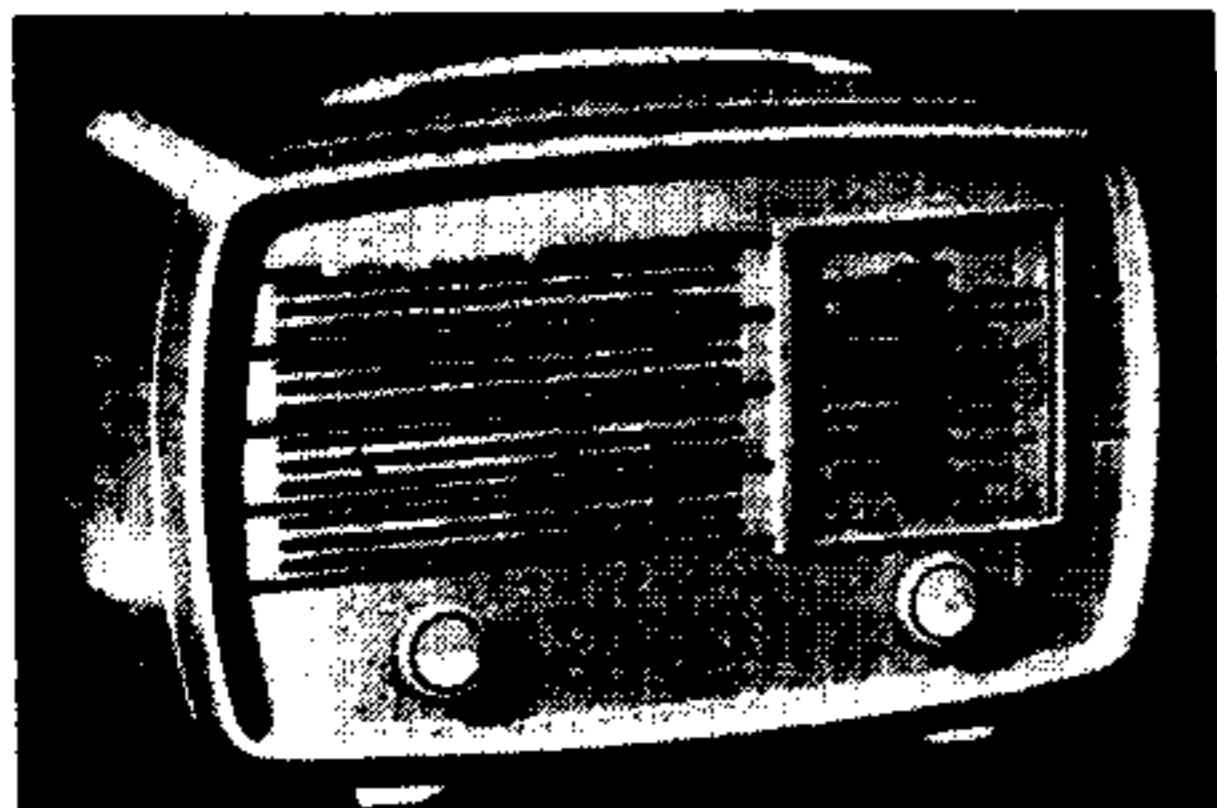


"TRADER" SERVICE SHEET

1034

PILOT Little Maestro

A.C. and A.C./D.C. Models of the 1952 Versions



TWO new "Little Maestro" receivers are covered together here, the A.C. and A.C./D.C. versions. They can be distinguished from earlier models of the same designation by the type Nos. T66 and T65 respectively, in very small print, in the bottom right-hand corner of the paper label on the rear chassis member. If this is missing, our photograph will provide identification.

The receivers are 4-valve (plus rectifier) 2-band superhets, and both operate from mains of 200-250 V. The A.C./D.C. model can be adjusted also for 110 V. The waveband ranges are 190-550 m and 1,100-2,000 m.

Release date and original price, both models: September 1951; £11 15s, plus purchase tax.

CIRCUIT DESCRIPTION

Tuned frame aerial input L1, C22 and loading coil L2 (M.W.) or L1, C22 and loading coil L2 (L.W.) to heptode valve (V1, Brimar 6BE6 (A.C. model) or 12BE6 (A.C./D.C. model)) which operates as frequency changer with electron coupling. On S.W. S2 closes to connect fixed trimmer C3. Provision is made for the connection of an external aerial via C1.

