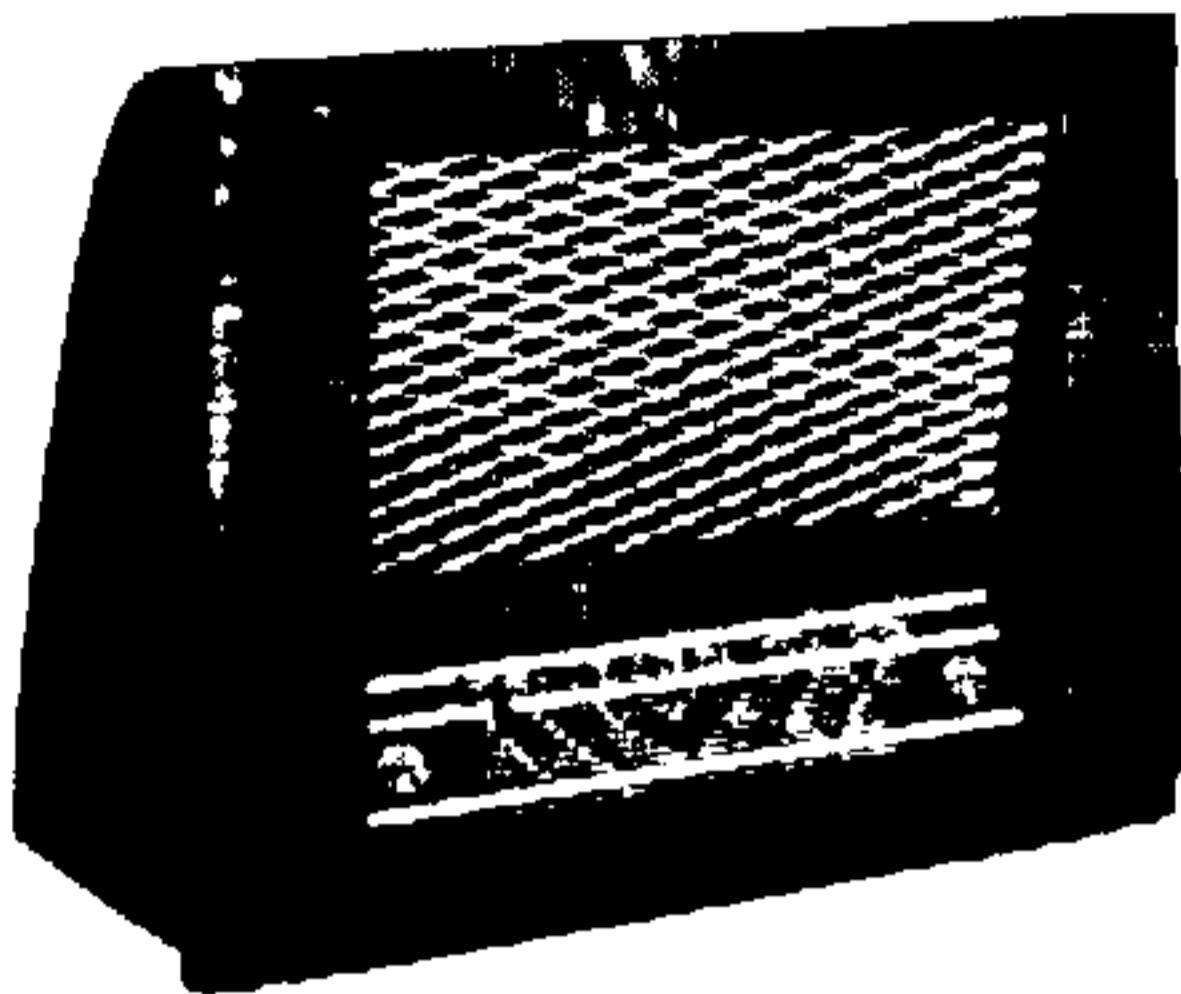
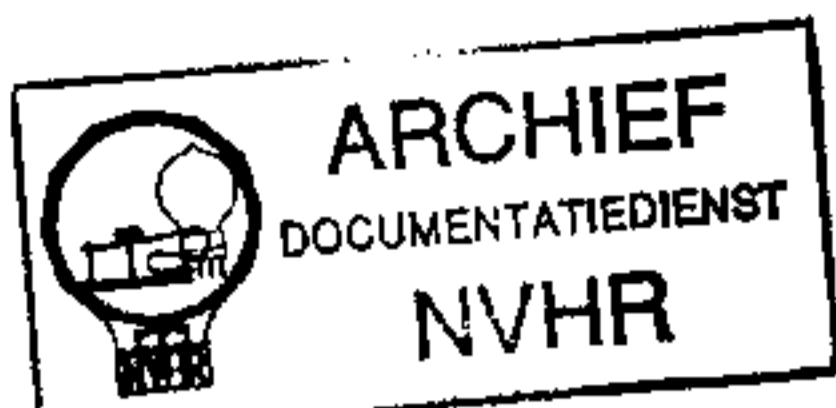


