

COMPONENTS AND VALUES

| RESISTANCES | | Values (ohms) |
|-------------|-----------------------------------|---------------|
| R1 | V1 C.G. resistance | 500,000 |
| R2 | V1 C.G. decoupling resistance | 500,000 |
| R3 | Aerial circuit stabiliser | 50 |
| R4 | Osc. anode reaction S.W.1 damping | 50 |
| R5 | Osc. anode reaction S.W.2 damping | 250 |
| R6 | V2 C.G. resistance | 50,000 |
| R7 | V3 C.G. decoupling resistance | 500,000 |
| R8 | V4 signal diode load | 500,000 |
| R9 | V.F. stopper | 50,000 |
| R10 | Manual volume control | 500,000 |
| R11 | V4 triode anode load | 100,000 |
| R12 | V4 A.V.C. diode load resistances | 1,000,000 |
| R13 | V5 C.G. resistance | 500,000 |
| R14 | V5 C.G. resistance | 1,000,000 |
| R15 | V5 C.G. I.F. stopper | 50,000 |

| OTHER COMPONENTS (Continued) | | Approx. Values (ohms) |
|------------------------------|---|-----------------------|
| L10 | Osc. anode S.W.1 reaction | 0.4 |
| L11 | Osc. circuit S.W.2 tuning coil | 0.3 |
| L12 | Osc. anode S.W.2 reaction | 34.0 |
| L13 | Osc. circuit M.W. tuning coil | 3.8 |
| L14 | Osc. anode M.W. reaction | 60.0 |
| L15 | Osc. circuit L.W. tuning coil | 4.6 |
| L16 | Osc. anode L.W. reaction | 1.5 |
| L17 | 1st I.F. trans. { Pri. 5.0 { Sec. 5.0 | 5.0 |
| L18 | | |
| L19 | 2nd I.F. trans. { Pri. 5.0 { Sec., total 5.0 | 5.0 |
| L20 | | |
| L21 | Speaker speech coil | 2.5 |
| L22 | Speaker input trans. { Pri. 700.0 { Sec. 0.4 | 700.0 |
| S1-S18 | Waveband switches | — |
| S19 | Scale lamp switch | — |
| S20 | L.T. circuit switch, ganged R10 | — |

| Switch | Gram. (G) | S.W.1 (1) | S.W.2 (2) | M.W. (3) | L.W. (4) |
|--------|-----------|-----------|-----------|----------|----------|
| S1 | — | C | — | — | — |
| S2 | — | — | C | — | — |
| S3 | — | — | — | C | — |
| S4 | — | — | — | — | C |
| S5 | — | C | — | — | — |
| S6 | — | — | C | — | — |
| S7 | — | — | — | C | — |
| S8 | — | — | — | — | C |
| S9 | C | — | — | — | — |
| S10 | — | C | — | — | — |
| S11 | — | — | C | — | — |
| S12 | — | — | — | C | — |
| S13 | — | — | — | — | C |
| S14 | C | — | — | — | — |
| S15 | — | C | — | — | — |
| S16 | — | — | C | — | — |
| S17 | — | — | — | C | — |
| S18 | — | — | — | — | C |

| CONDENSERS | | Values (μF) |
|------------|----------------------------------|-------------|
| C1 | V1 C.G. condenser | 0.0001 |
| C2 | V1 C.G. decoupling | 0.1 |
| C3 | V1, V3 S.G.'s by-pass condensers | 0.1 |
| C4 | V2 C.G. condenser | 0.0001 |
| C5 | Osc. circuit L.W. fixed trimmer | 0.00004 |
| C6 | Osc. circuit S.W.1 tracker | 0.005 |
| C7 | V3 C.G. decoupling | 0.1 |
| C8 | I.F. by-pass | 0.0001 |
| C9 | Coupling to V4 A.V.C. diode | 0.0001 |
| C10 | Fixed tone corrector | 0.001 |
| C11 | A.F. coupling to V4 triode | 0.05 |
| C12 | I.F. by-pass | 0.0005 |
| C13 | A.F. coupling to V5 | 0.05 |
| C14 | Tone corrector | 0.001 |
| C15 | H.T. circuit R.F. by-passes | 0.1 |
| C16 | Aerial circuit S.W.1 trimmer | 0.25 |
| C17 | Aerial circuit S.W.2 trimmer | — |
| C18 | Aerial circuit M.W. trimmer | — |
| C19 | Aerial circuit L.W. trimmer | — |
| C20 | Aerial circuit tuning | — |
| C21 | Oscillator circuit tuning | — |
| C22 | Osc. circuit S.W.1 trimmer | — |
| C23 | Osc. circuit S.W.2 trimmer | — |
| C24 | Osc. circuit M.W. trimmer | — |
| C25 | Osc. circuit L.W. trimmer | — |
| C26 | Osc. circuit S.W.2 tracker | — |
| C27 | Osc. circuit M.W. tracker | — |
| C28 | Osc. circuit L.W. tracker | — |
| C29 | 1st I.F. trans. pri. tuning | — |
| C30 | 1st I.F. trans. sec. tuning | — |
| C31 | 2nd I.F. trans. pri. tuning | — |
| C32 | 2nd I.F. trans. sec. tuning | — |