In the alternative aerial circuit shown to the left of our main diagram, aerial input on L.W. is via S7 and the bottom coupling capacitor to

the L.W. tuning coil, which is shunted by the 100 pF capacitor. On M.W., the L.W. coil provides coupling to the M.W. coil, S6 being closed, and S7 open. There is a plate aerial, but no frame aerial.

Single oscillator grid coil L4 is tuned by C24. Parallel trimming by C7, C25 (M.W.) and C7, C25 and C26 (L.W.); series tracking by C8 (M.W. and L.W.). Reaction coupling by cathode coil L5.

Second valve (V2, Brimar 6BA6 (A.C. model) or 12BA6 (A.C./D.C. model)) is a variable- $\mu$  R.F. pentode, operating as intermediate fre-

(Continued col. 1 overleaf)

COMPONENTS AND VALUES

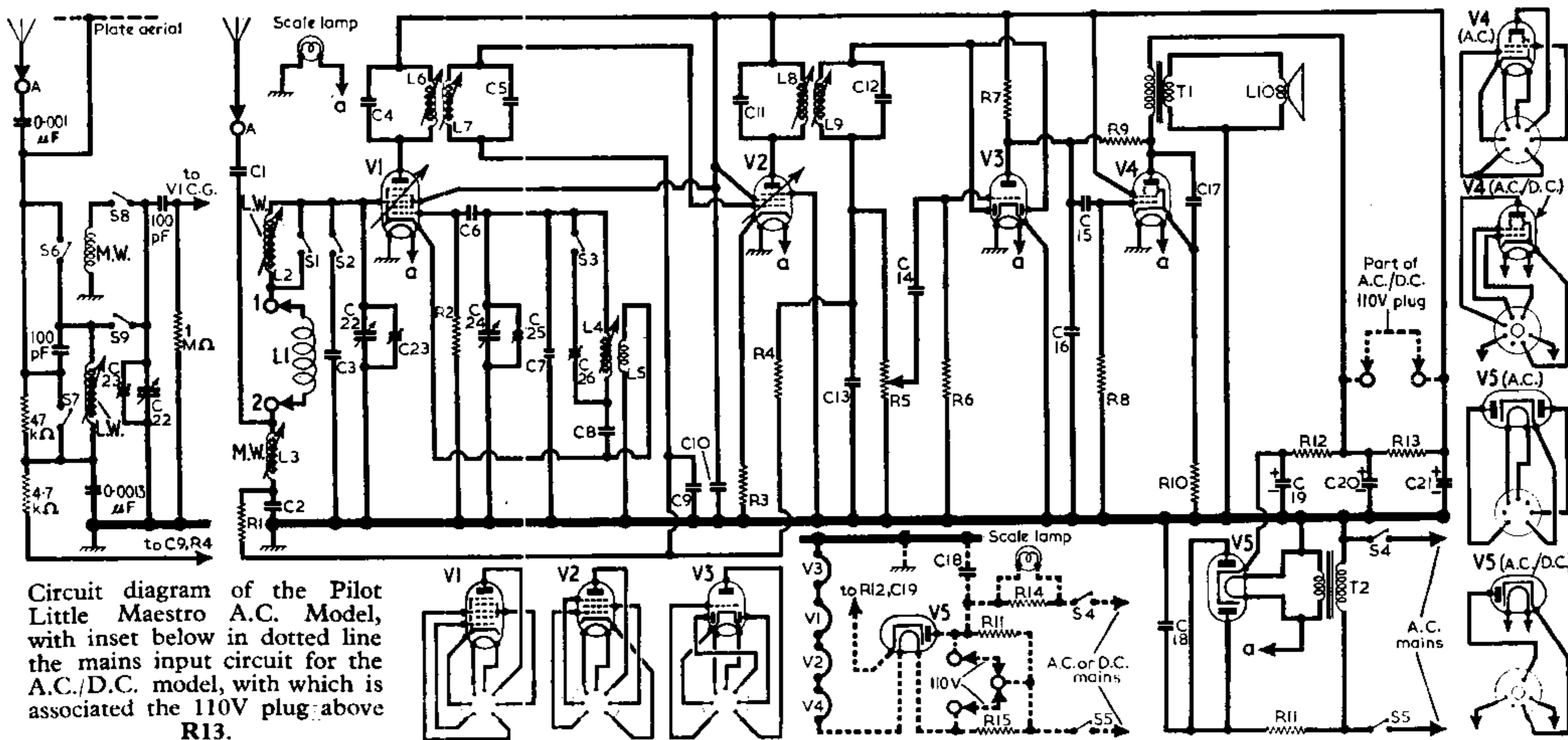
CAPACITORS	Values	Locations
C1	Aerial series ...	300pF G4
C2	A.G.C. decoupling ...	0.1 $\mu$ F F3
C3	L.W. trimmer ...	180pF F4
C4	1st I.F. trans. tuning ...	100pF A2
C5		100pF A2
C6	V1 osc. C.G. ...	100pF G4
C7	Osc. trimmer ...	20pF A1
C8	Osc. tracker ...	530pF G4
C9	A.G.C. decoupling ...	0.1 $\mu$ F F3
C10	H.T. decoupling ...	0.1 $\mu$ F F4
C11	2nd I.F. trans. tuning ...	100pF B2
C12		100pF B2
C13	I.F. by-pass ...	100pF E3
C14	A.F. coupling ...	0.001 $\mu$ F E3
C15		0.01 $\mu$ F E4
C16	Tone correctors ...	0.001 $\mu$ F E4
C17		0.001 $\mu$ F E4
C18	Mains R.F. filter ...	0.01 $\mu$ F D3
C19*	H.T. smoothing ...	16 $\mu$ F C1
C20*		16 $\mu$ F C1
C21*	8 $\mu$ F D4	
C22†	Aerial tuning ...	A2
C23‡	M.W. aerial trim. ...	A2
C24‡	Oscillator tuning ...	A1
C25‡	M.W. osc. trim. ...	A1
C26‡	L.W. osc. trim. ...	700pF A1