PILOT 75

Transportable Table Receiver

Ned. Ver. v. Historie v/d Radio⁷



and C28 (L.W.). The frame aerial is not in operation on S.W., provision being made for the connection of an external aerial which is coupled via L2 to single tuned circuit L3, C28. An external aerial can also be used on M.W. and L.W. and is then tapped into the tuning coil circuit.

First valve (V1, Brimar 757) is a trade help-out operating as frequency changer with internal coupling. Oscillator grid coils L6 (S.W.)

(Continued col. 1 overleaf)

COMPONENTS AND VALUES

RESISTORS	Values	Locations
R1	V1 C.G.	1MΩ F3
R2	V1 G.B.	220Ω F3
R3	V1 osc. C.G.	17kΩ F3
R4	Osc. stabilizer	68Ω F2
R5	V2 G.B.	270Ω E3
R6	L.F. stopper	47kΩ E2
R7	A.G.C. decoupling	1MΩ F2
R8	Volume control	500kΩ D2
R9	V3 C.G.	10MΩ E2
R10	H.T. decoupling	4.7kΩ D2
R11	V3 anode load	270kΩ E3
R12	Tone control	500kΩ D3
R13	Part tone control	170kΩ D3
R14	V4 C.G. stopper	4.7kΩ E3
R15	V4 G.B.	270Ω E3
R16*	H.T. smoothing	1.03kΩ D3
R17		4.7kΩ E3

* Two resistors, 1.5kΩ + 3.3kΩ, in parallel.

CAPACITORS

Values	Locations	
C1	Aerial coupling ... 0.01μF F3	
C2	L.W. aerial trimmers ... 0.001μF G3	
C3		
C4	V1 C.G. ... 100pF F3	
C5	1st I.F. trans. tuning ... 100pF B1	
C6		
C7	V1 cath. by-pass ... 0.1μF F3	
C8	V1 osc. C.G. ... 100pF F2	
C9	A.G.C. decoupling ... 0.1μF F2	
C10	Osc. tracker ... 500pF F3	
C11	H.T. decoupling ... 0.1μF F3	
C12	V2 cath. by-pass ... 0.1μF E3	
C13	2nd I.F. trans. tuning ... 100pF B1	
C14		
C15	I.F. by-pass ... 100pF E2	
C16	Tone compensator ... 100pF E3	
C17	A.F. coupling ... 0.002μF E3	
C18	I.F. by-pass ... 100pF E2	
C19	A.F. coupling ... 0.04μF E3	
C20	Part tone control ... 500pF D3	
C21	Tone corrector ... 0.001μF E3	
C22*	V4 cath. by-pass	
C23*		50μF E3
C24*		16μF C1
C25*	H.T. smoothing ... 16μF C1	
C26†		16μF C1
C27‡	M.W. aerial trim. ... 65pF G3	
C28‡	S.W. aerial trim. ... 50pF F3	
C29†	Aerial tuning ... — A1	
C30†	Oscillator tuning ... — A1	
C31†	S.W. osc. trim. ... 50pF F3	
C32‡	M.W. osc. trim. ... 65pF G3	
	L.W. osc. trim. ... 700pF G2	

