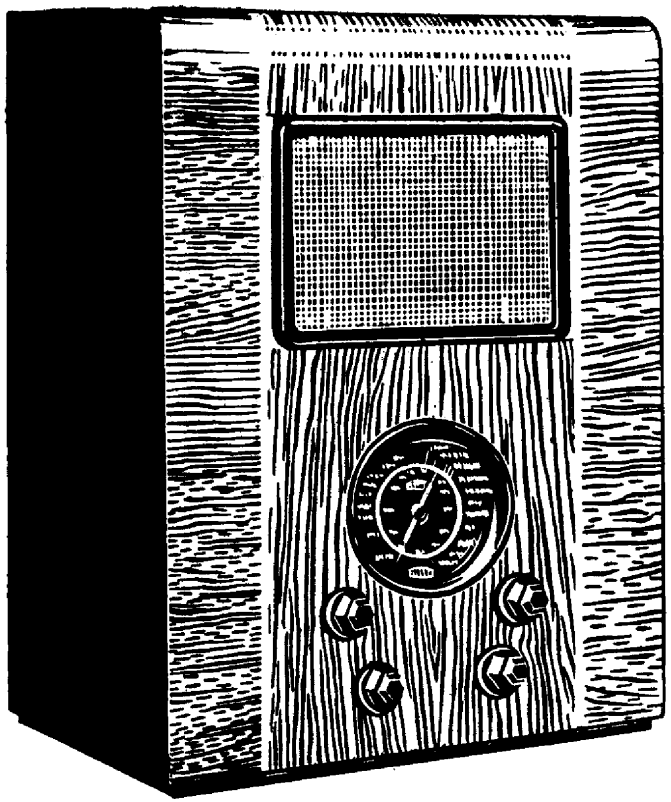
LISSEN

SERVICE MANUAL FOR BATTERY OPERATED RECEIVER
MODEL 8122



TECHNICAL SPECIFICATION

THE Lissen model 8122 is a battery operated receiver for use with an external aerial.

The aerial is coupled to the tuned grid circuit of the R.F. amplifying valve, a variable mu R.F. pentode (V1). A Droitwich filter is incorporated in the aerial circuit for use near the National Transmitter.

Volume is controlled by the potentiometer R1, which varies the bias on this valve.

The coupling to the detector valve, a triode (V2) is another tuned circuit. Reaction is obtained by the feed back from the coil L8 to the tuned grid circuit of the detector, and is controlled by the reaction condenser C5.

The detector is coupled to the output stage by a shunt fed A.F. transformer.

The output valve is an audio-frequency pentode (V3). A tone correcting network is employed and is so arranged that the high note response can be varied if desired. This valve is transformer coupled to the low impedance voice coil of the permanent magnet moving coil speaker.

SERVICE DATA FOR BATTERY RECEIVER MODEL 8122

GENERAL REMARKS

In the event of trouble check the following details :—

(1) Batteries : L.T. and H.T., and confirm that the leads are correctly connected.

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

(3) Locate trouble to a particular stage by : (*a*) Checking valve operating conditions, or (*b*) Stage by stage test with an oscillator, *i.e.*, output stage, detector stage and R.F. stage.

(4) Locate faulty component by testing with a suitable meter or by substitution, as the case may be.

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

Those readings given in column A and B are obtained with new (126 volts) and partially discharged (101 volts) H.T. batteries respectively.

The battery plugs should be placed in the sockets indicated below :-

Battery Leads	Battery Sockets
Red plug	126 volts
Blue plug	70 volts
Black plug	9 volts
Brown plug	— volts
Yellow plug	See notes below

POSITION OF YELLOW BATTERY PLUG

The anode current of a pentode is controlled by the auxiliary grid voltage, which is applied in this case through the yellow battery lead. The auxiliary grid voltage required for the correct anode current will vary with individual valves.

For this reason, the pentode valve is marked with a letter either A, B, C, or D, and this letter represents a certain H.T.+ tapping.

The letter A indicates 124½ volts.

,, ,, B ,, 117 ,,

,, ,, C ,, 108 ,,

,, ,, D ,, 99 ,,

The yellow battery lead should be connected into the appropriate socket, as indicated by the above table.

