

'TRADER' SERVICE SHEET

# 203

# LISSEN 8303

## 3-VALVE A.C. TRANSPORTABLE

**T**HE Lissen 8303 receiver is a 3-valve (plus rectifier) A.C. transportable with a self-contained frame aerial. Features of the specification are a combined volume and reaction control, a 2-position tone control operated by a plug and socket arrangement and sockets for an external aerial and earth.

### CIRCUIT DESCRIPTION

Tuned frame aerial input **L2, L3, C16** to variable- $\mu$  pentode R.F. amplifier (**V1, Ever Ready metallised A50N**). An external aerial and earth can be coupled by means of **L1**. Gain control by **R4** which varies G.B. applied.

Choke fed tuned grid coupling by **L4, C3, L7, L8, C19** to triode detector valve (**V2, Ever Ready metallised A30D**) which operates on grid leak system with **C5, R6**. Reaction is applied from anode by coils **L5, L6** and is controlled by variable condenser **C18**, which is ganged with **R4**. Provision for connection of gramophone pick-up in grid circuit, switch **S2** opening when the combined wave-change and gramophone switch unit is in the gramophone position and disconnecting the H.T. supply from the screen of **V1**. R.F. filtering in anode circuit of **V2** by **C7** and choke **L9**; decoupling by **R7** and **C8**.

Resistance-capacity coupling by **R8, C9** and **R10** between **V2** and pentode

output valve (**V3, Ever Ready A70D**). Fixed tone correction in C.G. circuit by **C10** and in anode circuit by **C12**; 2-point tone control by plug and socket arrangement enabling **C13** to be brought into circuit.

H.T. current is supplied by I.H.C. full-wave rectifying valve (**V4, Ever Ready A11D**). Smoothing by speaker field coil **L12** and dry electrolytic condensers **C14** and **C15**.

RESISTANCES			Values (ohms)
R1	V1 S.G. H.T. potential divider	..	40,000
R2		..	25,000
R3		..	15,000
R4	V1 gain control, ganged C18	..	5,000
R5	V1 fixed G.B. resistance	..	300
R6	V2 grid leak	..	1,000,000
R7	V2 anode decoupling	..	80,000
R8	V2 anode load	..	25,000
R9	V2 G.B. resistance	..	800
R10	V3 C.G. resistance	..	500,000
R11	V3 C.G. R.F. stopper	..	100,000
R12	V3 G.B. resistance	..	150

### COMPONENTS AND VALUES

CONDENSERS		Values ( $\mu$ F)
C1	V1 S.G. by-pass	.. 0.1
C2	V1 cathode by-pass	.. 0.1
C3	R.F. coupling condenser	.. 0.00005
C4	V2 grid circuit fixed trimmer (L.W.)	.. 0.00005
C5	V2 grid condenser	.. 0.0001
C6	V2 cathode by-pass	.. 0.5
C7	V2 anode R.F. by-pass	.. 0.002
C8	V2 anode decoupling	.. 0.5
C9	V2 to V3 A.F. coupling	.. 0.01
C10	Tone corrector	.. 0.0003
C11*	V3 cathode by-pass	.. 50.0
C12	V3 anode by-pass	.. 0.0025
C13†	Tone correctors	.. 0.01
C14*	H.T. smoothing	.. 8.0
C15*	H.T. smoothing	.. 8.0
C16†	Aerial circuit tuning	.. 0.0005
C17†	Aerial circuit trimmer	.. —
C18†	Reaction control, ganged R4	.. 0.0005
C19†	V2 grid circuit tuning	.. 0.0005
C20†	V2 grid circuit trimmer	.. —

OTHER COMPONENTS		Approx. Values (ohms)
L1	External aerial coupling	.. 1.4
L2	Frame aerial windings	.. 13.0
L3		.. 13.0
L4	V1 anode R.F. choke	.. 460.0
L5	Reaction coils	.. 3.0
L6		.. 4.5
L7	V2 grid tuning coils	.. 1.5
L8		.. 20.0
L9	V2 anode R.F. choke	.. 460.0
L10	Speaker speech coil	.. 1.7
L11	Hum neutralising coil	.. 0.1
L12	Speaker field coil	.. 3,000.0
T1	Speaker input trans. { Pri. Sec. ...	0.4
T2	Mains trans. { Pri. total Rect. heat. sec. H.T. sec., total	47.5
		0.05
		0.15
375.0		
S1, S3	Wave-change switches	.. —
S2	Radio muting switch (gram.)	.. —
S4	Mains switch	.. —

