

V1 and V3 are both R.F. hexodes.

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	I.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		5.0
L19	2nd I.F. trans. { Pri. . . . . 5.0 { Sec., total . . . . . 5.0	5.0
L20		5.0
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	0.1
C5	Osc. circuit L.W. fixed trimmer	0.0001
C6	Osc. circuit S.W.1 tracker	0.0004
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	—
C33	—	—
C34	—	—

† Variable. ‡ Pre-set.

**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 PM22A	133	5.2	138	0.8

GENERAL NOTES

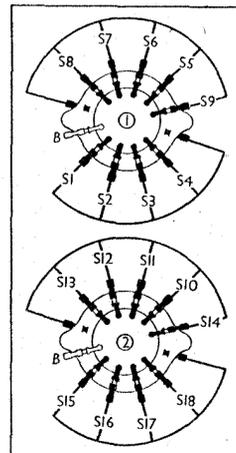
**Switches.**—The wavechange and gramophone switches S1-S18 are in two ganged rotary units beneath the chassis, indicated in our under-chassis view, and shown in detail in the diagrams on this page. It will be noted on examining the actual units that each has a large plate on the rotor which shorts together 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.

**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 C28 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