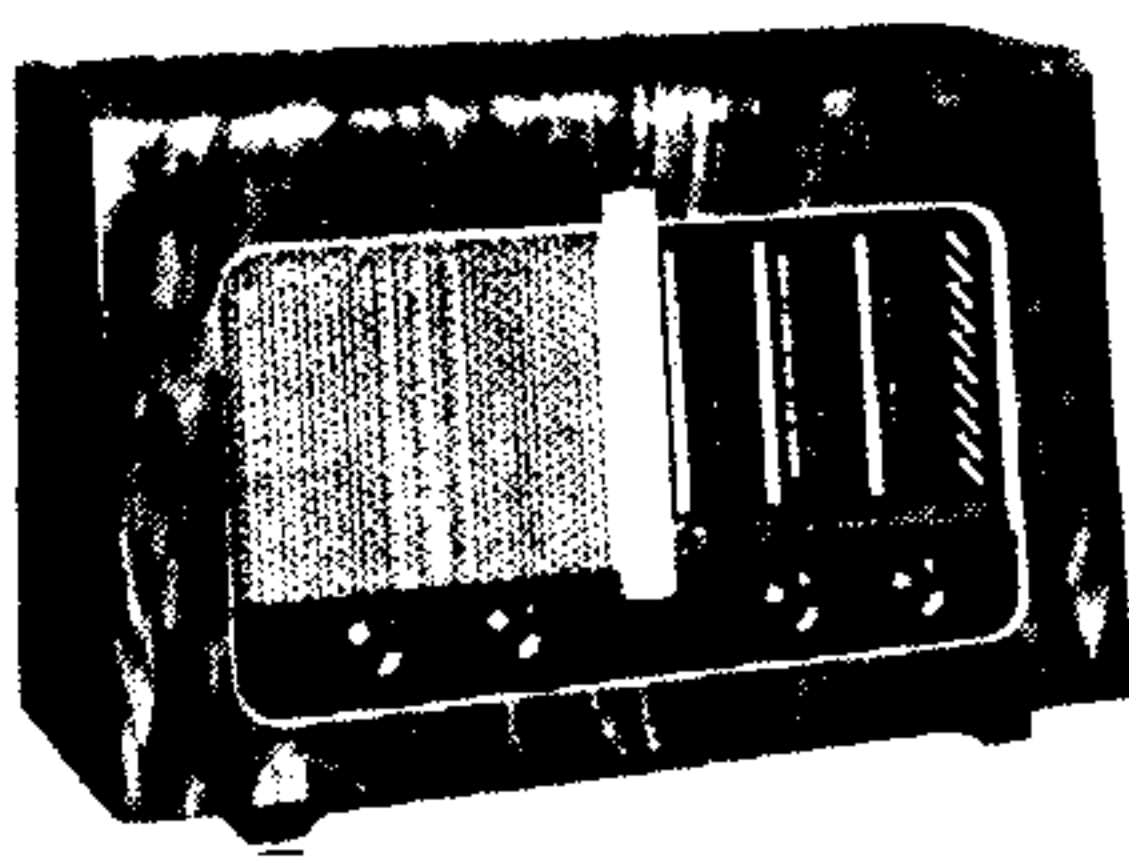
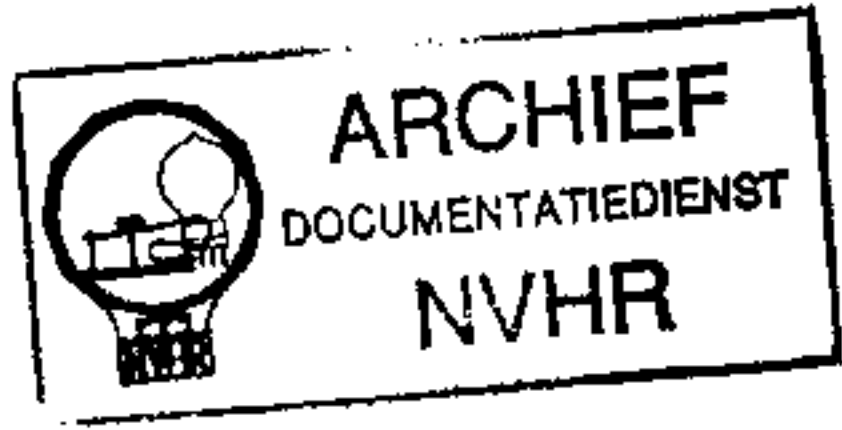


Ned. Ver. v. Historie v/d Radio



# PILOT JACK (A.C. Model)

wired models 6BA6) is a variable-mu R.F. pentode operating as intermediate frequency amplifier with tuned transformer couplings C4, L13, L14, C5 and C14, L15, L16, C15.

valve (V5, Brimar 6X5GT) operating with its anodes strapped to form a half wave rectifier. T2 is a heater transformer only.