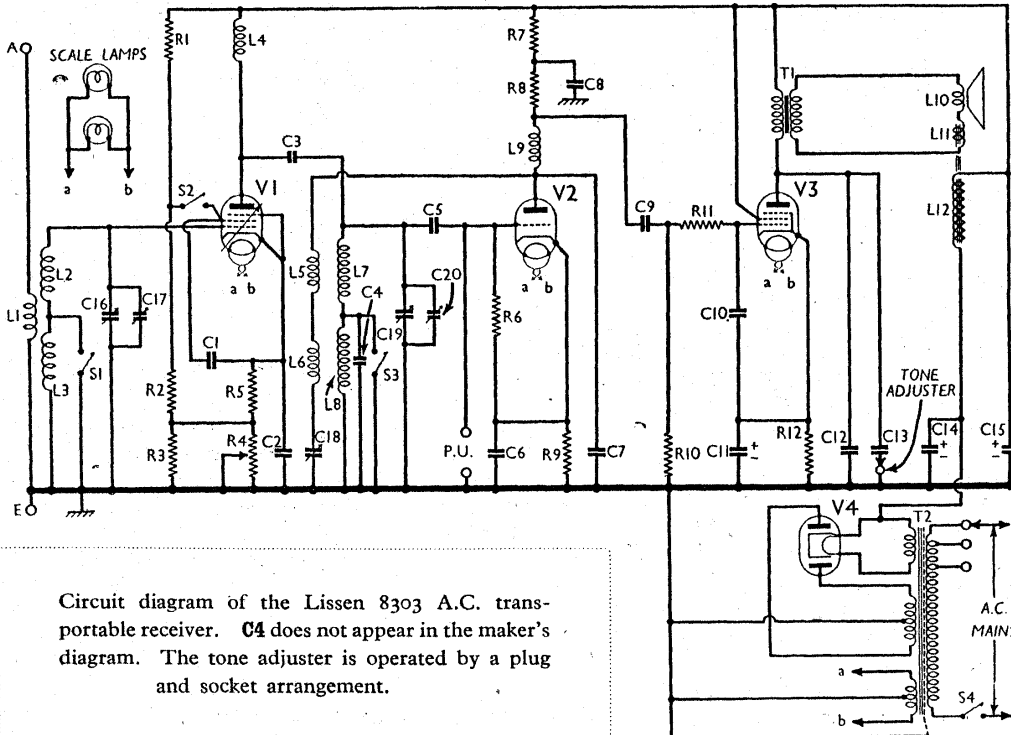
\* Electrolytic. † Variable. ‡ Pre-set.

### DISMANTLING THE SET

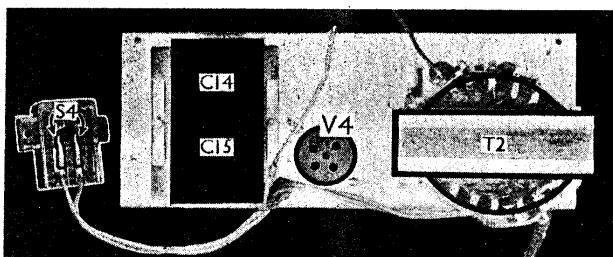
**Removing Chassis.**— First remove the three control knobs (pull off) and the four bolts holding the main unit to the bottom of the cabinet. Now unsolder the leads from the chassis to the mains transformer unit and the leads from the chassis to the speaker terminal panel.

Then remove the two round-head wood screws holding the front of the chassis to the cabinet and the collars from the two bolts passing through the sides of the cabinet and holding the chassis. Next unsolder the leads to the terminal panel for the frame aerial, when the chassis can be withdrawn.

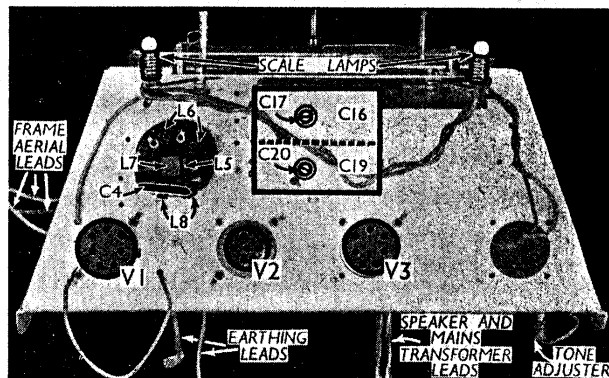
When replacing the chassis, connect the leads to the frame aerial terminal panel as follows:— blue to the bottom tag; green to the tag above it, black to the



Circuit diagram of the Lissen 8303 A.C. transportable receiver. C4 does not appear in the maker's diagram. The tone adjuster is operated by a plug and socket arrangement.



Above, the mains transformer unit. Right, plan view of the chassis, with the coil can removed. L6 and L8 are beneath L5 and L7, but their tags are indicated.



remaining tag. Connect the leads to the mains transformer as follows, numbering the tags from right to left: 1, black; 3, red; and take the black earthing lead to the tag on one of the transformer fixing bolts. The leads to the speaker should be connected as follows, numbering them from left to right: 1 and 2 joined together, red; 3, blue. The black earthing lead goes to the tag on the top left-hand fixing screw.

