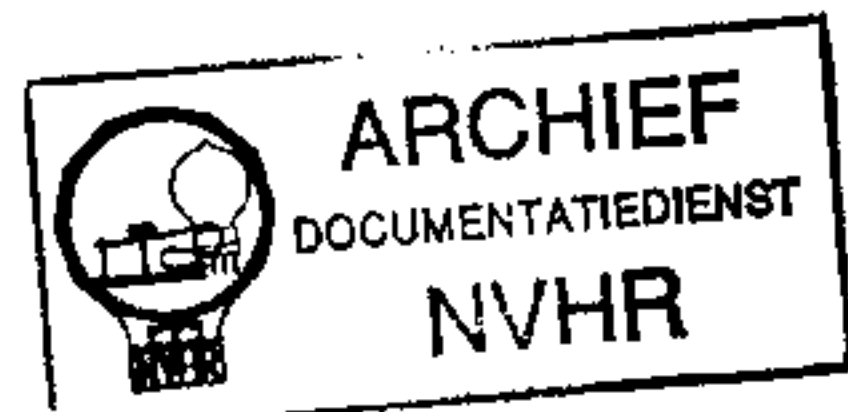
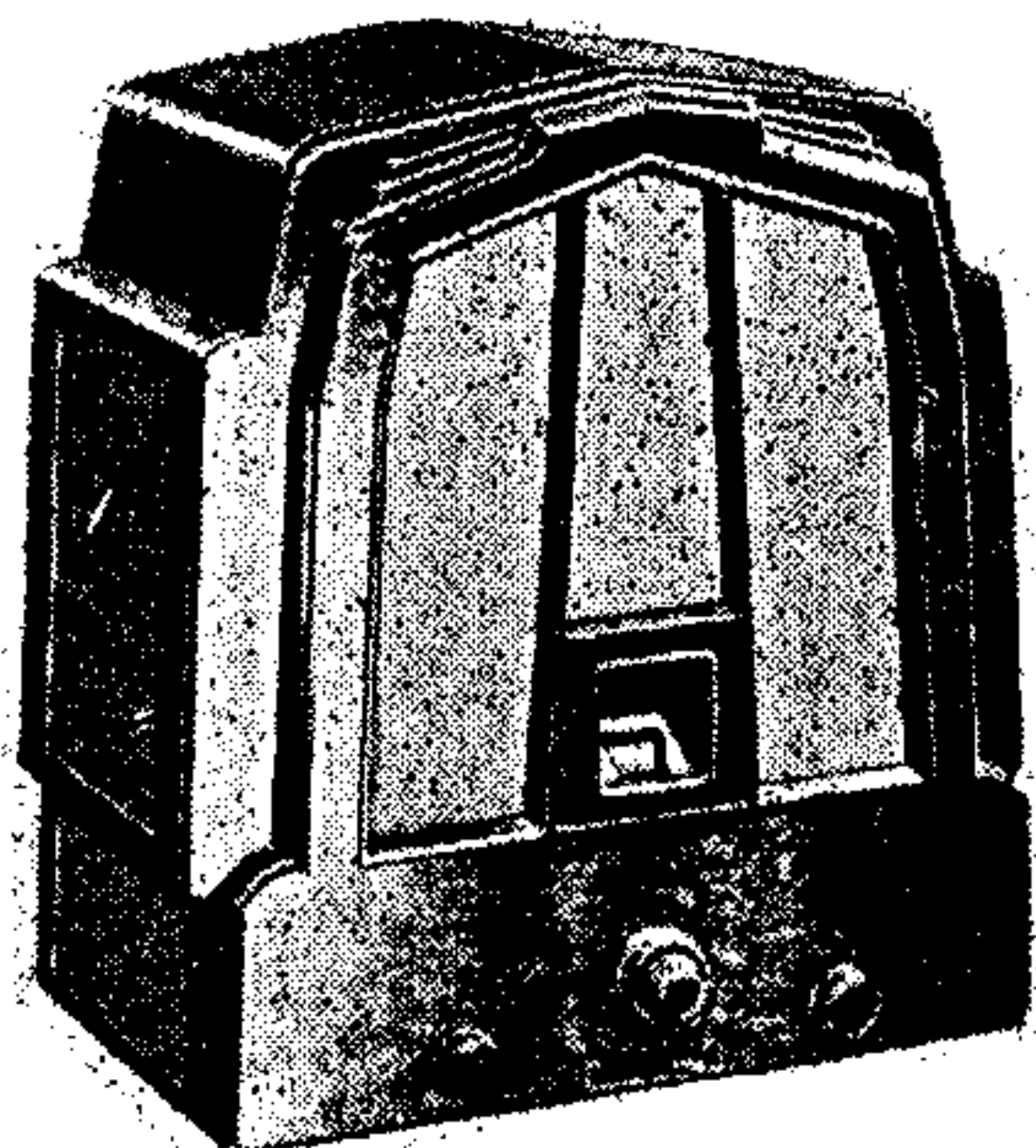


