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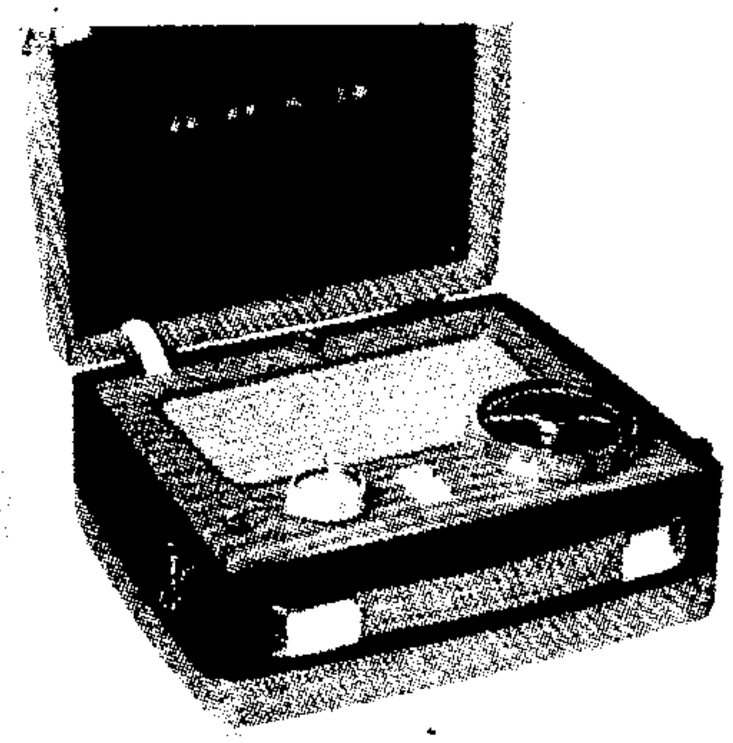
Met dank aan Cleeren - De Smet

BUSH BP61

Battery Operated Portable Radio



EMPLOYING M.W. and L.W. frame aerials and four Mullard valves, the Bush BP61 is a 2-band portable receiver designed to operate from all-dry batteries. The wave-band ranges are 190-560m and 1,110-1,880m.

Release date and original price: August 1957, £9 16*s* 7*d*. *Purchase tax extra.*

CIRCUIT DESCRIPTION

Tuned aerial input on M.W. by **L1, C2** and in addition by **L2, C1,** on L.W. precedes heptode valve **V1,** which operates as frequency changer with electron coupling. **L1, L2** are mounted in the cabinet lid and form the frame aerial.

Oscillator grid coil **L5** is tuned by **C6, C7, C8, C9** and **C10** on M.W. and by **C7, C9** and **C10** on L.W. Series tracking by **C11**. Resistive damping by **R3** on M.W. **C10** is formed by one section of the ganged tuning capacitor and **C9** is a parallel trimmer capacitor. Reaction coupling from oscillator via **C12, L6.**

Second valve **V2** is a variable-mu R.F. pentode operating as intermediate frequency amplifier with tuned transformer couplings **C4, L3, L4, C5; C14, L7, L8, C15.**

Intermediate frequency 470kc/s.

Diode signal detector is part of a diode-pentode valve **V3.** Audio-frequency component in its rectified output is developed across volume control **R8,** which also operates as diode load, and is passed via

(*Continued overleaf col.* 1)

