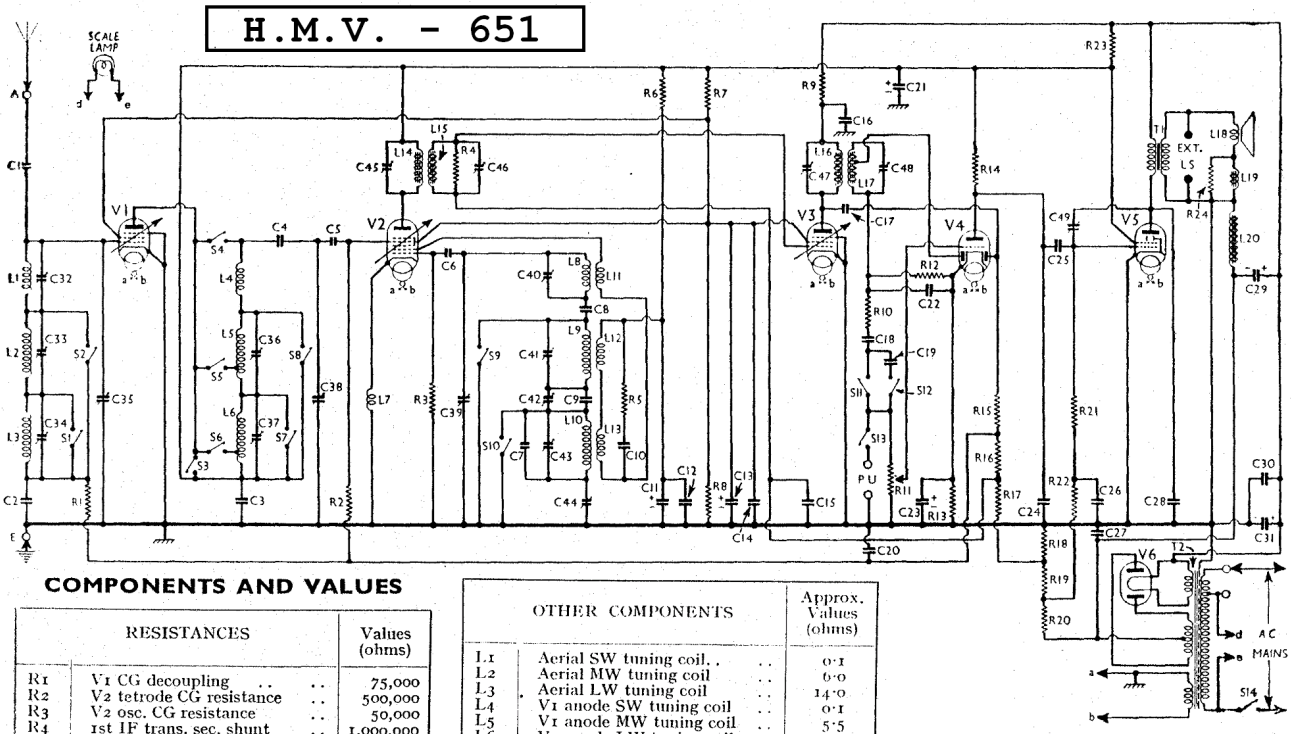
H.M.V. - 651



COMPONENTS AND VALUES

	RESISTANCES	Values (ohms)
R1	V1 CG decoupling	75,000
R2	V2 tetrode CG resistance	500,000
R3	V2 osc. CG resistance	50,000
R4	1st IF trans. sec. shunt	1,000,000
R5	Part of V2 oscillator anode circuit stabiliser	100
R6	V2 osc. anode HT feed	23,000
R7	V1, V2, V3 SG's HT potential divider	23,000
R8		35,000
R9	V3 anode HT feed	10,000
R10	IF stopper	100,000
R11	Manual volume control	2,000,000
R12	V4 signal diode load	500,000
R13	V4 GB resistance	750
R14	V4 triode anode load	50,000
R15	V4 AVC diode load resistances	500,000
R16		500,000
R17		500,000
R18	AVC delay and V5 GB potential divider	1,000
R19		7,500
R20		50,000
R21	V5 CG resistance	150,000
R22	V5 CG decoupling	100,000
R23	V1, V2, V3, V5, SG's and V1, V2, V4 anodes HT feed	1,000
R24	Hum neut. coil shunt	0·4

