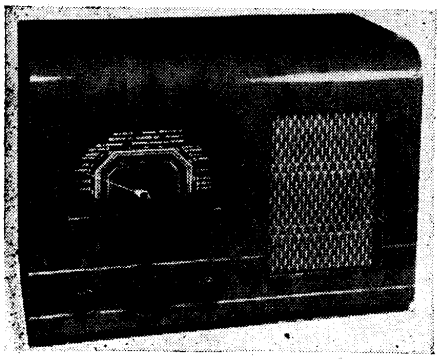
"TRADER" SERVICE SHEET

731

COSSOR 57



AN AC/DC midget receiver, the Cossor 57 is a 4-valve (plus rectifier) 2-band (SW and MW) superhet designed for 200-220 V and 220-240 V mains. The SW range is 15-50 m.

Release date and original price: August, 1942; £15 0*s.* (£12 6*s.* 11*d.*, *plus* £2 13*s.* 1*d. purchase tax*).

CIRCUIT DESCRIPTION

Aerial input is via **C2** and coupling coil **L1** (SW), or **C3** (MW), to single-tuned circuits **L2, C28** (SW) and **L3, C28** (MW). **L3** is wound as a frame aerial on the back cover of the receiver.

First valve **(V1, Cossor 6K8G)** is a triode hexode operating as frequency changer with electron coupling. Oscillator grid coils **L4** (SW) and **L5** (MW) are tuned by **C29.** Parallel trimming by **C30** (SW) and **C31** (MW); series tracking by **C9** (SW) and **C10** (MW). Inductive reaction coupling from anode by coils **L6** (SW) and **L7** (LW), with capacitative coupling across the trackers.

Second valve **(V2, Cossor 6K7G)** is a variable-mu RF pentode operating as intermediate frequency amplifier with tuned-primary, tuned-secondary iron-cored transformer couplings **C6, L8, L9, C7** and **C13, L10, L11, C14.**

Intermediate frequency 465 kc/s.

Diode second detector is part of double diode triode valve **(V3, Cossor 6Q7G).** Audio frequency component in rectified output is developed across the manual volume control **R6,** which operates as load resistor, and passed via **C18** and **R8** to CG of triode section.

Second diode of **V3,** fed from **V2** anode via **C15,** provides DC potential which is developed across **R11** and fed back through decoupling circuits as GB to FC and IF valves, giving AVC.

Resistance-capacitance coupling by **R9, C19** and **R12** between **V3** triode and pentode output valve **(V4, Cossor 25A6G).** Fixed tone correction by **C20.** Provision for connection of low impedance external speaker.

When the receiver operates with AC mains, HT current is supplied by half-wave rectifying valve **(V5, Cossor 25Z6G),** which on DC mains behaves as a low resistance. Smoothing by resistors **R17, R18** and capacitors **C22, C23, C24.**

