

LISSEN

SERVICE MANUAL FOR SUPERHETERODYNE RECEIVERS MODELS 8125, 8128 & 8129

TECHNICAL SPECIFICATION

A.C. mains operated superheterodyne receiver for use with an external elevated aerial.

The aerial is inductively and capacitatively coupled to the band pass filter, the two tuned stages of which are also inductively coupled.

The first valve (V1) is an octode, which functions as a true electron coupled frequency changer of high efficiency and is non radiating. The oscillator section is tuned by one section of the gang condenser with specially shaped vanes. The amplifier section of this valve has variable mu characteristics and is controlled by the A.V.C.

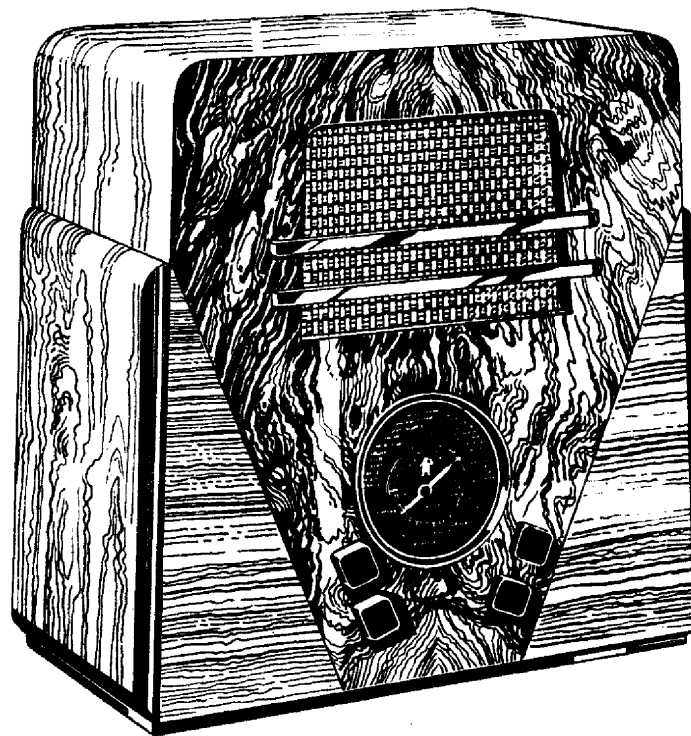


Fig. 1

The frequency changer stage is transformer coupled to the I.F. amplifier a variable-mu R.F. pentode valve, which is also A.V.C. controlled.

Another I.F. transformer couples this valve to a diode signal rectifier, which is incorporated in the duo-diode valve (V3).

The other diode provides fully delayed quiet automatic volume control.

The signal rectifier stage is resistance-capacity coupled to the output stage where a high magnification A.F. pentode (V4) is employed, which in turn is transformer coupled to the low impedance voice coil of the energised moving coil speaker.

SERVICE DATA FOR SUPERHETERODYNE RECEIVERS MODELS 8125, 8128 & 8129

GENERAL REMARKS

In the event of trouble, check the following details:—

- (1) Power supply; if the pilot lamp lights it is certain that the power supply is not at fault, otherwise check: (a) Pilot bulb; (b) Mains leads, plugs and sockets; (c) Mains switch; (d) Receiver correctly adjusted for power supply.
- (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) Stage by stage test with oscillators A.F., I.F., and R.F. stages, including the alignment of the tuned circuits.
- (4) Locate faulty component by testing with voltmeter, ammeter, ohmmeter, etc., or by substitution, as the case may be.
- (5) Check trimming with the help of oscillator if not attended to under 3 (b).

The charts are given in the order they will usually be required. Measurements made should be within + or - 10 per cent of the readings given, providing the mains input voltage stated below is applied to the particular tap on the mains transformer.

Input 227 volts to the 200—215 volts tap
 " 225 " " 216 235 " "
 " 243 " " 236 250 " "

It follows that a lower or higher mains input voltage will give readings in proportion.

OPERATING CONDITIONS OF THE VALVES

Note.—All readings are with sensitivity control at minimum, and with no signal being received. Voltages are measured from the chassis.

