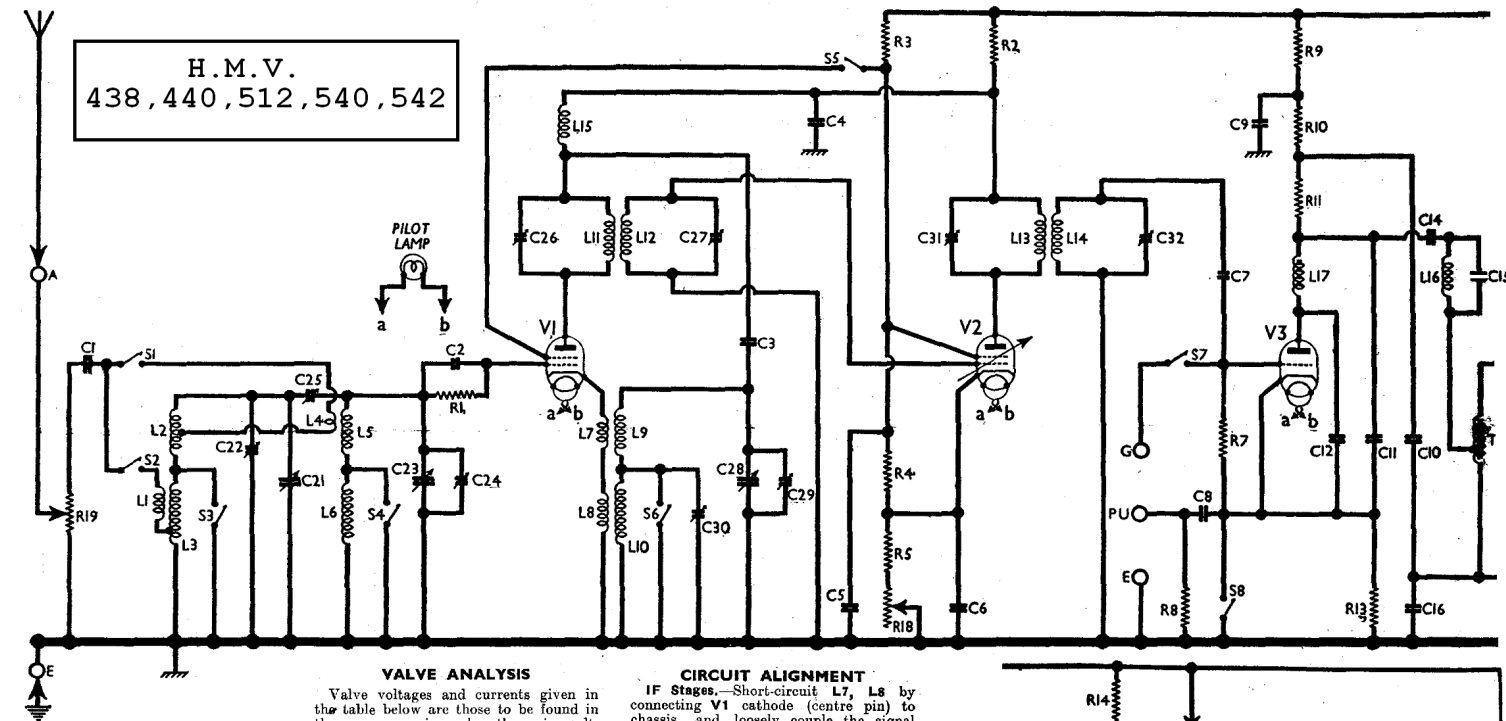


H.M.V.  
438,440,512,540,542



#### VALVE ANALYSIS

Valve voltages and currents given in the table below are those to be found in the average receiver when the mains voltage tapping is properly adjusted and the receiver is switched to medium waves. Where two values are given, the first is taken with the volume control at minimum and the second with the control at maximum.

Voltages were measured on the 1,200 V scale of a Universal Avometer; the same readings will be obtained using the 400 V scale of the model 7 Universal Avometer.

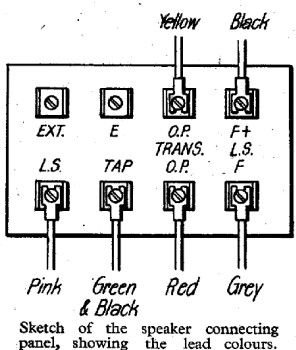
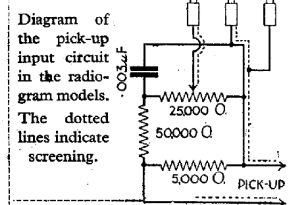
Valve	Anode Voltage (V)	Anode Current (mA)	Screen Voltage (V)	Screen Current (mA)
V1 MS4B	200-180	4.0-2.0	120-70	1.0-0.1
V2 VM84	220-190	0.1-5.5	120-70	0.1-2.4
V3 MH4	75	2-8	—	—
V4 MPT4	220	30-0	175	6-0
V5 U12†	—	—	—	—

† Heater to chassis, 240 V. D.C. heater to HT negative (HT secondary CT on T3), 355.

