

# LISSEN 8302 MAINS ALL-WAVE FIVE

**CIRCUIT.**—The aerial can be plugged into two sockets, one of which connects a resistance in series with the input. Coupling from the aerial consists of an inductive band-pass filter on medium and long waves. On short waves, the aerial is coupled to the aerial coil via a condenser and coupling coil.

V1, a triode hexode frequency changer, is the first valve. The output of this passes through an I.F. transformer to the grid of V2, an H.F. pentode acting as I.F. amplifier.

The signal passes by means of a further I.F. transformer to the demodulating diode of V3, a double diode triode. The other diode of V3 provides A.V.C. via the usual network. The rectified signal then passes through a volume control to the grid of the triode section of V3.

V3 is resistance capacity coupled to V4, an output pentode. A tone control consisting of a variable resistance and fixed condenser arrangement is connected between the anode and earth line of V4.

Mains equipment consists of mains transformer, smoothing choke (speaker field), full-wave rectifying valve V5, and electrolytic smoothing condensers.

**Special Notes.**—By means of a resistance network in the cathode-grid circuit of V4, a negative feed back effect is obtained. This, incidentally, does away with the need for a cathode shunt condenser for the output valve.

There are two dial lights in the receiver. These are fixed in screw-in holders mounted one each side of the dial assembly. They are rated at 6.2 volts .3 amp.

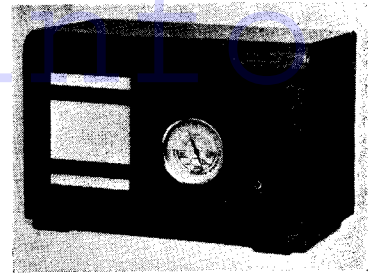
A pair of sockets at the rear of the chassis sub-panel enables a pick-up to be connected. An adjacent pair of sockets enables an external speaker to be used.

This should be of the permanent-magnet type, complete with its own matching transformer.

R7 and R8 are to be found in the oscillator coil can.

**Chassis Removal.**—Take off the back of the set. The four control knobs on the front of the receiver are of the spring-fixing type.

Turn the set on its side (speaker upwards) and remove the four fixing bolts securing the chassis. The washers (rubber and metal) will be found to remain in the holes, and these should not be taken out.



The 8302 is an all-wave A.C. super-het, marketed by Lissen, Ltd., at 10½ gns. Negative feed-back is applied to the last stage for high output with good quality.

The chassis can then be removed to the extent of the speaker cable. A further extension can be obtained by removing the speaker cable from its spring clip.

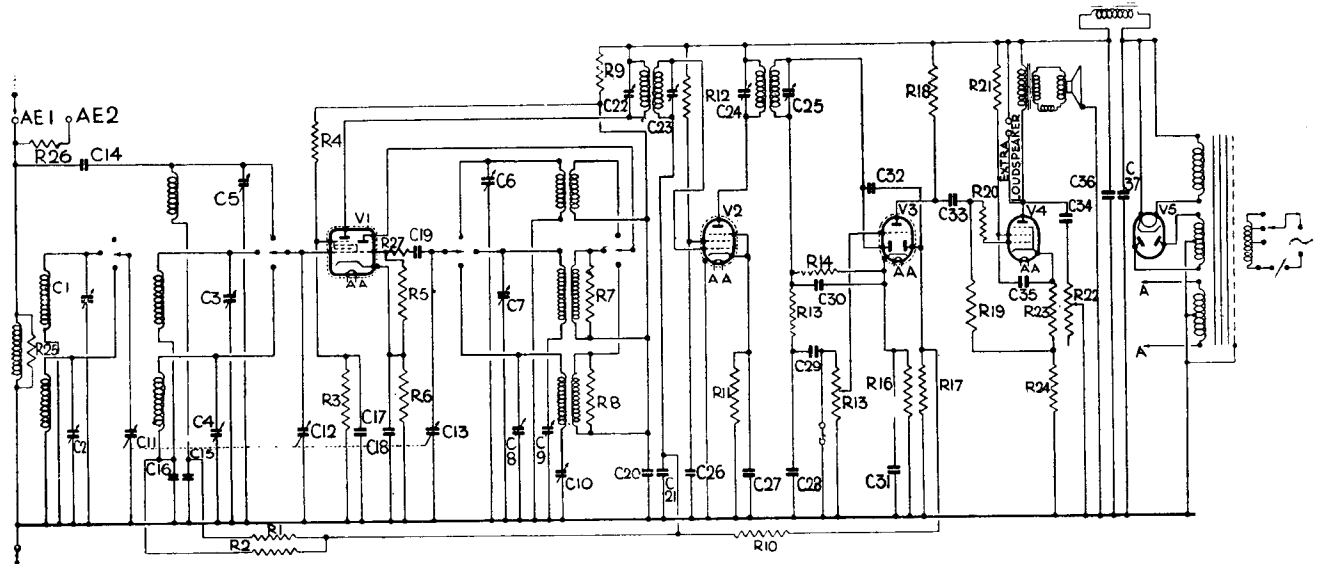
The speaker can be removed by undoing the four screws on the speaker frame, or, alternatively, unsoldering the various leads to the speaker transformer. For the reverse procedure, from left to right, the colours of the leads are: brown, blue and red.

