LISSEN

SERVICE MANUAL FOR A.C. OR D.C. MAINS OPERATED THREE WAVE-BAND RECEIVER MODEL 8130

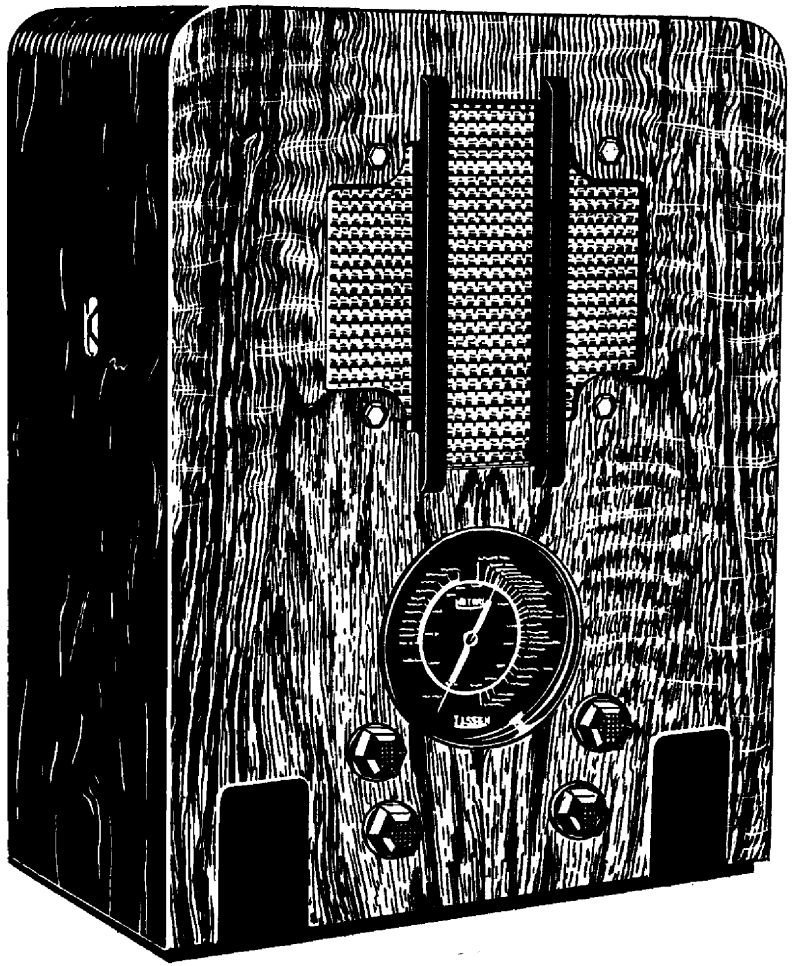
TECHNICAL SPECIFICATION

THE Lissen model "8130" is a universal A.C. or D.C. mains operated, three wave-band receiver, for operation with an external aerial. The wave-bands covered are 18.5-54 metres, 202–560 metres and 900 2,000 metres. Four valves including a rectifier are employed.

The first valve (V1) is a variable-mu R.F. pentode which functions as a R.F. amplifier on all wavebands. It is preceded by a tuned grid circuit.

Volume control is effected by varying the bias on the variable-mu pentode, by means of the potentiometer R4.

The detector valve (V2) is a triode which functions as a grid rectifier, and is coupled to the first valve by a tuned anode circuit.



Reaction is provided by the coil L8 on short waves and by L9 on the medium and long waves. It is controlled on all wavelengths by the condenser C11.

The detector is coupled by a parallel-fed transformer to the output valve (V3), a high slope A.F. pentode, which in turn is transformer coupled to the low impedance voice coil of the energised moving coil speaker.

A tone correcting network is employed and is so arranged that the high frequency response can be varied by the plug and socket on the back of the chassis, which connects the condenser C19 between the anode of V3 and chassis.

SERVICE DATA FOR A.C. OR D.C. MAINS OPERATED THREE WAVE-BAND RECEIVER MODEL 8130

GENERAL REMARKS

In the event of trouble check the following details :—

(1) Power supply ; if the pilot lamps light it is certain that the power supply is not at fault, otherwise check : (*a*) Tuning scale lights and fuses ; (*b*) Mains lead, plugs and sockets ; (*c*) Mains switch ; (*d*) Receiver correctly adjusted for power supply.

In the case of a D.C. supply, if the pilot lamps light, but no signal is received, reverse the mains plug in its socket.

