

# LISSEN 8305 MAINS STRAIGHT THREE



The Lissen 8305 is a simple "straight" three valve plus rectifier set for A.C. mains. Band-pass input and tone control are two features of the specification.

**CIRCUIT.**—A band-pass input circuit precedes V1, an H.F. pentode, the aerial being connected through a small series condenser.

Volume is controlled by a potentiometer, which varies the bias on the cathode of this valve.

A single tuned circuit couples the signal to V2, a triode detector, reaction being fed back from the anode in the usual way.

The L.F. output of V2 is fed to V3, the output pentode, through a resistance and capacity stage, and, after amplification, to the moving-coil speaker *via* a matching transformer.

Attention is drawn to the H.F. choke in the anode circuit of V1.

Tone is controlled by means of a condenser and flying lead. There is the usual pentode compensating condenser, and the tone control condenser is connected in parallel with it when the flying lead is earthed—that is, in the normal tone position. In the high tone position this condenser is out of circuit.

Mains equipment consists of transformer and full-wave rectifier, and smoothing is by the speaker field and electrolytic condensers.

**Special Note.**—The dial lights are rated at 6.2 volts .3 amp. The holders are fixed by knurled headed screws, one on each side of the gang condenser. Removal of these enables the holders to be removed to the extent of the connecting leads. This is sufficient for replacement purposes.

Connections are provided for an external speaker on the back of the chassis. These are taken from the primary of the output transformer, so that an extension speaker must have its own matching transformer with a primary impedance of not less than 7,000 ohms.

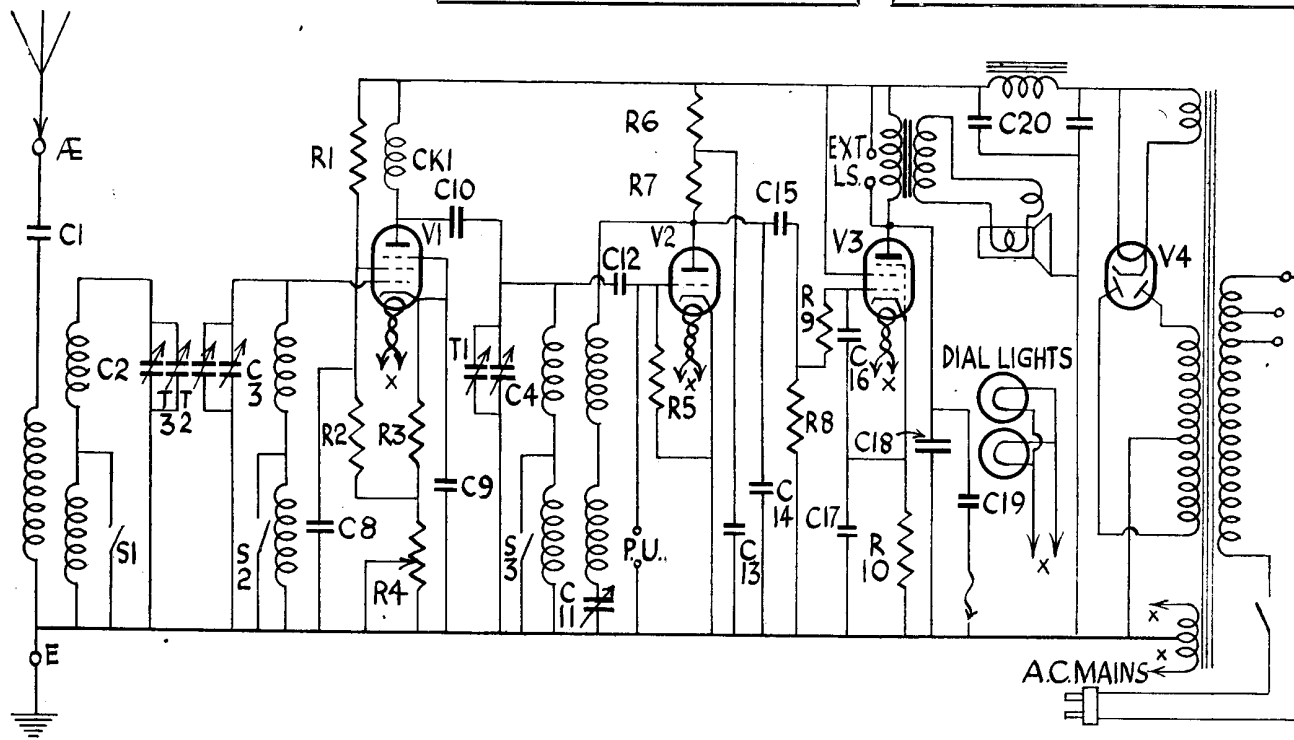
Provision is also made for using a pick-up with this set, the connections being to the grid of V2, and to the chassis. A pick-up is not, therefore, affected by the volume control, and should have its own.

