KOLSTER-BRANDES LIMITED

FOOTSCRAY SIDCUP KENT

MODEL
PR 10

SERVICE DATA

ISSUED JULY, 1958

SPECIFICATION

The PR 10 is a five-valve, two-waveband table receiver suitable for A.C. mains operation.

VOLTAGE RATING: 200–250 volts A.C. 50 c/s.

POWER CONSUMPTION: 36 watts.

WAVERANGES: Long Waveband: 160–280 Kc/s. (1,875–1,070 metres).
Medium Waveband: 500–1,620 Kc/s. (600–185 metres).

CONTROLS: Off/on and Volume.
Tuning.
Wavechange.

VALVE COMPLEMENT:

TYPE	FUNCTION
Brimar 6BE6	Frequency Changer.
Brimar 6BJ6	I.F. Amplifier.
Brimar 6AT6	2nd Detector and 1st Audio Amplifier.
Brimar 6AQ5	Audio Output.
Brimar EZ80	Rectifier.

DIMENSIONS: Width 18 inches (45·7 cms).
Height 12·75 inches (32·4 cms.).
Depth 6·0 inches (15·25 cms.).

WEIGHT: 8¾ lbs. approx. (4 kilos).

GENERAL INFORMATION

This receiver is based on a printed circuit design and all components, other than the loudspeaker and output transformer, are mounted on a single flat plate printed board.

Aerial and earth terminals are not provided, as the design incorporates an 8-inch ferrite aerial unit with high-Q coils for long and medium wavebands.

SETTING-UP PROCEDURE

1. Lay receiver on its face, then remove the four fixing screws which secure the cabinet back assembly to the cabinet front assembly. These are situated two each side of the cabinet back supports.
2. Set the mains voltage adjustment pin (situated on a panel attached to the mains transformer) to the correct position.
3. Check that all valves are firmly pressed into their sockets.
4. Replace back of cabinet and screw up.

CIRCUIT DESCRIPTION

The aerial circuit consists of an 8-inch ferrite aerial unit with two windings. One is used for M.W. whilst the two in series give the L.W. inductance. C_1 (120 pF) is switched across the total inductance on L.W. to give aerial circuit tracking.

A single tapped oscillator coil circuit with cathode injection is used and on M.W. C_5 (390 pF) acts as padder and D.C. grid blocking condenser.

On L.W. C_6 (320 pF) is switched in parallel with the coil to give the correct coverage; i.e., after presetting the oscillator coil for M.W. no further adjustment is made for L.W.

The I.F. circuit is conventional with the detector circuit using R_6 (0·5 MΩ) as diode load and volume control. This is tapped and components R_5 and C_{10} provide a bass compensation circuit giving bass lift at lower settings of the volume control.

A 6AQ5 is used as audio output with a tapped output transformer giving hum bucking with the use of R_{12} (1·8 kΩ). C_{15} (0·01 μF) gives fixed tone compensation.

The rectifier (EZ80) is fed from a separate heater winding to reduce heater cathode stress and the A.C. input to anode is via R_{14} (75 Ω). This latter is a small wire wound type which will fuse under certain fault conditions.

C_{17} (0·03 μF) removes modulation hum in conjunction with R_{14}.

REMOVAL OF PRINTED CIRCUIT AND SCALE BACKPLATE ASSEMBLY FROM CABINET

1. Remove cabinet back assembly by means of four screws. (Two each side of cabinet back assembly.)
2. Remove knobs: Tuning, Wavechange, Volume } pull off type.
3. Unscrew five 4BA nuts.
   1. One each end of scale plate on pulley assembly.
   2. Two on printed board support bracket.
   3. One on printed board.

   NOTE: All of these five fixings can be identified by a plastic tubular pillar below.
4. The printed board, scale backplate, and drive assembly may now be withdrawn from the cabinet front, leaving the leads to the output transformer still connected for servicing.