Intermediate frequency 470 kc/s.

Diode signal detector is part of double diode triode valve (V3, Brimar 6Q7GT). A.F. component in rectified output is developed across load resistor R7 and passed via C20 and volume control R9 to grid of triode section. I.F. filtering by C16, R8, C19 and C23.

Second diode of V3, fed from V2 anode via C18, provides D.C. potential, giving A.G.C.

Resistance-capacitance coupling by R13, C25 and R16 between V3 triode and beam tetrode output valve (V4, Brimar 6V6GT), C25 being shunted by C26 on M.W. and L.W. bands. Tone correction by negative feedback on M.W. and L.W. between V4 and V3 anodes via S17 and R15, and variable tone control in V3 anode circuit by C24 and tone control R14.

H.T. current is supplied by I.H.C. rectifying

CAPACITORS		Values	Locations
C1	Aerial series	500pF	H3
C2	Chassis isolator	0.002μF	H3
C3	A.G.C. decoupler	0.1μF	G4
C4	1st I.F. trans. tuning	100pF	B2
C5		100pF	B2
C6	V1 osc. C.G.	100pF	H4
C7	H.T. by-pass	0.1μF	G4
C8	L.W. osc. trimmer	150pF	H4
C9	S.W. osc. tracker	0.006μF	H4
C10	M.W. osc. tracker	530pF	H4
C11	L.W. osc. tracker	225pF	H4
C12	S.G. decoup.	0.1μF	G4
C13	V2 anode decoup.	0.1μF	G4
C14	2nd I.F. trans. tuning	100pF	C2
C15		180pF	C2
C16	I.F. by-pass	100pF	F4
C17*	V3 cath. by-pass	25μF	F4
C18	A.G.C. coupling	20pF	F4
C19	I.F. by-pass	100pF	F4
C20	A.F. coupling	0.005μF	F4
C21	P.U. isolators	0.02μF	F4
C22		0.02μF	F4
C23	I.F. by-pass	500pF	F3
C24	Part tone control	0.01μF	F3
C25	A.F. coupling	0.001μF	F3
C26	Tone corrector	0.01μF	G3
C27*	H.T. smoothing	8μF	G3
C28	Mains R.F. filter	0.05μF	E4
C29*	V4 cath. by-pass	25μF	E3
C30	Tone corrector	0.002μF	G3
C31*	H.T. smoothing	32μF	D1
C32*		32μF	D1
C33†	S.W. aerial trim	50pF	H3
C34†	M.W. aerial trim	50pF	H3
C35†	L.W. aerial trim	50pF	H3
C36†	Aerial tuning	5528pF	B1
C37†	Oscillator tuning	5528pF	B2
C38†	S.W. osc. trimmer	50pF	H4
C39†	M.W. osc. trimmer	50pF	H4
C40†	L.W. osc. trimmer	50pF	H4

## COMPONENTS AND VALUES

RESISTORS		Values	Locations
R1	V1 C.G. stopper	33Ω	G3
R2	V1 osc. C.G.	22kΩ	H4
R3	S.G. H.T. feed	10kΩ	G4
R4	V2 G.B.	180Ω	G4
R5	V2 H.T. decoup.	2.2kΩ	F4
R6	L15 shunt	470kΩ	G4
R7	Diode load	270kΩ	F4
R8	I.F. stopper	47kΩ	F4
R9	Volume control	1MΩ	E3
R10	V3 G.B.	4.7kΩ	F3
R11	A.G.C. decoup.	1MΩ	F4
R12	A.G.C. diode load	1MΩ	F4
R13	V3 anode load	270kΩ	F4
R14	Tone control	1MΩ	E3
R15	Tone corrector	1.5MΩ	F3
R16	V4 C.G.	470kΩ	F3
R17	Grid stopper	4.7kΩ	F3
R18	H.T. smoothing	2.2kΩ	F3
R19	V4 G.B.	270Ω	F3
R20	H.T. smoothing	680Ω	E4
R21	Surge limiter	100Ω	E4

\* Electrolytic. [† Variable. ‡ Pre-set. § "Swing" value, min. to max.