Ned. Ver. v. Historie v/d Radio



EKCO RS2

DC Model and AC Model



DESIGNED specifically for operation on DC mains of 200-250 V, the Ekco RS2DC receiver, on a sample of which this *Service Sheet* was prepared, has a 3-valve, 2-band TRF circuit using directly heated valves.

The differences in the AC version, which covers the same mains voltage range, are fully described under "AC Model" overleaf.

Release date and original price, both models: 1931; £15 15s.

CIRCUIT DESCRIPTION

Aerial input via gain control capacitors **C16**, **C17** and coupling coils **L1** (MW) **L2** (LW) to single-tuned circuit **L3**, **L4**, **C18**, which precede tetrode RF amplifying valve (**V1**, Mullard **PM13** or **Cossor 410SG**). Aerial input via variable capacitor **C16** is partially neutralised on MW by input via **C17**, which is pre-set.

Tuned-secondary RF transformer coupling by **L5**, **L6** and **L9**, **L10**, **C20** between

V1 and triode detector valve (**V2**, Mullard **PM4DX** or **Cossor 410LF**) which operates on grid leak system with **C6**, **R3**. Provision for connecting gramophone pick-up in CG circuit via **C7**, **C8**. Reaction coupling from anode via **L7**, **L8** is controlled by **C19**.

Transformer AF coupling by **T1** between **V2** and pentode output valve (**V3**, Mullard **PM25** or **Cossor 410PT**). Fixed tone correction by **C12** and provision for connecting high-impedance external speaker across balanced armature internal speaker **LS** in anode circuit.

HT and filament current is obtained directly from DC mains via input smoothing filter **L11**, **L12**, **C15**. Valve heaters, together with ballast resistors **R6**, **R7** and current regulating resistance lamp (**Barretter**, Philips 1904) are connected in series across mains input, **V1** and **V2** being shunted by **R8** and **R9**, **R10**, **R11** respectively.

These resistors, together with **R12**, **R13**, form a potential divider in the negative end of the circuit from which are obtained the GB potentials for all valves, tapping points providing suitable bias potentials relative to the positions of the respective filaments. This potential divider operates in conjunction with capacitors **C13**, **C14** to smooth the HT current.

In order to meet the various conditions of DC mains supplies, a hum adjustment panel containing two pairs of tappings **E**, **E1** and **A**, **B** is provided. The earth socket may thus be connected directly to chassis (which is isolated from the receiver circuit by **C2**) at **E**, or via **C3** at **E1**. Similarly, **C14** may be returned to the earth socket at **A** or to HT negative at **B** in either position of **E**, **E1**.