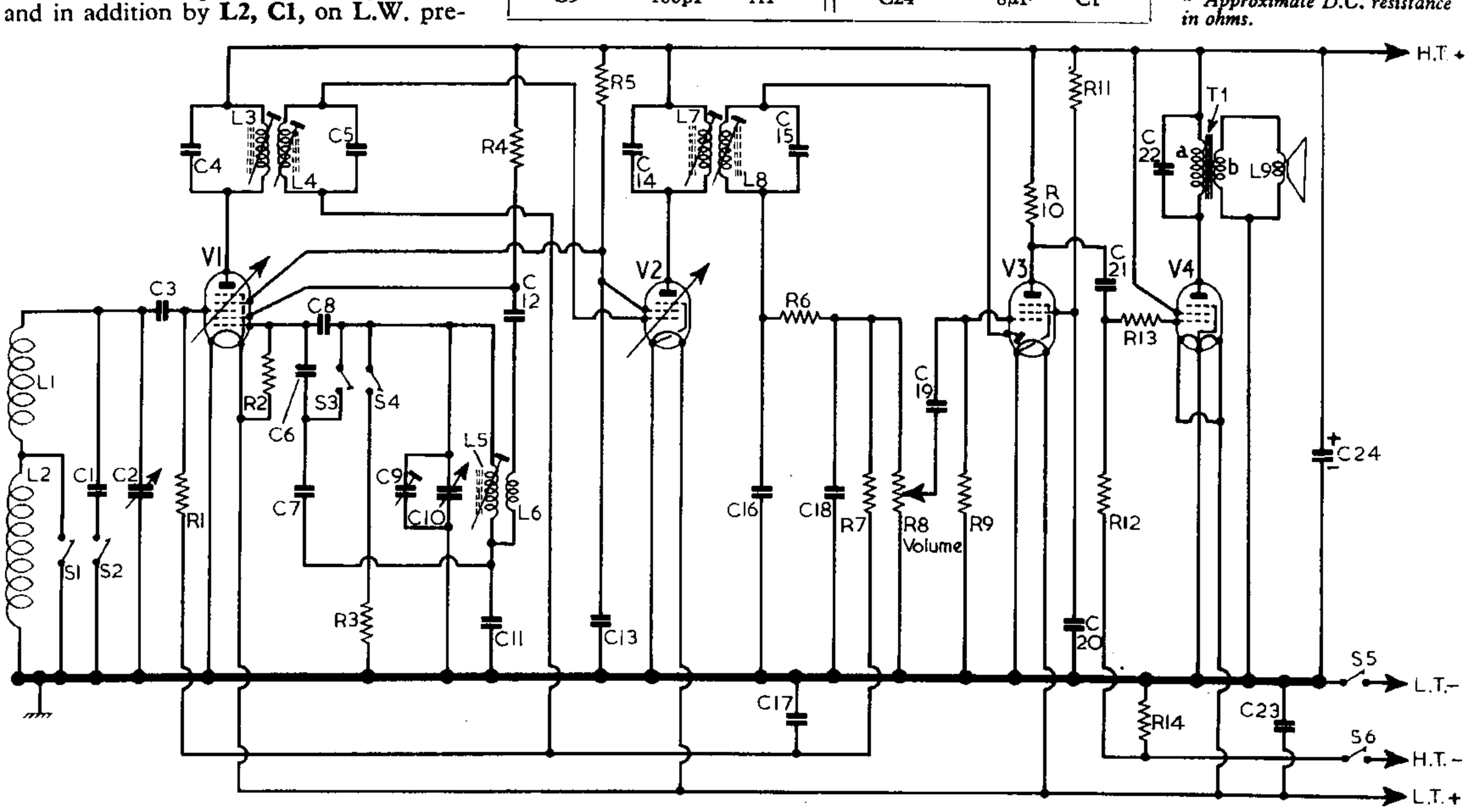
Resistors		
R1	1MΩ	B1
R2	27kΩ	A2
R3	56kΩ	B1
R4	47kΩ	B2
R5	15kΩ	B2
R6	100kΩ	B1
R7	2·2MΩ	B1
R8	1MΩ	C1
R9	10MΩ	B2
R10	1·2MΩ	B2
R11	3·3MΩ	B2
R12	2·2MΩ	C2
R13	470kΩ	C2
R14	560Ω	C2

