

LISSEN

SERVICE MANUAL FOR FOUR VALVE THREE BAND SUPERHET MAINS RECEIVER MODEL 8647

This Manual also applies to Receiver 8547/A

CIRCUIT ALIGNMENT PROCEDURE FOR RECEIVER TYPE 8647.

Intermediate Frequency Circuit Alignment.

(1) Short circuit the gang condenser across the oscillator section (rear section).

(2) Adjust the wave switch to the M.W. position.

(3) Apply a signal of 452 Kc/s. modulated 30% at 400 c.p.s. between signal grid and chassis of the frequency changer valve V1, by connection, via a condenser of 0.1uF. capacity to the middle section of the gang condenser (C8). Trim each I.F. circuit in the following order:—

2nd I.F.T. secondary (C26) 2nd I.F.T. primary (C25),

1st I.F.T. secondary (C24) 1st I.F.T. primary (C23).

The circuits should be trimmed to a single peak.

(4) Check each circuit by going over the trimmers in the same order again.

(5) Remove the short circuit from the gang condenser.

NOTE:—As the circuits are brought into line the level of the 452 Kc/s. signal should be reduced to prevent the A.V.C. from coming into action and giving misleading results.

Radio Frequency Circuit Alignment.

The three wavebands long, medium and short waves are quite independent of each other and any adjustment to the trimmers or padders of any one band affects only that particular band.

Long Wave Band Alignment.

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

(2) Set the long wave padder (C21) approximately two-thirds in.

(3) Set the pointer against the 1,000 metre mark on the scale.

(4) Apply a modulated signal of 1,000 metres to the A. and E. sockets of the receiver.

(5) Adjust the L.W. oscillator trimmer (C18) to receive this signal and then the L.W. band pass trimmers (C6, C3) to give maximum output.

(6) Set the pointer to the 1,700 metre mark on the scale.

(7) Apply a signal of 1,700 metres and adjust the L.W. padder (C21) to give maximum output on that signal.

(8) Reset the pointer to the 1,000 metre mark on the scale and re-adjust the L.W. oscillator and band pass trimmers (C18, C6, C3) to give maximum output on the 1000 metre signal.

(9) Check again at 1,700 metres and see that the pointer is at the 1,700 metre mark when receiving the 1,700 metre signal. If it is not, make a slight adjustment to the L.W. padder (C21).

Medium Waveband Alignment.

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

(2) Set the medium wave padder (C19) approximately three-quarters in.

(3) Set the pointer against the 214m. mark on the scale.

(4) Apply a signal of 214 metres to the A. and E. sockets of the receiver.

(5) Adjust the M.W. oscillator trimmer (C17) to receive this signal and then the M.W. band pass trimmers (C5, C2) to give maximum output.

(6) Set the pointer to the 500 metre mark on the scale.

(7) Apply a signal of 500 metres and adjust the M.W. padder (C19) to give maximum output on that signal.

(8) Reset the pointer to the 214 metre mark on the scale and re-adjust the M.W. oscillator and band-pass trimmers (C17, C5, C2) to give maximum output on the 214 metre signal.

(9) Check again at 500 metres and see that the pointer is at the 500 metres mark when receiving the 500 metre signal. If it is not, make a slight adjustment to the M.W. padder (C19).

Short Wave Band Alignment.

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

(2) Set the pointer against the 15 Mc/s. mark on the scale.

(3) Apply a signal of 15 Mc/s. to the A. and E. sockets of the receiver.

(4) Unscrew fully the S.W. oscillator trimmer (C16). Slowly screw in the S.W. oscillator trimmer until this signal is heard. Care should be taken that the right peak is selected. Two peaks will be found on this trimmer, the correct one having the trimmer at the lower capacity, which is the first one heard when screwing in the trimmer. Having selected the correct peak adjust the S.W. aerial trimmer (C4) to give maximum output.

(5) Apply a signal of 6 Mc/s. and tune the receiver to this signal. Adjust the top turn of the S.W. oscillator coil (L9) and the gang simultaneously to give maximum output on this signal.

(6) Reset the pointer to the 15 Mc/s. mark and re-adjust the S.W. oscillator and aerial trimmers (C16, C4) to give maximum output on that signal.

SERVICE DATA FOR MODEL 8647.

