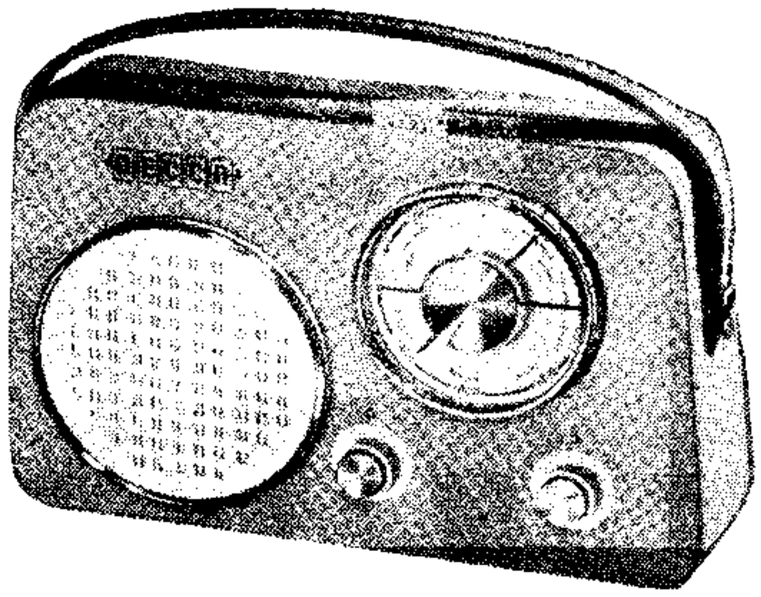
DECCA "DEBONETTE" TP50 & TP50A



Operating from two 9V batteries, Decca TP50 is a transistorized portable radio receiver covering Medium and Long wavebands. Signal input is normally from an internal ferrite rod aerial but a socket is provided for the connection of a car type external aerial. It is housed in a plastics fabric-covered case with carrying strap. Waveband ranges are 190-565m (M.W.) and 1,120-1,950m (L.W.).

TP50A is virtually the same receiver fitted to a larger cabinet and using larger capacity batteries.

Release dates: TP50 April 1961, TP50A January 1962. Original price (both models): £12 8s 4d. Purchase tax extra.

TRANSISTOR ANALYSIS

Voltage readings given in the table in col. 3 are taken from information supplied by the manufacturers. They were taken on an Avometer model 8 with no signal input and the volume control set at minimum output. All voltages are negative with respect to chassis.

CIRCUIT DESCRIPTION

TR1 operates as a self-oscillating mixer with the R.F. signal input coupled to its base via **C5** from a tapping on the aerial coil **L1** (M.W.) or **L2** (L.W.). Base bias is derived from the potential divider **R1, R2.** **T2** is tuned at oscillator frequency by **C3b** and **C10** on M.W. with **C11** and **C12** switched in parallel by **S6** on L.W. (On M.W. **C11** and **C12** are switched to by-pass the L.W. aerial coil **L2**.) Regenerative feedback is provided by the coupling windings in **TR1** collector and emitter.

The resultant intermediate frequency produced from the R.F. and heterodyne signals and selected by the double-tuned

(*Continued overleaf Col. 1*)

Transistor Table

Transistor		Emitter (V)	Base (V)	Collector (V)
TR1	OC44	1·2	1·1	6·9
TR2	OC45	0·7	0·9	6·8
TR3	OC45	1·45	1·65	6·8
TR4	OC81D	1·7	1·2	17·2
TR5	OC81	8·6	8·8	17·5
TR6	OC81	—	7·2	8·6

Resistors

R1	47kΩ	A1
R2	10kΩ	A1
R3	—	†
R4	3·3kΩ	A2
R5	390Ω	A1
R6	75kΩ	A1
R7	1kΩ	A2
R8	12kΩ	B2
R9	1·8kΩ	A2
R10	390Ω	B2
R11	6·8Ω	B3
R12	470Ω	B2
R13	47kΩ	B2
R14	18kΩ	B2
R15	5·1kΩ	C2
R16	1kΩ	B2
R17	1kΩ	B3
R18	8·2kΩ	B1
R19	180Ω	C2
R20	8·2kΩ	C1
R21	180Ω	B1
~~R22~~	~~4·7Ω~~	~~C1~~
R23	4·7Ω	C1
RV1	5kΩ	B2