	CONDENSERS	Values (μF)
C1	Series aerial condenser	0·0000075
C2	V1 CG decoupling	0·05
C3	V1 anode RF by-pass.	0·1
C4	HT blocking condenser	0·1
C5	V1 to V2 RF coupling	0·000035
C6	V2 osc. CG condenser	0·00005
C7	Osc. circuit LW fixed trimmer	0·000023
C8	Osc. circuit SW tracker	0·0035
C9	Osc. circuit MW fixed tracker	0·00035
C10	Part of V2 oscillator anode circuit stabiliser	0·00015
C11*	V2 osc. anode decoupling	4·0
C12	V2 osc. anode RF by-pass	0·005
C13*	V1, V2, V3 SG's decoupling	4·0
C14	V1, V2, V3 SG's RF by-pass	0·1
C15	V3 CG decoupling	0·23
C16	V3 anode decoupling	0·05
C17	Coupling to V4 AVC diode	0·000075
C18	MW and LW AF coupling to V4 triode	0·01
C19	SW AF coupling to V4 triode	0·001
C20	AVC line decoupling	0·05
C21*	V1, V2, V4 anodes decoupling	4·0
C22	HF by-pass	0·0001
C23*	V4 cathode by-pass	25·0
C24	Fixed tone corrector	0·00035
C25	V4 triode to V5 AF coupling	0·05
C26	V5 CG decoupling	0·23
C27	Auto GB RF by-pass	0·05
C28	Fixed tone corrector	0·0023
C29*	HT smoothing	8·0
C30	HT circuit RF by-pass	0·015
C31*	HT smoothing	4·0
C32‡	Aerial circuit SW trimmer	—
C33‡	Aerial circuit MW trimmer	—
C34‡	Aerial circuit LW trimmer	—
C35†	Aerial circuit tuning	—
C36‡	V1 anode circuit MW trimmer	—
C37‡	V1 anode circuit LW trimmer	—
C38†	V1 anode circuit tuning	—
C39†	Oscillator circuit tuning	—
C40‡	Osc. circuit SW trimmer	—
C41‡	Osc. circuit MW trimmer	—
C42‡	Osc. circuit MW tracker	—
C43‡	Osc. circuit LW trimmer	—
C44‡	Osc. circuit LW tracker	—
C45‡	1st IF trans. pri. tuning	—
C46‡	1st IF trans. sec. tuning	—
C47‡	2nd IF trans. pri. tuning	—
C48‡	2nd IF trans. sec. tuning	—
C49†	Variable tone control	—

* Electrolytic. † Variable. ‡ Pre-set.

	OTHER COMPONENTS	Approx. Values (ohms)
L1	Aerial SW tuning coil	0·1
L2	Aerial MW tuning coil	6·0
L3	Aerial LW tuning coil	14·0
L4	V1 anode SW tuning coil	0·1
L5	V1 anode MW tuning coil	5·5
L6	V1 anode LW tuning coil	14·0
L7	V2 cathode frequency stabiliser	0·1
L8	Osc. circuit SW tuning coil	0·1
L9	Osc. circuit MW tuning coil	5·5
L10	Osc. circuit LW tuning coil	4·2
L11	Osc. SW reaction coil	1·0
L12	Osc. MW reaction coil	2·0
L13	Osc. LW reaction coil	3·0
L14	1st IF trans. Pri.	5·0
L15	1st IF trans. Sec.	5·0
L16	2nd IF trans. Pri.	5·0
L17	2nd IF trans. Sec.	5·0
L18	Speaker speech coil	4·0
L19	Hum neutralising coil	0·8
L20	Speaker field coil	1,600·0
T1	Output trans. Pri.	400·0
	Output trans. Sec.	0·6
T2	Mains trans. Pri., total	30·0
	Mains trans. Heater sec.	0·1
	Mains trans. Rect. heat. sec.	0·1
	Mains trans. HT sec., total	630·0
S1-S12	Waveband switches	—
S13	Gram. pick-up switch	—
S14	Mains switch, ganged R11	—

VALVE ANALYSIS

Valve voltages and currents given in the table below are those measured in our receiver when it was operating on mains of 228 V, using the 224-255 V tapping on the mains transformer. 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 **V2** should become unstable when its anode current is being measured or **V3** when its screen current is being measured, they can be stabilised by connecting a non-inductive condenser of about 0·1 μF from grid (top cap) of the valve concerned to chassis.