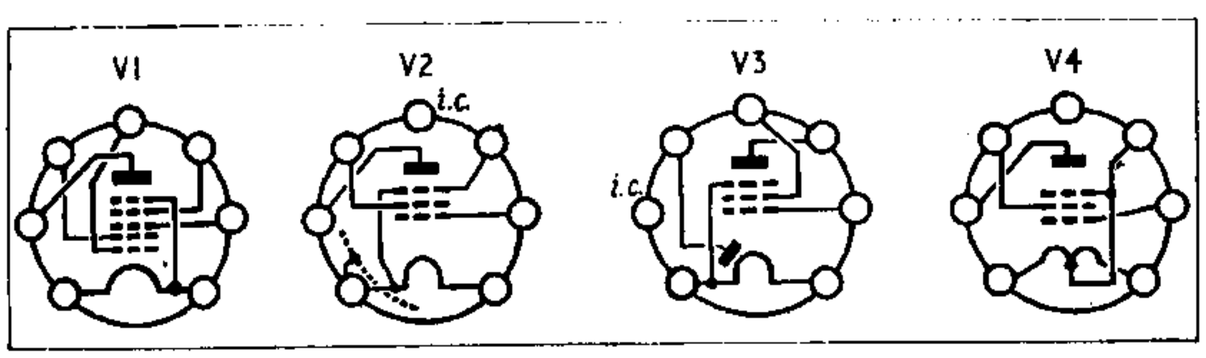
Capacitors		
C1	160pF	B1
C2	—	A2
C3	100pF	A1
C4	100pF	B2
C5	100pF	B2
C6	15pF	B1
C7	556pF	A2
C8	160pF	B1
C9	26pF	A1
C10	—	A1
C11	610pF	A2
C12	270pF	A2
C13	0·04μF	B2
C14	100pF	B2
C15	100pF	B2
C16	100pF	B2
C17	0·04μF	B2
C18	100μF	C1
C19	0·002μF	C2
C20	0·01μF	C2
C21	0·01μF	C2
C22	0·001μF	C2
C23	0·25μF	A2
C24	8μF	C1

Coils*		
L1	2·5	—
L2	13·0	—
L3	8·6	B2
L4	8·6	B2
L5	6·0	A1
L6	1·0	A1
L7	8·6	B2
L8	8·6	B2
L9	3·0	—

Other Components*		
T1 a	600·0	—
T1 b	0·37	
S1-S4	—	B1
S5, S6	—	C1

* *Approximate D.C. resistance in ohms.*





Circuit diagram of the Bush BP61. In earlier versions of this receiver an aerial trimmer capacitor is connected in parallel with **C2.** *Automatic bias for* **V4** *is derived from the voltage drop across* **R14.** *Diagrams showing the valve base connections, drawn as seen from the free ends of the pins, are inset beneath the circuit diagram.*

Circuit Description—*continued*

C19 to the control grid of **V3** pentode section, which operates as A.F. amplifier. I.F. filtering by **R6, C18.** The D.C. potential developed across **R8** is fed back as bias via decoupling circuit **R7, C16** to **V1** and **V2,** giving automatic gain control.

Resistance-capacitance coupling by **R10, C21** between **V3** pentode anode and the control grid of pentode output valve **V4.** Grid bias for **V4** is obtained from the voltage drop across **R14,** which is in series with the negative H.T. lead and chassis. Tone correction by **C22.** H.T. decoupling by **C24.**

CIRCUIT ALIGNMENT

Equipment Required.—An accurately calibrated signal generator modulated 30 per cent at 400c/s; an audio output meter; a non-metallic trimming tool.

