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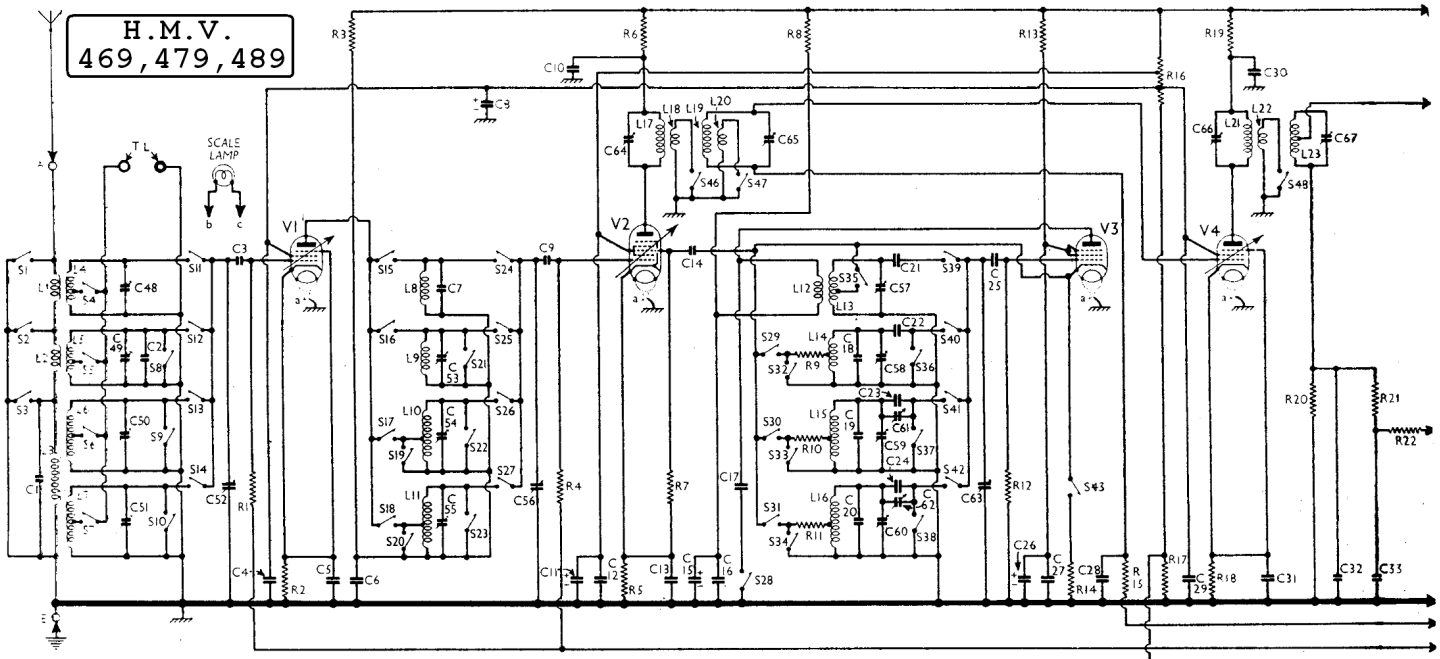

Note in particular the IF transformer arrangements, and the two tone controls **R32** and **R34**, the latter being ganged with **S46-S48**.

	RESISTANCES	Values (ohms)
R1	V1 CG resistance	500,000
R2	V1 fixed GB resistance	150
R3	V1 anode HT feed	5,000
R4	V2 CG resistance	500,000
R5	V2 fixed GB resistance	350
R6	V2 anode HT feed	5,000
R7	V2 injector grid resistance	50,000
R8	V3 anode HT feed	5,000
R9	Osc. circuit SW2 stabiliser	150
R10	Osc. circuit MW stabiliser	500
R11	Osc. circuit LW stabiliser	230
R12	V3 CG resistance	50,000
R13	V3 SG HT feed	15,000
R14	V3 Gram. GB resistance	500
R15	V4 CG decoupling	1,000,000
R16	V1, V2, V4 SG's HT feed and T.I. GB potential divider	17,100*
R17		75
R18	V4 fixed GB resistance	500
R19	V4 anode HT feed	3,500
R20	V5 signal diode load	350,000
R21	IF stopper resistances	100,000
R22		100,000
R23	V5 AVC diode load resistances	500,000
R24		500,000
R25	AVC line and T.I. CG decoupling	500,000
R26	Manual volume control	2,000,000
R27	V6 GB and AVC delay voltage resistances	1,500
R28		500
R29	V6 anode decoupling	23,000
R30	V6 anode load resistance	50,000
R31	Part " Bass " attenuator circuit	10,000
R32	" Bass " control	2,000,000
R33	Part of fixed tone corrector	5,000,000
R34	" Brilliance " control	1,000,000
R35	V7 GB resistance	200
R36	Hum neut. coil shunt	0·4
R37	T.I. anode HT feed	1,000,000