COMPONENTS AND VALUES

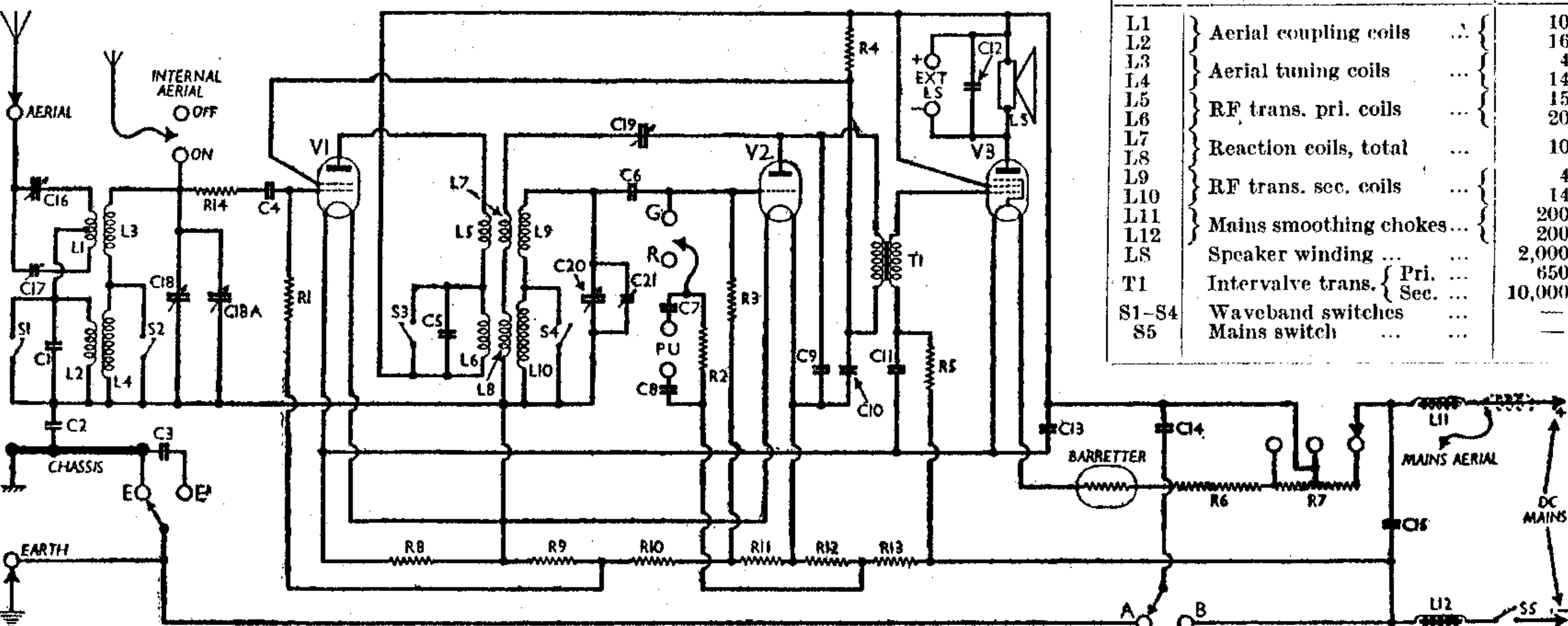
RESISTORS		Values (ohms)
R1	V1 CG resistor ...	2,000,000
R2	PU shunt ...	200,000
R3	V2 gridleak ...	1,000,000
R4	V1 SG and V2 HT feed ...	25,000
R5	V3 CG decoupling ...	250,000
R6	Filament circuit ballast ...	812
R7	Voltage adjustment ...	360*
R8	V1 and V2 filament shunts and V1-V3 GB potential divider resistors ...	210
R9		45
R10		92
R11		45
R12		12
R13		22
R14	V1 CG stabiliser ...	600

* Tapped at 200Ω + 160Ω from R6.

CAPACITORS		Values (μF)
C1	Aerial LW shunt ...	0.001
C2	Chassis isolator ...	1.0
C3	Hum adjustment ...	0.002
C4	V1 CG capacitor ...	0.0001
C5	V1 anode and LW shunt ...	0.001
C6	V2 CG capacitor ...	0.0003
C7	PU isolators ...	0.1
C8		0.1
C9	RF by-pass ...	0.0005
C10	V1 anode decoupling ...	1.0
C11	V3 CG decoupling ...	1.0
C12	Fixed tone corrector ...	0.002
C13	HT smoothing capacitors ...	2.0
C14		4.0
C15	Mains input smoothing ...	2.0
C16†	Aerial input control capacitors ...	0.0003
C17†		—
C18†	Aerial circuit tuning ...	0.0005
C18A†	Manual aerial trimmer ...	—
C19†	Reaction control ...	0.0003
C20†	RF trans. sec. tuning ...	0.0005
C21†	RF trans. MW trimmer ...	—

† Variable. ‡ Pre-set.

