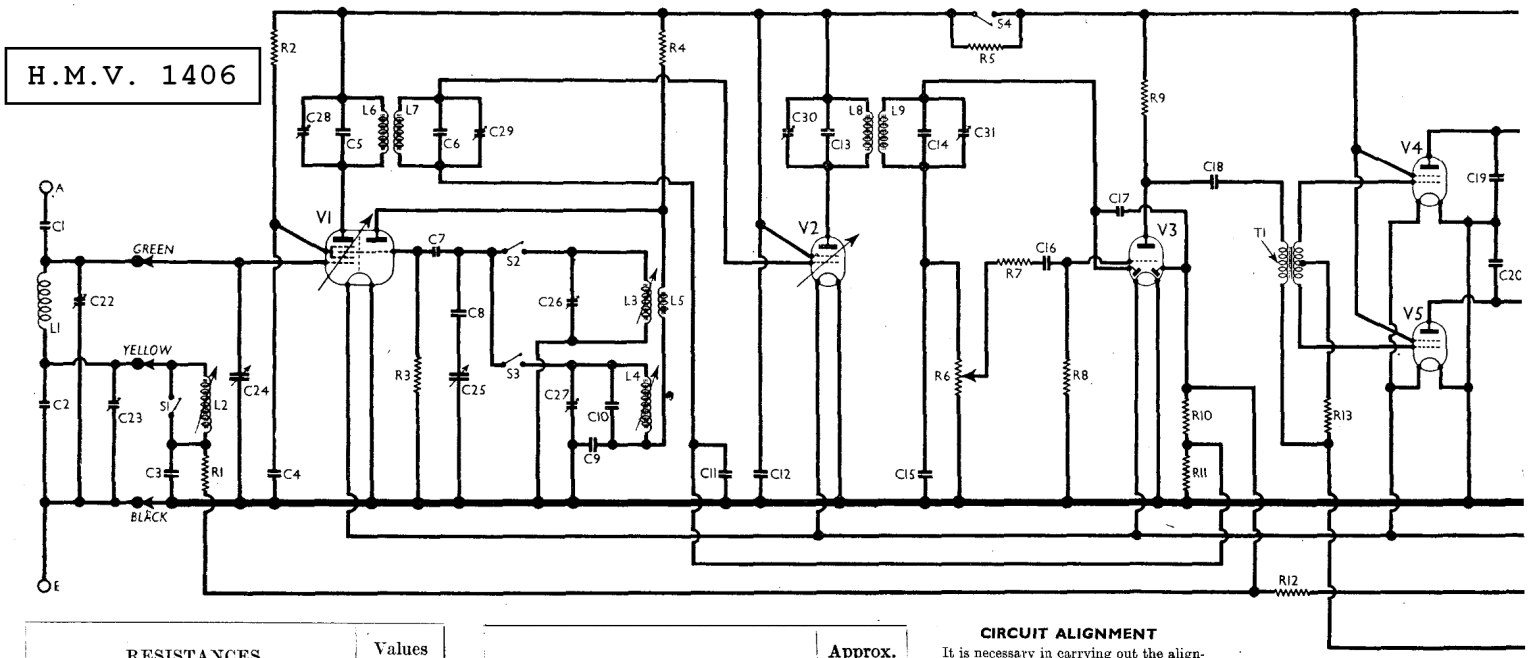
H.M.V. 1406



RESISTANCES		Values (ohms)
R1	V1 hexode CG decoupling	2,300,000
R2	V1 SG HT feed	23,000
R3	V1 osc. CG resistance ...	100,000
R4	V1 osc. anode HT feed ...	23,000
R5	HT economiser resistance	10,000
R6	Manual volume control; V3 signal diode load ...	500,000
R7	V3 triode grid stopper ...	100,000
R8	V3 triode CG resistance ...	2,300,000
R9	V3 triode anode load ...	100,000
R10	V3 AVC diode load resistances	2,300,000
R11		350,000
R12	Part GB pot. divider ...	2,300,000
R13	V4, V5 CG's decoupling ...	230,000
R14	GB and AVC delay potential divider resistances	150
R15		300
R16		450

