Supplement to Wireless & Electrical Trader, 5 October 1957

"TRADER" SERVICE SHEET

1321

ROBERTS R77

Personal Portable with Shoulder Sling

EMPLOYING a ferrite rod internal aerial, the Roberts model R77 is a 2-band, four valve portable receiver, designed to operate from all-dry batteries. The wavebands covered are: M.W. 190-570m and L.W. 1,000-1,900m. This receiver employs a printed circuit and is housed in a coach-hide leather case.

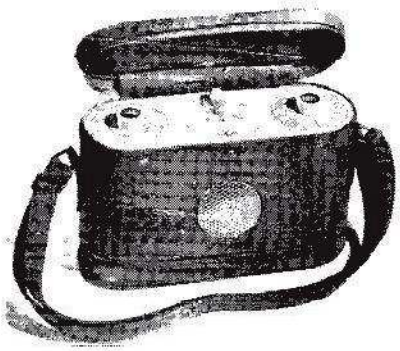
Release date and original price: May 1957, £13 4*s* 7*d* (*including batteries*). *Purchase tax extra.*

CIRCUIT DESCRIPTION

Ferrite rod internal aerial coils **L1, L2** (M.W.) and **L3** (L.W.) are tuned by **C3,** and precede heptode valve **V1** which operates as a frequency changer with electron coupling. Oscillator grid coil **L6** is tuned by **C12** and functions on both M.W. and L.W. Parallel trimming by **C11** (M.W.) and **C8, C9** (L.W.). There are no series tracking capacitors. Reaction coupling from oscillator anode via **L7.** I.F. amplifier **V2** is a variable-mu R.F. pentode coupled by tuned transformers **C6, L4, L5, C7** and **C16, L8 L9, C17.**

Intermediate frequency 470 kc/s.

Diode signal detector is part of diode-pentode valve **V3.** Audio frequency component in its rectified output is developed across **R7,** which combines the functions of diode load and volume control. The A.F. output is passed from **R7** via **C19** to the pentode section of **V3** which functions as an A.F. amplifier. I.F. filtering by **C18** across **R7.** The D.C. potential developed across **R7** is fed, as A.G.C. bias, via **R6** to **V1** and **V2.** A.G.C. line decoupling by **R6** and **C13.**



Appearance of Roberts R77

Resistance-capacitance coupling by **R10, C21** and **R11** between **V3** and **V4.** Grid bias of approximately 5.5V is developed across **R12** in the H.T. negative lead to chassis. **C24** across primary winding of **T1** provides tone correction.

COMPONENT VALUES AND LOCATIONS

Capacitors			C18	100pF	A2	R10	2·2MΩ	B2
C1	120pF	B1	C19	0·01μF	B2	R11	2·2MΩ	C2
C2	30pF	B1	C20	0·01μF	C2	R12	560Ω	C2
C3	413pF	A1	C21	0·01μF	B2			
C4	30pF	A1	C22	100pF	B2	***Other Components****		
C5	0·01μF	B2	C23	8μF	B2	L1 } total	0·5	A1
C6	100pF	A2	C24	2,000pF	B2	L2 }		B1
C7	100pF	A2	***Resistors***			L3	5·5	B1
C8	280pF	B1	R1	120kΩ	B2	L4	8·0	A2
C9	30pF	A1	R2	27kΩ	A1	L5	8·0	A2
C10	100pF	A1	R3	27kΩ	B1	L6	2·7	B1
C11	30pF	A2	R4	33kΩ	B1	L7	0·9	B1
C12	177pF	A1	R5	39kΩ	B2	L8	8·0	B2
C13	0·05μF	B2	R6	2·2MΩ	B2	L9	8·0	B2
C14	0·01μF	B2	R7	500kΩ	C1	L10	3·0	—
C15	0·01μF	A2	R8	10MΩ	B2	T1 {a	512·0	B1
C16	100pF	B2	R9	10MΩ	B2	T1 {b	—	
C17	100pF	B2				S1-S6	—	B1

