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"TRADER" SERVICE SHEET

1273

ROBERTS R66

2-band A.C./All-dry Portable Superhet

EMPLOYING a ferrite rod internal aerial, the Roberts R66 is a 2-band 4-valve (plus two metal rectifiers) portable, designed to operate from all-dry batteries or A.C. mains of 200-250 V. The wavebands covered are 182-580m and 900-2,000m.

Release date and original price: April, 1956, £13 19s. 9d. Batteries and purchase tax extra.

CIRCUIT DESCRIPTION

Ferrite rod internal aerial coils **L1** (M.W.) and **L2** (L.W.) are tuned by **C3** and precede heptode valve **V1** which operates as frequency changer with electron coupling.

Oscillator grid coils **L5** (M.W.) and **L6** (L.W.) are tuned by **C9**. Parallel trimming by **C10** (M.W.) and **C10, C12** (L.W.); series tracking by **C11** (M.W.) and **C13** (L.W.). Reaction coupling from oscillator anode via **L7** (M.W.) and **L8** (L.W.).

Second valve **V2** is a variable-mu R.F. pentode operating as intermediate frequency amplifier with tuned transformer couplings **L3, L4** and **L9, L10.**

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 load resistor **R6** and is passed via **C20,** volume control **R8,** and **C21** to **V3** pentode section which operates as A.F. amplifier. I.F. filtering by **C19** and **C24.**

D.C. potential developed across **R6** is fed back as bias to **V1** and **V2** giving automatic gain control. Resistance-capacitance coupling by **R11, C23, R12** between **V3** and pentode output valve **V4.** Grid bias is developed across **R13** in the H.T. negative lead to chassis.

For mains operation switches **S6(M), S7(M), S9(M)** and **S10(M)** close, and H.T. current is supplied by half-wave metal rectifier **MR1.** Smoothing by **R14** and electrolytic capacitors **C27, C28.** L.T. current is supplied by full-wave metal rectifier **MR2,** and is smoothed by **R15, R16** and electrolytic capacitors **C29, C30, C31.** For battery operation, switches **S8(B), S11(B)** and **S12(B)** close and the **(M)** switches open.

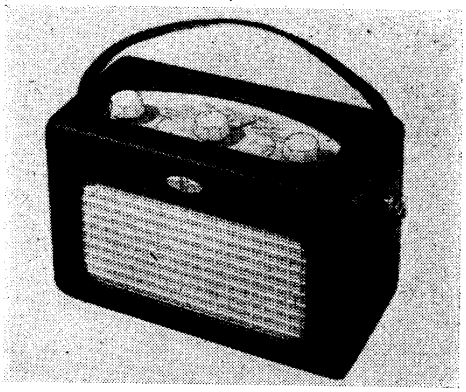
GENERAL NOTES

Switches.—**S1-S5** are the band switches, and **S6(M)-S12(B)** are the mains/battery changeover switches ganged in two rotary units beneath the chassis. These units are indicated in the underside illustration of the chassis, and shown in detail in the diagram in column 2 overleaf.

Switches **S1, S3** and **S5** close for M.W. operation and switches **S2, S4** close for L.W. operation. Switches with the suffix **(M)** close for mains operation and those with the suffix **(B)** close for battery operation. From the fully anti-clockwise setting of the control knob, the switch positions are L.W. (batt.); M.W. (batt.); off; M.W. (mains); L.W. (mains).

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 connection, and a standard 2-pin plug is used for L.T. battery connection.

(Continued col. 1 overleaf)



