LISSEN

SERVICE MANUAL FOR FIVE VALVE THREE BAND SUPERHET MAINS RADIOGRAM MODEL 8422

CIRCUIT ALIGNMENT PROCEDURE FOR RECEIVER 8422.

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 473 Kc/s. modulated 30 per cent., 400 c.p.s., through a condenser of 0·1 mfd. capacity across the signal grid and chassis of the frequency changer valve, V1. Trim each I.F. circuit in the following order :—

2nd I.F.T. secondary trimmer C28 ; 2nd I.F.T. primary trimmer C27 ; 1st I.F.T. secondary trimmer C26 ; 1st I.F.T. primary trimmer C25. 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 473 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.

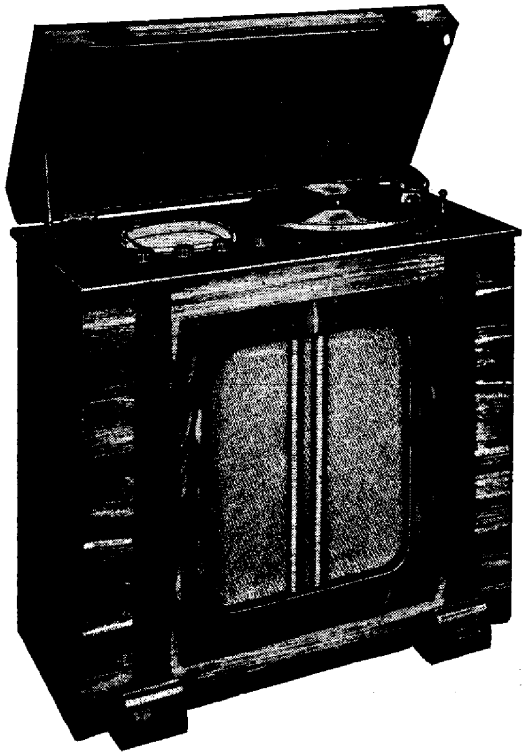
(4) Apply a modulated signal of 1,000 metres to the A and E sockets of the receiver.

(5) Adjust the L.W. oscillator trimmer C18 to receive this signal. Then adjust the L.W. bandpass trimmers C10, 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) Reset the pointer to the 1,000-metre mark on the scale and readjust the L.W. oscillator and bandpass trimmers C18, C10, 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 slight adjustment to the long wave padder C21.

Medium Waveband Alignment.

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

(2) Set the medium wave padder C19 approximately two-thirds 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. Then adjust the M.W. bandpass trimmers C9, 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 readjust the M.W. oscillator and bandpass trimmers C17, C9, 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 Alingment.

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

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

(3) Unscrew fully the S.W. oscillator trimmer C16. Apply a signal of 15 Mc/s. to the A and E sockets. 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 is the one with the trimmer at the lower capacity, that is, the first one heard when screwing in the trimmer. Having selected the correct peak, adjust the S.W. signal circuit trimmer C8 to give maximum output.

(4) 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.

(5) Reset the pointer to the 15 Mc/s. mark and readjust the S.W. oscillator and signal circuit trimmers C16, C8 to give maximum output.

SERVICE DATA FOR MODEL 8422.

