

## COSSOR 500, 501, 502 & 520 radio receivers

FOUR "Melody Maker" table radios and a console radiogram are covered in this Data Sheet. Models 500 and 501AC are identical receivers for a.c. operation, except for the cabinet which is wooden in the Model 500 and plastic in the Model 501AC. The radiogram is Model 502 and this uses exactly the same circuit, although the mechanical arrangement of the chassis differs. Model 520 is a later receiver, using the same chassis as the Model 500, but housed in a new cabinet. The fifth receiver is Model 501U, which is an a.c.-d.c. version of the chassis.

### CIRCUIT DETAILS

On medium and long wave bands, bottom-end coupling is used by virtue of the impedance of C1. On short waves, the signal is coupled to the grid circuit via L1 to L2, the impedance of C1 being so small at these frequencies that no coupling takes place in that way. For local station reception, a built-in frame aerial is provided, mounted on the cabinet back, and which can be plugged into the aerial and earth sockets.

The triode section of V1 functions as a conventional shunt-fed local oscillator, coupling to the mixer being by internal

inter-electrode capacitances. The short-wave grid coil is variable (L7) with parallel trimming by C14. The fixed medium and long wave coils (L9, L10) are parallel-trimmed by C15 (l.w. only) and C12, with series padding by C13, C16 and C18.

The i.f. signal is coupled via the i.f. transformer L5/L6 to V2, a pentode i.f. amplifier, and thence via L12/L13 to the strapped diodes of V3. The d.c. component in the rectified output, developed across the diode load, is fed back as a.g.c. bias via the decoupling components R6 and C17, to the signal grids of V1 and V2. The a.f. component across the diode load, R9 (volume control), is coupled via C24 to the triode section of the valve for amplification. An i.f. filter is formed by R18, C21 and C22. Sockets are provided on the back of the chassis for the use of a high impedance or crystal pick-up.

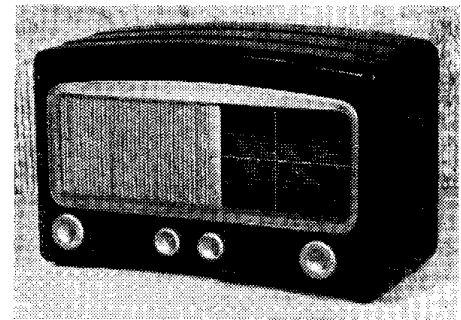
The audio signal is r.c. coupled to the output stage V4, R13 being the grid resistor and R14, C27 and C28 forming a tone control circuit, R14 being the manual control. Fixed tone correction is provided by C29 across the primary of the output transformer and by the resistors R12 and R15, which form a negative feedback potential divider between the secondary of the output transformer and the V3 cathode circuit.

The speaker is an 8-in. p.m. unit with a speech coil impedance of 3Ω. The undistorted output is 2.5 watts. Sockets are provided for the use of a 3Ω external speaker.

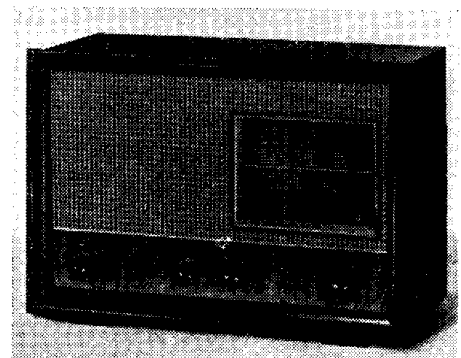
The a.c. power pack uses a full wave rectifier V5, with smoothing by C31, R17 and C26. The rectified h.t. current is passed through part of the primary winding of the output transformer in order to neutralise residual hum.

### Model 502

This radiogram version uses an identical circuit to that of the 500/501AC models, but the output and rectifying stages are separated from the main



Model 501



Model 520

## SERVICE SNAPS

### COSSOR 500, 501, 502, 520

**Valves:** One each 7S7, 7B7, 7C6, 7C5 and 7Y4 (the 7C5 may be replaced by a 6V6GT in some models), or—62TH, 62VP, 62DDT, 67PT and 66KU, or—OM10, OM6, OM4, 6V6GT and 6X5U. Model 501U: OM10, OM6, OM4, 332PEN and OM1, or—14S7, 7B7, 7C6, 35A5 and 35Z3.