DESIGNED to operate from A.C. mains only of 200-250 V, 40-100 c/s, the A.C. Pilot Jack (T42) is a 4-valve (plus rectifier) 3-band superhet. Waveband ranges are 13-50 m, 180-550 m and 1,000-2,000 m.

A double-wound mains transformer is used for heater current supplies, but the H.T. circuit and chassis are "live" to the mains. The A.C./D.C. models are covered in Service Sheet 985.

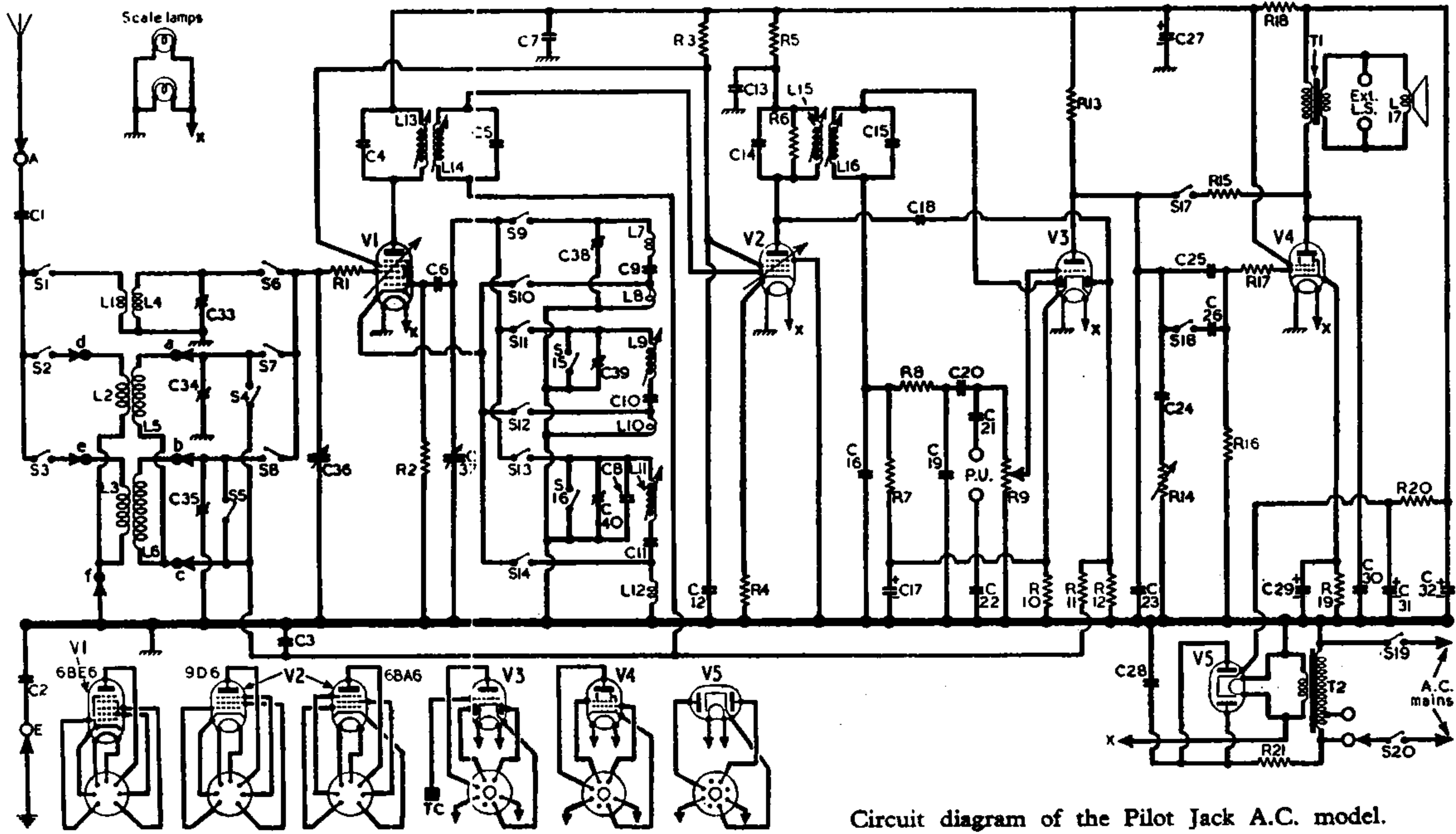
Release date and original price: October, 1949, £16 17s, plus purchase tax.