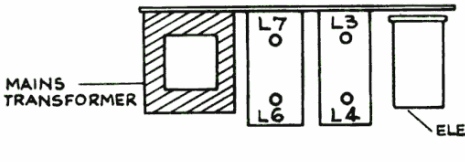
ALIGNMENT INSTRUCTIONS

The following equipment will be required:

A. A.M. signal generator covering the range 140–1700 Kc/s.

B. Power output meter.

1. Set the tuning pointer to datum with the gang condenser at maximum capacity.
2. Progressively reduce signal input as the sensitivity increases with alignment, maintaining approximately 50 mW output.
3. All measurements made with R.F. signal modulated 30% at 400 c/s.
4. The oscillator operates at a higher frequency than the input signal on both bands.
5. I.F. ALIGNMENT
   (*a*) Set generator to 422 Kc/s and connect via 0·1 μF to the signal grid of V_1 6BE6 (between gang condenser frame and aerial section).
   (*b*) Pre-set the I.F. transformer cores as follows:—



L3 approx. normal position.
L6, L4 slightly unscrewed from normal position.

(c) Trim for maximum gain by adjusting cores in the following order: L7, L6, L3, L4.

(d) Readjust L6 for maximum.

No further adjustment should be made without complete re-alignment.

6. R.F. ALIGNMENT

(a) Connect the signal generator to a shielded test coil (twelve turns of P.V.C. insulated connecting wire on a 2-inch diameter former) situated axially in relation to the aerial coils on the ferrite rod. This is necessary as no aerial or earth terminals are provided.

(b) The following operations should be carried out in the order indicated, being repeated as necessary, until scale accuracy with maximum sensitivity is attained.

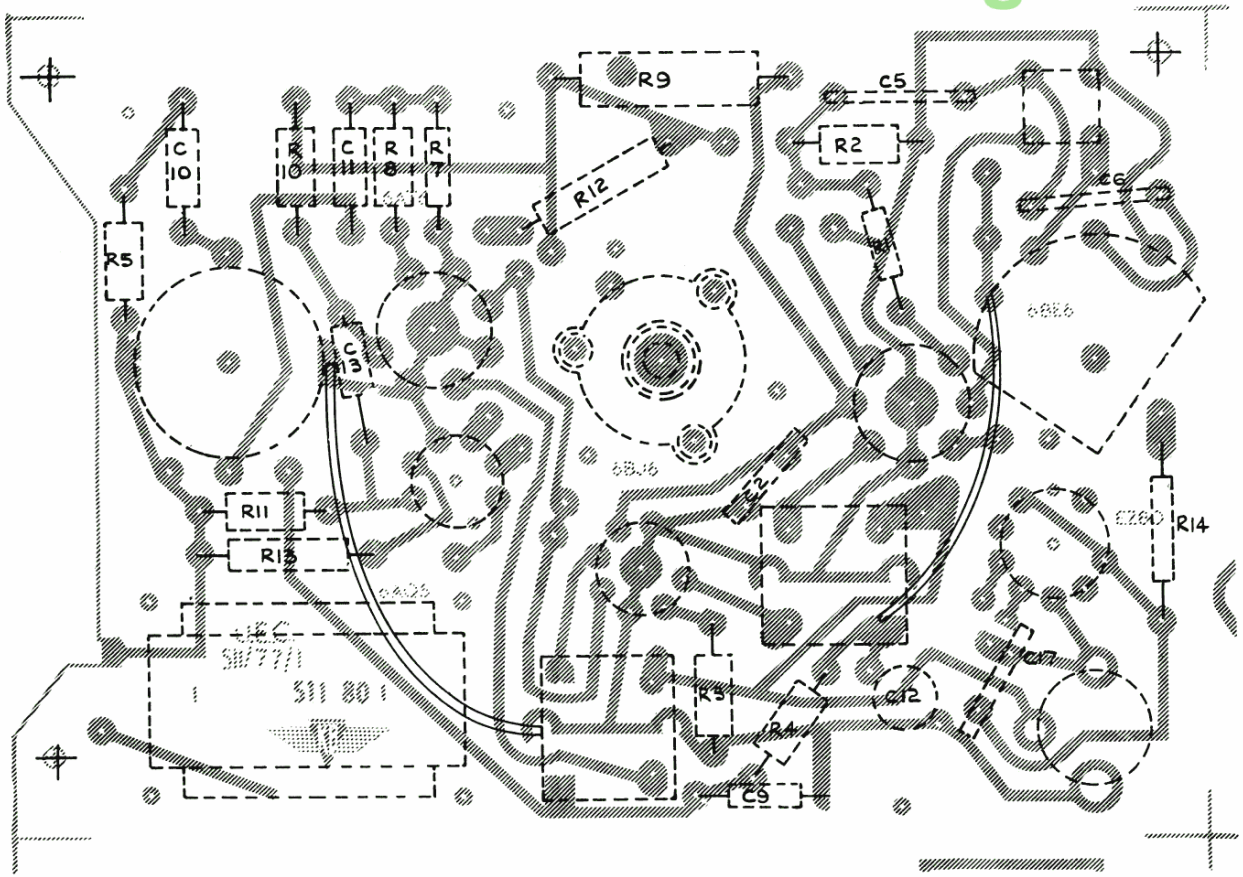
Operation.	Input Frequency.	Waveband.	Pointer Position.	Adjustment.
1.	600 kc/s.	M.W.	500 M.	Osc. core L5 and move M.W. aerial coil on ferrite rod to position of maximum gain.
2.	1400 kc/s.	M.W.	214 M.	Osc. trimmer T2. Aerial trimmer T1.
3.	Repeat operations 1 and 2.			
4.	225 kc/s.	L.W.	1333 M.	Move L.W. aerial coil, on ferrite rod, to the position of maximum gain.