RESISTORS	Values	Locations
R1	A.G.C. decoupling	220k $\Omega$ F3
R2	V1 osc. C.G. ...	22k $\Omega$ G4
R3	V2 G.B. ...	68 $\Omega$ F4
R4	A.G.C. decoupling	1M $\Omega$ F4
R5	Volume control	250k $\Omega$ D3
R6	V3 C.G. ...	10M $\Omega$ E4
R7	V3 anode load ...	470k $\Omega$ E4
R8	V4 C.G. ...	1M $\Omega$ E4
R9	Neg. feed-back ...	1M $\Omega$ E4
R10	V4 G.B. ...	270 $\Omega$ E4
R11	Surge limiter ...	100 $\Omega$ D3
R12	H.T. smoothing ...	1k $\Omega$ D3
R13		2.2k $\Omega$ E4
R14*	Scale lamp shunt ...	22 $\Omega$ E3
R15*	Ballast resistor ...	830 $\Omega$ C2

\* A.C./D.C. model only.  
† 220 $\Omega$  in A.C./D.C. model.

OTHER COMPONENTS	Approx. Values (ohms)	Locations
L1	Frame aerial ...	1.0 —
L2	L.W. loading coil ...	8.0 A1
L3	M.W. loading coil ...	1.4 A1
L4	Osc. tuning coil ...	2.0 G4
L5	Osc. reaction coil ...	0.4 G4
L6	1st I.F. trans. { Pri. ...	7.0 A2
L7		7.0 A2
L8	2nd I.F. trans. { Pri. ...	7.0 B2
L9		7.0 B2
L10	Speech coil ...	2.5 B1
T1	O.P. trans. { Pri. ...	450.0 B1
	{ Sec. ...	0.4
T2	Heater trans. { Pri. ...	155.0 C2
	{ Sec. ...	0.4
S1-S3	Waveband switches	— G4
S4, S5	Mains sw., g'd R5 ...	— D3

\* Electrolytic. † Variable. ‡ Pre-set.  
§ Two capacitors, 10pF + 10pF, in parallel.



Circuit diagram of the Pilot Little Maestro A.C. Model, with inset below in dotted line the mains input circuit for the A.C./D.C. model, with which is associated the 110V plug above R13.

**Circuit Description—continued**

quency amplifier with tuned transformer couplings C4, L6, L7, C5 and C11, L8, L9, C12.

Intermediate frequency 470 kc/s.

Diode signal detector is part of double diode triode valve (V3, Brimar 6AT6 (A.C. model) or 12AT6 (A.C./D.C. model)). Audio frequency component in rectified output is developed across volume control R5, which acts as diode load, and is passed via C14 to control grid of triode section. I.F. filtering by C13.