## CIRCUIT DESCRIPTION

Aerial input on S.W. by coupling coil L1 to single-tuned circuit L4, C36, which precedes heptode valve (V1, Brimar 6BE6) operating as frequency changer with electron coupling. On M.W. and L.W., input is from tuned frame aerials L5, C36 (M.W.) and L6, C36 (L.W.), although provision is made for the connection of an external aerial via frame aerial coupling coils L2 (M.W.) and L3 (L.W.).

Oscillator grid coils L7, L8 (S.W.), L9, L10 (M.W.) and L11, L12 (L.W.) are tuned by C37. Parallel trimming by C38 (S.W.), C39 (M.W.) and C40 (L.W.). Series tracking by C9 (S.W.), C10 (M.W.) and C11 (L.W.). Inductive reaction coupling from cathode by coils L8 (S.W.), L10 (M.W.) and L12 (L.W.).

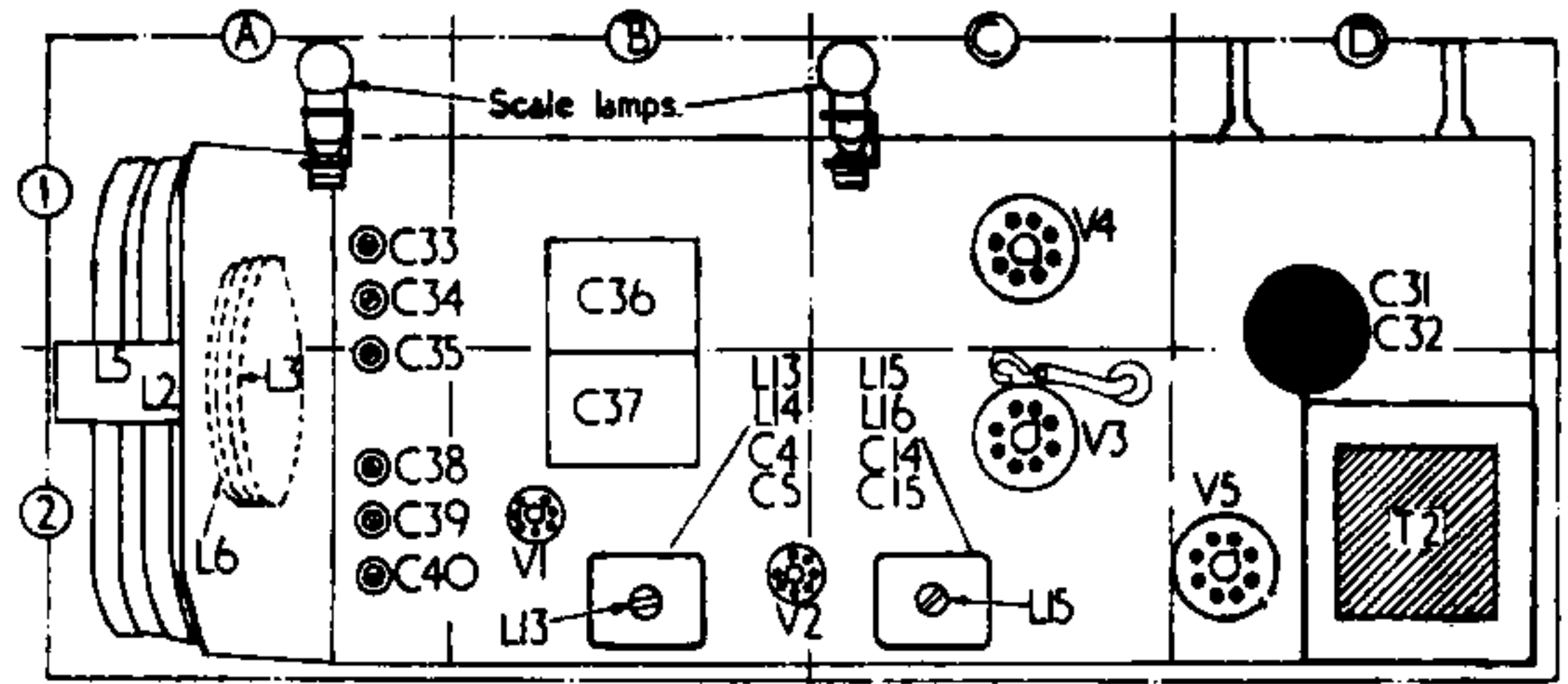
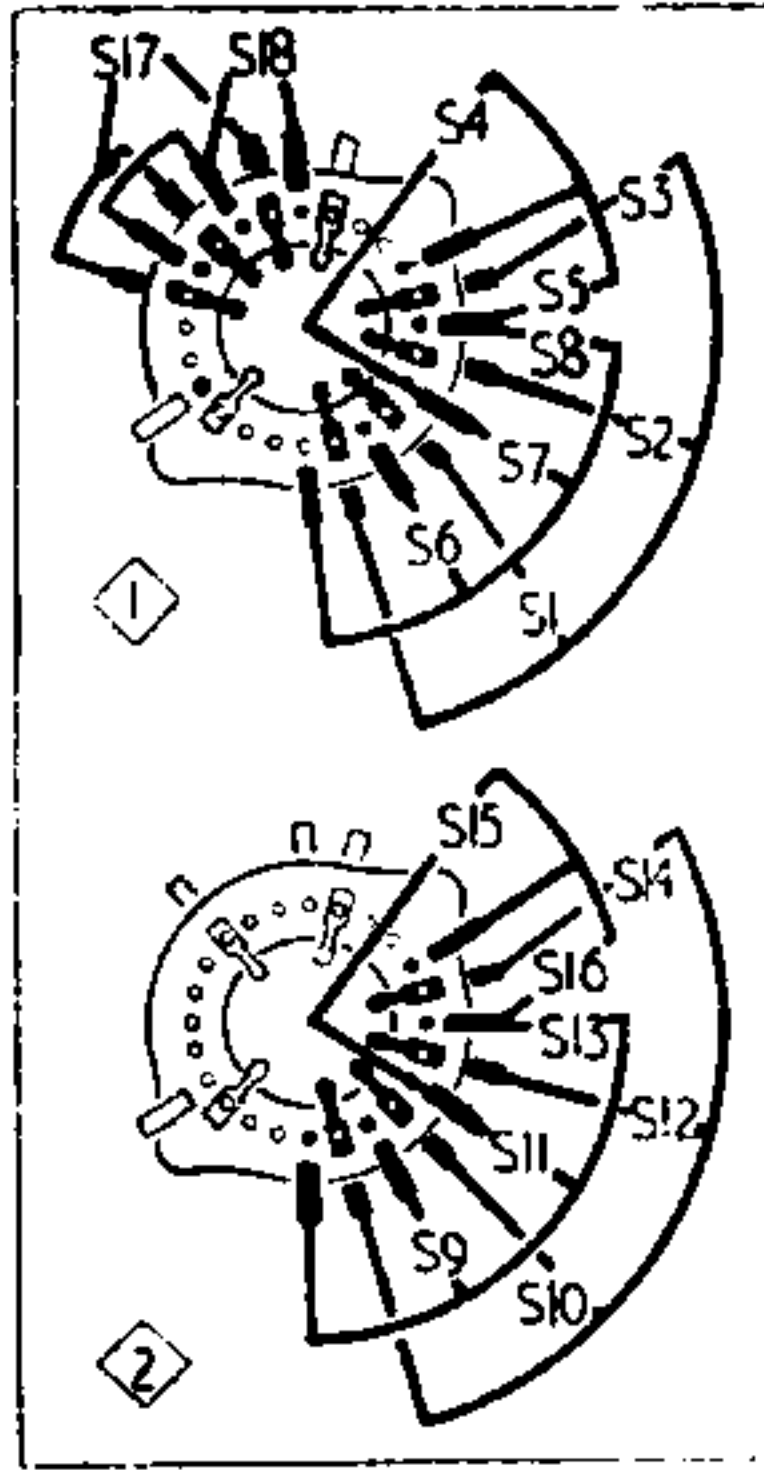
Second valve (V2, Brimar 9D6 or in suitably



Circuit diagram of the Pilot Jack A.C. model.