CONDENSERS

Code	Description	Part No.	Values
C1	M.W. Aerial Coupling ..	71,261	5 mmfd. Cera.
C2	M.W Bandpass Primary Trimmer	80,000	100 mmfd. Max.
C3	L.W. Bandpass Primary Trimmer	80,000	100 mmfd. Max.
C4 C5 C6	Triple Gang	80,508	
C7	A.V.C. Decoupling ..	68,008	·05 mfd.
C8	S.W. Signal Circuit Trimmer	82,503	20 mmfd. Max.
C9	M.W. Bandpass Secondary Trimmer	80,000	100 mmfd. Max.
C10	L.W. Bandpass Secondary Trimmer	80,000	100 mmfd. Max.
C11	V1 Screen Bypass ..	68,009	·1 mfd.
C12	V1 Anode and Oscillator Anode Decoupling	67,513	8 mfd. 350v. Elec.
C13	Oscillator Anode Coupling	66,515	300 mmfd. Mica
C14	Oscillator Grid Coupling	66,513	100 mmfd. Mica
C15	V1 Cathode Bypass ..	68,009	·1 mfd.
C16	S.W. Oscillator Circuit Trimmer	82,503	20 mmfd. Max.
C17	M.W. Oscillator Circuit Trimmer	80,000	100 mmfd. Max.
C18	L.W. Oscillator Circuit Trimmer	80,000	100 mmfd. Max.
C19	M.W. Padder Variable ..	80,511	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 ..	66,534	·0033 mfd. Mica
C23	A.V.C. Decoupling ..	68,009	·1 mfd.
C24	A.V.C. Decoupling ..	68,009	·1 mfd.
C25	I.F. Trimmers	80,001	300 mmfd. Max.
C26		80,001	300 mmfd. Max.
C27		80,001	300 mmfd. Max.
C28		80,001	300 mmfd. Max.
C29	V2 Cathode Bypass ..	68,009	·1 mfd.
C30	V2 Screen Bypass ..	68,009	·1 mfd.
C31	V3 Anode Decoupling ..	67,009	2 mfd. 300v. Peak Elec.
C32	Signal Diode Load Bypass	66,512	50 mmfd. Mica
C33	L.F. Coupling	68,008	·05 mfd.
C34	V3 Cathode Bypass ..	67,005	50 mfd. 12v. Peak Elec.
C35	L.F. Coupling	68,008	·05 mfd.
C36	V4 Cathode Bypass ..	67,005	50 mfd. 12v. Peak Elec.
C37	A.V.C. Coupling ..	71,262	10 mmfd. Cera.
C38	H.T. Smoothing	67,513	16 mfd. 350v. Elec.
C39	V5 Reservoir		8 mfd. 350v. Elec.
C40	Tone Control	25,656	·002 mfd.
C41	V1 Heater R.F. Bypass ..	68,003	·005 mfd.
C42	H.F. Bypass	68,502	·005 mfd. 3,000v. Test
C43	V2 Anode Decoupling ..	68,020	·1 mfd. 1,000v. Test

SWITCHES

Code	Description	Part No.
S1	Aerial Circuit Primary Selector	83,518
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	Motor Switch	
S9	Mains On/Off Ganged To Volume Control	

VALVES

Code	Description	Part No.	
V1	Frequency Changer ..	4,093	Ever Ready A36B
V2	I.F. Amplifier	4,083	Ever Ready A50P
V3	2nd Det., A.V.C., Rect., and L.F. Amplifier ..	4,067	Ever Ready A23A
V4	Output	4,085	Ever Ready A70D
V5	Rectifier	4,084	Ever Ready A11D

RECEIVER TYPE 8422.

D.C. Resistance of Inductances.

Radio Frequency Circuits.

M.W. Aerial Primary Coil	(L1)	17 ohms
L.W. Aerial Primary Coil	(L2)	135 ohms
M.W. Bandpass Primary Coil ..	(L3)	2.6 ohms
L.W. Bandpass Primary Coil ..	(L4)	45 ohms
S.W. Aerial Primary Coil	(L5)	2.0 ohms
S.W. Signal Grid Coil	(L6)	Very Low
M.W. Bandpass Secondary Coil ..	(L7)	2·5 ohms
L.W. Bandpass Secondary Coil ..	(L8)	44 ohms
S.W. Oscillator Grid Coil	(L9)	Very Low
M.W. Oscillator Grid Coil	(L10)	1·7 ohms
L.W. Oscillator Grid Coil	(L11)	5·0 ohms
S.W. Tickler Coil	(L12)	Very Low
M.W. Tickler Coil	(L13)	2·9 ohms
L.W. Tickler Coil	(L14)	9·7 ohms

Intermediate Frequency Circuits.

Primary and Secondary Coils of each I.F.T. (L15, L16, L17, L18)	6·8 ohms

Low Frequency Circuits.

Output Transformer Primary ..	(L19)	650 ohms
Output Transformer Secondary ..	(L20)	Very Low
Smoothing Choke	(L21)	230 ohms
Mains Transformer Rectifier Heater Secondary	(L22)	Very Low
Mains Transformer H.T. Secondary..	(L23)	255 ohms
Mains Transformer Valve Heater Secondary	(L24)	Very Low
Mains Transformer Primary, 250 v. tap	(L25)	19·0 ohms

VOLTAGE AND CURRENT MEASUREMENTS FOR RECEIVER TYPE 8422.

