Met dank aan Johan van Wijngaarden

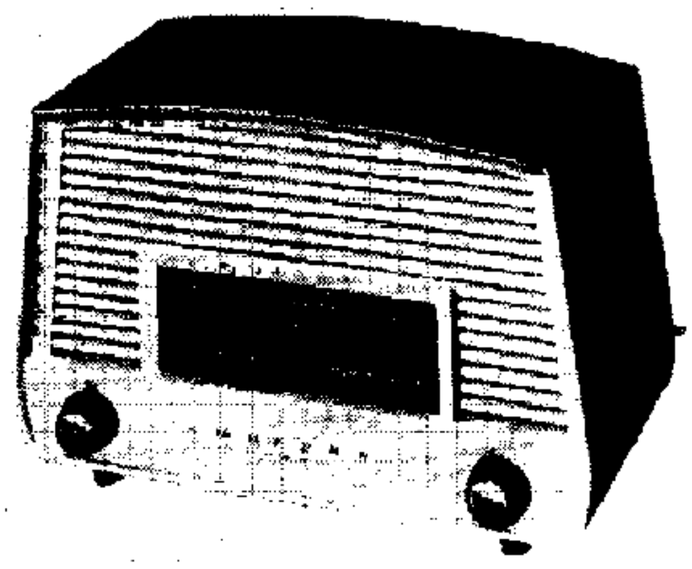
# MURPHY U198H & U198M

## *2-band Table Receivers for A.C. or D.C. Mains Operation*

THE Murphy U198H is a 2-band superhet receiver housed in a maroon plastics moulded cabinet and employing five valves and a ferrite rod aerial. It is designed to operate from A.C. or D.C. mains of 200-250V, 25-100c/s in the case of A.C. Average mains consumption is 41W.

Model U198M employs an identical chassis, but is housed in a two-tone maroon and cream cabinet.

*Release dates and original prices:* *U198H, April* 1954, £10 1s 5d; *U198M, March* 1954, £10 1s 5d. *Purchase tax extra.*



*Appearance of the U198M. This has a two-tone cabinet; the U198H is similar but has a single-tone cabinet.*

### CIRCUIT DESCRIPTION

Tuned ferrite rod aerial input **L1, C1, C3** (M.W.) and by **L2, C2** and **C3** (L.W.) precede triode-hexode frequency changer **V1.**

Parallel-fed local oscillator **V1a** is tuned by **L6, C12** and **C16** (M.W.) and by **L7, C11, C13, C14** and **C16** (L.W.). Series damping by **R3** on M.W.

**Intermediate frequency 470 kc/s.**

Variable-mu R.F. pentode **V2** operates as intermediate frequency amplifier with tuned transformer couplings **C6, L3, L4, C7; C17, L8, L9, C18.**