* Tapped at 5,000 Ω + 3,100 Ω + 9,000 Ω from HT

	OTHER COMPONENTS		Approx. Values (ohms)
L1	Aerial SW1 coupling coil		1·0
L2	Aerial SW2 coupling coil		8·0
L3	Aerial MW and LW coupling		40·0
L4	Aerial SW1 tuning coil		0·1
L5	Aerial SW2 tuning coil		0·2
L6	Aerial MW tuning coil		6·0
L7	Aerial LW tuning coil		19·0
L8	V1 anode SW1 tuning coil		0·1
L9	V1 anode SW2 tuning coil		0·2
L10	V1 anode MW tuning coil		6·0
L11	V1 anode LW tuning coil		19·0
L12	Osc. circuit SW1 reaction		8·5
L13	Osc. circuit SW1 tuning coil		0·1
L14	Osc. circuit SW2 tuning coil		0·1
L15	Osc. circuit MW tuning coil		6·0
L16	Osc. circuit LW tuning coil		5·0
L17	1st IF trans. pri. coil		6·7
L18	1st IF trans. selectivity coil		4·0
L19	1st IF trans. sec. coil		6·7
L20	1st IF trans. balance coil		4·5
L21	2nd IF trans. pri coil		6·7
L22	2nd IF trans. selectivity coil		4·0
L23	2nd IF trans. sec. coil		6·7
L24	Speaker speech coil		5·0
L25	Hum neutralising coil		0·7
L26	Speaker field coil		400·0
L27	HT smoothing choke		170·0
T1	Intervalve trans.	Pri.	350·0
		Sec.	2,730·0

	CONDENSERS	Values (μF)
C1	MW and LW aerial shunt	0·00005
C2	Aerial SW2 fixed trimmer	0·00001
C3	V1 CG condenser	0·00005
C4	V1 SG RF by-pass	0·01
C5	V1 cathode by-pass	0·1
C6	V1 anode decoupling	0·1
C7	V1 anode circuit SW1 trimmer	0·000005
C8*	V1, V4 SG's decoupling	1·0
C9	V2 CG condenser	0·00005
C10	V2 anode decoupling	0·1
C11*	V2 SG decoupling	8·0
C12	V2 SG RF by-pass	0·01
C13	V2 cathode by-pass	0·01
C14	V2 injector grid coupling	0·00005
C15*	V3 anode decoupling	2·0
C16	V3 anode RF by-pass	0·005
C17	V3 anode SW2, MW and LW coupling	0·001
C18	Osc. circ. SW2 fixed trimmer	0·000015
C19	Osc. circ. MW fixed trimmer	0·00001
C20	Osc. circ. LW fixed trimmer	0·000023
C21	Osc. circuit SW1 tracker	0·007§
C22	Osc. circuit SW2 tracker	0·0023
C23	Osc. circuit MW fixed tracker	0·00035
C24	Osc. circ. LW fixed tracker	0·00015
C25	V3 CG condenser	0·0001
C26*	V3 SG decoupling	2·0
C27	V3 SG RF by-pass	0·001
C28	V4 CG decoupling	0·05
C29	V4 SG RF by-pass	0·1
C30	V4 anode decoupling	0·1
C31	V4 cathode by-pass	0·5
C32	IF by-pass condensers	0·00005
C33		0·00005
C34	V5 heater RF by-pass	0·01
C35	Coupling to V5 AVC diode	0·00005
C36	AF coupling to V6	0·1
C37	AVC line and T.I. CG decoupling	0·05
C38*	V6 anode decoupling	2·0
C39*	V6 cathode by-pass	25·0
C40	AF coupling to T1	0·5
C41	Part " Bass " attenuator circuit	0·015
C42	Part of fixed tone corrector	0·05
C43	Part " Brilliance " attenuator	0·005
C44*	V7 cathode by-pass	25·0
C45*	HT Smoothing	16·0
C46*		16·0
C47*		32·0
C48‡	Aerial circuit SW1 trimmer	—
C49‡	Aerial circuit SW2 trimmer	—
C50‡	Aerial circuit MW trimmer	—
C51‡	Aerial circuit LW trimmer	—
C52†	Aerial circuit tuning	—
C53‡	V1 anode SW2 trimmer	—
C54‡	V1 anode MW trimmer	—
C55‡	V1 anode LW trimmer	—
C56†	V1 anode circuit tuning	—
C57‡	Osc. circuit SW1 trimmer	—
C58‡	Osc. circuit SW2 trimmer	—
C59‡	Osc. circuit MW trimmer	—
C60‡	Osc. circuit LW trimmer	—
C61‡	Osc. circuit MW tracker	—
C62‡	Osc. circuit LW tracker	—
C63†	Oscillator circuit tuning	—
C64‡	1st IF trans. pri. tuning	—
C65‡	1st IF trans. sec. tuning	—
C66‡	2nd IF trans. pri. tuning	—
C67‡	2nd IF trans. sec. tuning	—

