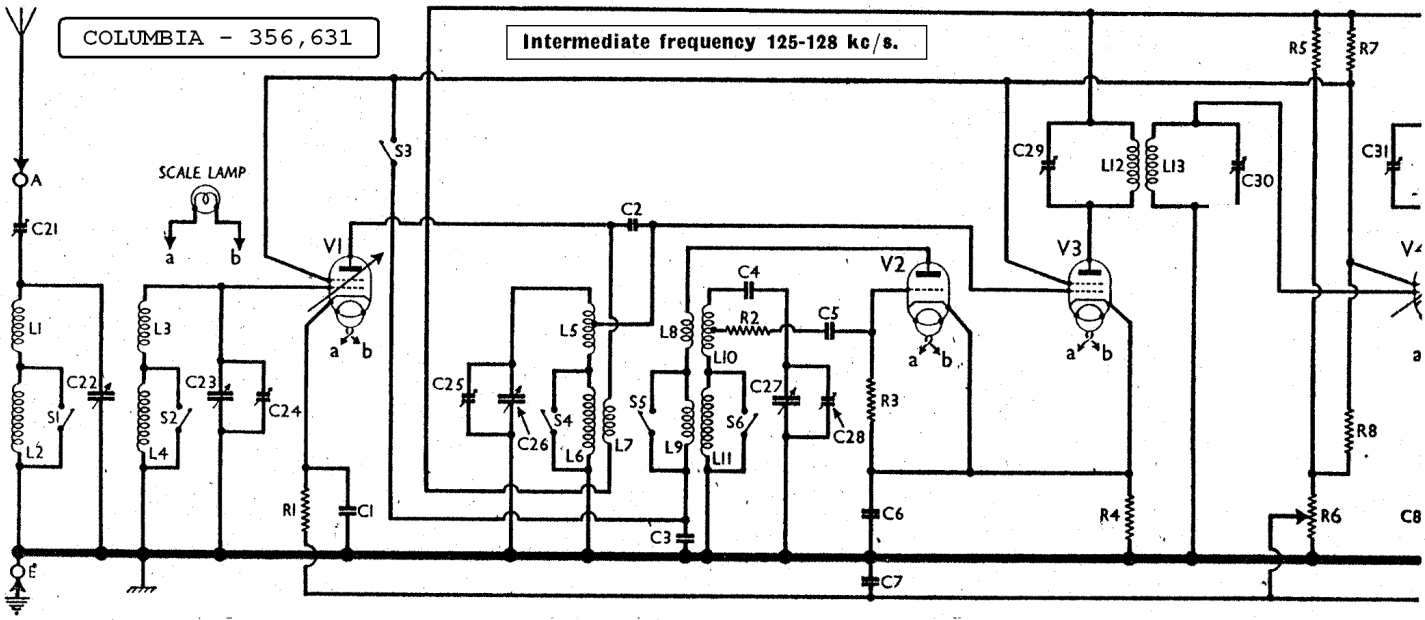


VALVE ANALYSIS

Valve voltages and currents given in the table below are those quoted in the makers' manual. They represent within ± 10 per cent. conditions to be expected

Valve	Anode Voltage (V)	Anode Current (mA)	Screen Voltage (V)	Screen Current (mA)
V1 VMS4	190	5·5	53	1·7
V2 MH4	50	20	—	—
V3 MS4	190	0·15	53	0·1
V4 VMS4	190	5·5	53	1·7
V5 MH4	195	0·9	—	—
V6 PX4	300	50·0	—	—
V7 U12	—	45·0†	—	—

† Each anode, DC.