If at any time it is necessary to replace the output valve by one that is not lettered, the correct position for the yellow plug may be found as follows :—remove the first two valves from their sockets, and insert a milliammeter in the Red H.T. lead. Now switch on the set and adjust the position of the Yellow plug until the milliammeter measures as nearly as possible to 4.5 milliamps. A new H.T. battery of 126 volts should be used for this adjustment.

OPERATING CONDITIONS OF THE VALVES

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

Valve	Circuit	Column A. (New H.T.)	Column B. (Partially discharged H.T.)
R.F. valve, Ever Ready K50M (Metallized)	Anode voltage	113 volts	88 volts
	Anode current	1.1 m.a.	0.9 m.a.
	Screen voltage	72 volts	58 volts
	Screen current	0.2 m.a.	0.16 m.a.
Detector valve, Ever Ready K30C (Metallized)	Anode voltage	80 volts	50 volts
	Anode current	1.5 m.a.	1.2 m.a.
Output valve, Ever Ready K70B Clear	Anode voltage	110 volts	88 volts
	Anode current	4.7 m.a.	3.8 m.a.
	Aux. grid voltage	Same as Yellow battery plug	
	Aux. grid current	0.8 m.a. (approx.)	0.65 m.a. (approx.)
Total current consumption		8.3 m.a.	6.7 m.a.

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

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

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

CIRCUIT ANALYSIS

Valve	Circuit	Associated Components
R.F. valve (V1)	Anode circuit	L5. C8. Red H.T. lead and plug.
	Screen circuit	Blue H.T. lead and plug.
	Grid circuit	L3, L4. C1, C3, C7. R1, R2, R5, R6. S1, S3. Brown G.B. lead and plug.
Detector valve (V2)	Anode circuit	L8. C5, C10, C11. Primary T1. R4. Red H.T. lead and plug.
	Grid circuit	L6, L7. C2, C4, C9. R3. S2.
Output valve (V3)	Anode circuit	T2 primary. C12. R7. Tone adjuster plug and socket. Red H.T. lead and plug.
	Aux. grid circuit. ..	Yellow H.T. lead and plug.
	Grid circuit	T1 secondary. R1, R5, R6. S3. Brown G.B. lead and plug.

CONDENSERS

Circuit Indication	Specification	Location	Component Number
C1 ..	Aerial tuning condenser	Fig. 5	80,014
C2 ..	Grid tuning condenser		
C3 ..	Aerial trimmer condenser		
C4 ..	Grid trimmer condenser		
C5 ..	Reaction condenser	Fig. 6	80,013
C6 ..	.0003 mfd. mica	Fig. 6	66,968
C7 ..	0.1 mfd. tubular 350 volt D.C.	Fig. 6	68,020
C8 ..	.00005 mfd. mica .. .	Fig. 6	66,036
C9 ..	.00005 mfd. mica .. .	Fig. 6	66,036
C10 ..	.0002 mfd. mica	Fig. 6	66,038
C11 ..	0.1 mfd. tubular 350 volt D.C.	Fig. 6	68,020
C12 ..	.01 mfd. tubular 450 volt D.C.	Fig. 6	68,005

INDUCTANCES AND TRANSFORMERS

Circuit Indication	Specification	Location	Component Number
L1 ..	Droitwich filter coil, 20 ohms	Fig. 6	78,066
L2 ..	Aerial coupling coil, 38.5 ohms		
L3 ..	Aerial coil M.W., 2.5 ohms	Fig. 5	78,069
L3, L4	Aerial coil L.W., 12.3 ohms		
L5 ..	R.F. choke, 162 ohms	Fig. 6	79,008
L6 ..	Grid coil M.W., 2.9 ohms		
L6, L7	Grid coil L.W., 19.8 ohms	Fig. 5	78,068
L8 ..	Reaction coil, 9.0 ohms		
L9 ..	Speaker voice coil	Fig. 8	85,004
T1 ..	Intervalve transformer Primary 954 ohms.. Secondary 8,330 ohms	Fig. 6	77,027
T2 ..	Output transformer, primary, 894 ohms; secondary, 9.3 ohms ..	Fig. 6	77,079