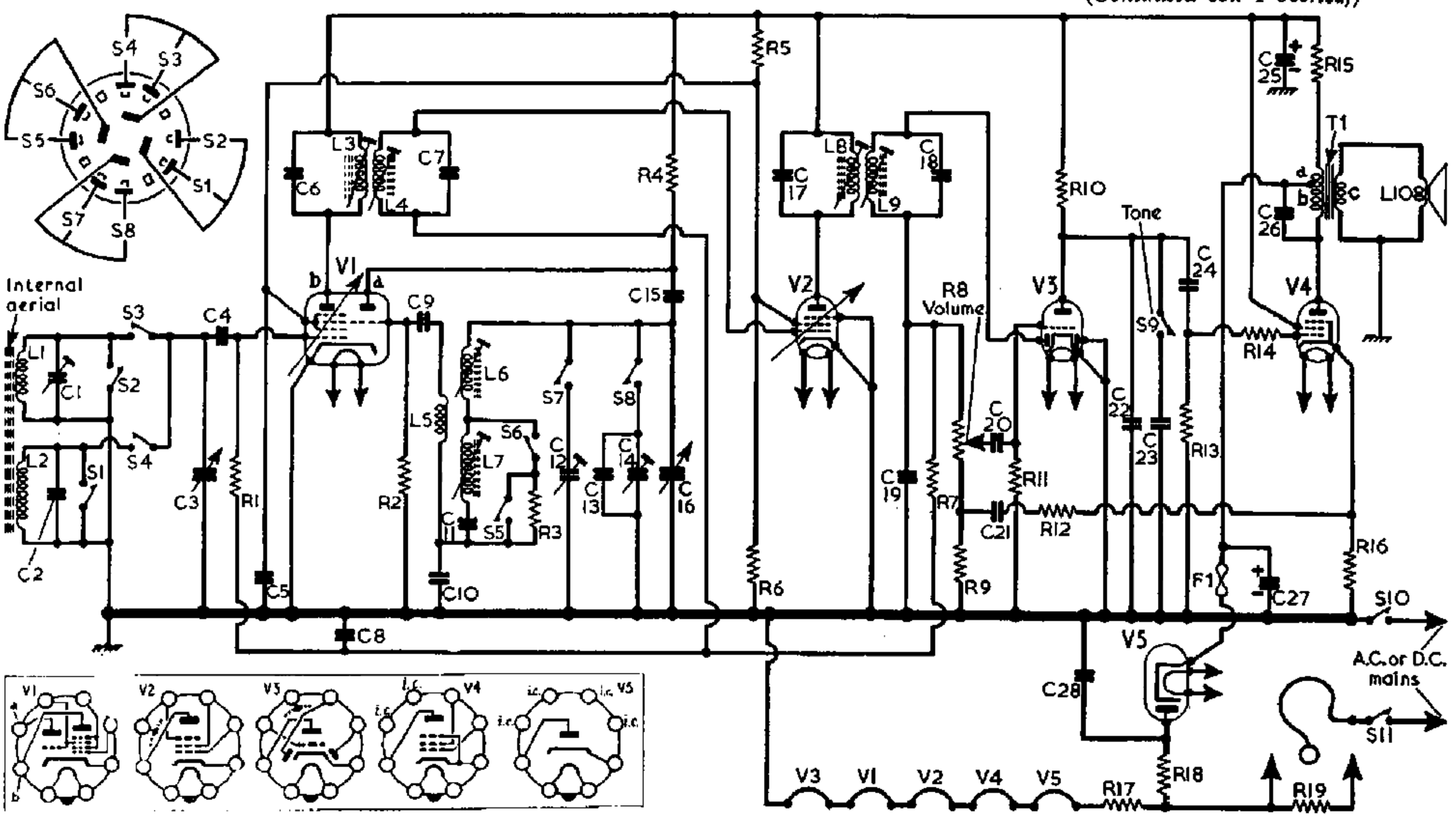
Diode signal detector is part of a double-diode-triode valve **V3.** Audio frequency component in its rectified output is developed across **R9** and volume control **R8,** and passed via **C20** to the control grid of **V3** triode section, which operates as A.F. amplifier. I.F. filtering by **C19.** The D.C. potential developed across **R8, R9** is fed back as bias via decoupling circuit **R7, C8** to **V1** and **V2,** giving automatic gain control.

Resistance-capacitance coupling by **R10, C24** to the control grid of pentode output valve **V4.** Tone correction is by frequency selective negative feedback derived from the un-bypassed cathode bias resistor **R16,** and fed via **R12, C21** to the coupling network formed by volume control **R8** and **R9. High** and middle frequencies are progressively at-

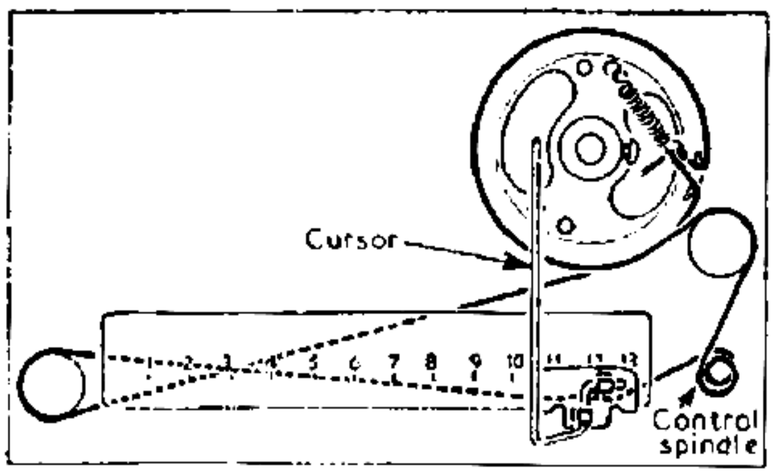
(*Continued col.* 1 *overleaf*)