**Dial Lamp:** One 6.5V, 0.3A, M.E.S. (Model 501U—8V, 0.2A, M.E.S.).

**Volume Control:** 0.5MΩ, with d.p. on-off switch.

**Tone Control:** 0.5MΩ.

**Intermediate Frequency:** 470 kc/s.

**Mains Fuses:** Two 500mA cartridge type (Model 501U only).

**Electrolytics:** 32+16μF, 350V; 25μF, 25V.

**Waveranges:** Longwave, 940–2,050m; mediumwave, 187–575m; shortwave, 15.8–51.3m (19–5.8 Mc/s).

**Mains Input:** 200–255V, 40–100 c/s a.c. (some models have an additional 103–130V tapping). Model 501U is for d.c.-only operation, 190–250V.

### RELEASE DATES AND PRICES

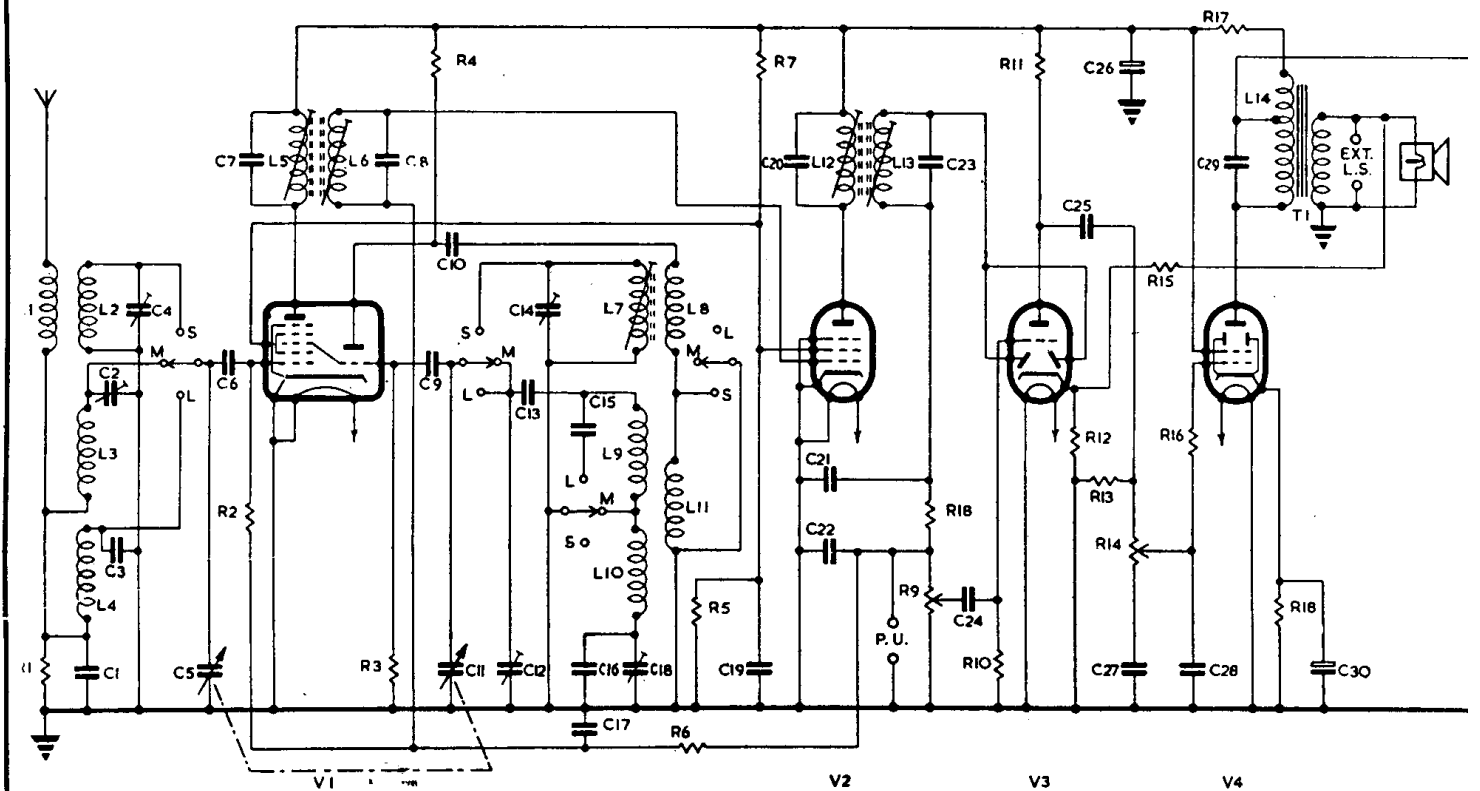
Model 500:	May, 1950	£15 2 9
Model 501AC:	June, 1950	£12 19 6
Model 501U:	November, 1950	£13 8 2
Model 502:	March, 1951	£49 5 6
Model 520:	November, 1954	£15 10 0
(All prices exclusive of tax.)		

