

LISSEN

SERVICE MANUAL FOR 5 VALVE, 3 BAND SUPERHET MAINS RECEIVER MODEL 8317

TECHNICAL SPECIFICATION

THE Lissen Model No. 8317 is a three-band superhet receiver for A.C. mains operation (200-250 volts, 40-100 cycles).

Valves are as follows:—

Frequency changer
Ever Ready A36B (Triode hexode).

I.F. Amplifier
Ever Ready A50P (Variable- μ H.F.
Pentode).

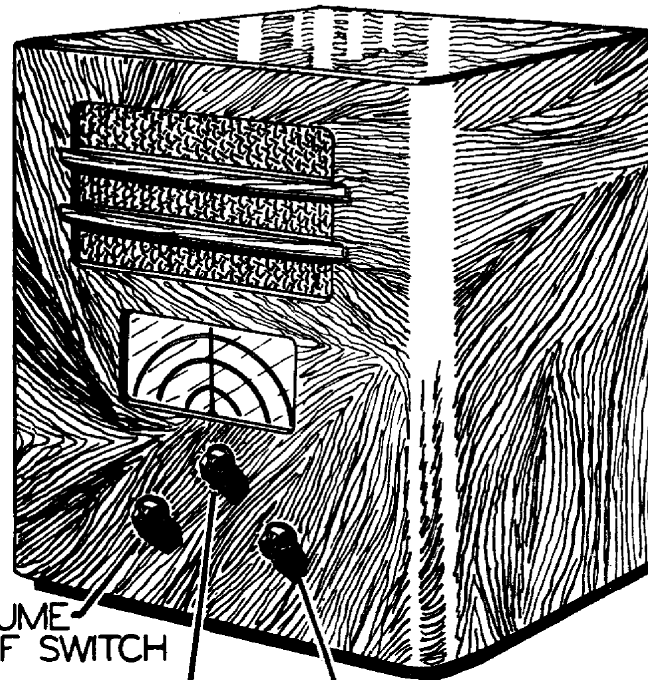
Detector and A.V.C.
Ever Ready A20B (Double diode).

Output Valve
Ever Ready A70D (High slope Pentode).

Rectifier
Ever Ready A11D (Double diode).

An inductively coupled band-pass filter precedes the frequency changer on long and medium waves; on short waves the aerial is coupled direct to the signal frequency coil through a condenser (C14).

The grid coils in the oscillator circuits are tuned, and the oscillator frequency is higher than the signal frequency on medium and long waves, and lower on short waves.



VOLUME
& OFF SWITCH
TUNING
SELECTOR SWITCH

The primary of the 1st I.F. transformer forms the anode load of the frequency changer, and this winding, in common with the other I.F. coils, is tuned to 455 Kc/s.

The anode circuit of the I.F. amplifier includes the primary of the second I.F. transformer, the secondary of which is connected direct to the signal diode, and through a small condenser to the A.V.C. diode. The latter applies the A.V.C. potential via decoupled circuits to the grid of the frequency changer and I.F. valves.

The audio output from the signal diode is applied to the grid of the output pentode via a condenser (C28). The maximum undistorted output from the L.F. pentode is 2 watts.

The H.T. rectifier circuit is conventional and the speaker field is used as a smoothing choke.

Wavelengths covered by the 8317 receiver are as follows:—

Long waves ...	850 to 1,920 metres.
Medium waves	198 to 580 metres.
Short waves ...	19 to 50 metres.

The wavechange switches are in position "A" on short waves, "B" on medium waves, and "C" on long waves.

SERVICE DATA FOR MODEL NO. 8317.

CONDENSERS

Code	Description	Part No.	Values
C1	M.W. B.P.1 Trimmer	82,500	5/40 mmfd.
C2	L.W. B.P.1 Trimmer	82,501	40/100 mmfd.
C3	M.W. B.P.2 Trimmer	82,500	5/40 mmfd.
C4	L.W. B.P.2 Trimmer	82,501	40/100 mmfd.
C5	S.W. Aerial Trimmer	82,500	5/40 mmfd.
C6	S.W. Oscillator Trimmer	82,500	5/40 mmfd.
C7	M.W. Oscillator Trimmer	82,500	5/40 mmfd.
C8	L.W. Oscillator Trimmer	82,501	40/100 mmfd.
C9	M.W. Padder	82,502	300/600 mmfd.
C10	L.W. Padder	80,503	200/400 mmfd.
C11	L.W. Padder		
C12	Triple Gang	80,503	540 mmfd. Max.
C13			
C14	S.W. Aerial Coupling	71,262	10 mmfd.
C15	S.W. Padder	68,005	.01 mfd.
C16	A.V.C. Decoupling	68,020	.1 mfd.
C17	F.C. Screen Decoupling	68,020	.1 mfd.
C18	F.C. Cathode By-pass	68,020	.1 mfd.
C19	F.C. Oscillator Grid	66,035	.0001 mfd.
C20	F.C. Oscillator Anode		
	Decoupling	68,020	.1 mfd.
C21	A.V.C. Decoupling	68,020	.1 mfd.
C22			
C23	I.F. Trimmers on I.F.T. Assembly		
C24			
C25			
C26	I.F. Screen By-pass	68,020	.1 mfd.
C27	I.F. Bias By-pass	68,020	.1 mfd.
C28	L.F. Coupling	68,014	.05 mfd.
C29	Signal Diode Load By-pass	66,038	.0002 mfd.
C30	A.V.C. Coupling	71,262	10 mfd.
C31	Output Bias By-pass	67,005	50 mfd., P.V.12
C32	Tone Correction	68,502	.005 mfd.
C33	H.T. Smoothing	67,031	8 + 8 mfd., 540 Peak
C34			