(2) Valves : (*a*) Check characteristics, or (*b*) Substitute known good valves.

(3) Locate trouble to a particular stage : (*a*) Check valve operating conditions, or (*b*) Test the A.F., detector and R.V. stages with an oscillator and check the alignment of the tuned circuits.

(4) Locate faulty component by testing with a suitable measuring instrument, or if necessary, by substitution.

(5) Check trimming with the help of an oscillator, if not attended to under 3 (*b*).

The charts are given in the order they will usually be required.

Voltage and current readings are given for A.C. and D.C. supplies. Higher or lower input voltages will give proportionately higher or lower voltage and current readings.

VALVE HEATER CIRCUIT

The four valve heaters, the tuning scale lights and the resistance R13 are all wired in series, and take a current of 0.2 amps.

It should be remembered that this circuit will be broken if either of the tuning scale lights should fail or be removed.

They should be replaced by bulbs of the 3.5 volt 0.3 amp. type.

OPERATING CONDITIONS OF THE VALVES

All readings are taken with volume control at maximum and no reaction. (All voltages are measured from chassis.)

Valve	Circuit	Input : 230 volts, D.C.	Input : 250 volts, A.C.
R.F. valve, Ever Ready C50N (V1).	Anode voltage	142 volts	175 volts
	Anode current	7.6 m.a.	9 m.a.
	Screen voltage	186 volts	222 volts
	Screen current	3 m.a.	3.4 m.a.
Det. valve Ever Ready C30B (V2).	Anode voltage	40 volts	48 volts
	Anode current	2.2 m.a.	2.5 m.a.
Output valve Ever Ready C70D (V3).	Anode voltage	157 volts	186 volts
	Anode current	36 m.a.	41 m.a.
	Aux. grid voltage	186 volts	222 volts
	Aux. grid current	8.6 m.a.	10 m.a.
Rectifier valve, Ever Ready C10B (V4).	—	—	—
Power consumption ..		60 watts	75 watts
Undistorted output ..		1.5 watts	2.5 watts

NOTE.—All voltages are measured with a 1,000 ohms per volt meter.

If a particular reading should vary considerably from the above table, a systematic check of the circuits associated with the particular valve should be made.

The following tables will facilitate the testing of the components concerned.

CIRCUIT ANALYSIS

Valve	Circuit	Associated Components
R.F. valve (V1).	Anode circuit	L5, L6, L7. C3, C4, C10. R5. S3, S4, S5.
	Screen circuit	R1, R2. C8.
	Grid circuit ..	L2, L3, L4. C1, C2, C7. S1, S2.
	Cathode circuit	R3, R4. C9.
Detector valve (V2).	Anode circuit	L8, L9, L10. R7, R8, R9. C11, C13, C14, C15, C16.
	Grid circuit ..	R6. C12.
Output valve (V3).	Anode and aux. grid circuit	T2. R12. C18, C19. Tone adjuster.
	Grid circuit ..	T1. R10.
	Cathode circuit	R11. C17.

SWITCH POSITIONS

Short Wave	Medium Wave	Long Wave
S1, S2, S4, S5, S6 closed S3 open	S1, S3, S4 closed S2, S5, S6 open	S3 closed S1, S2, S4, S5, S6 open

S7 closed when set is "on." Open when set is "off."

INDUCTANCES AND TRANSFORMERS

Circuit Indication	Specification		Location	Component Number
L1	Aerial coupling coil, 37.9 ohms ..	Aerial coil unit	Fig. 5	78,036
L2	Short wave grid coil			
L3	Medium wave grid coil 2.3 ohms ..			
L4	Long wave grid coil 13.7 ohms ..			
L5	Short wave anode coil	Anode coil unit	Fig. 5	78,037
L6	Medium wave anode coil, 3.5 ohms ..			
L7	Long wave anode coil, 14.1 ohms ..			
L8	Short wave reaction coil	3.3 ohms		
L9	Medium and long wave reaction coil			
L10	R.F. choke, 310 ohms ..		Fig. 6	79,010
L11	Speaker voice coil	1.8 ohms total	Fig. 7	85,009
L12	Speaker hum balancing coil ..			
L13	Speaker field coil, 600 ohms			
L14	Mains R.F. filter choke, 1 ohm		Fig. 6	79,004
L15	Mains R.F. filter choke, 1 ohm			
T1	Intervalve transformer : primary 770 ohms ; secondary, 1,900 ohms		Fig. 5	77,026
T2	Output transformer : primary, 750 ohms ; secondary, 0.36 ohms		Fig. 6	77,031

