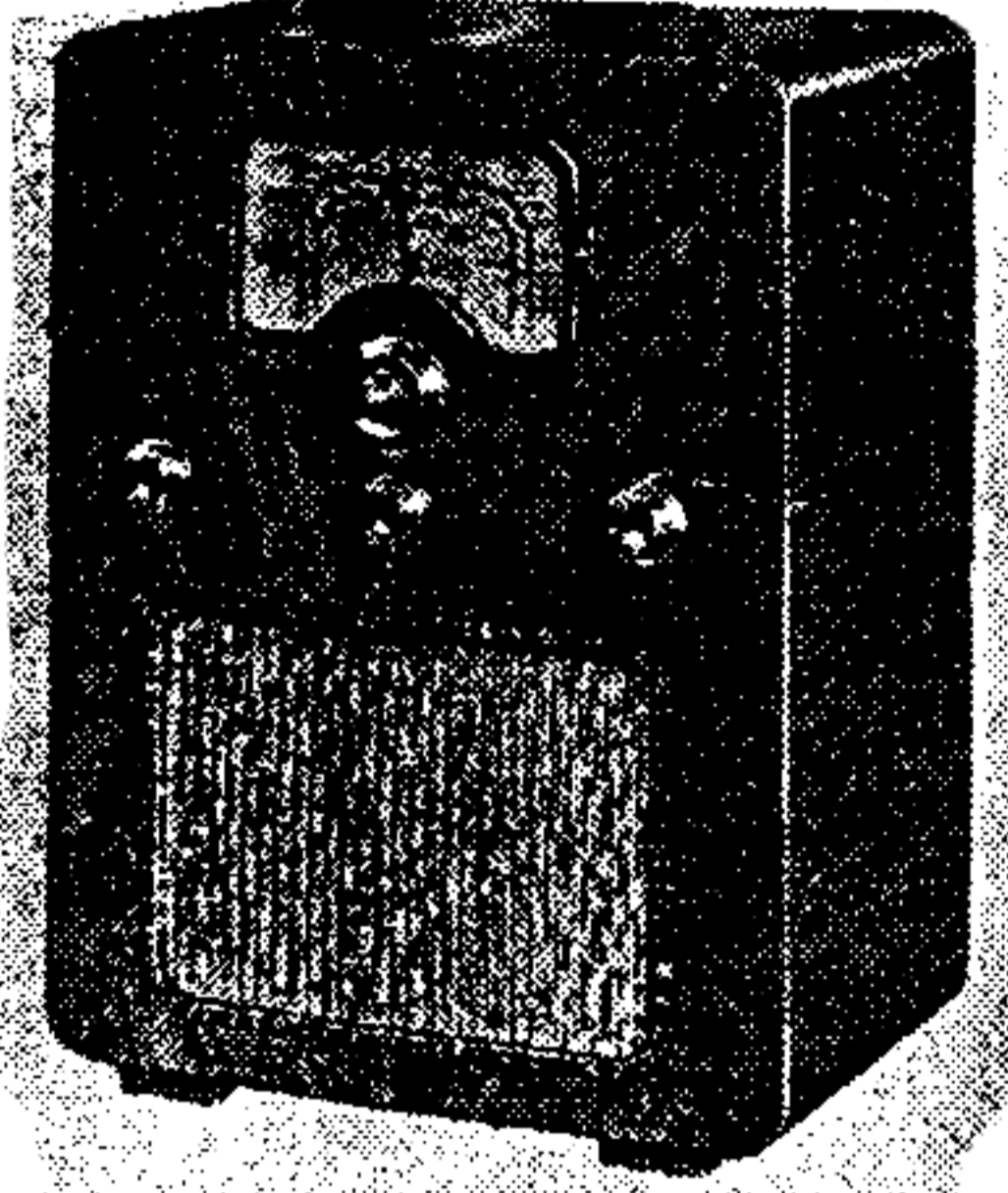
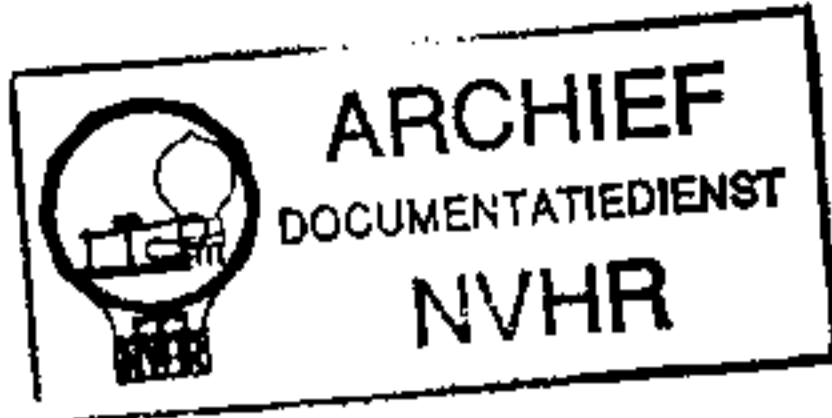