Capacitors

C1	30pF	A2
C2	20pF	A2
C3a	—	A2
C3b	—	A2
C4	—	A1
C5	0·05μF	A2
C6	30pF	A3
C7	—	A1
C8	—	A1
C9	0·01μF	A2
C10	30pF	A3
~~C11~~	~~20pF~~	~~A2~~
C12	200pF	A2
C13	10μF	A2
C14	—	A1
C15	—	A1
C16	10μF	A2
C17	—	B1
C18	10μF	A2
C19	0·1μF	B2
C20	10μF	B3
C21	0·1μF	B2
C22	0·1μF	B2
C23	100μF	B2
C24	0·1μF	B3
C25	0·003μF	C1
C26	100μF	C2
C27	100μF	C2

Coils*

L1	—	A3
L2	5·5	C3
L3	—	B3
L4	70·0§	—

Transformers*

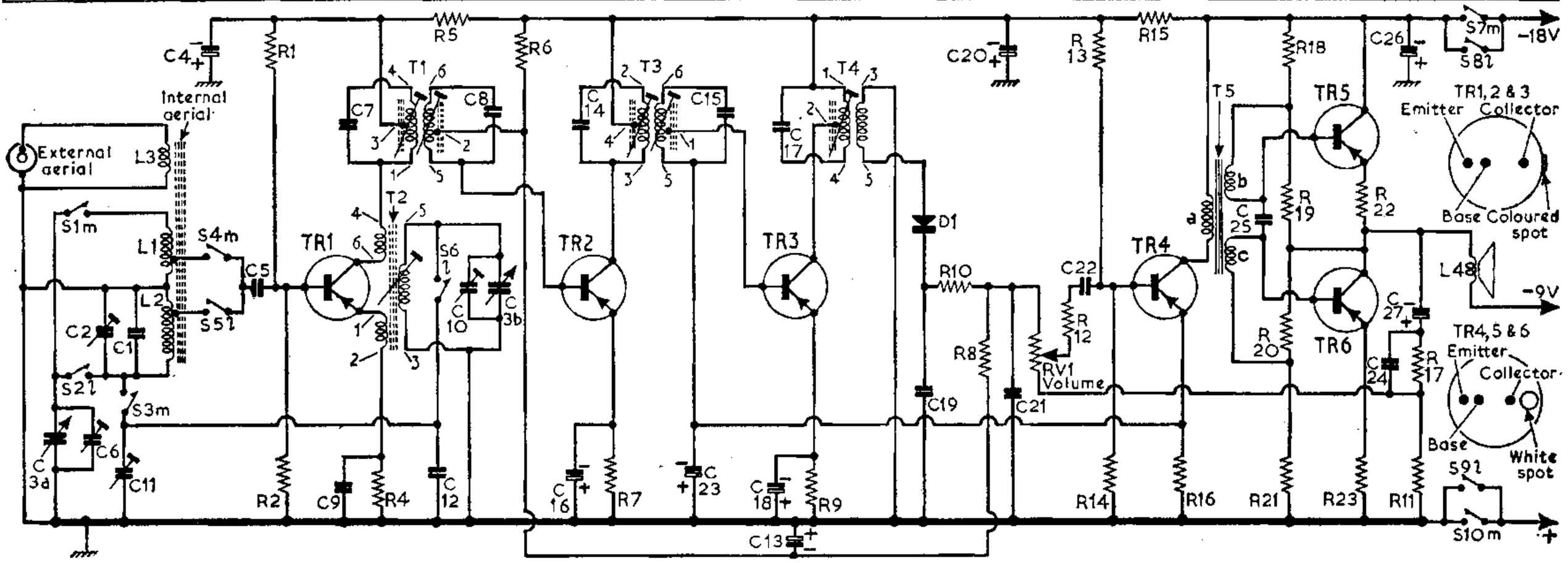
T1	—	A1
T2	—	A2
T3	—	A1
T4	—	B1
T5 a	175·0	B1
T5 b	36·0	B1
T5 c	36·0	B1