OTHER COMPONENTS		Approx. Values (ohms)
L1	Aerial coupling coils ...	10.0
L2		16.5
L3	Aerial tuning coils ...	4.0
L4		14.0
L5	RF trans. pri. coils ...	15.0
L6		20.0
L7	Reaction coils, total ...	10.5
L8		
L9	RF trans. sec. coils ...	4.0
L10		14.0
L11	Mains smoothing chokes ...	200.0
L12		200.0
LS	Speaker winding ...	2,000.0
T1	Intervalve trans. { Pri. ...	650.0
	{ Sec. ...	10,000.0
S1-S4	Waveband switches ...	—
S5	Mains switch ...	—



Circuit diagram of the Ekco RS2DC TRF receiver, which uses battery valves. **C18A** is a manual aerial trimmer. An internal aerial and a mains aerial are provided. Diagrams of valve bases are omitted, as they are very simple, to save space.

VALVE ANALYSIS

Valve voltages and currents given in the table below are approximate only, but they will serve as a guide both for DC and AC models, although in practice voltages in the AC model are generally a little lower than those in the DC model.

Voltages should be measured with a high resistance meter, whose negative lead should be connected to the negative side of C15 in the DC model, or to chassis in the AC model.

Valve	Anode Voltage (V)	Anode Current (mA)	Screen Voltage (V)	Screen Current (mA)
V1 PM13	160	2.5	105	0.8
V2 PM4DX	105	1.0	—	—
V3 PM25	150	10.0	160	4.0

DISMANTLING THE SET

Removing Chassis.—Remove the four control knobs (recessed grub screws); remove the detachable bottom, held by four 4BA screws through the rubber feet, which gives access to whole of underside of chassis; remove fixing ring from mains switch at side of cabinet, and push switch in; remove four screws holding speaker baffle to front of cabinet; remove four 4BA screws holding chassis to bottom of cabinet.

The speaker may be freed from the chassis by removal of connecting leads (screw terminals on speaker) and four fixing screws in chassis deck.

When replacing, the position of the speaker sub-baffle relative to the front of the cabinet may be adjusted to a nice fit by sliding it backwards or forwards in the slotted fixing holes in the chassis deck. As the screw heads are beneath the chassis deck, this may be done before replacing the bottom cover.

