LISSEN

SERVICE MANUAL FOR FIVE VALVE THREE-BAND SUPERHET MAINS RECEIVER MODEL 8417

Circuit Alignment Procedure for Receiver Type 8417.

(1) Short circuit the gang condenser across the oscillator section (front section).
(2) Adjust the wave switch to the medium wave position.
(3) Apply a signal of 452 Kc/s., modulated 30 per cent., 400 c.p.s., through a condenser of 0.1 *u*F. capacity, across the signal grid and chassis of the frequency changer valve, V1. Trim each I.F.T. circuit in the following order:—

2nd I.F.T. Secondary trimmer (C25), 2nd I.F.T. Primary trimmer (C24), 1st I.F.T. Secondary trimmer (C23), 1st I.F.T. Primary trimmer (C22). 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.

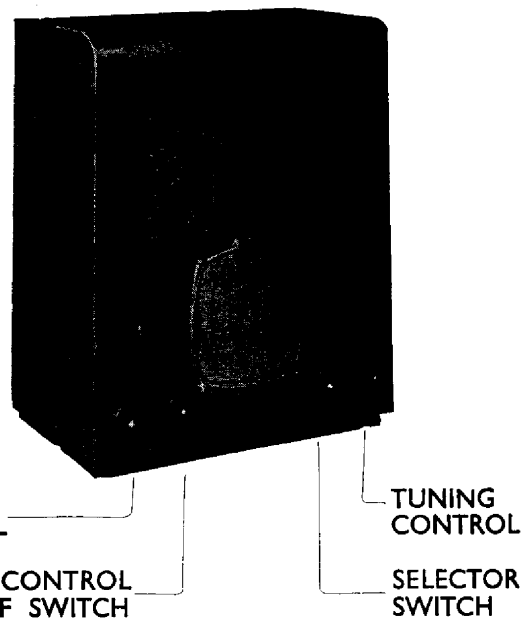
NOTE.—As the circuits are brought into line the level of the 452 Kc/s signal should be reduced to prevent the A.V.C. from coming into action and giving misleading results.

Radio Frequency Circuit Alignment.

The three wave bands, 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 three-quarters in.
(3) Set the pointer against the 1,200-metre mark on the scale.
(4) Apply a modulated signal of 1,200 metres to the A and E sockets of the receiver.
(5) Adjust the long wave oscillator trimmer (C18) to receive this signal. Then adjust the long wave 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 long wave padder (C21) to give maximum output on that signal.
(8) Re-set the pointer to the 1,200-metre mark on the scale and re-adiust the long wave oscillator and band-pass trimmers (C18, C6, C3) to give maximum output on the 1,200-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 on the scale with the gang at maximum capacity.
(2) Set the medium wave padder (C20) 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 medium wave oscillator trimmer (C17) to receive this signal. Then adjust the medium wave 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 medium wave padder (C20) to give maximum output on that signal.
(8) Re-set the pointer to the 214-metre mark on the scale and re-adjust the medium wave 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-metre mark when receiving the 500-metre signal. If it is not, make a slight adjustment to the medium wave padder (C20).

Short Waveband Alignment.

(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) Screw in fully the S.W. oscillator trimmer (C16). Apply a signal of 15 Mc/s. to the A and E sockets. Slowly unscrew 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 higher capacity, that is, the first one heard when unscrewing the trimmer. Having selected the correct peak, adjust the S.W. signal circuit trimmer (C4) to give maximum output.
(4) Apply a signal of 7.5 Mc/s. and tune the receiver to this signal. Adjust the top turn of the S.W. oscillator coil (L7) and the gang simultaneously to give maximum output on this signal.
(5) Re-set the pointer to the 15 Mc/s. mark and re-adjust the S.W. oscillator and signal circuit trimmers (C16, C4) to give maximum output.

SERVICE DATA FOR MODEL No. 8417.

