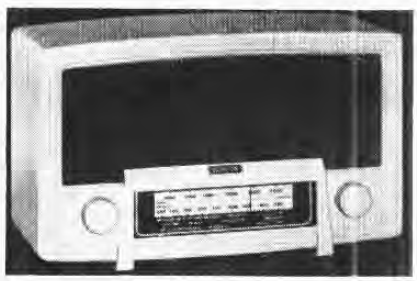
Supplement to Wireless & Electrical Trader, 3 April 1954

"TRADER" SERVICE SHEET

1139

COSSOR 512

"Melody Minor"



EMPLOYING two ferrite rod internal aerials, the Cossor 512 "Melody Minor" is a 3-valve (plus rectifier) 2-band table superhet, designed to operate from A.C. or D.C. mains of 200-250 V, 40-100 c/s in the case of A.C. The waveband ranges are 187-547m and 863-2,065m.

Release date and original price: October 1953, £11 18s 6d. Purchase tax extra.

CIRCUIT DESCRIPTION

The aerial input coils **L1** (M.W.) and **L3** (L.W.) are mounted on lengths of ferrite rod to form the internal aerial, and, together with loading coils **L2** (M.W.) and **L4** (L.W.), are tuned by **C29**. Provision is also made for the connection of an external aerial and earth via **C1** and **C2**, which isolate the **A** and **E** sockets from chassis. In earlier models, a single frame aerial winding **L15** was used instead of the ferrite rod cored aerials. The aerial input circuit of these models is drawn separately to the left of the main circuit diagram.

Triode hexode valve **(V1, Cossor 141TH)** operates as frequency changer with electron coupling. Oscillator grid coils **L5** (M.W.) and **L6** (L.W.) are tuned by **C30**. Parallel trimming by **C31** (M.W.) and **C9, C31** (L.W.); series tracking by **C11** (M.W.) and **C10, C11** (L.W.). Reaction coupling from anode by **L7** (M.W.) and **L8** (L.W.).

Second valve **(V2, Cossor 171DDP)** is a double diode R.F. pentode, its pentode section operating as intermediate frequency amplifier with tuned transformer couplings **C6, L9, L10, C7** and **C16, L11, L12, C17.**

Intermediate frequency 470 kc/s.

One diode section of **V2** operates as signal detector, the audio frequency component in its rectified output being developed across **R13** and passed via **C22**, volume control **R14**, and **R16** to control grid of pentode output valve **(V3, Cossor 451PT)**. I.F. filtering by **C18, R12** and **C19**. Tone control adjustment my means of **C21** and a two-position link at the rear of the chassis. Fixed tone correction by **C26** in **V3** anode circuit.

Second diode of **V2** is fed from **V2** pentode anode via **C14**, and a proportion of the rectified output, that developed across **R9** in the potential divider **R8, R9,** is fed back as bias to **V1** and **V2** pentode section.

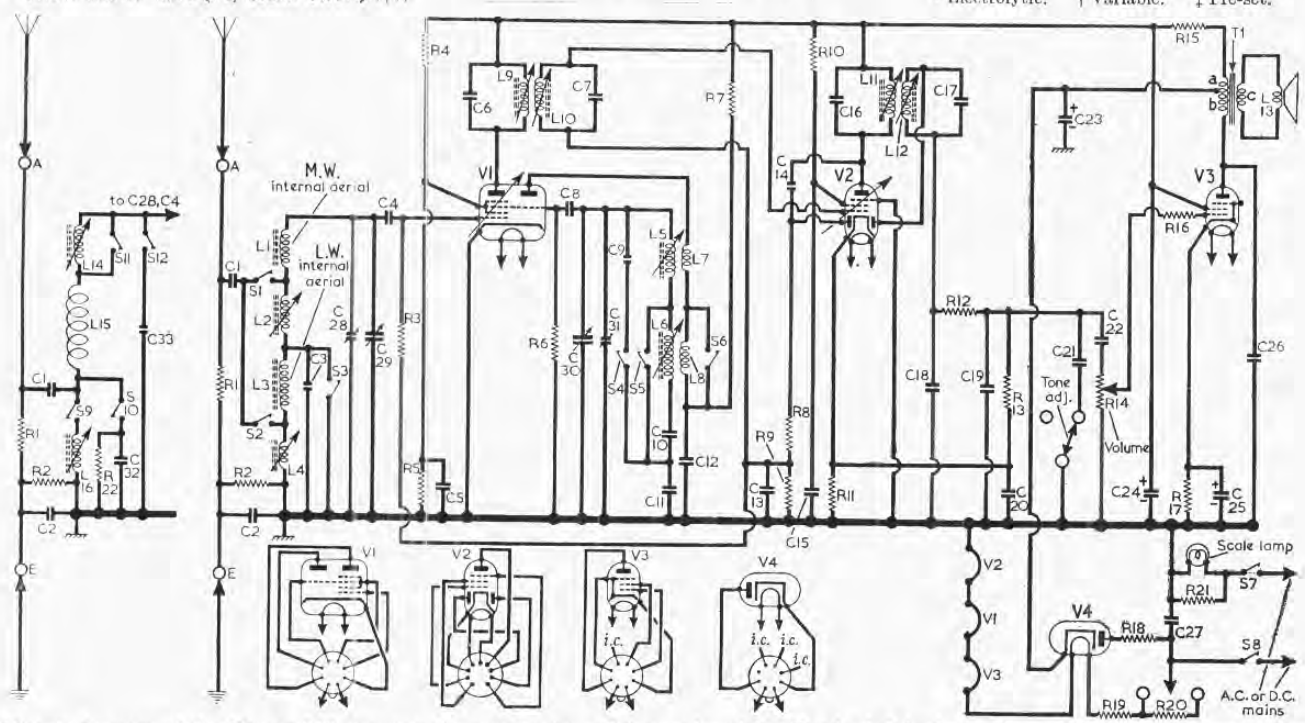
H.T. current is supplied by I.H.C. half-wave rectifier **(V4, Cossor 311SU)**. Smoothing by **R15** and electrolytic capacitors **C23, C24.** Residual hum is neutralized by passing the H.T. current through section **a** of the output transformer **T1.** **R18** protects the rectifier, and **R21** protects the scale lamp from current surges. Mains R.F. filtering by **C27.**