# COSSOR 388

## 2-BAND AC RECEIVER

TR Ned. Ver. v. Historie v/d Radio



The Cossor Model 388

**S**UITABLE for mains of 200-250 V, 40-100 C/S, the Cossor 388 is a 3-valve (plus rectifier) AC 2-band receiver with provision for both a gramophone pick-up and an extension speaker.

### CIRCUIT DESCRIPTION

Aerial is coupled via series condenser **C1**, switch **S1** and coupling condenser **C2** on MW, and via **C1** and coupling coil **L1** on LW, to aerial circuit tuning coils **L2** (MW), plus **L3** (LW) which are tuned by **C16**. A small variable condenser **C17** forming part of the gang assembly, but controlled by a small

spindle concentrically disposed within the main gang spindle, operates as a manual trimmer.

First valve (**V1**, Cossor metallised **MVS/Pen**) is a variable- $\mu$  RF pentode operating as signal frequency amplifier with gain control by **R3**.

Tuned-primary RF transformer coupling by **L4**, **L5**, **C18**, **L8**, **L9** between **V1** and RF pentode valve (**V2**, Cossor metallised **MS/Pen**) operating as leaky grid detector with **C6** and **R8**. Reaction is applied from anode by coils **L6**, **L7** and controlled by variable condenser **C20**. Provision for connection of gramophone pick-up between low potential end of RF transformer secondary coils **L8**, **L9**, and chassis. When operating on radio, **L9** and **V2** cathode are connected to chassis via switches **S6**, **S7**; for use with a pick-up **S6** and **S7** open so that the pick-up sockets are in **V2** grid circuit and **R10**, **C8** are in the cathode circuit to provide GB.

Resistance-capacity coupling by **R11**, **C10**, **R12**, via RF filter **R13**, **C11**, between **V2** and triode output valve (**V3**, Cossor **41MP**). Fixed tone correction in anode circuit by **C12**. Provision for connection of high impedance external speaker across leads to internal speaker input transformer **T1**.