**Approximate D.C. resistance in ohms.*

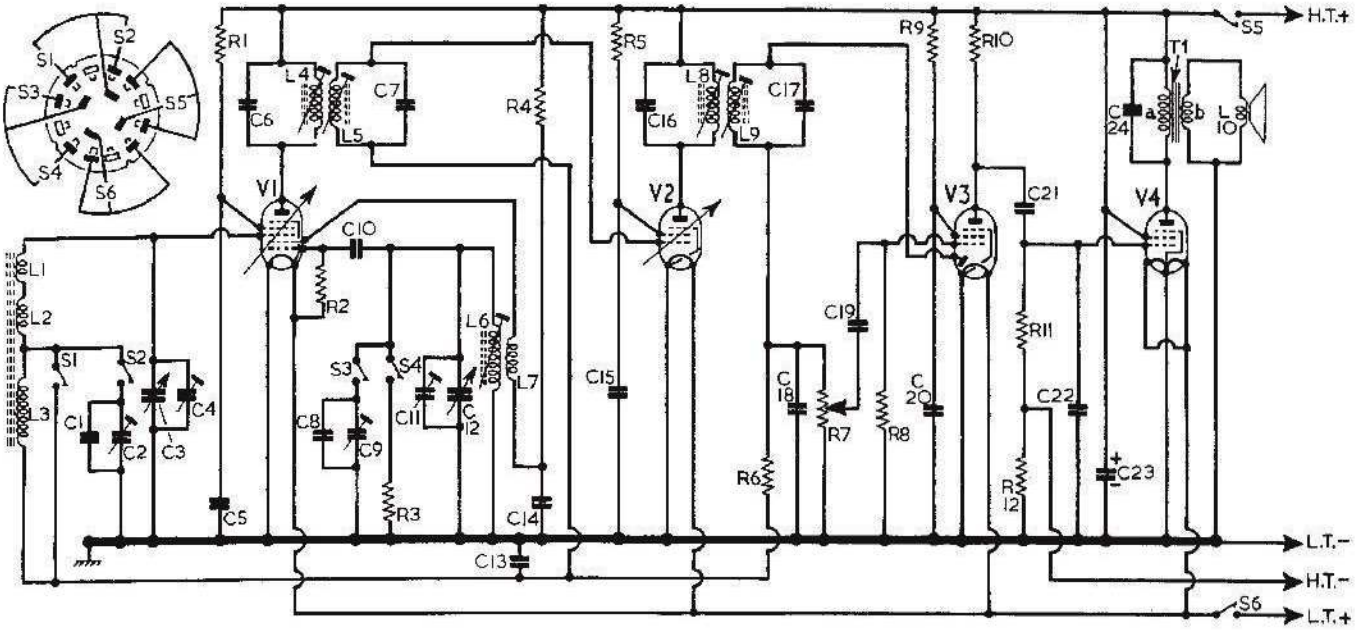
CIRCUIT ALIGNMENT

1.—Remove chassis from carrying case as explained under "Dismantling." Switch receiver to M.W. and turn gang to minimum capacitance.

2.—Connect signal generator via a 0.1μF capacitor between **V1** control grid and frame of tuning gang. Connect output meter either across winding **b** of **T1** or via a 0.1μF capacitor from **V4** anode to chassis. Feed in a 470kc/s signal and adjust cores of **L9, L8** (B2) and **L5, L4** (A2) for maximum output on meter.

3.—Couple signal generator, via a loop of

(Continued in column 1 overleaf)



Circuit diagram of Roberts R77. **L1, L2** and **L3** are mounted on a ferrite rod and form the internal aerial. Inset in the upper left-hand corner is shown a diagram of the switch unit, drawn as seen from behind the control panel.

Circuit Alignment—continued

wire, loosely to ferrite rod aerial. Set tuning gang to maximum capacitance and check that datum marks dividing the M.W. and L.W. scales are in line with index marks on front panel.