CONDENSERS

Code	Description	Part No.	Values
C1	S.W. Aerial Coupling	71,262	10 mmfd. Ceramic
C2	M.W. B.P. Primary Trimmer	82,500	40 mmfd. Max.
C3	L.W. B.P. Primary Trimmer	82,501	90 mmfd. Max.
C4	S.W. Aerial Trimmer ..	82,500	40 mmfd. Max.
C5	M.W. B.P. Secondary Trimmer	82,500	40 mmfd. Max.
C6	L.W. B.P. Secondary Trimmer	82,501	90 mmfd. Max.
C7	S.W. Tracking	68,005	·01 mfd.
C8	A.V.C. Decoupling ..	68,009	·1 mfd.
C9, C10, C11	Triple Gang ..	80,509	
C12	V1 Screen By-pass ..	68,009	·1 mf.d
C13	V1 Cathode By-pass ..	68,009	·1 mfd.
C14	V1 Oscillator Grid Coupling	66,513	100 mmfd. Mica
C15	V1 Oscillator Anode Coupling	66,515	300 mmfd. Mica
C16	S.W. Oscillator Trimmer	82,503	20 mmfd. Max.
C17	M.W. Oscillator Trimmer	80,000	100 mmfd. Max.
C18	L.W. Oscillator Trimmer	80,000	100 mmfd. Max.
C19	M.W. Padder Fixed ..	66,521	500 mmfd. Mica
C20, C21	M.W. Padder, Variable / L.W. Padder, Variable	82,505	250 mmfd. Max. (Double Padder)
C22, C23, C24, C25	I.F. Trimmers ..	80,001	300 mmfd. Max.
C26	A.V.C. Decoupling ..	68,009	·1 mfd.
C27	V2 Screen By-pass ..	68,009	·1 mfd.
C28	V2 Cathode By-pass ..	68,009	·1 mfd.
C29	Signal Diode Load By-pass	66,513	100 mmfd. Mica
C30	L.F. Coupling	68,008	·05 mfd.
C31	Tone Control	25,656	·002 mfd.
C32	V3 Cathode By-pass ..	67,005	50 mfd. 12 v. Peak Elec.
C33	A.V.C. Coupling ..	71,262	10 mmfd. Ceramic
C34	V3 Anode Decoupling ..	67,012	2 mfd. 300 v. Peak Elec.
C35	L.F. Coupling	68,008	·05 mfd.
C36	V4 Cathode By-pass ..	67,005	50 mfd. 12 v. Peak Elec.
C37	H.T. Smoothing ..	67,502	16mfd. 350 v. Working / 8 mfd. Elec.
C38	V5 Reservoir	67,502	
C39	V1 Heater By-pass (R.F.)	68,003	·005 mfd.
C40	V3 Cathode By-pass ..	66,516	500 mmfd. Mica
C41	I.F. Filter	66,513	100 mmfd. Mica

INDUCTANCES

Code	Description	Part No.	
L1, L2, L3, L4, L5, L6, L7, L8	Signal Frequency Coil	78,505	—
L9, L10, L11, L12	Oscillator Coil ..	78,523	—
L13, L14	1st I.F. Transformer ..	77,501	—
L15, L16	2nd I.F. Transformer	77,503	—
L17, L18	Output Transformer on Speaker ..		
L19	Smoothing Choke ..	79,501	—
L20, L21, L22, L23	Mains Transformer	77,541	—

VOLTAGE AND CURRENT MEASUREMENTS FOR RECEIVER TYPE 8417

Measurements made with a Model 7 Avometer on the 1,000 v. range for voltages above 10 v. and on the 10 v. range for voltages below 10 v. Measurements made with the receiver tuned to 300 metres, volume and tone controls at maximum, but no signals applied.

Frequency Changer A36B ..	Ea	273 v.	Ia	3·5 mA.
	Es	107 v.	Is	7·1 mA.
	Eoa	106 v.	Ioa	6·8 mA.
	Ec	2·6 v.	Ic	17·4 mA.
I.F. Amplifier A50P ..	Ea	273 v.	Ia	8·1 mA.
	Es	191 v.	Is	2·9 mA.
	Ec	2·3 v.	Ic	11·0 mA.
L.F. Amplifier A23A ..	Ea	128 v.	Ia	2·6 mA.
	Ec	2·7 v.	Ic	2·6 mA.
Output A70D	Ea	246 v.	Ia	36·0 mA.
	Es	273 v.	Is	5·0 mA.
	Ec	6·6 v.	Ic	41·0 mA.
Rectifier A11D	Ea1–Ea2			516 v. R.M.S.
	Ec	292 v.	Ic	73·0 mA.

Main H.T. Line 273 v.
Main H.T. Current 73 mA.
Normal Input Current 0·3 Amp. R.M.S.