#### Switch Table

Switch	Gram	MW	LW
S1	—	—	—
S2	—	—	—
S3	—	—	—
S4	—	—	—
S5	—	—	—
S6	—	—	—
S7	—	—	—
S8	—	—	—
S9*	—	—	—

\* Closed between settings only.



Sketch of the speaker connecting panel, showing the lead colours.

#### CIRCUIT ALIGNMENT

**IF Stages.**—Short-circuit L7, L8 by connecting V1 cathode (centre pin) to chassis, and loosely couple the signal generator output to V1 control grid circuit via the leads associated with C25. Feed in a 128 KC/S (2,340 m) signal, and adjust C26 and C27 for maximum output. Feed in a 123 KC/S (2,440 m) signal, and adjust C27 for maximum output. Feed in a 125.5 KC/S (2,390 m) signal, and adjust C32 for maximum output. Repeat these adjustments, always in the same order.

**RF and Oscillator Stages.**—Transfer signal generator leads to A and E sockets via a suitable dummy aerial. If the scale pointer does not register correctly, it may be adjusted after freeing its drive drum (cheese-head screw).

**MW.**—Switch set to MW, tune to 210 m on scale. Unscrew C25 several turns, and screw up C24 fully. Feed in a 210 m (1,430 KC/S) signal, and adjust C29, then C22 (near aerial socket), for maximum output. Now adjust C24 for maximum output, and check whether receiver is "lively" below 240 m. If it is not, C24 has been unscrewed too far, and must be tightened up a little.

**LW.**—Switch set to LW, tune to 1,000 m on scale, feed in a 1,000 m (300 KC/S) signal, and adjust C30 for maximum output.

Any subsequent disturbance of the wiring is liable to throw the receiver out of alignment.

**Image Suppressor.**—Switch set to MW, tune to 315 m on scale, feed in a strong 250 m (1,200 KC/S) signal. Find the image point by slight adjustment of the tuning control if necessary, and adjust C25, with a non-metallic screwdriver, for minimum output. Feed in a 350 m (860 KC/S) signal, tune in its image at about 496 m, and adjust L4 on its slotted bracket for minimum output.

Care should be exercised with the wiring of C25, as its capacity is very small, and disturbance may carry the adjustment beyond the range of the condenser.

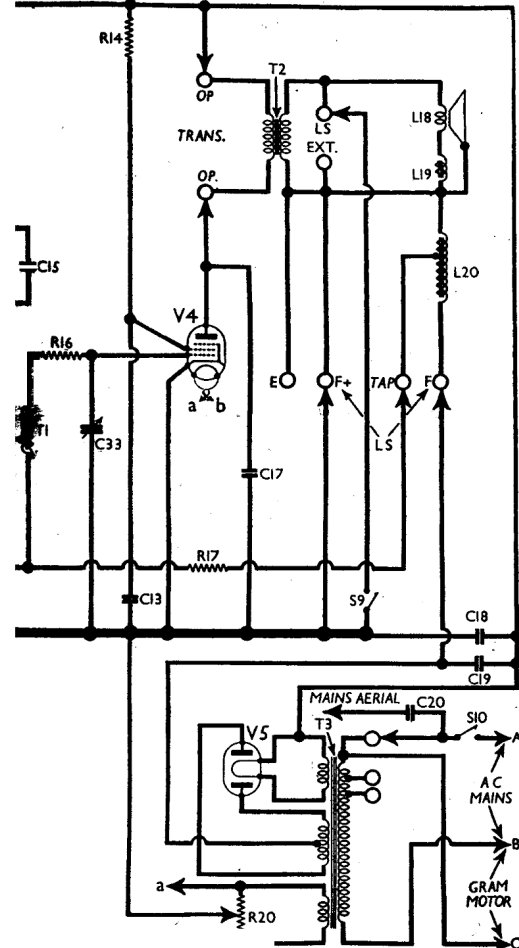
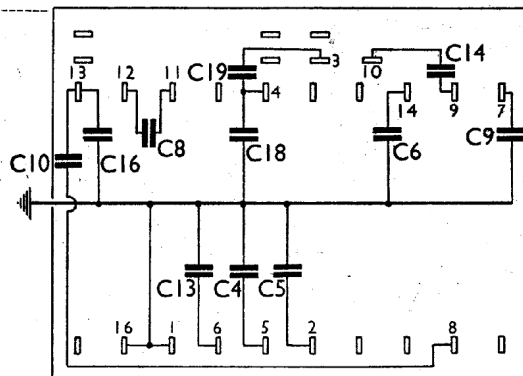


Diagram of the internal connections of the condenser block, drawn as seen when viewed from the rear of the chassis. The lead to tag 3 may in some cases be taken instead to the tag just above tag 13.