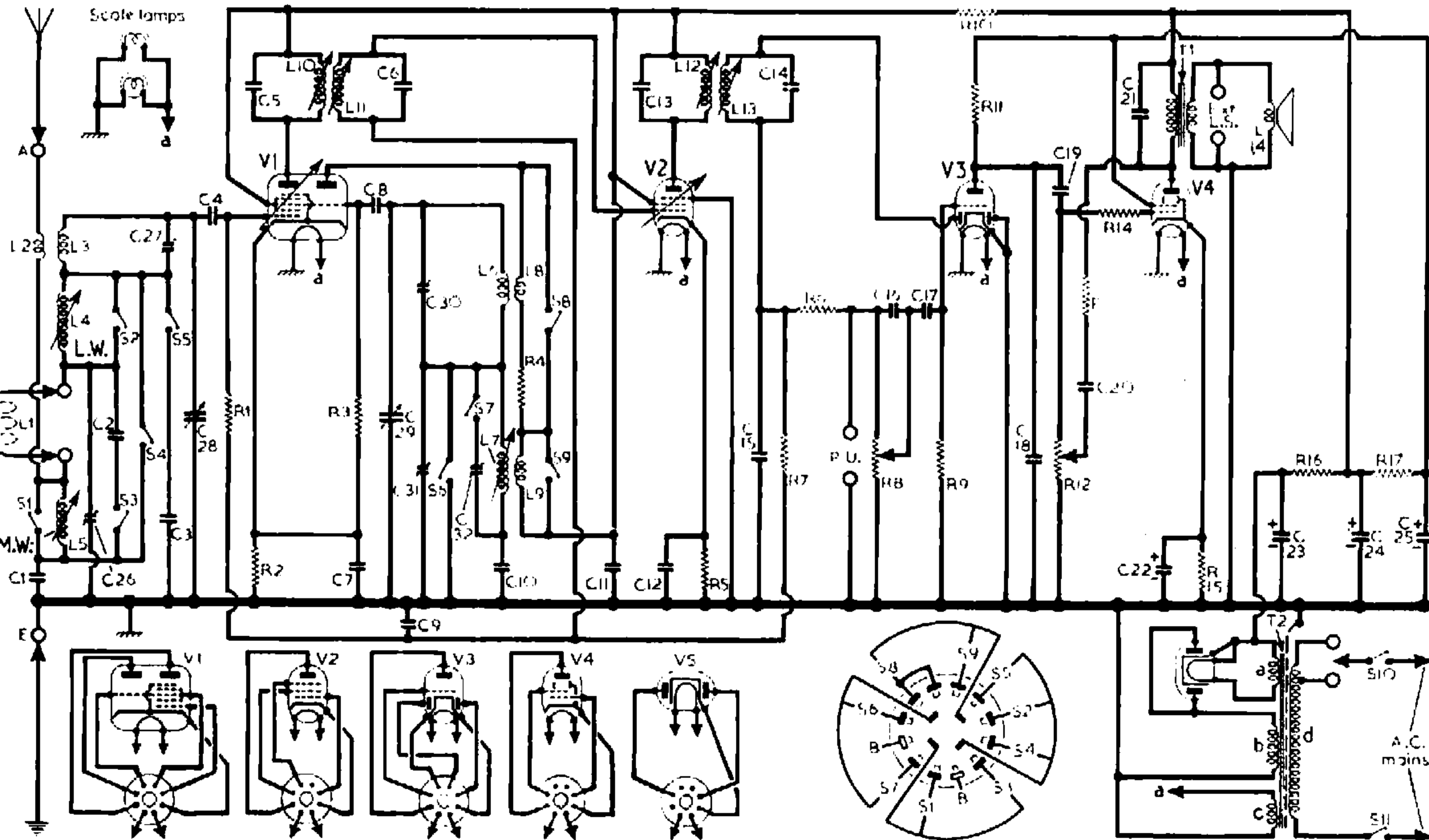
* Electrolytic. † Variable. ‡ Pre-set.

PROVIDED with a frame aerial winding for use in areas of high signal strength, the Pilot 75 is a 4-valve (plus rectifier) 3-band superhet designed to operate from A.C. mains only of 200-250 V, 40-100 c/s. Although a half-wave rectifier is used, the mains transformer is double-wound, and the chassis is isolated from the mains. The waveband ranges are 16.5-50 m, 185-550 m and 1,200-2,000 m.

Release date and original price: September 1952, £16 17s 9d plus purchase tax.