chassis by means of an octal plug-and-socket arrangement. The drive cord system differs (see separate diagram). Mains consumption is the same on radio (40 watts) but rises to 55 watts when used for gramophone.

The gram unit is a non-mix 3-speed autochanger for 33, 45 and 78 r.p.m. records, the required speed being selected by means of a rotary switch. Two sapphire stylus pick-up heads are provided, red spot for l.p. and green spot for 78. The heads are easily interchangeable, being a sliding fit on an adaptor plugged into the pick-up arm.

An 8-in. p.m. speaker is used, with a speech coil impedance of 3Ω. Provision is made for the connection of a 3Ω extension speaker.

Circuit diagram of the Cossor Melody Maker 500



This circuit diagram applies also to Models 501AC, 502 and 520. The component values are those used when the Cossor Octal range of valve differences when either of the other valve ranges are used (see table below) are given on page 4.

COMPONENT LIST

Resistors

- R1 1kΩ
- R2 330kΩ
- R3\* 100kΩ
- R4 33kΩ
- R5 33kΩ
- R6 2.2MΩ
- R7 12kΩ
- R8 47kΩ
- R9 500kΩ
- R10 4.7MΩ
- R11\* 680kΩ
- R12 100Ω
- R13\* 470kΩ
- R14 500kΩ
- R15 470Ω
- R16 47kΩ
- R17 2.7kΩ
- R18\* 270Ω

- C15 133pF
- C16 470pF
- C17 0.1μF
- C19 0.1μF
- C20 100pF
- C21 100pF
- C22 100pF
- C23 100pF
- C24 0.005μF
- C25\* 0.1μF
- C26 32μF, 350V
- C27 0.002μF
- C28 100pF
- C29 0.005μF
- C30 25μF, 25V
- C31 16μF, 350V

\*Where the Octal range of valves is used, C25 is 0.01μF.

COILS AND TRANSFORMERS

- L1 S.W. aerial coil v.l.
- L2 S.W. aerial coupling v.l.
- L3 M.W. aerial coil 3.5Ω
- L4 L.W. aerial coil 13.5Ω
- L5 1st i.f.t. primary 9Ω
- L6 1st i.f.t. secondary 9Ω
- L7 S.W. oscillator coil v.l.
- L8 S.W. feedback winding 2.6Ω
- L9 M.W. oscillator coil 2.8Ω
- L10 L.W. oscillator coil 7.5Ω
- L11 M.W. and L.W. feedback coil 5.5Ω
- L12 2nd i.f.t. primary 9Ω
- L13 2nd i.f.t. secondary 9Ω
- T1 Output transformer primary 280Ω, L14 section secondary 13Ω
- T2 Mains transformer 200V tapping 40Ω, 220V tapping 43.5Ω, 240V tapping 47Ω, H.t. winding 265 + 265Ω, L.t. secondaries v.l.

