

# LISSEN

## SERVICE MANUAL FOR 5 VALVE 3 BAND PRESS BUTTON SUPERHET MAINS RECEIVER MODEL 8453

### Circuit Alignment Procedure for Receiver Type 8453.

#### Intermediate Frequency Circuit Alignment.

- (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  $\mu$ F. 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 (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 and also the automatic position, 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 and 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-adjust 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 frequency 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.

#### Push Button Alignment.

The wavelength of each of the seven push buttons is adjustable within certain limits, by means of the pairs of trimmers which may be reached by removing the small panel from the right-hand side of the receiver. The adjustment range of each button, as shown on the trimmer board, is as follows:—

Button	1	...	...	...	Mains	...	On-off
"	2	...	...	...	200	...	300 m.
"	3	...	...	...	200	...	300 m.
"	4	...	...	...	290	...	445 m.
"	5	...	...	...	350	...	480 m.
"	6	...	...	...	470	...	535 m.
"	7	...	...	...	850	...	1,460 m.
"	8	...	...	...	1,300	...	1,665 m.

To receive a certain wavelength on push button apply that signal to the A and E sockets of the receiver. With the appropriate button pressed, adjust the corresponding oscillator trimmer, which is on the left of the panel, to receive this signal. Then adjust the signal circuit trimmer for maximum output. Check each circuit by going over the trimmers in the same order again.

# SERVICE DATA FOR MODEL No. 8453.

## RESISTANCES

Code	Description	Part No.	Value
R1	A2 Potentiometer, Part	71,963	11,000 ohm. 1 watt
R2	A2 Potentiometer, Part	71,962	110,000 ohm. 1 watt
R3	A.V.C. Decoupling	71,962	110,000 ohm. 1 watt
R4	A.V.C. Decoupling	71,962	110,000 ohm. 1 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. 1 watt
R8	V1 Bias	71,969	150 ohm. 1 watt
R9	S.W. Het. Voltage Control	71,945	200 ohm. 1 watt
R10	M.W. Het. Voltage Control	71,967	1,100 ohm. 1 watt
R11	L.W. Het. Voltage Control	71,982	2,100 ohm. 1 watt
R12	V2 Bias	71,960	250 ohm. 1 watt
R13	V2 Screen Feed	24,756	25,000 ohm. 1 watt
R14	Signal Diode Load, Part	71,944	510,000 ohm. 1 watt
R15	Signal Diode Load, Part	71,945	260,000 ohm. 1 watt
R16	I.F. Stopper	71,962	110,000 ohm. 1 watt
R17	Tone Control	81,509	2 megohm. Vari.
R18	Volume Control	81,504	500,000 ohm. Vari.
R19	V3 Bias	71,914	1,000 ohm. 1 watt
R20	A.V.C. Diode Load	71,900	1-1 megohm. 1 watt
R21	A.V.C. Decoupling	71,945	260,000 ohm. 1 watt
R22	V3 Anode Load	71,955	40,000 ohm. 1 watt
R23	V3 Anode Decoupling	71,963	11,000 ohm. 1 watt
R24	Reverse Feed Back Coupling	71,911	250,000 ohm. 1 watt
R25	V4 Grid Stopper	71,962	110,000 ohm. 1 watt
R26	V4 Grid Leak	71,944	510,000 ohm. 1 watt
R27	V4 Bias	71,969	150 ohm. 1 watt
R28	F.C. Screen Stopper	89,502	75 ohm. 1 watt
R29	Press Burton Het. Voltage Control	71,988	5,100 ohm. 1 watt

## VALVES

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

## RECEIVER TYPE 8453

### 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	(L10)	Very low
M.W. Tickler	(L11)	6.1 ohms
L.W. Tickler	(L12)	8.4 ohms
M.W. Push-Button Signal Circuit Coil	(L25)	2.5 ohms
L.W. Push-Button Signal Circuit Coil	(L24)	11.2 ohms
M.W. Push-Button Oscillator Circuit Coil	(L26)	2.5 ohms
L.W. Push-Button Oscillator Circuit Coil	(L27)	7.4 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