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 300 metres, volume and tone controls at maximum but no signal applied.

Frequency Changer A36B	Ea	230 v.	Ia	1·5 mA.
	Es	83 v.	Is	4·7 mA.
	Eoa	108 v.	Ioa	5·8 mA.
	Ec	2·3 v.	Ic	12·0 mA.
I.F. Amplifier A50P	Ea	250 v.	Ia	6·7 mA.
	Es	182 v.	Is	2·5 mA.
	Ec	2·2 v.	Ic	9·2 mA.
L.T. Amplifier A23A	Ea	127 v.	Ia	3·2 mA.
	Ec	5·7 v.	Ic	3·2 mA.
Output Pentode A70D	Ea	244 v.	Ia	33·7 mA.
	Es	270 v.	Is	5·3 mA.
	Ec	5·9 v.	Ic	39·0 mA.
Rectifier A11D	Ea1 Ea2	505 v.	—	R.M.S.
	Ec	287 v.	Ic	64·0 mA.

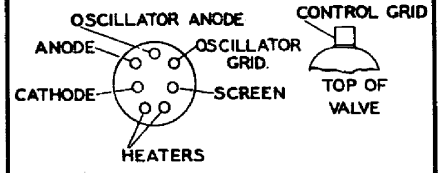
Main H.T. Line, 270 volts.
Main H.T. Current, 64 mA.
Normal Input Current, 0·28 amp.

INDUCTANCES

Code	Description	Part No.
L1	M.W. Aerial Primary Coil ..	77,519
L2	L.W. Aerial Primary Coil ..	77,520
L3	M.W. Bandpass Primary Coil	77,519
L4	L.W. Bandpass Primary Coil	77,520
L5	S.W. Aerial Primary Coil ..	77,521
L6	S.W. Signal Grid Coil ..	77,521
L7	M.W. Bandpass Secondary Coil	77,519
L8	L.W. Bandpass Secondary Coil	77,520
L9	S.W. Oscillator Grid Coil ..	77,531
L10	M.W. Oscillator Grid Coil ..	77,530
L11	L.W. Oscillator Grid Coil ..	77,530
L12	S.W. Tickler Coil	77,531
L13	M.W. Tickler Coil	77,530
L14	L.W. Tickler Coil	77,530
L15	1st I.F.T. Primary Coil	77,535
L16	1st I.F.T. Secondary Coil	
L17	2nd I.F.T. Primary Coil	77,503
L18	2nd I.F.T. Secondary Coil	
L19 L20	Output Transformer on Speaker	
L21	H.T. Smoothing Choke ..	79,501
L22 L23 L24 L25	Mains Transformer ..	77,513

