

BUSH - MB60

VALVE ANALYSIS

Valve voltages given in the table below are those derived from the manufacturer's information. They were measured on the 10V and 1,000V ranges of a Model 7 Avometer, chassis being the negative connection in every case.

The receiver was switched to M.W. and was operating from A.C. mains.

H.T. voltage measured at C37 was 105V; filament voltage measured at C40 was 1.3V, V5 bias voltage measured across R20 was -4.9V.

| Valve | Anode (V) | Screen (V) |
|-------------------|-----------|------------|
| V1 DK96 {mixer .. | 80 | 70 |
| V2 DF96 {osc. .. | 30 | — |
| V3 DF96 .. | 85 | 60 |
| V4 DAF96 .. | 85 | 60 |
| V5 DL96 .. | 15 | 15 |
| | 83 | 85 |

Resistors

| | | |
|-----|-------|----|
| R1 | 2.2MΩ | E4 |
| R2 | 100kΩ | E4 |
| R3 | 2.7kΩ | F4 |
| R4 | 27kΩ | E3 |
| R5 | 33kΩ | B1 |
| R6 | 33kΩ | E4 |
| R7 | 33kΩ | F3 |
| R8 | 27kΩ | F4 |
| R9 | 2.7MΩ | F4 |
| R10 | 2.7MΩ | F4 |
| R11 | 500kΩ | B1 |
| R12 | 10MΩ | F4 |
| R13 | 2.7MΩ | F4 |
| R14 | 1MΩ | F4 |
| R15 | 1.8MΩ | F4 |
| R16 | 330kΩ | F4 |
| R17 | 100kΩ | A1 |
| R18 | 10kΩ | C1 |
| R19 | 1kΩ | C1 |
| R20 | 560Ω | F4 |
| R21 | 1.8kΩ | C1 |
| R22 | 100Ω | C2 |
| R23 | 10Ω | B2 |
| R24 | 10Ω | B2 |

Coils*

| | | |
|----|------|----|
| L1 | — | E3 |
| L2 | — | E3 |
| L3 | — | D3 |
| L4 | 16.0 | A1 |
| L5 | 16.0 | A1 |
| L6 | 4.0 | B1 |
| L7 | 2.0 | B1 |
| L8 | 16.0 | A2 |

| | | |
|-----|------|----|
| L9 | 16.0 | A2 |
| L10 | 16.0 | A2 |
| L11 | 16.0 | A2 |
| L12 | 3.0 | C2 |

Capacitors

| | | |
|-----|---------|----|
| C1 | 1,800pF | F3 |
| C2 | 30pF | B1 |
| C3 | 523pF | A1 |
| C4 | 30pF | B1 |
| C5 | 160pF | B1 |
| C6 | 30pF | B1 |
| C7 | 560pF | E4 |
| C8 | 0.01μF | E3 |
| C9 | 0.04μF | F3 |
| C10 | 110pF | A1 |
| C11 | 110pF | A1 |
| C12 | 100pF | B1 |
| C13 | 523pF | A1 |
| C14 | 30pF | B1 |
| C15 | 30pF | B1 |
| C16 | 30pF | B1 |
| C17 | 450pF | B1 |
| C18 | 515pF | B1 |
| C19 | 0.01μF | B1 |
| C20 | 110pF | A2 |
| C21 | 110pF | A2 |
| C22 | 0.04μF | F3 |
| C23 | 0.04μF | F4 |
| C24 | 110pF | A2 |
| C25 | 110pF | A2 |
| C26 | 68pF | F4 |
| C27 | 3.3pF | F4 |
| C28 | 0.1μF | B1 |

| | | |
|-----|---------|----|
| C29 | 0.003μF | F4 |
| C30 | 0.01μF | F4 |
| C31 | 0.003μF | F4 |
| C32 | 0.003μF | F3 |
| C33 | 50μF | C2 |
| C34 | 0.01μF | B1 |
| C35 | 0.04μF | C1 |
| C36 | 0.1μF | E4 |
| C37 | 50μF | B2 |
| C38 | 20μF | C2 |
| C39 | 0.5μF | E3 |
| C40 | 3,000μF | A2 |
| C41 | 3,000μF | A2 |
| C42 | 1,000μF | B2 |

