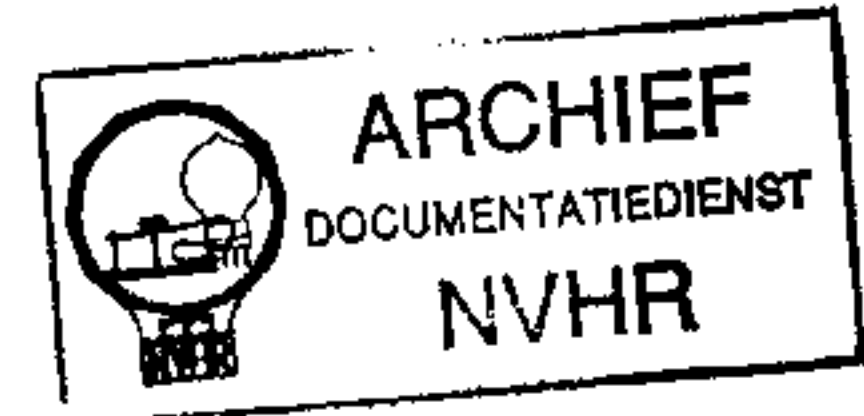


'TRADER' SERVICE SHEETS



DRUMMER M45 A.C. SUPERHET

THE Drummer M45 receiver is a 4-valve (plus rectifier), A.C. superhet, employing a heptode frequency changer. The second detector and A.V.C. valve is a separate double diode, and the output valve is a steep-slope pentode. The circuit employs efficient iron-cored coils, and they are carefully adjusted at the works to give a sensibly "square topped" response.

CIRCUIT DESCRIPTION

Aerial input by way of coupling coils **L1, L2** to capacity-coupled band-pass filter. Primary **L3, L4** tuned by **C19**; secondary **L5, L6** tuned by **C21**; coupling condenser **C1**. First valve (**V1, Marconi metallised MX40**) is a heptode functioning as frequency-changer with electron coupling. Oscillator grid coils **L7, L8** tuned by **C23**; anode reaction coils **L9, L10**. One variable-mu H.F. pentode I.F. amplifier (**V2, Mazda metallised AC/VP1**) with tuned-primary, tuned-secondary iron-cored transformer couplings **L11, L12** and **L13, L14**. I.F. 117.5 KC/S. Diode second detector forming part of double diode valve (**V3, Mazda metallised AC/DD**). Second diode provides voltage which is developed across **R11, R12** and **R13** and fed back as G.B. to frequency-changer and I.F. valves, thus giving automatic volume control. Output from rectifier diode is fed to output pentode (**V4, Mazda AC2/Pen**) by way of coupling condenser **C11** and manual volume control **R10**. Delay voltage for A.V.C. circuit is obtained by means of resistances **R15, R16**, one of which, **R15**, also provides G.B. for **V4**. Tone control effected by condenser **C15** and variable resistance **R17**.

H.T. current supplied by I.H.C. full-wave rectifying valve (**V5, Marconi MU14**). Smoothing by speaker field **L15** and dry electrolytic condensers **C16, C17**.

DISMANTLING THE SET

Removing Chassis.—This is a simple matter. First remove the four control knobs (set screws). Then unplug the

loud-speaker lead from the three sockets on the chassis. Finally, remove the three hexagon-headed and slotted screws holding the chassis to the base of the cabinet. The chassis can then be withdrawn. When testing, the loud-speaker lead must be re-connected.

Removing Speaker.—If this is necessary, it is best to remove it with its sub-baffle. Six wood screws hold the latter in position.