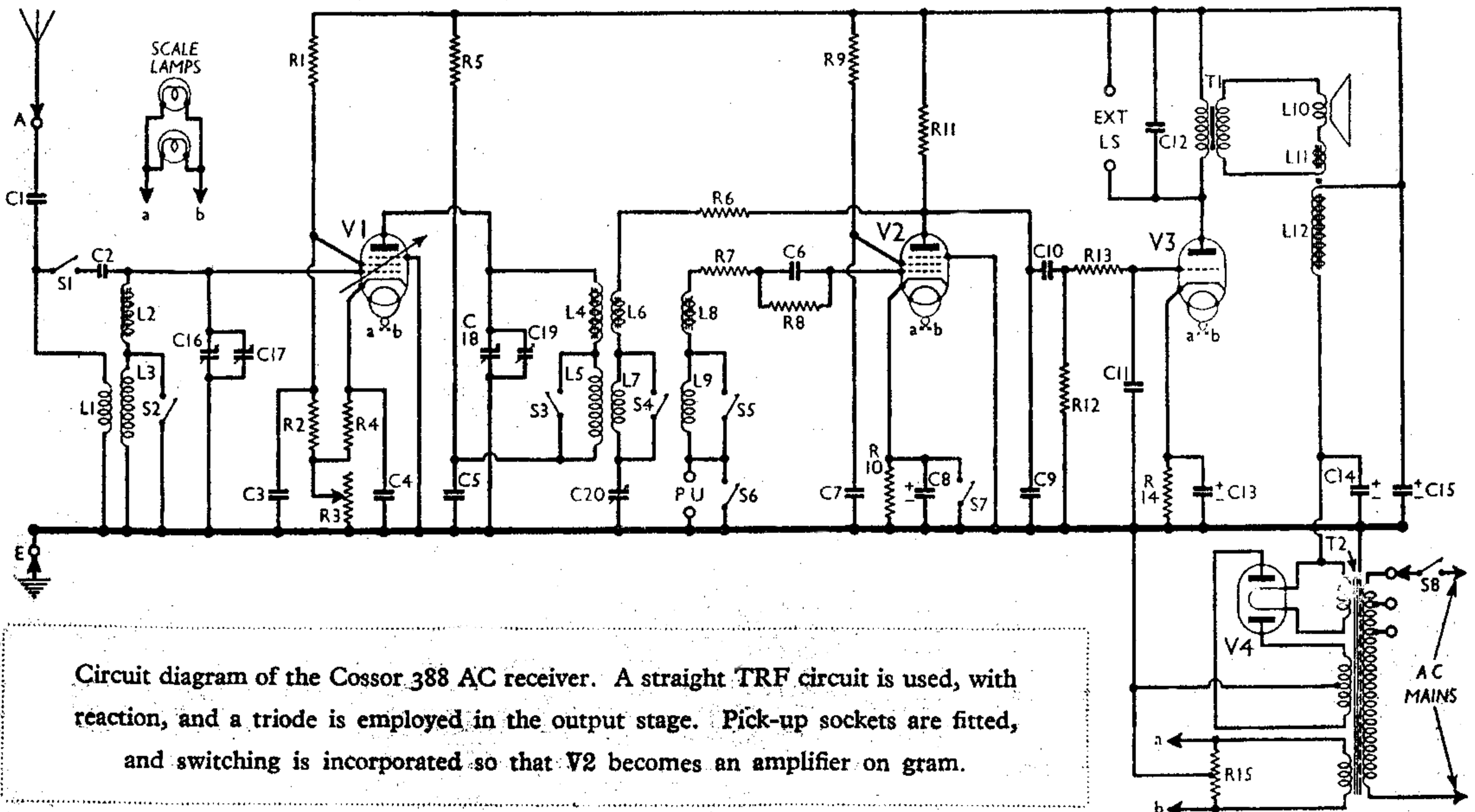
HT current is supplied by full-wave rectifying valve (**V4**, Cossor **442BU**). Smoothing by speaker void **L10** and dry electrolytic condensers **C14**, **C15**.

