LISSEN

SERVICE MANUAL FOR FIVE VALVE THREE BAND SUPERHET MAINS RECEIVER MODEL 8503

This Manual also applies to Superhet Radiograms 8480, 8481, 8529, 8533 and 8539

Circuit Alignment Procedure for Receiver Type 8503.

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% 400 c.p.s. between signal grid and chassis of the frequency changer valve V1, by connection, via a condenser of 0·1 mfd. 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 Waveband Alignment.

(1) See that the pointer registers with the 180° 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. Then adjust the L.W. bandpass 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 long wave padder C21 to give maximum output on that signal,

(8) Re-set the pointer to the 1,000-metre mark on the scale and re-adjust the L.W. oscillator and bandpass trimmers C18, C6, C3 to give maximum output on the 1,000-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 long wave padder C21.

Medium Waveband Alignment.

(1) See that the pointer registers with the 180° 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 214-metre 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. bandpass 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) Re-set the pointer to the 214-metre mark on the scale and re-adjust the M.W. oscillator and bandpass 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-metre mark when receiving the 500 metre signal. If it is not, make a slight adjustment to the M.W. padder C19.

Short Waveband Alignment.

(1) See that the pointer registers with the 180° 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) Re-set 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 8503.

This Manual also applies to Superhet Radiograms 8480, 8481, 8529, 8533 and 8539.

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, C8, C9	Triple Gang	80,515		
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, C24	I.F. Trimmers	82,506	77,537	100 mmfd. Max.
C25, C26	I.F. Trimmers	82,506	77,538	100 mmfd. Max.
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	73,785	50 mmfd. Mica
C33	I.F. Filter	66,512	73,785	50 mmfd. Mica
C34	L.F. Coupling	68,014	73,785	·05 mfd. 1,000v. Test
C35	V3 Cathode Bypass ..	67,005	73,785	50 mfd. 12v. Peak Elec.
C36	V3 Anode Decoupling ..	67,009	73,785	2 mfd. 300v. Peak Elec.
C37	Tone Control	66,516 or 66,521		500 mmfd. Mica
C38	L.F. Coupling	68,014		·05 mfd. 1,000v. Test
C39	V4 Cathode Bypass ..	67,005		50 mfd. 12v. Peak Elec.
C40	H.T. Smoothing	67,514		24 mfd. 350v. Working
C41	V5 Reservoir	67,514		16 mfd. 350v. Working
C42	H.F. Bypass	68,503		.01 mfd. 3,000v. Test
C43	A.V.C. Delay Bypass ..	67,005		50 mfd. 12v. Peak Elec.
C44	H.F. Bypass	68,502		.005 mfd. 3,000v. Test
C45	H.F. Bypass	68,502		·005 mfd. 3,000v. Test

SWITCHES

Code	Description	Part No.	Part of	
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	
V1	Frequency Changer ..	4,120		Ever Ready ECH3
V2	I.F. Amplifier	4,121		,, EF9
V3	2nd Det., A.V.C., Rect. and L.F. Amplifier ..	4,122		,, EBC3
V4	Output	4,124		,, EL3
V5	Rectifier	4,125		,, AZ1