RESISTANCES	Values (ohms)
R1 V1 CG resistance ...	2,000,000
R2 V1 V2 anodes decoupling ...	5,000
R3 V1 V2 SG's potential divider ...	35,000
R4 V2 fixed GB resistance ...	850
R5 V3 grid leak ...	1,000,000
R6 V3 CG decoupling ...	1,000,000
R7 V3 anodes decoupling ...	10,000
R8 V3 anode load resistances ...	10,000
R9 V3 anode load resistances ...	25,000
R10 V3 (gram) GB resistance ...	500
R11 V4 SG HT feed ...	10,000
R12 Part variable tone control ...	250,000
R13 V4 CG decoupling ...	15,000
R14 Volume control, ganged ...	25,200
R15 Hum neutralising control ...	50

\* Not in circuit diagram.

CONDENSERS	Values (μF)
C1 Aerial coupling condenser ...	0.0005
C2 V1 CG condenser ...	0.00005
C3 V1 osc. anode coupling ...	0.0001
C4 V1 V2 anodes decoupling ...	1.0
C5 V1 V2 SG's decoupling ...	0.1
C6 V2 cathode by-pass ...	0.00005
C7 V3 CG condenser ...	0.00005
C8 V3 CG decoupling ...	1.0
C9 V3 anodes decoupling ...	1.0
C10 Part feed-back coupling ...	2.0
C11 V3 anode RF filter cond. ...	0.002
C12 V3 anode RF filter cond. ...	0.002
C13 V4 SG decoupling ...	0.00005
C14 AF coupling to T1 ...	0.1
C15 Part of tone filter ...	0.0003
C16 Part feed-back coupling ...	2.0
C17 Fixed tone corrector ...	0.002
C18 HT smoothing condensers ...	2.0
C19 HT smoothing condensers ...	2.0
C20 Mains aerial coupling ...	0.0003
C21 Band-pass pri. tuning ...	—
C22 Band-pass pri. MW trimmer ...	—
C23 Band-pass sec. tuning ...	—
C24 Band-pass sec. MW trimmer ...	—
C25 Image suppressor ...	0.000005
C26 1st IF trans. pri. tuning ...	—
C27 1st IF trans. sec. tuning ...	—
C28 Oscillator circuit tuning ...	—
C29 Osc. circ. MW trimmer ...	—
C30 Osc. circ. LW trimmer ...	—
C31 2nd IF trans. pri. tuning ...	—
C32 2nd IF trans. sec. tuning ...	—
C33 Variable tone control ...	0.00005

\* In condenser block. † Variable. ‡ Pre-set

OTHER COMPONENTS	Approx. Values (ohms)
L1 Aerial LW coupling coil ...	72-0
L2 Band-pass primary coils ...	3-5
L3 Image suppressor coil ...	18-0
L4 Band-pass secondary coils ...	0.1
L5 Band-pass secondary coils ...	3-5
L6 Oscillator reaction coils ...	18-0
L7 Osc. circ. MW tuning coil ...	0.25
L8 Osc. circ. LW tuning coil ...	0.5
L9 1st IF trans. Pri. ...	100-0
L10 1st IF trans. Sec. ...	100-0
L11 2nd IF trans. Pri. ...	100-0
L12 2nd IF trans. Sec. ...	100-0
L13 V1 osc. coupling coil ...	95-0
L14 Part of tone filter ...	240-0
L15 V1 anode RF filter coil ...	240-0
L16 Speaker speech coil ...	—
L17 Hum neutralising coil ...	—
L18 Speaker field coil, total ...	2,250*
L19 Speaker field coil, total ...	—
L20 Intervolve auto-transformer, total ...	4,000-0
T2 Speaker input (Pri. ...)	750-0
T3 Speaker input (Sec. ...)	2-0
T4 Mains Heater sec. ...	29-2
T5 Mains Heater sec. ...	0.15
T6 HT sec., total ...	720-0
S1-84 Waveband switches ...	—
S5 Radio muting switch ...	—
S7, S8 Radio/gram change switches ...	—
S9 Wave-change muting switch ...	—
S10 Mains switch ...	—

\* Tapped at 250 Ω from chassis.