* Electrolytic. † Variable. ‡ Pre-set.
§ Two 0.0035 in parallel in our chassis.

	CONDENSERS (*Continued*)	Values (μF)
C54‡	V1 anode MW trimmer	—
C55‡	V1 anode LW trimmer	—
C56†	V1 anode circuit tuning	—
C57‡	Osc. circuit SW1 trimmer	—
C58‡	Osc. circuit SW2 trimmer	—
C59‡	Osc. circuit MW trimmer	—
C60‡	Osc. circuit LW trimmer	—
C61‡	Osc. circuit MW tracker	—
C62‡	Osc. circuit LW tracker	—
C63†	Oscillator circuit tuning	—
C64‡	1st IF trans. pri. tuning	—
C65‡	1st IF trans. sec. tuning	—
C66‡	2nd IF trans. pri. tuning	—
C67‡	2nd IF trans. sec. tuning	—

* Electrolytic. † Variable. ‡ Pre-set.
§ Two 0.0035 in parallel in our chassis.

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OTHER COMPONENTS (*Continued*)			Approx. Values (ohms)
T2	Output trans.	Pri. ..	150·0
		Sec. ..	0·7
T3	Mains trans.	Pri., total ..	8·8
		Heater sec. ..	0·1
		Rect. heat. sec.	0·1
		HT sec., total	180·0
S1-S43	Waveband switches		—
S44,45	Radio-gram change switches..		—
S46-48	Selectivity switches, ganged R34		—
S49	Mains switch, ganged R26 ..		—

VALVE ANALYSIS

Valve voltages and currents given in the table (col. 2) 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 **V4** should become unstable when its screen current is being measured, as in our case, it can be stabilised by connecting a non-inductive condenser of about 0·1 μF from grid (top cap) to chassis.

Valve	Anode Voltage (V)	Anode Current (mA)	Screen Voltage (V)	Screen Current (mA)
V1 W63	192	7·0	88	1·9
V2 X64	207	3·4	127	6·3
V3 Z63	192	6·6	187	1·7
V4 W63	197	4·5	88	1·2
V5 D63	—	—	—	—
V6 Z63 *	93	1·3	93	0·3
V7 KT66	215	61·0	225	4·3
V8 U50	346†	—	—	—
T.I. 6G5	15	0·2	—	—
	Target			
	225	2·7		

* Used as a triode. G3 93 V, 0.2 mA.
† Each anode, AC.

