'TRADER' SERVICE SHEET 185

LISSEN 8305

3-VALVE A.C. RECEIVER

THE recently released Lissen 8305 is a 3-valve (plus rectifier) A.C. receiver suitable for mains of 200-250 V, 40-100 C/S, and has provision for using both a gramophone pick-up and an extension speaker. Tone control is obtained by means of a plug and socket arrangement.

CIRCUIT DESCRIPTION

Aerial input via fixed series condenser and coupling coil **L1** to inductively-coupled band-pass filter. Primary coils **L2, L3** are tuned by **C15**; secondary coils **L4, L5** are tuned by **C17**.

First valve (**V1, Ever Ready metallised A50P**) is a variable-mu pentode operating as R.F. amplifier. Gain control by variable cathode resistance **R4** which varies G.B. applied.

Choke-fed tuned-grid coupling by **L6, C4, L9, L10, C20** between **V1** and triode detector valve (**V2, Ever Ready metallised A30D**) which operates on grid leak system with **C5** and **R5**. Reaction is applied from anode by coils **L7, L8** and controlled by variable condenser **C19**. Provision for connection of gramophone pick-up in grid circuit. Anode R.F. by-passing by **C7**.

Resistance-capacity coupling by **R7, C8** and **R8** between **V2** and pentode output valve (**V3, Ever Ready A70D**). Fixed tone correction in C.G. circuit by **C9** and in anode circuit by **C11**; two-point tone control by **C12** and plug-socket arrangement. Provision for connection of high-impedance external speaker across primary of internal speaker transformer **T1**.

H.T. current is supplied by I.H.C. full-wave rectifying valve (**V4, Ever Ready A11B**). Smoothing by speaker field coil **L13** and dry electrolytic condensers **C13, C14**.

COMPONENTS AND VALUES

	RESISTANCES	Values (ohms)
R1	V1 S.G. H.T. potential divider	10,000
R2		50,000
R3	V1 fixed G.B. resistance	100
R4	V1 gain control	21,000
R5	V2 grid leak	2,000,000
R6	V2 anode decoupling	25,000
R7	V2 anode load	25,000
R8	V3 C.G. resistance	200,000
R9	V3 C.G. H.F. stopper	100,000
R10	V3 G.B. resistance	150

	CONDENSERS	Values (μF)
C1	Aerial series condenser	0·0001
C2	V1 S.G. by-pass	0·1
C3	V1 cathode by-pass	0·1
C4	R.F. coupling	0·00005
C5	V2 grid condenser	0·0001
C6	V2 anode decoupling	0·5
C7	V2 anode R.F. by-pass	0·001
C8	V2 to V3 A.F. coupling	0·025
C9	Tone corrector	0·0005
C10*	V3 cathode by-pass	50·0
C11	Tone correctors	0·002
C12		0·01
C13*	H.T. smoothing	8·0
C14*		8·0
C15†	Band-pass pri. tuning	—
C16‡	Band-pass pri. trimmer	—
C17†	Band-pass sec. tuning	—
C18‡	Band-pass sec. trimmer	—
C19†	Reaction control	0·0005
C20†	V2 grid circuit tuning	—
C21‡	V2 grid circuit trimmer	—

* Electrolytic. † Variable. ‡ Pre-set.