| | | |
|---|---|---|
| **Resistors** | | |
| R1 | 1MΩ | F4 |
| R2 | 47kΩ | F4 |
| R3 | 10Ω | G4 |
| R4 | 27kΩ | F4 |
| R5 | 27kΩ | F4 |
| R6 | 68kΩ | F4 |
| R7 | 1·5MΩ | F4 |
| R8 | 500kΩ | D3 |
| R9 | 1·5kΩ | D3 |
| R10 | 220kΩ | E4 |
| R11 | 10MΩ | E4 |
| R12 | 10kΩ | D4 |
| R13 | 470kΩ | E4 |
| R14 | 100kΩ | E4 |
| R15 | 1·5kΩ | B2 |
| R16 | 220Ω | D4 |
| R17 | 934Ω | A1 |
| R18 | 160Ω | A1 |
| R19 | 168Ω | A1 |
| **Capacitors** | | |
| C1 | 35pF | F3 |
| C2 | 110pF | F4 |
| C3 | 528pF | C2 |
| C4 | 470pF | G4 |
| C5 | 0·04μF | G4 |
| C6 | 100pF | B1 |
| C7 | 100pF | B1 |
| C8 | 0·04μF | F4 |
| C9 | 68pF | C1 |
| C10 | 520pF | G4 |
| C11 | 390pF | C2 |
| C12 | 35pF | C1 |
| C13 | 145pF | G3 |
| C14 | 35pF | C2 |
| C15 | 100pF | G4 |
| C16 | 528pF | C2 |
| C17 | 100pF | B1 |
| C18 | 390pF | E4 |
| C19 | 270pF | E4 |
| C20 | 0·01μF | A2 |
| C21 | 0·02μF | D3 |
| C22 | 0·001μF | E4 |
| C23 | 0·01μF | E4 |
| C24 | 0·005μF | D4 |
| C25 | 32μF | B2 |
| C26 | 0·01μF | B2 |
| C27 | 32μF | B2 |
| C28 | 0·05μF | D4 |
| **Coils*** | | |
| L1 | — | G3 |
| L2 | 10·0 | E3 |
| L3 | 14·5 | B1 |
| L4 | 14·5 | B1 |
| L5 | — | C1 |
| L6 | 5·2 | C1 |
| L7 | 9·8 | C1 |
| L8 | 14·5 | B1 |
| L9 | 5·5 | B1 |
| L10 | 2·5 | A2 |
| **Other Components*** | | |
| T1 a | 6·3 | B2 |
| T1 b | 185·0 | B2 |
| T1 c | — | B2 |
| F1 | 250mA | E4 |
| S1-S8 | — | G4 |
| S9 | — | E4 |
| S10, S11 | — | D3 |

*Approximate D.C. resistance in ohms.




*Circuit diagram, valve base connections and switch diagram of the U198H.*




Above.—*Sketch of the tuning drive system as seen from the front of an upright chassis.*

### Circuit Description—*continued*

tenuated as the volume control settings are reduced, thus compensating for loss of low frequencies at low volume control settings. Tone control by **C23** via 2-position switch **S9**.

H.T. current is supplied by half-wave rectifying valve **V5**. Smoothing by **C27, R15** and **C25**. Hum neutralizing is achieved by passing H.T. current through winding **a** of output transformer **T1**.

## CIRCUIT ALIGNMENT

**Equipment Required.**—An accurately calibrated signal generator; an A.C. voltmeter for use as output meter; a coupling coil for use during R.F. alignment and consisting of 20 turns of wire wound on a 6in diameter former; a non-metallic trimming tool.