GENERAL NOTES

Switches.—**S1-S43** are the waveband switches, and **S44, S45** the radio-gram. switches, ganged together in six rotary units beneath the chassis, which are indicated in our under-chassis view. The units are shown in detail in the diagrams on page v. The table (page v) gives the switch positions for the five control settings, starting from fully anti-clockwise. A dash indicates *open*, and **C**, *closed*.

S46-S48 are the QMB selectivity switches, ganged with the "brilliance" control, **R34**. The individual switches are indicated in our plan chassis view. In the fully anti-clockwise position of **R34, S46** and **S48** are *open*, and **S47** *closed*. On turning **R34** clockwise, the QMB unit operates, and **S46, S48** are *closed*, and **S47** *open*.

S49 is the QMB mains switch, ganged with the volume control **R26**.

Coils.—These are all contained in five screened units on the chassis deck. The RF and oscillator coils are in the three tubular cans, and the IF transformers in the rectangular cans. The latter have their trimmers at the tops of the cans, but the trimmers of the tubular units are reached from beneath the chassis. Note that in most cases the coil units contain a number of additional components. **The choke L27 is beneath the chassis.**

Scale Lamp.—This is a special Osram tubular lamp, rated at 230 V, 15 W. It is fitted with a double contact small bayonet cap, and fits into a suitable holder mounted horizontally. The lamp is connected permanently to the 195-223 V tapping on **T3** primary.

CIRCUIT ALIGNMENT

NOTE.—The descriptions SW1 and SW2 used here apply to our own circuit, in which, as usual, SW1 is the *lowest* wavelength band. H.M.V. refer to this band as SW2.

IF Stages.—Switch set to SW1 (11-35 m), turn gang to maximum, volume control to maximum, bass control fully anti-clockwise and brilliance control as far anti-clockwise as possible without operating the selectivity switch.

Connect signal generator to control grid (top cap) of **V2,** via a 0.1 μF condenser, and chassis. Feed in a 465 KC/S signal, and adjust **C64, C65, C66** and **C67** in turn for maximum output. Re-check.

RF and Oscillator Stages.—Turn gang to minimum and note reading of vernier dial. Turn gang until vernier has advanced by 10 divisions. Pointer should now indicate 725 m on the LW scale. If not, adjust until it does. Set tone and volume controls as for IF alignment above. Connect signal generator to **A** and **E** sockets.

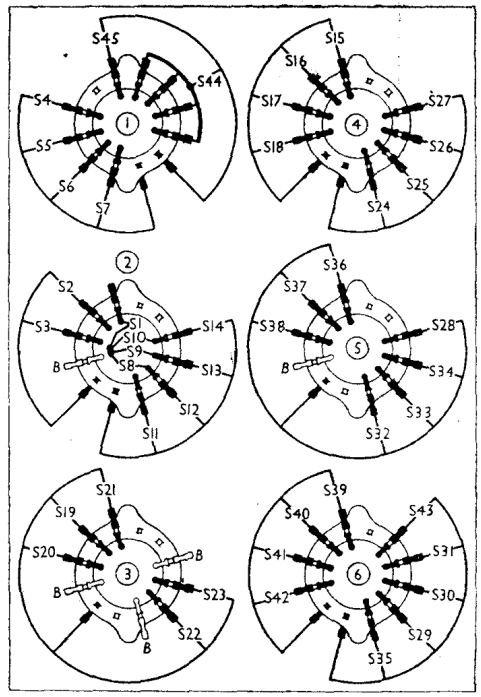
LW.—Switch set to LW, tune to 725 m on scale, feed in a 725 m (413·8 KC/S) signal, and adjust **C60** for maximum output. Feed in an 850 m (352·9 KC/S) signal, tune it in, and adjust **C51** and **C55** for maximum output. Feed in a 1,900 m (157·9 KC/S) signal, tune it in, and adjust **C62** for maximum output, while rocking the gang for optimum results. Repeat the adjustments, starting at 725 m.

MW.—Switch set to MW, tune to 195 m on scale, feed in a 195 m (1,539 KC/S) signal, and adjust **C59** for maximum output. Feed in a 210 m (1,429 KC/S) signal, tune it in, and adjust **C50** and **C54** for maximum output. Feed in a 530 m (566 KC/S) signal, tune it in, and adjust **C61** for maximum output, while rocking the gang for optimum results. Repeat these adjustments.