## CONDENSERS

Code	Description	Part No.	Value
C1	S.W. Aerial Coupling	71,262	10 mmfd.
C2	M.W. B.P. Primary Trimmer	82,500	40 mmfd. Max. ceramic
C3	L.W. B.P. Primary Trimmer	82,501	90 mmfd. Max. ceramic
C4	S.W. Aerial Trimmer	82,500	40 mmfd. Max. ceramic
C5	M.W. B.P. Secondary Trimmer	82,500	40 mmfd. Max. ceramic
C6	L.W. B.P. Secondary Trimmer	82,501	90 mmfd. Max. ceramic
C7	S.W. Tracking	68,005	.01 mfd. Paper
C8	A.V.C. Decoupling	68,009	.1 mfd. Paper
C9			
C10	Triple Gang	80,509	—
C11			
C12	V1 Screen By-pass	68,009	.1 mfd. Paper
C13	V1 Cathode	68,009	.1 mfd. Paper
C14	V1 Oscillator Grid Coupling	66,513	.0001 mfd. Mica
C15	V1 Oscillator Anode Coupling	66,515	.0003 mfd. Mica
C16	S.W. Oscillator Trimmer	82,503	20 mmfd. Max. ceramic
C17	M.W. Oscillator Trimmer	80,000	100 mmfd. Max. ceramic
C18	L.W. Oscillator Trimmer	80,000	100 mmfd. Max. ceramic
C19	M.W. Padder, Fixed	66,521	.0005 mfd. Mica
C20	M.W. Padder, Variable	82,505	250 mmfd. Max. ceramic
C21	L.W. Padder, Variable	82,505	250 mmfd. Max. ceramic
C22			
C23	I.F. Trimmers	80,001	300 mmfd. Max.
C24			
C25			
C26	A.V.C. Decoupling	68,009	.1 mfd. Paper
C27	V2 Screen By-pass	68,009	.1 mfd. Paper
C28	V2 Cathode By-pass	68,009	.1 mfd. Paper
C29	Signal Diode Load By-pass	66,512	.00005 mfd. Mica
C30	L.F. Coupling	68,008	.05 mfd. Paper
C31	Tone Control	25,656	.002 mfd. Paper
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. 350 v. peak, Elec.
C35	L.F. Coupling	68,008	.05 mfd. Paper
C36	V4 Cathode Decoupling	67,005	50 mfd. 12 v. peak, Elec.
C37	H.T. Smoothing	67,502	16 mfd. 350 v. peak, Elec.
C38	V5 Reservoir	67,502	8 mfd. 350 v. peak, Elec.
C39	M.W. Automatic Circuit Aerial Coupling	71,262	10 mmfd.
C40	L.W. Automatic Circuit Aerial Coupling	71,262	10 mmfd.
C41	Button 2, Signal Circuit Trimmer	80,512	100 mmfd. Max.
C42	Button 3, Signal Circuit Trimmer	80,512	100 mmfd. Max.
C43	Button 4, Signal Circuit Trimmer	80,514	300 mmfd. Max.
C44	Button 4, Signal Circuit Trimmer, fixed	66,541	50 mmfd. S.M.
C45	Button 5, Signal Circuit Trimmer	80,514	300 mmfd. Max.
C46	Button 5, Signal Circuit Trimmer, fixed	66,542	100 mmfd. S.M.
C47	Button 6, Signal Circuit Trimmer	80,514	300 mmfd. Max.
C48	Button 6, Signal Circuit Trimmer, fixed	66,544	200 mmfd. S.M.
C49	Button 7, Signal Circuit Trimmer	80,514	300 mmfd. Max.
C50	Button 8, Signal Circuit Trimmer	80,514	300 mmfd. Max.
C51	Button 8, Signal Circuit Trimmer, fixed	66,544	200 mmfd. S.M.
C52	Automatic Circuit Oscillator Coupling	66,544	200 mmfd. S.M.
C53	Button 2, Oscillator Circuit Trimmer	80,512	100 mmfd. Max.
C54	Button 3, Oscillator Circuit Trimmer	80,512	100 mmfd. Max.
C55	Button 4, Oscillator Circuit Trimmer	80,514	300 mmfd. Max.
C56	Button 5, Oscillator Circuit Trimmer	80,514	300 mmfd. Max.
C57	Button 6, Oscillator Circuit Trimmer	80,514	300 mmfd. Max.
C58	Button 6, Oscillator Circuit Trimmer, fixed	66,546	300 mmfd. S.M.
C59	Button 7, Oscillator Circuit Trimmer	80,512	100 mmfd. Max.
C60	Button 8, Oscillator Circuit Trimmer	80,512	100 mmfd. Max.
C61	Button 5, Oscillator Circuit Trimmer, fixed	66,541	50 mmfd. S.M.
C62	V1 Heater H.F. By-pass	68,003	.005 mfd.
C63	V3 Cathode By-pass	66,521	.0005 mfd. Mica
C64	I.F. By-pass	66,513	.0001 mfd. Mica