COMPONENTS AND VALUES

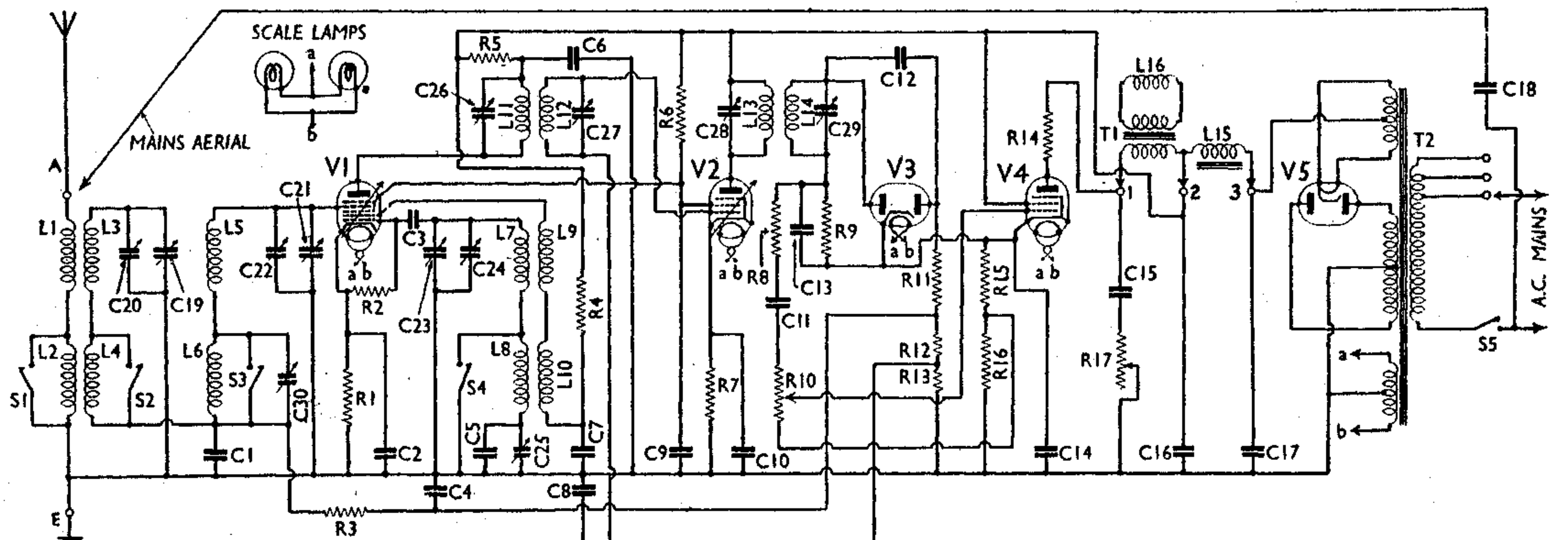
Condensers		Values (μF)
C1	Band-pass coupling	0.02
C2	V1 cathode by-pass	0.1
C3	Osc. grid condenser	0.0003
C4	V1 cont. grid decoupling ..	0.005
C5*	Osc. tracker, fixed	0.0014
C6	V1 anode decoupling	0.01
C7	V1 osc. anode decoupling ..	0.1
C8	V2 cont. grid decoupling ..	0.01
C9	V1 and V2 S.G.'s by-pass ..	0.1
C10	V2 cathode by-pass	0.1
C11	L.F. coupling to V4	0.01
C12	A.V.C. diode coupling	0.0001
C13	Rect. diode reservoir	0.0001
C14	V4 cathode by-pass, electro-lytic	50.0
C15	Tone control condenser	0.05
C16	H.T. smoothing, electrolytics {	8.0
C17		8.0
C18		0.0003
C19	Band-pass pri. tuning	—
C20	Band-pass pri. trimmer, pre-set ..	—
C21	Band-pass sec. tuning	—
C22	Band-pass sec. trimmer, pre-set ..	—
C23	Oscillator tuning	—
C24	Oscillator trimmer, pre-set	—
C25	Oscillator tracker, pre-set	—
C26	1st I.F. trans. pri. tuning	—
C27	1st I.F. trans. sec. tuning	—
C28	2nd I.F. trans. pri. tuning	—
C29	2nd I.F. trans. sec. tuning	—
C30	Band-pass sec. L.W. trimmer, pre-set ..	—

* In our chassis, two condensers in parallel.

Resistances		Values (ohms)
R1	V1 fixed G.B. resistance	450
R2	Osc. grid resistance	90,000
R3	V1 cont. grid decoupling	2,000,000
R4	Osc. anode decoupling	60,000
R5	V1 anode decoupling	2,000
R6	V1 and V2 S.G.'s decoupling ..	40,000
R7	V2 fixed G.B. resistance	450
R8	H.F. stopper	90,000
R9	Rect. diode load	2,000,000
R10	Manual volume control	500,000
R11	A.V.C. diode load	1,000,000
R12		500,000
R13		250,000
R14	V4 anode circuit stabiliser	150
R15	V4 G.B. and A.V.C. delay voltage resistances ..	150
R16		150
R17	Tone control resistance	50,000