OTHER COMPONENTS		Approx. Values (ohms)
L1	Band-pass primary coils...	3·0
L2	Band-pass primary coils...	20·0
L3	Band-pass secondary coils	3·0
L4	Band-pass secondary coils	20·0
L5	V3 CG tuning coils ...	3·5
L6	V3 CG tuning coils ...	20·0
L7	V1 anode choke	50·0
L8	Oscillator reaction coils ...	2·0
L9	Oscillator reaction coils ...	4·0
L10	Osc. MW tuning coil ...	3·5
L11	Osc. LW tuning coil ...	11·0
L12	1st IF trans. Pri. ...	47·0
L13	1st IF trans. Sec. ...	51·0
L14	2nd IF trans. Pri. ...	47·0
L15	2nd IF trans. Sec. ...	51·0
L16	Speaker speech coil ...	9·0
L17	Speaker field coil ...	10,600·0
L18	HT smoothing choke ...	750·0
T1	Intervalve trans. Pri. ...	1,700·0
T1	Intervalve trans. Sec. ...	6,000·0
T2	Speaker input trans. Pri. ...	150·0
T2	Speaker input trans. Sec. ...	2·0
T3	Mains trans. Pri., total ...	19·0
T3	Mains trans. Heater sec. ...	0·1
T3	Mains trans. Rect. heat. sec.	0·1
T3	Mains trans. HT sec., total	410·0
S1, S2	Waveband switches ...	—
S4-S6	Waveband switches ...	—
S3, S7, S8	R/G change switches ...	—
S9	Wave change mute	—
S10	Mains switch	—

CAPACITORS		Values (μF)
C1	V1 cathode by-pass ...	0·1
C2	V1–V3 RF coupling ...	0·00005
C3	SG and osc. HT decoupling	1·0
C4	Osc. circuit tracker ...	0·0017
C5	V2 CG capacitor ...	0·0003
C6	V2, V3 cathodes by-pass	0·5
C7	V1, V4 cathodes decoupling	1·0
C8	V4 cathode by-pass ...	0·1
C9	HT circuit decoupling ...	1·0
C10	V5 anode decoupling ...	1·0
C11	V5 CG decoupling ...	0·5
C12	IF by-pass	0·002
C13	AF coupling to T1 ...	0·1
C14	V5 cathode by-pass ...	0·5
C15	Part variable tone control	0·002
C16	HT smoothing capacitors	4·0
C17	HT smoothing capacitors	4·0
C18	HT smoothing capacitors	6·0
C19	V6 filament by-pass ...	4·0
C20	Mains aerial coupling ...	0·0003
C21‡	Aerial series trimmer ...	0·00007
C22†	Band-pass pri. tuning ...	0·00045
C23†	Band-pass sec. tuning ...	0·00045
C24‡	B-P sec. MW trimmer ...	—
C25‡	V3 CG MW trimmer ...	—
C26†	V3 CG circuit tuning ...	0·00045
C27†	Oscillator circuit tuning	0·00045
C28‡	Osc. circ. MW trimmer...	—
C29‡	1st IF trans. pri. tuning	0·00014
C30‡	1st IF trans. sec. tuning	0·00014
C31‡	2nd IF trans. pri. tuning	0·00014
C32‡	2nd IF trans. sec. tuning	0·00014

† Variable. ‡ Pre-set.

RESISTORS		Values (ohms)
R1	V1 fixed GB resistor ...	320
R2	V2 grid stopper ...	5,000
R3	V2 CG resistor	25,000
R4	V3 GB resistor	2,000
R5	Part HT potential divider	100,000
R6	V1, V4 gain control ...	20,000
R7	V1, V3, V4 SG's HT feed potential divider ...	25,000
R8	V1, V3, V4 SG's HT feed potential divider ...	50,000
R9	V4 fixed GB resistor ...	320
R10	V5 CG decoupling ...	100,000
R11	V1–V4 HT feed resistor...	6,000*
R12	Pick-up limiter	200,000
R13	PU volume control ...	100,000
R14	V5 GB resistors ...	1,000
R15	V5 GB resistors ...	5,000
R16	V5 anode decoupling ...	25,000
R17	V5 anode load	50,000
R18	Variable tone control ...	600,000
R19	Speaker field ballast ...	3,000
R20	V6 GB resistor	800
R21	Heater circuit pot.	20

* Made up of two 3,000Ω resistors connected in series.