CONDENSERS		Values (μF)
C1	External aerial series condenser	0·000015
C2	Aerial circuit LW fixed trimmer	0·000005
C3	V1 hexode CG decoupling	0·1
C4	V1 SG decoupling ...	0·1
C5	1st IF transformer fixed trimmer condensers ...	0·00015
C6		0·00015
C7	V1 osc. CG condenser ...	0·000075
C8	Osc. circuit MW tracker...	0·0005
C9	Osc. circuit LW tracker...	0·0004
C10	Osc. circuit LW fixed trimmer	0·000075
C11	V2 CG decoupling ...	0·1
C12	V2 SG decoupling ...	0·1
C13	2nd IF transformer fixed trimmer condensers ...	0·00015
C14		0·00015
C15	IF by-pass	0·0001
C16	AF coupling to V3 triode	0·05
C17	Coupling to V3 AVC diode	0·000075
C18	AF coupling to T1 ...	0·05
C19	Fixed tone correction condensers	0·001
C20		0·001
C21*	HT reservoir condenser...	8·0
C22‡	Frame aerial MW trimmer	—
C23‡	Aerial circuit LW trimmer	—
C24†	Aerial circuit tuning ...	—
C25†	Oscillator circuit tuning...	—
C26‡	Osc. circuit MW trimmer	—
C27‡	Osc. circuit LW trimmer	—
C28‡	1st IF trans. pri. tuning...	—
C29‡	1st IF trans. sec. tuning...	—
C30‡	2nd IF trans. pri. tuning	—
C31‡	2nd IF trans. sec. tuning	—

* Electrolytic. † Variable. ‡ Pre-set.

OTHER COMPONENTS		Approx. Values (ohms)
L1	Frame aerial winding (MW)	0·7
L2	Frame loading coil (LW)...	9·0
L3	Osc. circuit MW tuning coil	2·2
L4	Osc. circuit LW tuning coil	7·0
L5	Osc. MW reaction coil ...	1·8
L6	1st IF trans. Pri. ...	3·75
L7	1st IF trans. Sec. ...	3·75
L8	2nd IF trans. Pri. ...	3·75
L9	2nd IF trans. Sec. ...	3·75
L10	Speaker speech coil... ...	3·0
T1	Intervalve trans. Pri.	200·0
	Intervalve trans. Sec., total ...	5,500·0
T2	Output trans. Pri., total ...	450·0
	Output trans. Sec.	0·2
S1-S3	Waveband switches ...	—
S4	Battery economiser switch	—
S5	HT circuit switch	—
S6	LT circuit switch	—
S7	GB circuit switch	—

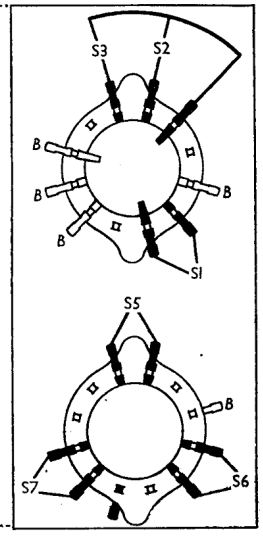
VALVE ANALYSIS

Valve voltages and currents given in the table below are those measured in our receiver when it was operating with a new battery reading 109 V overall on load. The economiser switch was at max.

The receiver was tuned to the lowest wavelength on the medium wave band, and the volume control was at maximum; in order, however, to prevent the receiver from responding to a possible signal the frame aerial was disconnected and the green and yellow leads joined to connect together the input CG and the AVC line.

Voltages were measured on the 400 V scale of a model 7 Universal Avometer, chassis being negative.