OTHER COMPONENTS

Component	Approx. Values (ohms)	Locations
L1, L2, L3	0.4	H3
L4, L5, L6	0.1	A2
L7, L8, L9	6.0	A2
L10, L11, L12	Very low	H3
L13, L14, L15	1.0	A2
L16, L17, L18	24.0	A2
L19, L20, L21	Very low	H4
L22, L23, L24	Very low	H4
L25, L26, L27	2.5	H4
L28, L29, L30	0.2	H4
L31, L32, L33	12.0	H4
L34, L35, L36	0.6	H4
L37, L38, L39	7.0	B2
L40, L41, L42	7.0	B2
L43, L44, L45	7.0	C2
L46, L47, L48	7.0	C2
L49, L50, L51	2.8	
L52, L53, L54	0.5	
L55, L56, L57	430.0	
L58, L59, L60	160.0	D2
L61, L62, L63	0.3	D2
S1-S18		H3
S19-S20		H3
S21-S22		E3



Left: Diagrams of the waveband switch units. Below them is the switch table.

Plan view of the chassis. The frame aerial windings are on a panel on the left.

**Drive Cord Replacement.**—50 inches of fine gauge nylon braided glass yarn is required for a new tuning drive cord, which should be run as shown in the sketch below, where the system is viewed from the front, as though seen through the scale assembly upon the back of which it is mounted, with the gang at maximum capacitance. The cursor can be slipped on afterwards.

CIRCUIT ALIGNMENT

All the adjustments may be made with the chassis in the cabinet, the cores of L14, L16 being made accessible by removing the cabinet base cover, secured by six round-head screws. Before aligning the I.F. stages, the cores should be freed by melting the wax seals.

**I.F. Stages.**—Switch set to L.W., turn gang and volume control to maximum. Connect

VALVE ANALYSIS

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

Voltage measurements were made with an Avo Electronic Testmeter which introduces no appreciable voltage drop, and allowance must be made for the current drawn by other meters. Chassis was the negative connection.

Valve	Anode		Screen		Cath.
	V	mA	V	mA	
V1 6BE6	186	3.4	100	7.2	
V2 9D6	176	4.0	100	1.0	1.0
V3 6Q7GT	112	0.3			1.8
V4 6V6GT	213	27.0	186	2.5	8.4
V5 6X5GT	228†				265.0

† A.C. reading.

DISMANTLING THE SET

**Removing Chassis.**—Pull off four control knobs (with felt washers) from front of set;

Remove the three 2BA bolts with washers securing the chassis to the cabinet;

Withdraw the chassis to the extent of the speaker leads and unsolder them from the tags on the output transformer.

When replacing, the short chassis fixing screw goes to the left-hand front corner of cabinet

Switch	S.W.	M.W.	L.W.
S1	C		
S2		C	
S3			C
S4	C		
S5	C	C	
S6	C		
S7		C	
S8			C
S9	C		
S10	C		
S11		C	
S12		C	
S13			C
S14			C
S15	C		
S16	C	C	
S17		C	
S18		C	C

base, viewed from rear. Connect the speaker leads to the output transformer as follows, numbering the tags from top to bottom: 1, black; 2, blue; 3, red; 4, green.