4.—Set tuning gang to 550m, feed in a 545.4kc/s signal and adjust core of **L6** (B1) for maximum output on meter. Adjust position of **L1** on ferrite rod for maximum output on meter. Set tuning gang to 200m, feed in a 1,500kc/s signal and adjust **C11**, then **C4**, for maximum output on meter.

5.—Switch receiver to L.W., set tuning gang to "Kalundborg," feed in a 245kc/s (1,224m) signal and adjust **C9** and **C2** for maximum output on meter. Tune to "Paris" on scale, feed in a 164kc/s (1,829m) signal, and adjust position of **L3** on ferrite rod for maximum output on meter.

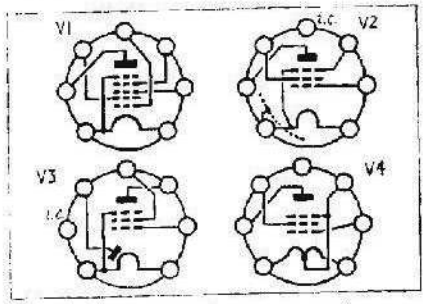
6.—Repeat operations 1-6 until optimum results are achieved.

VALVE ANALYSIS

Valve voltages given in the table below are those derived from the manufacturers' information. They were measured with an AVO Electronic Testmeter while the receiver was working from a new set of batteries and adjusted for normal operation, but with no signal input. The H.T. current was approximately 10.4mA and the L.T. current was 125mA.

Valve		Anode V	Screen V	Grid V*
V1 DK96	mixer	86	76	—
	osc.	30	—	—
V2 DF96	..	86	65	—
V3 DAF96	..	34	16	—
V4 DL96	..	94	86	5·1

*Measured at control grid.

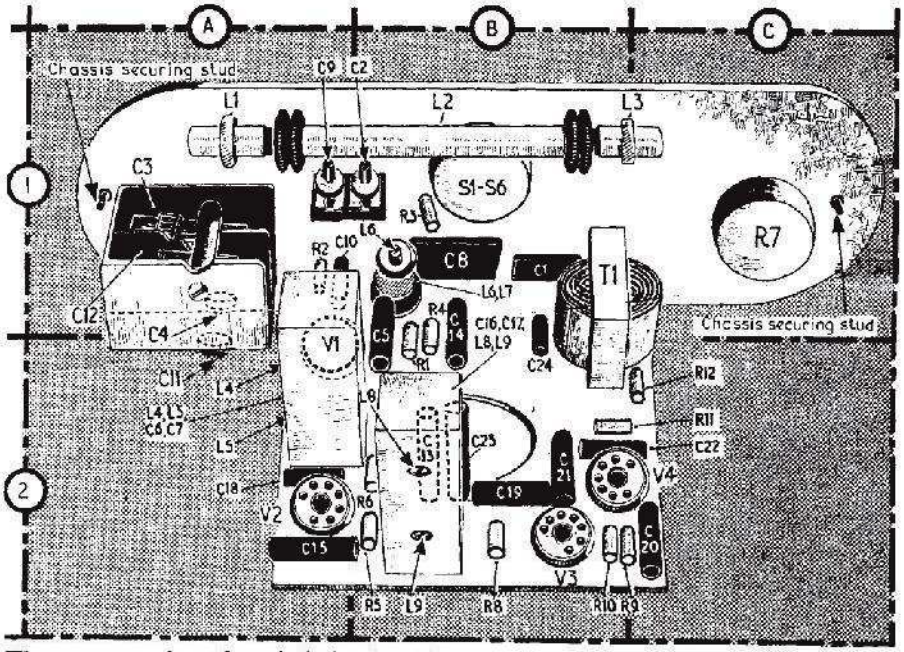


Diagrams of valve base connections as viewed from underside of chassis.

DISMANTLING

Removing Chassis.—Place receiver on its back and unzip both top and bottom of leather carrying case. Remove both batteries, then loosen and remove the two brass retaining rods which are screwed to the chassis securing studs (located in A1, C1). After removing the two fibre battery containers, the chassis (with panel) may be withdrawn from the top of the carrying case.