Appearance of the Roberts R66

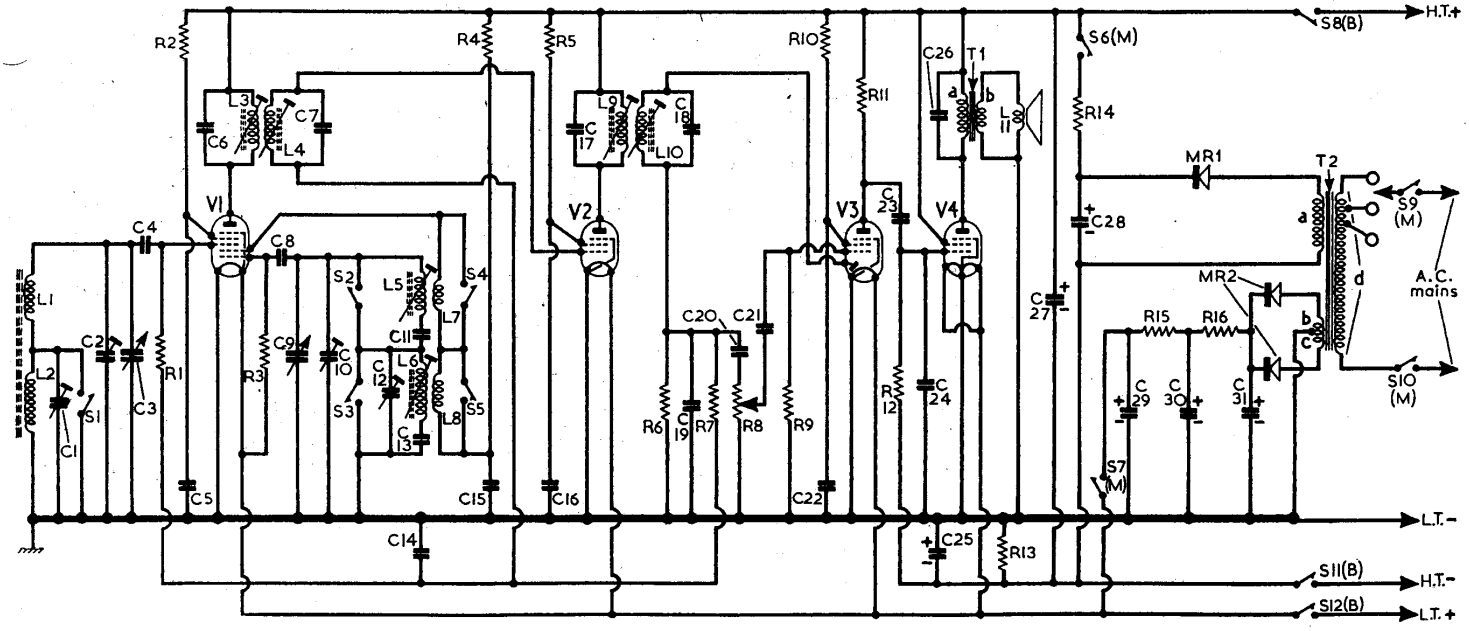
COMPONENT VALUES AND LOCATIONS

Capacitors		
C1	60pF	C1
C2	30pF	C1
C3	523pF	F3
C4	100pF	D3
C5	0·01μF	D3
C6	100pF	C2
C7	100pF	C2
C8	100pF	D3
C9	523pF	F3
C10	30pF	C1
C11	575pF	C2
C12	60pF	C1
C13	195pF	C2
C14	0·05μF	F3
C15	0·01μF	D3
C16	0·01μF	E3
C17	100pF	A1
C18	100pF	A1
C19	100pF	F3
C20	0·01μF	F3
C21	0·01μF	G3
C22	0·01μF	G3
C23	0·01μF	G3
C24	100pF	G4
C25	20μF	G3
C26	0·001μF	G4
C27	40μF	G4
C28	40μF	G4
C29	2,500μF	B2
C30	2,500μF	B2
C31	2,500μF	E4

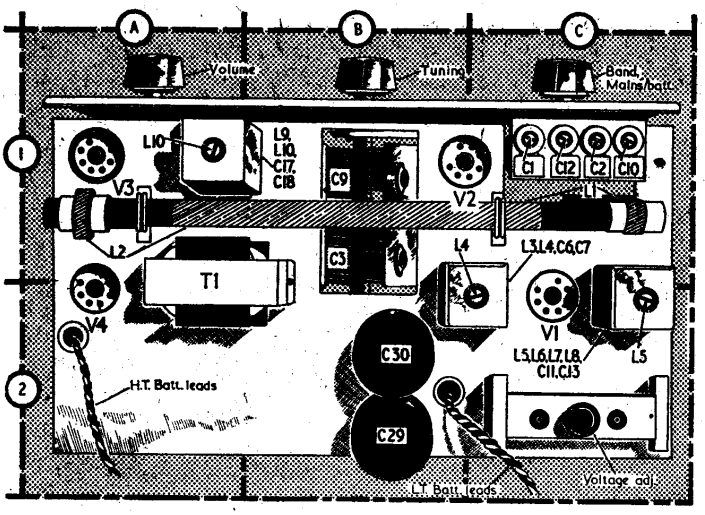
Resistors		
R1	1MΩ	D3
R2	120kΩ	D3
R3	27kΩ	D3
R4	33kΩ	D3
R5	39kΩ	E3
R6	1MΩ	F3
R7	2·2MΩ	F3
R8	500kΩ	G3
R9	10MΩ	G3
R10	2·7MΩ	G3
R11	1MΩ	G3
R12	2·2MΩ	G3
R13	560Ω	G3
R14	3·9kΩ	F4
R15	3·9Ω	E4
R16‡	5·4Ω	F4

