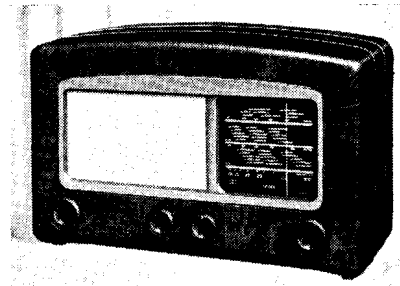


# COSSOR 494

## "Melody Maker"



THE Cossor "Melody Maker" of 1949, model 494, is a 4-valve (plus rectifier) 3-band superhet designed to operate from A.C. mains of 200-250 V, 40-100 c/s. The waveband ranges are 15.8-51.3 m, 187-575 m and 940-2,050 m.

Provision is made for the connection of a gramophone pick-up and an external speaker, and although an external aerial should be used for permanent installations, a frame winding is mounted on the back cover for temporary locations.

Release date and original price: July 1949; £12 19s. 6d. plus purchase tax.

### CIRCUIT DESCRIPTION

Input from external aerial, or internal frame aerial L1, is inductively coupled on S.W. by L2, and capacitatively "bottom" coupled on M.W. and L.W. by C1, to single-tuned circuits L3, C26 (S.W.), L4, C26 (M.W.) or L5, C26 (L.W.) which precede a triode-heptode valve (V1, Cossor 757) operating as frequency changer with internal coupling.

Triode oscillator grid coils L6 (S.W.), L7 (M.W.), L8 (L.W.) are tuned by C27, with parallel trimming by C28 (S.W.), C29 (M.W.), C8 (L.W.) and series tracking by C7 (M.W.), C7, C9, C30 (L.W.). Inductive reaction coupling from

anode by L9 (S.W.), L10 (M.W. and L.W.).

Second valve (V2, Cossor 7B7) is a variable-mu R.F. pentode operating as intermediate frequency amplifier with tuned transformer couplings C4, L11, L12, C5 and C12, L13, L14, C13.

Intermediate frequency 465 kc/s.

Diode second detector is part of double diode triode valve (V3, Cossor 7C6), in which the diode sections are wired in parallel. Audio frequency component in rectified output is developed across the manual volume control R8, which is the load resistor, and passed via C16 and R9

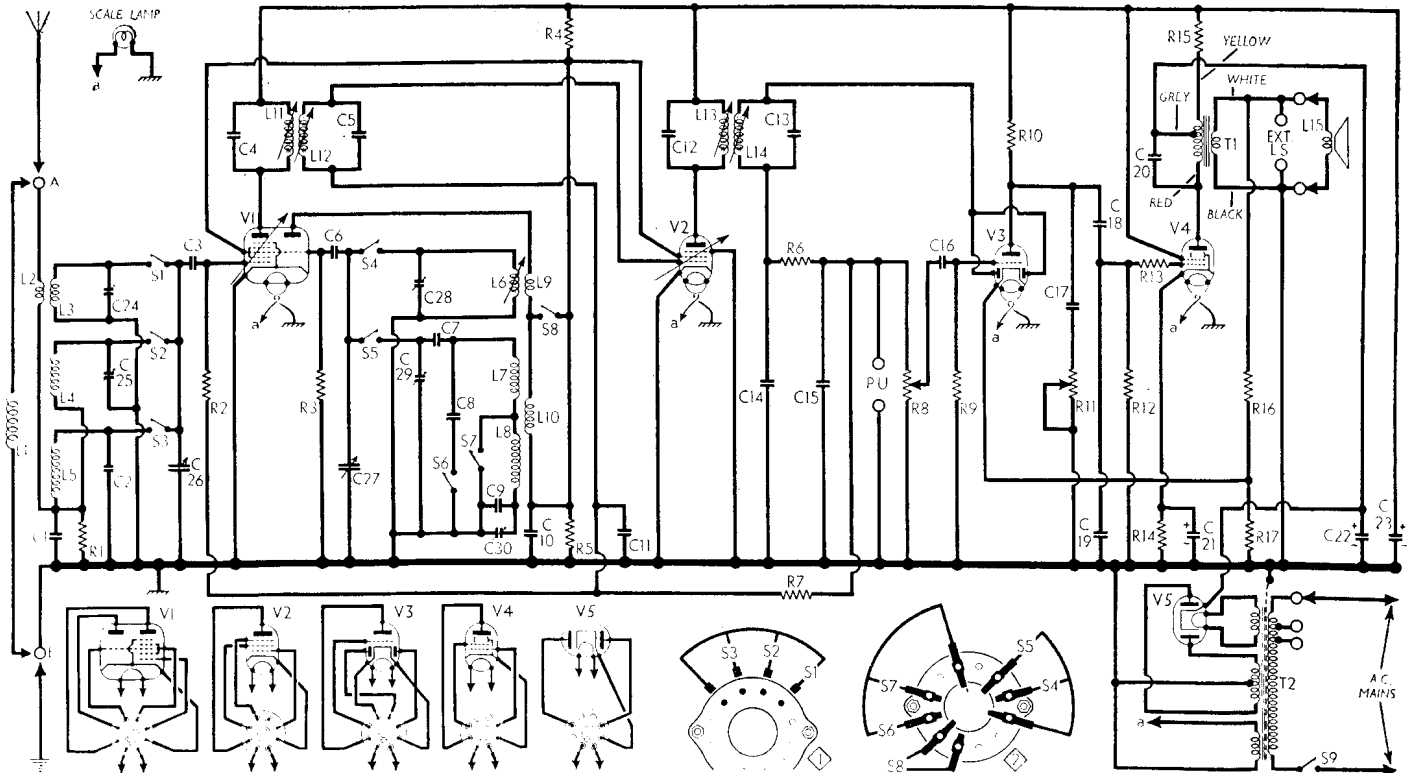
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### COMPONENTS AND VALUES