Valve	Circuit	Operating Conditions
F.C. and Osc. valve (V1) Ever Ready A80A (Metalized)	Anode voltage	265 volts
	Anode current	1.6 m.a.
	Screen voltage	76 volts
	Screen current	2.5 m.a.
I.F. valve (V2) Ever Ready A50N (Metalized)	Anode voltage	265 volts
	Anode current	5.2 m.a.
Duo-Diode valve (V3) Ever Ready A20B (Metalized)	Anode voltage	265 volts
	Anode current	5.2 m.a.
Output valve (V4) Ever Ready A70D (Clear)	Anode voltage	245 volts
	Anode current	26 m.a.
	Aux. Grid voltage	267 volts
	Aux. grid current	3.0 m.a.
Rectifier valve (V5) Ever Ready A11D (Clear)	Anode voltage	245 volts
	Anode current	26 m.a.

POWER SUPPLY CIRCUIT	
Mains Transformer	Output
V1, V2, V3, V4 heater winding	4 volts R.M.S.
V5 heater winding	4 volts R.M.S.
Dial lamp winding	2 volts R.M.S.
H.T. winding	700 volts R.M.S.
Rectifier	Output
Unsmoothed	430 volts
Smoothed	280 volts

CONDENSERS			
Circuit Indication	Specification	Location	Component Number
C1	Primary circuit band pass tuning condenser	Fig. 7	80,002
C2	Secondary circuit band pass tuning condenser	Fig. 7	80,002
C3	Oscillator circuit tuning condenser	Fig. 7	80,002
C4	Medium wave trimmer for primary circuit of band pass	Fig. 7	80,002
C6	Medium wave trimmer for secondary circuit of band pass	Fig. 7	80,002
C6	Oscillator circuit, medium wave trimmer	Fig. 7	80,002
C7	Oscillator circuit, long wave trimmer	Fig. 7	78,001
C8	I.F. transformer T1 primary tuning condenser	Fig. 7	77,008
C9	I.F. transformer T1 secondary tuning condenser	Fig. 7	77,008
C10	I.F. transformer T2 primary tuning condenser	Fig. 7	77,020
C11	I.F. transformer T2 secondary tuning condenser	Fig. 7	77,020
C12	Tone control	Fig. 8	80,003
C13	.000015 mfd. mica (350 volts D.C. working)	Fig. 8	66,750
C14	0.25 mfd. tubular (350 volts D.C. working)	Fig. 8	66,012
C15	2 mfd. electrolytic (300 volts D.C. working)	Fig. 8	67,009
C16	0.1 mfd. tubular (350 volts D.C. working)	Fig. 8	66,020
C17	0.001 mfd. mica (350 volts D.C. working)	Fig. 8	66,970
C18	0.1 mfd. tubular (350 volts D.C. working)	Fig. 8	66,020
C19	0.1 mfd. tubular (350 volts D.C. working)	Fig. 8	66,020
C20	0.1 mfd. tubular (350 volts D.C. working)	Fig. 8	66,020
C21	0.1 mfd. tubular (350 volts D.C. working)	Fig. 8	66,020
C22	0.1 mfd. tubular (350 volts D.C. working)	Fig. 8	66,020
C23	.0001 mfd. mica (350 volts D.C. working)	Fig. 8	66,966
C24	.0001 mfd. mica (350 volts D.C. working)	Fig. 7	66,966
C25	0.05 mfd. tubular (350 volts D.C. working)	Fig. 8	66,014
C26	.0001 mfd. mica (350 volts D.C. working)	Fig. 8	66,966
C27, C28	8 mfd. + 16 mfd. electrolytic (450 volts D.C. working)	Fig. 8	67,002
C29	20 mfd. electrolytic (30 volts D.C. working)	Fig. 8	67,008
C30	0.01 mfd. tubular (450 volts D.C. working)	Fig. 8	66,005
C31	.000005 mfd. Lemco	Fig. 7	66,000

WIRING COLOUR CODE		
Valve	Grid Circuit	Anode Circuit
F.C. and Osc. valve (V1)	Frequency changer, Screened lead	Osc.: Brown, yellow tracer F.C.: Blue, yellow tracer
I.F. valve (V2)	Green	Screened lead
Duo diode valve (V3)	—	Screened leads
Output valve (V4)	—	Brown, yellow tracer
Rectifier valve (V5)	Cathode: Red	Anode: Yellow
H.T. and screen wiring	Red.	
A.V.C. circuit	Black with Red tracer.	

