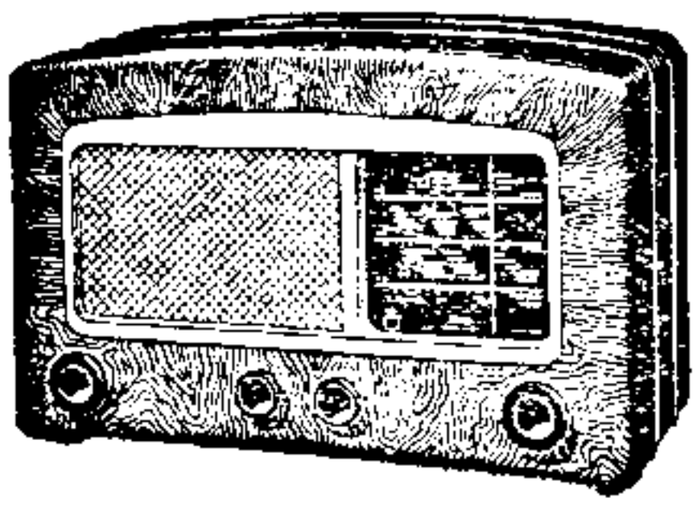
COSSOR

MELODY MAKER

MODEL 501U



GENERAL DESCRIPTION
5 valve all-wave Superheterodyne Receiver for A.C. and D.C. Mains of 190–250 volts (40–100 cycles on A.C. mains). There are two voltage adjustment tappings on the mains dropping resistor ; 221–250 (top) 190–220 (lower).

PRICE £13 8s. 2d. Plus Tax.

DATE RELEASED November 1950.

CABINET Moulded in brown and beige. 16½" × 7¾" × 10¾".

UNDISTORTED OUTPUT 2 watts.

CONSUMPTION 57 watts.

WAVEBANDS

SHORT Waveband	19–5·8 Mc/s.	15·8–51·3 metres
MEDIUM Waveband	1605–520 Kc/s.	187–575 metres
LONG Waveband	320–146 Kc/s.	940–2050 metres

INTERMEDIATE FREQUENCY 470 Kc/s.

VALVES

OM10	Triode Hexode Frequency Changer
OM6	Variable-mu R.F. Pentode
OM4	Double Diode Triode
332 Pen.	Output Pentode
OM1	Half-wave Recitfier

DIAL LAMP
Replacements should be rated 8 volts at 0·2 amps. M.E.S. fitting.

MAINS FUSES
Two 500 M.A. Cartridge type.

LOUDSPEAKER
An 8" high flux density magnet moving coil unit with a speech coil impedance of 3 ohms. The sockets marked EXTERNAL LOUDSPEAKER are for an external unit with a speech coil impedance of 3 ohms.

BUILT-IN FRAME AERIAL
The frame aerial, mounted on the cabinet back, is intended only for local station reception. For more distant station listening a normal aerial and earth should be used.

ALIGNMENT PROCEDURE

The equipment required for alignment of the I.F. and R.F. stages of the Receiver are an accurately calibrated modulated signal generator, an output meter to match to 3 ohms impedance, and a non-metallic trimming tool. Adjustment of the I.F. transformer inductances should always be followed by complete realignment of the R.F. section.

The output from the Receiver should be maintained at a low level by means of the input 'attenuator throughout the entire alignment procedure.

I.F. TRANSFORMERS
Switch to M.W. and set the tuning condenser at minimum capacity.
Set the Volume and Tone controls fully clockwise.
Inject a 470 Kc/s. modulated signal into the control grid of V1, via a 0·1 mfd. condenser. The screening of the signal generator input lead should be connected to the chassis via a good quality 0·1 mfd. condenser.
Adjust L13, L12, L6 and L5 for maximum response on the output meter, in the order given.
Repeat the procedure and check for sensitivity and bandwidth.