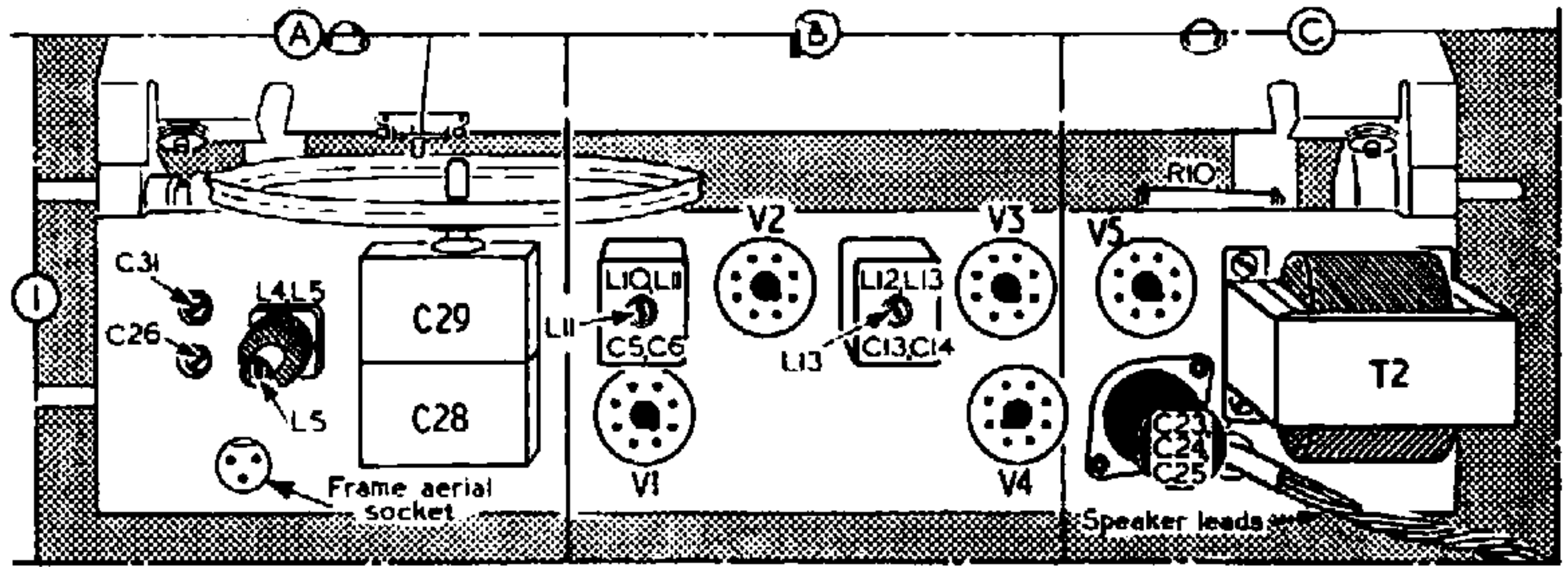
CIRCUIT DESCRIPTION

Tuned frame aerial input by L1, loading coil L5 and C28 (M.W.); or L1, loading coils L4, L5



Circuit diagram of the Pilot 75 A.C. superhet. In the aerial circuit S1 and S4 close on S.W., S2 closes on M.W., and S3 and S5 close on L.W. L1 is the frame aerial winding. In the oscillator circuit, L7 acts as M.W. and L.W. tuning coil, C32 being shunted across it for L.W. operation.

OTHER COMPONENTS		Approx. Values (ohms)	Locations
L1	Frame aerial	2.0	—
L2	S.W. aerial coup.	0.3	F3
L3	S.W. aerial tuning	—	F3
L4	L.W. loading coil	0.5	A1
L5	M.W. loading coil	1.7	A1
L6	Oscillator tuning coils	2.0	G3
L7	Oscillator reaction coils	—	F2
L8	Oscillator reaction coils	—	G3
L9	1st I.F. trans. {Pri.	7.0	B1
L10	1st I.F. trans. {Sec.	7.0	B1
L11	2nd I.F. trans. {Pri.	7.0	B1
L12	2nd I.F. trans. {Sec.	7.0	B1
L13	Speech coil	2.8	—
L14	O.P. trans. {Pri.	420.0	—
T1	O.P. trans. {Sec.	0.6	—
T2	Mains trans. {a	—	C1
	trans. {b	220.0	C1
	trans. {c	—	C1
	trans. {d, total	00.0	C1
S1-S9	Waveband switches	—	G3
S10, S11	Mains sw., g'd R12	—	D3



Plan view of the chassis. The tuning drive system is shown in the drawing below.

output of signal generator, via an 0.1 μ F capacitor in "live" lead, to control grid (pin 6) of V1 and chassis. Feed in a 470 kc/s (638.3 m) signal and adjust the cores of L13 (location reference B1), L12 (E2), L11 (B1) and L10 (F2) for maximum output, reducing the input as the circuits come into line to avoid A.G.C. action. Repeat these adjustments until no further improvement results.