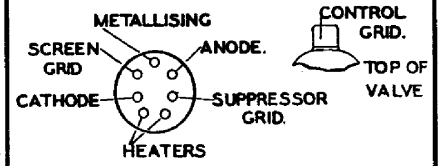
RESISTANCES

Code	Description	Part No.	Values
R1	A.V.C. Decoupling ..	71,945	260,000 ohms, ½ watt
R2	V1 Bias	71,943	200 ohms, ½ watt
R3	Oscillator Grid Leak..	71,968	51,000 ohms, ½ watt
R4	V1 Screen Feed ..	71,979	41,000 ohms, ½ watt
R5	V1 Anode and Osc. Anode Decoupling	71,935	5,000 ohms, ½ watt
R6	Oscillator Anode Feed	71,928	20,000 ohms, 1 watt
R7	S.W. Heterodyne Volts Control	71,943	200 ohms, ½ watt
R8	M.W. Heterodyne Volts Control	71,906	1,500 ohms, ½ watt
R9	L.W. Heterodyne Volts Control	71,988	5,100 ohms, ½ watt
R10	V2 Screen Feed ..	71,999	30,000 ohms, ½ watt
R11	V2 Bias	71,960	250 ohms, ½ watt
R12	A.V.C. Decoupling ..	71,945	260,000 ohms, ½ watt
R13	V3 Anode Decoupling	71,963	11,000 ohms, ½ watt
R14	V3 Anode Load ..	71,979	41,000 ohms, ½ watt
R15	Signal Diode Load Part	71,944	510,000 ohms, ½ watt
R16	Signal Diode Load Part	71,945	260,000 ohms, ½ watt
R17	V3 Bias and A.V.C. Delay Part	71,961	800 ohms, ½ watt
R18	A.V.C. Delay Part ..	71,906	1,500 ohms, ½ watt
R19	Volume Control ..	81,502	500,000 ohms, Varia.
R20	A.V.C. Diode Load Part	71,944	510,000 ohms, ½ watt
R21	A.V.C. Diode Load Part	71,944	510,000 ohms, ½ watt
R22	A.V.C. Decoupling ..	71,944	510,000 ohms, ½ watt
R23	V4 Grid Leak ..	71,944	510,000 ohms, ½ watt
R24	V4 Bias	71,969	150 ohms, ½ watt
R25	V4 Grid Stopper ..	71,968	51,000 ohms, ½ watt
R26	Reverse Feed Back Coupling	71,911	250,000 ohms, ½ watt
R27	Tone Control ..	81,509	2 Megohms, Varia.
R28	V3 Grid Stopper ..	89,510	100,000 ohms, ½ watt
R29	V2 Anode Decoupling	71,936	2,500 ohms, ½ watt
R30	L.W. Aerial Primary Shunt	71,988	5,100 ohms, ½ watt



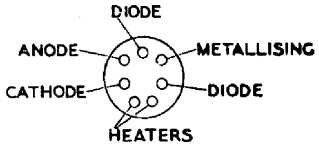
UNDERSIDE OF HOLDER FOR A.36.B. VALVE

Fig. 1.



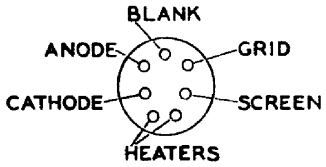
UNDERSIDE OF HOLDER FOR A.50.P. VALVE

Fig. 2.



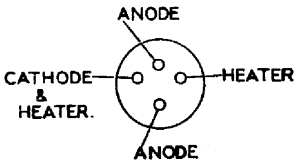
UNDERSIDE OF HOLDER FOR A.23.A. VALVE.

Fig. 3.



UNDERSIDE OF HOLDER FOR A.70.D. VALVE

Fig. 4.



UNDERSIDE OF HOLDER FOR A.11.D. VALVE.

Fig. 5.

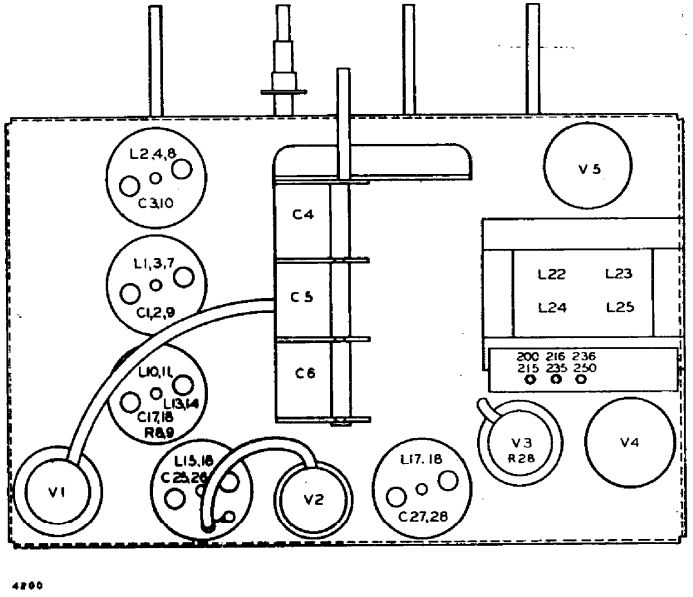


Fig. 6.

