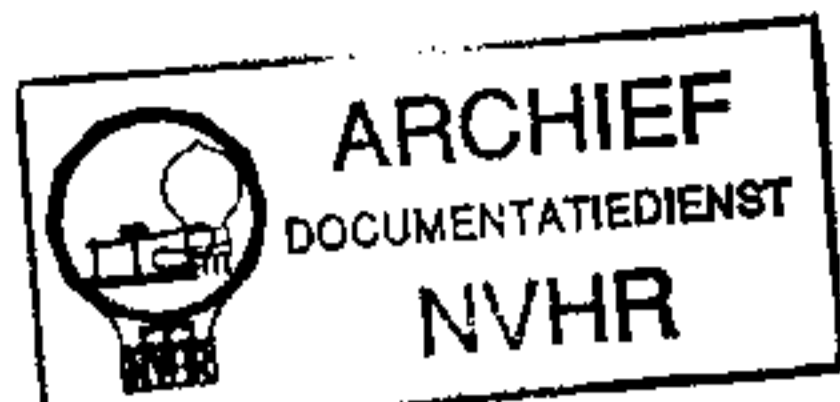
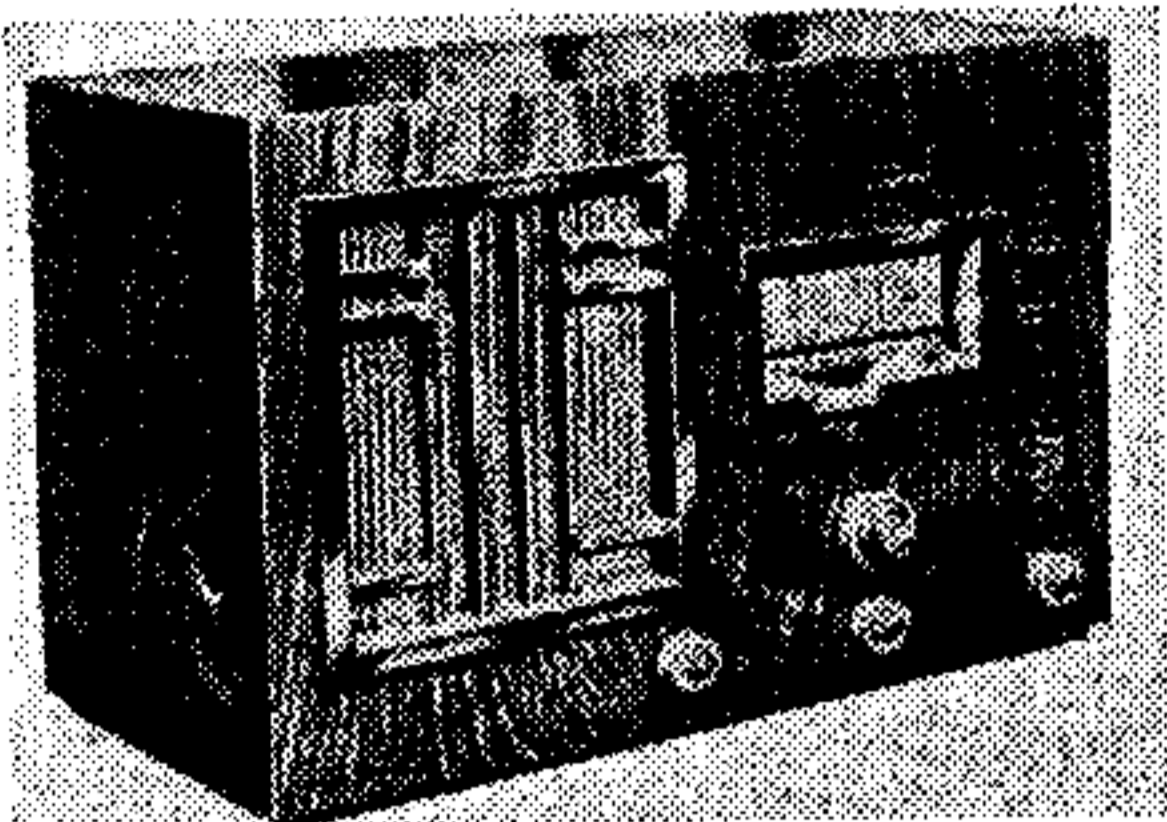


Ned. Ver. v. Historie v/d Radio



COSSOR 368

BATTERY RECEIVER



THE Cossor 368 is a 3-valve (plus rectifier) 2-band TRF receiver, designed for use with AC mains of 200-250 V, 40-100 C/S.

