

"TRADER" SERVICE SHEET  
**778**

REVISED ISSUE OF  
SERVICE SHEET No. 227

COVERING a short-wave range of 19-50 metres, the Lissen 8302 receiver is a 4-valve (plus rectifier) A.C. 3-band super-het suitable for mains of 200-250 V, 40-60 c/s. The Lissen 8322 radiogram employs a chassis which is similar except for the addition of pick-up switching. The equivalent Ever Ready models are 5029 (table) and 5040 (radiogram). Our illustration shows the 8302.

Release date, all models, 1937. Original prices: 8302, £11 15s; 8322, £16 19s 6d; 5029, £11 15s; 5040, £16 19s 6d.

**CIRCUIT DESCRIPTION**

Aerial input via socket A1 direct, or from A2 via potential divider R1, R2, to coupling coil L1 and inductively coupled M.W. and L.W. band-pass filter. Primary coils L2, L3 are tuned by C23; secondaries L5, L6 are tuned by C27. On S.W., input is via C1 to single-tuned circuit L4, C27.

First valve (V1, Ever Ready metallised A36B) is a triode hexode operating as frequency changer with internal coupling. Oscillator grid coils L7 (S.W.), L9 (M.W.) and L11 (L.W.) are tuned by C28; parallel trimming by C29 (S.W.), C30 (M.W.) and C31 (L.W.); series tracking by C32 (M.W.) and C33 (L.W.). Anode reaction coils L8 (S.W.), L10 (M.W.) and L12 (L.W.).

Second valve (V2, Ever Ready metallised A50P), a variable-mu R.F. pentode, operates as intermediate frequency amplifier with tuned-primary tuned-secondary transformer couplings C34, L13, L14, C35 and C36, L15, L16, C37.

Intermediate frequency 455 kc/s. Diode second detector is part of double diode triode valve (V3, Ever Ready metallised A23A).

**LISSEN 8302**

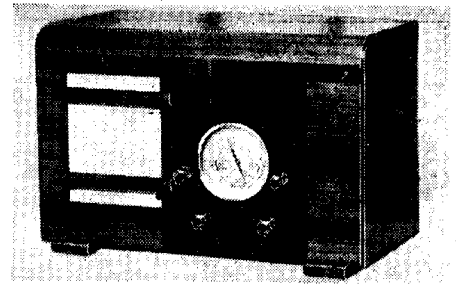
& EVER READY 5029, etc.

Resistance-capacitance coupling by R19, C16 and R22 between V3 triode and pentode output valve (V4, Ever Ready A70D). A.F. voltages developed across resistors R25 and R26 in cathode circuit are returned to C.G. thus providing a negative feed-back circuit. Provision for connection of high impedance external speaker. Tone control by R27, C18.

H.T. current is supplied by I.H.C. full-wave rectifying valve (V5, Ever Ready A11D). Smoothing by dry electrolytic capacitors C19, C20 and speaker field L19.