VALVE VOLTAGES AND CURRENT

A.C. Models

	Anode		Screen		Cathode
	V	mA	V	mA	
V1(t)	96	3.2	—	—	} 9.6
V1(h)	208	3	80	3.4	
V2	204	10	80	2.3	12.3
V3	46	2	—	—	2
V4	268	32	202	2.5	34.5 (9V)
V5	250 (a.c.)	29	—	—	58 (280V)

The above readings obtained with receiver tuned to low frequency end of m.w. band under no-signal conditions, using a 1k/V meter on a Model 500 using the 7S7 series valve complement.

A.C.-D.C. Model

V1(t)	60	1.8	—	—	} 6.55
V1(h)	140	1.6	50	3.25	
V2	140	3.4	50	1.15	4.55
V3	20	v.l.	—	—	—
V4	220	30	140	2.3	32.3 (6V)
V5	210	43.4	—	—	43.4 (230V)

Above readings taken on receiver using Octal valve complement.

\* Values may vary if different valve complement is used. With B8A valves, R3 is 18kΩ and R18 is 180Ω. With Octal range, R13 is 270kΩ and R11 is 100kΩ.

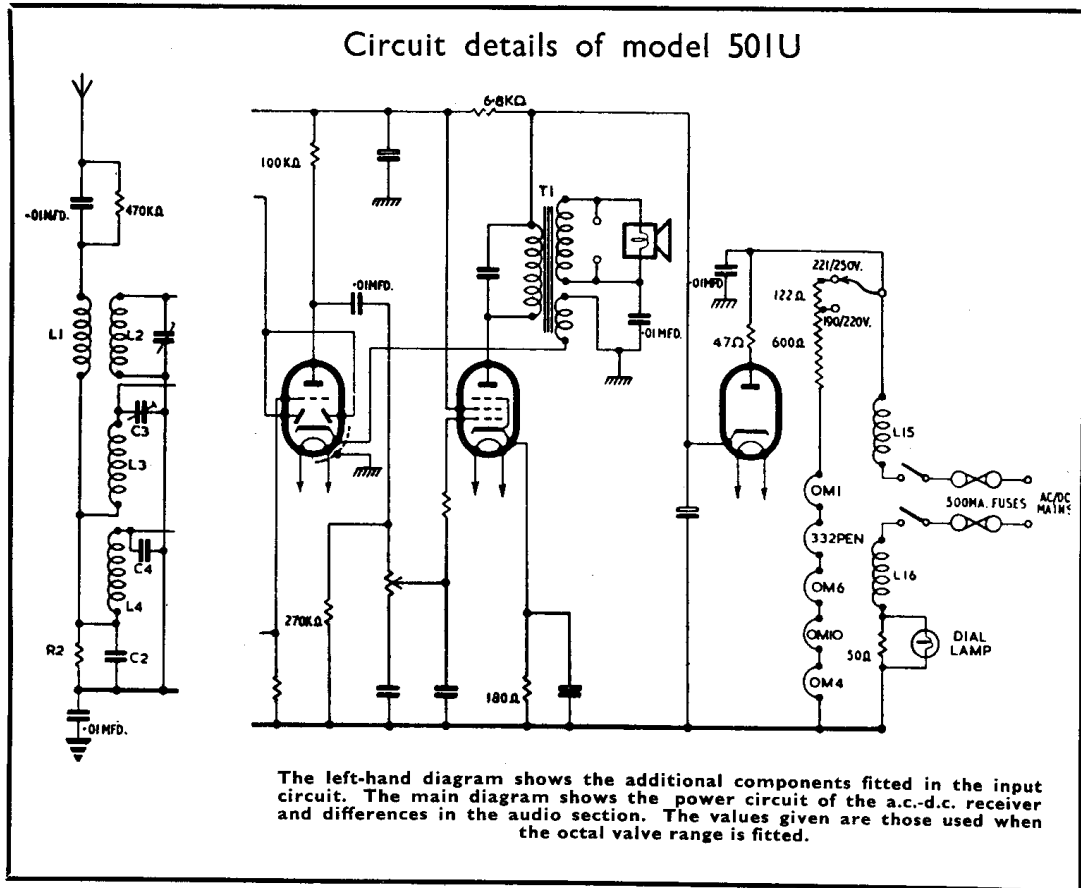
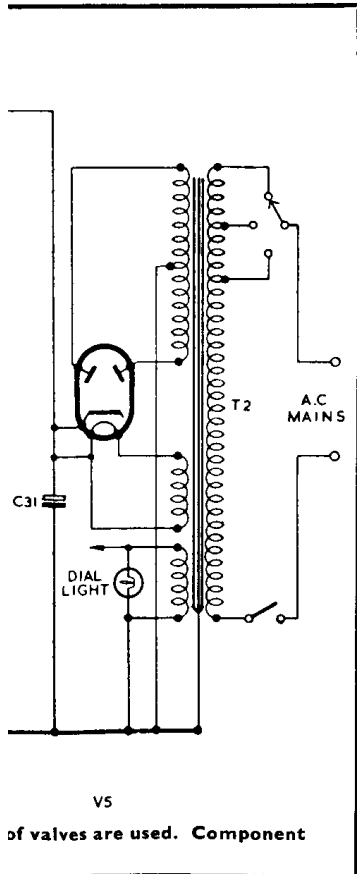
Capacitors