D.C. potential developed across R5 is fed back as bias via decoupling circuit R4, C9, R1, C2 to F.C. and I.F. stages, giving automatic gain control.

Resistance-capacitance coupling, via R7, C15 and R8, between V3 anode and output tetrode valve (V4, Brimar 6AQ5 (A.C. model) or 35L6GT (A.C./D.C. model)). Tone correction by C16 in V3 anode circuit, C17 in V4 anode circuit and by negative feedback via R9 between V4 and V3 anodes.

In the A.C. model, H.T. current is supplied by I.H.C. full-wave rectifying valve (V5, Brimar 6X4) whose anodes are connected together to form a half-wave rectifier. Smoothing by R12, R13 and electrolytic capacitors C19, C20 and C21. R11 protects V5 from current surges. Transformer T2 has only one secondary winding and feeds the heaters of all the valves including V5. Mains R.F. filtering by C18.

In the A.C./D.C. model, H.T. current is supplied by I.H.C. half-wave rectifying valve (V5, Brimar 35Z4GT). Smoothing is as before, but the valve heaters, together with ballast resistor R15, scale lamp and R14 are connected in series across the mains input. R14 protects the scale lamp from current surges. For 110 V operation R11, R13 and R15 are short-circuited.

**GENERAL NOTES**

**Switches.** S1-S3 are the waveband switches, gauged in a single rotary unit beneath the chassis and mounted concentrically with the tuning control spindle which, if the knob is depressed and turned, engages with the switch for waveband changing. In the M.W. position (knob anti-clockwise) S1 closes only. On L.W., S2, S3 close.

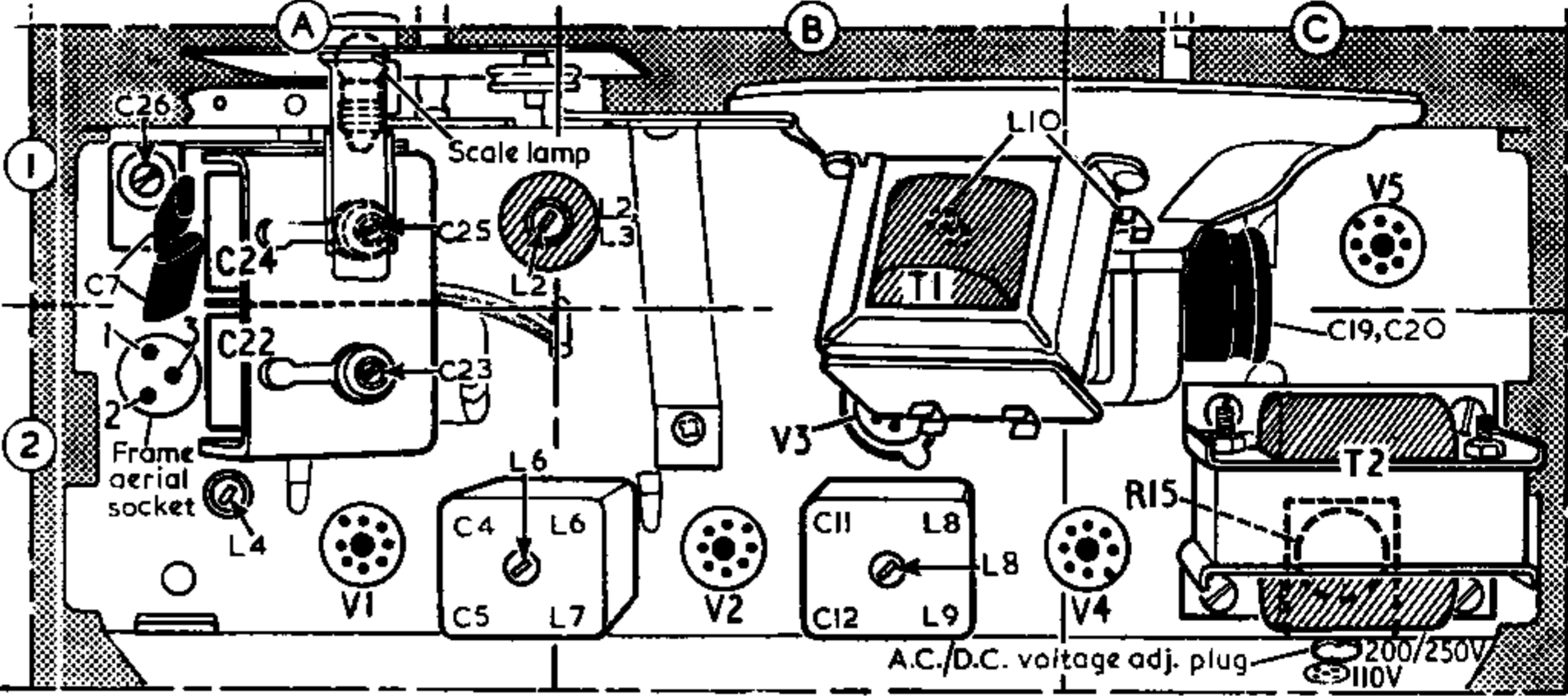
In the earlier version there were two more switches. Then, S6 and S8 (in diagram on left of main circuit diagram overleaf) closed on M.W., and S7, S9 closed for L.W.