No switching position is provided for this and, although connection of a pick-up is usually sufficient to cut out the radio reproduction, the volume and reaction controls should be set at minimum and the set tuned to a position where there is no broadcast.

**Removing Chassis.**—Take off the four knobs from the front of the cabinet (these are secured by spring clips) and remove the mains switch from the side of the cabinet by taking out the two wood screws

RESISTANCES		
R.	Purpose.	Ohms.
1	V1 screen decoupling potr. . .	10,000
2	V1 screen decoupling potr. . .	50,000
3	V1 cathode bias . . . . .	100
4	Volume . . . . .	21,000
5	V2 grid leak . . . . .	2 meg.
6	V2 anode decoupling . . . . .	25,000
7	V2 anode load . . . . .	25,000
8	V3 grid leak . . . . .	260,000
9	V3 grid stopper . . . . .	.1 meg.
10	V3 cathode bias . . . . .	150
	Speaker field . . . . .	2,000

CONDENSERS		
C.	Purpose.	Mfrs.
1	Series aerial . . . . .	.0001
8	V1 screen potr. decoupling . . .	.1
9	V1 cathode bias shunt . . . . .	.1
10	H.F. coupling . . . . .	.00005
11	Reaction . . . . .	.0005
12	V2 grid . . . . .	.0001
13	V2 anode decoupling . . . . .	.5
14	V2 anode by-pass . . . . .	.001
15	L.F. coupling . . . . .	.025
16	Tone correction . . . . .	.0005
17	V2 cathode bias shunt . . . . .	50
18	Pentode compensating . . . . .	.002
19	Tone control . . . . .	.01
20	H.T. smoothing . . . . .	8+8



As this circuit diagram shows, the 8305 is basically orthodox and quite a straightforward service proposition. Volume is controlled by V1 bias and by reaction.

For more information remember  
[www.savoy-hill.co.uk](http://www.savoy-hill.co.uk)

which are reached from the inside of the cabinet.

Take out the four fixing bolts from underneath the cabinet and free the speaker leads from the cleat. The chassis may then be removed to the extent of the speaker leads which should be enough for ordinary purposes.

Should it be considered necessary to disconnect these leads, reconnection will be as follows, reading from left to right: (1) red lead, (2) blue lead, (3) black lead.

## Circuit Alignment Notes

**Calibration.**—With the gang condenser plates fully meshed the pointer should be exactly horizontal—that is, parallel with the line dividing the scales. If this is not so, the set screw in the centre of the pointer should be slackened and the pointer moved to the correct position.

**Medium Waves.**—All the necessary ganging on this receiver is carried out on medium waves at 202 metres. A signal of this wavelength should, accordingly, be injected from a modulated oscillator at the aerial and earth terminals via a dummy aerial and tuned in.

The reaction control should be advanced to bring the receiver to the point of maximum sensitivity—that is, just below the oscillation point—and T1, T2 and T3

adjusted for maximum reading on an output meter.

The meter should be connected across the external speaker terminals. These are on the primary of the output transformer, and the output meter should have a series condenser of about 4 mfd. and should be switched to a high range.

### QUICK TESTS

Quick tests are available on this receiver on the terminal strip on the back of the speaker transformer. Volts measured between this and the chassis should be:—

- Red lead, 270 volts, smoothed H.T.
- Blue lead, 260 volts, smoothed H.T.
- Black lead, 410 volts, unsmoothed H.T.

### VALVE READINGS

No signal. No reaction. Volume maximum.  
200 volt A.C. mains.

V.	Type.	Electrode.	Volts.	M.A.
1	All Ever Ready. A50P met (7)	Anode ..	270	11
		Screen ..	185	3.9
2	A30D met (5)	Anode ..	80	5.8
		Screen ..	260	40
3	A70D (7)	Anode ..	270	5.2
		Screen ..	410	—
4	A11D (4)	Filament	—	—

Condensers made by A. H. Hunt, Ltd., are used in this receiver. Replacements are C20, list 2548 (7s. 3d.), and C17, list 1953 (1s. 9d.).