Miscellaneous

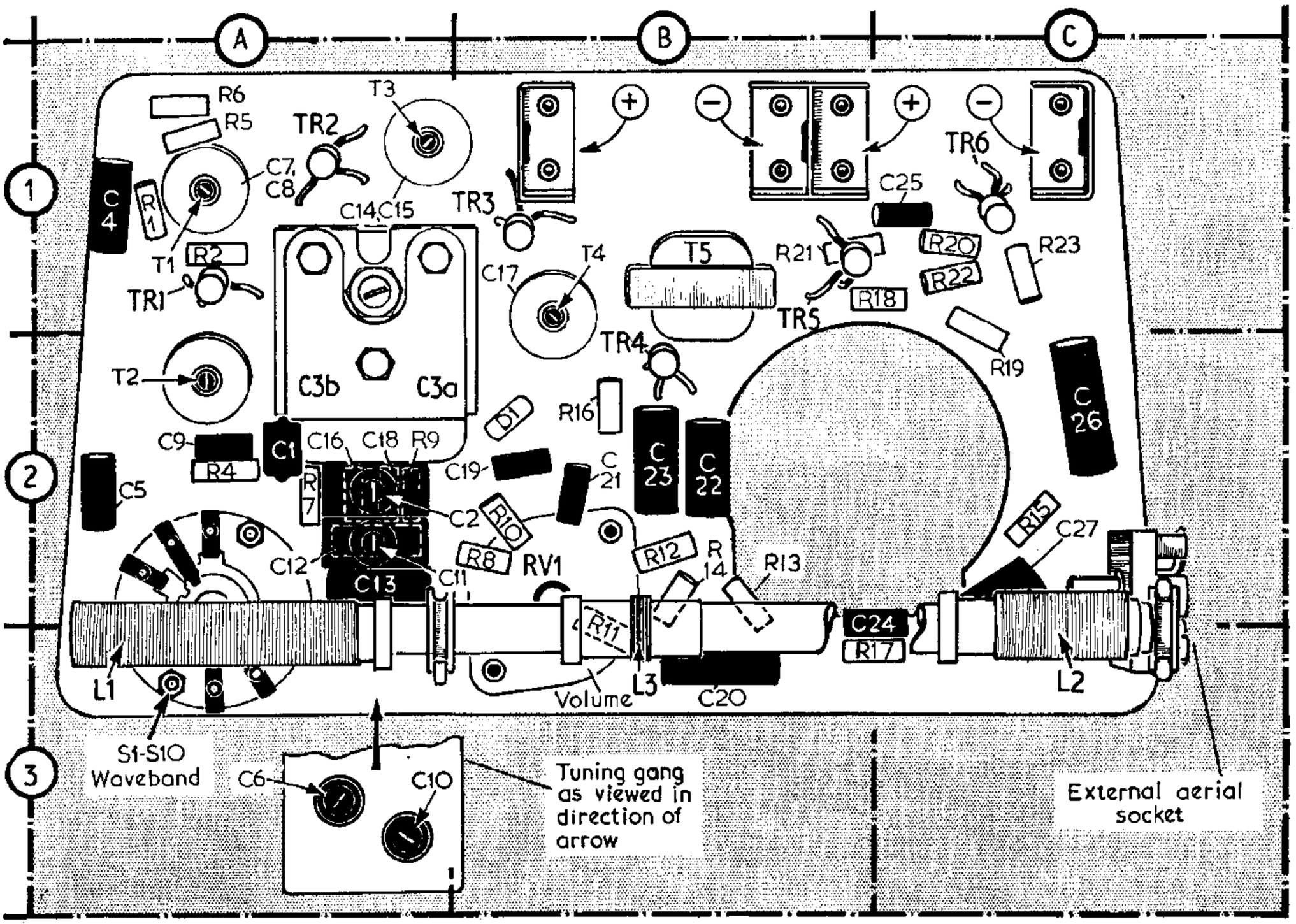
D1	OA70	B2
S1-S10	—	A3

**Approximate D.C. resistance in ohms.*
†No Component
§125Ω in TP50A.

C	3a	6,2, 11,1		4	5		9,7		12	10	8,3b	16,14		23	15	18,17,13		19	20,21	22		25		24, 26,27	C
R					1,2		4	5	6		7			9		10	8	RV1, 12, 13,14, 15, 16		18,19,20,21	22,23	17,11			R



Circuit diagram of Decca TP50 and TP50A. L.W. oscillator shunt capacitors **C11** *and* **C12** *are connected across L.W. aerial coil* **L2** *on M.W., de-tuning L.W. aerial circuit to prevent breakthrough. Base bias for* **TR3** *is derived from* **TR4** *emitter potential*



Rear view of an upright TP50 chassis. In the TP50A the battery brackets are different, to accommodate the larger size batteries, otherwise the chassis are identical. Components **C12, C16, C18** *and* **R9** *are located on the chassis behind* **C2** *and* **C11.** *The waveband switches, drawn from the same angle, are shown in detail at the foot of col. 2*

Circuit Description—*continued*

transformer **T1** in **TR1** collector circuit is at 472kc/s. This is amplified by 1st and 2nd I.F. amplifiers **TR2** and **TR3** which are coupled by the I.F. transformer **T3,** and is then applied via **T4** to the detector diode **D1. R4, R7** and **R9** are emitter D.C. stabilizing resistors.