The gang condenser should be rocked for maximum gain whilst adjusting the aerial trimmer.

COIL AND TRANSFORMER DATA

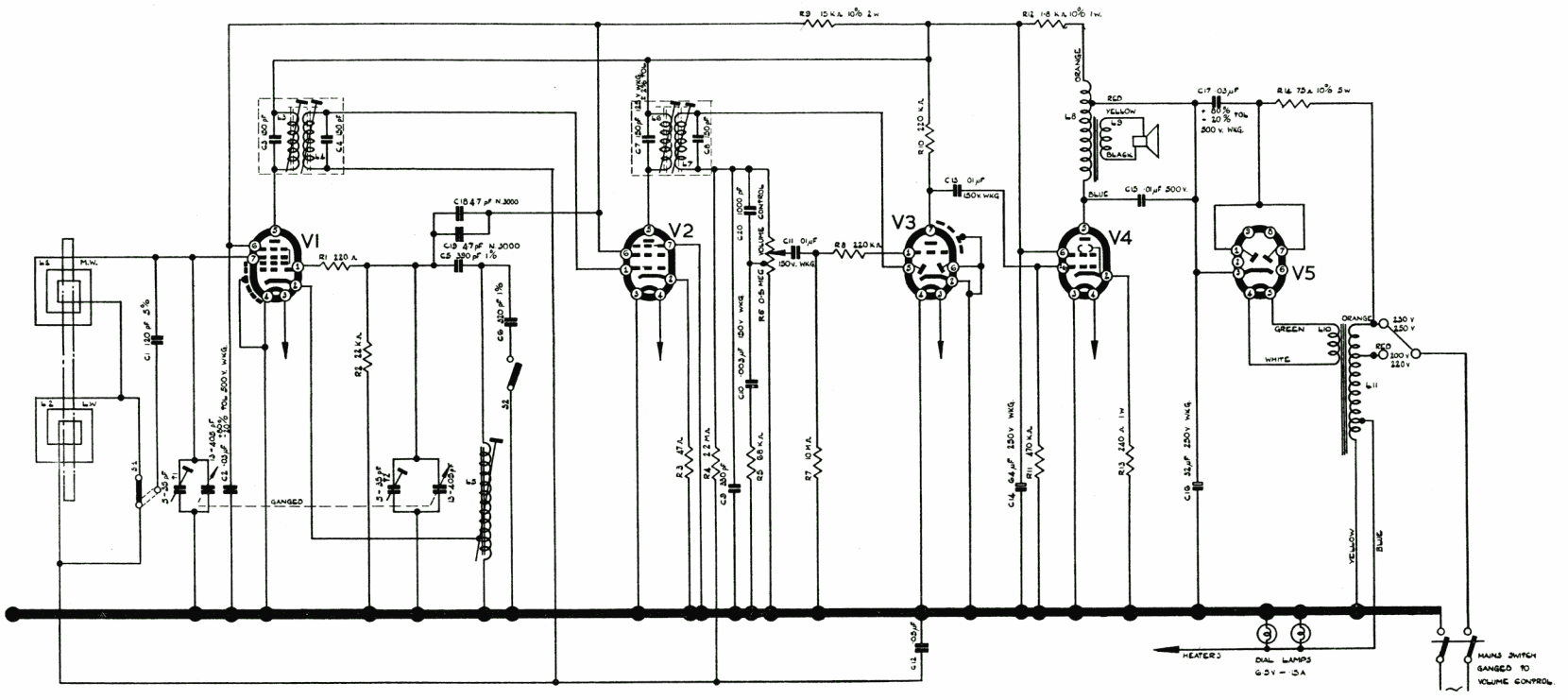
Circuit Ref. No.	Function	Approx. Resistance in ohms.
L1	M.W. AERIAL	1·2
L2	L.W. AERIAL	3·4
L3, 4, 6, 7	I.F. COIL 1 AND 2, BOTH WINDINGS	8·5
L5	OSCILLATOR COIL	6·0
L10, 11	MAINS TRANSFORMER—PRIMARY (TOTAL)	180
	L.T.1	Less than 1
	L.T.2	1·3

