"TRADER" SERVICE SHEET

1582

REGENTONE BT18 "MINIM"

Personal Portable Radio Receiver

WIRED on a printed circuit panel, Regentone BT18 is a personal portable radio receiver employing six transistors and one crystal diode. It is housed in a plastics cabinet. The waveband coverage is 187-555m (m.w.) and 1,071-1,829m (l.w.) with signal pick-up by an internal ferrite rod aerial. An external socket is provided for the connection of an earphone. Operating power is obtained from a 9V dry battery.

Release date and original price: September, 1961, £8 18s 6d. Purchase tax extra.

TRANSISTOR ANALYSIS

The table of voltages given in col. 2 was compiled from information supplied by the manufacturer. Readings were taken on a model 8 Avometer with no signal input and the volume control set at minimum. All the measurements are negative with respect to chassis.

If the meter connection causes instability a 10kΩ stopper resistor should be wired in series with the meter probe.

CIRCUIT DESCRIPTION

Aerial coils **L1** and **L2** are wound on a ferrite rod to form an internal aerial. M.W. section **L1, L1a** is tuned by **C18** and **C18a** and l.w. section **L2** by **C18, C18a** and **C1**. R.f. signals from the aerial are coupled by the secondary windings **L1b** and **L2a** via **C2** to the base of the self-oscillating mixer stage **TR1**. Heterodyne signals are generated by positive feedback from collector to emitter by the coupling of **L4** and **L5** through **L3** which is tuned at oscillator frequency by **C4, C19** and **C19a** on m.w. with **C17** and **TC1** switched in parallel on l.w.

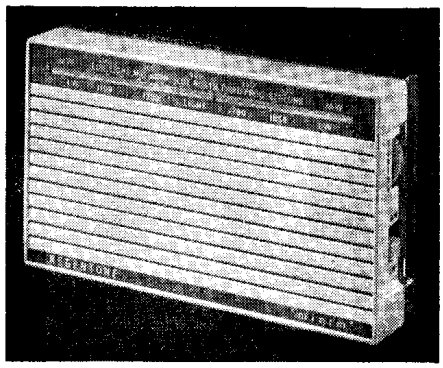
L6 and **C20** form a tuned circuit which is resonant at 470 kc/s and comprises **TR1** col-

(Continued overleaf Col. 1)

Transistor Table

Transistor	Emitter (V)	Base (V)	Collector (V)
TR1 OC44 ..	0·92	0·95	7·0
TR2 OC45 ..	0·55	0·72	7·0
TR3 OC45 ..	0·95	1·10	7·0
TR4 OC81D* ..	0·95	1·05	8·5
TR5 OC81† ..	4·50	4·60	9·0
TR6 OC81† ..	—	0·10	4·6

**Or OC75. †Or OC74.*



Resistors

R1	10kΩ	E3
R2	3·9kΩ	E3
R3	56kΩ	E3
R4	68kΩ	E3
R5	8·2kΩ	D4
R6	1·2kΩ	E4
R7	22kΩ	E4
R8	680Ω	E4
R9	4·7kΩ	E4
R10	3·9kΩ	E3
R11	1kΩ	E4
R12	1kΩ	D3
R13	47kΩ	D3
R14	680Ω	D3
R15	10kΩ	D3
R16	1kΩ	D3
R17	15Ω	D3
R18	75Ω	D4
R19	2·2kΩ	D4
R20	75Ω	D4
R21	2·2kΩ	D3
R22	2·7kΩ	D4
R23§	680Ω	E3
RV1	5kΩ	D3

Capacitors

C1	65pF	E3
C2	0·01μF	E3
C3	0·01μF	E3
C4	210pF	E3
C5	8μF	D4
C6	56pF	E3
C7	18pF	E4
C8	0·05μF	E4
C9	0·05μF	E4
C10	0·01μF	D4
C11	0·05μF	E4
C12	45μF	E4
C13	8μF	D3
C14	0·04μF	D3
C15	32μF	D3
C16	45μF	D4
C17	170pF	E4
C18	†	A2
C18a	†	A2
C19	†	A2
C19a	†	A2
C20	†	B1
C21	†	B2
C22	†	B2
TC1	†	E4