R.F. and Oscillator Stages.—As the tuning scale is fixed to the cabinet, and a substitute tuning scale is not provided, the following adjustments must be carried out with the chassis in its cabinet. Transfer signal generator leads to A and E sockets.

S.W.—Switch receiver to S.W., tune to 16.5 m,

L.W.—Switch receiver to L.W., tune to 1,300 m, feed in a 1,300 m (230 kc/s) signal and adjust C32 (G2) for maximum output. If any further M.W. adjustments are made, they must be followed by L.W. re-alignment.

GENERAL NOTES

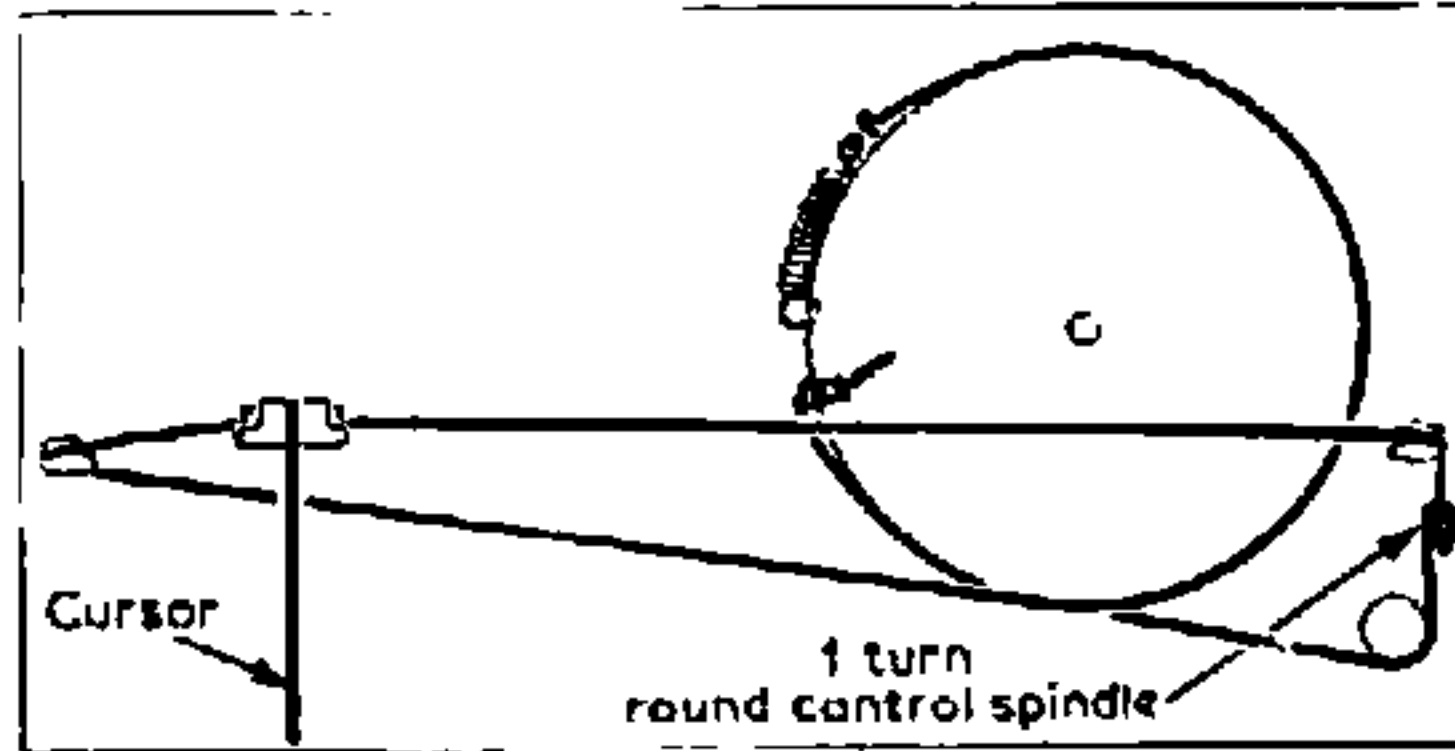
Switches.—S1-S9 are the waveband switches, ganged in a 3-position rotary unit beneath the chassis. This is indicated in our underside view of the chassis, and it is shown in detail in the diagram inset beneath our main circuit diagram, where it is drawn as seen from the remote end of an inverted chassis. The table below gives the switch positions for the three control settings, starting from the fully anti-clockwise position of the control knob. A dash indicates open, and C, closed.