RESISTORS		Values (ohms)	Locations
R1	Aerial coupling ...	1,000	A2
R2	V1 hept. C.G. ...	330,000	J4
R3	V1 osc. C.G. ...	47,000	J4
R4	H.T. feed potential {	12,000	H4
R5	divider resistors {	33,000	K4
R6	I.F. stopper ...	47,000	G4
R7	A.G.C. decoupling ...	2,200,000	D3
R8	Volume control ...	500,000	D3
R9	V3 C.G. resistor ...	4,700,000	E4
R10	V3 triode load ...	680,000	G4
R11	Tone control ...	500,000	F3
R12	V4 C.G. resistor ...	470,000	E4
R13	V4 C.G. stopper ...	47,000	F4
R14	V4 G.B. resistor ...	270	F5
R15	H.T. smoothing ...	2,700	F3
R16	Feed-back potential {	470	G5
R17	divider ...	100	G5

CAPACITORS		Values (µF)	Locations
C1	Aerial coupling ...	0.005 †	A2
C2	Aerial L.W. trim...	0.00075	G3
C3	V1 hept. C.G. ...	0.0005	J3
C4	1st I.F. transformer {	0.0001	A2
C5	tuning ...	0.0001	A2
C6	V1 osc. C.G. ...	0.0001	H3
C7	V1 osc. C.G. ...	0.00044	H3
C8	Osc. L.W. trim. ...	0.000133	G3
C9	Osc. L.W. track. ...	0.0005	H3
C10	H.T. feed decoup. ...	0.1	H4
C11	A.G.C. decoup. ...	0.1	E3
C12	2nd I.F. transformer {	0.0001	A2
C13	tuning ...	0.0001	A2
C14	I.F. by-passes ...	0.0001	G5
C15	I.F. by-passes ...	0.0001	F4
C16	A.F. coupling ...	0.005	E3
C17	Part tone control ...	0.02	F3
C18	A.F. coupling ...	0.1	F4
C19	I.F. by-pass ...	0.0001	E4
C20	Tone corrector ...	0.005	C3
C21*	V4 cath. by-pass ...	25.0	F5
C22*	H.T. smoothing ...	16.0	A2
C23*	H.T. smoothing ...	32.0	A2
C24†	Aerial S.W. trim ...	0.00006	K3
C25†	Aerial M.W. trim ...	0.00006	J3
C26†	Aerial tuning ...	—	A1
C27†	Oscillator tuning ...	—	A2
C28†	Osc. S.W. trim. ...	0.00006	J3
C29†	Osc. M.W. trim. ...	0.00006	J3
C30†	Osc. L.W. tracker ...	0.00006	H3

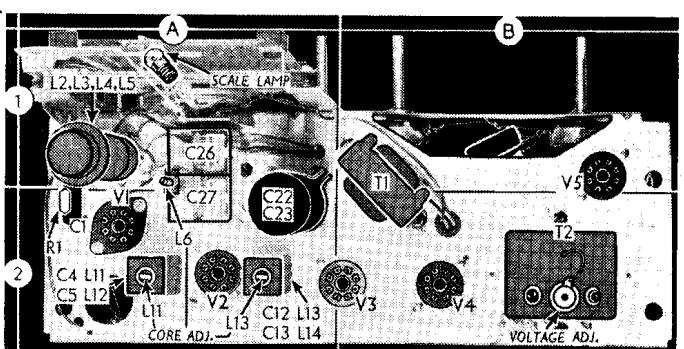
\* Electrolytic. † Variable. ‡ Pre-set.