## RESISTANCES

R.	Purpose.	Ohms.
1	V1 A.V.C. decoupling s.w. ...	110,000
2	V1 A.V.C. decoupling m. and l.w. ...	110,000
3	V1 screen potr. (part)...	20,000
4	V1 screen potr. (part)...	5,000
5	Osc. grid leak ...	26,000
6	V1 cathode bias ...	150
7	M.W. oscillator shunt ...	1,000
8	L.W. oscillator shunt ...	2,000
9	V1 screen feed osc. anode decoupling ...	10,000
10	V2 A.V.C. decoupling ...	110,000
11	V2 cathode bias ...	100
12	V2 screen decoupling ...	25,000
13	H.F. filter ...	110,000
14	Demodulator diode load ...	510,000
15	Volume control ...	500,000
16	V3 cathode bias ...	300
17	A.V.C. diode load ...	510,000
18	V3 anode load ...	20,000
19	V4 grid leak ...	260,000
20	V4 grid stopper ...	21,000
21	V4 screen decoupling ...	2,500
22	Tone control ...	50,000
23	V4 cathode bias potr. and neg. feed back ...	150
24	V4 cathode bias potr. and neg. feed back ...	250
25	Aerial shunt ...	11,000
26	A2 aerial shunt ...	110,000
27	Oscillator grid ...	200

## CONDENSERS

C.	Purpose.	Mfds.
14	Short wave aerial coupling ...	.00001
15	Short wave tracking ...	.01
16	V1 A.V.C. decoupling ...	.1
17	V1 screen decoupling ...	.1
18	V1 cathode shunt ...	.1
19	Oscillator grid ...	.0001
20	Oscillator anode decoupling ...	.1
21	V2 A.V.C. decoupling ...	.1
22	V2 screen decoupling ...	.1
27	V2 cathode shunt ...	.1
28	H.F. by-pass ...	.0002
29	L.F. coupling ...	.05
30	H.F. by-pass ...	.0002
31	V3 cathode shunt ...	50
32	A.V.C. diode coupling ...	.00001
33	L.F. coupling ...	.05
34	Tone control ...	.05
35	V4 screen decoupling ...	.05
36	H.T. smoothing ...	8
37	H.T. smoothing ...	8



Band-pass input on medium and long waves with a single coil on short is found in the 8302. A high I.F., of 455 kc., is employed.

For more information remember  
www.savoy-hill.co.uk

## Circuit Alignment Notes

**I.F. Circuits.**—Connect a service oscillator between the top grid cap of V1 and chassis, and short-circuit the oscillator section of the gang condenser. Turn gang condenser to maximum capacity and volume control to maximum. Connect an output meter across the primary of the speaker transformer. Inject at 455 kc.

Adjust the trimmers of the I.F. transformers (starting with the second I.F. transformer) until maximum response is obtained, reducing the input from the oscillator as the circuits come into line to render the A.V.C. inoperative.

**Signal Circuits.**—Leave the output meter connected as before, but connect the service oscillator to the A1 and earth terminals of the receiver. Remove the oscillator gang shorting strip. Only feed sufficient input from the service oscillator to obtain a half-scale deflection of the output meter, so as to render the A.V.C. inoperative.

See that the scale pointer registers with the 180-degree line on the scale with the gang at maximum capacity.

**Medium Waves.**—Set condenser P1 approximately two-thirds in. Tune set and oscillator to 214 metres (1,402 kc.) and adjust C7, C3 and C1 for maximum.

Tune set and oscillator to 500 metres (600 kc.) and adjust the medium-wave padding condenser P1 for maximum response, simultaneously rocking the gang to ensure optimum results.

Repeat both operations until correct calibration with maximum sensitivity is obtained.

**Long Waves.**—Set condenser P2 approximately one-third in. Tune set and oscillator to 1,200 metres (250 kc.) and adjust C8, C4 and C2 for maximum.

Tune set and oscillator to 1,700 metres (176 kc.) and adjust long-wave padding condenser P2 for maximum response, simultaneously rocking the gang to ensure optimum results.

Repeat both the above operations until correct calibration with maximum sensitivity is obtained.

**Short Waves.**—Screw condenser C6 right in. Tune set and oscillator to 15 mc. and slowly unscrew C6 until the signal is heard. The first peak is the correct calibration.

Tune set and oscillator to 7 mc. and adjust the end turn of the short-wave coil (L4 in lay-out diagram) near C20 to give maximum output.

Repeat both the above operations until correct calibration with maximum sensitivity is obtained.

### Replacement Condensers

Exact service replacement electrolytics for the Lissen 8302 are available from A. H. Hunt, Ltd., of Garratt Lane, Wandsworth, London, S.W.18. These are: Block containing C's 35, 36 and 37, list number 2,925, price 9s. 6d.; for C31 there is unit 1,953, at 1s. 9d.