SWITCH POSITIONS			
Circuit Indication	Medium Waves	Long Waves	Gramophone
S1	Closed	Open	Closed
S2	Closed	Open	Closed
S3	Open	Open	Closed
S4	Closed	Closed	Open
S5	Open	Open	Closed
S6	Open	Closed	Open
S7	Open	Open	Closed
S8	Closed	Open	Closed
S9	Mains on-off switch		
S10	Open	Open	Closed

INDUCTANCES AND TRANSFORMERS			
Circuit Indication	Specification	Location	Component Number
L1	Aerial circuit coupling coil, 24 ohms	Fig. 7	78,000
L2	Medium wave primary band pass coil, 2.3 ohms	"	"
L2, L3	Long wave primary band pass coil, 17.3 ohms	"	"
L4	Medium wave secondary band pass coil, 2.3 ohms	"	"
L4, L5	Long wave secondary band pass coil, 17.3 ohms	"	"
L6	Oscillator grid coil, medium waves, 1.74 ohms	"	78,001
L6, L7	Oscillator grid coil, long waves, 3.26 ohms	"	"
L8	Oscillator anode coil, 45 ohms	"	"
L9	Speaker speech coil, 1.5 ohms	Fig. 9	85,000
L10	Speaker energising coil, 3,000 ohms	"	"
L11	Speaker hum balancing coil, 0.9 ohms	"	"
T1	1st I.F. transformer, primary 93 ohms; secondary, 93 ohms	Fig. 7	77,003
T2	2nd I.F. transformer, primary, 42 ohms; secondary, 42 ohms	Fig. 7	77,020
T3	Output transformer, primary, 700 ohms; secondary, 0.32 ohms	Fig. 8	77,515
T4	Mains transformer, primary, 37 + 3 + 8 ohms H.T. secondary 160 + 180 ohms	Fig. 7	77,001
	V1, V2, V3, V4 heater winding, 0.07 ohms	"	"
	V5 heater winding, 0.13 ohms	"	"
	Winding for dial lights, 0.35 ohms	"	"

CIRCUIT ANALYSIS		
Valve	Circuit	Associated Components
F.C. and Osc. valve (V1)	Anode circuit Screen circuit Control grid circuit	T.1. primary, C8, C19, R5, R6, C15. Screened cable, L4, L5, C2, C5, C14, S3, R13 and A.V.C. circuit. L8, C18, R7, S5, S6.
	Oscillator anode circuit Oscillator grid circuit	Screened cable, L6, L7, C3, C6, C7, C17, R3, R4, S4, S7, S8. R1, R2, R23, C16, S10.
I.F. valve (V2)	Anode circuit Screen circuit Grid circuit Cathode circuit	Screened cable, T2 primary, C10, C23. R8, C20. T1. Secondary, C9, C21, R10 and A.V.C. circuit. R9, C22.
Duo-diode (V3)	Demodulator diode circuit A.V.C. diode circuit	Screened cable, T2 secondary, R15, R16, R19, C11, C24, C25, C26, C12. Screened cable, C23, C29, R11, R12, R19, R20, R22.
Pentode output valve (V4)	Anode and aux. grid circuit Grid circuit Cathode circuit	T3 primary, R21, C30. R17, R18, C25. R19, R20, R22, C29.