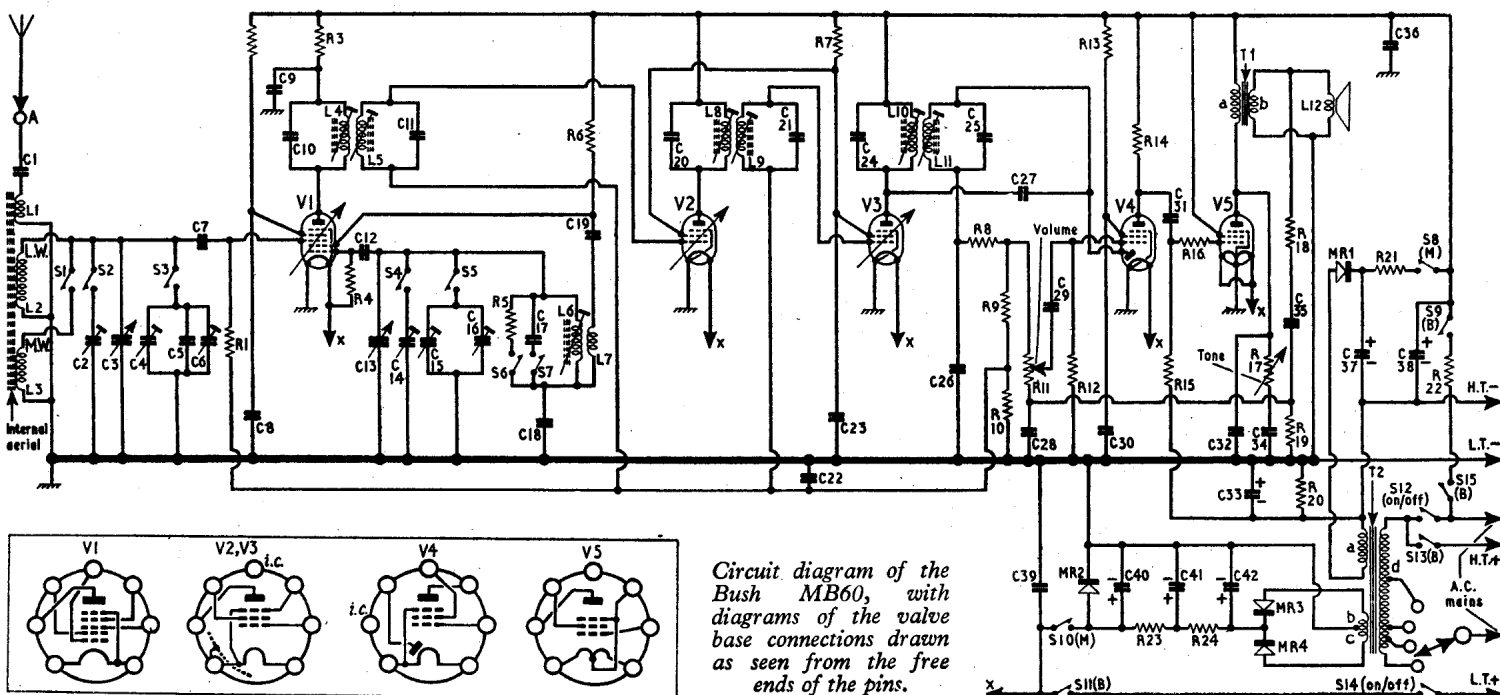
Miscellaneous*

| | | |
|----------|--------------|----|
| T1 | { a. 460.0 } | C1 |
| | { b. 0.2 } | |
| T2 | { a. 420.0 } | B2 |
| | { b. 0.8 } | |
| | { c. 0.8 } | |
| | { d. 770.0 } | |
| | (pri. total) | |
| MR1 | † | B2 |
| MR2-MR4 | ‡ | B2 |
| S1-S7 | — | B1 |
| S8-S11 | — | C1 |
| S12, S14 | — | A1 |
| S13, S15 | — | C2 |

*Approximate D.C. resistance in ohms.

†Westinghouse. 16RC1-1-8-1

‡S.T.C. FSX1634C



Circuit diagram of the Bush MB60, with diagrams of the valve base connections drawn as seen from the free ends of the pins.

CIRCUIT ALIGNMENT

Equipment Required.—An accurately calibrated signal generator, modulated 30 per cent at 400c/s; an output meter; a single loop of insulated wire to form a coupling loop; a 0.1μF capacitor; and a non-metallic screw-driver trimming tool.

The receiver and signal generator should be allowed to warm up for at least ten minutes before commencing the alignment procedure.

I.F. Stages

- 1.—Remove chassis from cabinet. Connect output meter across T1 secondary winding. Connect signal generator, via the 0.1μF capacitor, to V2 control grid (pin 6). Set the volume control to maximum and the tone control for maximum top response.
- 2.—Switch receiver to M.W. and tune it to 300m. Feed in a modulated 470kc/s signal and adjust the cores of L11 (A2), L10 (F4), L9 (A2) and L8 (F4) for maximum output, progressively reducing the signal generator output as the circuits are brought into line.
- 3.—Transfer the signal generator to V1 control grid (pin 6). Feed in a modulated 470kc/s signal and adjust the cores of L5 (A1) and L4 (F3) for maximum output. Disconnect signal generator.

R.F. and Oscillator Stages

- 4.—Check that with the tuning gang at maximum capacitance the cursor coincides with the datum line on the tuning scales. Couple the signal generator output to the receiver by means of the single loop of insulated wire placed about three feet from the receiver and with its plane at right angles to the ferrite rod aerial.
- 5.—With the receiver switched to M.W., tune it to 500m. Feed in a 600kc/s signal and adjust the core of L6 (B1) for maximum output.
- 6.—Tune receiver to 200m. Feed in a 1,500kc/s signal and adjust C14 (B1) and C2 (B1) for maximum output.
- 7.—Repeat operations 5 and 6.
- 8.—Switch receiver to L.W. and tune it to 1,400m. Feed in a 214kc/s signal and adjust C15 (B1), and C16 if necessary; and C4 (B1), and C6 if necessary, for maximum output.

- 9.—The ferrite rod L.W. aerial coil L2 (E3) has been aligned at the factory and should not be moved. Alignment of the M.W. ferrite rod aerial coil L3 (D3) will normally not be necessary. If alignment of L3 is essential, switch the receiver to M.W. and tune it to 500m. Feed in a 600kc/s signal and slide the former of L3 along the ferrite rod for maximum output, then seal the former of L3 to the ferrite rod to prevent it from moving.