise limiting	...	...	...	...	Instantaneous peak limiting
Audio output	...	...	...	...	At least 250mV (normally set at 125 mW) with a 1mV input modulated 30% at 1000 Hz
Auxiliary audio output	...	...	...	...	1.75V, with a 1mV input modulated 30% at 5000 Hz

(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	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 Hz signal at either:— 1V e.m.f. for 82 ohms carbon microphone, or 25mV e.m.f. for 82 ohms dynamic microphone, or 50mV e.m.f. for 300 ohms dynamic microphone. (With the modulator set appropriately).
Tone modulation	...	...	...	...	M.C.W. appropriately 80% to 100% from 920 Hz to 1120 Hz
Input impedance	...	...	...	...	82 ohms (unbalanced) carbon microphone, or 200 ohms (balanced) dynamic microphone, or 82 ohms (balanced) dynamic microphone
A.F. bandwidth	...	...	...	...	150 Hz to 20,000 Hz for u.h.f. reception; 150 Hz to 10,000 Hz for v.h.f. reception
Sidetone	...	...	...	...	Alternative systems are available, viz:— (1) By rectified carrier (u.h.f. only) (2) From modulator Level 250mV when carrier is 80% modulated at 1000 Hz

AL 6.