### COMPONENTS AND VALUES

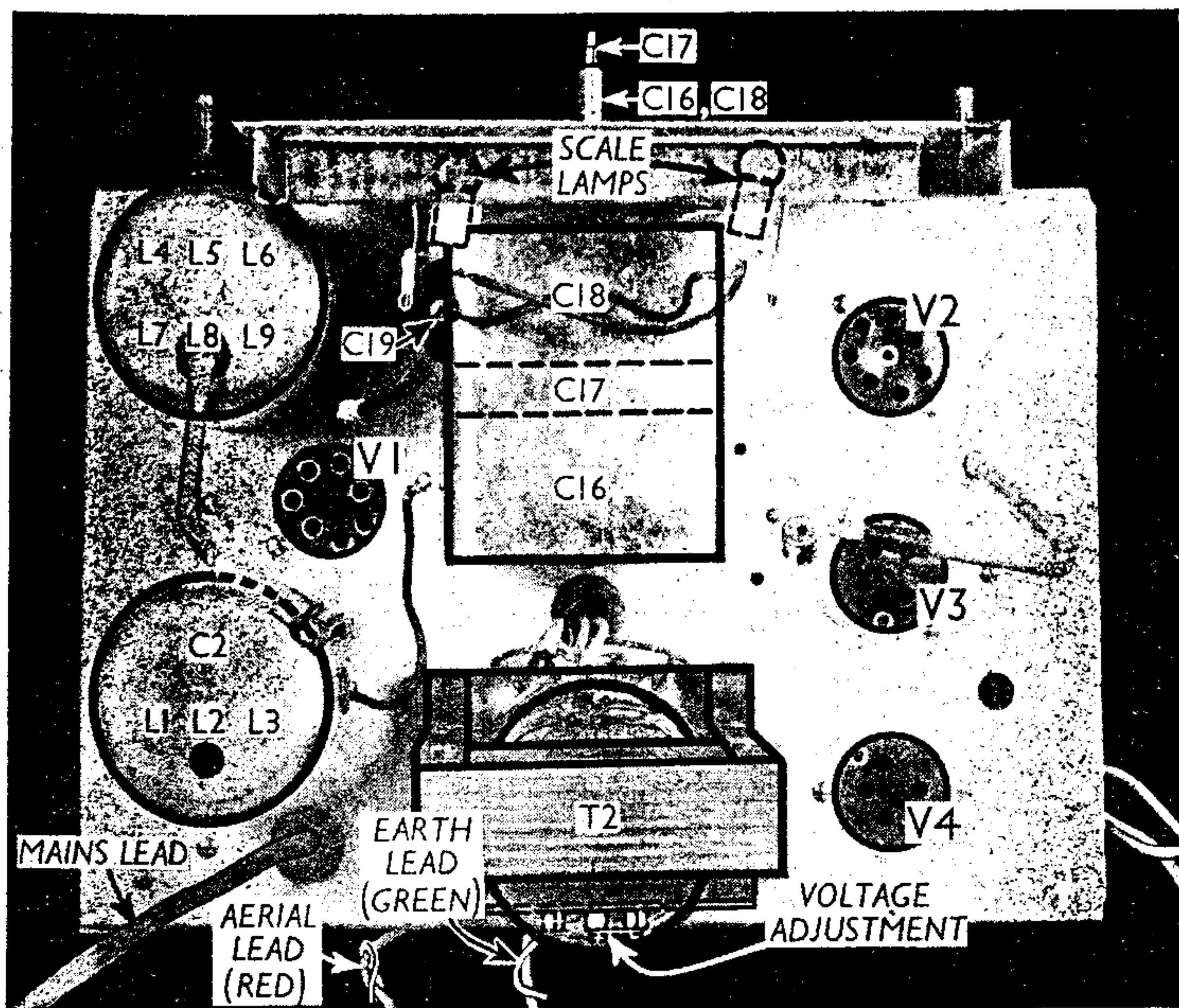
RESISTANCES		Values (ohms)
R1	V1 SG HT potential divider	30,000
R2	resistances .. .. .	40,000
R3	V1 gain control .. .. .	12,000
R4	V1 fixed GB .. .. .	500
R5	V1 anode HT feed .. .. .	10,000
R6	V2 reaction circuit stabilising	300
R7	resistances .. .. .	200
R8	V2 grid leak .. .. .	1,000,000
R9	V2 SG HT 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
R15	V1, V2, V3 heater circuit pot., total .. .. .	25 $\Omega$

CONDENSERS		Values ( $\mu$ F)
C1	Aerial series condenser .. .. .	0.0005
C2	Aerial MW coupling .. .. .	0.000015
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 (gram) 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 .. .. .	—

‡ Centre-tapped. \* Electrolytic. † Adjustable. ‡ Fixed.