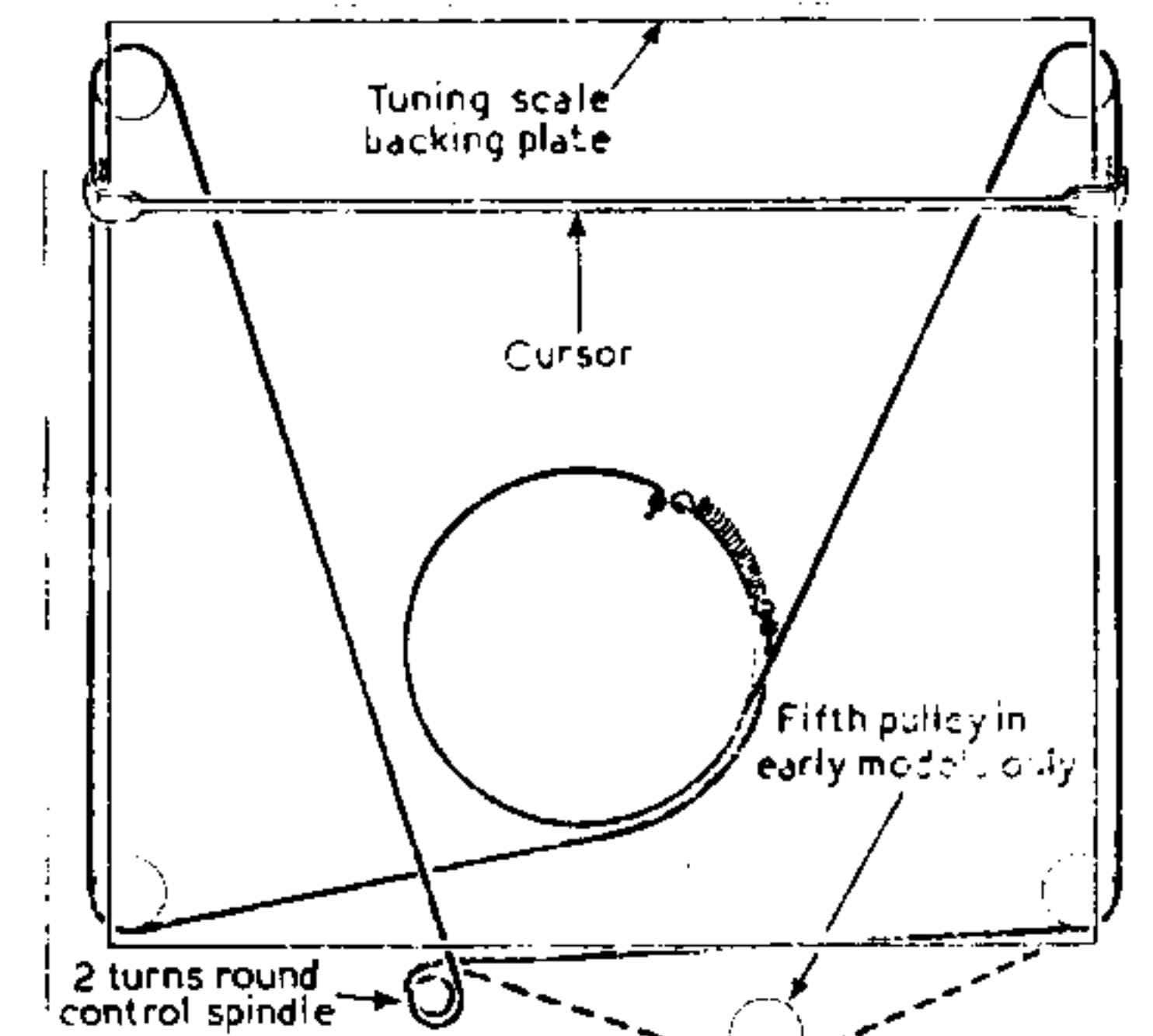
GENERAL NOTES

**Switches.**—S1-S18 are the waveband switches, ganged in two rotary units beneath the chassis. These are indicated in detail in our under-chassis drawing, and shown in detail in the diagrams inset beside the plan illustration of the chassis.

The table (above) 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.

**Scale Lamps.**—These are two small lamps, with large, 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 3-4 Ω) external speaker.



The tuning drive, as seen from the front.