Provision is made for a gramophone pick-up, which may be left permanently connected, and an external speaker.

Release date: 1935.

CIRCUIT DESCRIPTION

Aerial input via series condenser C1 and coupling coil L1 (MW and LW) and S1, C2 (MW) to single tuned circuit L2 (MW) and L3 (LW), tuned by C16. Final manual trimming by C17.

First valve (V1, Cossor metallised MVS/Pen) is a variable-mu pentode operating as RF amplifier. Gain control by variable resistance R3 at negative end of screen potential divider R1, R2. Fixed minimum GB is obtained from drop along cathode resistance R4.

Tuned-primary RF transformer coupling by L4, L5, C18 and L8, L9 between V1

and a second RF pentode valve (V2, Cossor metallised MS/Pen), which operates as detector on grid leak system with C6 and R8. Provision for connection of gramophone pick-up in earthy end of grid circuit by sockets which are short-circuited by S6 on radio. Cathode resistance R10, which provides GB for gramophone operation, is also short-circuited on radio by S7.

Reaction is applied from anode via coils L6, L7, and controlled by C20.

Resistance-capacity coupling by R11, C10 and R12 between V2 and triode output valve (V3, Cossor 41MP). RF filtering by C9, R13, C11. Provision for connection of high impedance external speaker in anode circuit. Fixed tone correction by C12, also in anode circuit.

HT current is supplied by full-wave rectifying valve (V4, Cossor 442BU). Smoothing by speaker field L12 and dry electrolytic condensers C14, C15.