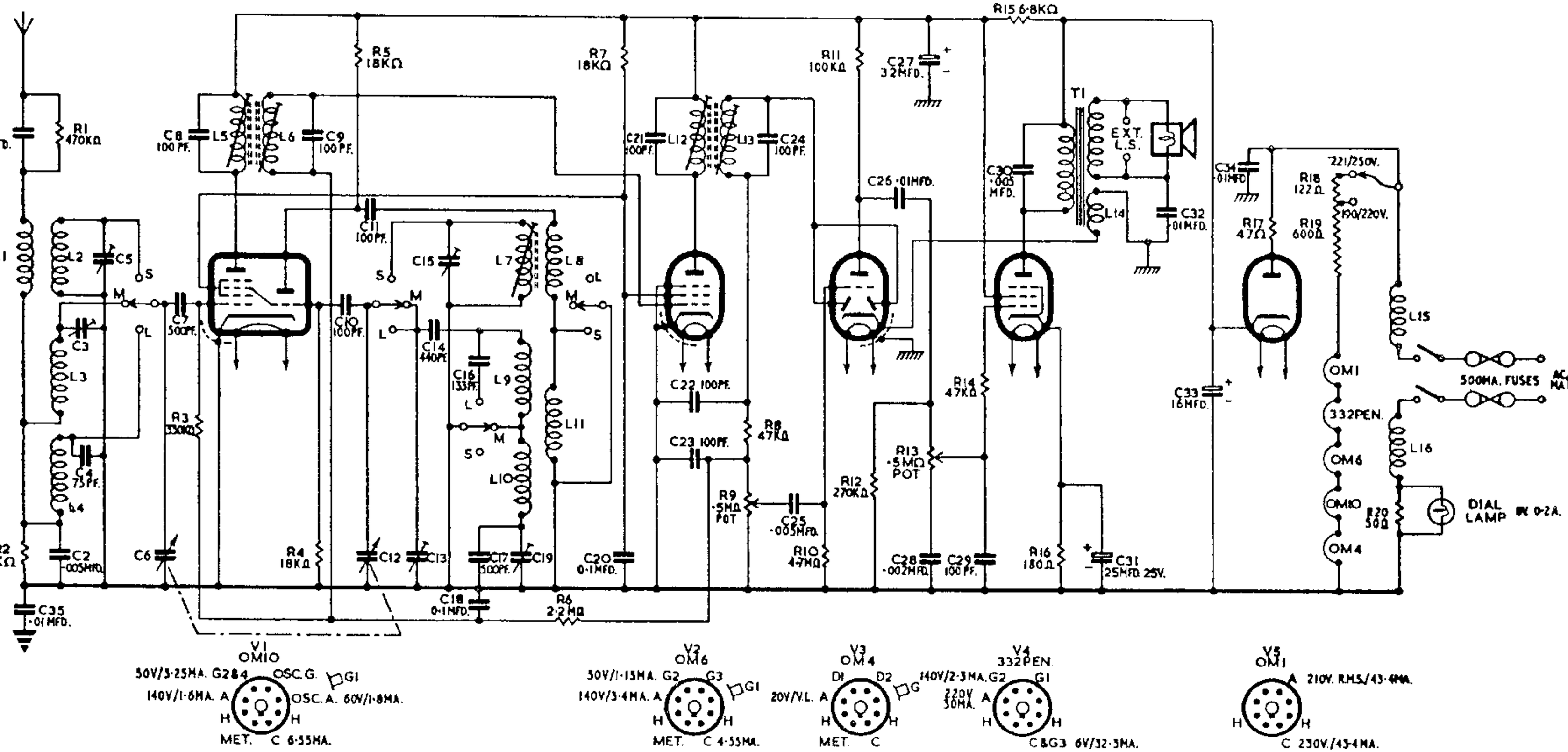
MEDIUM WAVEBAND
Switch to M.W., set the tuning condenser to mechanical minimum.
Set the tuning pointer to line marked MIN on top left of scale.*
With a standard dummy aerial in circuit, inject a 1550 Kc/s. modulated signal via the Aerial and Earth sockets.
Set pointer to line marked M.W. (or M. on some scales).*
Adjust the oscillator trimmer C13 for maximum response.
Adjust the aerial trimmer C3 for maximum response.
Check calibration and sensitivity at spot frequencies.

LONG WAVEBAND
Switch to L.W. (fully clockwise), set the tuning pointer to line marked L on top right of scale and inject a 160 Kc/s. signal.*
Adjust the oscillator padder C19 for maximum response.
Check calibration and sensitivity at spot frequencies.

SHORT WAVEBAND
Switch to S.W. (fully anti-clockwise), set the tuning pointer to line marked S on top left of scale and inject an 18 Mc/s. signal.*
Adjust the oscillator trimmer C15 for maximum response. It will be found that there are two positions where this is possible ; the correct one will be that which requires the least capacity.
Adjust the aerial trimmer C5 for maximum response.
Set pointer to line marked S on top right of scale and inject a 6 Mc/s. signal.
Adjust the iron dust core in the oscillator coil L7 for maximum response.
Repeat the adjustments to C15 and L7 until one no longer affects the other.
Set pointer to line marked S on top left of scale and retrim C5 (slightly " rocking " the gang).
Check calibration and sensitivity at spot frequencies.
Finally, the pointer should be checked against the line marked MAX on top right of scale.*

* This alignment marking is not visible when the Receiver is in the cabinet.

