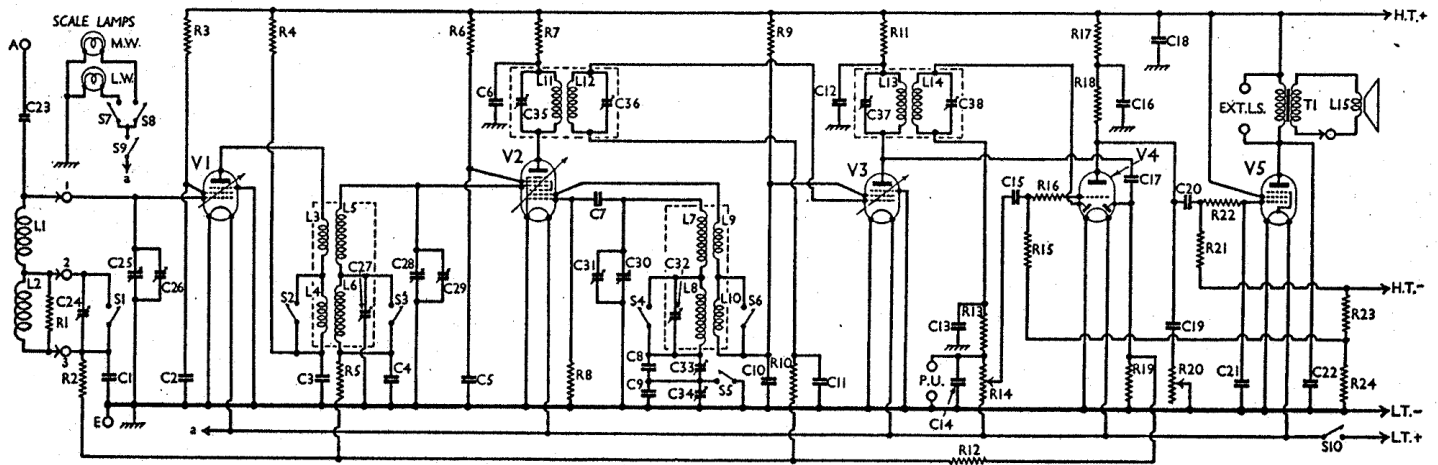


BUSH - BP 5



Circuit diagram of the Bush BP5 transportable battery superhet. Note the scale lamp switching. L1 and L2 are the frame aerial windings. The circles indicated by the figures 1, 2 and 3 show the points of connection between the frame aerials and the chassis wiring.

COMPONENTS AND VALUES

| Resistances | | Values (ohms) |
|-------------|--|---------------|
| R1 | L.W. frame shunt | 100,000 |
| R2 | V1 C.G. decoupling | 1,000,000 |
| R3 | V1 S.G. H.T. feed | 100,000 |
| R4 | V1 anode decoupling | 10,000 |
| R5 | V2 pentode C.G. decoupling .. | 1,000,000 |
| R6 | V2 S.G.'s H.T. feed | 100,000 |
| R7 | V2 pent. anode decoupling .. | 10,000 |
| R8 | V2 osc. C.G. resistance | 70,000 |
| R9 | V2 osc. anode decoupling and V3 S.G. H.T. feed | 10,000 |
| R10 | V3 C.G. decoupling | 1,000,000 |
| R11 | V3 anode decoupling | 10,000 |
| R12 | A.V.C. line decoupling | 1,000,000 |
| R13 | I.F. stopper | 50,000 |
| R14 | V4 signal diode load; vol. control | 500,000 |
| R15 | V4 triode C.G. resistance | 5,000,000 |
| R16 | V4 triode C.G. I.F. stopper .. | 500,000 |
| R17 | V4 triode anode decoupling .. | 20,000 |
| R18 | V4 triode anode load | 20,000 |
| R19 | V4 A.V.C. diode load | 1,000,000 |
| R20 | Variable tone control | 50,000 |
| R21 | V5 C.G. resistance | 500,000 |
| R22 | V5 C.G. I.F. stopper | 100,000 |
| R23 | Automatic G.B. resistances { | 350 |
| R24 | | 250 |

| Other Components | | Approx. Values (ohms) |
|------------------|-----------------------------------|-----------------------|
| L1 | Frame aerial windings { | 1.3 |
| L2 | | 3.8 |
| L3 | H.F. transformer primary { | 3.3 |
| L4 | | 8.0 |
| L5 | H.F. transformer secondary { | 3.3 |
| L6 | | 14.0 |
| L7 | Oscillator grid tuning coils { | 4.0 |
| L8 | | 8.0 |
| L9 | Oscillator anode reaction coils { | 2.0 |
| L10 | | 2.6 |
| L11 | 1st I.F. trans. { Pri. .. | 65.0 |
| L12 | | 65.0 |
| L13 | 2nd I.F. trans. { Pri. .. | 65.0 |
| L14 | | 65.0 |
| L15 | Speaker speech coil | 2.0 |
| Tr | Speaker input trans. { Pri. .. | 700.0 |
| | | 0.25 |
| S1-S6 | Waveband switches | — |
| S7-S9 | Scale lamp switches | — |
| S10 | L.T. switch, ganged R14 .. | — |