**Scale Lamps.**—These are M.E.S. type lamps, with small clear spherical bulbs. They are rated at 6.5 V, 0.3 A (A.C. model) or 3.5 V, 0.15 A (A.C./D.C. model).

**A.C. and A.C./D.C. Models.**—The only differences between the two models lie in the mains input circuits. The main circuit diagram is that of the A.C. model. The differences in the A.C./D.C. model are shown in the dotted diagram inset beneath the main diagram, which replaces the A.C. mains input circuit, with one exception: the 110 V adjustment plug shown above R13 appears only in the A.C./D.C. model.

**Modifications.**—Earlier versions than our sample receiver had the alternative aerial circuit shown on the left of our main diagram overleaf. This included a plate aerial, but no frame aerial, and it applied to both A.C. and A.C./D.C. models. C7 was omitted in these models, and C8 was 470 pF.

**Drive Cord Replacement.**—2 feet of fine-gauge nylon braided glass yarn is required for a new tuning drive cord, which should be run as shown



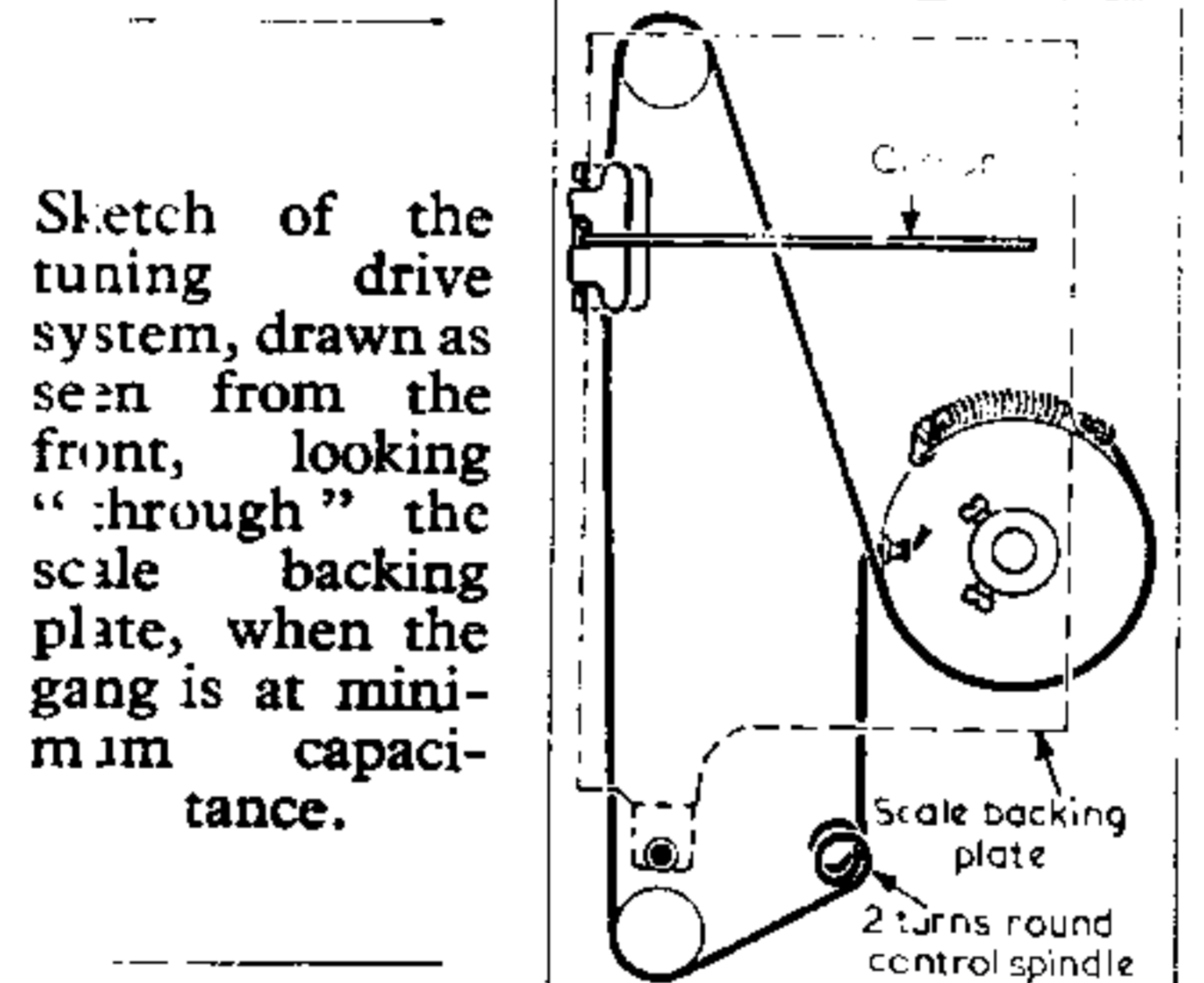
Plan view of the A.C. chassis. R15 and the voltage adjustment appear only in the A.C./D.C. model.