S10, S11 are the Q.M.B. mains switches, ganged with the variable tone control R12.

Scale Lamps.—These are two Osram lamps, with small clear spherical bulbs and M.E.S. bases, rated at 6.5 V, 0.3 A.

External Speaker.—Two sockets are provided at the rear of the chassis for the connection of a low impedance (about 4 Ω) external speaker.

Drive Cord Replacement.—About 60 inches of fine-gauge nylon-braided glass yarn is required for a new drive cord, which should be run as shown in the accompanying sketch. This length includes an ample margin for tying off.



Sketch showing the tuning drive system, as seen from the front with the gang at minimum capacitance.

feed in a 16.5 m (18.2 Mc/s) signal and adjust C30 (F3) and C27 (F3) for maximum output. If two peaks are obtained when adjusting C30, it should be set to the one involving the higher capacitance. Repeat these adjustments until no further improvement results.

M.W.—Switch receiver to M.W., tune to 200 m, feed in a 200 m (1,500 kc/s) signal and adjust C31 (A1) and C26 (A1) for maximum output. Tune receiver to 500 m, feed in a 500 m (600 kc/s) signal and adjust the cores of L7 (F2) and L5 (A1) for maximum output. When adjusting L7 core it should be set to the peak which occurs with the core in the windings of both L7 and L9. Repeat these adjustments until no further improvement results.

Circuit Description—continued

and L7 (M.W.) are tuned by C29. L7 is also used for L.W. operation, when it is shunted by C32. Parallel trimming by C30 (S.W.), C31 (M.W.) and C32 (L.W.); series tracking by C10 (M.W. and L.W.). Inductive reaction coupling from anode by L8 (S.W.) and L9 (M.W. and L.W.). Stabilization by R4.

Second valve (V2, Brimar 7B7) is a variable-mu R.F. pentode operating as intermediate frequency amplifier with tuned transformer couplings C5, L10, L11, C6 and C13, L12, L13, C14.

Intermediate frequency 470 kc/s. Diode signal detector is part of double diode triode valve (V3, Brimar 7C6). Audio frequency component in rectified output is developed across volume control R8, which acts as diode load, and is passed via C17 to grid of triode section. C16 provides some high-note boost at low settings of the volume control.

Provision is made for the connection of a gramophone pick-up across R8. I.F. filtering by C15, R6 and the capacitance of the screened lead to the volume control. D.C. potential developed across R6, R8 is fed back as bias to V1 and V2, giving automatic gain control.

Resistance-capacitance coupling by R11, C19 and R12 between V3 triode and beam pentode output valve (V4, Brimar 7C5). Fixed tone correction by C21 in anode circuit. Variable tone control by R12 in negative feed-back circuit R13, C20 and R12, between V4 anode and control grid circuits. Provision is made for the connection of a low impedance external speaker across T1 secondary winding.

H.T. current is supplied by I.H.C. rectifying valve (V5, Brimar 7Y4) whose anodes are connected together for half wave operation. Smoothing by R16, R17 and electrolytic capacitors C23, C24 and C25.