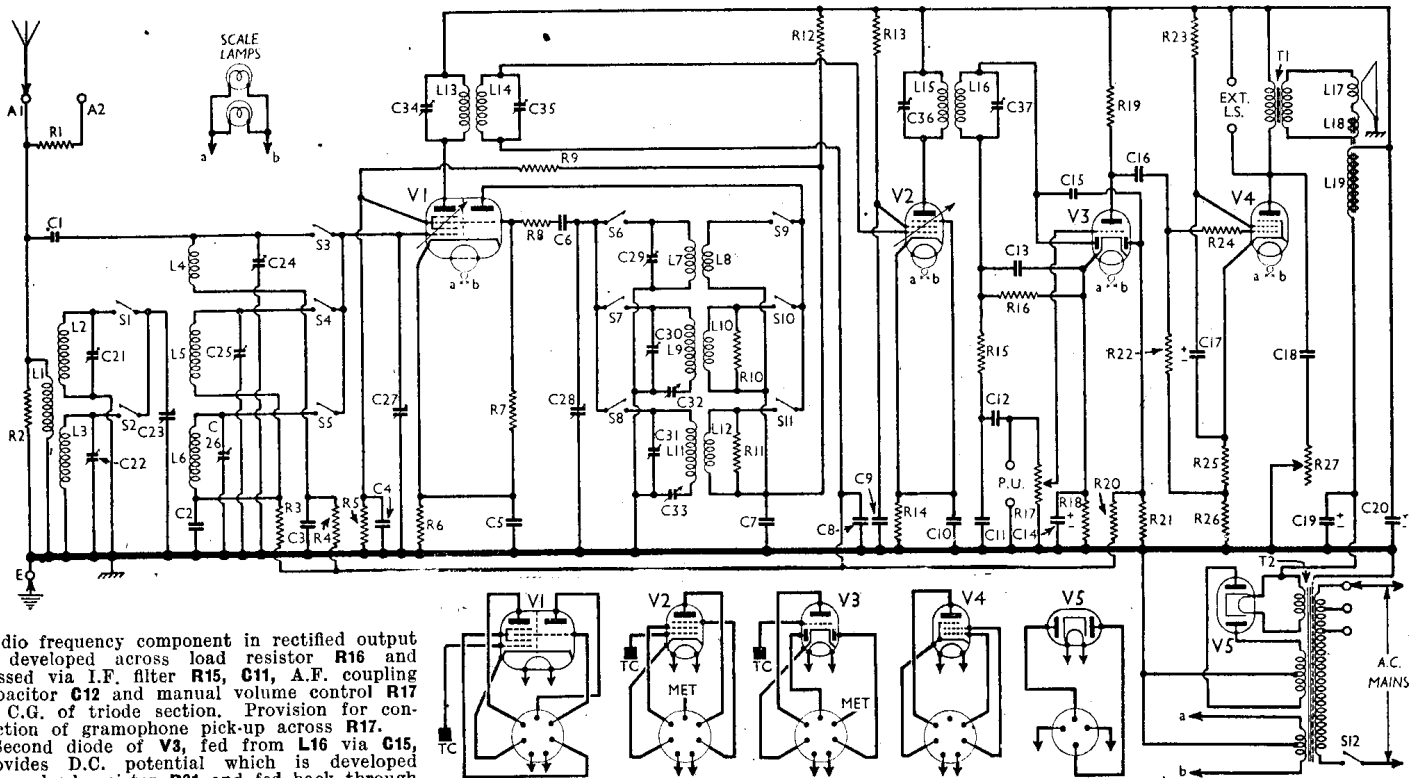
**COMPONENTS AND VALUES**

RESISTORS		Values (ohms)
R1	A2 aerial feed potential divider	110,000
R2		10,000
R3	V1 hex. C.G. decoupling	100,000
R4		100,000
R5	Part H.T. pot. divider	20,000
R6	V1 fixed G.B. resistor	150
R7	V1 osc. C.G. resistor	26,000
R8	V1 osc. C.G. stabiliser	200
R9	Part H.T. pot. divider	5,000
R10	Osc. M.W. stabiliser	1,000
R11	Osc. L.W. stabiliser	2,000
R12	Part H.T. pot. divider	10,000
R13	V2 S.G. H.T. feed	25,000
R14	V2 fixed G.B. resistor	100
R15	I.F. stopper	100,000
R16	V3 signal diode load	500,000
R17	Manual volume control	500,000
R18	V3 G.B. resistor	300
R19	V3 triode anode load	20,000
R20	A.V.C. line decoupling	100,000
R21	V3 A.V.C. diode load	510,000
R22	V4 C.G. resistor	260,000
R23	V4 S.G. H.T. feed	2,500
R24	V4 C.G. I.F. stopper	20,000
R25	V4 G.B. and negative feed-back pot.	150
R26		250
R27	Variable tone control	50,000