The rectified audio output from **D1,** which operates with slight forward bias derived from the network **R6, R8, RV1** and **R11,** is developed across the diode load resistor and volume control **RV1.** The positive D.C. potential present across **RV1** as a result of rectified carrier current is employed as A.G.C. voltage and fed back via **R8** to reduce the gain of the 1st I.F. amplifier **TR2.**

From the slider of **RV1** the audio signal is capacitively coupled to the driver **TR4** and from **TR4** output, is transformer coupled via **T5** to the bases of the output transistors **TR5** and **TR6.** The applied signal voltages are transferred by the two secondary windings **b** and **c** in opposite phase but equal in amplitude. High impedance speaker **L4** is connected as the output stage load impedance eliminating the need of a separate output transformer.

The lower end of the volume control **RV1** is coupled to the junction **R11, R17, C24** to provide negative feedback.

CIRCUIT ALIGNMENT

Equipment Required.—An A.M. signal generator; an A.C. voltmeter for use as an output meter; two resistors (1kΩ and 2kΩ) and a bladed type trimming tool.

1.—Switch to M.W. and set the tuning gang to the fully meshed position. Connect the signal generator across M.W. aerial coil **L1:** connect the A.C. voltmeter across the speaker speech coil **L4.**

2.—Feed in a 472kc/s modulated signal and maintaining the input only sufficiently high to give a reasonable deflection in the output meter, adjust the top and bottom cores of **T1** and **T3** and the core of **T4** for maximum output.

3.—Repeat operation 2.

4.—Connect the signal generator via the 2kΩ resistor to the external aerial socket. Tune receiver to 460m. Feed in a 652kc/s signal and adjust **T2** and **L1** for maximum output. Adjust **L1** by sliding its former along the ferrite rod.

5.—Tune receiver to 230m. Feed in a 1,300kc/s signal and adjust **C10** and **C6** (osc. and aerial) for maximum output.

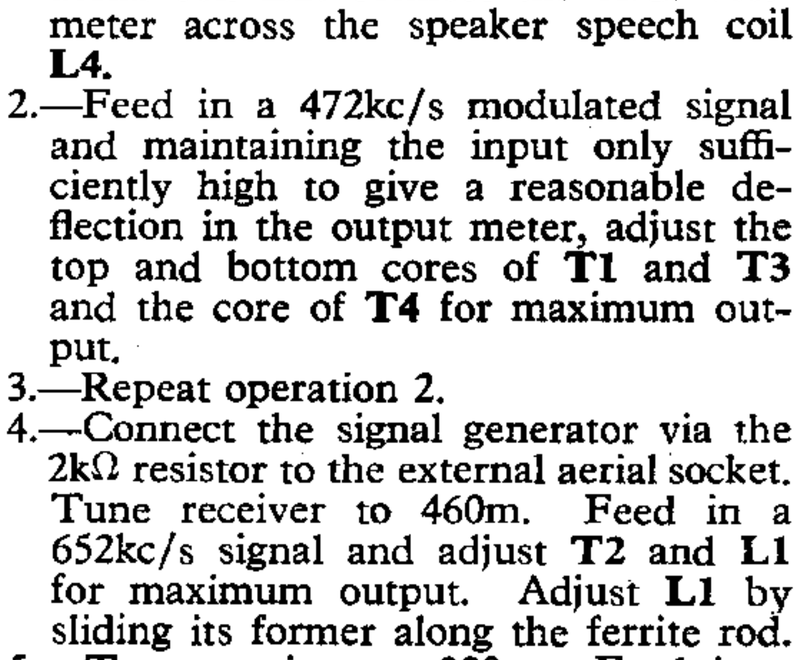
6.—Repeat operations 4 and 5.

7.—Switch to L.W. and tune receiver to 1,750m. Connect the signal generator via the 1kΩ resistor to the external aerial socket. Feed in a 170kc/s signal and adjust **C11** and **L2** for maximum output. Note: When adjusting **C11** there may be a degree of oscillator pulling. Care should be taken to adjust **C11** and **L2** for maximum signal at the correct tracking point.

8.—Tune receiver to 1,250m. Feed in a 240kc/s signal and adjust **C2** for maximum output.

9.—Repeat operations 7 and 8.

SWITCH UNIT



GENERAL NOTES

Dismantling.—To remove the receiver from its case proceed as follows: Remove the back cover, unplug and remove the batteries.

Pull off the transparent tuning knob and slide off the tuning pointer.

Pull off volume and waveband control knobs. Unplug the loudspeaker connections. Take out two hexagon headed printed panel securing screws (one each side) and withdraw the chassis.

Switches.—S1-S6 are waveband switches; **S7-S10** are battery on/off switches. They are all combined in a three-position rotary unit mounted on the printed panel in location reference A3. A separate diagram of the unit in col. 2 gives the individual switch positions.

Batteries.—Batteries recommended by the makers are two Vidormax T6004 (TP50) and two Vidormax T6006 or Ever-Ready PP6 (TP50A).

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.