RESISTANCES

Code	Description	Part No.	Part of	Values
R1	V1 Grid Leak	71,900		1.1 Megohm, ½ watt
R2	V1 Screen Potentiometer Part	89,517	73,785	25,000 ohms, ½ watt
R3	V1 Screen Potentiometer Part	71,999	73,785	30,000 ohms, ½ watt
R4	V1 Bias	71,943		200 ohms, ½ watt
R5	Oscillator Anode Feed	71,999	73,785	30,000 ohms, ½ watt
R6	Oscillator Grid Leak ..	71,968		51,000 ohms, ½ watt
R7	S.W. Heterodyne Volts Control	71,969		150 ohms, ½ watt
R8	M.W. Heterodyne Volts Control	71,906	77,553	1,500 ohms, ½ watt
R9	L.W. Heterodyne Volts Control	71,988	77,553	5,100 ohms, ½ watt
R10	A.V.C. Decoupling ..	71,945	73,785	260,000 ohms, ½ watt
R11	A.V.C. Decoupling ..	71,945	73,785	260,000 ohms, ½ watt
R12	V2 Anode Decoupling	71,982	73,785	2,100 ohms, ½ watt
R13	V2 Screen Feed ..	71,939	73,785	80,000 ohms, ½ watt
R14	V2 Bias	71,960		250 ohms, ½ watt
R15	Signal Diode Load Part	71,945	73,785	260,000 ohms, ½ watt
R16	Signal Diode Load Part	71,945	73,785	260,000 ohms, ½ watt
R17	I.F. Filter	71,962	73,785	11,000 ohms, ½ watt
R18	Volume Control ..	81,502		500,000 ohms, Varia.
R19	V3 Bias and A.V.C. Delay Part	89,515	73,785	1,600 ohms, ½ watt
R20	A.V.C. Delay Part ..	89,516	73,785	3,100 ohms, ½ watt
R21	V3 Anode Decoupling	71,963	73,785	11,000 ohms, ½ watt
R22	V3 Anode Load ..	71,909	73,785	50,000 ohms, ½ watt
R23	Tone Control ..	81,509		2 Megohms, Varia.
R24	Reverse Feed Back Coupling	71,911		250,000 ohms, ½ watt
R25	A.V.C. Diode Load	71,900	73,785	1.1 Megohm, ½ watt
R26	V4 Grid Stopper ..	71,968		51,000 ohms, ½ watt
R27	V4 Grid Leak ..	71,944		510,000 ohms, ½ watt
R28	V4 Bias	71,969		150 ohms, ½ watt
R29	V5 Anode	89,524		75 ohms, ½ watt
R30	V5 Anode	89,524		75 ohms, ½ watt

INDUCTANCES

Code	Description	Part No.	Part of
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, L6	S.W. Aerial Primary Coil / S.W. Signal Grid Coil	77,552	
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, L16	1st I.F. Primary Coil / 1st I.F. Secondary Coil	77,537	
L17, L18	2nd I.F. Primary Coil / 2nd I.F. Secondary Coil	77,538	
L19, L20	Output Transformer on Speaker		85,514
L21	Smoothing Choke	79,502	
L22, L23, L24, L25	Mains Transformer ..	77,544	

VOLTAGE AND CURRENT MEASUREMENTS FOR RECEIVER TYPE 8503.

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	239 v.	Ia	2·2 mA.
	Es	92 v.	Is	3·0 mA.
	Eoa	102 v.	Ioa	4·2 mA.
	Ec	1·9 v.	Ic	9·4 mA.
I.F. Amplifier EF9	Ea	222 v.	Ia	6·2 mA.
	Es	88 v.	Is	1·8 mA.
	Ec	2·0 v.	Ic	8·0 mA.
L.F. Amplifier EBC3	Ea	133 v.	Ia	1·9 mA.
	Ec	5·8 v.	Ic	1·9 mA.
Output Pentode EL3	Ea	215 v.	Ia	31·9 mA.
	Es	239 v.	Is	4·8 mA.
	Ec	5·4 v.	Ic	36·7 mA.
Rectifier AZ1	Ea1 / Ea2		449 v.	R.M.S.
	Ec	255 v.	Ic	58·7 mA.

Main H.T. Line, 239 volts.
Main H.T. Current, 58·5 mA.
Normal Primary Current, 0·2 R.M.S. amp.