Circuit diagram of the Cossor 388 AC receiver. A straight TRF circuit is used, with reaction, and a triode is employed in the output stage. Pick-up sockets are fitted, and switching is incorporated so that **V2** becomes an amplifier on gram.



Plan view of the chassis. Note that aerial and earth leads, instead of sockets, are provided. C2 is included in the L1-L3 unit. C17 is a manually operated trimmer.

was tuned to the lowest wavelength on the medium band and the volume control was at maximum, but the reaction control was at minimum. There was no signal input, as the aerial and earth leads were shorted.

Voltages were measured on the 400 V scale of a model 7 Universal Avometer, chassis being negative.

Valve	Anode Voltage (V)	Anode Current (mA)	Screen Voltage (V)	Screen Current (mA)
V1 MVS/Pen	185	3.9	105	1.4
V2 MS/Pen	90	1.1	25	0.4
V3 41MP	225	27.0	—	—
V4 442BU	318†	—	—	—

† Each anode, AC.

**GENERAL NOTES**

**Switches.**—S1-S5 are the waveband switches, S6, S7 the radio-gram. switches and S8 the mains switch, ganged in a rotary barrel type of switch which extends across the chassis. 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	OFF	MW	LW	GRAM.
S1	C	C	—	—
S2	C	C	—	C
S3	—	C	—	C
S4	—	C	—	C
S5	—	C	—	C
S6	—	C	C	—
S7	—	C	C	—
S8	—	C	C	C

**Coils.**—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

*Continued overleaf*

OTHER COMPONENTS		Approx. Values (ohms)
L1	Aerial LW coupling coil	8.0
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.	0.15
L12	Speaker field coil	2,500.0
T1	Speaker input trans. { Pri... 175.0 Sec... 0.19	
T2	Mains trans. { Pri., total 67.0 Heater sec. 0.1 Rect. heat. sec. 0.1 HT sec., total 1,500.0	
S1-S5	Waveband switches	—
S6, S7	Gram and pick-up switches	—
S8	Mains switch	—

**Removing Speaker.**—The speaker can be removed from the cabinet by slackening the four clamps (nuts and lock washers) and swivelling them out of the way. When replacing, see that the transformer is on the right and connect the leads as given in column two.

**VALVE ANALYSIS**

Valve voltages and currents given in the table (col. 3) are those measured in our receiver when it was operating on mains of 230 V, using the 220 V tapping on the mains transformer. The receiver