CONDENSERS

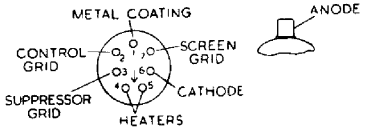
Circuit Indication	Specification		Location	Component Number
C1	Aerial tuning condenser	Two gang condenser	Fig. 5	80,014
C2	Aerial tuning condenser trimmer ..			
C3	Anode tuning condenser			
C4	Anode tuning condenser trimmer ..			
C5	.0002 mfd. Mica		Fig. 6	66,967
C6	.00001 mfd. Ceramic (Disc type)		Fig. 5	71,262
C7	S.W. aerial coil trimmer ..		Fig. 5	80,000

CONDENSERS (*continued*)

Circuit Indication	Specification	Location	Component Number
C8	0.1 mfd. tubular, 350 volts D.C. working	Fig. 6	68,020
C9	0.1 mfd. tubular, 350 volts D.C. working	Fig. 6	68,020
C10	0.1 mfd. tubular, 350 volts D.C. working	Fig. 6	68,020
C11	Reaction condenser	Fig. 6	80,040
C12	.00005 mfd. ceramic (hood type)	Fig. 5	71,250
C13	0.1 mfd. tubular 350 volts D.C. working	Fig. 6	68,020
C14	.0001 mfd. mica	Fig. 6	66,966
C15	.0003 mfd. mica	Fig. 6	66,037
C16	2 mfd. dry electrolytic 300 volts D.C. working	Fig. 6	67,009
C17	50 mfd. dry electrolytic 12 volts D.C. working	Fig. 6	67,005
C18	.01 mfd. tubular 450 volts D.C. working	Fig. 6	68,005
C19	.01 mfd. tubular 450 volts D.C. working	Fig. 6	68,005
C20	16 mfd. } Block type dry		
C21	8 mfd. } electrolytic 300 volts D.C. working	Fig. 6	67,001
C22	0.1 mfd. tubular 350 volts D.C. working	Fig. 6	68,020
C23	0.1 mfd. tubular 350 volts D.C. working	Fig. 6	68,020
C24	0.1 mfd. tubular 350 volts D.C. working	Fig. 6	68,020

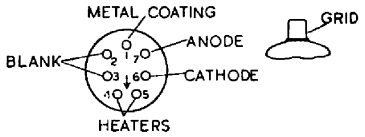
RESISTANCES

Circuit Indication	Resistance Value	Colour Code			Location	Component Number
		Body	Tip	Dot		
R1	31,000 ohms (2 watts) ..	Org.	Brn.	Org.	Fig. 6	71,980
R2	31,000 ohms (2 watts) ..	Org.	Brn.	Org.	Fig. 6	71,980
R3	200 ohms (½ watt) ..	Red	Blk.	Brn.	Fig. 6	71,943
R4	Volume control, 10,000 ohms ..	—	—	—	Fig. 5 and 6	81,010
R5	5,000 ohms (½ watt) ..	Grn.	Blk.	Red	Fig. 6	71,935
R6	510,000 ohms (½ watt) ..	Grn.	Brn.	Yel.	Fig. 5	71,944
R7	11,000 ohms (½ watt) ..	Brn.	Brn.	Org.	Fig. 6	71,963
R8	50,000 ohms (½ watt) ..	Grn.	Blk.	Org.	Fig. 6	71,971
R9	2,000 ohms (½ watt) ..	Red	Blk.	Red	Fig. 6	71,907
R10	26,000 ohms (½ watt) ..	Red	Blue	Org.	Fig. 6	71,974
R11	200 ohms (½ watt) ..	Red	Blk.	Brn.	Fig. 6	71,991
R12	11,000 ohms (½ watt) ..	Brn.	Brn.	Org.	Fig. 6	71,963
R13	Tapped Power Resistor (796 ohms)	—	—	—	Fig. 5	71,228