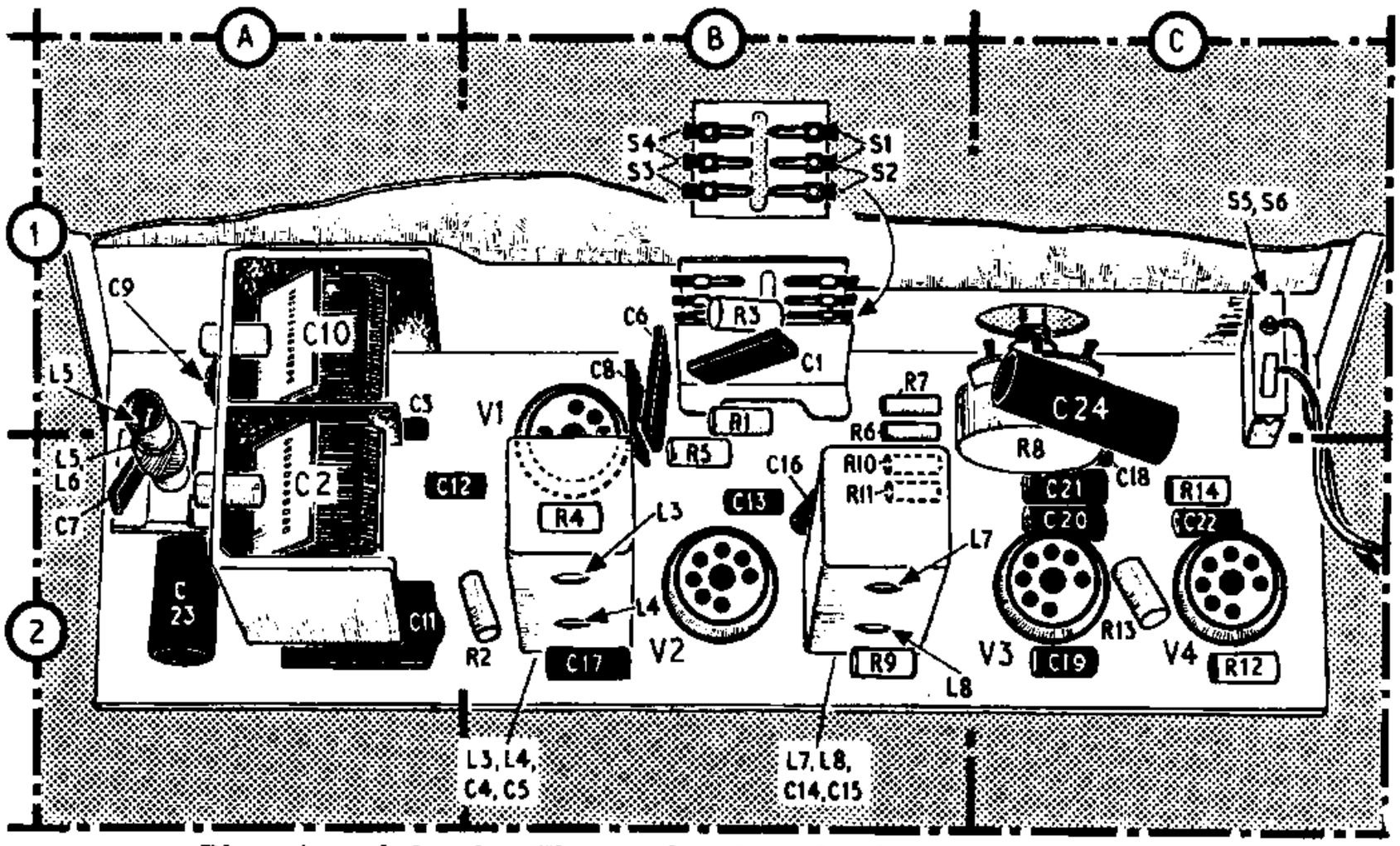
1.—Turn volume control and tuning gang to maximum. Connect audio output meter across **T1** secondary winding. Connect signal generator output to **C2** (A2) and chassis.

2.—Feed in a 470kc/s signal and adjust the cores of **L8** (B2), **L7** (B2), **L4** (B2) and **L3** (B2) for maximum output. Repeat these adjustments until no improvement in output can be obtained.

3.—Loosely couple signal generator output to the frame aerial. Switch the receiver to M.W. and tune it to 500m. Feed in a 600kc/s signal and adjust the core of **L5** (A1) for maximum output. Rock the tuning control slightly during this adjustment.

4.—Tune the receiver to 200m. Feed in a 1,500kc/s signal and adjust **C9** (A1) for maximum output.

5.—Repeat operations 3 and 4 until no improvement in calibration can be obtained.



Plan view of chassis. The panel and speaker have been cut away.

VALVE ANALYSIS

Valve voltages given in the table below are those derived from the manufacturer's information. They were measured on the 1,000V and 10V ranges of a model 8 Avometer while the receiver was working from a set of new batteries and adjusted for normal operation, but with no signal input. The H.T. current was 10mA and the L.T. current was 125mA.