CAPACITORS		Values (μF)
C1	Aerial S.W. coupling	0.00001
C2	V1 hex. C.G. decoupling	0.1
C3	Aerial circ. S.W. tracker	0.01
C4	V1 S.G. decoupling	0.1
C5	V1 cathode by-pass	0.1
C6	V1 osc. C.G. capacitor	0.0001
C7	V1 osc. anode decoupling	0.1
C8	V2 C.G. decoupling	0.1
C9	V2 S.G. decoupling	0.1
C10	V2 cathode by-pass	0.1
C11	I.F. by-pass	0.0002
C12	A.F. coupling to V3 triode	0.05
C13	I.F. by-pass	0.0002
C14*	V3 cathode by-pass	50.0
C15	V3 A.V.C. diode coupling	0.00001
C16	V4 A.F. coupling	0.05
C17*	V4 S.G. decoupling	8.0
C18	Part of T.C. filter	0.05
C19*	H.T. smoothing capacitors	8.0
C20*		8.0
C21†	B.-P. pri. M.W. trimmer	0.00004
C22†	B.-P. pri. L.W. trimmer	0.0001
C23†	Band-pass pri. tuning	0.00054
C24†	Aerial S.W. trimmer	0.00004
C25†	B.-P. sec. M.W. trimmer	0.00004
C26†	B.-P. sec. L.W. trimmer	0.0001
C27†	B.-P. sec. and S.W. tuning	0.00054
C28†	Oscillator circuit tuning	0.00054
C29†	Osc. circ. S.W. trimmer	0.00004
C30†	Osc. circ. M.W. trimmer	0.00004
C31†	Osc. circ. L.W. trimmer	0.0001
C32†	Osc. circ. M.W. tracker	0.0006
C33†	Osc. circ. L.W. tracker	0.0006
C34†	1st I.F. trans. pri. tuning	—
C35†	1st I.F. trans. sec. tuning	—
C36†	2nd I.F. trans. pri. tuning	—
C37†	2nd I.F. trans. sec. tuning	—

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



Audio frequency component in rectified output is developed across load resistor R16 and passed via I.F. filter R15, C11, A.F. coupling capacitor C12 and manual volume control R17 to C.G. of triode section. Provision for connection of gramophone pick-up across R17. Second diode of V3, fed from L16 via C15, provides D.C. potential which is developed across load resistor R21 and fed back through decoupling circuits as G.B. to F.C. and I.F. valves, giving automatic volume control.

Circuit diagram of the Lissen 8302. R25 and R26 provide negative feed-back.

OTHER COMPONENTS		Approx. Values (ohms)	
L1	Aerial coupling coil ...	11.0	
L2	Band-pass primary coils ...	2.6	
L3		11.0	
L4	Aerial S.W. tuning coil ...	Very low	
L5	Band-pass secondary coils	2.4	
L6		11.5	
L7	Osc. S.W. tuning coil ...	Very low	
L8	Osc. S.W. reaction coil ...	0.2	
L9	Osc. M.W. tuning coil ...	1.75	
L10	Osc. M.W. reaction coil ...	6.5	
L11	Osc. L.W. tuning coil ...	5.0	
L12	Osc. L.W. reaction coil ...	8.3	
L13	1st I.F. trans. { Pri. ...	7.0	
L14		Sec. ...	7.0
L15	2nd I.F. trans. { Pri. ...	7.0	
L16		Sec. ...	7.0
L17	Speaker speech coil ...	1.75	
L18	Hum neutralising coil ...	0.1	
L19	Speaker field coil ...	2,000.0	
T1	Speaker input trans. { Pri. ...	800.0	
		Sec. ...	0.1
T2	Mains { Pri., total ...	46.0	
		Heat. sec., total	0.1
		Rect. heat. sec.	0.2
	H.T. sec., total	380.0	
S1-S11	Waveband switches	—	
S12	Mains switch, ganged R17	—	

**VALVE ANALYSIS**

Valve voltages and currents given in the table below are those measured in our receiver when it was operating on mains of 230 V, using the 216-235 V tapping on the mains transformer. The receiver was tuned to the lowest wave-length on the medium band and the volume control was at maximum, but there was no signal input.