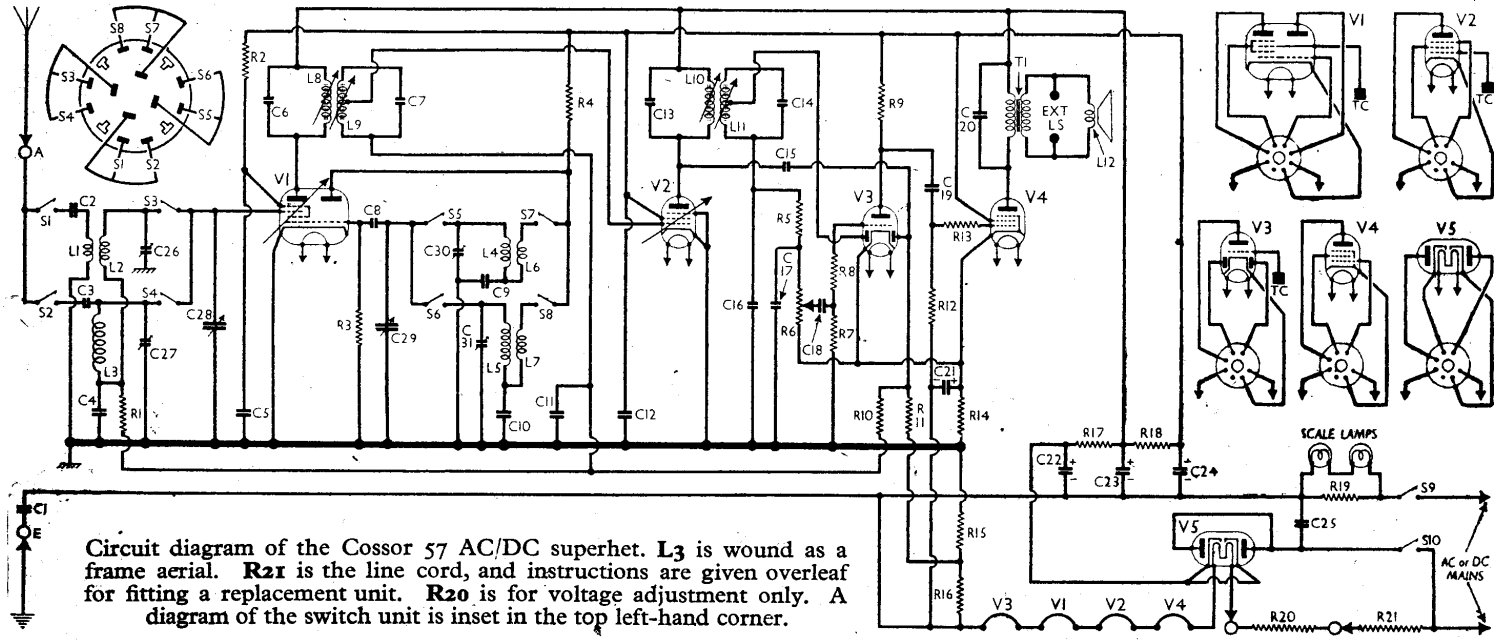
Valve heaters, together with scale lamps, line cord ballast resistor **R21** and voltage adjustment resistor **R20** are connected in series across mains input. Resistors **R15, R16** form a potential divider in the negative HT lead to chassis to provide fixed GB voltages for **V1, V2** and AVC delay. Additional AVC delay, together with GB for **V3** triode, is obtained from the drop along **R14.** GB for **V4** is derived from the total drop along **R14, R15, R16.**

COMPONENTS AND VALUES

	RESISTORS	Values (ohms)
R1	V1 hex. CG decoupling ...	500,000
R2	V1 SG HT feed	8,000
R3	V1 osc. CG resistor ...	50,000
R4	V1 osc. anode HT feed ...	10,000
R5	IF stopper	50,000
R6	Manual volume control; V3 signal diode load ...	500,000
R7	V3 triode CG resistor ...	2,000,000
R8	IF stopper	100,000
R9	V3 triode anode load ...	500,000
R10	AVC line decoupling ...	2,000,000
R11	V3 AVC diode load ...	1,000,000
R12	V4 CG resistor	500,000
R13	V4 grid stopper	100,000
R14	V3 triode and V4 GB; V1, V2 fixed GB; and AVC delay pot. divider	75
R15		40
R16		500
R17	HT smoothing resistors ...	2,000
R18		3,000
R19	Scale lamp shunt... ...	50
R20	Heater ballast	83
R21	Line cord heater ballast...	447

	CAPACITORS	Values (μF)
C1	Earth isolator	0·05
C3	Aerial SW series	0·0005
C3	Aerial MW series... ...	0·000005
C4	V1 hex. CG decoupling ...	0·05
C5	V1 SG decoupling ...	0·05
C6	1st IF transformer tuning capacitors	0·000065
C7		0·000075
C8	V1 osc. CG capacitor ...	0·00005
C9	Osc. circ. SW tracker ...	0·005177
C10	Osc. circ. LW tracker ...	0·000638
C11	V2 CG decoupling ...	0·05
C12	V2 SG decoupling ...	0·05
C13	2nd IF transformer tuning capacitors	0·00006
C14		0·000075
C15	AVC diode coupling ...	0·00001
C16	IF by-pass capacitors	0·00005
C17		0·00005
C18	V3 triode CG capacitor ...	0·005
C19	AF coupling to V4 ...	0·005
C20	Fixed tone corrector ...	0·005
C21*	V4 CG decoupling ...	25·0
C22	HT smoothing capacitors	8·0
C23		16·0
C24		16·0
C25	Mains RF by-pass ...	0·01
C26‡	Aerial circ. SW trimmer...	—
C27‡	Aerial circ. MW trimmer...	—
C28†	Aerial circuit tuning ...	—
C29†	Oscillator circuit tuning...	—
C30‡	Osc. circ. SW trimmer ...	—
C31‡	Osc. circ. MW trimmer ...	—