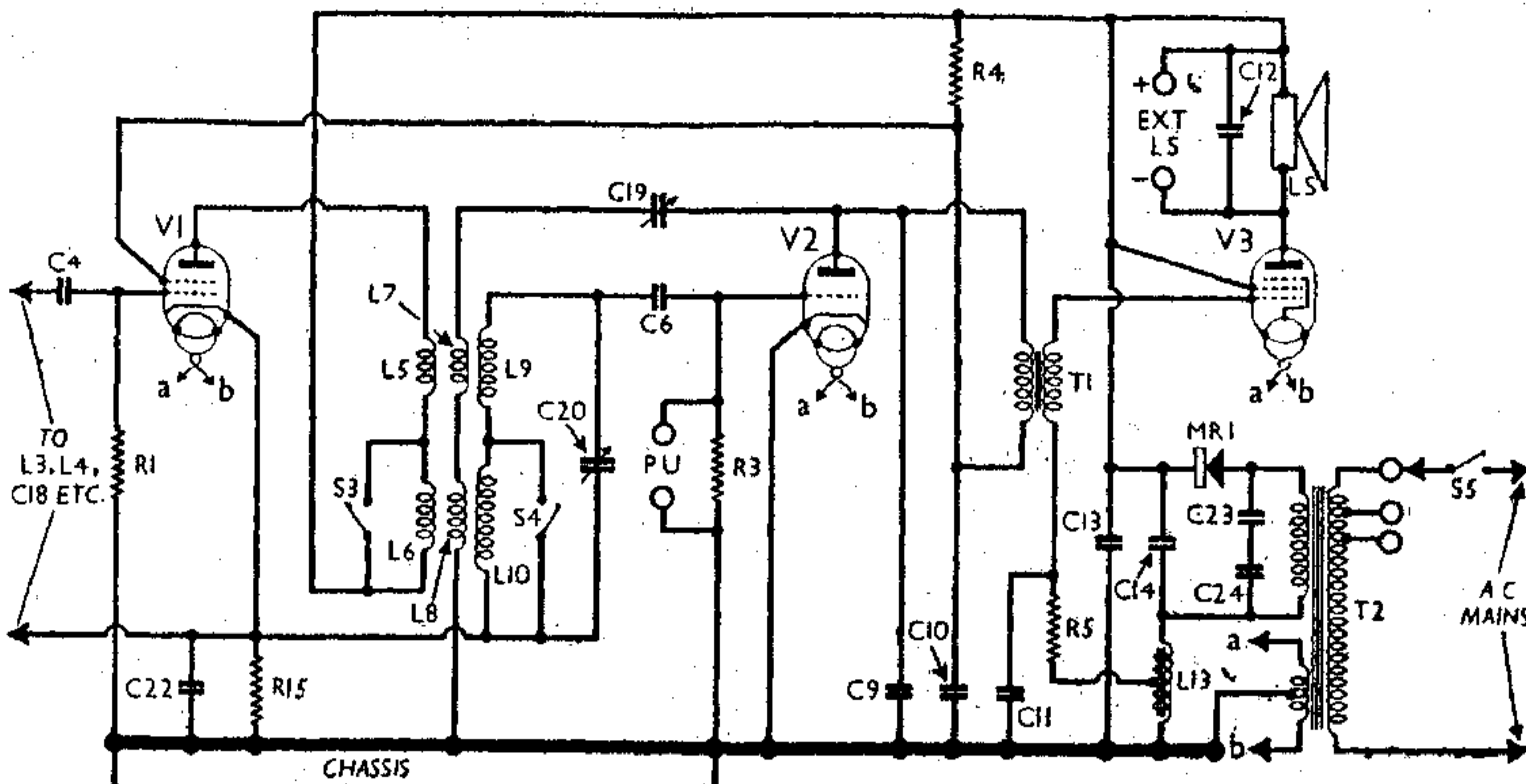
GENERAL NOTES

Switches.—The waveband switches S1-S4 form a simple two-position rotary unit beneath the gang unit. All the switches close on MW and open on LW, and all are insulated from chassis. S5 is the QMB mains switch which fits in a hole on the side of the cabinet.

Capacitor Blocks.—There are two of these, mounted on the chassis deck. The tags of the C2, C14, C15 unit are indicated in our plan view, and those of C10, C11, C13 in our under-chassis view. All the capacitors are paper insulated, and replacements must be of this type, as electrolytics might be damaged by reversed polarity if the mains plug were inserted the wrong way round.

External speaker.—Two sockets are provided at the rear of the chassis for the connection of a high impedance (about 8,000 Ω) external speaker.

Hum Adjustment.—A small rectangular panel is fitted beneath the chassis with four threaded sockets for hum elimination adjustments. The sockets are in two pairs marked E, E1 and A, B, and one knurled screw is provided for each pair, forming what are virtually two separate two-way single-pole switches and giving four different circuit arrangements.



Essential portion of the circuit diagram of the Ekco RS2AC showing the differences in this model as compared with the DC circuit diagram overleaf.

The panel is accessible from beneath the cabinet, a hole being provided for it in the bottom cover.

The adjusting screw for the E and E1 positions has a 6BA thread, and that for the A and B positions has a 4BA thread, so that it is impossible to fit both screws in the E, E1 or A, B positions.

Alternative Aerials.—An internal aerial, consisting of a piece of rubber-covered flex terminated in a plug, is fitted inside the back cover of the cabinet, and two sockets marked "Internal aerial; ON; OFF" are provided for it at the rear of the chassis.

A mains aerial plug on a flying lead is provided also, and this is connected to a third insulated conductor in the mains lead. Capacitive coupling is thereby effected to the mains. The plug is inserted in the normal aerial socket when it is desired to use the mains aerial.

CIRCUIT ALIGNMENT

There is no aligning necessary as in the normal modern receiver, except to adjust C21 at about 200m (1,500 kc/s) on a weak signal, but C17 needs adjustment to permit C16 to operate effectively as an input control.

With C16 set somewhere near minimum, the set should be tuned to receive the local MW station. C17 should then be adjusted for minimum output, as it neutralises some of the input from C16. If C16 is then advanced signal strength increases.

AC MODEL

The receiver circuit of the AC version of the RS2 is virtually the same as that of the DC version, but owing to the employment of a double wound mains transformer and indirectly

heated valves (for V1 and V2) the power supply and biasing circuits are considerably simplified.