This Manual also applies to Receiver 8547/A.

CONDENSERS

Code	Description	Part No.	Part of	Values
C1	M.W. Aerial Coupling ..	71,261	77,550	5 mmfd. Cera.
C2	M.W. Bandpass Primary Trimmer ..	80,000	77,550	100 mmfd. Max.
C3	L.W. Bandpass Primary Trimmer ..	80,000	77,551	100 mmfd. Max.
C4	S.W. Signal Circuit Trimmer ..	82,503	77,552	20 mmfd. Max.
C5	M.W. Bandpass Secondary Trimmer ..	80,000	77,550	100 mmfd. Max.
C6	L.W. Bandpass Secondary Trimmer ..	80,000	77,551	100 mmfd. Max.
C7	} Triple Gang ..	80,515		
C8				
C9				
C10	R.F. Coupling ..	66,516 or 66,521		500 mmfd. Mica
C11	A.V.C. Decoupling ..	68,014		.05 mfd. 1,000v. Test
C12	V1 Screen Bypass ..	68,020		.1 mfd. 1,000v. Test
C13	V1 Cathode Bypass ..	68,020		.1 mfd. 1,000v. Test
C14	Oscillator Grid Coupling ..	66,513		100 mmfd. Mica
C15	Oscillator Anode Coupling ..	66,515		300 mmfd. Mica
C16	S.W. Oscillator Circuit Trimmer ..	82,503	77,554	20 mmfd. Max.
C17	M.W. Oscillator Circuit Trimmer ..	80,000	77,553	100 mmfd. Max.
C18	L.W. Oscillator Circuit Trimmer ..	80,000	77,553	100 mmfd. Max.
C19	M.W. Padder Variable ..	80,514		300 mmfd. Max.
C20	M.W. Padder Fixed ..	66,515		300 mmfd. Mica
C21	L.W. Padder Variable ..	80,511		300 mmfd. Max.
C22	S.W. Padder Fixed ..	66,536		.0057 mfd.
C23	} I.F. Trimmers	82,506	77,537	100 mmfd. Max.
C24				
C25				
C26				
C27	V2 Anode Decoupling ..	68,020		.1 mfd. 1,000v. Test
C28	A.V.C. Coupling ..	71,262		10 mmfd. Cera.
C29	A.V.C. Decoupling ..	68,020		.1 mfd. 1,000v. Test
C30	V2 Cathode Bypass ..	68,020		.1 mfd. 1,000v. Test
C31	V2 Screen Bypass ..	68,020		.1 mfd. 1,000v. Test
C32	Signal Diode Load Bypass ..	66,512	73,786	50 mmfd. Mica
C33	I.F. Filter ..	66,512	73,786	50 mmfd. Mica
C34	L.F. Coupling ..	68,014		.05 mfd. 1,000v. Test
C35	V3 Cathode Bypass ..	67,006		25 mfd. 25v. Peak Elec.
C36	V3 Cathode H.F. Bypass ..	66,515		300 mmfd. Mica
C37	Tone Correction ..	68,502		.005 mfd. 3,000v. Test
C38	Tone Control ..	68,505		.04 mfd. 3,000v. Test
C39	H.F. Bypass ..	68,502		.005 mfd. 3,000v. Test
C40	H.T. Smoothing	67,514		24 mfd. 350v. Working
C41	V4 Reservoir			
C42	H.F. Bypass ..	68,503		.01 mfd. 3,000v. Test
C43	H.F. Bypass ..	68,502		.005 mfd. 3,000v. Test

SWITCHES

Code	Description	Part No.	Part of	Values
S1	Aerial Circuit Primary Selector	83,526		4-Position G.S.M.L.
S2	Bandpass Primary Selector ..			
S3	Bandpass Secondary Selector ..			
S4	Oscillator Grid Circuit Selector ..			
S5	Oscillator Anode Circuit Selector ..			
S6	Radio Cut-out ..			
S7	Pick-up Connector ..			
S8	Mains On/Off ganged to Volume Control ..			