Voltages were measured on the 1,200 V scale of an Avometer, chassis being negative.

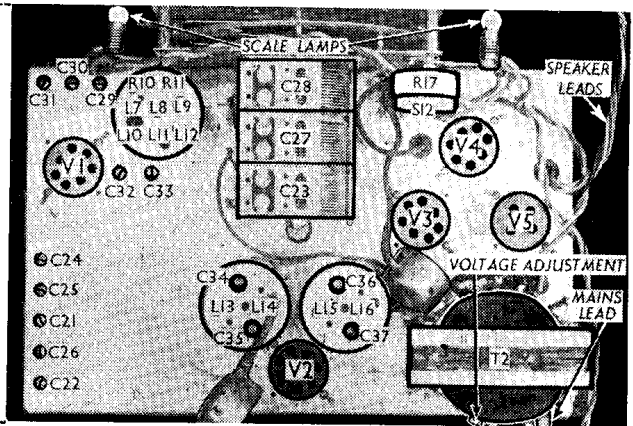
Valve	Anode Voltage (V)	Anode Current (mA)	Screen Voltage (V)	Screen Current (mA)
V1 A36B	255	1.9	70	3.8
	Oscillator	—		
V2 A50P	100	7.4	160	3.3
	255	9.2		
V3 A23A	125	6.0	—	—
V4 A70D	225	33.0	235	5.4
V5 A11D	350†	—	—	—

† Each anode, A.C.

**DISMANTLING THE SET**

**Removing Chassis.**—Remove the four control knobs (pull off); remove the four bolts (with washers and distance-pieces) holding chassis to bottom of cabinet;

Plan view of the chassis. Several trimmers shown are reached through holes in the chassis deck. R10 and R11 are inside the L7-L15 coil unit.



free speaker leads from cleat on side of cabinet, when chassis may be withdrawn. When replacing, if speaker leads have been unsoldered, connect them as follows, numbering tags from left to right: 1, brown; 2, blue; 3 and 4 (joined together) red. The black lead goes to the tag on a speaker fixing screw.

**Removing Speaker.**—Remove four screws (with washers and lock-washers) holding speaker to sub-baffle. When replacing, the transformer goes on top. Connect the leads as described previously.

**CIRCUIT ALIGNMENT**

**I.F. Stages.**—Short circuit the oscillator tuning coils by a wire across C28. Feed in a 455 kc/s (659.3 m) signal between control grid (top cap) of V1 and chassis, and adjust C37, C36, C35 and C34 in turn for maximum output. Re-check, then remove the short on C28.

**R.F. and Oscillator Stages.**—With gang at maximum, pointer should cover the horizontal lines on the scale. Transfer signal generator leads to A1 and E sockets.

**M.W.**—Switch set to M.W., set C32 about two-thirds in, tune to 214 m on scale, feed a 214 m (1,400 kc/s) signal and adjust C30, C25 and C21 for maximum output.

Tune to 500 m on scale, feed in a 500 m (600 kc/s) signal and adjust C32 for maximum output.

Return to 214 m and re-adjust C30, C25 and C21, then return to 500 m, and if the pointer does not indicate 500 m when the signal is accurately tuned, re-adjust C32 until it does. Check calibration at 214, 300 and 500m.

**L.W.**—Switch set to L.W. and set C33 about one-third in. Tune to 1,200 m on scale, feed in a 1,200 m (250 kc/s) signal and adjust C31,

then C26 and C22, for maximum output. Tune to 1,700 m on scale, feed in a 1,700 m (176.5 kc/s) signal, and adjust C33 for maximum output. Return to 1,200 m, and re-adjust C31, C26 and C22, then re-adjust C33 until the 1,700 m signal is accurately tuned at 1,700 m on the scale.