**Removing Power Pack.**—To remove the power pack from the cabinet, remove the four bolts holding it to the bottom of the cabinet and remove the mains switch from the side of the cabinet (two round-head wood screws). Now unsolder the leads to the speaker and chassis and when replacing, connect the leads to the chassis as above and the leads to the speaker as follows, numbering the tags from left to right: 1 and 2 joined together, yellow; 4, red.

**Removing Frame Aerial.**—First remove the chassis and power pack as described above and then remove the round-head screws holding the frame to the cabinet.

**Removing Speaker.**—Remove the four screws (with fibre and spring washers) holding it to the sub-baffle and when replacing, see that the transformer is at the bottom and do not forget to replace the earthing tag on the top left-hand fixing screw. Connect the leads as mentioned above.

**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 wavelength on the medium band and the combined volume and reaction control was in such a position that the resistance was fully out of circuit, but the vanes of the condenser were not fully in mesh, that is the spindle was turned through about 110 degrees from minimum. There was no signal input, as the frame aerial leads were connected together.

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 A50N	265	3.5	80	1.4
V2 A30D	50	2.1	—	—
V3 A70D	235	38.0	265	5.0
V4 A11D	360†	—	—	—

† Each anode, A.C.

**GENERAL NOTES**

**Switches.**—S1 and S3 are the waveband switches, ganged with the radio muting switch S2 in a single unit beneath the chassis, the individual switches being marked in our under-chassis view.

The table below gives the switch positions for the three control settings, starting from fully anti-clockwise. O indicates open, and C closed.

Switch	L.W.	M.W.	Gram.
S1	O	C	C
S2	C	C	C
S3	O	C	C

S4 is the Q.M.B. mains switch, in a moulded unit mounted at the right-hand side of the cabinet.

**Coils.**—L1-L3 are the frame aerial windings, the ends terminating at a panel which also carries sockets for an external aerial and earth. The connections from the chassis to the windings are soldered to tags on this panel.

L5-L8 are in a single screened unit on the chassis deck, which also contains C4. L7 and its reaction coil L5 are wound on a former which is mounted horizontally, while below them on a separate vertically mounted former are L6 and L8. The screw-on cover of this unit has been removed in our plan chassis view, and the tags to which L6 and L8 are connected are indicated.

L4 and L9 are R.F. chokes, mounted beneath the chassis.

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

**External Speaker.**—No provision is made for an extension speaker but a high resistance type could be connected across those tags on T1 which are connected to the primary. Alternatively, a low resistance type (about 2 O) could be connected across the secondary of T1.

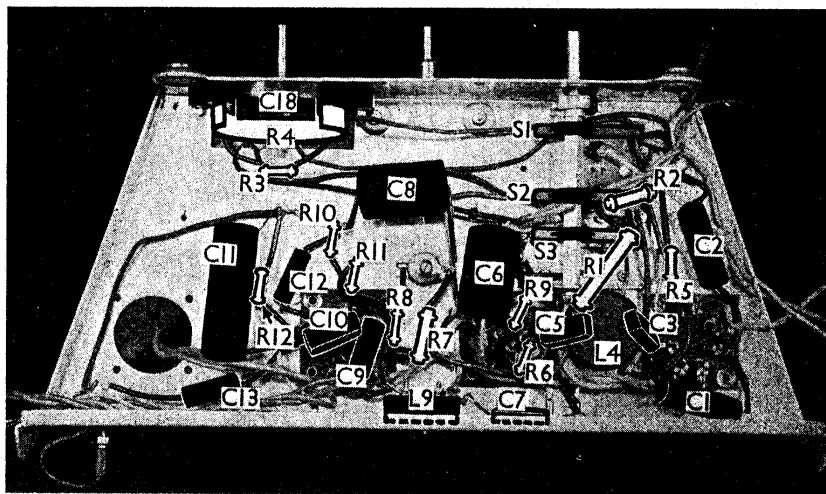
**Condensers C14, C15.**—These are two 8 μF dry electrolytic types in a single carton, and are mounted on the mains transformer unit. The black lead is the common negative, the red lead is the positive of C14, and the yellow is the positive of C15.

**Chassis Divergencies.**—C4 appears in our chassis but not in the makers' diagram. Similarly the diagram shows the H.T. side of C1 connected to the junction of R1 and R2, but in our chassis it was taken direct to the screen socket of V1.

**CIRCUIT ALIGNMENT**

Connect signal generator to external A and E sockets, and feed in a 220 m. signal. Switch set to M.W., tune to 220 m. on scale, and with C18 just beginning to mesh (R4, of course, having reached its maximum), adjust C20 and C17 for maximum output.

Now gradually increase reaction until receiver is just short of oscillation, and re-adjust C20, and also C17, if necessary. If receiver commences to oscillate, slacken off reaction slightly.



Under-chassis view. The switches are marked. C18 and R4 are ganged.