CIRCUIT ALIGNMENT

I.F. Stages.—Remove cabinet base cover and stand receiver on its side, so that top and underside of chassis are accessible. Connect

Waveband Switch Table

Switch	S.W.	M.W.	L.W.
S1	—	—	—
S2	—	—	—
S3	—	—	—
S4	—	—	—
S5	—	—	—
S6	—	—	—
S7	—	—	—
S8	—	—	—
S9	—	—	—

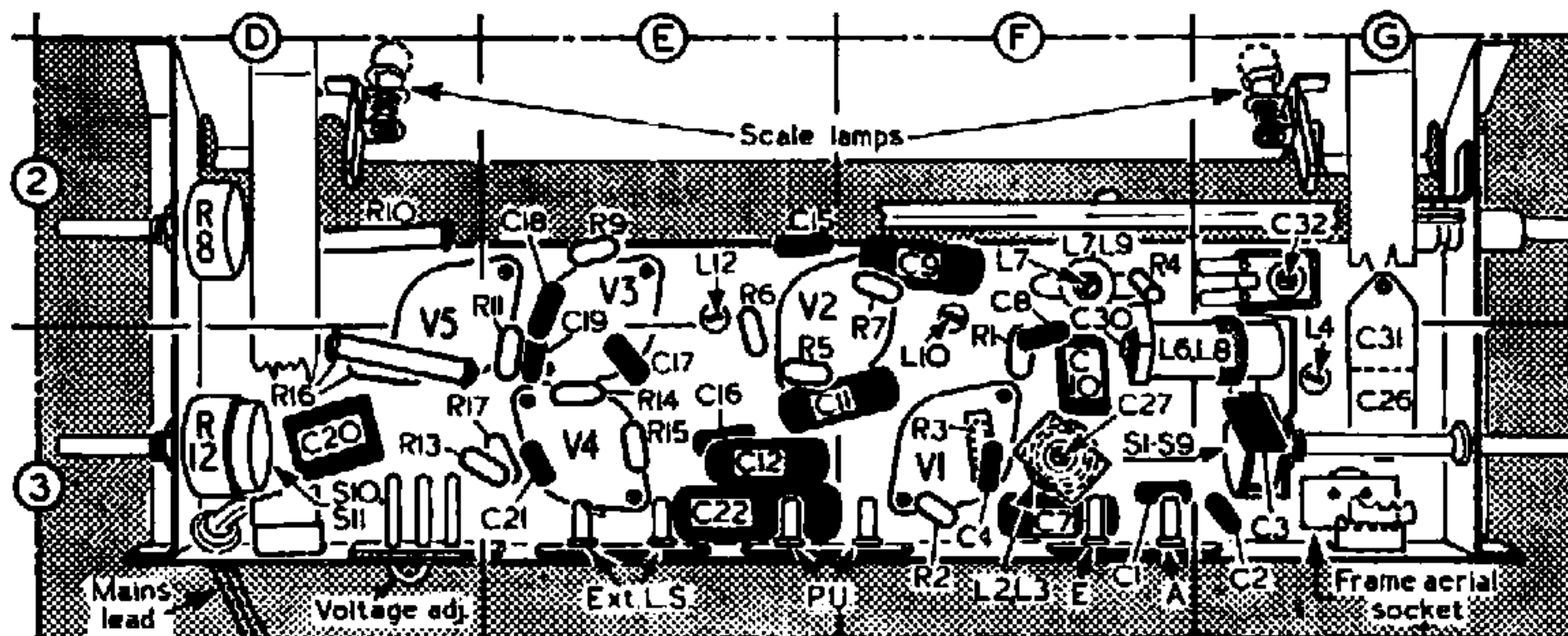
VALVE ANALYSIS

Valve voltages and currents given in the table below are those measured in our receiver when it was operating from 230 V A.C. mains. The receiver was tuned to the highest wavelength end of M.W., and the volume control was at maximum, but there was no signal input.

Voltage readings were taken with an Avo Electronic Test Meter, and as this instrument has a high internal resistance, allowance should be made for the current drawn when using other types of meter. Chassis was the negative connection in every case. The voltage measured across C24 was 172 V.

Valves	Anode		Screen		Cath.
	V	mA	V	mA	
V1 7S7	96	2.5	96	2.8	1.7
V2 7B7	96	2.8	96	2.0	2.5
	96	7.5			
V3 7C6	92	2.6	—	—	—
V4 7C5	161	25.0	159	3.0	6.8
V5 7Y4	195*	—	—	—	216.0†

* A.C. reading. † Cathode current 47mA.



Underside view of the chassis. The S1-S9 diagram is inset in the circuit overleaf.