VALVES

Code	Description	Part No.	Part of	Values
V1	Frequency Changer ..	4,120		Ever Ready ECH3
V2	I.F. Amplifier ..	4,121		EF9
V3	2nd Det., A.V.C., Rect. and Output ..	4,123		EBL1
V4	Rectifier ..	4,125		AZ1

RESISTANCES

Code	Description	Part No.	Part of	Values
R1	V1 Grid Leak ..	71,900		1.1 Megohm, $\frac{1}{2}$ watt
R2	V1 Screen Potentiometer Part ..	89,517	73,786	25,000 ohms, $\frac{1}{2}$ watt
R3	V1 Screen Potentiometer Part ..	71,999	73,786	30,000 ohms, $\frac{1}{2}$ watt
R4	V1 Bias ..	71,943		200 ohms, $\frac{1}{2}$ watt
R5	Oscillator Anode Feed ..	71,999	73,786	30,000 ohms, $\frac{1}{2}$ watt
R6	Oscillator Grid Leak ..	71,968		51,000 ohms, $\frac{1}{2}$ watt
R7	S.W. Heterodyne Volts Control ..	71,969		150 ohms, $\frac{1}{2}$ watt
R8	M.W. Heterodyne Volts Control ..	71,906	77,553	1,500 ohms, $\frac{1}{2}$ watt
R9	L.W. Heterodyne Volts Control ..	71,988	77,553	5,100 ohms, $\frac{1}{2}$ watt
R10	A.V.C. Decoupling ..	71,945	73,786	260,000 ohms, $\frac{1}{2}$ watt
R11	A.V.C. Decoupling ..	71,945	73,786	260,000 ohms, $\frac{1}{2}$ watt
R12	V2 Anode Decoupling ..	71,982	73,786	2,100 ohms, $\frac{1}{2}$ watt
R13	V2 Screen Feed ..	71,939	73,786	80,000 ohms, $\frac{1}{2}$ watt
R14	V2 Bias ..	71,960		250 ohms, $\frac{1}{2}$ watt
R15	Signal Diode Load ..	71,944	73,786	510,000 ohms, $\frac{1}{2}$ watt
R16	I.F. Filter ..	71,962	73,786	110,000 ohms, $\frac{1}{2}$ watt
R17	Volume Control ..	81,502		500,000 ohms, Varia.
R18	V3 Bias and A.V.C. Delay Part ..	71,969	73,786	150 ohms, $\frac{1}{2}$ watt
R19	A.V.C. Delay Part ..	71,957	73,786	100 ohms, $\frac{1}{2}$ watt
R20	A.V.C. Diode Load ..	71,900	73,786	1.1 Megohm, $\frac{1}{2}$ watt
R21	Tone Control ..	81,500		50,000 ohms, Varia.
R22	V4 Anode ..	89,524		75 ohms, $\frac{1}{2}$ watt
R23	V4 Anode ..	89,524		75 ohms, $\frac{1}{2}$ watt

INDUCTANCES

Code	Description	Part No.	Part of	Values
L1	M.W. Aerial Primary Coil ..	77,550		
L2	L.W. Aerial Primary Coil ..	77,551		
L3	M.W. Bandpass Primary Coil ..	77,550		
L4	L.W. Bandpass Primary Coil ..	77,551		
L5	S.W. Aerial Primary Coil ..	77,552		
L6	S.W. Signal Grid Coil ..			
L7	M.W. Bandpass Secondary Coil ..	77,550		
L8	L.W. Bandpass Secondary Coil ..	77,551		
L9	S.W. Oscillator Grid Coil ..	77,554		
L10	M.W. Oscillator Grid Coil ..	77,553		
L11	L.W. Oscillator Grid Coil ..	77,553		
L12	S.W. Tickler Coil ..	77,554		
L13	M.W. Tickler Coil ..	77,553		
L14	L.W. Tickler Coil ..	77,553		
L15	1st I.F.T. Primary Coil ..	77,537		
L16	1st I.F.T. Secondary Coil ..			
L17	2nd I.F.T. Primary Coil ..	77,538		
L18	2nd I.F.T. Secondary Coil ..			
L19	} Output Transformer on Speaker 7,000 ohms. load			85,524
L20				
L21	Smoothing Choke ..	79,502		
L22	} Mains Transformer ..	77,544		
L23				
L24				
L25				

Voltage and Current Measurements for Receiver, Type 8647.

Measurements made with a Model 7 Avometer on the 1,000-volt range for voltages above 10 volts, and on the 10-volt range for voltages below 10 volts. Measurements made with the receiver tuned to 1,000 Kc/s, volume and tone controls at maximum but no signal applied.