S.M. denotes Silvered Mica type.

## INDUCTANCES

Code	Description	Part No.	Value
L1, L2	Signal Frequency Manual Coil	78,505	—
L3, L4			
L5, L6			
L7, L8			
L9, L10	Oscillator Frequency Manual Coil	78,523	—
L11, L12			
L13, L14			
L15, L16	1st I.F. Transformer	77,501	—
L17, L18	2nd I.F. Transformer	77,503	—
	Output Transformer on Speaker	—	—
L19	Smoothing Choke	79,501	—
L20, L21	Mains Transformer	77,541	—
L22, L23			
L24, L25			
L26, L27	Signal Frequency Automatic Coil	78,518	—
	Oscillator Frequency Automatic Coil	78,519	—

## SWITCHES

Code	Description	Part No.	Value
S1, S2	4-Position Oak Switch	83,509	—
S3, S4			
S5, S6			
B1, B2			
B3, B4			
B5, B6			
B7, B8	8-Button Push-Button Switch	83,517	—

## VOLTAGE AND CURRENT MEASUREMENTS FOR RECEIVER TYPE 8453

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.
I.F. Amplifier A50P	Ec 2.6 v.	Ic 17.4 mA.
	Ea 273 v.	Ia 8.1 mA.
	Es 191 v.	Is 2.9 mA.
L.F. Amplifier A23A	Ec 2.3 v.	Ic 11.0 mA.
	Ea 128 v.	Ia 2.6 mA.
	Ec 2.7 v.	Is 5.0 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 274 v.  
Main H.T. current 73 mA.  
Normal Input current 0.3 Amp. R.M.S.

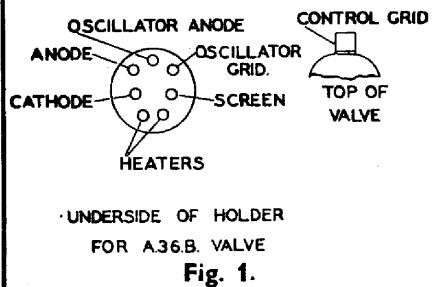


Fig. 1.

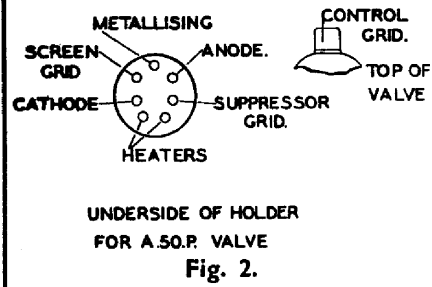


Fig. 2.