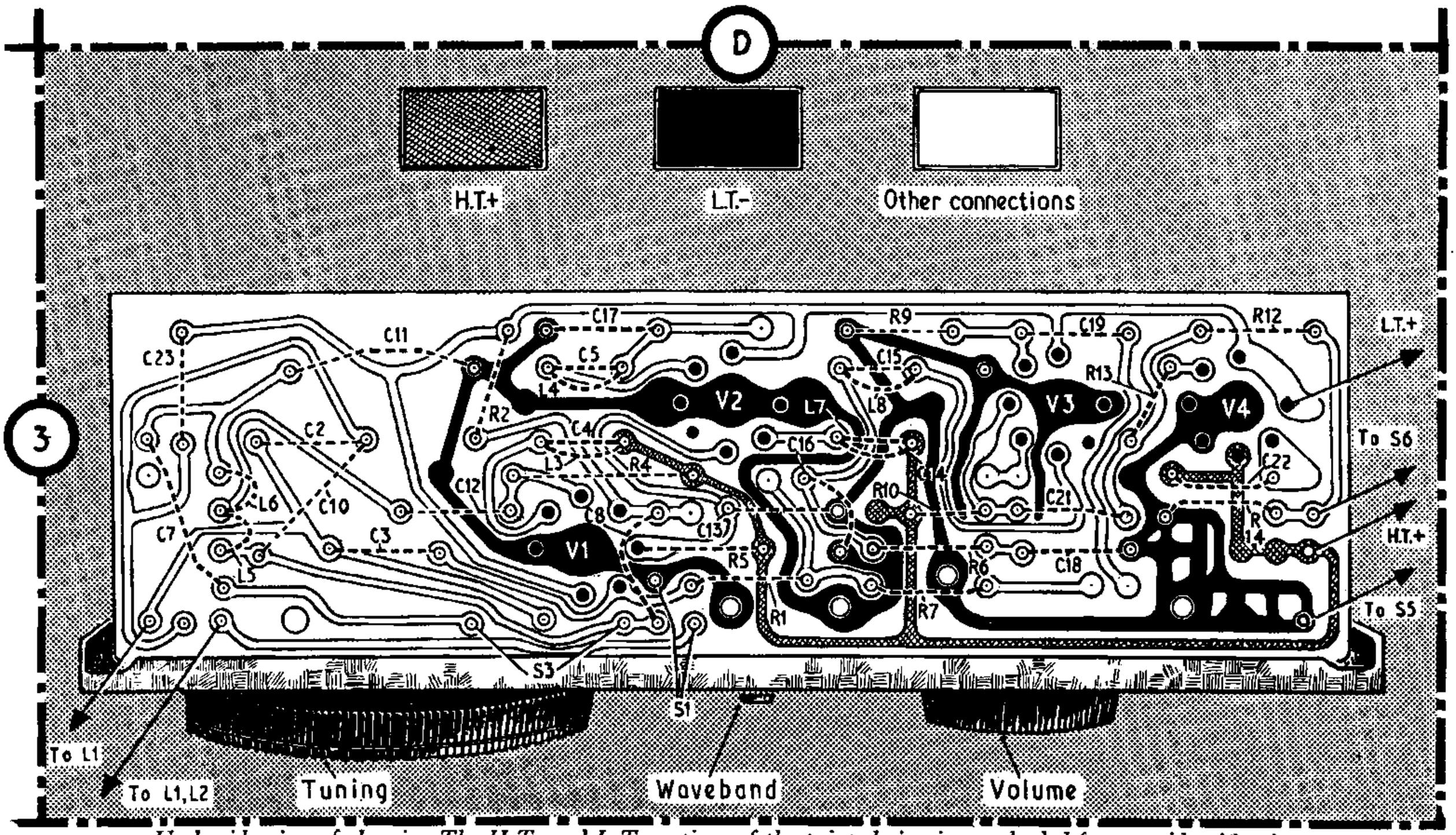
Valve		Anode (V)	Screen (V)	Grid (V)
V1 DK96	mixer	78	72	—
	osc.	28	—	—
V2 DF96	..	81	72	—
V3 DAF96	..	28	30	—
V4 DL96	..	80	82	−4.9*

* *Measured across R14.*

GENERAL NOTES

Switches.—S1-S4 are the waveband switches ganged in a sliding unit in location reference B1. Above the switch unit a detailed diagram of the contacts is drawn as seen when viewed from the rear of an upright chassis. **S1, S4** are closed on M.W. **S2, S3** are closed on L.W. **S5** and **S6** are the lid-operated battery switches and are shown in location reference C1.

Batteries.—The batteries recommended by the manufacturers are as follows: H.T., Ever Ready B126, rated at 90V; L.T., Ever Ready AD35, rated at 1.5V.



Underside view of chassis. The H.T. and L.T. sections of the printed circuit are shaded for easy identification.

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