in the sketch below, where the chassis is viewed from the front with the gang at minimum capacitance.

**CIRCUIT ALIGNMENT**

In order to make the under-chassis I.F. core adjustments accessible the chassis should be removed from its cabinet.

**I.F. Stages.**—Connect output of signal generator, via a 0.1 μF capacitor in the "live" lead, to control grid (pin 7) of V1 and chassis. Switch set to M.W., tune to 500 m, feed in a 470 kc/s



(6:8.8 m) signal and adjust the cores of L9 (location reference E4), L8 (B2), L7 (F4) and L6 (A2) for maximum output. Repeat.

**R.F. and Oscillator Stages.**—As the tuning scale is fixed to the cabinet, and no calibration marks are provided on the scale backing plate, it is advisable to carry out the following adjustments, where possible, with the chassis in the cabinet. With some earlier models however, the gang capacitor was mounted in such a position that it was not possible to adjust C23 or C25 without withdrawing the chassis.

If the chassis has to be withdrawn, a substitute paper tuning scale should be made, and can be calibrated by holding it up against the tuning scale and marking off on it the 214.3 m, 500 m, and 1,304 m alignment points, and the lower edge of the clear centre portion of the scale. The substitute scale should then be fastened by tape to the front of the scale backing plate so that its lower mark coincides with the engraved line at the bottom right-hand corner of the backing plate.

With the gang at maximum capacitance the cursor should coincide with the lower edge of the clear centre section of the scale or with the mark on the scale backing plate. Adjustments can be made by sliding the cursor carriage along the drive cord. Transfer signal generator leads, via a suitable dummy aerial to A socket and chassis. As one side of the mains is connected to chassis care should be taken to see that the signal generator is not earthed.

**M.W.**—Switch set to M.W., tune to 214.3 m, feed in a 214.3 m (1,400 kc/s) signal and adjust C25 (A1) and C23 (A2) for maximum output. Tune to 500 m, feed in a 500 m (600 kc/s) signal and adjust the cores of L4 (A2) and L3 (F3) for maximum output. Repeat these adjustments.

**L.W.**—Switch set to L.W., tune to 1,304 m, feed in a 1,304 m (230 kc/s) signal and adjust C26 (A1) and the core of L2 (A1) for maximum output. Repeat these adjustments.

**VALVE ANALYSIS**

Valve voltages and currents given below were measured on our receivers when they were operating from A.C. mains of 230 V. The receivers were tuned to the highest wavelength end of M.W. with the volume controls turned to maximum, but there was no signal input.

Voltage readings were measured on an Avo Electronic TestMeter, which draws no appreciable current, and allowance should be made for the current drawn when using other types of meter. Chassis was the negative connection in every case.