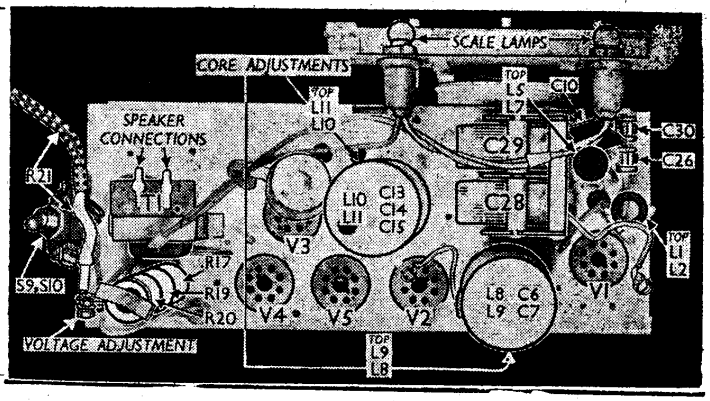
* Electrolytic. † Variable. ‡ Pre-set.



Circuit diagram of the Cossor 57 AC/DC superhet. **L3** is wound as a frame aerial. **R21** is the line cord, and instructions are given overleaf for fitting a replacement unit. **R20** is for voltage adjustment only. A diagram of the switch unit is inset in the top left-hand corner.

	OTHER COMPONENTS		Approx. Values (ohms)
L1	Aerial SW coupling coil	...	1·0
L2	Aerial SW tuning coil	...	Very low
L3	Aerial MW (frame) coil	...	0·5
L4	Osc. SW tuning coil	...	Very low
L5	Osc. MW tuning coil	...	6·0
L6	Osc. SW reaction coil	...	0·1
L7	Osc. MW reaction coil	...	1·5
L8	1st IF trans. Pri.	...	19·0
L9	1st IF trans. Sec.	...	19·0
L10	2nd IF trans. Pri.	...	19·0
L11	2nd IF trans. Sec.	...	19·0
L12	Speaker speech coil	...	2·0
T1	Output trans. Pri.	...	550·0
	Output trans. Sec.	...	Very low
S1-S8	Waveband switches	...	—
S9, S10	Mains circuit switches	...	—

Plan view of the chassis. **R17, R19, R20** are three separate sections of a wire-wound unit. The IF core adjustments are indicated. **L3** is fitted to the back cover of the set.



VALVE ANALYSIS

Valve voltages and currents given in the table below are those measured by the makers, with the volume control at minimum, the receiver tuned to 200 m and connected to 200 V AC mains. Voltages were measured with a high resistance meter whose negative lead was connected to chassis.

Valve	Anode Voltage (V)	Anode Current (mA)	Screen Voltage (V)	Screen Current (mA)
V1 6K8G	140	1·5	80	3·0
	Oscillator			
	76	2·5		
V2 6K7G	140	5·0	110	1·5
V3 6Q7G	50	Very low	—	—
V4 25A6G	130	20·0	110	3·0
V5 25Z6G*	—	—	—	—

* Cathode readings 210 V, 33·0 mA, DC.

DISMANTLING THE SET

Removing Chassis.—Remove the three control knobs (recessed grub screws);

remove back cover (four set screws with washers) and unsolder from the aerial panel on it the four leads from chassis;

remove the fixing ring from the mains switch on side of cabinet, and push switch in;

remove the ¼in. wood screw holding top of scale assembly to front of cabinet;

remove the three screws (with washers) holding chassis to bottom of cabinet, when chassis may be withdrawn to extent of speaker leads; or, if these are unsoldered, it may be freed entirely.

When replacing, the yellow lead from chassis goes to the aerial socket on the back cover, and the plain grey rubber lead goes to the earth socket.

The remaining two grey rubber leads, marked with red paint, go to the ends of the frame winding on the two tags under the aerial panel fixing rivets.

Removing Speaker.—Slacken the four clamp nuts and swivel the clamps.

When replacing, the connecting panel should be at the top.

GENERAL NOTES

Switches.—**S1-S8** are the waveband switches, ganged in a single rotary 2-way unit indicated in our under-chassis view. The unit is shown in detail in the diagram inset in the circuit diagram overleaf. **S1, S3, S5, S7** close on SW and open on LW; **S2, S4, S6, S8** close on MW and open on SW.

S9, S10 are the QMB mains switches, in a toggle unit fitted to the side of the cabinet.

Coil L3 is wound flat on the back cover of the receiver, where it is connected to tags under the rivets holding the **A, E** panel. Two leads marked with red paint connect these to chassis.

Scale Lamps.—These are two Osram MES type lamps rated at 6.5 V, 0.3 A.

External Speaker.—Two tags on the output transformer **T1** on the chassis deck provide convenient points for the connection of a low impedance (2.5-4 Ω) external speaker.

