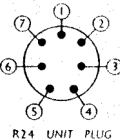
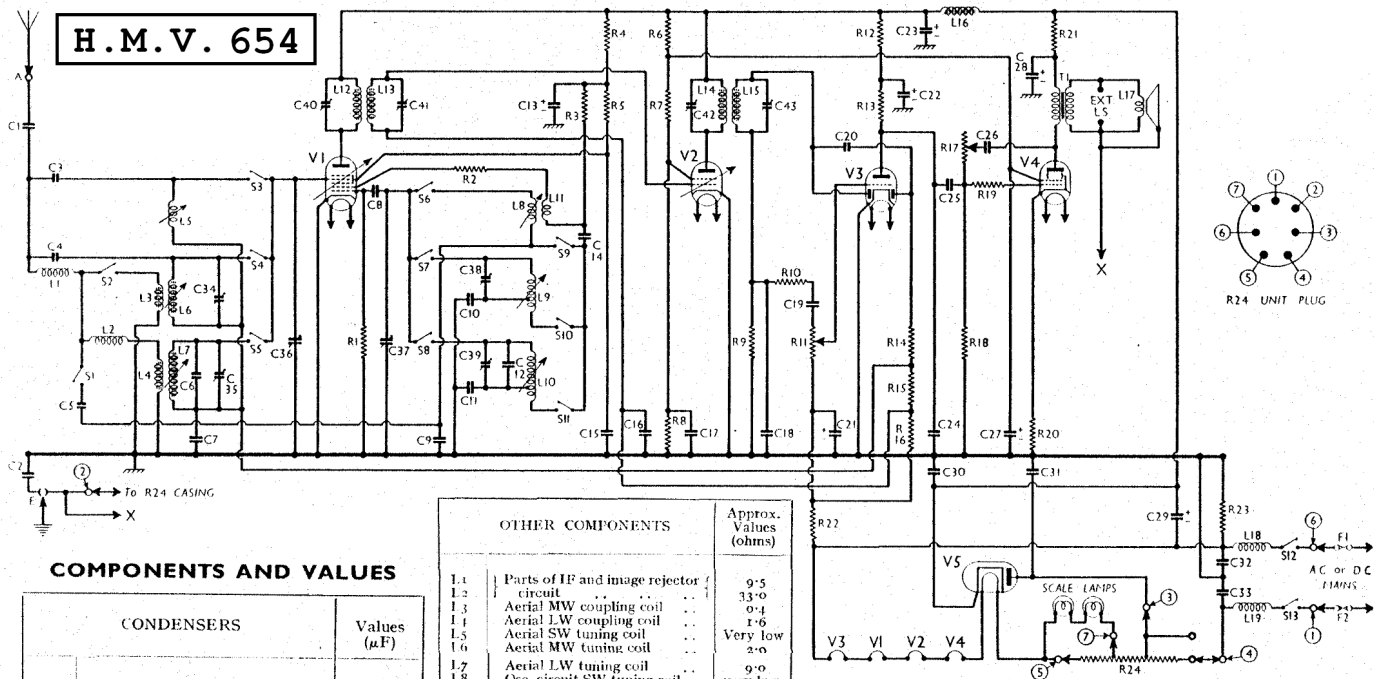