Other Components*		
L1	0·65	C1
L2	8·0	A1
L3	10·6	C1
L4	10·6	C1
L5	2·3	C2
L6	7·5	C2
L7	2·0	C2
L8	5·0	C2
L9	10·6	A1
L10	10·6	A1
L11	2·8	—
T1 a	460·0	A1
T1 b	0·4	A1
T2 a	195·0	D4
T2 b	0·5	D4
T2 c	0·5	D4
T2 d	320·0	D4
MR1	RMO†	F4
MR2	FSW1392A†	F4
S1-S12	—	D3

*Approximate D.C. resistance in ohms. †SenTerCel. ‡3·9Ω resistor+1·5Ω resistance wire (see "General Notes").



Circuit diagram of the Roberts R66. **L1, L2** form the ferrite rod internal aerial. **MR2** is the full-wave L.T. rectifier.



Plan illustration of the chassis. The position of the left-hand end section of L2 in location A1 is adjusted during alignment.

General Notes—*continued*

Internal Aerial.—The internal aerial assembly consists of the M.W. and L.W. tuning coils mounted at either end of a length of ferrite rod. The rod is mounted in two rubber grommets and is secured to the chassis by two metal brackets.

The manufacturers state that on no account should the ferrite rod be handled when removing the chassis from its carrying case, or when picking up the chassis.

Modification.—In our sample model **R16** consisted of a 3.9Ω resistor connected in series with a length of resistance wire measuring 1.5Ω. In some receivers this length of resistance wire may be omitted.

CIRCUIT ALIGNMENT

1.—Remove chassis from its carrying case. Switch receiver to M.W. and turn gang to minimum capacitance.

2.—Connect output of signal generator to junction of **C3**, **C4** and to chassis. Feed in a 470 kc/s signal and adjust the cores of **L10** (location reference A1), **L9** (F3), **L4** (C2) and **L3** (E3) for maximum output.

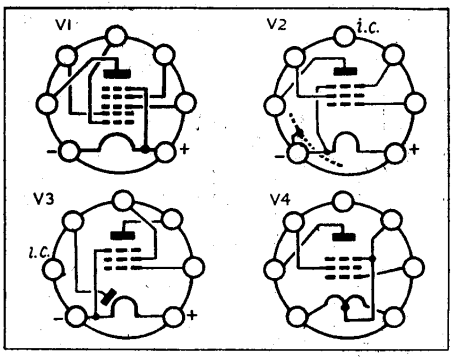
3.—Repeat the adjustments in operation 2 until no further improvement results.

4.—Check that with the gang at maximum capacitance, the cursor coincides with the high wavelength ends of the M.W. and L.W. scales.

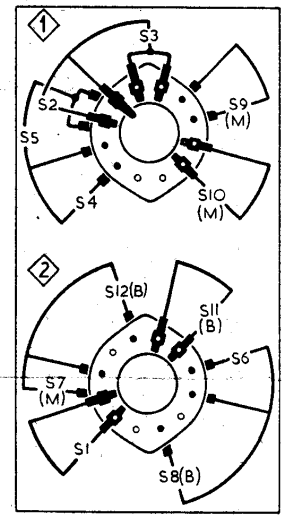
5.—Disconnect the signal generator leads and lay them close to the ferrite rod internal aerial. Switch receiver to L.W. and tune it to "Paris" on the L.W. tuning scale.

6.—Feed in a 164 kc/s (1,829m) signal and adjust the core of **L6** (D3) for maximum output. The internal aerial coil **L2** (A1) should be adjusted for maximum output at this frequency by sliding the end section of the coil (location A1) along its ferrite rod.

7.—Tune receiver to "Kalundborg" on L.W. tuning scale, feed in a 245 kc/s (1,224m) signal and adjust **C12** (C1) and **C1** (location C1) for maximum output.



Diagrams of the valve base connections as viewed from the underside of the valve holders.