† Variable. ‡ Pre-set.

| OTHER COMPONENTS | | Approx. Values (ohms) |
|------------------|--------------------------------|-----------------------|
| L1 | Aerial S.W.1 coupling coil | 1.4 |
| L2 | Aerial S.W.1 tuning coil | 0.05 |
| L3 | Aerial S.W.2 coupling coil | 0.4 |
| L4 | Aerial S.W.2 tuning coil | 0.4 |
| L5 | Aerial M.W. coupling coil | 1.2 |
| L6 | Aerial M.W. tuning coil | 2.1 |
| L7 | Aerial L.W. coupling coil | 100.0 |
| L8 | Aerial L.W. tuning coil | 9.0 |
| L9 | Osc. circuit S.W.1 tuning coil | 0.05 |

R.F. and Oscillator Stages.—Connect signal generator to A and E sockets. Switch set to L.W., tune to 750 m. on scale, feed in a 750 m. signal, and adjust C27, then C21 for maximum output. Feed in a 2,000 m. signal, tune it in on receiver, and adjust C30 for maximum output, rocking the gang slightly for optimum results. Re-trim C27 and C21 and re-track C30 until no further improvement results. On the M.W. (3) band and S.W.2 (2) band a similar procedure is adopted. On M.W., adjust C26 and C20 at 200 m. and C29 at 550 m. On S.W.2, adjust C25 and C19 at 50 m., and C23 at 170 m. On the S.W.1 (1) band, there is no variable tracker, so C24 and C18 are adjusted at 13.5 m. Trimming is very critical on this band, and care must be taken to see that the pressure of the trimming tool is not affecting the process. If a dummy aerial is used with the signal generator, it should be replaced by a

VALVE ANALYSIS
Valve voltages and currents given in the table below are those measured in our receiver when it was operating with a new H.T. battery reading 138 V on the H.T. section, on load. The receiver was tuned to the lowest wavelength on the medium wave 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 VP2B | 138 | 0.7 | 55 | 0.9 |
| V2 210DET | 138 | 5.3 | — | — |
| V3 VP2B | 138 | 1.7 | 55 | 0.6 |
| V4 1DD2A | 78 | 0.5 | — | — |
| V5 FM22A | 133 | 5.2 | 138 | 0.8 |

GENERAL NOTES

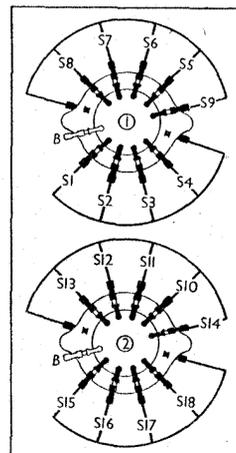
Switches.—The wavechange and gramophone switches S1-S18 are in two ganged rotary units beneath the chassis, indicated in our under-chassis view, and shown in detail in the diagrams on this page. It will be noted on examining the actual units that each has a large plate on the rotor which shorts together all the switches, except the two in use in each unit. On gram. the switches S9 and S14 mute the radio circuits.

The makers' diagram shows the two contacts which are marked blank (B) in our diagrams connected to chassis and H.T. line respectively. This modification would add two switches which would provide extra muting on gram.

In our circuit and switch diagrams we have omitted the switches formed by the centre plates for the sake of clarity. If they were included the total number of wavechange and gramophone switches would rise from eighteen to thirty-six.

The table below gives the switch positions for the five control settings, starting from fully anti-clockwise. A dash indicates open, and C closed.

Remove short from C23 and replace normal top cap of V1.



Switch diagrams, looking from the rear of the underside of the chassis. These have been simplified as explained above.

S19 is the scale lamp switch, incorporated in the volume control knob. It is normally open, but when the small button is pressed, it closes and switches on the scale lamps.

S20 is the L.T. circuit switch, ganged with the volume control, R10.

Coils.—L1, L2; L3, L4; L9, L10 and L11, L12 are on four tubular un-screened units beneath the chassis. L5-L8, L13-L16, and the I.F. transformers L17, L18 and L19, L20 are in four screened units on the chassis deck.

Scale Lamps.—These are two Osram M.E.S. types, rated at 2.5 V, 0.2 A. They are switched in circuit by S19.

CIRCUIT ALIGNMENT

For alignment the volume control should be at maximum. With the gang fully meshed the pointer should coincide with the two ends of the scales.

I.F. Stages.—Remove the grid connector from the top of V1, and connect signal generator to top cap of the valve and chassis, with a 0.25 MO resistance across these two points. Short C23.

Feed in a 473 KC/S (634.2 m.) signal, and adjust C34, C33, C32 and C31 in that order for maximum output. Repeat with low signal input, and check by swinging generator from 468 to 478 KC/S, noting that resonance occurs exactly at 473 KC/S.