PRINTED CIRCUIT



CIRCUIT DIAGRAM

V1 6BE6 V2 6BJ6 V3 6AT6 V4 6AQ5 V5 EZ 80

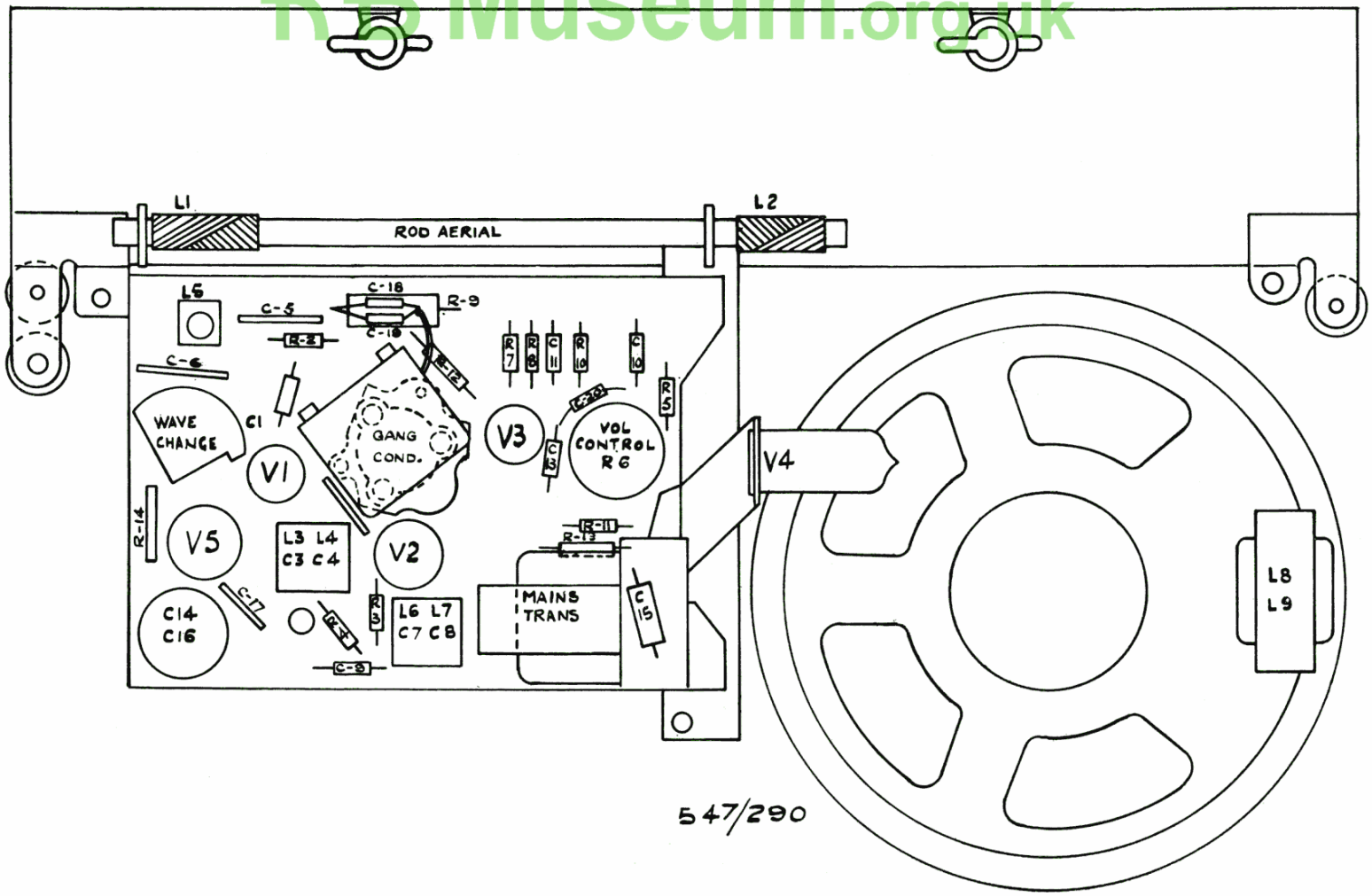


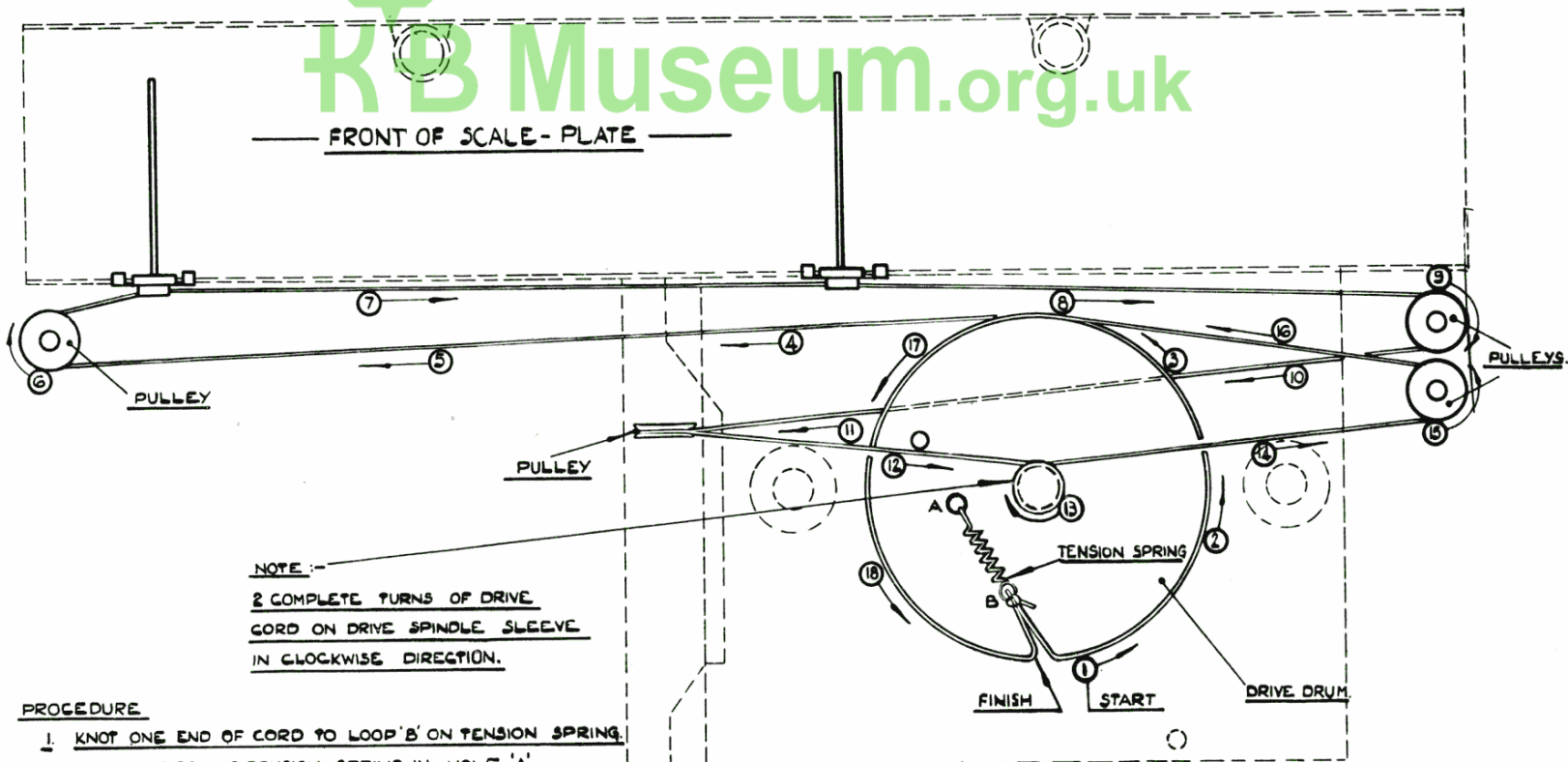
NOTE
1. I.F. 452 K.C/S.
2. WAVE SWITCH SHOWN IN M.W. POSITION.
3. ALL RESISTORS ARE ± 20% & ½W UNLESS OTHERWISE STATED.
4. ALL CONDENSERS ARE ± 20% & 350 V.W. UNLESS OTHERWISE STATED.

R5/A 82K, .01 C10, 22 K.Ω. R5
ALTERNATIVE ARRANGEMENT FOR R5 & C10.

WAVE RANGES M.W. 1620 - 500 K.C/S.
L.W. 280 - 150 K.C/S

TOP VIEW CHASSIS





PROCEDURE

1. KNOT ONE END OF CORD TO LOOP 'B' ON TENSION SPRING.