- C1 0.005μF
- C3 75pF
- C6 500pF
- C7 100pF
- C8 100pF
- C9 100pF
- C10 100pF
- C13 440pF

VALVES

	500, 501AC, 502, 520			501U	
	7S7	62TH	OM10	14S7	OM10
V1 Frequency changer	7S7	62TH	OM10	14S7	OM10
V2 I.f. amplifier	...	7B7	62VP	7B7	OM6
V3 Det., a.g.c., a.f.	...	7C6	62DDT	OM4	7C6
V4 Output	...	7C5*	67PT	6V6GT	35A5
V5 H.t. rectifier	...	7Y4	66KU	6X5U	35Z3

\*May be 6V6GT in some receivers.



## MODEL 501U

The a.c.-d.c. version of the 500/501AC chassis is almost identical except for the power-supply circuit and output transformer. This is shown in the circuit diagram, which applies to those models using octal valve complement (OM10, OM6, etc.).

Other differences include the isolating components in the aerial and earth leads, as shown in the sketch. Certain component values are different, as follows:

- R3 becomes 18kΩ.
  - R4 becomes 18kΩ.
  - R7 becomes 18kΩ.
  - R11 becomes 100kΩ.
  - C25 becomes 0.01μF
- The values of R17, R18, R13 and C25 are also changed to the values shown in the diagram. R5 is omitted and no pick-up sockets are provided.

### Loctal Valves

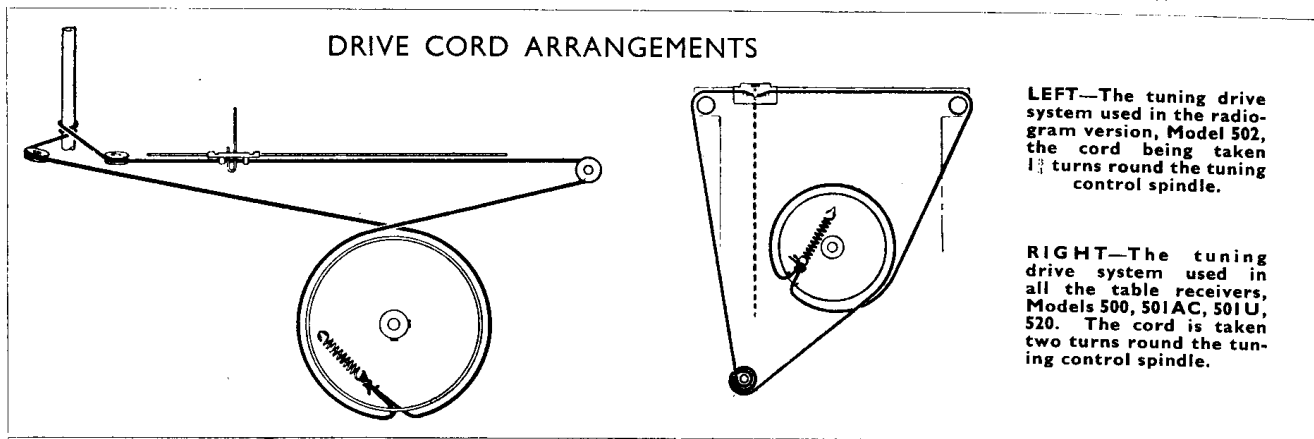
In versions of the 501U using loctal series valves (14S7, 7B7, etc.) the circuit does not differ so widely from that of the 500/501AC chassis.