| Condensers | | Values (μF) |
|------------|--|-------------|
| C1 | V1 C.G. decoupling | 0.1 |
| C2 | V1 S.G. by-pass | 0.1 |
| C3 | V1 anode decoupling | 0.1 |
| C4 | V2 pentode C.G. decoupling .. | 0.1 |
| C5 | V2 S.G.'s by-pass | 0.1 |
| C6 | V2 pent. anode decoupling .. | 0.1 |
| C7 | V2 osc. C.G. condenser | 0.0005 |
| C8 | Oscillator M.W. tracker | 0.002 |
| C9 | Oscillator L.W. tracker | 0.0018 |
| C10 | V2 osc. anode decoupling and V3 S.G. by-pass | 0.1 |
| C11 | V3 C.G. decoupling | 0.1 |
| C12 | V3 anode decoupling | 0.1 |
| C13 | I.F. by-passes | 0.0001 |
| C14 | | 0.0001 |
| C15 | L.F. coupling to V4 triode .. | 0.02 |
| C16 | V4 triode anode decoupling .. | 0.1 |
| C17 | Coupling to V4 A.V.C. diode .. | 0.0001 |
| C18 | H.T. supply reservoir | 2.0 |
| C19 | Part of tone control circuit .. | 0.02 |
| C20 | V4 to V5 L.F. coupling | 0.03 |
| C21 | V5 C.G. I.F. by-pass | 0.0003 |
| C22 | Fixed tone corrector | 0.001 |
| C23 | External aerial coupling | Very low |
| C24† | Frame aerial L.W. trimmer .. | — |
| C25† | Frame aerial tuning | — |
| C26† | Frame aerial trimmer | — |
| C27† | H.F. trans. L.W. trimmer .. | — |
| C28† | H.F. trans. tuning | — |
| C29† | H.F. trans. trimmer | — |
| C30† | Oscillator tuning | — |
| C31† | Oscillator trimmer | — |
| C32§ | Oscillator L.W. trimmer .. | — |
| C33† | Oscillator M.W. tracker | — |
| C34† | Oscillator L.W. tracker | — |
| C35† | 1st I.F. trans. pri. tuning .. | — |
| C36† | 1st I.F. trans. sec. tuning .. | — |
| C37† | 2nd I.F. trans. pri. tuning .. | — |
| C38† | 2nd I.F. trans. sec. tuning .. | — |

† Variable. ‡ Pre-set.

§ One pre-set and one 0.00003 μF fixed condenser in parallel.

The I.F. transformers are in two screened units on the chassis deck, and the trimmers are of the dual type, the hexagonal nuts adjusting the primary trimmers, and the central grub screws the secondaries. The L13, L14 transformer also contains the fixed condenser C17.

Scale Lamps.—These are two Osram M.E.S. types, rated at 2.5 V, 0.3 A. They are individually switched on the M.W. and L.W. bands, and neither of them lights until the master control S9 is closed by pushing in the volume control.

Batteries.—L.T., Exide celluloid-cased 2 V 30 AH cell, type CZH3. H.T., Drydex 144 V battery. Grid bias is automatic.

VALVE ANALYSIS

Valve voltages and currents given in the table below are those measured in our receiver when it was operating from a new H.T. battery reading 150 V. The volume control was at maximum and the receiver was tuned to the lowest wavelength on the medium band but there was no signal input as the frame connections were shorted together.

Voltages were measured on the 1,200 V scale of an Avometer, with chassis as negative.

| Valve | Anode Volts | Anode Current (mA) | Screen Volts | Screen Current (mA) |
|----------|-------------|--------------------|--------------|---------------------|
| V1 VP2 | 125 | 1.0 | 80 | 0.4 |
| V2 FC2* | 130 | 0.6 | 55 | 0.8 |
| V3 VP2 | 115 | 2.4 | 120 | 0.7 |
| V4 TDD2A | 108 | 0.5 | — | — |
| V5 PM22A | 138 | 2.8 | 140 | 0.9 |

* Osc. anode (G2) 120 V, 0.8 mA.

GENERAL NOTES

Switches.—S1-S8 are in a single unit beneath the chassis, seen in our under-chassis view. All the switches, except S7 (nearest the control knob) are closed on the M.W. band and open on the L.W. band. S7 is open on the M.W. band and closed on the L.W. band.

S9 is the scale lamp master switch, which closes when the volume control and battery switch knob is pushed in. S10 is the Q.M.B. L.T. battery switch, ganged with the volume control R14.

Coils.—L1 and L2, the frame aerials, are mounted on the inside of the hinged back of the cabinet, and are connected to the chassis by plugs and sockets which are colour-coded. The points at which the connections are made are indicated in our circuit diagram by the figures 1, 2 and 3, and the sockets seen in the plan chassis view are similarly marked.

L3-L6 and L7-L10 are in two screened units beneath the chassis. These units also contain the pre-set condensers C27 and C32, which are adjustable through holes in the vertical partition carrying the coil units. The coil screens are held in position by bayonet fittings, but that belonging to the L7-L10 unit is only removable if the volume control and battery switch assembly is first detached from the front of the chassis, where it is held by two screws. This coil unit also contains the fixed condenser C7, and another small fixed condenser (0.0003 μF) wired in parallel with the pre-set condenser C32.