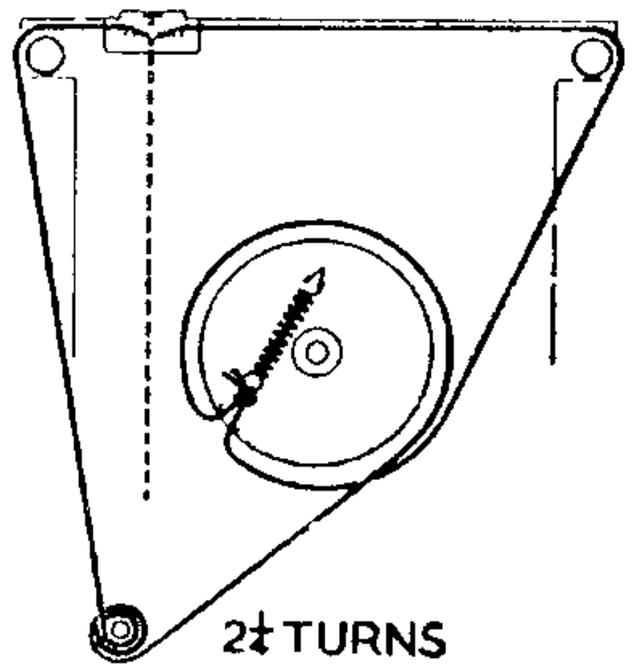
A. C. COSSOR LTD.,
COSSOR HOUSE, HIGHBURY GROVE, LONDON, N.5. ENGLAND
Telephone : CANONBURY 1234 (33 lines).



APPROXIMATE D.C. RESISTANCE OF COILS AND TRANSFORMERS

Circuit Code No.	Description	D.C. Resistance	Part Number	Circuit Code No.	Description	D.C. Resistance	Part Number
L1 ...	S.W. Aerial Coupling Coil	Very Low	MC.430221	L11 ...	M.W. & L.W. Oscillator Feed-back coil	2·8 ohms	MC.430207
L2 ...	S.W. Aerial Coil	Very Low					
L3 ...	M.W. Aerial Coil	3·5 ohms		L12 ...	2nd I.F. Transformer (Primary)	9 ohms	MC.415002/2
L4 ...	L.W. Aerial Coil	13·5 ohms		L13 ...	2nd I.F. Transformer (Secondary)	9 ohms	
L5 ...	1st I.F. Transformer (Primary)	9 ohms	MC.415002/2	L14 ...	Feed-back Winding on T1	Very Low	
L6 ...	1st I.F. Transformer (Secondary)	9 ohms					
L7 ...	S.W. Oscillator Coil	Very Low	MC.430145/3	L15 ...	Filter coil	7 ohms	MC.430267
L8 ...	S.W. Oscillator Coil (Feed-back)	29·5 ohms		L16 ...	Filter coil	7 ohms	
L9 ...	M.W. Oscillator Coil	5·5 ohms	MC.430207	T1 ...	Output Transformer (Primary)	310 ohms	MC.412043
L10 ...	L.W. Oscillator Coil	7·5 ohms			Output Transformer (Secondary)	Very Low	

SM 117

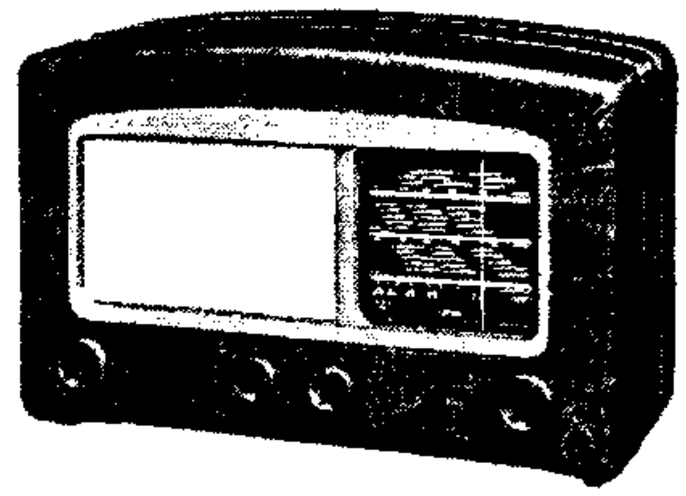


Circuit diagram of the Cossor Melody Maker 501U

COSSOR

"MELODY MAKER"

Models 501U & 494U



AN addition to the "Melody Maker" range of models, the Cossor 501U is a 4-valve (plus rectifier) 3-band superhet designed to operate from A.C. or D.C. mains of 190-250 V, 40-100 c/s in the case of A.C. The waveband ranges are 15.8-51.3 m, 187-575 m and 940-2,050 m. For use in areas of good signal strength, a frame aerial is wound on the back cover.

The 494U was a forerunner of the 501U, and used a chassis very much like it, but there were small differences which are explained overleaf. The appearance of both models is identical.

Release dates and original prices: 501U, November 1950, £13 8s 2d; *494U, March* 1950, £13 8s 2d. *Purchase tax extra.*

CIRCUIT DESCRIPTION

Aerial input is inductively coupled on S.W. by **L1** and capacitatively "bottom" coupled on M.W. and L.W. by **C2** to single tuned circuits **L2, C31** (S.W.), **L3, C31** (M.W.) and **L4, C31** (L.W.) which precede triode hexode valve **(V1, Cossor OM10)** operating as frequency changer with internal coupling.