Apart from the aerial isolating components and the power supply, the differences are as follows:

- R3 becomes 47kΩ.
- R17 becomes 2.2kΩ.
- C19 becomes 4μF.

The aerial isolating components become 1.5MΩ and 0.001μF.

The two mains dropping resistors (see 501U circuit) are now 190Ω and 700Ω respectively and the 50Ω limiter is now 70Ω. The negative feedback arrangement of the 500/501AC is retained (R12 and R15), as is R5.



## Alignment Procedure

### I.F. Circuits

Switch receiver to MW, with tuning gang at minimum capacitance and volume and tone controls fully clockwise. Inject a modulated signal of 470 kc/s into the signal grid of V1, via a 0.1 $\mu$ F capacitor. Adjust L13, L12, L6 and L5, in that order, for maximum output. Repeat these adjustments until no further improvement can be obtained.

**Note.**—Adjustment of the i.f. transformers should always be followed by complete re-alignment of the r.f. section.

### R.F. Circuits

**Medium Waveband.** Switch to MW and set the tuning gang to mechanical minimum and set the tuner pointer to

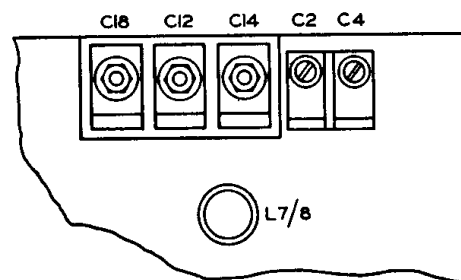
the line marked MIN on the top left of scale (the alignment markings are not visible when the receiver is in the cabinet).

Connect signal generator to the aerial and earth sockets via a standard dummy aerial and set pointer to line marked MW (or M on some scales).

Inject signal of 1,550 kc/s and adjust C12 and C2 for maximum output. Check calibration and sensitivity at spot frequencies.

**Long Waveband.** Switch to LW and set the tuning pointer to the line marked L on top right of scale. Inject 160 kc/s and adjust C18 for maximum output. Check calibration.

**Short Waveband.** Switch to SW and set tuning pointer to line marked S on



Sketch of under-chassis layout (right-hand top corner) showing position of trimmers for alignment purposes.

top left of scale. Inject 18 Mc/s and adjust C14 and C4 for maximum response. There are two positions where C14 peaks; the correct one is that requiring the least capacitance.

Set pointer to line marked S on top right of scale. Inject 6 Mc/s and adjust L7 for maximum response. Repeat the C14 and C4 adjustments. Check calibration.

## CIRCUIT VARIATIONS

The circuit diagram shown is that using the Loctal series of valves (7S7, etc.). Some models, however, may be fitted with alternative valve series (see separate table).

Where B8A valves are fitted (62TH,

etc.), the oscillator grid resistor R3 becomes 18k $\Omega$  and the output stage cathode resistor becomes 180 $\Omega$ .

Where Octal valves are fitted (OM10, etc.), the output stage grid resistor R13 becomes 270k $\Omega$ , the V3 anode load resistor R11 becomes 100k $\Omega$  and the coupling capacitor C25 is 0.01 $\mu$ F.

Where Loctal type valves are used, V4 may sometimes be an Octal valve (6V6GT), but the component values remain unchanged.

The fixed tone corrector C29 may, in some later models, be connected between the V4 anode and chassis, in which case the value is changed to 0.01 $\mu$ F.

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