



COMPONENTS AND VALUES

| RESISTANCES | | Values (ohms) |
|-------------|-------------------------|---------------|
| R1 | V1 fixed G.B. | 200 |
| R2 | V1 osc. C.G. resistance | 50,000 |
| R3 | V1 S.G. H.T. feed | 50,000 |
| R4 | V1 osc. anode H.T. feed | 50,000 |
| R5 | V2 fixed G.B. | 150 |
| R6 | A.V.C. line decoupling | 1,000,000 |
| R7 | I.F. stopper | 50,000 |
| R8 | V3 signal diode load | 500,000 |
| R9 | Manual volume control | 500,000 |
| R10 | V3 A.V.C. diode load | 300,000 |
| R11 | resistances | 200,000 |
| R12 | V4 G.B. resistance | 170 |

| CONDENSERS | | Values (μF) |
|------------|-----------------------------|-------------|
| C1 | Aerial isolating condenser | 0.002 |
| C2 | Earth isolating condenser | 0.02 |
| C3 | V1 cathode by-pass | 0.1 |
| C4 | V1 osc. C.G. condenser | 0.00015 |
| C5 | A.V.C. line decoupling | 0.1 |
| C6 | V1 S.G. decoupling | 0.1 |
| C7 | V1 osc. anode decoupling | 0.1 |
| C8 | V2 cathode by-pass | 0.1 |
| C9 | I.F. by-passes | 0.00015 |
| C10 | A.F. coupling to R9 | 0.0015 |
| C11 | P.U. isolating condenser | 0.05 |
| C12 | Coupling to V3 A.V.C. diode | 0.0025 |
| C13 | Mains R.F. by-pass | 0.02 |
| C14 | Tone corrector | 0.01 |
| C15 | V4 cathode by-pass | 25.0 |
| C16* | H.T. smoothing | 12.0 |
| C17* | Mains aerial coupling | 8.0 |
| C18* | Band-pass primary tuning | 0.00025 |
| C19† | Band-pass primary trimmer | — |
| C20† | Band-pass secondary tuning | — |
| C21† | Band-pass secondary trimmer | — |
| C22† | Oscillator circuit tuning | — |
| C23† | Oscillator circuit trimmer | — |
| C24† | Oscillator L.W. tracker | 0.0007 |
| C25† | 1st I.F. trans. pri. tuning | — |
| C26† | 1st I.F. trans. sec. tuning | — |
| C27† | 2nd I.F. trans. pri. tuning | — |
| C28† | 2nd I.F. trans. sec. tuning | — |
| C29† | — | — |
| C30† | — | — |

* Electrolytic. † Variable. ‡ Pre-set.

| OTHER COMPONENTS | | Approx. Values (ohms) |
|------------------|-------------------------------|-----------------------|
| L1 | Aerial M.W. coupling coil | 25.0 |
| L2 | Aerial L.W. coupling coil | 28.0 |
| L3 | Band-pass M.W. primary coil | 1.5 |
| L4 | Band-pass L.W. primary coil | 9.0 |
| L5 | Band-pass M.W. coupling coil | 0.2 |
| L6 | Band-pass L.W. coupling coil | 1.0 |
| L7 | Band-pass M.W. secondary coil | 1.5 |
| L8 | Band-pass L.W. secondary coil | 9.0 |
| L9 | Osc. circuit M.W. tuning coil | 1.3 |
| L10 | Osc. circuit L.W. tuning coil | 7.0 |
| L11 | Osc. anode M.W. reaction | 1.2 |

If there are two peaks, the correct one is the second reached when unscrewing C25 from maximum capacity. C23 and C21 are then adjusted for maximum output.

The set is then switched to the L.W. band, a signal of about 1,400 m. is injected, and tuned in. C26 is then adjusted for maximum output, rocking the gang slightly if necessary to obtain the optimum setting.