RESISTANCES					
Circuit Indication	Specification	Code Word			Component Number
		Body	Tip	Dot	
R1	150 ohms (1/2 watt)	Brown	Green	Brown	Fig. 8 71,969
R2	Sensitivity control				Fig. 8 82,000
R3	2,000 ohms				Fig. 8 71,914
R4	1,000 ohms (1/2 watt)	Brown	Black	Red	Fig. 8 71,968
R5	51,000 ohms (1/2 watt)	Green	Brown	Orange	Fig. 8 71,955
R6	40,000 ohms (1 watt)	Yellow	Black	Orange	Fig. 8 71,940
R7	40,000 ohms (1 watt)	Yellow	Black	Orange	Fig. 8 71,913
R8	100,000 ohms (1/2 watt)	Brown	Black	Yellow	Fig. 8 71,939
R9	80,000 ohms (1/2 watt)	Grey	Black	Orange	Fig. 8 71,943
R10	200 ohms (1/2 watt)	Red	Black	Brown	Fig. 8 71,944
R11	510,000 ohms (1/2 watt)	Green	Brown	Yellow	Fig. 8 71,944
R12	510,000 ohms (1/2 watt)	Green	Brown	Yellow	Fig. 8 71,944
R13	510,000 ohms (1/2 watt)	Green	Brown	Yellow	Fig. 8 71,944
R14	100,000 ohms (1/2 watt)	Brown	Black	Yellow	Fig. 8 71,910
R15	100,000 ohms (1/2 watt)	Brown	Black	Yellow	Fig. 7 71,910
R16	260,000 ohms (1/2 watt)	Red	Blue	Yellow	Fig. 8 71,945
R17	Volume control 500,000 ohms				Fig. 7 81,001
R18	25,000 ohms (1/2 watt)	Red	Green	Orange	Fig. 8 71,908
R19	50 ohms (1/2 watt)	Green	Black	Black	Fig. 8 71,959
R20	500 ohms (1 watt)	Green	Black	Brown	Fig. 8 71,941
R21	10,000 ohms (1/2 watt)	Brown	Black	Orange	Fig. 8 71,923
R22	100 ohms (1/2 watt)	Brown	Black	Brown	Fig. 8 71,957
R23	800 ohms (1/2 watt)	Orange	Black	Brown	Fig. 8 71,942