COMPONENTS AND VALUES

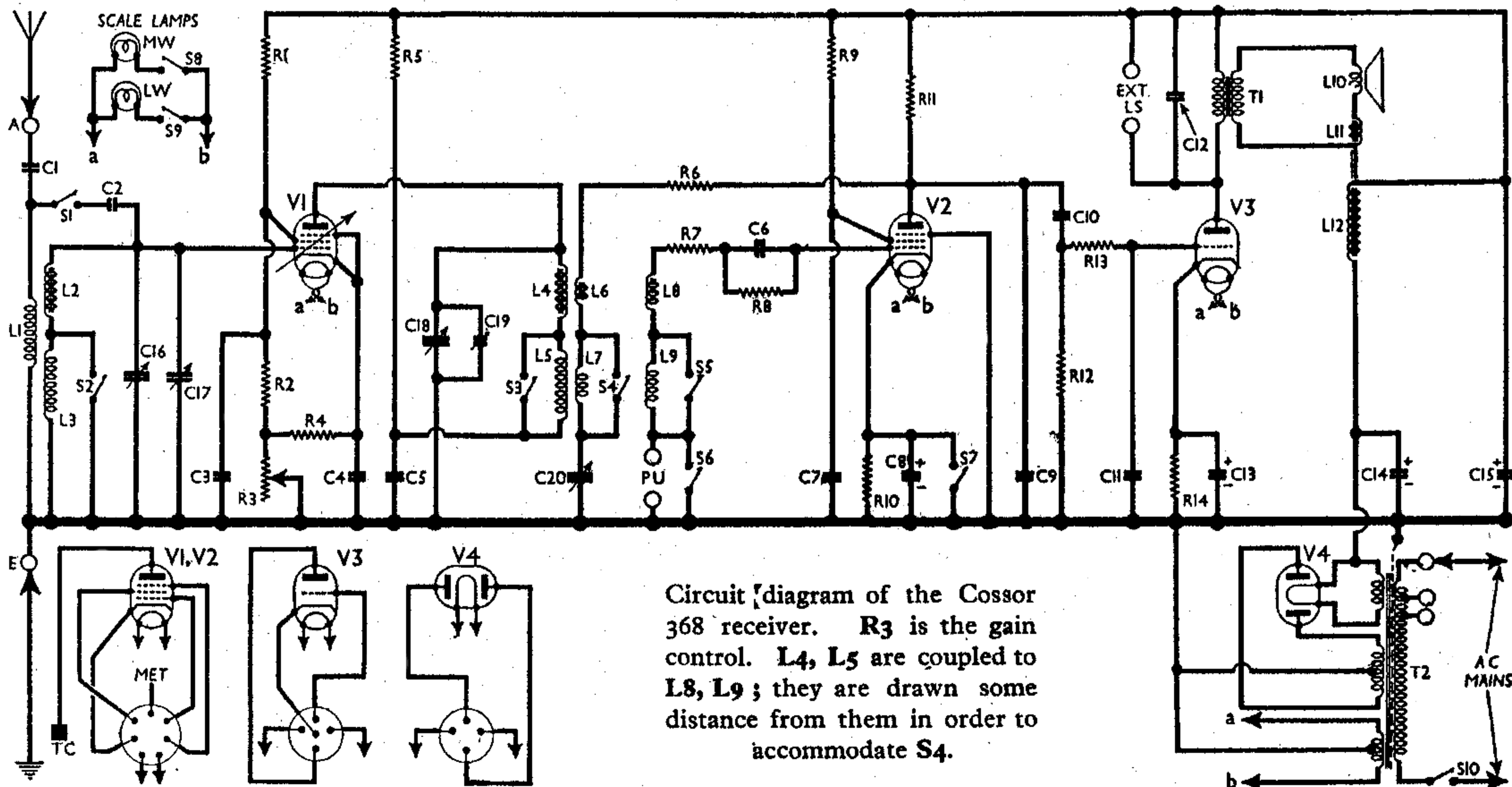
RESISTANCES		Values (ohms)
R1	V1 SG HT potential divider resistances ...	30,000
R2		40,000
R3	V1 gain control ...	12,000
R4	V1 fixed GB ...	1,500
R5	V1 anode HT feed ...	10,000
R6	V2 reaction circuit stabilising resistances ...	300
R7		200
R8	V2 grid leak ...	1,000,000
R9	V2 SG HT feed ...	500,000
R10	V2 gram GB resistance ...	1,000
R11	V2 anode load ...	100,000
R12	V3 CG resistance ...	500,000
R13	V3 CG RF stopper ...	100,000
R14	V3 GB resistance ...	300

CONDENSERS		Values (μF)
C1	Aerial series condenser ...	0.0005
C2	Aerial MW coupling ...	0.00015
C3	V1 SG decoupling ...	0.1
C4	V1 cathode by-pass ...	0.1
C5	V1 anode decoupling ...	0.1
C6	V2 CG condenser ...	0.0001
C7	V2 SG decoupling ...	0.1
C8*	V2 cathode by-pass ...	50.0
C9	V2 anode RF by-pass ...	0.0002
C10	V2 to V3 AF coupling ...	0.01
C11	V3 CG RF by-pass ...	0.0002
C12	Fixed tone corrector ...	0.005
C13*	V3 cathode by-pass ...	50.0
C14*	HT smoothing ...	6.0
C15*		4.0
C16†	Aerial circuit tuning ...	—
C17†	Aerial manual trimmer ...	—
C18†	V1 anode circuit tuning ...	—
C19†	V1 anode MW trimmer ...	—
C20†	Reaction control ...	—

* Electrolytic. † Variable. ‡ Pre-set.

OTHER COMPONENTS		Approx. Values (ohms)
L1	Aerial coupling coil ...	10.0
L2	Aerial MW tuning coil ...	1.5
L3	Aerial LW tuning coil ...	11.0
L4	RF trans. pri. MW tuning	1.5
L5	RF trans. pri. LW tuning	11.0
L6	MW reaction coil ...	0.5
L7	LW reaction coil ...	3.5
L8	RF trans. MW sec. coil ...	1.5
L9	RF trans. LW sec. coil ...	11.0
L10	Speaker speech coil ...	2.0
L11	Hum neutralising coil ...	0.1
L12	Speaker field coil ...	2,500.0
T1	Speaker input { Pri. trans. ...	275.0
	{ Sec. ...	0.15
	{ Pri. total ...	70.0
T2	Mains trans. { Heater sec. ...	0.15
	{ Rect. heat. sec. ...	0.2
	{ HT sec., total ...	1,500.0

(Continued overleaf.)