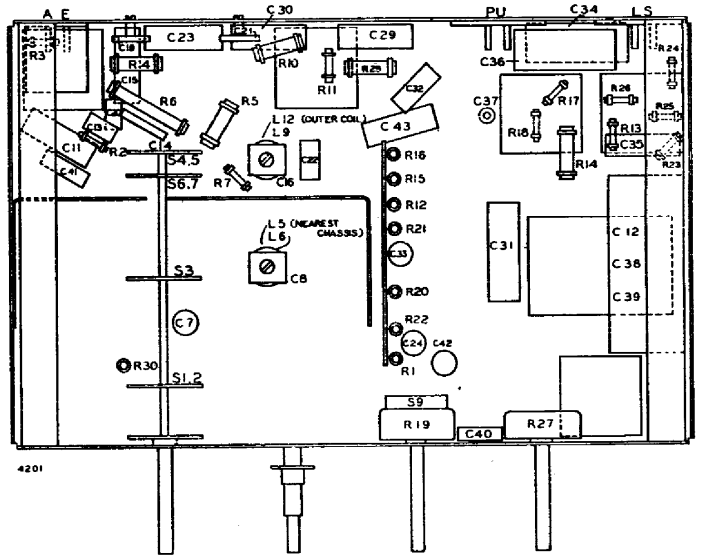
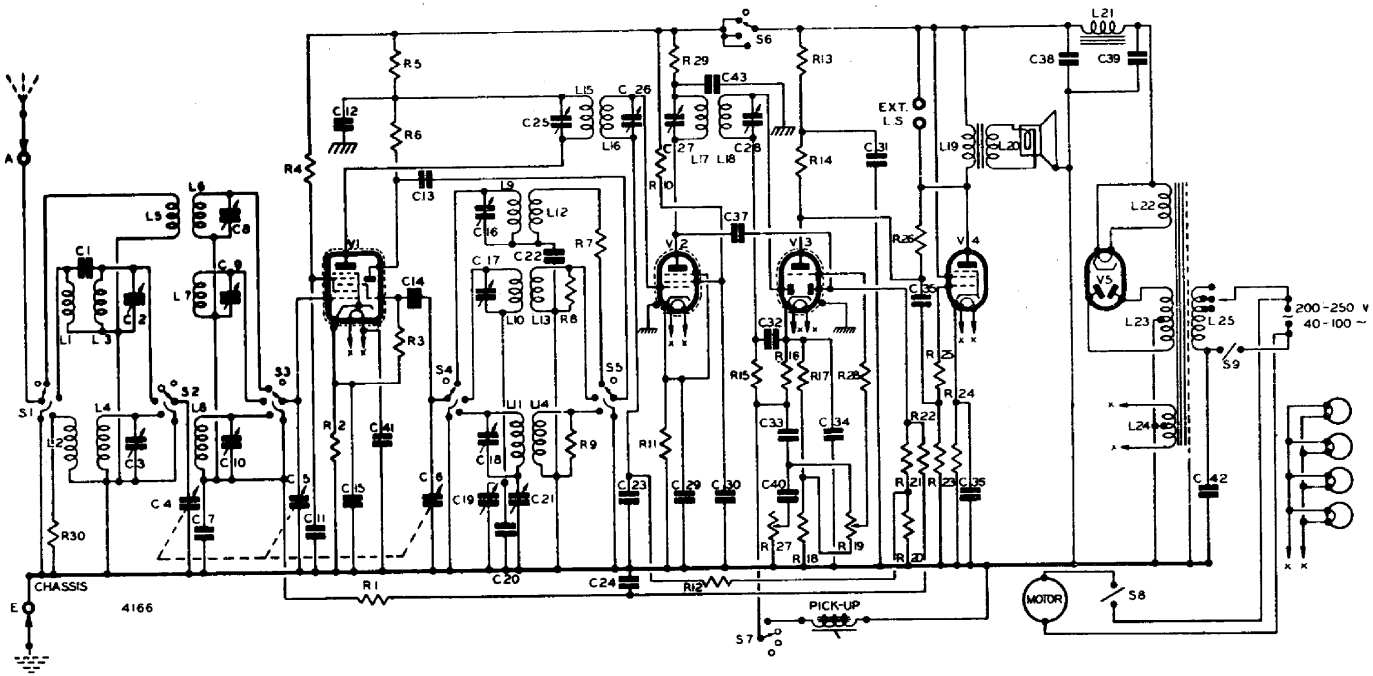


Fig. 7.



CIRCUIT DIAGRAM.

Fig. 8.