Valve	Anode Voltage (V)	Anode Current (mA)	Screen Voltage (V)	Screen Current (mA)
V1 KTW63	222	5·6	68	1·1
V2 X63	222	3·0	68	2·3
	Oscillator			
	132	3·2		
V3 KTW63	190	5·4	68	1·1
V4 DH63	124	1·5	—	—
V5 KT63	233	30·0	222	4·3
V6 U50	334†	—	—	—

† Each anode, AC.

GENERAL NOTES

Switches.—**S1-S12** are the waveband switches, and **S13** the pick-up switch, ganged in two rotary units beneath the chassis. These are indicated in our under-chassis view, and shown in detail in the diagrams overleaf.

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

S14 is the QMB mains switch, ganged with the volume control, **R11.**

Coils.—**L1-L3; L4-L6; L8-L13,** and the IF transformers **L14, L15** and **L16, L17** are in five screened units on the chassis deck. Most of these contain additional components as indicated in our plan chassis view. **L7** is a small coil on a tubular former beneath the chassis.

Scale Lamp.—This is a special high voltage Osram tubular type, with a small double-pole bayonet cap base. It is rated at 230 V, 15 W, and is connected across the 195-223 V input to the primary of **T2.**

CIRCUIT ALIGNMENT

IF Stages.—Switch set to LW, turn gang to maximum and volume control to maximum. Connect signal generator to grid (top cap) of **V2,** via a 0·1 μF condenser, leaving existing top cap connection in place, and to chassis. Feed in a 465 KC/S signal and adjust **C45, C46, C47** and **C48** in that order, for maximum output. Re-check these adjustments.

RF and Oscillator Stages.—**SW**—Connect signal generator to **A** and **E** sockets and switch set to SW. Feed in an 18 m (16·7 MC/S) signal, tune it in, and adjust **C40** and **C32** for maximum output, rocking the gang slightly for optimum results.

Feed in a 50 m (6 MC/S) signal, and tune it in. Then adjust the inductance of **L1** if necessary. A loop of wire will be found running across the coil former and this loop must be bent up or down until maximum output is obtained. Identify the loop by first removing the coil can; then replace the can and move the loop by a strip of insulating material with a suitable nick in it. This adjustment will not normally be necessary.

Return to 18 m and re-adjust **C32** very carefully, while rocking the gang.

MW—Switch set to MW, turn gang to minimum, and feed in a 195 m (1,540 KC/S) signal. Adjust **C41** for maximum output. Feed in a 225 m (1,330 KC/S) signal, tune it in, and adjust **C33** and **C36** for maximum output. Feed in a 530 m (565 KC/S) signal, tune it in, and adjust **C42** for maximum output, rocking the gang for optimum results. Return to 195 m, and check setting of **C41.**

LW—Switch set to LW, turn gang to minimum, and feed in a 725 m (413 KC/S) signal. Adjust **C43** for maximum output. Feed in an 800 m (375 KC/S) signal, tune it in, and adjust **C34** and **C37** for maximum output. Feed in a 1,900 m (158 KC/S) signal, tune it in, and adjust **C44** for maximum output, rocking the gang for optimum results. Check setting of **C43** at 725 m.

Finally, return to MW, and go through whole of MW and LW alignment again. Set the scale pointer to give best possible calibration compromise.

MODEL 661 MODIFICATIONS

The radiogram model 661 has an almost identical chassis, except that a Y63 tuning indicator is fitted. The cathode of this goes to chassis, the control grid goes to the **V1, V2** AVC line, the anode, via a 1 MO resistance to the 250 V HT line, and the target direct to the HT line. The indicator is mounted at the top left hand corner of the tuning scale, and the resistance is mounted on the T.I. holder.

The pick-up has a DC resistance of 850 O, and a 7,500 O resistor is connected across it.

The external speaker arrangements are different and are mentioned under "External Speakers" (col. 1).

The squirrel-cage induction motor has a DC resistance of 1,000 O.

TABLE AND DIAGRAMS

Switch	LW	MW	SW	Gram
S1	—	C	—	—
S2	—	—	C	—
S3	—	—	—	C
S4	—	—	C	—
S5	—	C	—	—
S6	C	—	—	—
S7	—	C	—	—
S8	—	—	C	—
S9	—	—	C	C
S10	—	C	—	—
S11	C	C	—	—
S12	—	—	C	—
S13	—	—	—	C

Switch diagrams, as seen from the underside of the chassis, in the directions of the arrows in the under-chassis view.