SW2.—Switch set to **SW2** (35-100 m), and set pointer to cover 725 m mark on LW scale. Feed in a 35·2 m (8·52 MC/S) signal, and adjust **C58** for maximum output. Feed in a 37·5 m (8 MC/S) signal, tune it in, and adjust **C49** and **C53** for maximum output; while rocking the gang for optimum results. Repeat adjustments.

SW1.—Switch set to SW1 (11-35 m), and fully unscrew **C48.** Feed in an 11·3 m (26·55 MC/S) signal, tune it in, and adjust **C57** for maximum output, while rocking the gang for optimum results. Then adjust **C48** for maximum output.

Inductance adjustment is provided on this band for the oscillator circuit, but should only need carrying out if the coils have been seriously disturbed. If this is so, continue as follows:



Diagrams of the six switch units, as seen from the rear of the underside of the chassis.

Feed in a 30 m (10 MC/S) signal, tune it in, and insert the ferrocart end of an E.M.I. "Tuning Wand" into can containing **L8.** If the output rises, the inductance of **L13** must be *decreased* by unsoldering the junction between **C21** (two condensers in our chassis) and the connecting wire going into the base of the coil unit, and sliding the condenser tag down towards the coil base until the insertion of either end of the wand into **L8** can produces a fall in output.

If the insertion of the ferrocart end of the wand produces a fall in output, but the insertion of the brass end raises the output, increase the inductance of **L13** by sliding the **C21** tag away from the coil base until either end of the wand inserted into **L8** can produces a fall in output.

Finally, re-solder the **C21** tag (if there are two, see that the tags are against each other, and soldered as far up to the moulded condenser cases as possible). Repeat the adjustments of **C57** and **C48**.

Switch	SW1	SW2	MW	LW	Gram
S1	—	—	—	—	C
S2	C	—	—	—	—
S3	C	C	—	—	—
S4	C	—	—	—	—
S5	—	C	—	—	—
S6	—	—	C	—	—
S7	—	—	—	C	—
S8	C	—	—	—	—
S9	C	C	—	—	—
S10	—	C	C	—	—
S11	C	—	—	—	C
S12	—	C	—	—	—
S13	—	—	C	—	—
S14	—	—	—	C	—
S15	C	—	—	—	—
S16	—	C	—	—	—
S17	—	—	C	—	—
S18	—	—	—	C	—
S19	C	C	—	—	—
S20	C	C	C	—	—
S21	C	—	—	—	C
S22	C	C	—	—	—
S23	C	C	C	—	—
S24	C	—	—	—	—
S25	—	C	—	—	—
S26	—	—	C	—	—
S27	—	—	—	C	—
S28	—	C	C	C	—
S29	—	C	—	—	—
S30	—	—	C	—	—
S31	—	—	—	C	—
S32	C	—	—	—	C
S33	C	C	—	—	—
S34	C	C	C	—	—
S35	C	—	—	—	—
S36	C	—	—	—	C
S37	C	C	—	—	—
S38	C	C	C	—	—
S39	C	—	—	—	—
S40	—	C	—	—	—
S41	—	—	C	—	—
S42	—	—	—	C	—
S43	—	—	—	—	C
S44	C	C	C	C	—
S45	—	—	—	—	C

CHASSIS DIVERGENCIES

In some table models (and in the radiogram model 479) a more elaborate external speaker arrangement is used, including a switch at the rear of the cabinet for internal or external speakers, or both. Across the external speaker sockets is connected a 50 Ω resistor for safety purposes.

The external speaker panel has three sockets into which is plugged a connector from the rotary switch. The three sockets are wired as follows: the first to one Ext. LS socket and one side of the 50 Ω resistor; the second to tag 2 on the speaker panel; the third to tag 1 on the speaker panel. (The link between tags 1 and 2 found in our chassis is removed). The other Ext. LS socket goes to the other end of the resistor and to tag 3 on the speaker panel. When the connector from the switch is plugged into the three sockets, it is possible to short either outer socket to the centre one (switching on the internal or external speaker), or to short all three together (switching on both speakers).