COMPONENTS AND VALUES

	RESISTORS	Values	Locations
R1	Aerial shunt ...	1·5MΩ	G4
R2	Anti-static leak ...	330kΩ	F3
R3	V1 C.G.	2·2MΩ	G3
R4	V1 S.G. pot. divider	15kΩ	F4
R5	V1 S.G. pot. divider	27kΩ	F4
R6	V1 osc. C.G. ...	47kΩ	F4
R7	Osc. anode feed ...	33kΩ	G3
R8	A.G.C. diode load	2·2MΩ	F4
R9	A.G.C. diode load	470kΩ	E4
R10	V2 S.G. feed ...	22kΩ	F4
R11	V2 G.B. ...	560Ω	E4
R12	I.F. stopper ...	47kΩ	E4
R13	Signal diode load ...	220kΩ	E3
R14	Volume control ...	500kΩ	D3
R15	H.T. smoothing ...	1·2kΩ	D3
R16	V3 C.G. stopper ...	47kΩ	D3
R17	V3 G.B.	270Ω	D4
R18	V4 surge limiter ...	180Ω	D4
R19	Heater ballast ...	950Ω	C2
R20	Heater ballast ...	300Ω	C2
R21	Scale lamp shunt ...	33Ω	D3
R22	L.W. aerial shunt...	4·7kΩ	—

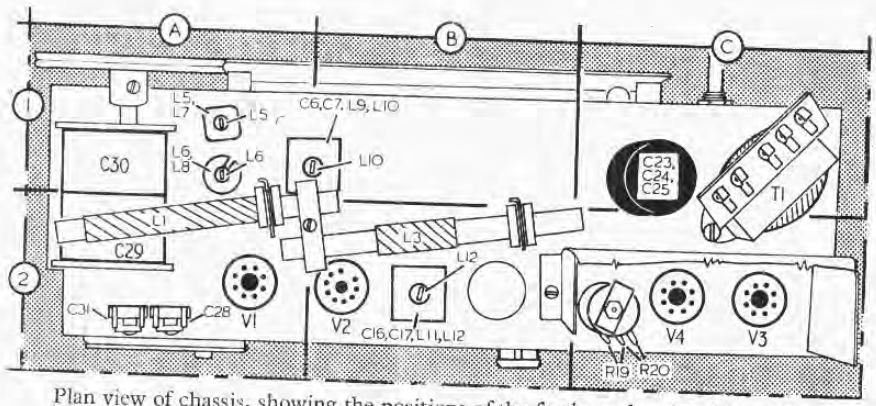
	CAPACITORS	Values	Locations
C1	Aerial coupling ...	0·0018μF	G4
C2	"E" socket isolator	0·01μF	E3
C3	L.W. aerial trim. ...	33pF	G4
C4	V1 C.G.	100pF	G4
C5	V1 S.G. decoupling	0·1μF	F3
C6	1st I.F. trans. tun.	100pF	A1
C7	1st I.F. trans. tun.	100pF	A1
C8	V1 osc. C.G. ...	120pF	G3
C9	L.W. osc. trimmer	47pF	G3
C10	L.W. osc. tracker...	220pF	G3
C11	M.W. osc. tracker...	638pF	G3
C12	Osc. anode decoup.	0·1μF	G3
C13	A.G.C. decoupling	0·05μF	F4
C14	A.G.C. coupling ...	10pF	F4
C15	V2 S.G. decoupling	0·1μF	F3
C16	2nd I.F. trans. tun.	100pF	B2
C17	2nd I.F. trans. tun.	175pF	B2
C18	I.F. by-passes ...	100pF	E4
C19	I.F. by-passes ...	100pF	E4
C20	V2 cath. by-pass ...	0·1μF	E4
C21	Tone adjustment ...	0·001μF	E4
C22	A.F. coupling ...	0·01μF	D3
C23*	H.T. smoothing ...	32μF	C1
C24*	H.T. smoothing ...	32μF	C1
C25*	V3 cath. by-pass ...	50pF	C1
C26	Tone corrector ...	0·005μF	D3
C27	Mains R.F. by-pass	0·01μF	D3
C28‡	M.W. aerial trim....	—	A2
C29†	Aerial tuning ...	—	A2
C30†	Oscillator tuning ...	—	A1
C31‡	M.W. osc. trim' ...	—	A2
C32	L.W. aerial coup....	0·0015μF	—
C33	L.W. aerial trim. ...	22pF	—