RESISTANCES

Circuit Indication	Specification	Colour Code			Location	Component Number
		Body	Tip	Dot		
R1	Volume control ohms	—	—	—	Fig. 6	81,007
R2	110,000 ohms (½ watt) ..	Brn.	Brn.	Yel.	Fig. 6	71,962
R3	2.1 megohms (½ watt) ..	Red	Brn.	Grn.	Fig. 6	71,902
R4	30,000 ohms (½ watt) ..	Org.	Blk.	Org.	Fig. 6	71,949
R5	800 ohms .. (½ watt) ..	Gry.	Blk.	Brn.	Fig. 6	71,961
R6	1,400 ohms (½ watt) ..	Brn.	Yel.	Red	Fig. 6	71,970
R7	30,000 ohms (½ watt) ..	Org.	Blk.	Org.	Fig. 6	71,949

SWITCH POSITIONS

Circuit Indication	Medium Waves	Long Waves
S1	Closed	Open
S2	Closed	Open
S3	Closed when set is "on"	Open when set is "off"
S4 ..	ditto	ditto

REMOVING THE CHASSIS FROM THE CABINET

Disconnect the batteries and remove from the cabinet.

The knobs are removed by a direct forward pull. Next the speaker plugs are pulled from their sockets. The two fixing bolts "A" (Fig. 8) accessible from the underside of the cabinet should now be removed and the chassis withdrawn.

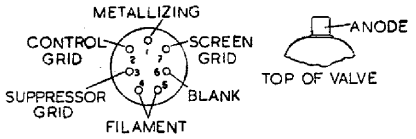
ADJUSTING THE GANGED CONDENSER AND DIAL POINTER

Rotate the gang till the pointers are at the higher wavelength end 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.

ADJUSTING THE RADIO FREQUENCY CIRCUITS

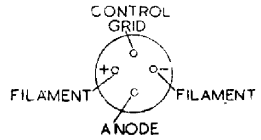
Rotate the gang till the pointers are at the lower wavelength ends of the scales and switch the receiver to the medium waveband. The volume control should be turned to maximum and the reaction control to minimum.

Apply a modulated signal of 200 metres (1,500 kilocycles) to the aerial socket and adjust the trimming condensers C3 and C4 for maximum output.