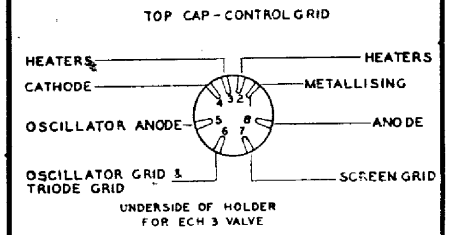


FIG. 1

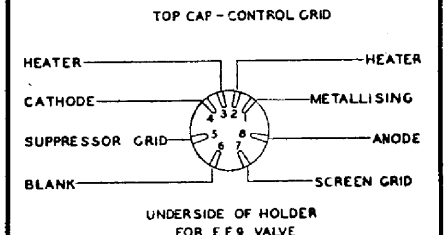


FIG. 2

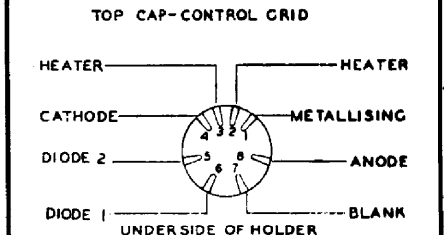


FIG. 3

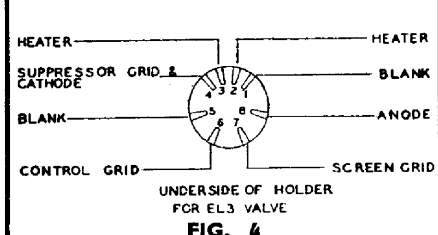


FIG. 4