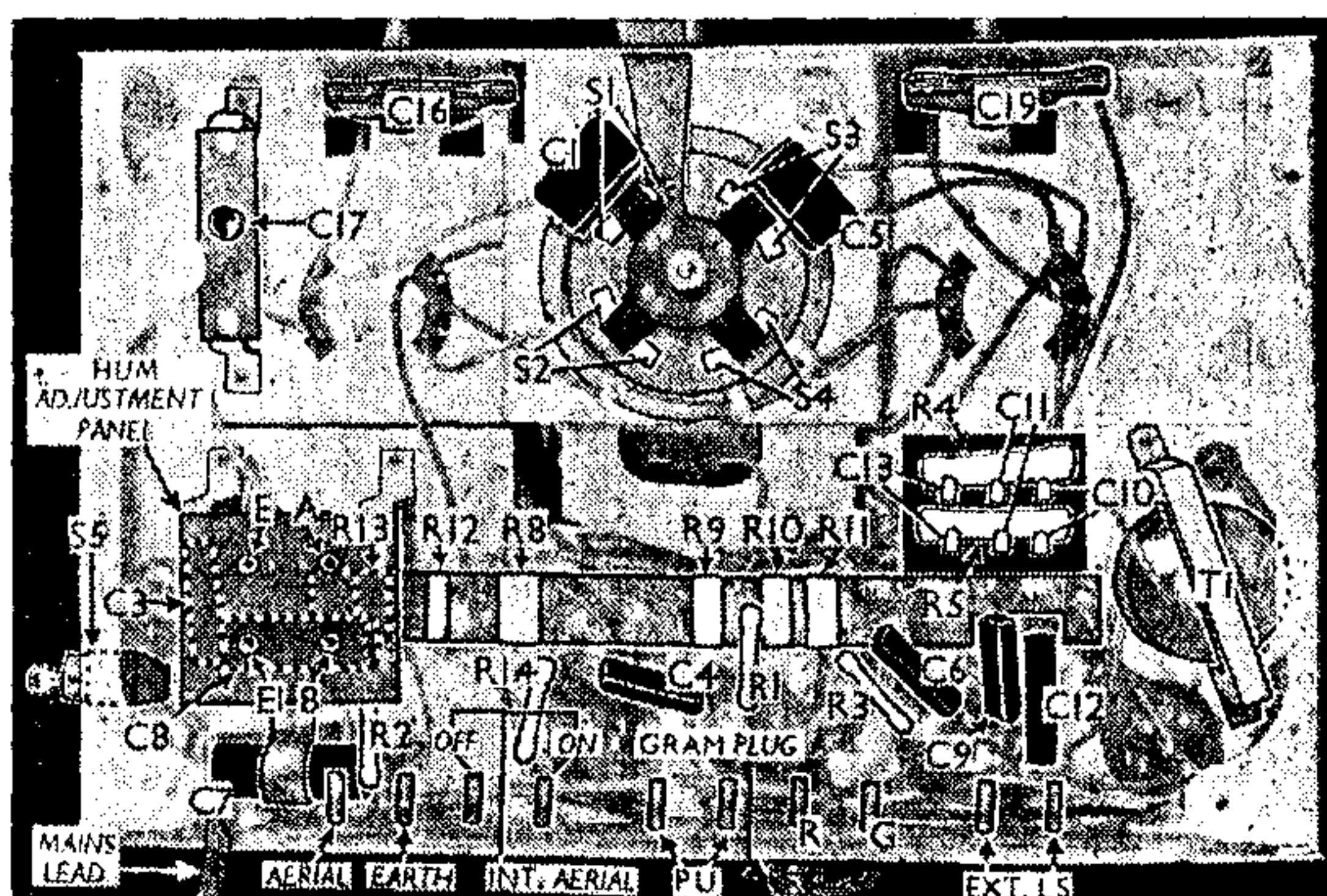
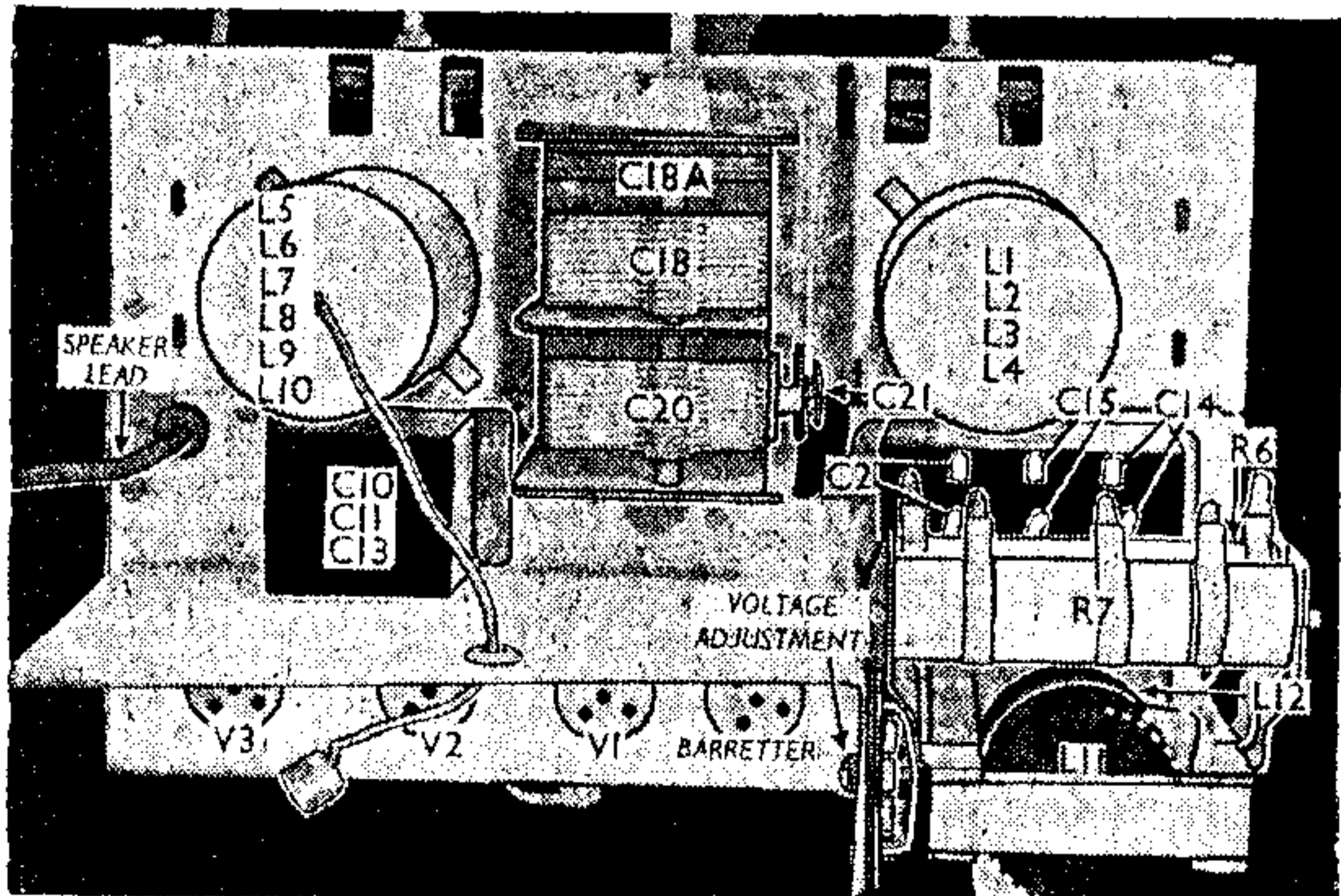
In the diagram above the DC circuit overleaf is redrawn to show the principal differences in the AC circuit. Certain obvious features, such as the aerial circuit C5, etc., which are common to both are omitted to save space. Where possible, components bear the same numbers as in the DC diagram, but added ones are given new numbers. Component values, where they differ from those in the DC model, are given in the table below.

Component	Value	Component	Approx. resist.
R4	9,000Ω	L13	1,000Ω
R15	600Ω	T2 {	Pri., total 220Ω HT sec., 430Ω heat. sec. very low
C14	8.0μF		
C22	0.1μF		
C23	0.002μF		
C24	0.002μF		

The tuning circuits are now returned to V1 cathode, and R1 goes to chassis. R2 is omitted, and the pick-up is connected across R3, which now goes to chassis. The valves are Mullard S4VA, 354V and PM24.

HT current is supplied by a half-wave Westinghouse rectifier MR1, fed from an untapped HT secondary on T2. Smoothing is effected by an iron-cored choke L13, in the negative lead to chassis, and capacitors C13, C14. A centre tapping on L13 provides GB potential for V3.

The physical distribution of components follows fairly well that in the DC model, T2 and L13 taking the place of L11, L12 on the chassis deck.



Plan view (left) and underside view (right) of the DC chassis. The R8-R13 unit and hum panel are omitted in the AC chassis.