* Electrolytic. † Variable. ‡ Pre-set.



Circuit diagram of the Cossor 512 showing the two ferrite rod internal aerials. On the left is shown the aerial input used on earlier versions, where **L16** is the M.W. tuning coil and **L14** is the L.W. coil. **L15** is the frame aerial winding.

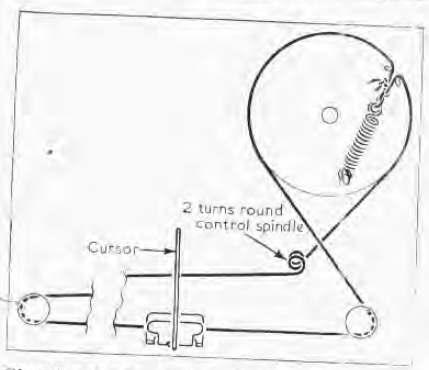
	OTHER COMPONENTS	Approx. Values (ohms)	Locations
L1	M.W. Int. aerial ...	0·3	A2
L2	M.W. loading coil...	1·5	G4
L3	L.W. Int. aerial ...	2·2	B2
L4	L.W. loading coil ...	2·2	G4
L5	Oscillator tun. coils	2·6	A1
L6		2·6	A1
L7	Osc. reaction coils	7·6	A1
L8		7·6	A1
L9	1st I.F. trans. Pri.	2·0	A1
L10	1st I.F. trans. Sec.	2·0	A1
L11	2nd I.F. trans. Pri.	12·0	A1
L12	2nd I.F. trans. Sec.	12·0	B2
L13	Speech coil ...	15·0	B2
L14	L.W. loading coil ...	2·5	
L15	Frame aerial ...	2·2	
L16	M.W. loading coil...	0·5	
T1	O.P. trans. a ...	1·5	
	b ...	30·0	
	c ...	480·0	A1
S1-S6	Waveband switches	—	
S7, S8	Mains sw., g'd R14	—	G3
		—	D3



Plan view of chassis, showing the positions of the ferrite rod aerials **L1** and **L3.**

GENERAL NOTES

Switches.—**S1-S6** are the waveband switches ganged in a single rotary unit beneath the chassis. The unit is indicated in our underside illustration of the chassis and shown in detail in column 2, where it is drawn as seen from the volume control end of an inverted chassis. The associated switch table below it shows the switch operations starting from the fully anti-clockwise setting of the control knob. A dash indicates open, and **C**, closed.



Sketch of the tuning drive cord system, drawn as seen from the front of the chassis with the gang at maximum capacitance.

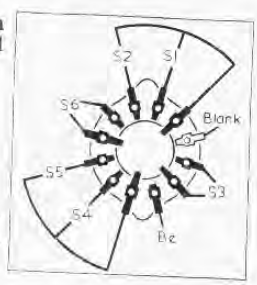
S7, S8.—These are the Q.M.B. mains switches, ganged with the volume control **R14.**

Scale Lamp.—This is a 3.5 V, 0.15 A lamp with a round spherical bulb and an M.E.S. base.

Modification.—Earlier models were fitted with a single conventional frame aerial winding in place of the ferrite internal aerials. A separate aerial input circuit for the earlier models is shown on the left of the main circuit diagram overleaf.