Triode oscillator grid coils are tuned by **C32**. Parallel trimming by **C33** (S.W.), **C34** (M.W.) and **C11, C34** (L.W.); series tracking by **C10** (M.W.) and **C10, C12, C35** (L.W.). Inductive reaction coupling from anode by **L8** (S.W.) and **L9** (M.W. and L.W.).

Second valve **(V2, Cossor OM6)** is a variable-mu R.F. pentode operating as intermediate frequency amplifier with tuned transformer couplings **C6, L10, L11, C7 and C15, L12, L13, C16.**

Intermediate frequency 470 kc/s.

Diode signal detector is part of double diode triode valve **(V3, Cossor OM4)** in which the diode sections are connected in parallel. Audio frequency component in rectified output is developed across manual volume control **R9**, which operates as diode load, and passed via **C19** to grid of triode section, which operates as A.F. amplifier.

D.C. potential developed across **R9** is fed back as bias, via decoupling circuit **R8** and **C9**, to F.C. and I.F. stages, giving automatic gain control.

Resistance-capacitance coupling by **R11, C20** and **R12** between **V3** triode and control grid of

(*Continued in col.* 3)

COMPONENTS AND VALUES

	CAPACITORS	Values	Locations
C1	Aerial isolator ...	0·01μF	G4
C2	Aerial coupling ...	0·005μF	A2
C3	Chassis isolator ...	0·01μF	G4
C4	L.W. aerial trim. ...	75pF	F3
C5	V1 C.G.	500pF	A1
C6, C7	1st I.F. trans. tuning	100pF 100pF	A2 A2
C8	V1 osc. C.G. ...	100pF	F3
C9	A.G.C. decoupling	0·1μF	G4
C10	M.W. tracker ...	440pF	F3
C11	L.W. osc. trimmer	133pF	F3
C12	L.W. tracker ...	500pF	F3
C13	Osc. anode coup.	100pF	G3
C14	V1, V2 S.G. decoup.	0·1μF	F3
C15, C16	2nd I.F. trans. tuning	100pF 100pF	B2 B2
C17, C18	I.F. by-passes ...	100pF 100pF	F4 F4
C19, C20	A.F. coupling ...	0·005μF 0·01μF	F4 E4
C21	Part tone control...	0·002μF	E3
C22	I.F. by-pass ...	100pF	E4
C23* C24*	H.T. smoothing ...	32μF 16μF	B2 B2
C25	Tone corrector ...	0·005μF	E4
C26*	V4 cath. by-pass ...	25μF	E4
C27	Chassis isolator ...	0·01μF	E4
C28	R.F. mains filter...	0·01μF	D4
C29‡	S.W. aerial trim....	—	G3
C30‡	M.W. aerial trim....	—	G3
C31†	Aerial tuning ...	—	A1
C32†	Oscillator tuning...	—	A2
C33‡	S.W. osc. trimmer	—	G3
C34‡	M.W. osc. trimmer	—	G3
C35‡	L.W. tracker ...	—	F3

* Electrolytic. † Variable. ‡ Pre-set.