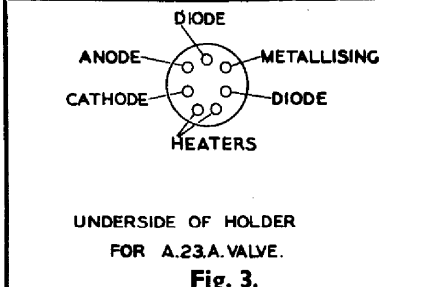


Fig. 3.

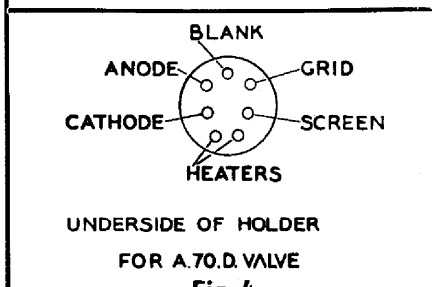


Fig. 4.

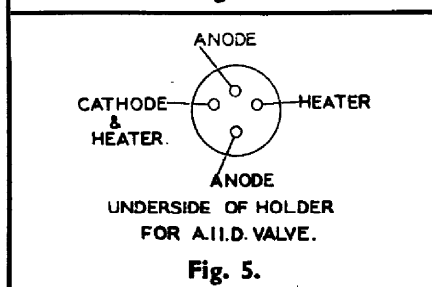


Fig. 5.

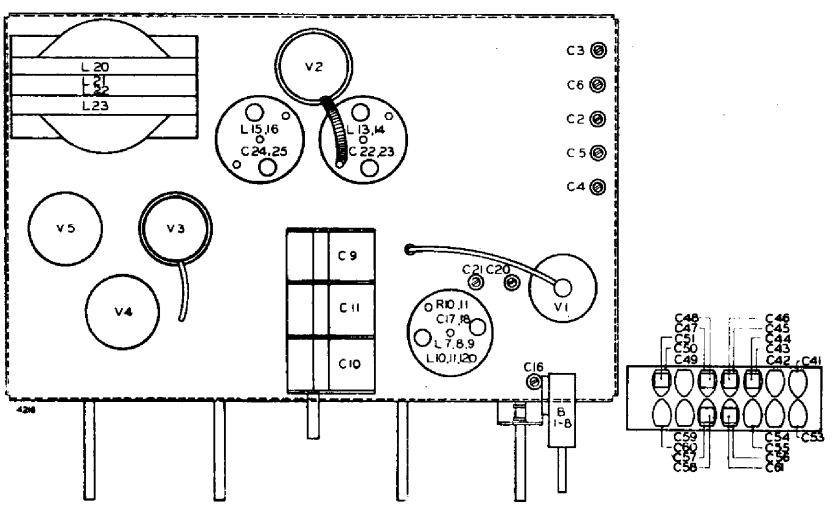


Fig. 6.