Valve	Anode Voltage (V)	Anode Current (mA)	Screen Voltage (V)	Screen Current (mA)
V1 X24	100	0·8	60	1·7
	Oscillator			
	67	1·4		
V2 Z21	100	1·9	100	0·8
V3 HD24	57	0·4	—	—
V4 KT2	98	0·8	100	0·2
V5 KT2	98	0·8	100	0·2



Diagrams of the two sides of the switch unit: above, as viewed in the direction of the arrow numbered 1 in the half-front view above; below, as viewed in the direction of the arrow numbered 2.

CIRCUIT ALIGNMENT

It is necessary in carrying out the alignment first to remove the chassis and the lid, with the frame aerial, from the case and reassemble them, with the batteries, on the bench.

At all stages of alignment, the overall voltage of the HT battery must be not less than 100 V on load, the frame aerial must be connected, the volume must be at maximum and the economiser switch at "Max."

The output from the signal generator must be kept as low as is consistent with providing a useful output reading and should be progressively reduced as the circuits are brought into line.

IF Stages.—Remove the small metal screen covering the **C15, R8, C16, R7** assembly on the right of the second IF transformer, switch receiver to MW, and turn gang to minimum.

Connect signal generator via a 0.1 μF condenser to anode (top cap) of **V2** and chassis, leaving existing connector on **V2** in place, and connect a 35,000 Ω resistance and a 0.1 μF condenser in series across **L9.** Feed in a 465 KC/S (645.2 m) signal and adjust **C30** for maximum output. Remove damping circuit from **L9** and connect it across **L8.** Adjust **C31** for maximum output at the same frequency. Remove damping circuit.

Remove signal generator lead from **V2** and connect it to **V1** control grid (top cap) leaving existing connector in place. Connect damping circuit across **L6** and adjust **C29** for maximum output at 465 KC/S. Remove damping circuit from **L6,** connect it across **L7,** and adjust **C28** for maximum output at the same frequency. Remove damping circuit and replace the small screen.

Do not make any further adjustments unless the whole procedure is repeated in the same order. After adjusting the IF circuits, the RF and oscillator stages must be re-aligned.

RF and Oscillator Stages.—The chassis, frame aerial and batteries must now be arranged on the bench to occupy exactly the same relative positions as they would if they were in the case.

The space between the frame winding and the HT battery must be ¾ inch, the battery label must face away from the aerial and the frame aerial leads must be "dressed" to approximately the same positions as they would occupy in the case.

Any adjustment made to the circuits on MW must be followed by LW adjustment. See that spiral indicator line registers with the end of the MW scale when the gang is at maximum.

Connect the screening of the signal generator lead to the receiver chassis, but leave the live end (not more than 6 inches long) free. If this arrangement does not provide sufficient coupling, the live lead may be connected to the aerial socket via a condenser not larger than 5 μμF (0.000005 μF).

MW.—Switch set to MW, tune to 200 m on scale, feed in a 200 m (1,500 KC/S) signal and adjust **C26** for maximum output. Feed in a 225 m (1,333 KC/S) signal, tune it in and adjust **C22** for maximum output.

Feed in a 520 m (576.9 KC/S) signal, tune it in, and adjust the core of **L3** for maximum output while rocking the gang for optimum results. Repeat the 200 m, 225 m and 520 m adjustments.

LW.—Switch set the LW, tune to 900 m on scale, feed in a 900 m (333.3 KC/S) signal and adjust **C27** for maximum output. Feed in a 1,350 m (222.2 KC/S) signal, tune it in and adjust **C23** for maximum output while rocking the gang for optimum results.

Tune to 1,900 m on scale, feed in a 1,900 m (157.9 KC/S) signal and adjust the cores of **L2** and **L4** for maximum output. Repeat 900 m, 1,350 m and 1,900 m adjustments.

Finally assemble the receiver in the case and check over the adjustment of **C22** at 225 m and **C23** at 1,350 m.