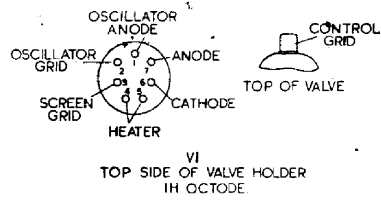


Fig. 2

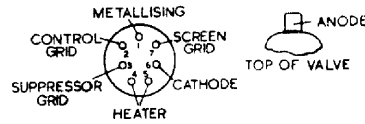


Fig. 3

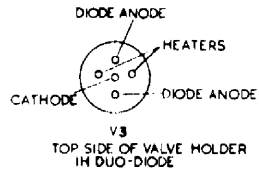


Fig. 4

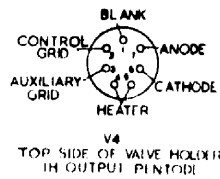


Fig. 5

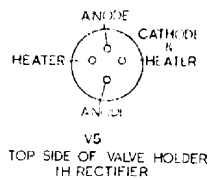


Fig. 6

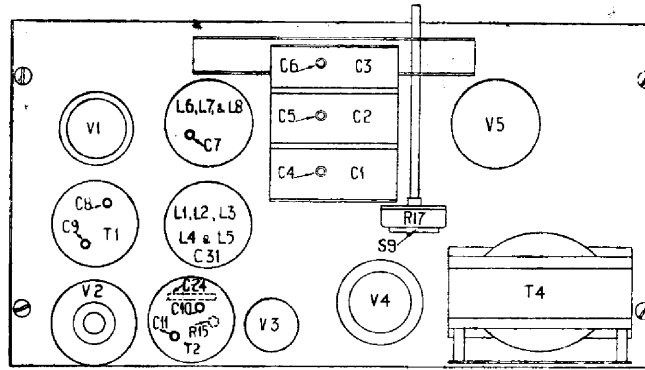


Fig. 7

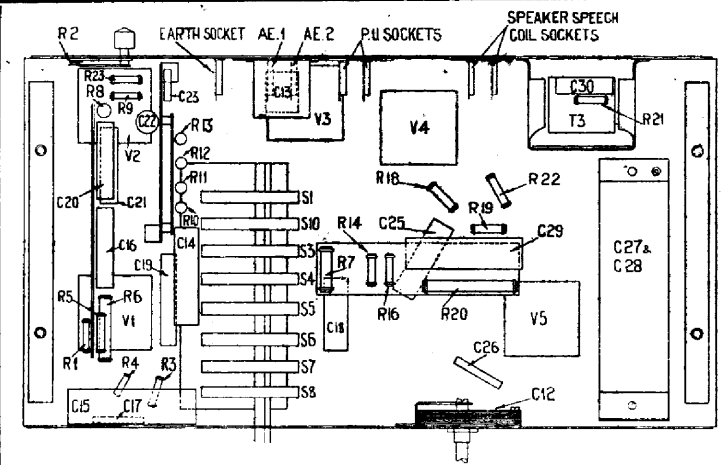
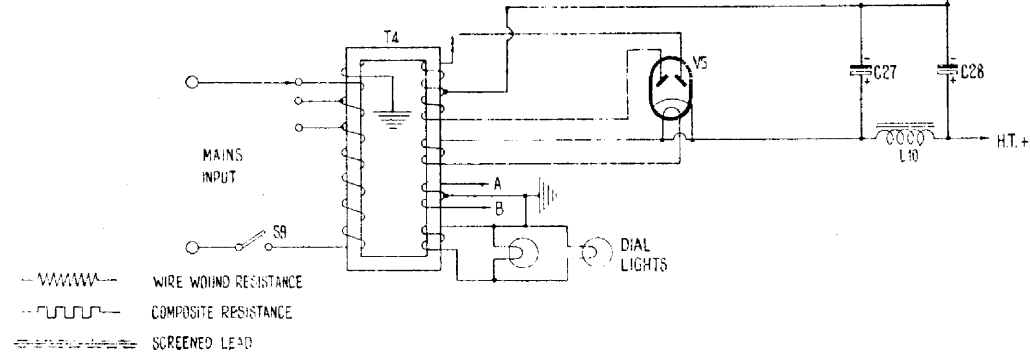
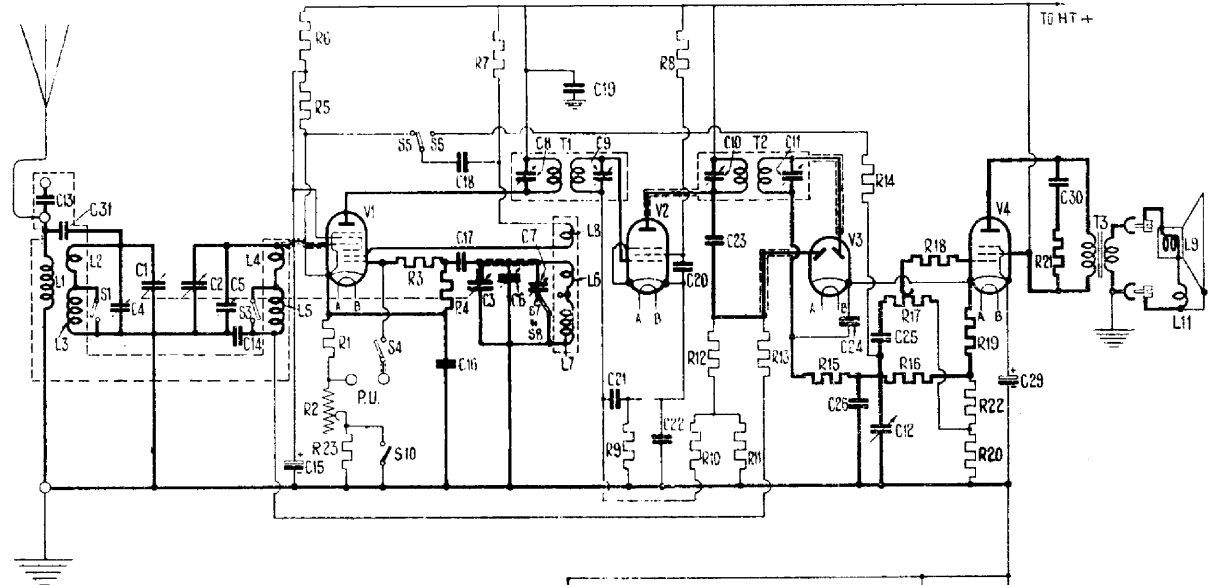