Circuit Diagram of the Cossor 494 A.C. "Melody Maker." Inset below it are diagrams of the waveband switch units, as seen from the rear.

OTHER COMPONENTS		Approx. Values (ohms)	Locations	
L1	Frame aerial ...	0.5	—	
L2	Aerial S.W. coup...	0.3	A1	
L3	Aerial tuning coils	Very low	A1	
L4		3.2	A1	
L5		13.0	A1	
L6		Very low	J3	
L7		Oscillator tuning coils ...	5.0	H3
L8	Oscillator reaction coils ...	7.0	H3	
L9	1st I.F. trans.	25.0	J3	
L10		2.2	H3	
L11	2nd I.F. trans.	8.5	A2	
L12		8.5	A2	
L13	Speech coil	8.5	A2	
L14		8.5	A2	
L15		2.25	—	
T1	Output trans.	Pri., yellow ...	12.0	B1
		Pri., grey-red ...	265.0	
		Sec. ...	0.5	
		Pri., total Heat.	44.0	
T2	Mains trans.	sec. ...	Very low	B2
		Rect. heat. sec. ...	0.2	
		H.T. sec., total ...	515.0	
S1-S8	W/band switches...	—	G3	
S9	Mains sw., g'd R8...	—	C3	

Plan view of the chassis. The core adjustments for L6 and the I.F. transformer primaries are indicated here. A "snap" fastener is used for voltage adjustments.



screws) and the scale lamp bracket, which is secured by a single cheese-head screw to a moulded projection inside the cabinet; remove the two cheese-head chassis retaining screws (with washers) at opposite ends of the rear chassis members, and slide out the chassis.

**CIRCUIT ALIGNMENT**

**I.F. Stages.**—Switch set to M.W., turn gang to minimum capacitance and volume control to maximum, connect signal generator (via an 0.1µF capacitor in the "live" lead) to control grid (pin 6) of V1 and the E socket, feed in a

scale, feed in a 193.6 m (1,550 kc/s signal, and adjust C29 (J3) and C25 (J3) for maximum output. Check calibration at 360 m (833.2 kc/s) and 520 m, (576.9 kc/s).

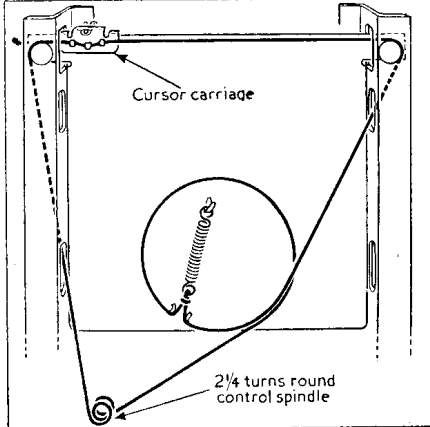
**L.W.**—Switch set to L.W., tune to vertical line (L) at top of scale, feed in a 1,875 m (160 kc/s) signal, and adjust C30 (H3) for maximum output. Check calibration at 1,200 m (250 kc/s) and 1,600 m (187.5 kc/s).

**S.W.**—Switch set to S.W., tune to left-hand vertical line (S) at top of scale, feed in a 16.67 m (18 Mc/s) signal, and adjust C28 (J3) and C24 (K3) for maximum output, choosing the peak of C28 involving the lesser capacitance. Tune to right-hand vertical line (S) at top of scale, feed in a 50 m (6 Mc/s) signal, and adjust the core of L6 (A1) for maximum output. Repeat these operations until no improvement results.

**GENERAL NOTES**

**Switches.**—S1-S8 are the waveband switches ganged in two rotary units beneath the chassis. The units are indicated in our under-chassis view, and shown in detail in the diagrams inset beneath the circuit diagram overleaf. The table below gives the switch positions for the three control settings, starting from the fully anticlockwise position of the control knob. A dash indicates open, and C, closed.