Diagrams of the band switch units as viewed from the rear of an inverted chassis as indicated in the underside illustration below.

8.—Switch receiver to M.W., tune to 550m, feed in a 545.4 kc/s signal and adjust the core of **L5** (C2) for maximum output. The internal aerial coil **L1** (C1) should be adjusted for maximum output at this frequency by sliding it along the ferrite rod.

9.—Tune receiver to 200m, feed in a 1,500 kc/s signal and adjust **C10** (C1) and **C2** (C1) for maximum output. Repeat these adjustments, and those in operation 8, until no further improvement results.

10.—Switch receiver to L.W. and repeat adjustments in operations 6 and 7.

DISMANTLING

Removing Chassis.—Open back cover of carrying case and remove batteries.

Place carrying case face downwards on the bench.

Remove two wood screws securing chassis-supporting wood blocks to cabinet, and withdraw blocks.

Slide chassis to bottom of carrying case and withdraw it to extent of speaker leads. Unsolder speaker leads.

VALVE ANALYSIS

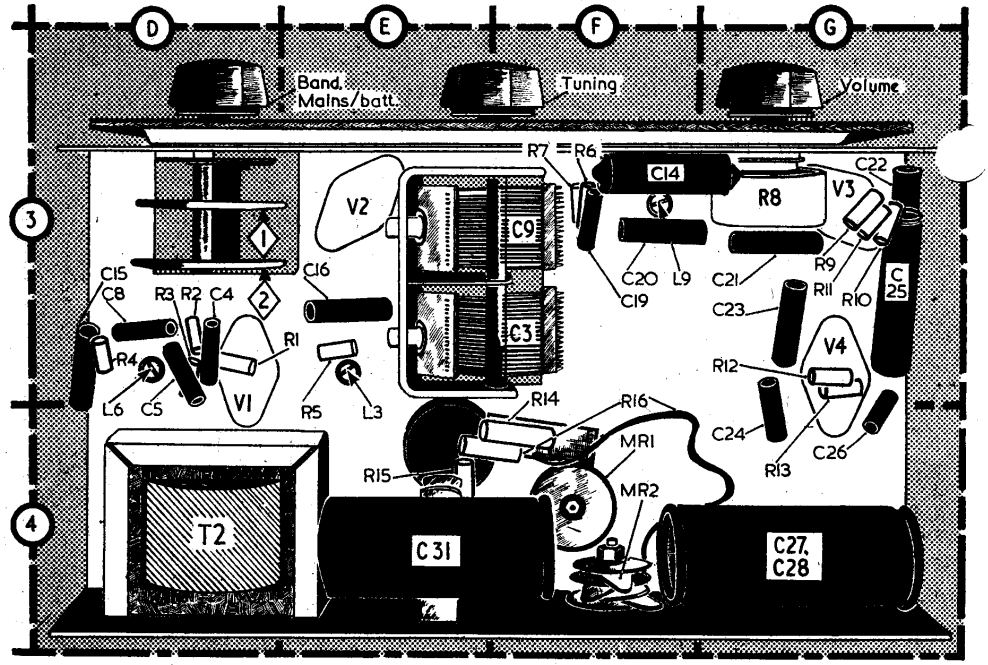
Valve voltages and currents given in the table below are those derived from the manufacturers' information, and were taken with the receiver operating from a new set of batteries. The receiver was tuned to a point at the low wavelength end of M.W. where there was no signal pick-up.

Voltages were measured with an Avo Electronic TestMeter, and as this instrument has a high internal resistance, allowance should be made for the current drawn by other types of meter. The total H.T. current was 10.4mA, and the voltage measured across **R13** was 5.5V (positive connection to chassis).

Valve		Anode		Screen	
		V	mA	V	mA
V1	DK96 ...	86 Oscillator 26	0·39 1·61	75	0·12
V2	DF96 ...	86	1·5	68	0·56
V3	DAF96 ...	30	0·063	35	0·02
V4	DL96 ...	84	5·2	86	1·0
MR1	RMO ...	116*	—	—	—
MR2	FSW1392A	6·7†	—	—	—

**A.C. reading when operating from 230V mains, using 220-230V tap; "cathode" voltage 130V.*

†A.C. reading, anode to anode, when operating from 230V mains; "cathode" voltage 2.6V.



Underside illustration of the chassis. **R16** in location reference F4 consists of a 3·9Ω resistor and a length of resistance wire.

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