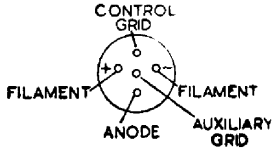
V1
TOP SIDE OF VALVE HOLDER
BATTERY R.F. PENTODE

Fig. 2



V2
TOP SIDE OF VALVE HOLDER
BATTERY TRIODE

Fig. 3



V3
TOP SIDE OF VALVE HOLDER
BATTERY OUTPUT PENTODE

Fig. 4

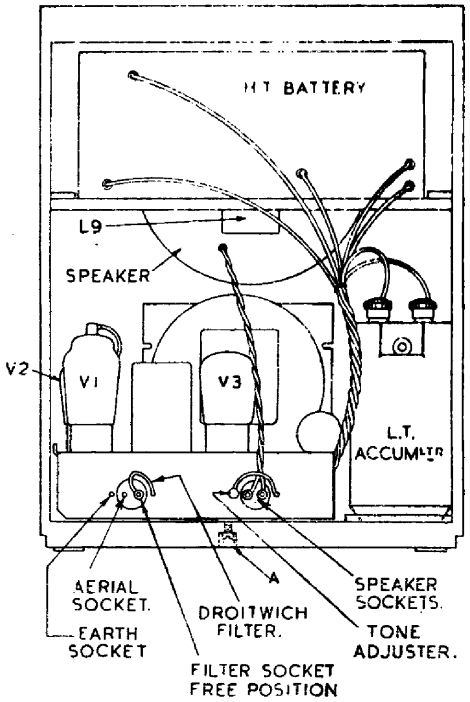


Fig. 8

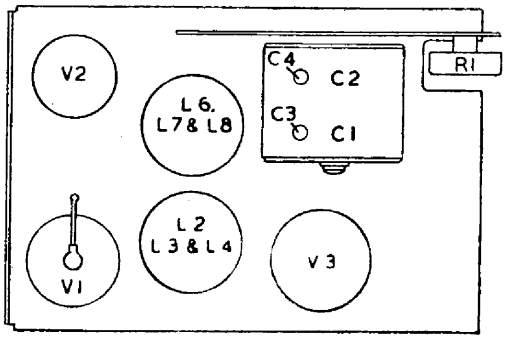


Fig. 5

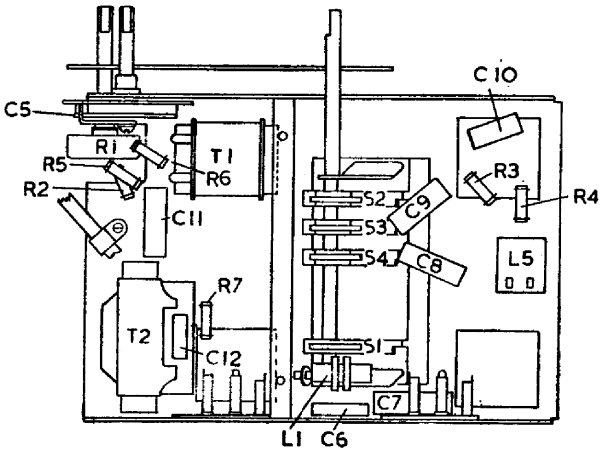
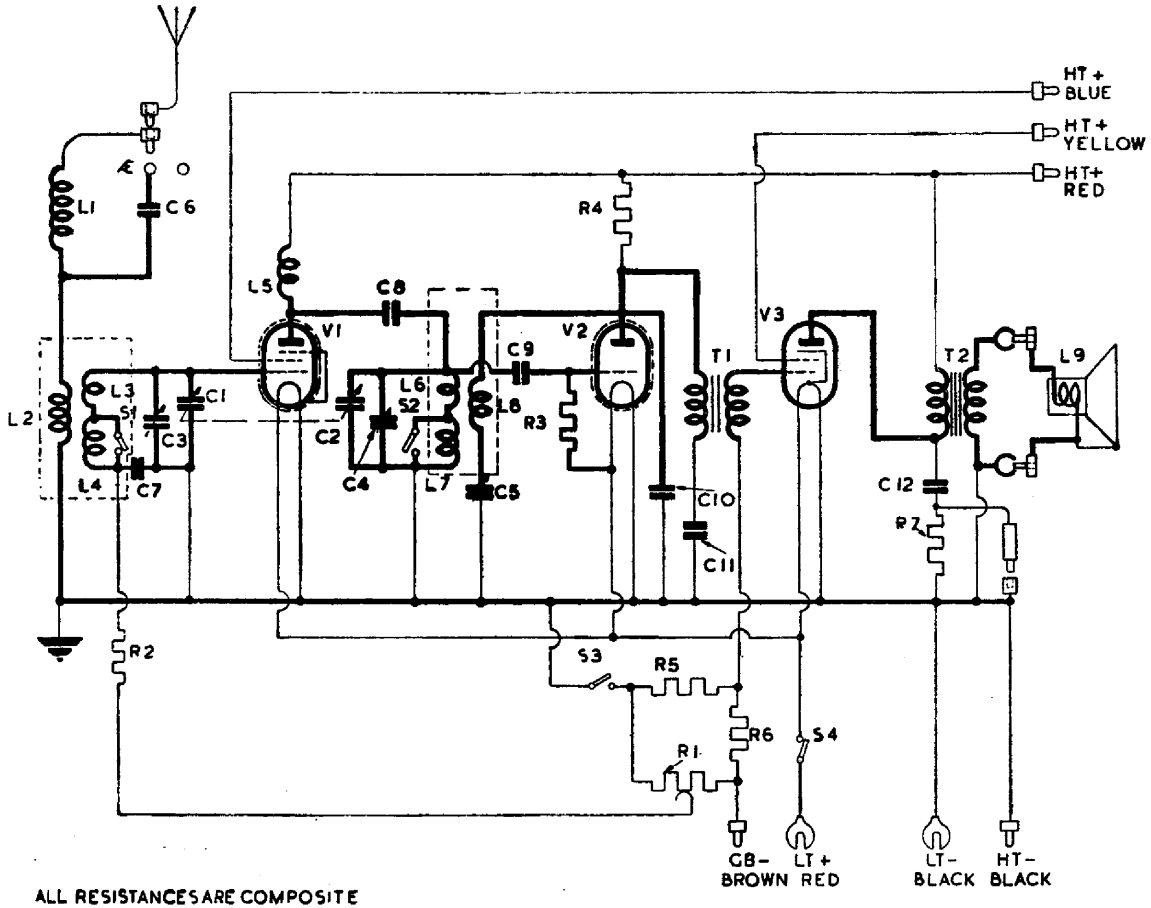


Fig. 6



ALL RESISTANCES ARE COMPOSITE
ALL SCREENING & VALVE METALIZING CONNECTED TO EARTH

CIRCUIT DIAGRAM