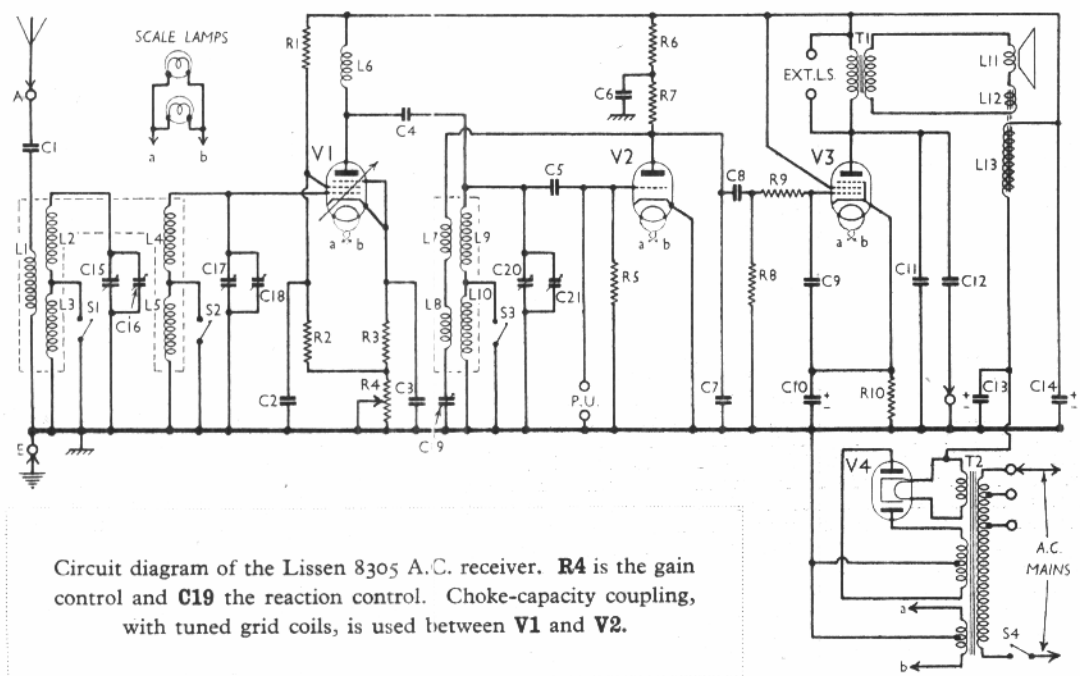
	OTHER COMPONENTS	Approx. Values (ohms)
L1	Aerial coupling coil	11·0
L2	Band-pass primary coils	2·5
L3		10·0
L4	Band-pass secondary coils	2·5
L5		10·0
L6	V1 anode R.F. choke	480·0
L7	Reaction coils, total	9·0
L8		
L9	V2 grid tuning coils	2·5
L10		10·0
L11	Speaker speech coil	1·9
L12	Hum neutralising coil	0·2
L13	Speaker field coil	2,000·0
T1	Speaker input trans. Pri.	265·0
	Speaker input trans. Sec.	0·3
T2	Mains trans. Pri. total	46·0
	Mains trans. Heater sec.	0·05
	Mains trans. Rect. heat. sec.	0·15
	Mains trans. H.T. sec. total	350·0
S1-S3	Waveband switches	—
S4	Mains circuit switch	—

DISMANTLING THE SET

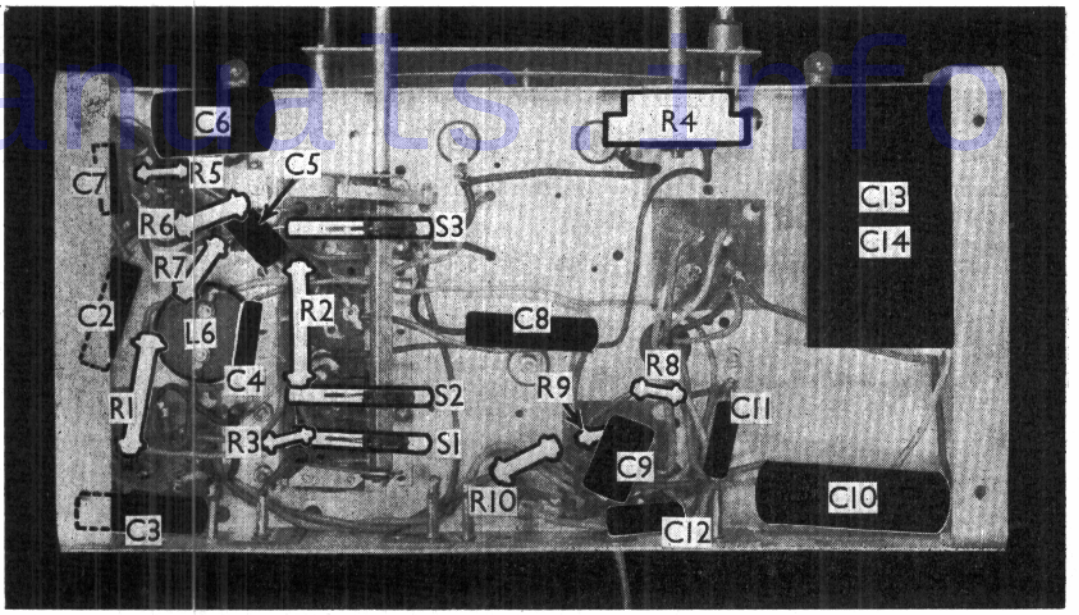
Removing Chassis.—If it is desired to remove the chassis from the cabinet first remove the four control knobs (pull off) and the four bolts (with washers) holding it to the bottom of the cabinet. Next remove the mains switch from the side of the cabinet (two round-head wood screws) and free the speaker leads from the cleat on the strip across the back of the cabinet. The chassis can now be withdrawn to the extent of the speaker leads, which is sufficient for normal purposes. *When replacing the chassis,* note that the control knobs are marked with their purpose so that they must be placed on the correct spindles.

To free the chassis entirely, unsolder the speaker leads and *when replacing* connect them as follows, numbering the tags on the speaker terminal panel from left to right:—1, red; 2, blue; 3, black. The brown lead goes to the tag on one of the screws holding the speaker to the sub-baffle.

Removing Speaker.—To remove the speaker from the cabinet, remove the four screws (with spring washers, washers on three of them) holding it to the sub-baffle. *When replacing,* see that the transformer is at the bottom and do not forget to replace the soldering tag for the earthing lead on the bottom left-hand screw.