VALVES

Code	Description	Part No.	
V1	Frequency Changer ..	4093	Ever-Ready A36B
V2	I.F. Amplifier	4083	Ever-Ready A50P
V3	Det., A.V.C. Rect., and L.F. Amplifier ..	4067	Ever Ready A23A
V4	Output	4085	Ever Ready A70D
V5	H.T. Rectifier	4084	Ever Ready A11D

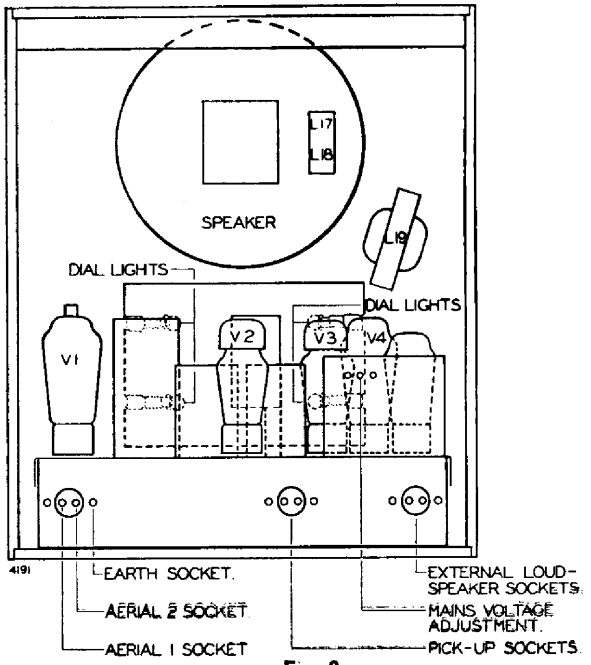


Fig. 9

RESISTANCES

Code	Description	Part No.	Values
R1	A2 Potentiometer, Part	71,963	11,000 ohm, ½ watt
R2	A2 Potentiometer, Part	71,962	110,000 ohm, ½ watt
R3	A.V.C. Decoupling ..	71,962	110,000 ohm, ½ watt
R4	A.V.C. Decoupling ..	71,962	110,000 ohm, ½ watt
R5	V1 Screen Feed ..	71,951	20,000 ohm, 2 watt
R6	V1 Oscillator Anode Feed	71,951	20,000 ohm, 2 watt
R7	V1 Oscillator Grid Leak	71,968	51,000 ohm, ½ watt
R8	V1 Bias	71,969	150 ohm, ½ watt
R9	S.W. Het. Voltage Control	71,943	200 ohm, ½ watt
R10	M.W. Het. Voltage Control	71,967	1,100 ohm, ½ watt
R11	L.W. Het. Voltage Control	71,982	2,100 ohm, ½ watt
R12	V2 Bias	71,960	250 ohm, ½ watt
R13	V2 Screen Feed ..	24,756	25,000 ohm, ½ watt
R14	Signal Diode Load, Part	71,944	510,000 ohm, ½ watt
R15	Signal Diode Load, Part	71,945	260,000 ohm, ½ watt
R16	I.F. Stopper	71,962	110,000 ohm, ½ watt
R17	Tone Control	81,509	2 megohm, Vari.
R18	Volume Control ..	81,502	500,000 ohm, Vari.
R19	V3 Bias	71,914	1,000 ohm, ½ watt
R20	A.V.C. Diode Load ..	71,900	1·1 megohm, ½ watt
R21	A.V.C. Decoupling ..	71,945	260,000 ohm, ½ watt
R22	V3 Anode Load ..	71,955	40,000 ohm, ½ watt
R23	V3 Anode Decoupling ..	71,963	11,000 ohm, ½ watt
R24	Reverse Feed-Back Coupling	71,911	250,000 ohm, ½ watt
R25	V4 Grid Stopper ..	71,962	110,000 ohm, ½ watt
R26	V4 Grid Leak ..	71,944	510,000 ohm, ½ watt
R27	V4 Bias	71,969	150 ohm, ½ watt
R28	V1 Screen Stopper ..	89,502	75 ohm, ½ watt

SWITCHES

Code	Description	Part No.	
S1, S2, S3, S4	Wave Change Switch	83,502	
S5	Mains On/Off, Ganged to Volume Control ..	—	

RECEIVER TYPE 8417

D.C. Resistance of Inductances.

Radio Frequency Circuits.