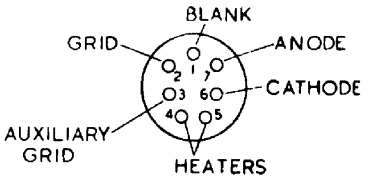
V1
TOP SIDE OF VALVE HOLDER
MAINS SCREENED R.F. PENTODE

Fig. 1



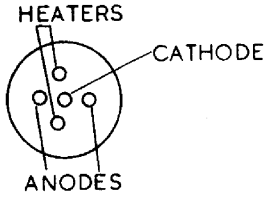
V2
TOP SIDE OF VALVE HOLDER
I.H. 7 PIN TRIODE DETECTOR

Fig. 2



V3
TOP SIDE OF VALVE HOLDER
I.H. PENTODE OUTPUT VALVE

Fig. 3



V4
TOP SIDE OF VALVE HOLDER
RECTIFIER VALVE

Fig. 4

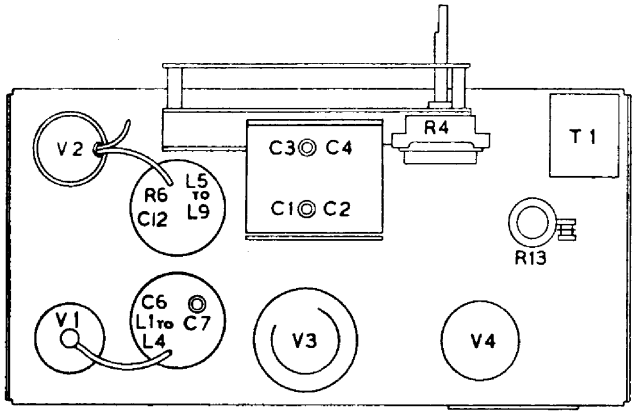


Fig. 5

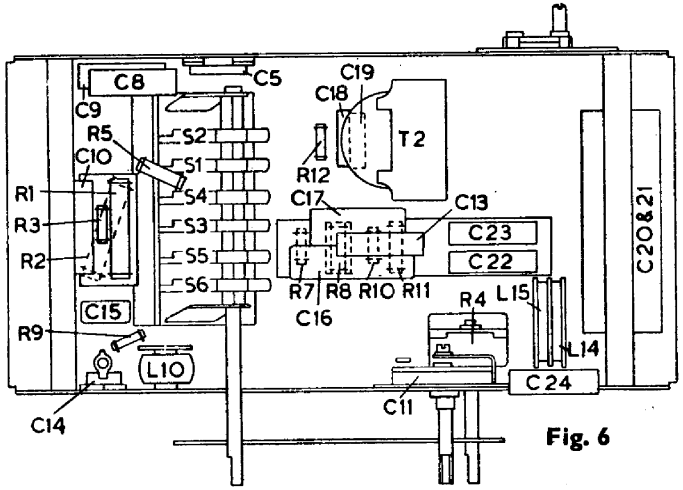
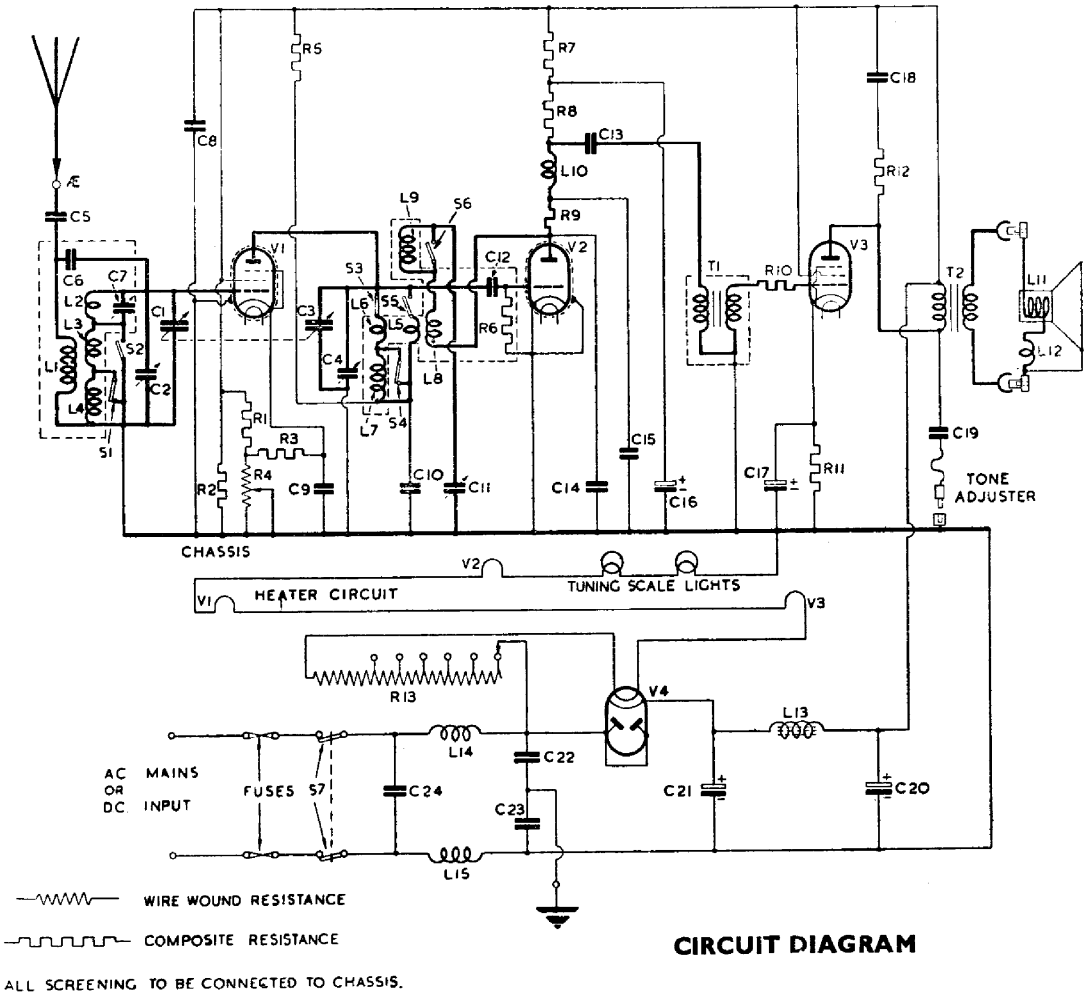