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

* Closed between settings only.

COLUMBIA - 356,631

CIRCUIT ALIGNMENT

IF Stages.—Remove **V2** from its holder to stop the oscillator from working, turn the volume control to maximum, and switch the set to MW. Couple the signal generator output to the receiver via a coupling coil laid on the bench so that it is close to the **L5, L8, L10** unit.

The best indicator is an 0-5 mA meter, for the connection of which a pair of terminals is provided on the connecting panel on the mains transformer **T2.** If the shorting strap marked **T.I. Link** in our circuit diagram and plan view is removed, the milliameter indicates **V5** anode current. Alternatively, the normal output meter may be used, or an 0-25 mA meter may be connected to terminals **3** and **4** on the speaker input transformer.

Feed in a 125 kc/s (2,400 m) signal, keeping input low, and adjust **C31, C32, C29** and **C30** for maximum output, in that order. Now feed in a 128 kc/s (2,344 m) signal, and readjust **C29** for maximum output. Return to 125 kc/s and readjust **C30,** then **C31** and **C32,** but do not disturb **C29.**

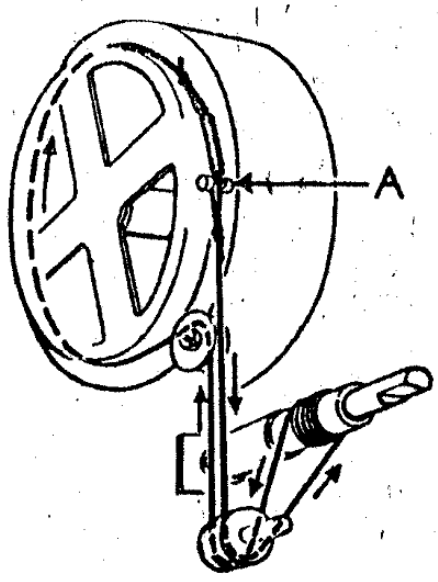
RF and Oscillator Stages.—Transfer signal generator leads to **A** and **E** sockets, via a suitable dummy aerial. The ends of the tuning scales should be about midway between the top and bottom of the pointer aperture when the gang is at minimum and maximum. It can be adjusted if the two fixing screws in the drum boss are slackened while in the minimum waveband position.

MW.—Switch set to MW, set the MW pointer at about the centre of its rail, tune to 220 m on scale, feed in a 220 m (1,364 kc/s) signal, and adjust **C28** for maximum output. If two peaks can be found, select that involving the lesser trimmer capacitance. Now tune to 300 m on scale, feed in a 300 m (1,000 kc/s) signal, and adjust **C24** and **C25** for maximum output. Check calibration at several points on the MW scale and adjust the pointer for the best compromise. Signal input should be kept low to avoid overloading throughout, and should be reduced as circuits come into line.

LW.—There are no LW adjustments, and no trimming should be attempted on this band. **C21** should, however, be adjusted on MW when the set is installed.

CORD DRIVE REPLACEMENT

Approximately 27 inches of flax fishing line, with a breaking strain of about 40lb., is required for the cord. Double back 1in. at one end, and tie to form a loop. A length of stiff copper wire with a hooked end will be found useful in manipulating the cord.



Cord drive sketch. The drum is viewed from the front, but the chassis is omitted.

Remove **R18** temporarily, set the gang to minimum capacitance, turn the control spindle to its stop in an anti-clockwise direction, slip the loop over the small stud **A,** seen in the sketch, and wind the cord in the direction shown there. Make six turns round the spindle, but do not permit one turn to overlap another.

Pull the cord tight, and make a loop at the free end, linked in the spring, so that the overall length of cord causes the spring to open when hooked on to stud **A.** Finally, adjust drum position on spindle if necessary.