Coils*

L1	—	B1
L1a	—	C1
L1b	—	B1
L2	—	A1
L2a	—	A1
L3	—	
L4	—	E3
L5	—	
L6	—	
L7	—	E3
L8	—	
L9	—	E4
L10	—	D4
L11	—	D4
L12	80	—

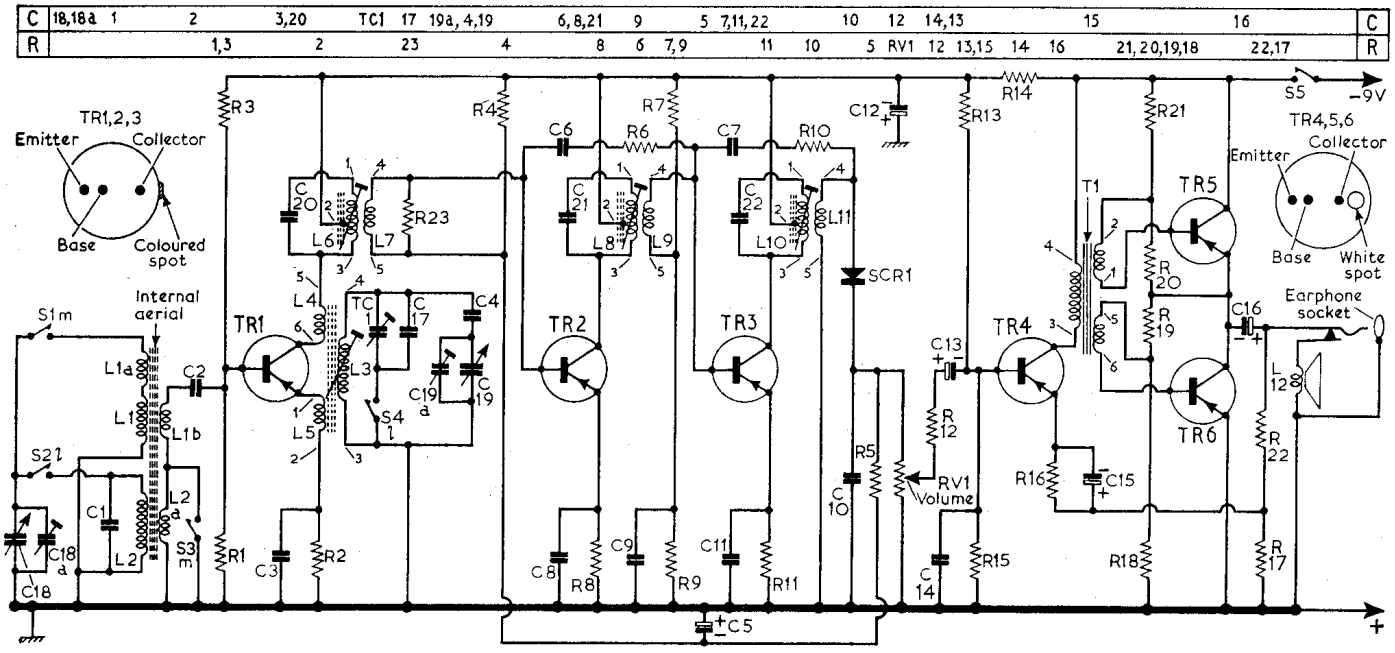
Transformers*

T1	Pri	450	D4
	Sec	60	
	Sec	60	

Miscellaneous

SCR1	OA70	D4
S1-S4	—	A2
S5	—	D3

**Approximate d.c. resistance in ohms.*
†No value given.
§Not fitted in some receivers.



Circuit diagram of the Regentone BT18. The loudspeaker **L12** *is automatically disconnected by the insertion of the earphone plug.*

Circuit Description—*continued*

lector load impedance at intermediate frequency. The low impedance secondary winding **L7** couples the i.f. signal to the base of the first i.f. amplifier **TR2.** A.g.c. is applied to this stage by feeding the rectified positive carrier d.c. developed across **RV1** to the junction of **R5** and **RV1** in the bias potentiometer **R4, R5** and **RV1. C5** is a.g.c. feed decoupling. The signal is amplified at i.f. by **TR2** and **TR3** with associated interstage coupling transformers **L8, L9** and **L10, L11** and the amplified output in **TR3** collector circuit is then fed to the detector crystal diode **SCR1.**

Demodulated audio output from **SCR1** is developed across the diode load and volume control **RV1** from the slider of which it is capacitively coupled via **C13** to the driver **TR4. T1** primary is connected in series with **TR4** collector and the two secondary windings feed the output stage **TR5** and **TR6** in anti-phase. The output transistors are wired for class B operation employing the high impedance loudspeaker, coupled via **C16** as the load impedance.