Other Components		Values (ohms)
L1	Aerial coupling coils	0.4
L2		3.0
L3	Band-pass primary coils	1.3
L4		15.0
L5	Band-pass secondary coils	1.3
L6		15.0
L7	Oscillator tuning coils	0.9
L8		9.0
L9	Oscillator reaction coils	0.3
L10		1.7
L11	1st I.F. transformer	Pri. 40.0
L12		Sec. 40.0
L13	2nd I.F. transformer	Pri. 40.0
L14		Sec. 40.0
L15	Speaker field	2000.0
L16	Speaker speech coil	1.8
T1	Speaker input trans- former	Pri. 550.0
		Sec. 0.4
T2	Mains transformer	Pri. total .. 50.0
		Heater sec. .. 0.05
		Rect. fil. sec. .. 0.1
		H.T. sec. .. 310.0
S1-S4	Waveband switches, ganged ..	—
S5	Mains switch (ganged R10) ..	—

(Continued overleaf)



The circuit diagram of the Drummer M45 A.C. superhet. Production chassis have the suppressor grid of V2 connected to earth, and not to cathode as shown above. L16 is the speaker speech coil. C5 comprised two fixed condensers in parallel in our chassis. The figures 1, 2, 3 refer to the loud-speaker sockets shown in the plan chassis view.

DRUMMER M45 A.C. SUPERHET
(cont'd.)

VALVE ANALYSIS

The voltages and currents given in the table below were obtained from a chassis with no signal input to the aerial terminal. All voltages were read on the 1,200 V scale of an Avometer with chassis as negative, and the anode currents of V1 and V2, and the oscillator anode (G2) current of V1 were measured with a milliammeter inserted in the low H.F. potential ends of the circuits.

Valve	Anode Volts	Anode Current (mA)	Screen Volts	Screen Current (mA)
V1 MX40*	265	3.0	95	2.4
V2 AC/VP1	275	3.0	95	0.6
V3 AC/DD	—	—	—	—
V4 AC2/Pen	260	32.0	275	8.0
V5 MU14	350†	—	—	—

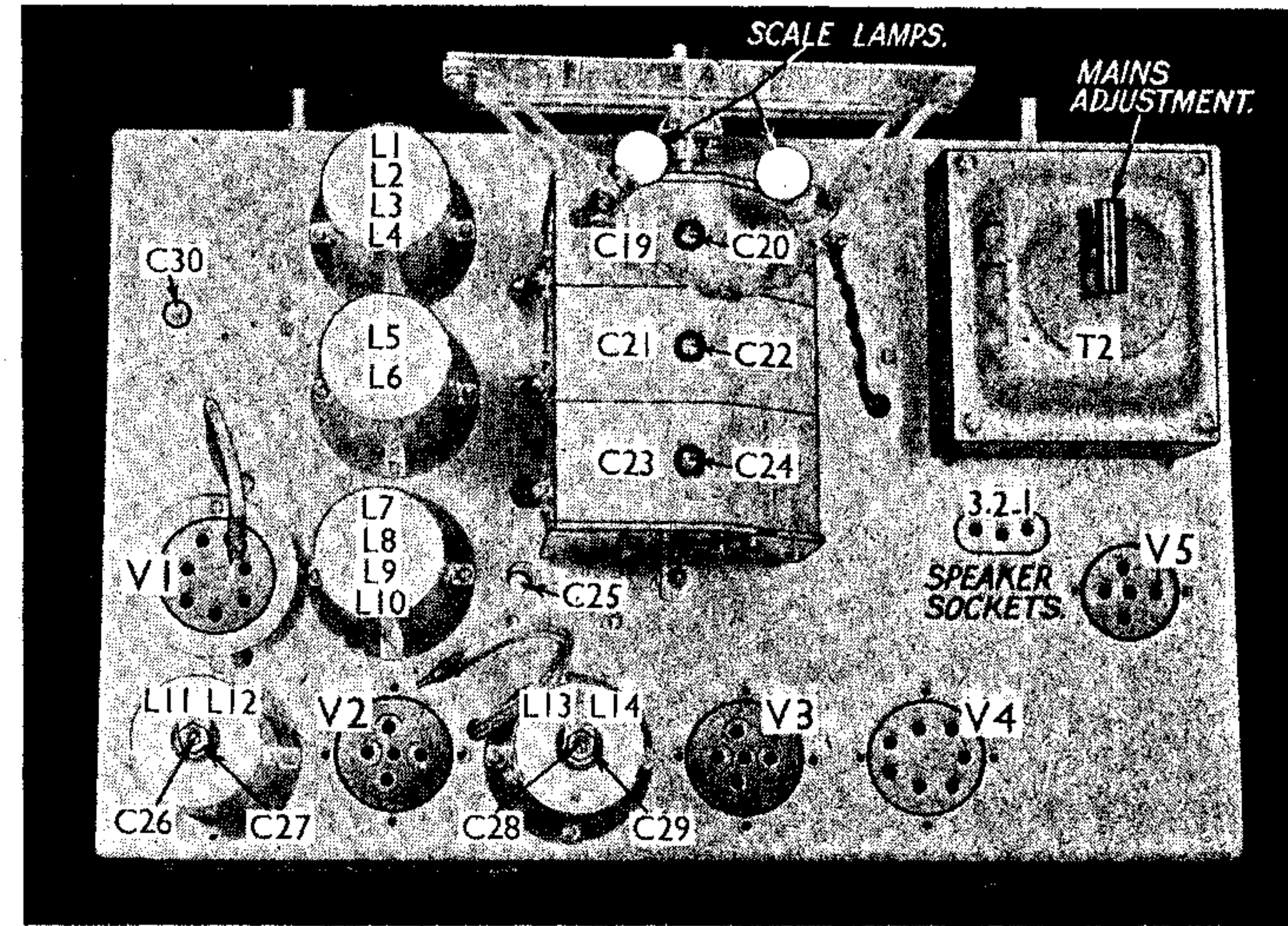
*Osc. anode G2, 150 V 2.4 mA.
† Each anode, A.C.