As it is necessary to remove the chassis from the cabinet for alignment purposes, an alignment calibration scale is provided, and is situated below the tuning scale backing plate.

### I.F. Stages

1.—Switch the receiver to M.W. and turn the volume control to maximum. Connect output meter across **T1** secondary winding. Connect signal generator via a 0.01μF capacitor to **V2** control grid (pin 6) and chassis. Tune the receiver to the 10.00 calibration mark on the alignment scale.

2.—Detune **L9** (B1) by unscrewing its core several turns. Feed in a 470kc/s signal and adjust **L8** (E4) and then **L9** (B1) for maximum output. Do not readjust **L8**.

3.—Connect signal generator across **C1** (F3). Unscrew **L4** (B1) several turns. Feed in a 470kc/s signal and adjust **L3** (F4) and then **L4** (B1) for maximum output. Do not readjust **L3**.

### R.F. and Oscillator Stages

4.—When the chassis is in the cabinet, check that with the gang at maximum the cursor coincides with the right-hand ends of the tuning scales. Connect the R.F. coupling coil to the signal generator output and place it about 1ft away from the R.F. end of the receiver, with its axis in line with the ferrite aerial rod.

5.—Switch the receiver to M.W. and tune it to 8.15 on the calibration scale. Feed in a 600kc/s signal and adjust **L6** (C1) for maximum output.

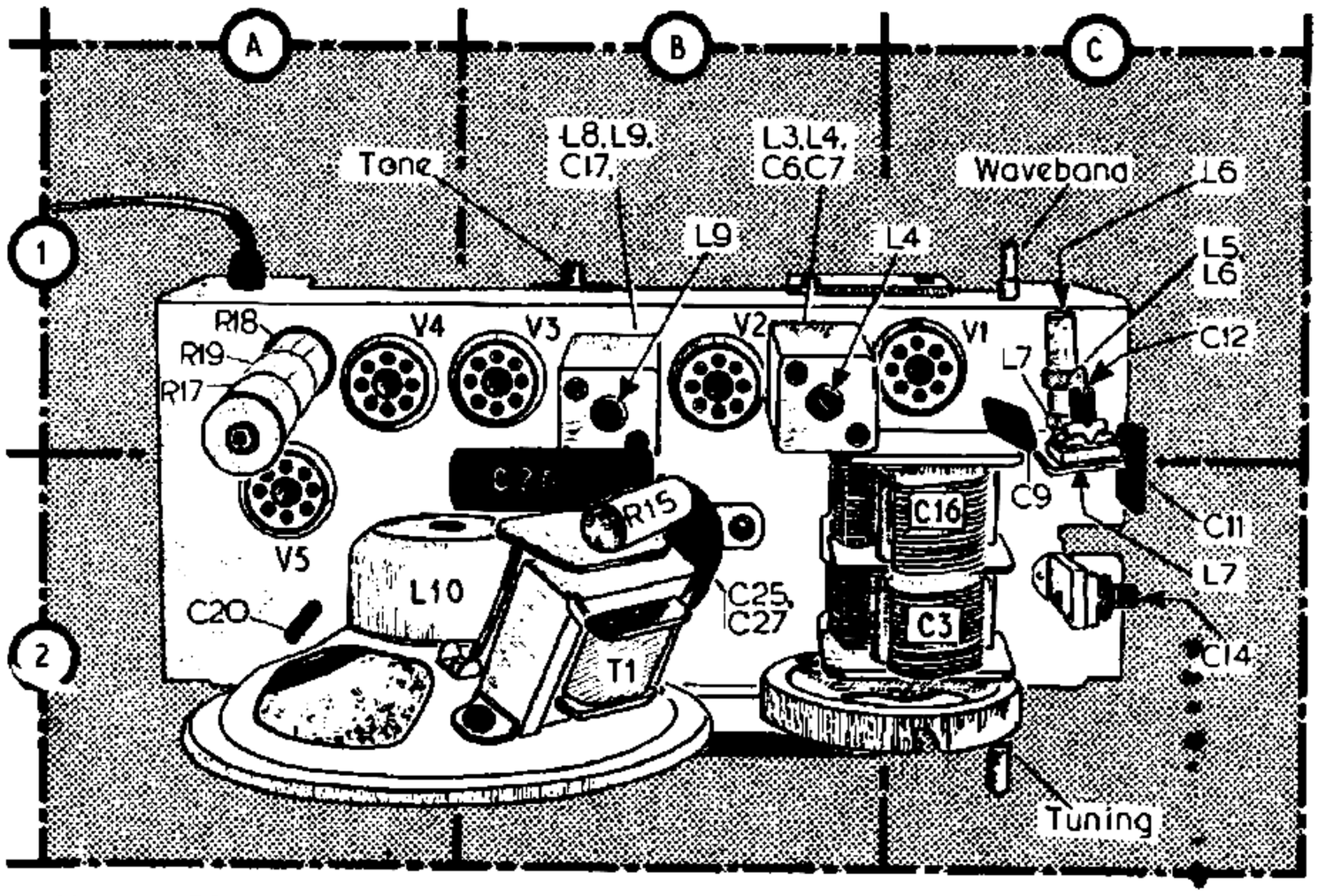
6.—Tune the receiver to 1.85 on the calibration scale. Feed in a 1,364kc/s signal and adjust **C12** (C1) and **C1** (F3) for maximum output.