## Lissen 8305 on Test

MODEL 8305. — "Olympian."  
M 200-250 volt, 40-100 cycle A.C. mains. Price 7 gns.

DESCRIPTION. — Two-waveband four-valve, including rectifier, straight set with band-pass input. Lacquer-finished wood cabinet.

FEATURES.—Aeroplane type of dial with names and wavelength calibration. Separate reaction and volume controls.

### Sensitivity and Selectivity

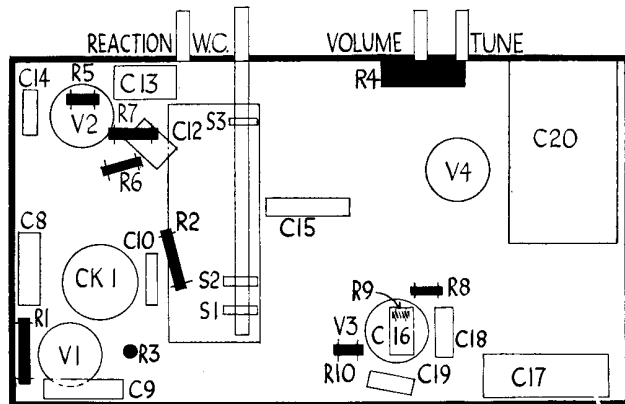
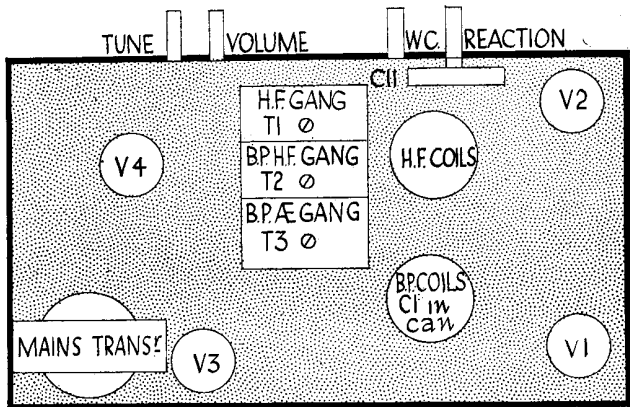
**MEDIUM WAVES** (195-575 metres). — Selectivity representative for valve combination consistent with gain which is appreciable.

Programmes easily received between local stations with careful use of volume and reaction. Reaction is free from overlap and easily handled.

**LONG WAVES** (875-2,000 metres). — Sensitivity high; selectivity capable of giving the usual stations. Deutschlandsender barely separated with critical use of controls.

### Acoustic Output

Fairly well balanced, with slight trace of colouration only, and no undue accentuation of either high or low frequencies.



The tinted diagram, left, is of the top of the Lissen chassis. In the underneath diagram, right, all resistors are shown in solid black, in order to facilitate reference.

## FIELD COIL FAULT: TESTING CONDENSERS

**A**N analyser check on a receiver which was to be serviced revealed a very curious fault, which was not in any way actually deteriorating the performance of the set.

The speaker field coil was checked for continuity whilst the receiver was switched off and was found to be open. Yet, on switching on the receiver, the speaker appeared to be functioning normally and the winding checked up correctly.

Switching off the set produced the break again, and it was found that this could be repeated at will, switching the receiver on and off any number of times always producing the same effect.

On removing the coil, an actual break was found, so apparently each time the receiver was switched on an arc occurred

which served to complete the circuit as long as current was flowing.

This fault, luckily enough discovered in the course of a routine check, would sooner

or later have meant another service call being made.

### Experiences, Please

**D**ETAILS of your service experiences are invited for publication, at the usual rates, in "Service Engineer."

Have you just conquered a teaser? Have you neat practical ideas of your own? Perhaps you hold special views on the best fault-tracking routine? Send your letter to the Editor of BROADCASTER.

**W**HEN a condenser is suspect it should first be tested for short circuit by the application of a low voltage in series with a meter. The meter should be protected by a series resistance.

The suitable value of resistance should be found by Ohm's law. It depends, of course, on the voltage used for the test and should be chosen so that, assuming a dead short in the condenser, the current flowing will give maximum deflection.

For example, if the meter read up to 5 m.a. and a 1½-volt cell was being employed, the safety resistor should have a value of 300 ohms. [R = E/C = 1.5 volt / .005 amp. = 300 ohms.]