VALVE ANALYSIS

Valve voltages and currents given in the table below are those measured in our receiver when it was operating on A.C. mains of 235 V. The receiver was tuned to the lowest wavelength on the medium band and the volume control was at maximum, but there was no signal input. Voltages were measured on the 1,200 V scale of an Avometer, chassis being negative.

| Valve | Anode Voltage (V) | Anode Current (mA) | Screen Voltage (V) | Screen Current (mA) |
|-----------|-------------------|--------------------|--------------------|---------------------|
| V1 FC13C* | 205 | 1.2 | 70 | 2.9 |
| V2 VP13C | 205 | 11.3 | 205 | 4.1 |
| V3 2D13C | — | — | — | — |
| V4 Pen36C | 185 | 41.0 | 205 | 5.7 |
| V5 UR1C† | — | — | — | — |

* Oscillator anode 90 V, 2.5 mA.
† Cathode to chassis 225 V, D.C.

GENERAL NOTES

Switches.—S1-S4 are the waveband switches in a single unit beneath the chassis. The individual switches are clearly marked in our under-chassis view. All the switches are *closed* on the M.W. band and *open* on the L.W. band. Note that one contact of S2 and S3, and one of S1 and S4 is common. The 740 radiogram has some extra switches, described under "Radiogram Modifications."

S5 is the Q.M.B. mains switch, ganged with the volume control R9.

Coils.—The band-pass and oscillator coils are in three screened units on the chassis deck, while the I.F. transformers L13, L14 and L15, L16 are in two further screened units, also on the chassis deck, provided with trimmers adjusted by concentric nuts and screws. The chokes L21, L22 are beneath the chassis.

Scale Lamp.—This is an Osram M.E.S. type, rated at 6.2 V, 0.3 A.

External Speaker.—Two screw terminals on the internal speaker terminal panel are provided for the connection of an external high resistance speaker.

Condenser C26.—The oscillator L.W. tracker is adjusted through a hole in the chassis deck between the V1 and V2 valveholders.

Condensers C17, C18.—These are two dry electrolytics with a common negative (black) lead. The red lead is the positive of C17 (12 μF) and the yellow the positive of C18 (8 μF).

RADIO-GRAM MODIFICATIONS

Basically the 740 radio-gram has a circuit similar to the 540 table and 640 console models. There are, however, certain additions and modifications.

In the first place, instead of the pick-up sockets being in series with C12 across R9 as in our diagram (which, incidentally, necessitates the use of a pick-up with a fairly large output), one of them is connected to chassis and the other to one of the outer contacts of an extra single-pole changeover switch. The lead from L14 to the junction of C5 and R6 is broken, and taken to the centre contact of the switch, the junction going to the third contact of the switch.

The lead from L15 to the H.T. line is broken, and two resistances in series are inserted. That nearest L15 is 5,000 Ω, and that nearest the H.T. line is 2,000 Ω. A condenser of 0.002 μF is connected from the top of L15 to chassis, and another of 2 μF (electrolytic) is connected from the junction of the two extra resistances to chassis.

The lead from C11 to R7 is broken and taken to the centre contact of another S.P.C.O. switch. The junction of R7 and C9 is taken to one outer contact of this switch, while from the remaining outer contact a lead goes to the junction of L15 and the 5,000 Ω extra resistance and 0.002 μF condenser.

A tone control circuit, consisting of a 0.05 μF fixed condenser and a 250,000 Ω variable resistance in series is connected across the primary of T1.

It will be seen that on radio the circuit is the same as in the table model, except for the extra resistances and condensers in the anode circuit of V2, (which provide a certain amount of decoupling), and the variable tone control.

On gramophone, V2 is used as an R.C. amplifier, and the radio circuit is fully muted.

The extra switches are accommodated on the wave-change switch assembly, and a gramophone position is provided.

CIRCUIT ALIGNMENT

Circuit alignment follows normal practice. The I.F. transformers are first aligned at 117.5 KC/S, feeding the signal generator output between the top cap of V1 and earth, and adjusting the trimmers C27, C28, C29 and C30 in turn for maximum output.

A signal of about 220 m. is now fed into the aerial and earth sockets, the scale pointer set to the same wavelength, and C25 is adjusted.