Access to the printed circuit.—Lay chassis with loudspeaker downwards on a clean surface and very carefully remove ferrite rod aerial from its clips. Loosen the four loudspeaker securing nuts, then remove the 4BA domed nut (with lock-washer) securing chassis clamp to centre of loudspeaker, and then the clamp. Lift printed circuit panel by its rear edge and remove over the loudspeaker magnet. On reassembling, care should be taken to ensure that the printed circuit panel is pushed hard against front of chassis before tightening the loudspeaker nuts.



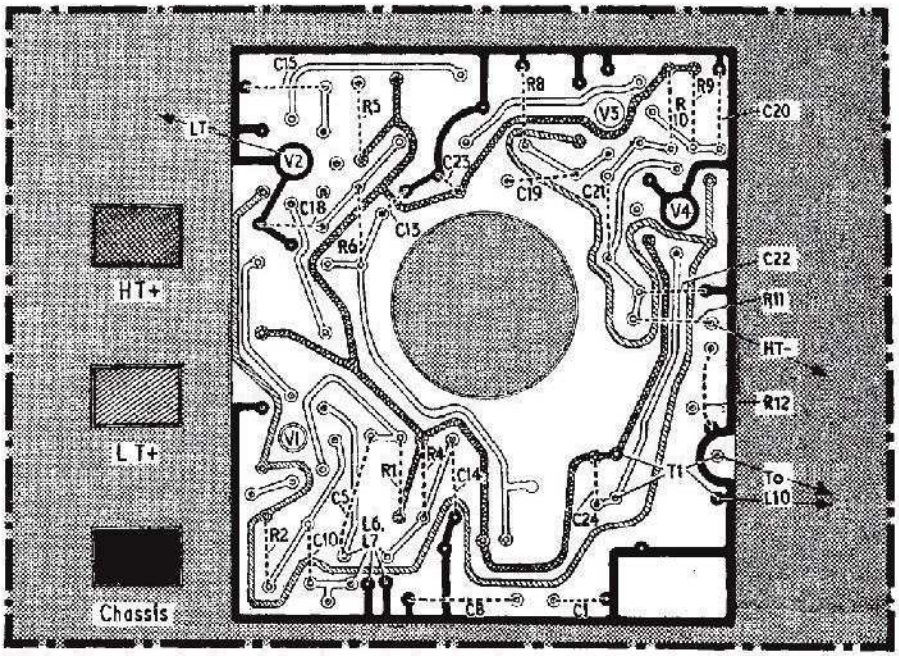
Three-quarter view of vertical chassis and panel showing component positions. Chassis securing studs in A1 and C1 are referred to under "Dismantling."

GENERAL NOTES

Switches.—**S1-S6** are the combined waveband and battery on/off switches. They are ganged in a single rotary unit (location reference B1) and details of their connections are shown in illustration inset above main circuit diagram. They operate as follows: **S1, S4** close for M.W. operation; **S2, S3** close for L.W. operation and **S5, S6** (battery on/off switches) close on switching to the M.W. or L.W. positions.

Batteries.—Those recommended by the makers are: L.T., Ever Ready AD35, rated at 1.5V; H.T., Ever Ready B126, rated at 90V. A standard 3-pin plug is used for H.T. battery connections, and a standard 2-pin plug for L.T. battery connections.

Tuning Gang.—In order to achieve accurate tracking, tuning capacitors **C3, C12** have dissimilar sections for aerial and oscillator tuning. The aerial section **C3** has a capacitance of 413pF, but the oscillator section **C12** has very much smaller moving vanes and its value is only 177pF. Series tracking capacitors are thus unnecessary in the oscillator circuit. The M.W. trimmers **C4** and **C11** are actually mounted on the tuning gang assembly.



Underside view of printed circuit panel showing the circuit connections. H.T. +, L.T. + and chassis connections are coded as indicated by the key to left of the panel.

Printed in England by Cornwall Press Ltd., Paris Garden, London, S.E.1.