GENERAL NOTES

Switches.—S1 to S4 are the waveband switches, mounted in one assembly. They are indicated in the under-chassis view. In our chassis a six unit assembly was employed, with two units unused. It is possible that later chassis will have only four units, but the switches will be in the same relative order. All the switches are *closed* on the M.W. band and *open* on the L.W. band.

S5 is the Q.M.B. mains switch, ganged with the volume control R10.

Coils.—There are five coil units in all, two H.F., one oscillator and two I.F. They are very accurately ganged and adjusted for correct response at the works by an oscillograph method, and the makers strongly deprecate any adjustments being made by the service man, with the possible exception of the



Plan view of chassis. The valves have been removed, together with the special valve screen over V1. V2 will have a 7-pin socket in production chassis. The speaker lead is fitted with a non-reversible triple plug which fits into the sockets 1, 2, 3. Note the special nut and screw adjustors for the I.F. transformer trimmers C26-C29.

trimmer of the first section of the gang condenser (C20).

However, all the trimmers are indicated on the circuit diagram, and in the chassis views. In addition, there is pre-set coupling between the primary and secondary coils of the I.F. transformers, by means of screws in slots in the metal screens, which, when loosened, allow the coupling to be varied by rotating one of the coils relative to the other. This adjustment is accurately set at the works, and should on no account be disturbed.

Each I.F. unit has, mounted at the top of its screen, a double adjustment, comprising an outer hexagon nut, operating the trimmer of one coil, and an inner slotted screw adjusting the other trimmer.

Alternative Valves.—Our advance chassis was fitted with the following alternative valves. V2, Mullard VP4A (suppressor grid connected to cathode); V3, Mullard 2D4A; V5, Mullard I.W.3. We understand that production chassis will be fitted with the types indicated in the circuit description and valve analysis.