**A.C. Model**

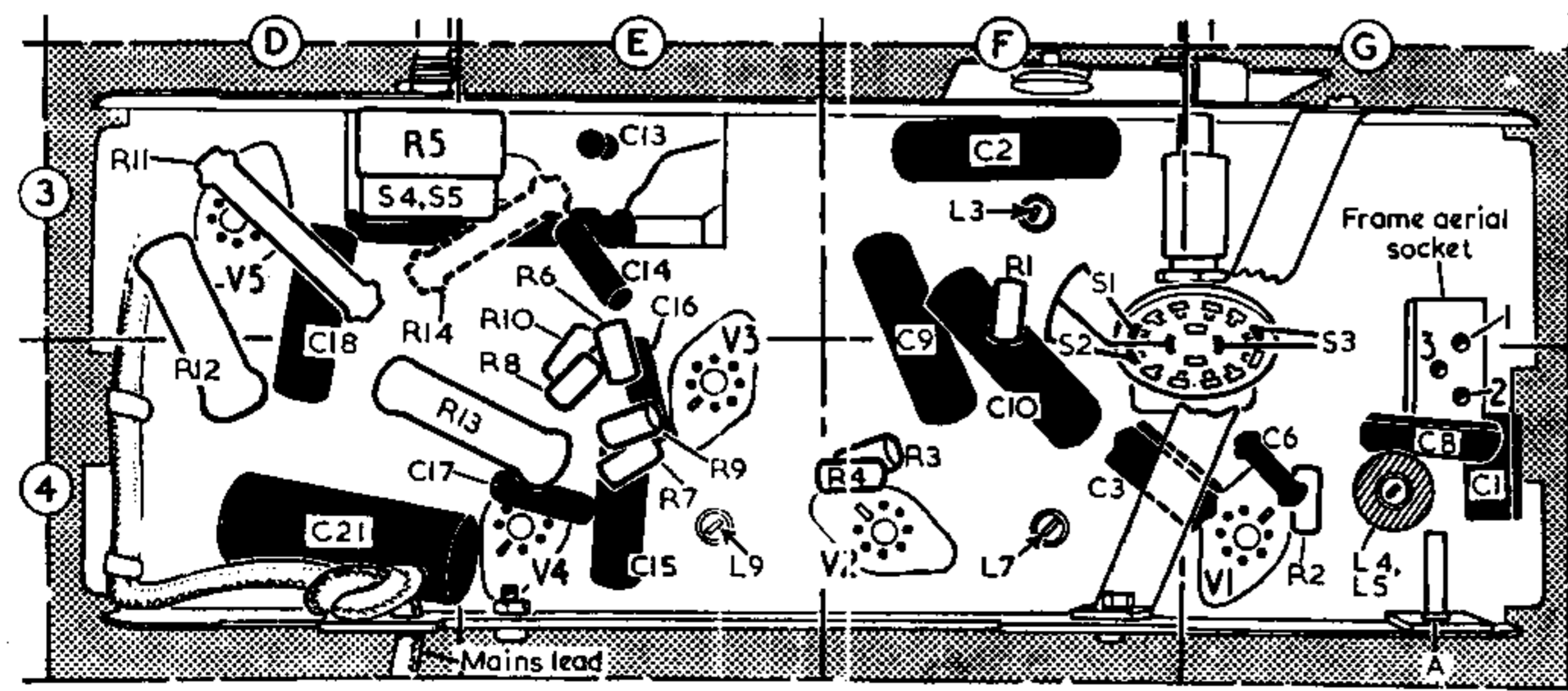
Valve	Anode		Screen		Cath.
	V	mA	V	mA	
V1 6BE6	120	3.3	120	8.2	—
V2 6BA6	120	10.5	120	4.7	1.0
V3 6AT6	78	1.2	—	—	—
V4 6AQ5	175	18.0	120	2.5	5.4
V5 6X4	215†	—	—	—	240.0

† A.C. voltage reading.

**A.C./D.C. Model**

Valve	Anode		Screen		Cath.
	V	mA	V	mA	
V1 12BE6	100	3.0	100	7.0	—
V2 12BA6	100	7.7	100	3.4	0.7
V3 12AT6	50	1.0	—	—	—
V4 35L6GT	135	34.0	100	5.0	7.5
V5 35Z4GT	210†	—	—	—	210.0

† A.C. voltage reading.



Underside view of the chassis. The detail of the waveband switch unit is shown.