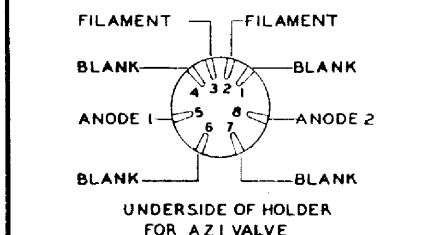


FIG. 5

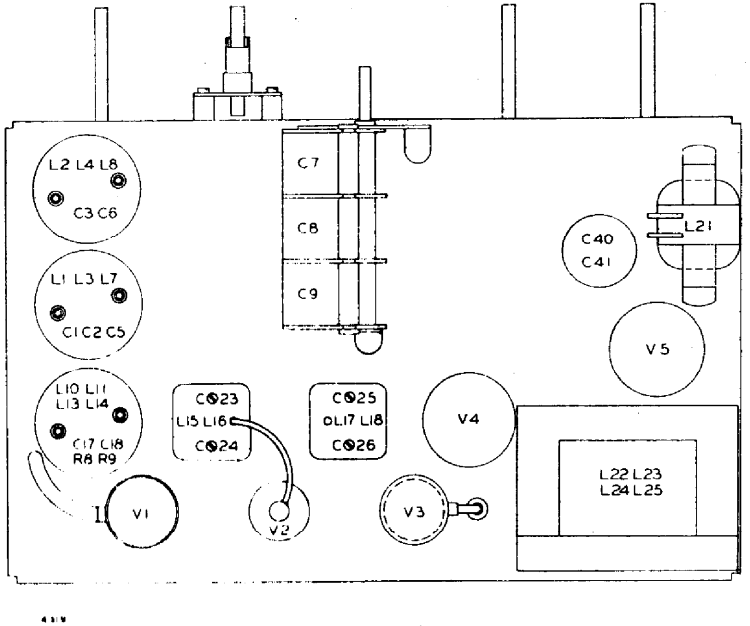


FIG. 6

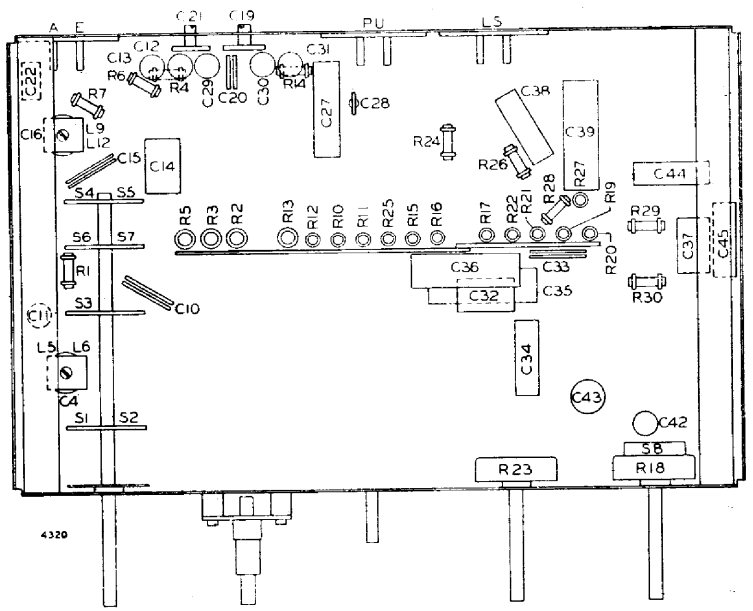
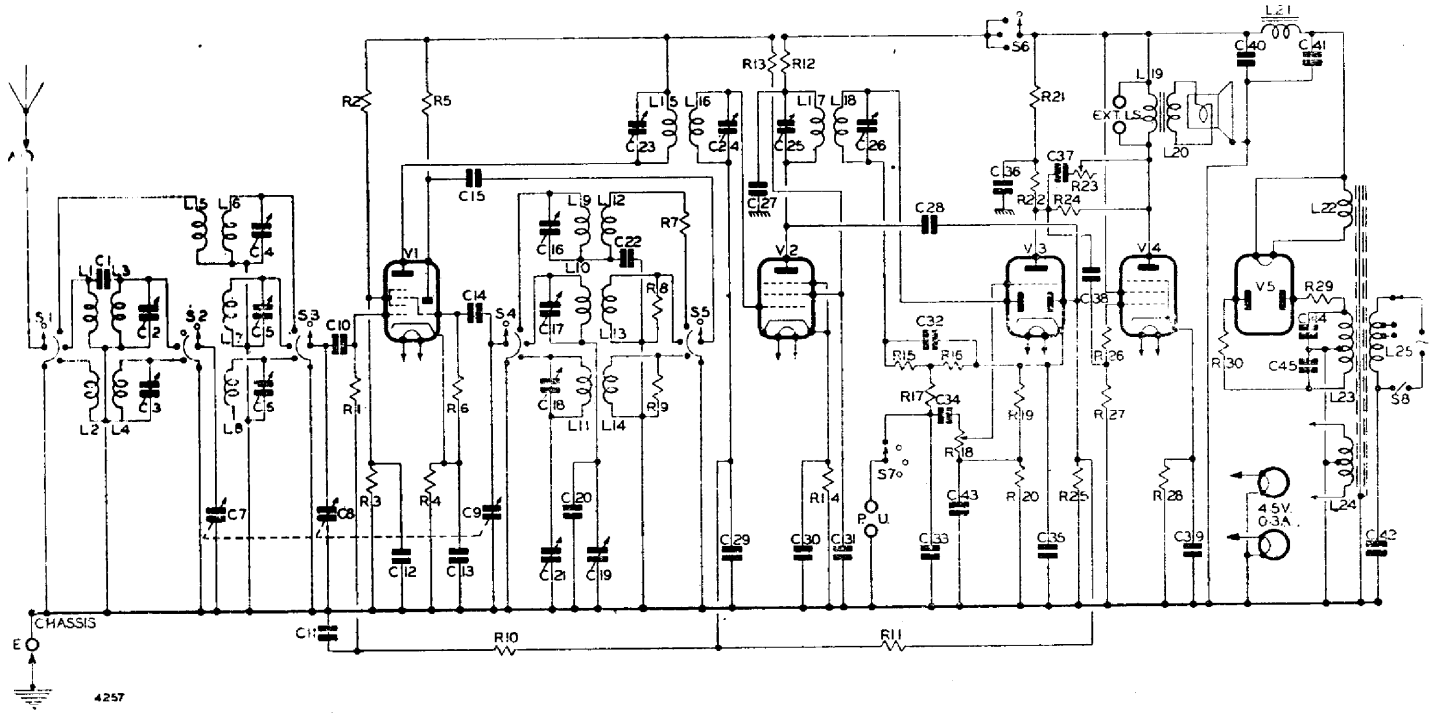


FIG. 7



CIRCUIT DIAGRAM

FIG. 8