A portion of the output developed across **R22** and **R17** is coupled to the emitter of **TR4** as negative feedback.

CIRCUIT ALIGNMENT

Equipment Required.—An a.m. signal generator; an audio output meter with an impedance of 80 ohms, or a model 8 Avometer switched to its 10V a.c. range; a length of plastics covered wire to form a coupling loop; a 390 ohm resistor and a bladed type trimming tool.

I.f. alignment can be carried out with the chassis in the case, for r.f. alignment the chassis should be removed as described under "Dismantling." Notches in the top edge of the scale backing plate correspond to r.f. alignment points, reading from left to right as follows: Cursor alignment (see "Drive Cord Replacement"), 200m, 1,330m and 500m.

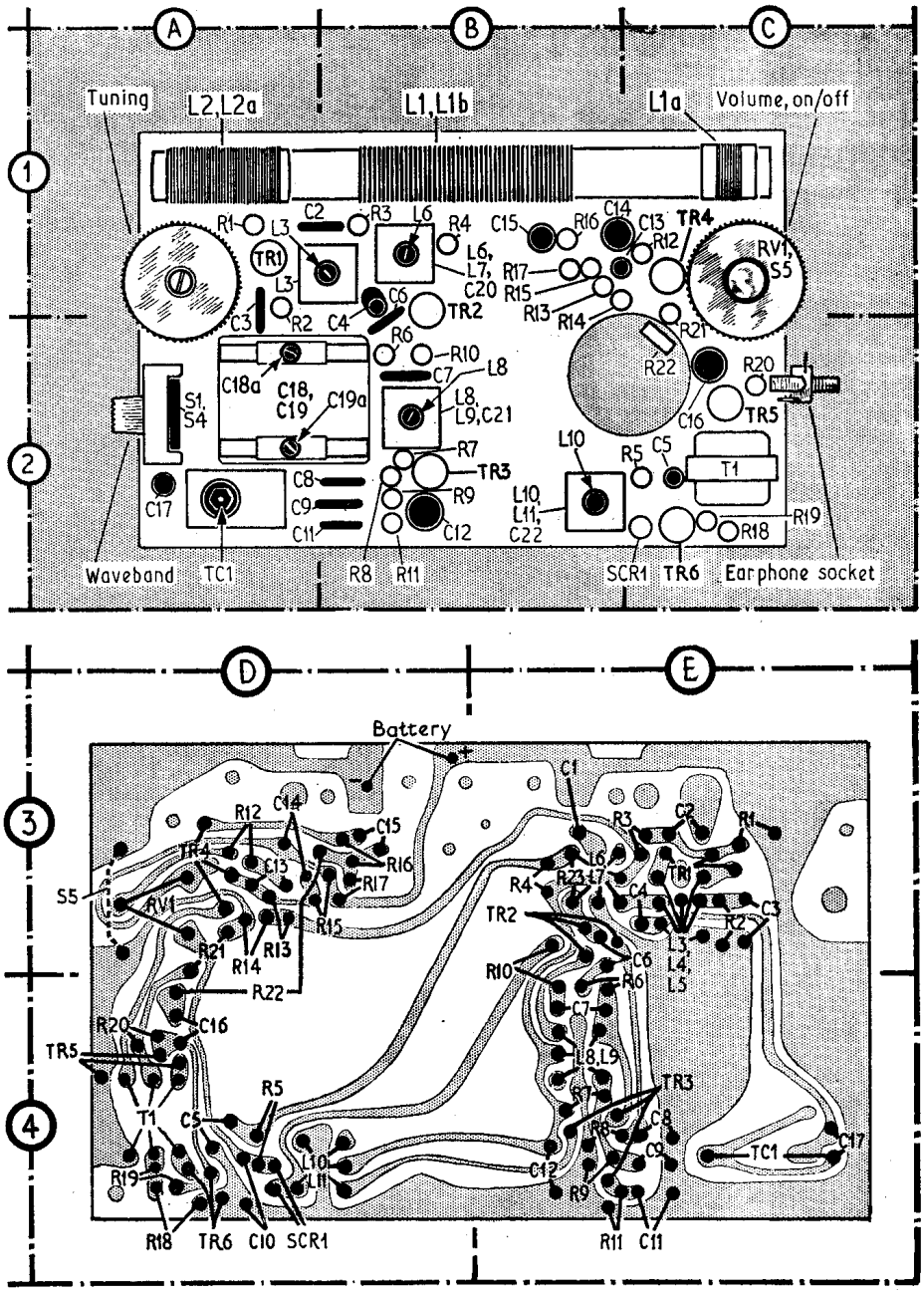
1.—Connect the audio output meter or model 8 Avometer in place of the loudspeaker. This may be done via the earphone socket using a suitable plug. Set the tuning gang to minimum capacitance and the volume control to maximum output.
2.—Wind three turns of plastics covered wire round the cabinet at right angles, i.e., round the ferrite rod. Connect the low impedance output from the signal generator to the coupling loop via the 390 ohm resistor.
3.—Feed in a 470kc/s modulated signal and maintaining the input signal to give an output reading of 50mW (3.2V on Avometer), adjust the cores of **L10, L8** and **L6** for maximum output.
4.—Switch to m.w. and tune receiver to 500m. Feed in a 600kc/s signal and adjust the core of **L3** and **L1a** by sliding it along the ferrite rod, for maximum output.
5.—Tune receiver to 200m. Feed in a 1,500m signal and adjust **C18a** and **C19a** for maximum output.
6.—Repeat operations 4 and 5 for optimum results.
7.—Switch to l.w. and tune receiver to 1,330m. Feed in a 225kc/s signal and adjust **TC1** for maximum output.
8.—Tune to 1,500m and using the B.B.C. Light Programme transmission, adjust **L2** by sliding it along the ferrite rod for maximum output.