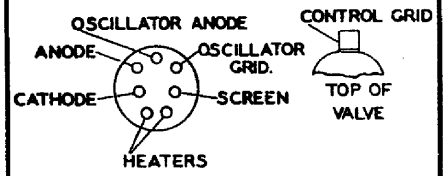
M. & L.W. Primary Coil	(L1)	11·4 ohms
M.W. Band-pass Primary Coil ..	(L2)	2·5 ohms
L.W. Band-pass Primary Coil ..	(L3)	11·1 ohms
S.W. Signal Frequency Coil	(L4)	Very low
M.W. Band-pass Secondary Coil ..	(L5)	2·5 ohms
L.W. Band-pass Secondary Coil ..	(L6)	11·0 ohms
S.W. Oscillator Grid Coil	(L7)	Very low
M.W. Oscillator Grid Coil	(L8)	1·8 ohms
L.W. Oscillator Grid Coil	(L9)	5·0 ohms
S.W. Tickler Coil	(L10)	Very low
M.W. Tickler Coil	(L11)	6·1 ohms
L.W. Tickler Coil	(L12)	8·4 ohms

Intermediate Frequency Circuits.

Primary and Secondary Coils of each I.F.T.	(L13, L14, L15, L16)	6·7 ohms

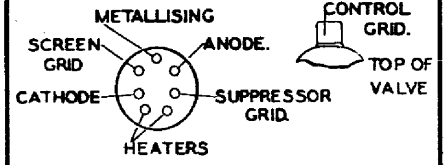
Low Frequency Circuits.

Output Transformer Primary ..	(L17)	650 ohms
Output Transformer Secondary ..	(L18)	Very low
Smoothing Choke	(L19)	230 ohms
Mains Transformer Rectifier Heater Secondary	(L20)	Very low
Mains Transformer H.T. Secondary ..	(L21)	255 ohms
Mains Transformer Valve Heater Secondary	(L22)	Very low
Mains Transformer Primary, 250 v. tap	(L23)	19·0 ohms



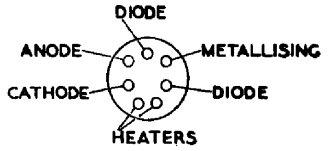
UNDERSIDE OF HOLDER
FOR A.36.B. VALVE

Fig. 1.



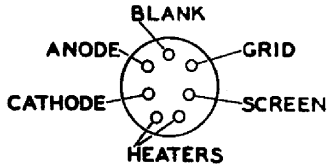
UNDERSIDE OF HOLDER
FOR A.50.P. VALVE

Fig. 2.



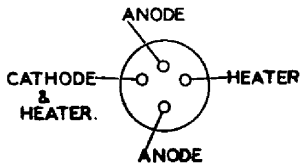
UNDERSIDE OF HOLDER
FOR A.23.A. VALVE.

Fig. 3.



UNDERSIDE OF HOLDER
FOR A.70.D. VALVE

Fig. 4.



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

Fig. 5.

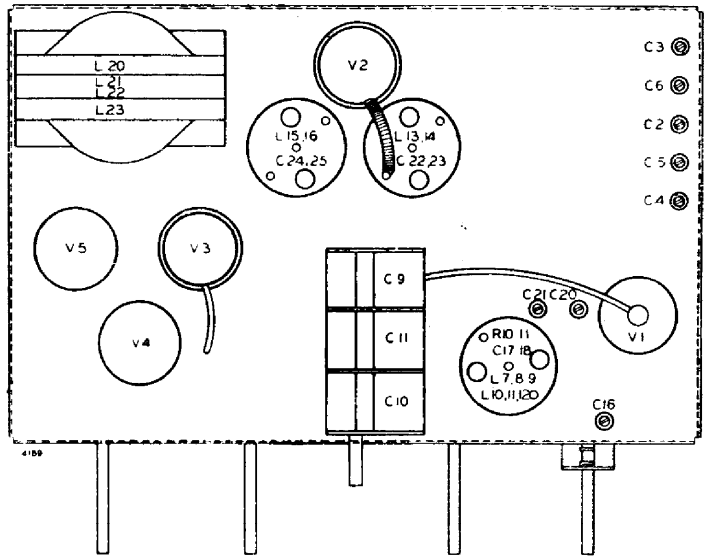


Fig. 6.