Frequency Changer ECH3	Ea Es Eoa Ec	242 v. 92 v. 102 v. 1.9 v.	Ia Is Ioa Ic	2.6 mA. 2.9 mA. 4.2 mA. 9.7 mA.
I.F. Amplifier EF9	Ea Es Ec	227 v. 92 v. 2.0 v.	Ia Is Ic	6.1 mA. 1.8 mA. 7.9 mA.
2nd Detector, A.V.C. Rect and Output Pentode EBL1 ..	Ea Es Ec Ebias	220 v. 242 v. 9.2 v. 5.6 v.	Ia Is Ic	32 mA. 5.3 mA. 37 mA.
Rectifier ..	Ea1 Ea2 Ec	499v. RMS 258 v.	Ic	57.5 mA.

Main H.T. Line, 242 volts.
Main H.T. Current, 57 mA.
Normal Primary Current, 0.21 amps. R.M.S.

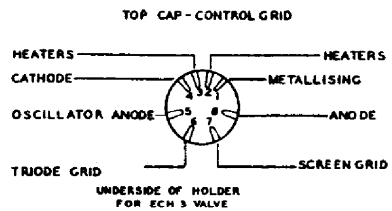


Fig. 1

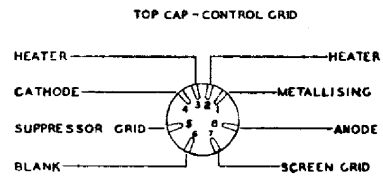


Fig. 2

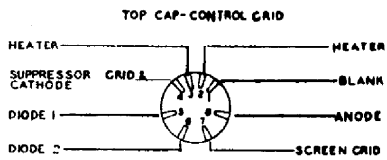


Fig. 3

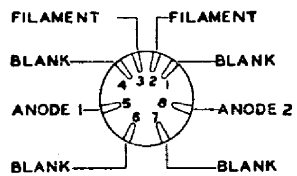


Fig. 4

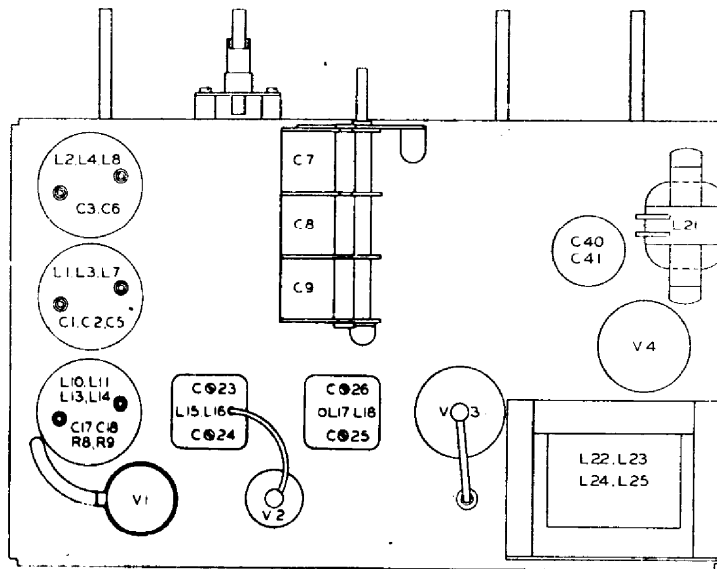


Fig. 5

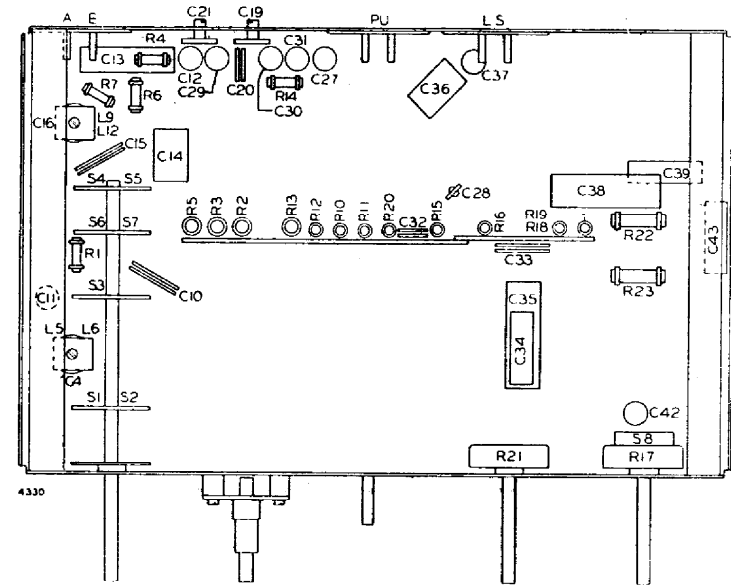
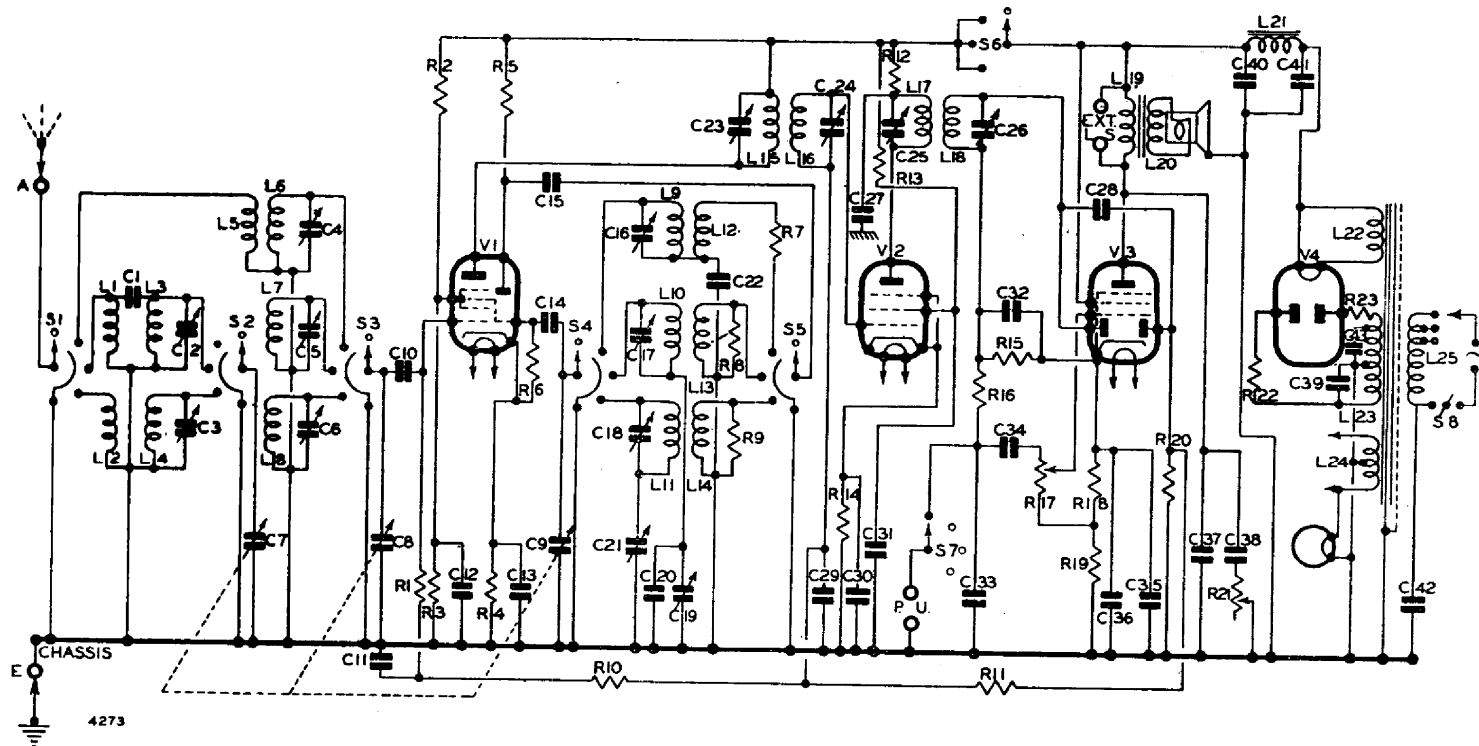


Fig. 6



CIRCUIT DIAGRAM

Fig. 7