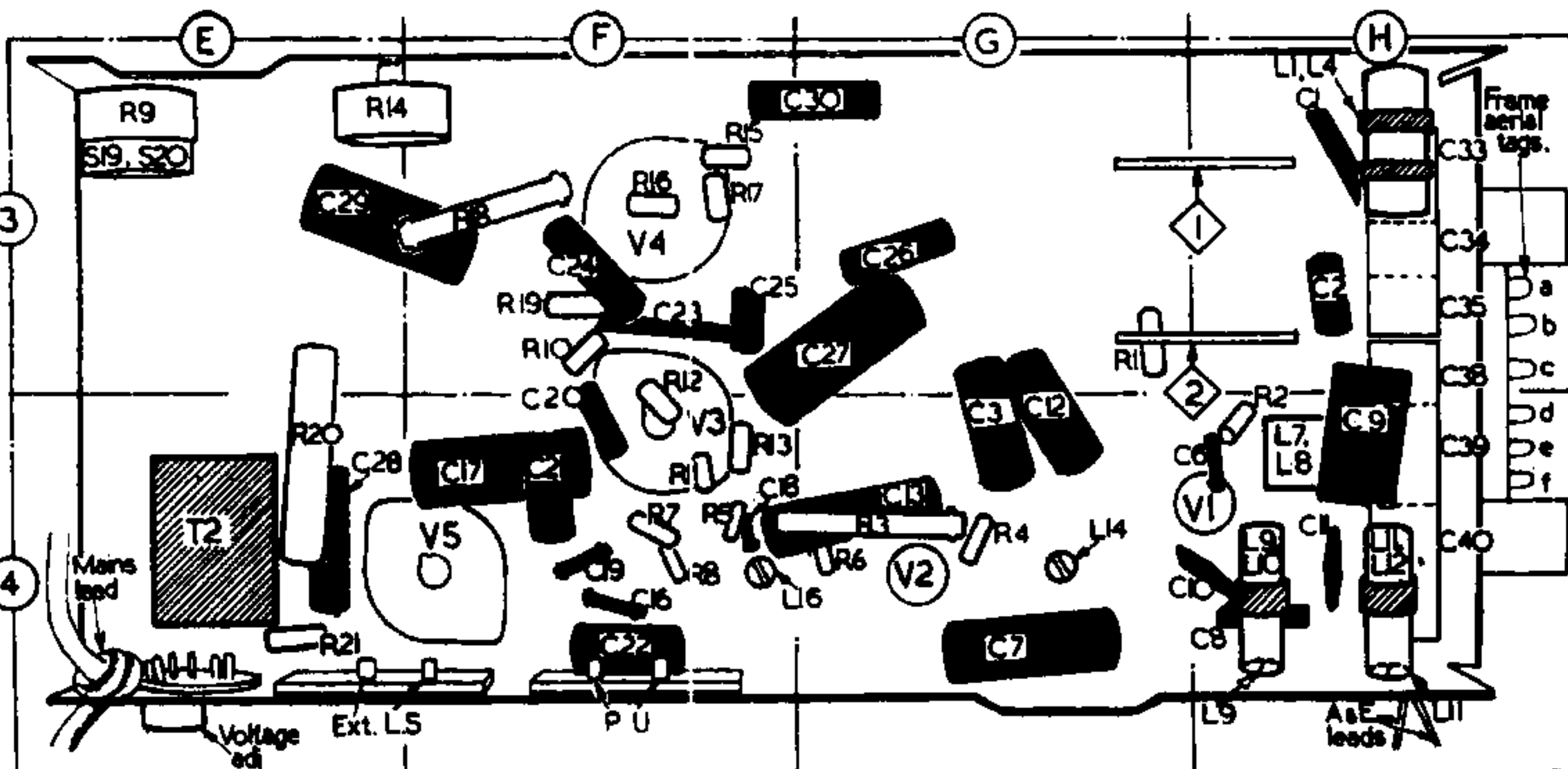
signal generator output, via a 0.1 μF capacitor in each lead, to control grid (pin 7) of V1 and chassis, feed in a 470 kc/s (638.3 m) signal and adjust the cores of L16 (location reference F4), L15 (C2), L14 (G4) and L13 (B2) for maximum output, reducing the input as the circuits come into line. Re-seal cores.

**R.F. and Oscillator Stages.**—Check that with the gang at maximum capacitance the cursor coincides with the highest wavelength ends of the tuning scale. The position of the cursor may be adjusted by sliding it up or down the drive cord. Transfer the signal generator leads, via a dummy aerial, to A and E sockets.

**S.W.**—Switch set to S.W., tune to 13.4 m on scale, feed in a 13.4 m (23 Mc/s) signal and adjust C38 (A2) and C33 (A1) for maximum output. Repeat these adjustments.

**M.W.**—Switch set to M.W., tune to 200 m on scale, feed in a 200 m (1,500 kc/s) signal and adjust C39 (A2) and C34 (A1) for maximum output. Tune to 500 m on scale, feed in a 500 m (600 kc/s) signal and adjust the core of L9 (H4) for maximum output. Repeat these adjustments.

**L.W.**—Switch set to L.W., tune to 1,000 m on scale, feed in a 1,000 m (300 kc/s) signal and adjust C40 (A2) and C35 (A2) for maximum output. Tune to 2,000 m on scale, feed in a 2,000 m (150 kc/s) signal and adjust the core of L11 (H4) for maximum output. Repeat these adjustments.



Underside view of the chassis. The waveband switch units are indicated by 1 and 2 in diamonds.