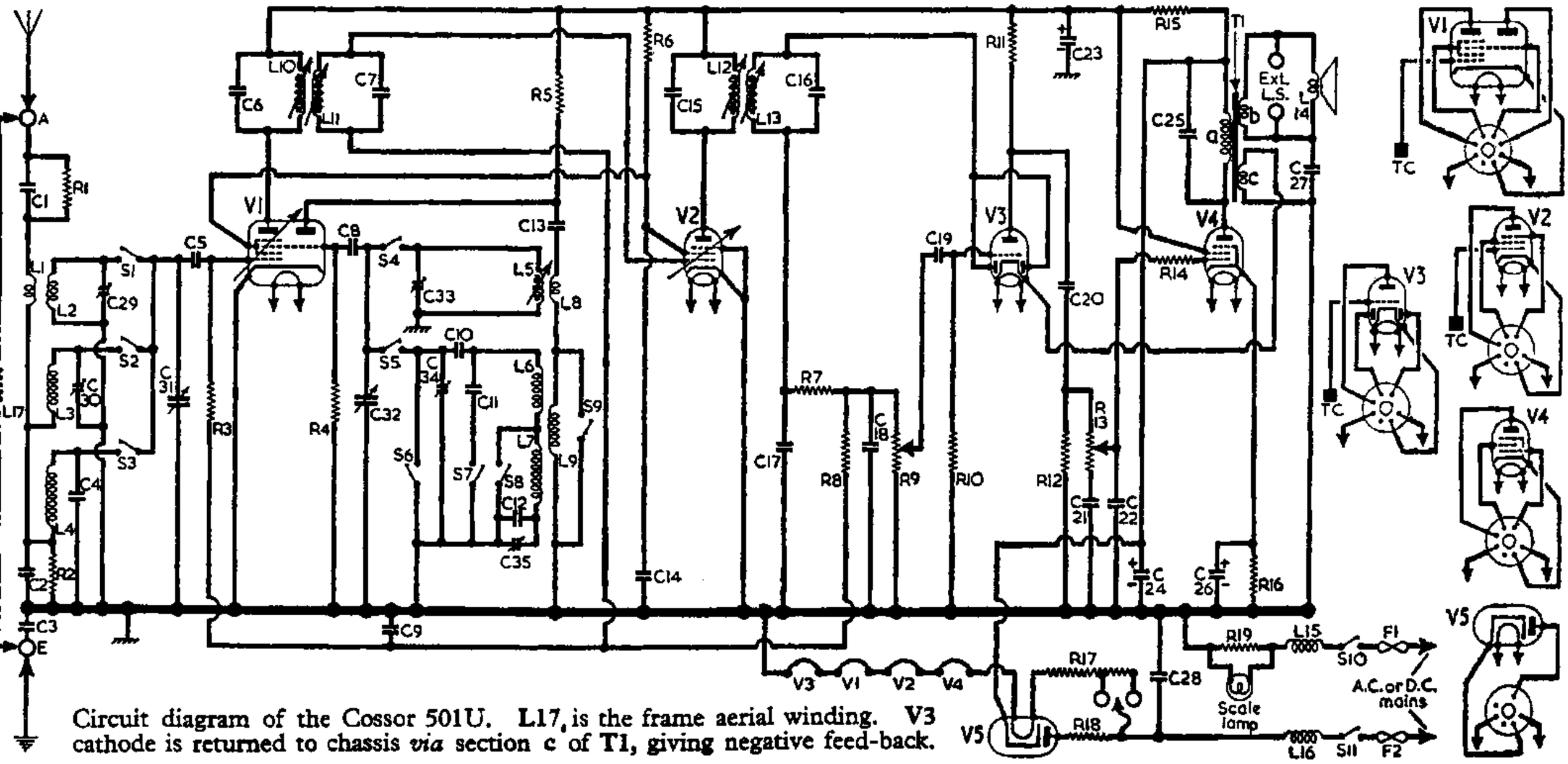
Circuit Description—*continued.*

pentode output valve **(V4, Cossor 332 Pen).** Variable tone control in **V4** grid circuit by **R13, C21** and **C22.** Fixed tone correction by **C25** and by the negative feed-back between winding **c** of **T1** and **V3** cathode.

H.T. current is supplied by I.H.C. half-wave rectifying valve **(V5, Cossor OM1).** Smoothing by **R15** and electrolytic capacitors **C23** and **C24.** **R18** protects **V5** and **R19** protects the scale lamp from current surges. Valve heaters, together with ballast resistor **R17,** scale lamp and R.F. chokes **L15, L16** are connected in series across the mains input. R.F. filtering by **C28** together with **L15** and **L16.**

	RESISTORS	Values	Locations
R1	Static by-pass ...	470kΩ	G4
R2	Aerial shunt ...	1kΩ	A2
R3	V1 C.G.	330kΩ	A1
R4	V1 osc. C.G. ...	18kΩ	G4
R5	Osc. anode feed ...	18kΩ	G4
R6	V1, V2 S.G. feed ...	18kΩ	G4
R7	I.F. stopper ...	47kΩ	F4
R8	A.G.C. decoupling	2·2MΩ	F4
R9	Volume control ...	500kΩ	D3
R10	V3 C.G.	4·7MΩ	F4
R11	V3 anode load ...	100kΩ	F3
R12	V4 C.G.	270kΩ	E3
R13	Tone control ...	500kΩ	E3
R14	V4 C.G. stopper ...	47kΩ	E4
R15	H.T. smoothing ...	6·8kΩ	F3
R16	V4 G.B.	180Ω	E4
R17	Heater ballast ...	*722Ω	C2
R18	Surge limiter ...	47Ω	D3
R19	Scale lamp shunt ...	50Ω	D4

* Tapped at 600Ω + 122Ω from V5 heater.



Circuit diagram of the Cossor 501U. **L17,** is the frame aerial winding. **V3** cathode is returned to chassis *via* section **c** of **T1,** giving negative feed-back.