Drive Cord Replacement.—About 40 inches of nylon-braided glass yarn is required for a new drive cord, which should be run as shown in the sketch in column 1, starting with the gang at maximum capacitance and running the cord clockwise round the drum.

Right : Diagram of the waveband switch unit.



Below : Waveband switch table.

Switch	M.W.	L.W.
S1	C	—
S2	—	—
S3	C	C
S4	—	C
S5	C	—
S6	C	—
S9	C	—
S10	—	C

VALVE ANALYSIS

Valve voltages and currents given in the table (col. 3) are those derived from the manufacturers' information and were measured on a receiver which was tuned to the highest wavelength end of M.W., but with no signal input.

Voltages were measured with a 20,000 ohms-per-volt meter, and allowance should be made for the current drawn by meters having a lower internal resistance. Chassis was the negative connection in every case.

Valve	Anode		Screen		Cath.
	V	mA	V	mA	V
V1 141TH	155	2·4	75	3·7	—
	Oscillator				
	70	2·9			
V2 171DDP	155	5·0	115	1·9	3·9
V3 451PT	168	33·0	156	6·3	4·2
V4 311SU	185*	—	—	—	184·0†

* A.C. reading. † Cathode current, 55.4 mA.

CIRCUIT ALIGNMENT

All the core and trimmer adjustments can be made accessible by removing the cabinet base and back cover. Turn volume control to maximum and set the tone adjustment to "Brilliant."

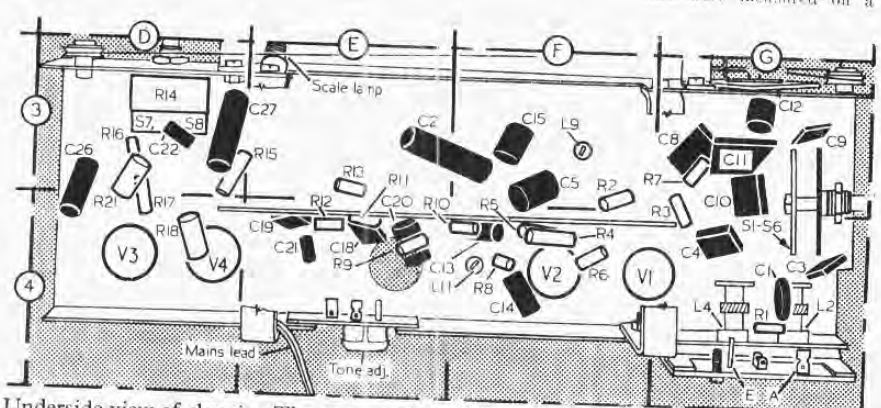
I.F. Stages.—Switch receiver to M.W. and turn gang to minimum capacitance. Connect output of signal generator, via an 0.1 μF capacitor in each lead, to control grid (pin 6) of **V1** and chassis. Feed in a 470 kc/s (638.3 m) signal and adjust the cores of **L12** (location reference B2) **L11** (F4), **L10** (A1) and **L9** (F3) for maximum output. The core of **L11** must be adjusted to the peak obtained with it screwed to its inner-more setting in the coil former, and the cores of the remaining coils adjusted to their outer-more settings.

R.F. and Oscillator Stages.—Although the receiver may be aligned with the chassis in its cabinet, calibration marks have been provided on the scale backing plate to allow for alignment outside the cabinet. Check that with the gang at maximum capacitance the cursor coincides with the high wavelength end of the tuning scale, or with the extreme right-hand calibration mark on the lower edge of the scale backing plate.

If it is intended to operate the receiver mainly from an external aerial and earth, then the output of the signal generator should be fed, via a standard dummy aerial, to the **A** and **E** sockets. If, however, the receiver is to be operated mainly from the internal aerials, then the output of the signal generator should be connected to a 20-turn, 4-inch diameter coil of wire, placed about one foot away from the internal aerials.

M.W.—Switch receiver to M.W., tune to 193.6 m (calibration mark at lower left-hand edge of backing plate) feed in a 193.6 m (1,550 kc/s) signal and adjust **C31** (A2) and **C28** (A2) for maximum output. Tune receiver to 521.7 m (middle calibration mark on lower edge of backing plate) feed in a 521.7 m (575 kc/s) signal and adjust the cores of **L5** (A1) and **L2** (G4) for maximum output. Repeat these adjustments until no further improvement results.

L.W.—Switch receiver to L.W., tune to 1,875 m (calibration mark at top edge of backing plate) feed in a 1,875 m (160 kc/s) signal and adjust the cores of **L6** (A1) and **L4** (G4) for maximum output.



Underside view of chassis. The two-position tone adjustment plug is shown in location reference E4.

Printed in England by Cornwall Press Ltd., Paris Garden, London, S.E.1.