# H.M.V. 654



## COMPONENTS AND VALUES

CONDENSERS	Values (μF)
C1 Aerial isolating condenser	0.0001
C2 Earth isolating condenser	0.01
C3 Aerial SW coupling	0.000015
C4 Image rejector condensers	0.0000023
C5 Aerial LW fixed trimmer	0.00005
C6 V1 tetrode CG decoupling	0.05
C7 V1 osc. CG condenser	0.0001
C8 Osc. circuit SW tracker	0.005
C9 Osc. circuit MW tracker	0.00055
C10 Osc. circuit LW tracker	0.0003
C11 Osc. circ. LW fixed trimmer	0.000175
C12 V1 osc. anode and SG decoupling	4.0
C13 V1 osc. anode coupling	0.005
C14 V1 SG RF by-pass	0.05
C15 V2 CG decoupling	0.05
C16 V2 SG RF by-pass	0.05
C17 IF by-pass	0.0001
C18 AF coupling to V3 triode	0.001
C19 Coupling to V3 AVC diode	0.000075
C20 V3 triode CG decoupling	50.0
C21 V3 triode anode decoupling	1.0
C22 Part of HT smoothing	8.0
C23 IF by-pass	0.00035
C24 V3 triode to V4 AF coupling	0.023
C25 Part of variable tone control	0.0005
C26 V4 SG decoupling	4.0
C27 V4 anode decoupling	32.0
C28 Part HT smoothing	16.0
C29 V5 cathode RF by-pass	0.05
C30 V5 anode RF by-pass	0.05
C31 Mains RF by-pass condensers	0.01
C32 Aerial circuit MW trimmer	—
C33 Aerial circuit LW trimmer	—
C34 Aerial circuit tuning	—
C35 Oscillator circuit tuning	—
C36 Osc. circuit MW trimmer	—
C37 Osc. circuit LW trimmer	—
C38 1st IF trans. pri. tuning	—
C39 1st IF trans. sec. tuning	—
C40 2nd IF trans. pri. tuning	—
C41 2nd IF trans. sec. tuning	—

\* Electrolytic. † Variable. ‡ Pre-set.

RESISTANCES	Values (ohms)
R1 V1 osc. CG resistance	100,000
R2 V1 osc. anode stabiliser	150
R3 V1 oscillator anode and SG HT feed resistances	10,000
R4	3,500
R5	75,000
R6 V2 and V4 SG's HT feed potential divider resistances	5,000
R7	5,000
R8	15,000
R9 V3 signal diode load	500,000
R10 IF stopper	230,000
R11 Manual volume control	2,000,000
R12 V3 triode anode decoupling	35,000
R13 V3 triode anode load	75,000
R14 V3 AVC diode load resistances	1,000,000
R15	500,000
R16 Variable tone control	2,300,000
R17 V4 CG resistance	2,000,000
R18 V4 grid stopper	350,000
R19 V4 GB resistance	50,000
R20 V4 anode HT feed	100
R21 V3 CG decoupling	1,000
R22 V1, V2 fixed GB; V3 triode GB; AVC delay resistance	100,000
R23 Heater circuit ballast resistance, total	23
R24	496*

\* 64 Ω + 370 Ω + 62 Ω from 5 V heater.

L12, L13 and L14, L15 are the IF transformers, in two screened units on the chassis deck, with their trimmers.

L16 is the HT smoothing choke, on the chassis deck, while L18, L19 are the mains filter chokes, beneath the chassis.

Scale Lamps.—These are two Bulgin MES types, rated at 8 V, 0.15 A, and fitted with frosted bulbs.

OTHER COMPONENTS	Approx. Values (ohms)
1.1 Parts of IF and image rejector circuit	9.5
1.2 Aerial MW coupling coil	33.0
1.3 Aerial LW coupling coil	0.4
1.4 Aerial SW tuning coil	1.6
1.5 Aerial LW tuning coil	Very low
1.6 Aerial LW tuning coil	2.0
1.7 Aerial LW tuning coil	9.0
1.8 Osc. circuit SW tuning coil	Very low
1.9 Osc. circuit MW coil, total	2.8
1.10 Osc. circuit LW coil, total	3.6
1.11 Oscillator SW reaction	1.2
1.12 1st IF trans. (Pri.)	4.0
1.13 1st IF trans. (Sec.)	4.0
1.14 2nd IF trans. (Pri.)	4.0
1.15 2nd IF trans. (Sec.)	4.0
1.16 HT smoothing choke	550.0
1.17 Speaker speech coil	3.0
1.18 Mains filter chokes	3.0
1.19 Output trans. (Pri.)	146.0
1.20 Output trans. (Sec.)	0.7
S1-S11 Waveband switches	—
S12, S13 Mains switches, ganged R11	—
F1, F2 Mains circuit fuses	—

## VALVE ANALYSIS

Valve	Anode Voltage (V)	Anode Current (mA)	Screen Voltage (V)	Screen Current (mA)
V1 X63	166	2.2	60	1.3
V2 KTW63	118	2.4	75	1.5
V3 DH63	166	6.1	75	1.5
V4 KT32	98	0.4	108	5.0
V5 U31†	118	51.0	—	—

† Cathode to chassis 182 V DC.