OTHER COMPONENTS			Approx. Values (ohms)	Locations
L1	S.W. aerial coup.		—	A1
L2	Aerial tuning coils		—	A1
L3			3·5	A1
L4			13·5	A1
L5	Oscillator tuning coils		—	G3
L6			5·5	F3
L7			7·5	F3
L8	Oscillator reaction coils		29·5	G3
L9			2·8	F3
L10	1st I.F. trans.	Pri. ...	9·0	A2
L11		Sec. ...	9·0	A2
L12	2nd I.F. trans.	Pri. ...	9·0	B2
L13		Sec. ...	9·0	B2
L14	Speech coil ...		2·6	—
L15	Mains R.F. filter chokes	...	7·0	D4
L16		...	7·0	D4
L17	Frame aerial ...		—	—
T1	O.P. trans.	a ...	310·0	
		b ...	—	B1
		c ...	—	
S1-S9	Waveband switches		—	F3
S10, S11	Mains sw., g'd. R9		—	D3
F1, F2	500mA fuses ...		—	C2

VALVE ANALYSIS

Valve voltages and currents given in the table below are those derived from the manufacturers' information, whose receiver was tuned to 500 m and was operating under "no signal" conditions from 200 V A.C. mains. 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 OM10	140	1·6	50	3·25	—
	Oscillator				
	60	1·8			
V2 OM6	140	3·4	50	1·15	—
V3 OM4	20	*	—	—	—
V4 332Pen	220	30·0	140	2·3	6
V5 OM1	210†	—	—	—	230

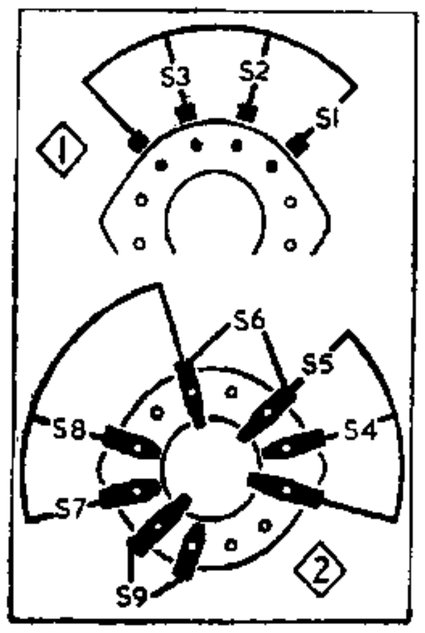
*Very low reading. †A.C. voltage.

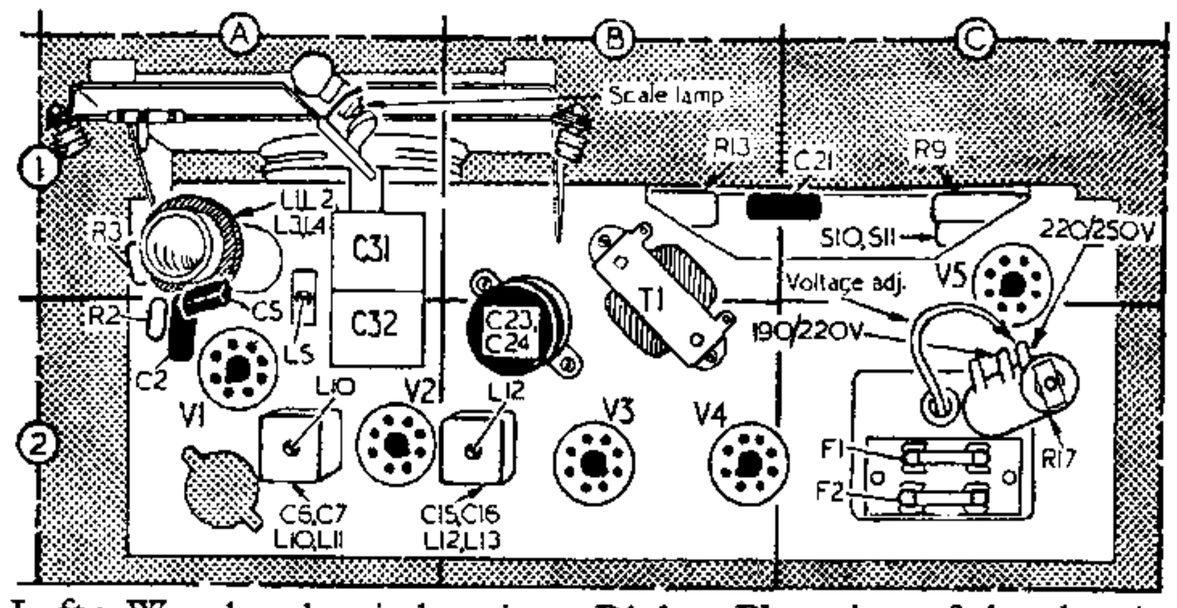
DISMANTLING THE SET

Removing Chassis.—Remove five self-tapping screws (with washers), withdraw frame aerial plugs, and remove back and base cover;

Remove the four control knobs (recessed screws), withdraw speaker plugs, remove chassis guard strip insulating rear member (two self-tapping screws), remove two screws thus revealed holding ends of chassis to moulded ribs on cabinet, and remove one further screw from top of scale assembly.