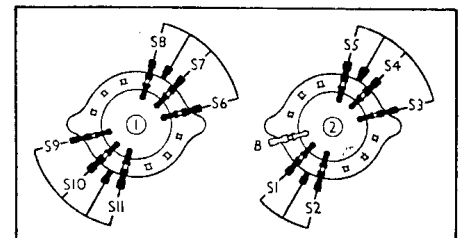
**S.W.**—Switch set to S.W. and tune in to 15 Mc/s on scale. Screw C29 right in, feed in a 15 Mc/s (20 m) signal, and slowly unscrew C29 until the first output peak is reached. It is important that the second peak is not used. Next adjust C24 for maximum output.

Feed in a 7.5 Mc/s (40 m) signal, tune it in, and adjust the end turn of L4 (nearest the end of the coil former) for maximum output. Return to 15 Mc/s and re-adjust C29 and C24 if necessary.

**GENERAL NOTES**

**Switches.**—S1-S11 are the wavechange 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 below. The table below gives the switch positions for the three control settings, starting from fully anti-clockwise. A dash indicates open, and C closed.

Switch	S.W.	M.W.	L.W.
S1 ...	—	C	—
S2 ...	—	—	C
S3 ...	C	—	—
S4 ...	—	C	—
S5 ...	—	—	C
S6 ...	C	—	—
S7 ...	—	C	—
S8 ...	—	—	C
S9 ...	C	—	—
S10 ...	—	C	—
S11 ...	—	—	C

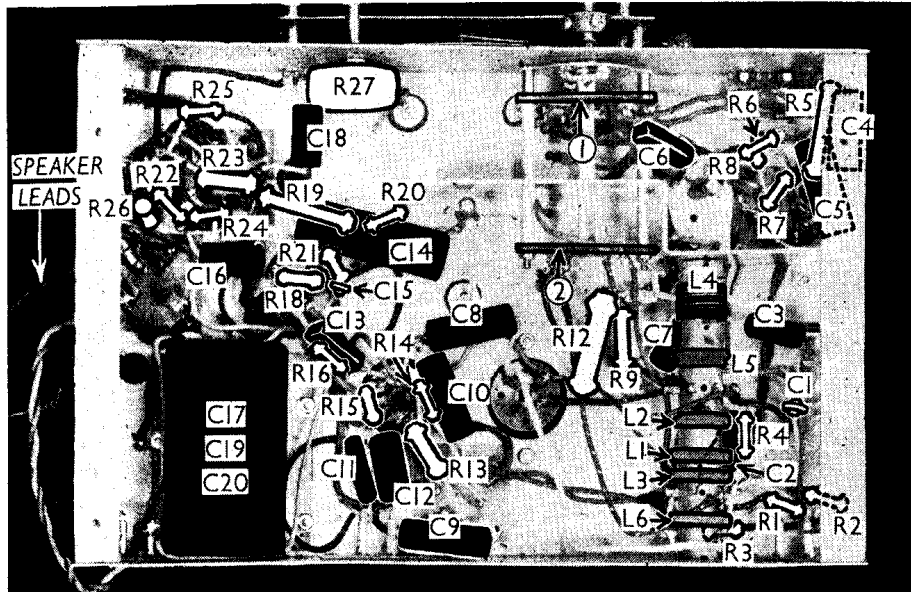


Waveband switch diagrams, seen from rear of inverted chassis.

**Scale Lamps.**—These are two Ever Ready M.E.S. types, rated at 6.2 V 0.3 A.

**External Speaker.**—Two sockets are provided at the rear of the chassis for high impedance (7,000Ω) external speaker.

**Capacitors C17, C19, C20.**—These are three 8 μF dry electrolytics, in a single carton beneath the chassis. The yellow and blue leads are the positive and negative connections respectively of C17. The black lead is the common negative of C19 and C20. The red lead to V5 valve holder is the positive of C19, and the red lead to one of the Ext.L.S. sockets is the positive of C20.



Under-chassis view. The switch diagrams 1 and 2 are shown in col. 3.