Capacitors C22, C23, C24.—These are all cardboard tubular type electrolytics. **C22** is rated at 8μF, 350 V working; **C23, C24** are both rated at 16 μF, 250 V peak working, 300 V surge.

Resistors R17, R19, R20.—These form the three sections of a wire-wound resistance unit on the chassis deck. The top section **R20** provides voltage adjustment ballast for the heater circuit, the tag of **R21** going to either end according to the voltage of the mains.

Chassis Divergencies.—A 15 μμF (0.000015 μF) capacitor may be found connected between **V1** hexode anode and chassis as additional capacitance across **L8.** In the makers' diagram the valve heater sequence, from HT negative to **R20,** was **V1, V2, V3, V4, V5,** so that **V1** and **V2** are transposed as compared with our sample.

Small differences in component values may be found in some chassis, but these are such as not to affect the performance seriously. In our sample **R15** was 47 Ω, and **C25** was 0.05 μF, but departures are due to supply difficulties, and we quote the original values in our tables.

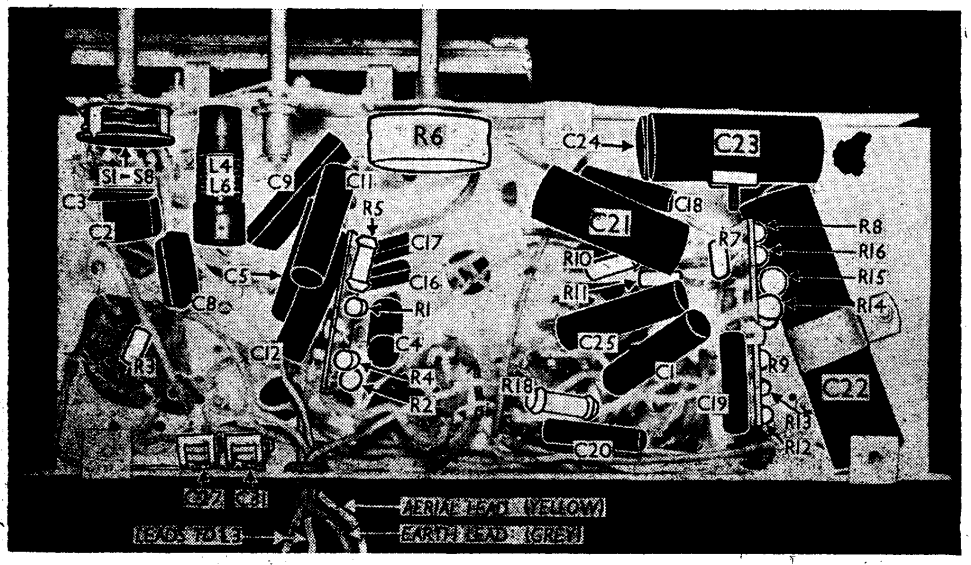
Line Cord Replacement.—In view of possible difficulty in obtaining line cords, the makers have prepared a suitable wire-wound replacement unit, in a strong perforated metal shroud, which can easily be fitted externally to the back cover.

The unit has three coloured connecting leads, and the instructions are as follows:

Mount the unit vertically, taking care that the fixing screws do not foul the frame winding. Disconnect **R21** (white fluffy lead) from **R20,** cut it back to mains lead and tape up.

Connect the orange (or yellow) lead from the replacement unit to **R20,** and the blue lead to the mains side of **S10.** The red lead is superfluous, and should be cut off and discarded.

The resistance of the replacement unit is a little higher than that of the original line cord, but this appears to have no adverse effect on the performance, and it is of some advantage when the set is working on mains voltages near the upper ends of the two adjustment positions.



Under-chassis view. A diagram of the switch unit is inset in the circuit overleaf.

CIRCUIT ALIGNMENT

IF Stages.—Switch set to MW, connect signal generator leads to control grid (top cap) of **V1** and chassis, feed in a 465 kc/s (645.16 m) signal, turn the volume control to maximum, and adjust the cores of **L9, L11, L8** and **L10** in that order for maximum output.

MW.—Transfer signal generator leads to **A** and **E** sockets, tune to 214 m on scale, feed in a 214 m (1,400 kc/s) signal, and adjust **C31,** then **C27,** for maximum output.

SW.—Switch set to SW, tune to 16 m on scale, feed in a 16 m (18.75 Mc/s) signal, and adjust **C30,** then **C26,** for maximum output.

Tracking is fixed, but a check should be made at several points on each band.

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