Switch	S.W.	M.W.	L.W.
S1	C	—	—
S2	—	C	—
S3	—	—	C
S4	C	—	—
S5	—	C	C
S6	—	—	C
S7	—	C	—
S8	C	—	—



Sketch of the tuning drive system, viewed from the rear.

465 kc/s (645.16m) signal, and adjust the cores of L14, L13, L12, L11 (location references H5, A2, J5, A2) for maximum output. Repeat these operations until no improvement results.

**R.F. and Oscillator Stages.**—With the gang at minimum capacitance the cursor should coincide with the low wavelength ends of the three scales. Transfer "live" signal generator lead to A socket, via a suitable dummy aerial.

**M.W.**—With set still switched to M.W., tune to the vertical line (M) at the top of the

**Scale Lamp.**—This is an Osram lamp rated at 6.5 V, 0.3 A. It has an M.E.S. base and a small clear spherical bulb.

**External Speaker.**—Two sockets are provided at the rear of the chassis for the connection of a low impedance (about 3Ω) external speaker.

**Drive Cord Replacement.**—Forty inches of high grade flax fishing line is required for a new drive cord. It should be run as shown in the sketch (col. 2), where the drive system is drawn as seen from the rear of the chassis when the gang is at maximum.

**VALVE ANALYSIS**

Valve voltages and currents given in the table below are those quoted by the manufacturers, whose receiver was tuned to 500m and was operating under "no signal" conditions from mains of 200 V, using the 200-215 V tapping on the mains transformer. Voltages were measured with a 1,000 ohms-per-volt meter, chassis being the negative connection.

Valve	Anode		Screen		Cath.
	V	mA	V	mA	
V1 787	208	3.0	80	3.4	—
	Oscillator	80			
V2 7B7	208	10.0	80	2.3	—
	208	2.0			
V3 7C6	46	—	—	—	—
V4 7C5	268	32.0	208	2.5	9
V5 7Y4	250	—	—	—	280

+ A.C.

**Circuit Description—continued**  
to grid of triode section, which operates as A.F. amplifier.

The D.C. potential developed across R8 is tapped off and fed back, through a decoupling circuit R7, C11, as G.B. to F.C. and I.F. valves.

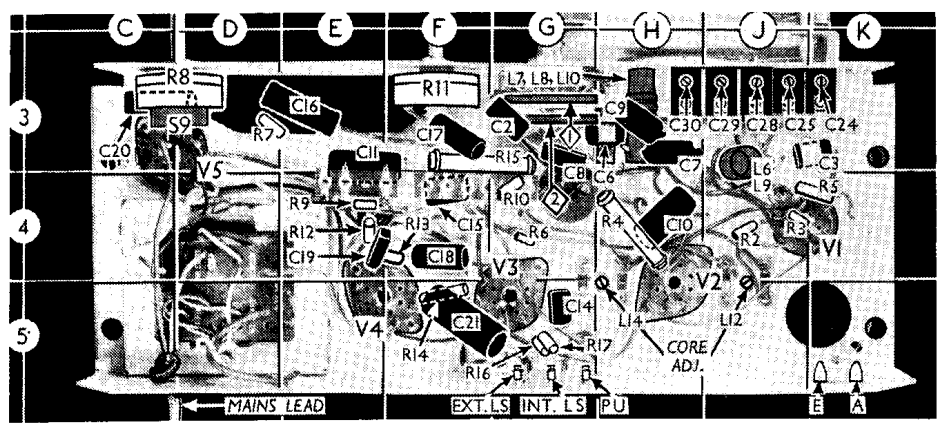
Resistance-capacitance coupling by R10, C18, R12, via C.G. stopper R13, between V3 triode and beam tetrode output valve (V4, Cossor 7C5).

A.F. voltages developed across T1 secondary winding are applied to a potential divider network R16, R17, from which they are tapped off and fed back to V3 grid circuit in negative phase.

H.T. current is supplied by I.H.C. full-wave rectifying valve (V5, Cossor 7Y4). Smoothing by resistor R15 and electrolytic capacitors C22, C23, residual hum being neutralized by passing the receiver H.T. current through a portion of T1 primary winding.

**DISMANTLING THE SET**

**Removing Chassis.**—Withdraw frame aerial and speaker connecting plugs, and remove the combined back and bottom cover (four cheese-head screws, with washers); remove the four control knobs (recessed grub



Under-chassis view. The waveband switch units are indicated by numbers 1 and 2 in diamonds.