Circuit diagram of the Cossor 368 receiver. R3 is the gain control. L4, L5 are coupled to L8, L9; they are drawn some distance from them in order to accommodate S4.

OTHER COMPONENTS (Continued.)		Approx. Values (ohms)
S1-S5	Waveband switches ...	—
S6, S7	Gram and pick-up switches ...	—
S8, S9	Scale lamp switches ...	—
S10	Mains switch ...	—

VALVE ANALYSIS

Valve voltages and currents given in the table below are those quoted in the makers' manual. The measurements were made with the set connected to mains of 240 V; there was no signal input, and the volume control was at maximum.

Voltages were measured on the 600 V scale of a 1,000 ohms-per-volt meter, whose negative lead was connected to chassis.

Valve	Anode Voltage (V)	Anode Current (mA)	Screen Voltage (V)	Screen Current (mA)
V1 MVS/Pcn.	215	2.0	120	1.0
V2 MS/Pcn.	55	1.8	35	0.4
V3 41MP	230	30.0	—	—
V4 442BU	350†	—	—	—

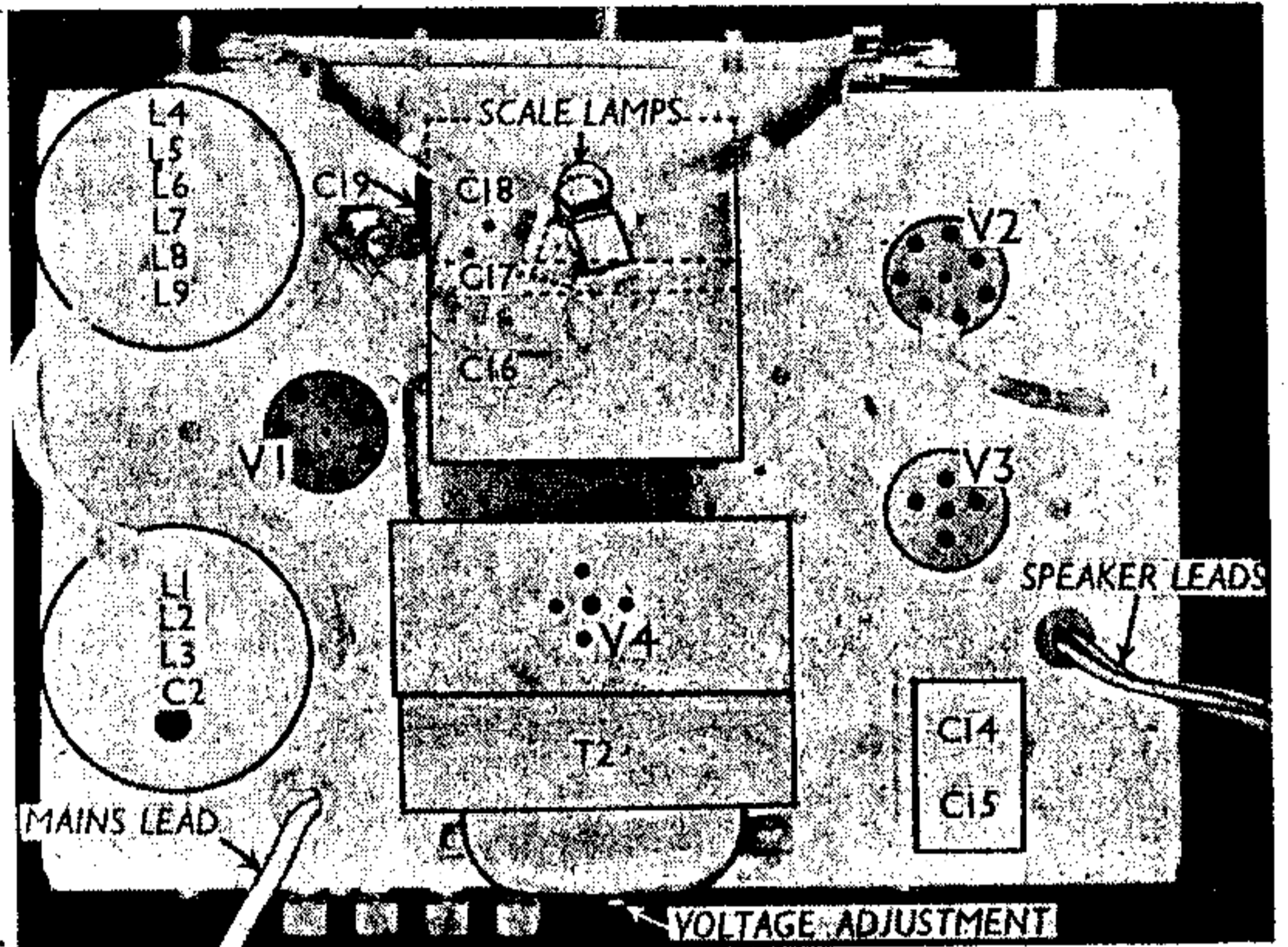
† Approximate voltage at each anode, AC.