7.—Repeat operations 5 and 6.

8.—Switch the receiver to L.W. and tune it to 7.35 on the calibration scale. Feed in a 176.5kc/s signal and adjust **L7** (C2) for maximum output.

9.—Tune the receiver to 1.05 on calibration scale. Feed in a 300kc/s signal and adjust **C14** (C2) for maximum output.

10.—Repeat operations 8 and 9.




*Above.—Plan view of the chassis.*

## GENERAL NOTES

**Switches.—S1-S8** are the waveband switches ganged in a single rotary unit beneath the chassis in location reference G4. The switch contacts are identified in the diagram shown in the top left-hand corner of the circuit diagram overleaf, where they are drawn as seen when viewed in the direction of the arrow in the under-chassis illustration. **S1, S3, S6** and **S7** close on M.W., while **S2, S4, S5** and **S8** close on L.W.

**Drive Cord Replacement.**—About 31in of nylon-braided glass yarn is required for a new drive cord, which should be run as shown in the sketch of the tuning drive system in col. 1, where it is drawn as viewed from the front of the chassis with the gang at maximum.

**Modifications.—S9** and **C23** may be omitted in early versions of this receiver. **V2** may be a UF41, and **V3** a UBC41. **C18** may be situated inside **L8, L9** I.F. transformer can. **C28** was 0.02μF but was increased to 0.05μF to avoid modulation hum.