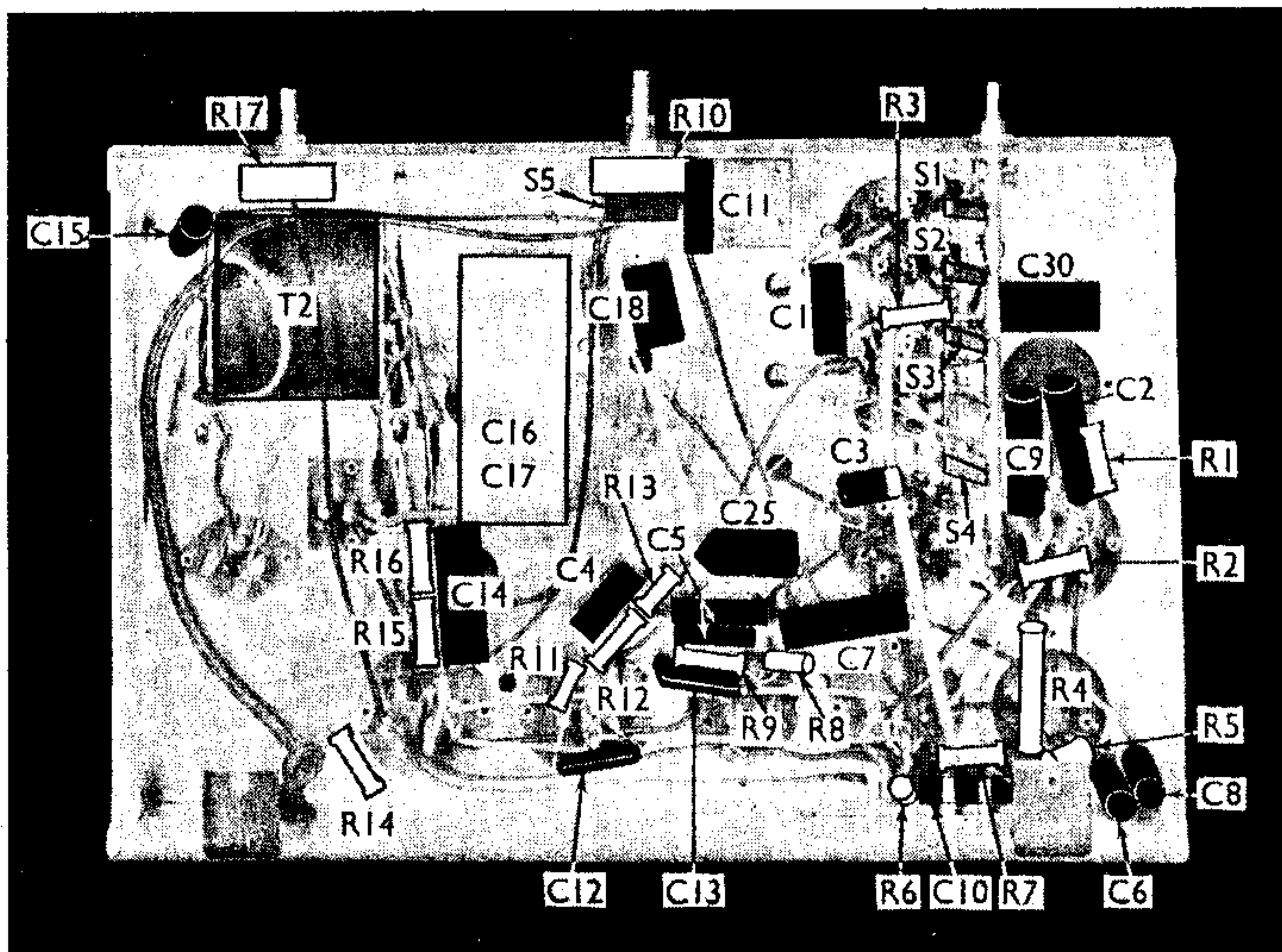
Speaker Mounting.—In production models the speaker may be mounted on rubber, in which case it must not be tightened up firmly, but must be allowed to float on its mounting.

Scale Lamps.—There are two of these in parallel across the heater winding of the mains transformer T2. The bulbs are Osram M.E.S. types, rated at 6.2 V, 0.3 A. Adjustable brackets permit the bulbs to be moved to give even illumination of the scale.

Speaker Lead.—The 3-way lead from the speaker terminates in a 3-pin non-reversible plug. Should a new lead, or or a new speaker be fitted, the connections at the speaker transformer T1 are: Blue lead, tag 4 and adjacent tag F; Black lead, tag 1; Red lead, other tag F. At the plug end the leads are connected so that black lead will connect to socket 1 on chassis; blue lead to socket 2, and red lead to socket 3.

Valve V1.—Connections of V1, the frequency changer, are given in Service Sheet No. 17, page 217, Col. 3, left-hand diagram.

Valve V2.—The AC/VP1 fitted in production chassis has its suppressor grid brought out to a separate pin on the base, and this will be earthed. Pin connections are given in Service Sheet No. 9, page 161, Col. 3, right-hand diagram.



Under-chassis view. The condensers C16, C17 are dry electrolytics, in one unit. C16 is the upper one looking at the underside of the chassis. C5 comprises two condensers in parallel in our chassis, but will be replaced by a single one later. C25 and C30 are pre-set condensers operated from the upper surface of the chassis.