DISMANTLING THE SET

The cabinet is fitted with a detachable bottom, upon removal of which access may be gained to most of the components beneath the chassis.

Removing Chassis.—Remove the control knobs (recessed screws); withdraw the sliding partition inside the cabinet; remove two wood screws holding the scale assembly to the front of the cabinet; unsolder from the speaker transformer the three leads connecting it to chassis; remove the four bolts (with washers) holding the chassis to the bottom of the

Plan view of the chassis. C17 is a small variable condenser sandwiched between C16 and C18. V4 is mounted on top of the mains transformer T2.



cabinet. If the chassis is now tilted slightly, it can be withdrawn. When replacing, connect the speaker leads as follows, numbering the tags from left to right: 1, blue; 2, red; 3 and 4 (joined together), yellow.

Removing Speaker.—Unsolder the three connecting leads and, since the speaker is riveted to the sub-baffle, remove the screws holding this to the front of the cabinet.

When replacing, the transformer should be at the top, and the leads should be connected as indicated above.

GENERAL NOTES

Switches.—S1-S5 are the waveband switches, S6, S7 the radio gram switches, S8, S9 the scale lamp switches and S10 the mains switch, in a rotary barrel type switch assembly. The individual switches

are indicated in our under-chassis view.

The table below gives the switch positions for the four control settings, starting from the "off" setting, and proceeding clockwise. A dash indicates open, and C, closed.

Switch Table

Switch	Off	MW	LW	Gram.
S1	C	C	—	—
S2	C	C	—	—
S3	—	—	—	—
S4	—	—	—	—
S5	—	—	—	—
S6	—	—	—	—
S7	—	—	—	—
S8	—	—	—	—
S9	—	—	—	—
S10	—	—	—	—

Colls.—L1-L3 and L4-L9 are in two screened units on the chassis deck. The former unit also contains C2.

Trimmers.—The only trimmers are associated with the gang condenser. C19, sealed with red wax, is mounted on the side of the C18 unit, while C17, operated by a spindle concentric with the main tuning spindle, is of the air-dielectric type, situated between C16 and C18.

Scale Lamps.—These are two Osram MES types, rated at 6.5 V, 0.3 A.