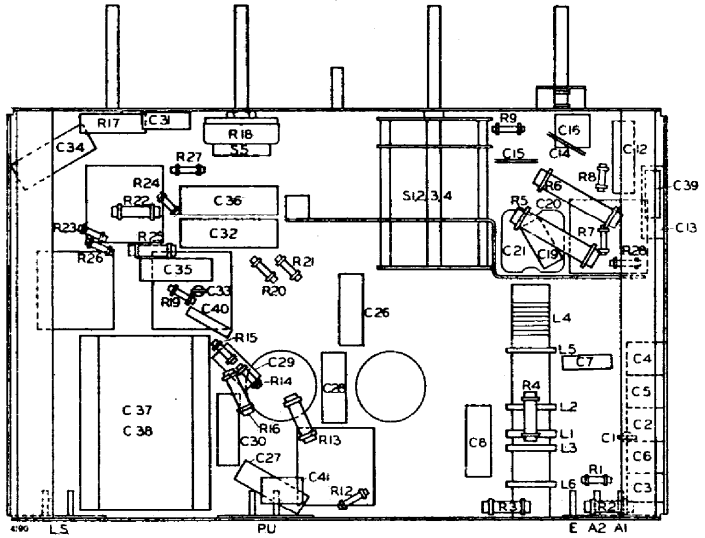
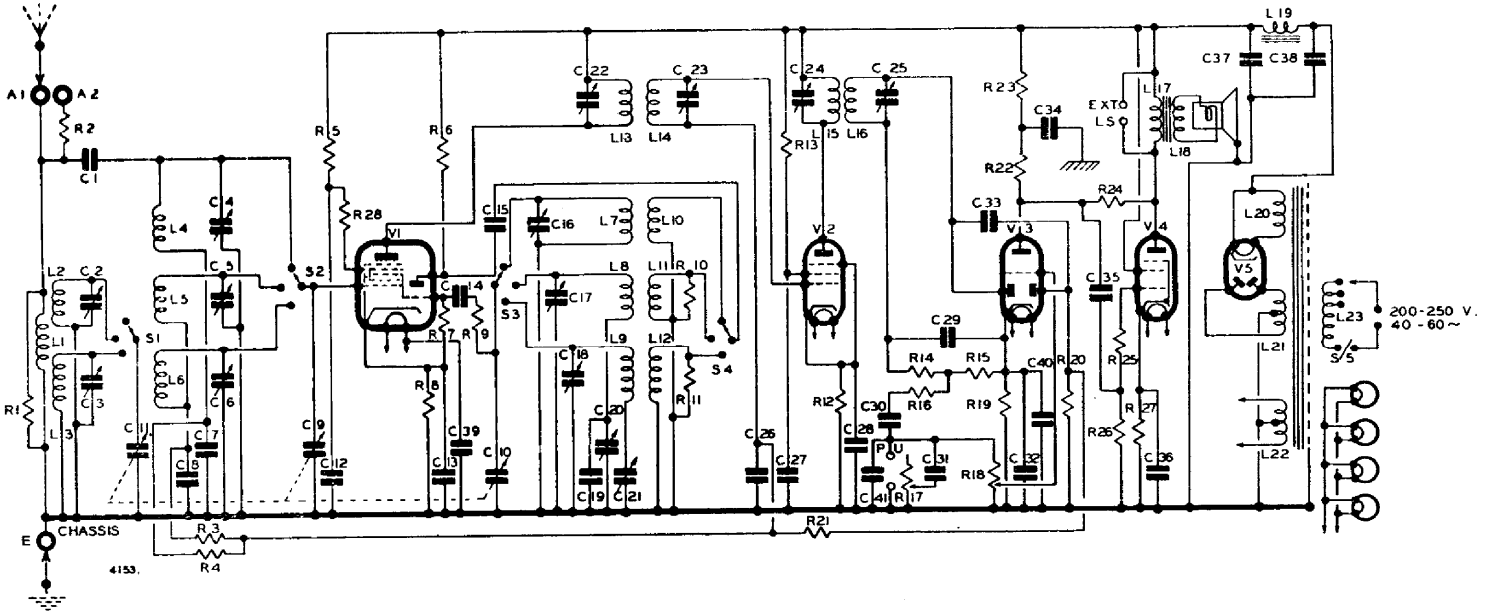


Fig. 7.



CIRCUIT DIAGRAM

Fig. 8.