2. ANCHOR HOOK OF TENSION SPRING IN HOLE 'A'
3. PROCEED WITH CORD IN DIRECTION OF ARROW FROM (1) TO (18)
4. FINISH BY KNOTTING REMAINING CORD END TO LOOP 'B' OF TENSION SPRING.

NOTE:- DRIVE CORD TO BE CUT TO 70" LONG & PRE STRETCHED BEFORE ASSY

547/291

DIAGRAM OF CORD-RUN ON PR-10.

VOLTAGE CHART

VALVE PIN VOLTAGES MEASURED WITH A VOLTMETER HAVING 1,000 OHMS/VOLT IMPEDANCE										
Valve	Circuit Reference	1	2	3	4	5	6	7	8	9
6BE6	Frequency Changer...	SN	0	6·3 A.C.	0	225	90	SN	—	—
6BJ6	I.F. Amplifier ...	SN	0·5	0	6·3 A.C.	225	90	0	—	—
6AT6	Detector and Audio Amplifier	SN	0	6·3 A.C.	0	SN	0	75	—	—
6AQ5	Output	0	11	0	6·3 A.C.	250	240	0	—	—
EZ80	Rectifier	235 A.C.	—	265	*	*	—	235 A.C.	—	—

E—Denotes Chassis Connection. SN—Denotes Slightly Negative

All measurements taken with controls set for minimum gain and no applied signal

Power input 240V. into 230–250 tap.
Pointer at Datum on M.W.
Smoothing Electrolytics C16 32mF, C14 64 mF.
D.C. voltage 265, 225.
Hum voltage 9, 0·2.
Smoothing resistors R12 1·8 K, R9 15 K.
Voltage drop 30, 140.