GENERAL NOTES

Dismantling.—To remove the printed panel chassis from the case for servicing, proceed as follows:

Gently squeeze the top and bottom of the case and remove the back section by inserting a thumb-nail in the slot in the underside of the case.

Unclip and remove the battery.



Plan view (upper drawing) and reverse-side view (lower drawing) of the receiver printed panel showing component locations.

Remove three Phillips-head screws, one at top centre and one in each bottom corner, securing the printed panel to the case.

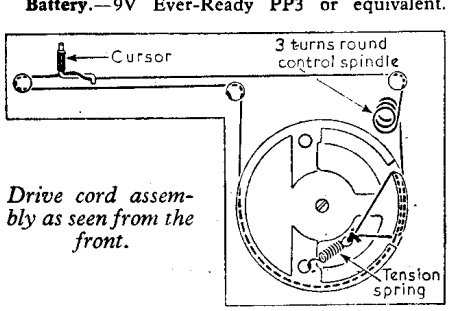
Unscrew the earphone socket retaining ring and washer from the outside of the case and push in the socket free of the case.

Withdraw chassis complete with loudspeaker.

Note: The loudspeaker is not secured to either the chassis or the case, and care should be taken to ensure it does not fall away from the chassis, otherwise the connecting leads may be damaged.

Drive Cord Replacement.—To replace the drive cord first remove the chassis as described under "Dismantling" and rotate the nylon tuning drum so that it takes up the position shown in the sketch in col. 3. Tie one end of the new cord to the tension spring and anchor the spring to the lower hole in the drum. Thread the cord out of the drum via the lower cut-out in the drum perimeter and up to the tuning spindle. Wind three turns in an anti-clockwise direction round the tuning spindle and continue round the three metal studs as shown in the sketch. Finish by making half a turn anti-clockwise round the tuning drum and, entering the drum by the upper cut-out, secure the free end of the cord to the spring with suitable tension. Attach the cursor to coincide with the extreme left-hand notch in the scale backing plate.

Battery.—9V Ever-Ready PP3 or equivalent.



Drive cord assembly as seen from the front.

Printed in Great Britain by Cornwall Press, Ltd., Paris Garden, Stamford Street, London, S.E.1, and Published by Iliffe Electrical Publications, Ltd., Dorset House, Stamford Street, London, S.E.1.