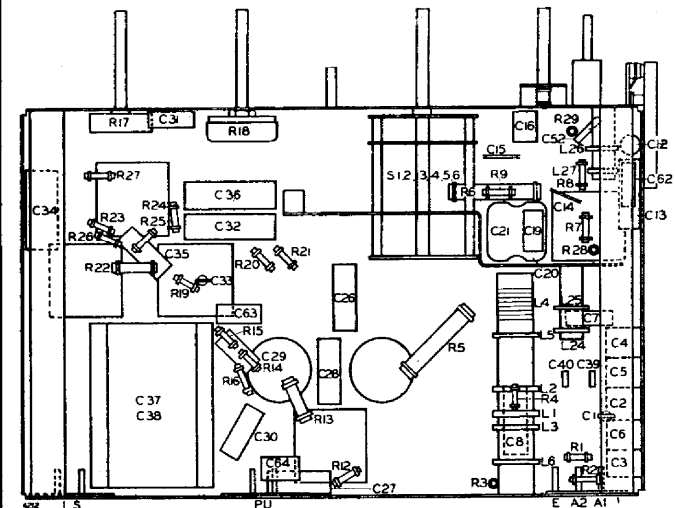
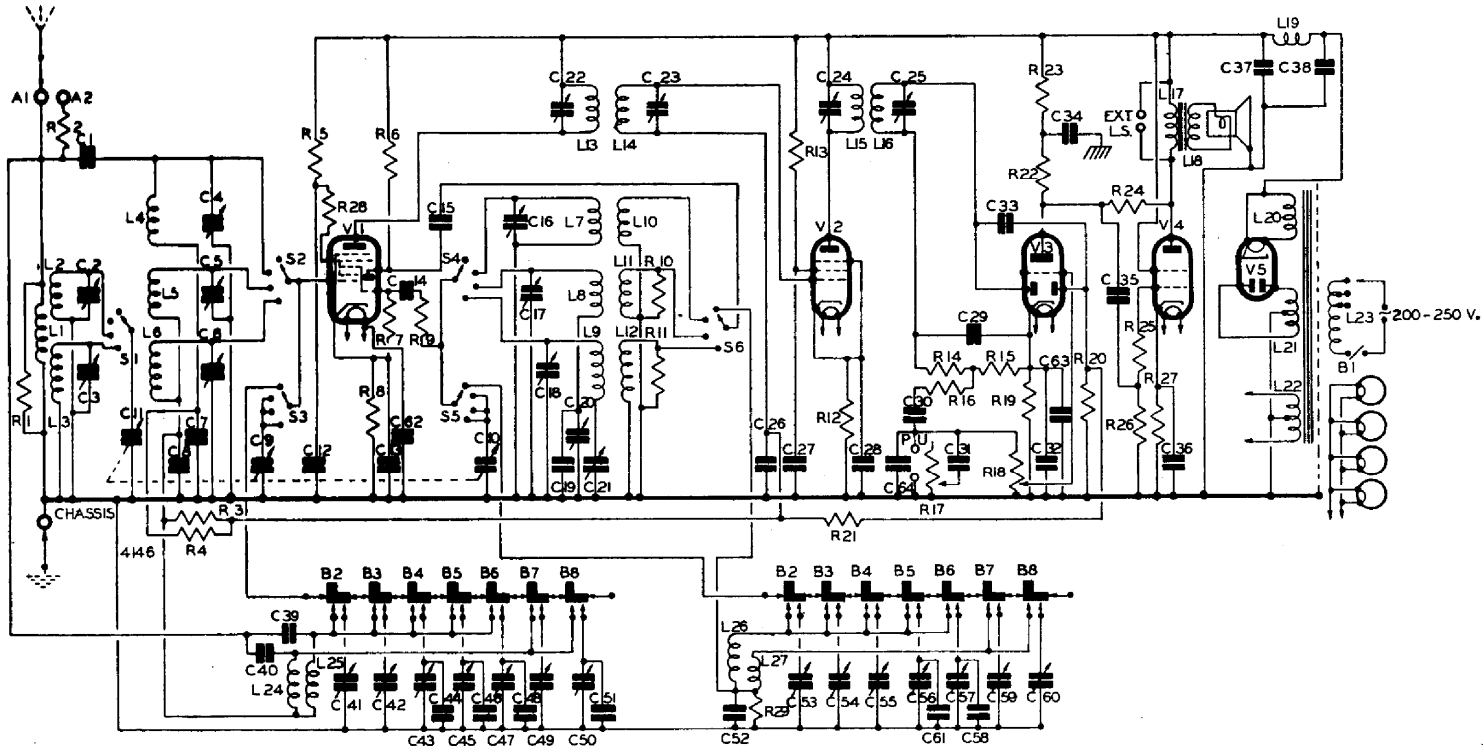


Fig. 7.



CIRCUIT DIAGRAM

Fig. 8.