When replacing, note that two smaller knobs go on the centre spindles (that with a white spot on the right), and see that the heat deflector is in position over the ballast resistor. It is a shaped piece of cardboard which slides along a moulded rib on the roof of the cabinet.



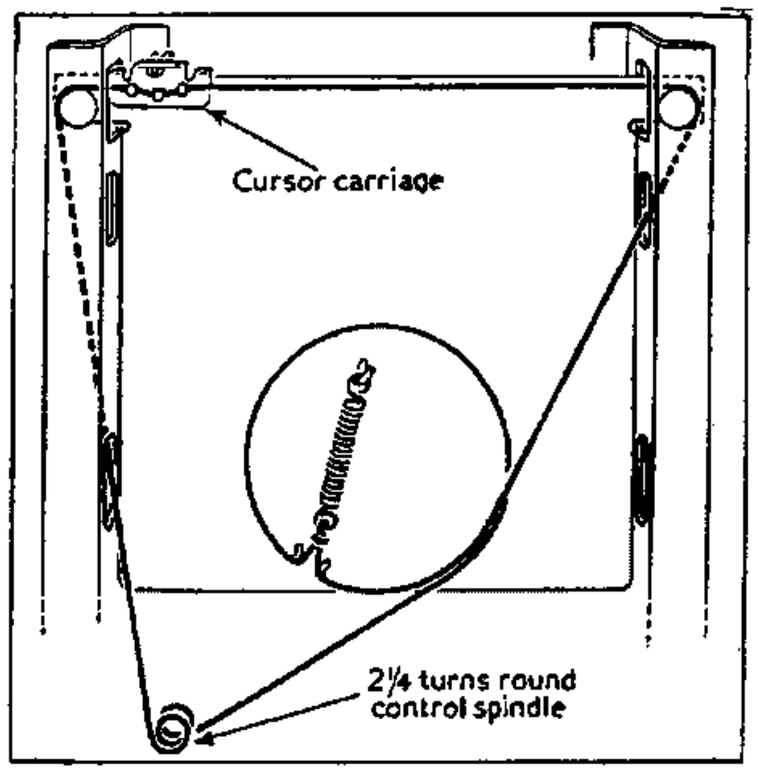


Left: Waveband switch units. Right: Plan view of the chassis.

CIRCUIT ALIGNMENT

I.F. Stages.—Switch set to M.W., turn gang to minimum and volume and tone controls fully clockwise. Connect output of signal generator, via an 0.1 μF capacitor, to control grid (top cap) of **V1** and chassis. Feed in a 470 kc/s (638.3 m) signal and adjust the cores of **L13** (location reference F4), **L12** (B2), **L11** (G4) and **L10** (A2) for maximum output. Repeat these adjustments.

R.F. and Oscillator Stages.—Turn gang to minimum and check that the cursor coincides



Tuning drive, viewed from rear.

with the line marked "**MIN**" at top left of tuning scale. This can be adjusted if necessary by slackening the two grub screws securing the drive drum to the gang spindle and rotating the drum. Transfer signal generator leads, via a dummy aerial, to **A** and **E** sockets.

M.W.—Switch set to M.W., tune to vertical line marked "**M**" at top of scale, feed in a 193.6 m (1,550 kc/s) signal and adjust **C34** (G3) and **C30** (G3) for maximum output.

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 **C35** (F3) for maximum output.

S.W.—Switch set to S.W., tune to vertical line "**S**" at top left of scale, feed in a 16.67 m (18 Mc/s) signal and adjust **C33** (G3) and **C29** (G3) for maximum output, **C33** being set to the lower capacitance peak of the two possible maximum output positions. Tune set to vertical line "**S**" at top right of scale, inject a 50 m (6 Mc/s) signal and adjust the core of **L5** (A1) for maximum output. Repeat the above adjustments to **C33** and **L5** until calibration is correct at both ends of band. Tune set to vertical line "**S**" at top left of scale and re-adjust **C29** while "rocking" the gang to obtain optimum results.

GENERAL NOTES

Switches.—**S1-S9** are the waveband switches, ganged in two rotary units beneath the chassis. These are indicated in our underside view of the chassis by the numbers **1** and **2** in diamond surrounds, and shown in detail in the diagrams inset beside the plan view drawing, where they are drawn as seen when viewed from the rear of an inverted chassis. The table below gives the switch positions for the three control settings, starting from the fully anti-clockwise 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	—
S9	C	—	—

S10, S11 are the Q.M.B. mains switches, ganged with the volume control **R9**.

External Speaker.—Two pairs of sockets are provided at the rear of the chassis for the connection of the internal speaker and a low impedance (about 3 Ω) external speaker. A third pair of sockets is unused in this A.C./D.C. receiver, except as bearers for internal connections.