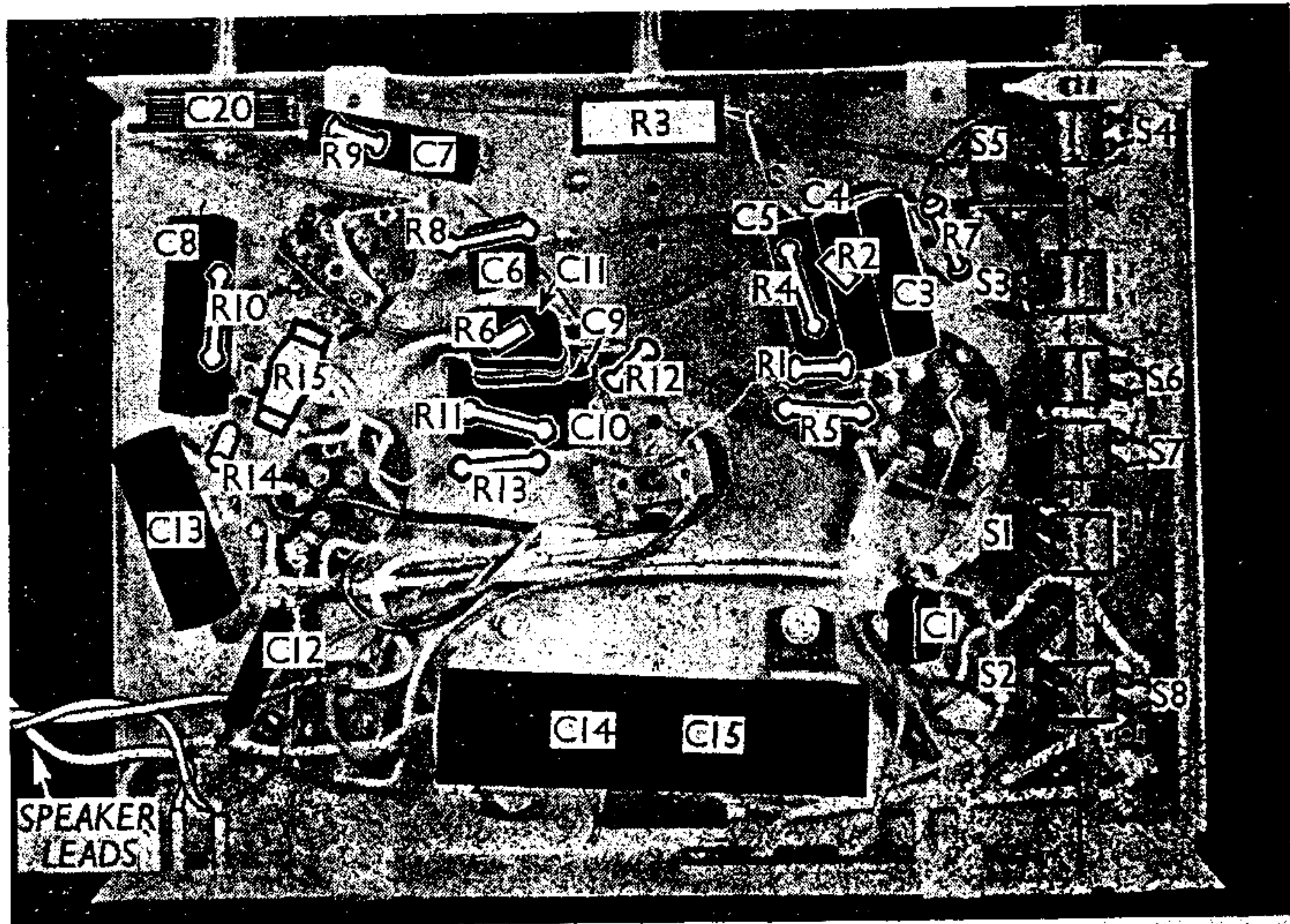
**DISMANTLING THE SET**

**Removing Chassis.**—If it is desired to remove the chassis from the cabinet, remove the control knob from the trimmer (screw down the centre), the other four knobs (recessed screws) and the four bolts (with washers and lock washers) holding the chassis to the platform.

Now remove the two round-head wood screws holding the scale assembly to the front of the cabinet, when by tilting the back upwards, the chassis can be withdrawn to the extent of the speaker leads, which is sufficient for normal purposes.

When replacing, do not forget to replace the wire washer on the spindle of the trimmer before fixing the trimmer knob.

To free the chassis entirely, disconnect the speaker leads (screw terminals) and when replacing, connect them as follows, numbering the terminals from bottom to top:—1, yellow; 2, red; 3, blue.



Under-chassis view. All the switches are included in the rotary barrel unit. R15 is a wire-wound resistor, centre-tapped.

tuning spindle, is of the air-dielectric type, situated between **C16** and **C18**.

**Scale Lamps.**—These are two Osram MES types, with small bulbs sprayed yellow. They are 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  $\Omega$ ) external speaker.

**Condensers C14, C15.**—These are two dry electrolytics in a single carton beneath the chassis having a common negative (black) lead. The red lead is the positive of **C14** (6  $\mu$ F) and the yellow lead is the positive of **C15** (4  $\mu$ F).

**Resistance R15.**—This is a 25  $\Omega$  wire-wound resistance which is centre-tapped.

## **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.