Mains input current 160 mA.
Total H.T. current 60 mA.
Filament current —
Power output 2 watts for 10% distortion.
Power supply range 200–250V. 40–100 c/s.
Power consumption 36 watts.
*6·3 Volts A.C. between Pins 4 and 5.

N.B.—Printed Circuit Receiver and hence all measurements between H.T.—ve and relevant Valve Pins.

IMPORTANT

This Receiver uses **BRIMAR** Valves and was specifically designed around them.
Its performance may be impaired unless **BRIMAR** Valves of the correct types are used when replacements are needed.

SPARES LIST

PRICES ARE SUBJECT TO ALTERATION WITHOUT NOTICE

Component	Colour Code	Circuit Ref.	Part No.	Price
Cabinet Front	... ...	...	547/220 Walnut	72/6
			547/220/1 Birds Eye Maple	78/–
Cabinet Back Assy. ...	... ...	...	547/166	12/–
COILS:—				
Rod Aerial Assy.	... ...	L1, 2	511/130	10/6
Oscillator Coil Assy. ...	... ...	L5	511/23	2/3
I.F. Coil Assy.	... ...	L3, 4, 6, 7	511/50	6/–
CONDENSERS:—				
Elec. 32+64 µF. 250V. ...	... ...	C16, 14	KEM 138	6/6
120 pF. ± 5% 350V. ...	... ...	C1	KST 88	1/3
320 pF. ± 1% 350V. ...	... ...	C6	KST 240	1/3
330 pF. 500V. ...	... ...	C9	KC 21	1/3
390 pF. ± 10% 350V. ...	... ...	C5	KST 239	1/3
·01 µF. 150V. ...	... ...	C13, 11, 15	KPM 19/B	1/3
·03 µF. + 80% — 20% 500V.	... ...	C2, 17	KC 113	1/3
·05 µF. 350V. ...	... ...	C12	KT 47/A	1/3
·003 µF.	... ...	C10	KPM 23/B	1/3
4·7 pF. N3000 ...	... ...	C18, 19	KC 41	1/3
1000 pF.	... ...	C20	KC 18	1/3
Dial Lamp 6·5V. ·15 Amp.	... ...	...	154/232	1/–

Component	Colour Code	Circuit Ref.	Part No.	Price
Ganged Condenser ...	... ...	...	547/210	13/–
Knob Assy.	... ...	...	547/123	1/6
Safety Sleeve	... ...	...	547/213	5d.
Drive Spindle Sleeve ...	... ...	...	547/212	8d.
POTENTIOMETER:—				
½ MΩ Lin.	... ...	R6	P504S17F	6/–
RESISTORS:—				
47Ω ½ W. ...	... ...	R3, 8	R470HE	1/–
220Ω ½ W. ...	... ...	R1	R221HE	1/–
240Ω 1 W. ...	... ...	R13	R241HFT	1/–
1·8 KΩ ± 10% 1 W. ...	... ...	R12	R182FF/T	1/–
15 KΩ ± 10% 2 W. ...	... ...	R9	R153FHT	1/–
22 KΩ ½ W. ...	... ...	R2	R223HE	1/–
220 KΩ ½ W. ...	... ...	R10	R224HE	1/–
470 KΩ ½ W. ...	... ...	R11	R474HE	1/–
2·2 MΩ ½ W. ...	... ...	R4	R225HE	1/–
10 MΩ ½ W. ...	... ...	R7	R106HE	1/–
75Ω W.W.	... ...	R14	511/211	1/–
68 KΩ ½ W. ...	... ...	R5	R683HE	1/–
Switch Wavechange ...	... ...	...	511/203	4/4
Speaker Assy.	... ...	L8, 9	547/119	37/6
TRANSFORMER:—				
Mains	... ...	L10, 11	511/85	18/–