Scale Lamp.—This has a large clear spherical bulb and an M.E.S. base, and is rated at 8 V, 0.2 A. Our specimen was marked 8 V, 1.6 W.

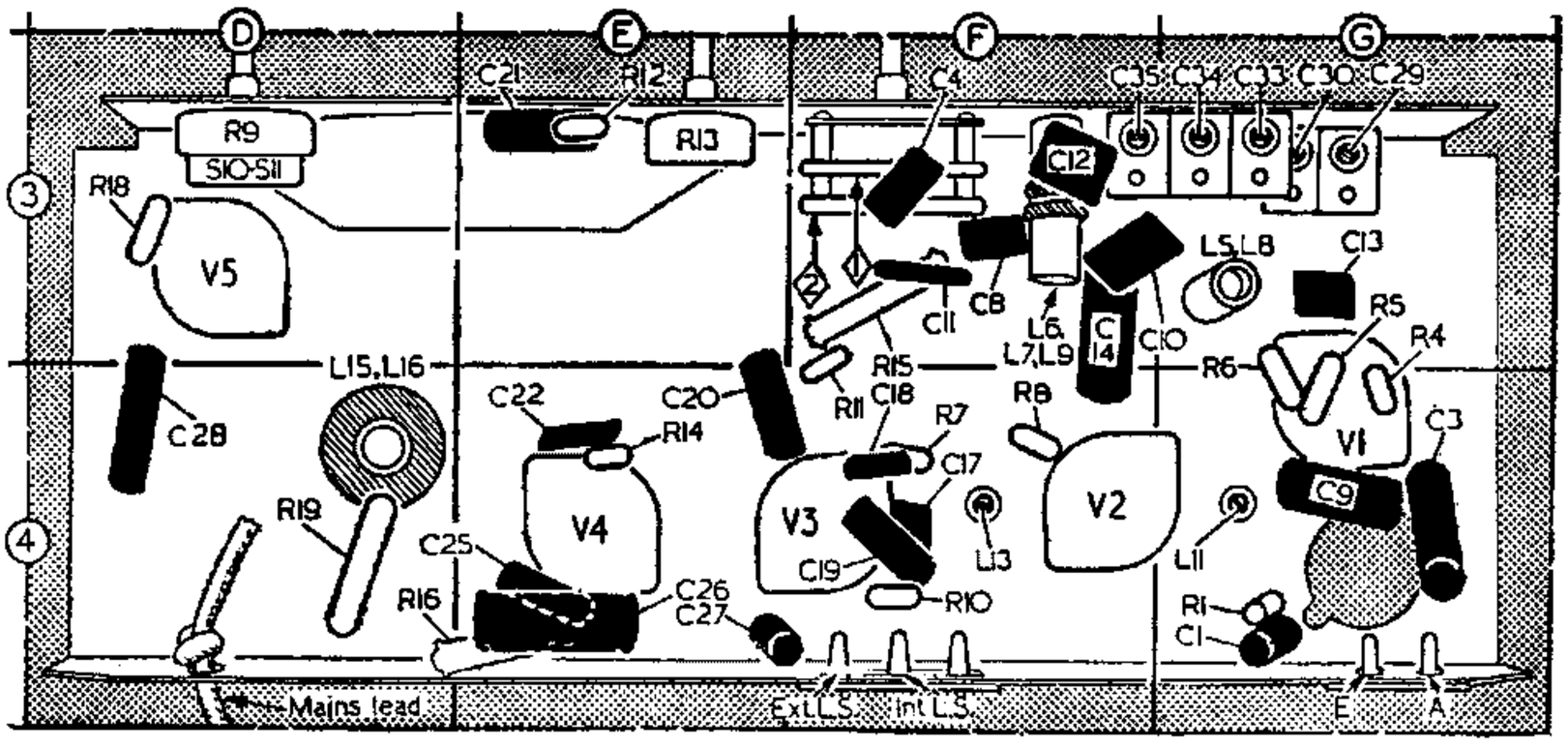
Drive Cord Replacement.—Forty inches of high grade flax fishing line, plaited and waxed, is required for a new drive cord. It should be run as shown in the sketch (col. 2), where it is drawn as seen from the rear when the gang is at maximum capacitance.

Model 494U

The circuit of the 494U is basically similar to that of the 501U, but there are two main differences. First, the oscillator H.T. feed circuit is different; and second, the tone control is different.

The difference in the oscillator circuit is that the reaction coils are series fed. The bottom of **L9** goes to the screen grids of **V1** and **V2** instead of to chassis, and **R5, C13** are omitted. **C14** was 0.01 μF, but otherwise component values were unchanged.

The tone control circuit **R13, C21** was connected between **V3** anode and cathode, and **C21** was 0.01 μF. **R14** went to the top of **R12**, which was 470 kΩ. **C22** was connected in parallel with **R12**. **R11** was 680 kΩ.



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