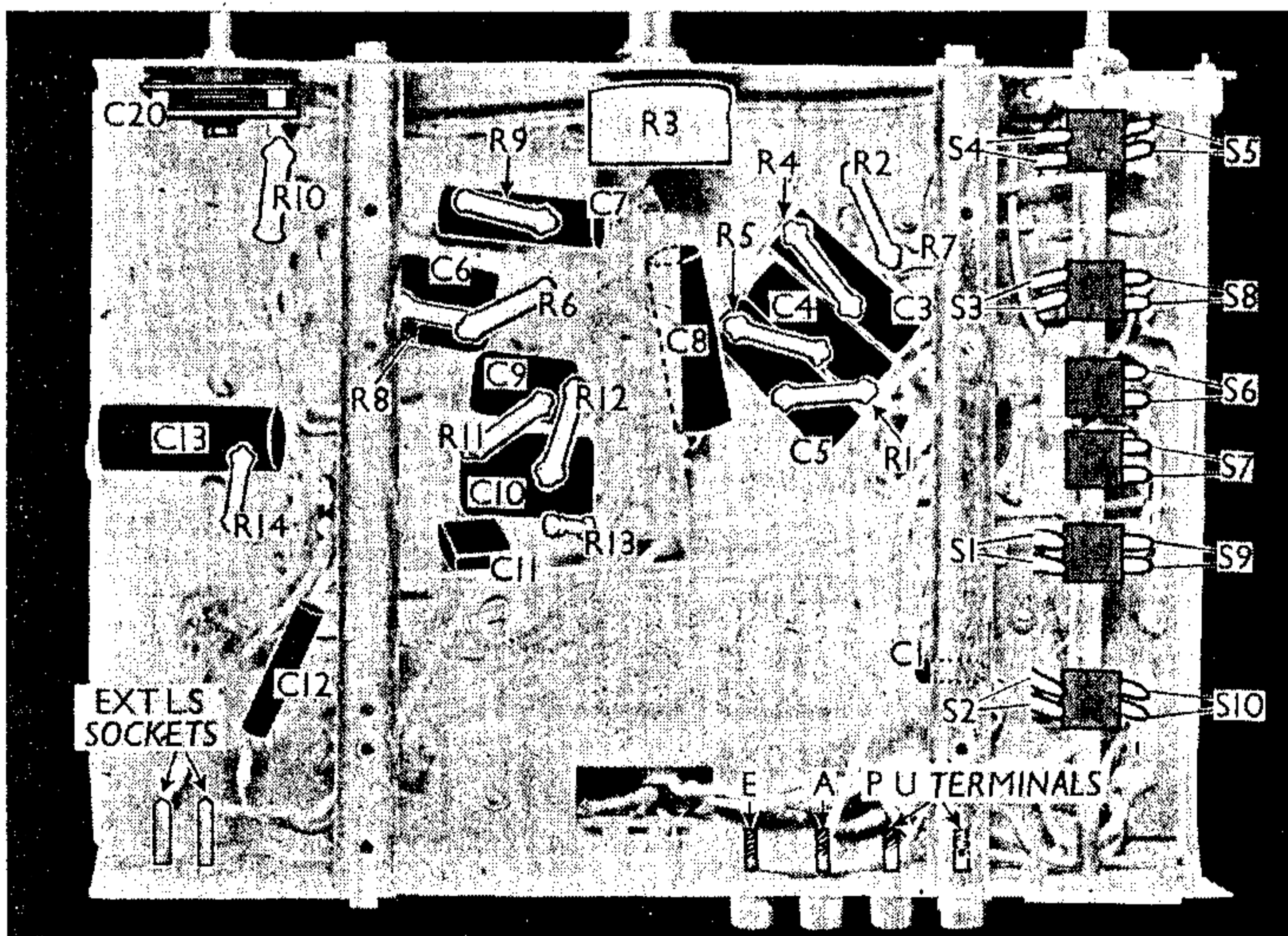
External Speaker.—Two sockets are provided at the rear of the chassis for a high impedance (3,000 O) external speaker.

Condensers C14, C15.—These are two dry electrolytics in a single container, mounted on the chassis deck. They have a common negative (black) lead. The red lead is the positive of C14 (6 µF) and the yellow lead is the positive of C15 (4 µF)

CIRCUIT ALIGNMENT

Strictly speaking, there are no actual alignment operations applicable to this receiver. C19 is adjusted and sealed at the works, while C17 is adjusted by the user.

The makers' instructions are to tune in a station on the MW band below 250 m, and manipulate C17 and the reaction condenser C20 to obtain optimum results. After this, the knob of C17 should not need touching unless critical reaction is being used on a weak station.



Under-chassis view. The switches are indicated individually.