Circuit diagram of the Lissen 8305 A.C. receiver. **R4** is the gain control and **C19** the reaction control. Choke-capacity coupling, with tuned grid coils, is used between **V1** and **V2**.



Under - chassis view. Note the simple wave - band switching, by **S1-S3. L6** is an H.F. choke. The reaction condenser is above the chassis.

VALVE ANALYSIS

Valve voltages and currents given in the table below are those measured in our receiver when it was operating on mains of 220 V, using the 216-235 V tapping on the mains transformer. The volume control was at maximum but the reaction control was at minimum, and 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 A50P ..	265	12·0	190	4·1
V2 A30D	145	2·9	—	—
V3 A70D	260	40·0	270	5·4
V4 A11B ..	350†	—	—	—

GENERAL NOTES

Switches.—**S1-S3** are the waveband switches, ganged in a single unit beneath the chassis, and individually marked in our under-chassis view. They are all *closed* on the M.W. band and *open* on the L.W.

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

Coils.—**L1-L5** and **L7-L10** are in two screened units on the chassis deck, the first also containing **C1**.

L6 is an H.F. choke, mounted beneath the chassis.

Scale Lamps.—These are two Ever Ready 6·2 V, 0·3 A, M.E.S. types.

External Speaker.—Two sockets are provided at the rear of the chassis for a high resistance external speaker.

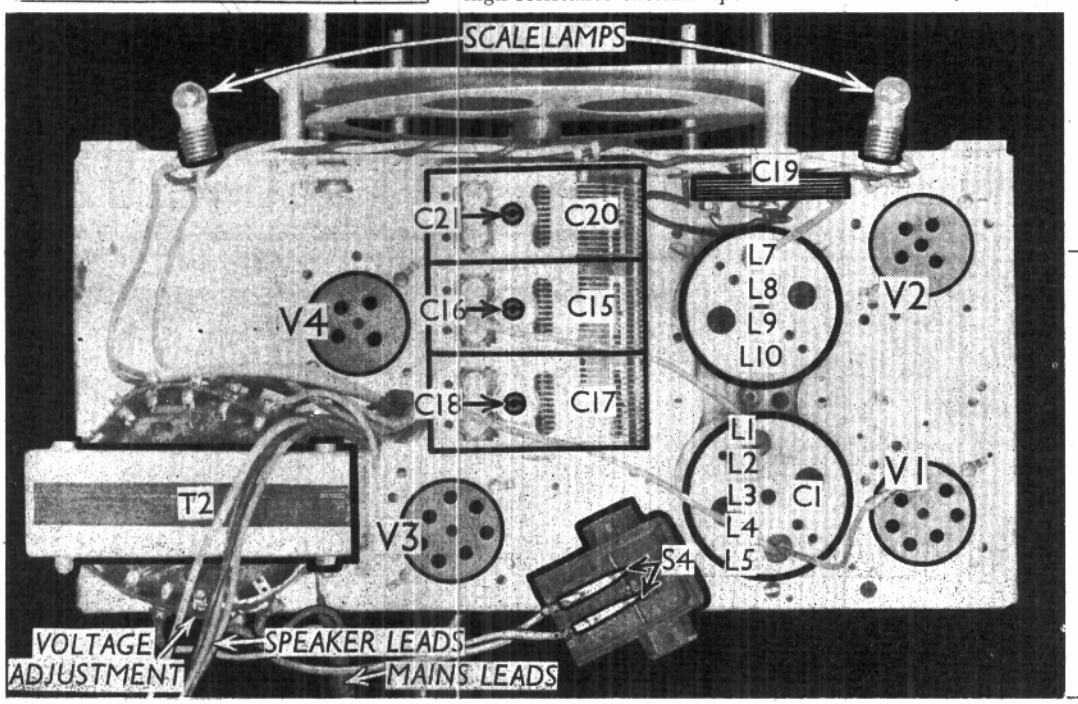
Condensers C13, C14.—These are two 8 μF dry electrolytic types, in a single carton mounted beneath the chassis. The black lead is the common negative, the red lead is the positive of **C13** and the yellow the positive of **C14.**

CIRCUIT ALIGNMENT

Connect a signal generator to the **A** and **E** sockets, and feed in a 220 m. signal. Switch set to M.W., tune to 220 m. on scale, and with gain control at maximum and reaction at minimum, adjust **C16, C18** and **C21** for maximum output.

Now gradually increase reaction until receiver is just short of oscillation, and re-adjust **C21**, and also **C16** and **C18** if necessary. If receiver commences to oscillate, slacken off reaction slightly.

If, when re-aligning, it is suspected that the pointer has moved relative to the rotors of the gang condenser, first re-set it by turning the gang to maximum and adjusting pointer until it coincides with the horizontal line dividing the M.W. and L.W. scales.



Plan view of the chassis. **S4** is the mains switch, normally mounted at the side of the cabinet. The first coil unit also contains **C1.**