Valve voltages and currents given in the table above are those measured in our receiver when it was operating on AC mains of 225 V, using the 223-250 V tapping on the mains resistance. 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 400 V scale of a model 7 Universal Avometer, chassis being negative.

If, as in our case, V1 should become unstable when its anode current is being measured, it can be stabilised by connecting a non-inductive condenser of about 0.1 μF from control grid (top cap) to chassis.

## GENERAL NOTES

**Switches.**—S1-S11 are the waveband switches, in a single rotary unit beneath the chassis, indicated in our under-chassis view, and shown in detail in the diagram in col. 3. The table (col. 2) gives the switch positions for the three control settings, starting from fully anti-clockwise. A dash indicates open, and C closed.

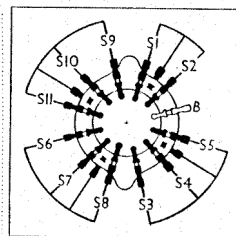
S12 and S13 are the QMB mains switches, ganged with the volume control R11.

**Coils.**—L1, L2; L3, L6; L4, L7; L5; L8, L11; L9; and L10 are in seven unscreened units beneath the chassis. L3, L6 and L4, L7 are iron-cored, the cores of L6 and L7 being adjustable. The inductances of L5 and L8 are adjustable by wire loops inside the coil formers. L9 and L10 are also adjustable in inductance by metal "spade" trimmers, whose positions are varied by means of screw adjusters, indicated in our under-chassis view.

## TABLE AND DIAGRAM

Switch	SW	MW	LW
S1	—	—	C
S2	—	C	—
S3	C	—	—
S4	—	C	—
S5	—	—	C
S6	C	—	—
S7	—	C	—
S8	—	—	C
S9	C	—	—
S10	—	C	—
S11	—	—	C

Switch diagram, drawn as seen from the underside of the chassis.



**RF and Oscillator Stages.**—The scale must be positioned so that the pointer spindle hole is exactly concentric with the spindle, and the scale is square in its frame. With gang at maximum, pointer must coincide exactly with the small black spot at the top right-hand corner of the scale.

Turn volume control to maximum, and tone control fully anti-clockwise, and connect signal generator to A and E sockets.

**MW.**—Switch set to MW, and tune to 225 m on scale (black spot). Feed in a 225 m (1,333 KC/S) signal and adjust C38 for maximum output. Tune to 225 m on scale (black spot) and feed in a 530 m (566 KC/S) signal. Adjust inductance ("spade" trimmer) of L9 (screw on paxolin coil mounting strip) for maximum output. Repeat these operations until no further improvement results. Return to 225 m and adjust C34 for maximum output.

Return to 530 m, and rotate upper core of L6 for maximum output. This is reached through a hole in the chassis deck by means of a special tool (EMI Service, Part No. 20730A) which consists of a pointed rod of insulating material with a rubber bush. It should be inserted through the hole in the chassis, the point located in the hole in the paxolin coil mounting strip, and the rubber bush bearing on the core. The core may now be rotated by turning the tool.

Repeat the adjustments of C34 and L6. **LW.**—Switch set to LW, tune to 1,100 m on scale, and feed in a 1,100 m (272.7 KC/S) signal. Adjust C39 for maximum output. Tune to 1,900 m on scale, feed in a 1,900 m (158 KC/S) signal, and adjust inductance ("spade" trimmer) of L10 (screw on paxolin coil mounting strip) for maximum output. Repeat these adjustments.