### CHECKING CURRENT OF A.C.-D.C. SETS

WHEN checking the total H.T. current of a universal set by putting a milliammeter in series with the rectifier cathode see that the smoothing condenser on the valve side of the choke is not disconnected.

If this condenser is out of circuit the

### QUICK TESTS

These are available on the speaker transformer leads. Volts measured between these and the chassis should be:—  
Brown, 395 volts, unsmoothed H.T.  
Blue, 220 volts, smoothed H.T.  
Red, 240 volts, smoothed H.T.

## Lissen 8302 on Test

**MODEL 8302.**—Standard model for A.C. mains operation, 200-250 volts, 40-100 cycles. Price, 10½ gns.

**DESCRIPTION.**—Three-waveband, five-valve, table model superhet, with speaker by side of the chassis.

**FEATURES.**—Controls for volume, tone, waveband, and tuning. Full-vision scale calibrated in names and wavelengths. Sockets for extension speaker and pick-up.

**LOADING.**—84 watts.

### Sensitivity and Selectivity

**SHORT WAVES (19-50 metres).**—Excellent sensitivity, good selectivity, easy handling, no appreciable drift. Gain well maintained over the band.

**MEDIUM WAVES (198-580 metres).**—Excellent sensitivity and very satisfactory selectivity. Local station spread small. Low background.

**LONG WAVES (850-1,920 metres).**—Good gain and average selectivity. Some overlap on Deutschland-sender. All main stations easily received.

### Acoustic Output

Well balanced tone, representative of pentode, with crisp, clean attack, and good low-note radiation. Coloration on speech very slight and general balance pleasing.

smoothed H.T. volts will fall, and a false current reading will be obtained.

Woolly reproduction may be caused by an open-circuited pentode cathode by-pass condenser. Intermittent low capacity can cause thundery rumblings.

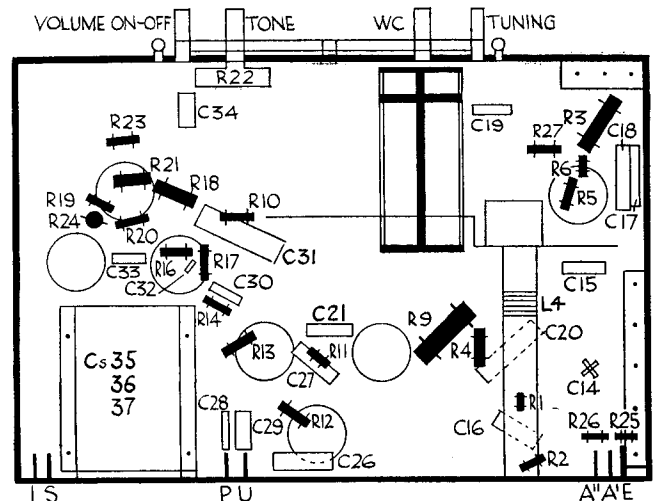
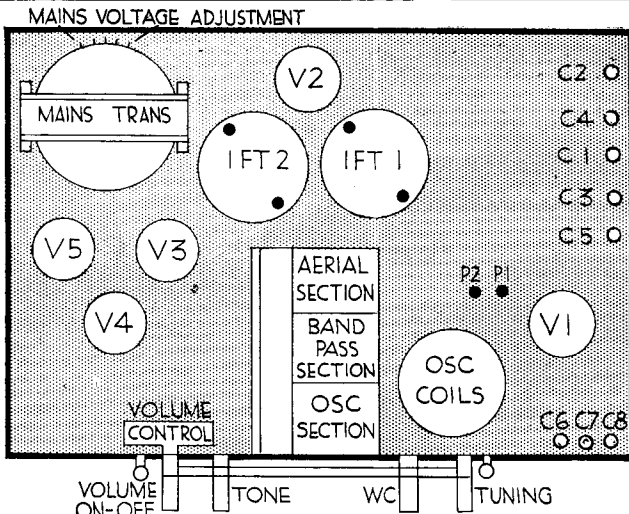
Thin and distorted reproduction may be caused by out-of-centre speaker cone or even fractured lead to the coil.

In cases of this kind of distortion it is best to try an additional speaker before laboriously investigating the receiver itself.

### VALVE READINGS

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

V.	Type.	Electrode.	Volts.	Ma.
1	All Ever-Ready.	A36Bmet.(7) Anode ...	245	2
		Osc. anode ...	100	7
		Screen ...	62	4
2	A50Pmet.(7)	Anode ...	245	9.5
		Screen ...	140	3.5
3	A23Amet.(7)	Anode ...	140	6
4	A70D (7)	Anode ...	215	31
		Screen ...	222	5
5	A11D (4)	Filament ...	395	—



These drawings give practical details of the 8302 chassis. Rs 7 and 8 are in the oscillator coil can and L4 (under chassis) is referred to in alignment notes.