Fig. 6



CIRCUIT DIAGRAM

REMOVING THE CHASSIS FROM THE CABINET

The knobs must first be removed by a direct forward pull. Next the speaker plugs are pulled from their sockets and the field leads disconnected at the speaker end.

The on-off switch must be unscrewed from the cabinet, and the fixing cleat B (Fig. 7) loosened.

The four fixing bolts A (Fig. 7) accessible from the underside of the cabinet should now be removed, and the chassis withdrawn from the cabinet.

It should be noted that to get access to the underside of the cabinet, it is only necessary to remove the card base plate which is held in place by four wood screws.

REPLACING THE DIAL LIGHTS

To replace the dial lights, remove valves V1, V2 and V4 and undo the clamping nuts shown in Fig. 7.

The brackets holding the bulbs may now be withdrawn sufficiently to replace the bulbs. Replacements should be of the 3.5 volt, 0.3 amp. type.

ADJUSTING THE GANGED CONDENSER AND DIAL POINTER

Rotate the gang till the pointers are at the higher wavelength ends of the scales. Push a flat ended rod through the hole in the side of the gang cover and against the vanes. Now rock the vanes by means of the rotor drive until it is felt that the rotors are fully in mesh. If the pointers do not coincide with the horizontal line dividing the scale, release the centre fixing screw and adjust them to this position.

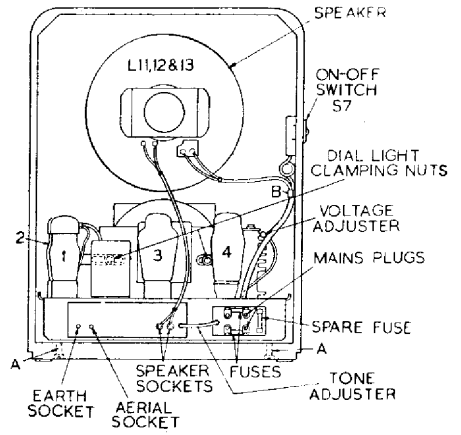


Fig 7.

ADJUSTING THE RADIO FREQUENCY CIRCUITS

Rotate the gang till the pointers are at the lower wavelength ends of the scales, and switch the receiver to the medium waveband. The volume control should be turned to " maximum " and the reaction control to minimum.

Apply a modulated signal of 202 metres to the aerial socket, and adjust the trimming condensers C2 and C4 in turn for maximum output.

Now switch the receiver to the short waveband and apply a modulated signal of 18.4 metres to the aerial socket. Next adjust the reaction condenser until the receiver is just below the point of oscillation, still leaving the volume control at maximum.

Now adjust the aerial coil trimmer C7 and the gang condenser simultaneously, for maximum output, and if necessary re-adjust the reaction condenser to keep the receiver just below the oscillation point.

NOTES

This space is reserved for recording any further information you may find useful. If advice is required at any time the Lissen Service Dept. will be pleased to help you.