Fig. 8



CIRCUIT DIAGRAM

REMOVING THE CHASSIS FROM THE CABINET

The knobs must first be removed, by a direct forward pull.

Next the four fixing bolts at the underside of the cabinet should be removed.

The speaker plugs are pulled from their sockets and the field leads disconnected at the speaker end by removing two screws and the chassis withdrawn from the cabinet.

The loudspeaker may also be removed by taking out its four fixing bolts.

It should be noted that to get access to the underside of the chassis, it is only necessary to remove the cabinet bottom board; the chassis need not be removed from the cabinet.

ADJUSTING THE TUNED CIRCUITS

Tuned Circuits

- (a) Tuned primary and secondary of I.F. transformers T1 and T2.
- (b) Tuned oscillator circuit.
- (c) Band pass input, two tuned circuits.

I.F. circuits (127 kcs., 2,306.6 metres)

The I.F. transformers should be adjusted before the band pass or oscillator circuits.

A modulated signal of 127 kcs., is applied between the frequency changer control grid and the chassis. A 2 mfd. condenser is connected between the oscillator plate and the chassis.

An output meter is connected across the primary of the output transformer.

When adjusting the primary trimmer of either transformer a 50,000 ohm resistance is connected across the secondary, and when adjusting the secondary it is connected across the primary.

Adjust the trimmers in this order for a maximum reading on the output meter.

- (a) T2 secondary trimmer C11 (Resistance across primary).
- (b) T2 primary trimmer C10 (resistance across secondary).
- (c) T1 secondary trimmer C9 (resistance across primary).
- (d) T1 primary trimmer C8 (resistance across secondary).

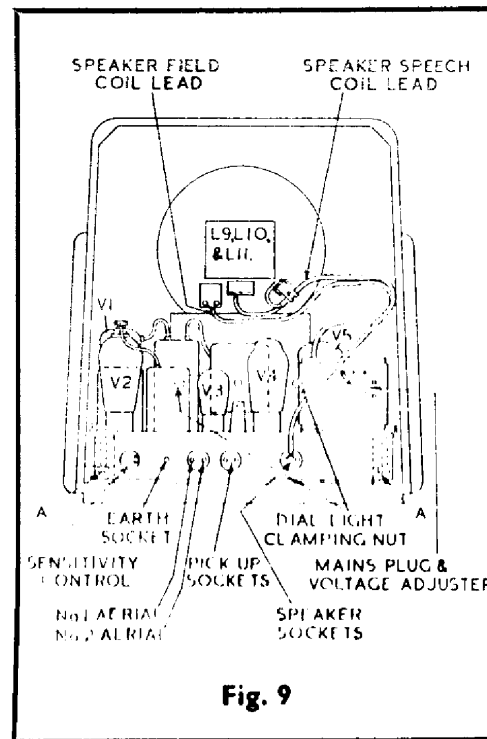


Fig. 9

Band Pass Input and Oscillator Circuits

Rotate the condenser drive so that the gang is at the stop at the minimum capacity position.

If the pointer does not coincide with the two index marks at the top and bottom of the scale, release the centre fixing screw and move the pointer into this position.

Apply a modulated signal of 196 metres to the aerial terminal, switch the receiver to medium waves, the gang being rotated as above.

Adjust the trimmers for a maximum reading on the output meter, in the following order:

- (a) C6.
- (b) C5.
- (c) C4.

Switch the receiver to the long waveband, rotate the condenser drive so that the pointer registers 1,200 metres. Apply a signal of this wavelength and then adjust trimmer C7 for maximum output.

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.