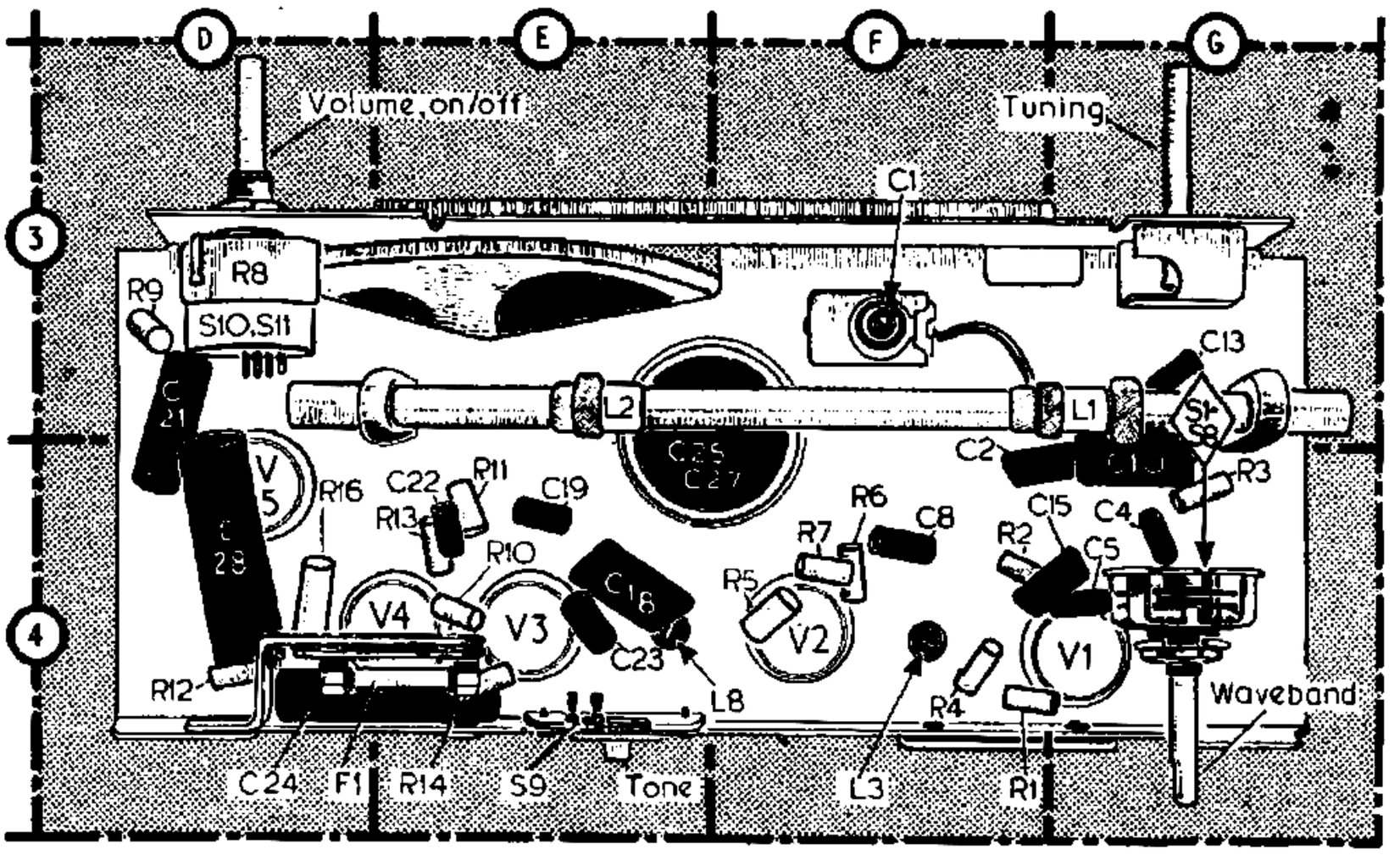
In Model U198M, **C28** is fitted in **L8, L9** I.F. transformer can. In later versions **L1** is spread instead of wave wound, and is connected in series with **L2** for L.W. operation. The D.C. resistance of **L2** is then 9.5Ω. **C1** and **C2** are then connected via a wavechange switch across **C3**. **C23** was changed to 0.005μF and **S9** was changed to a double-throw switch. **C23** was then connected directly to V3 anode. **S9** connected **C23** or **C21** to the junction of **R8** and **R9**, modifying the negative feed-back circuit.

**T1** may be modified in both models, in which case the D.C. resistance is: **a**, 6.3Ω; **b**, 200Ω.

## VALVE ANALYSIS

Valve voltages given in the table below are those derived from the manufacturers' information. Voltages were measured on a 20,000Ω/V meter, chassis being the negative connection in every case. The receiver was switched to M.W., but there was no signal input.

| Valve | | Anode (V) | Screen (V) | Cath. (V) |
|---|---|---|---|---|
| V1 UCH42 | mixer | 161 | 49 | — |
| | osc. | 75 | — | — |
| V2 10F9 | | 161 | 49 | — |
| V3 10LD3 | | 71 | — | — |
| V4 UL41 | | 183 | 161 | 9·5 |
| V5 UY41 | | — | — | 198·0 |




*Underside view of the chassis.* **S9, C23** *may be omitted in early versions.*

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