SWITCHES

Code	Description	Part No.	Values
S1	B.P.1	83,502	Wave Range Switch
S2	B.P.2		
S3	Oscillator Grid		
S4	Oscillator Anode		
S5	Mains Switch Ganged to Volume Control		

VALVES

Code	Description	Part No.	Values
V1	Frequency Changer	4,093	Ever Ready A36B
V2	Pentode I.F. Amplifier	4,083	Ever Ready A50P
V3	Double Diode Triode	4,066	Ever Ready A20B
V4	Output Pentode	4,085	Ever Ready A70D
V5	Rectifier	4,084	Ever Ready A11D

OPERATING CONDITIONS OF VALVES

Electrode	A36B		A50P		A70D		A11D
	Volts	mA.	Volts	mA.	Volts	mA.	
Anode	244	1.5	244	8.8	234	34.3	307 + 307 v.
Screen	65	3.3	153	3.2	244	5.3	—
Osc. Anode	97	7.0	—	—	—	—	—
Cathode	1.6	11.6	1.1	12.0	5.8	39.5	351 V. 70 mA.

NOTE.—All voltage readings are to CHASSIS, made with an Avometer on the 1,200-volt range for all voltages above 50 volt.

Primary Current 0.3 amp. at 225 volts input.

RESISTANCES

Code	Description	Part No.	Values
R1	A.V.C. Decoupling	71,962	110,000 ohm. ½ watt
R2	A.V.C. Decoupling	71,962	110,000 ohm. ½ watt
R3	V1 Screen Potentiometer	71,928	20,000 ohm. 1 watt
R4	V1 Screen Potentiometer	71,935	5,000 ohm. ½ watt
R5	V1 Oscillator Grid Leak	71,974	26,000 ohm. ½ watt
R6	V1 Bias	71,969	150 ohm. ½ watt
R7	M.W. Oscillator Volts Modifier	71,914	1,000 ohm. ½ watt
R8	L.W. Oscillator Volts Modifier	71,982	2,100 ohm. ½ watt
R9	V1 Decoupling	72,011	10,000 ohm. 2 watt
R10	A.V.C. Decoupling	71,962	110,000 ohm. ½ watt
R11	V2 Bias	71,957	100 ohm. ½ watt
R12	V2 Screen Feed	24,756	25,000 ohm. ½ watt
R13	Signal Diode Load	71,944	510,000 ohm. ½ watt
R14	Volume Control	81,502	500,000 ohm
R15	A.V.C. Diode Load	71,944	510,000 ohm. ½ watt
R16	Output Grid Stopper	71,978	21,000 ohm. ½ watt
R17	Output Bias	71,969	150 ohm. ½ watt
R18	A2 Potentiometer	71,962	110,000 ohm. ½ watt
R19	A2 Potentiometer	71,963	11,000 ohm. ½ watt
R20	S.W. Oscillator Grid Stopper	71,943	200 ohm. ½ watt

INDUCTANCES

Code	Description	Part No.	Values
L1	M. and L.W. Primary	78,505	Signal Frequency Coil
L2	M.W. B.P.1		
L3	L.W. B.P.1		
L4	S.W. Aerial		
L5	M.W. B.P.2		
L6	L.W. B.P.2	78,509	Oscillator Frequency Coil
L7	S.W. Grid		
L8	M.W. Grid		
L9	L.W. Grid		
L10	S.W. Tickler		
L11	M.W. Tickler	77,501	1st I.F. Transformer
L12	L.W. Tickler		
L13	1st I.F. Primary Coil		
L14	1st I.F. Secondary Coil	77,503	2nd I.F. Transformer
L15	2nd I.F. Primary Coil		
L16	2nd I.F. Secondary Coil	85,508	
L17	Speaker Field, 1,500 ohm cold		
T1	Output Transformer on Speaker	77,505	
T2	Mains Transformer		

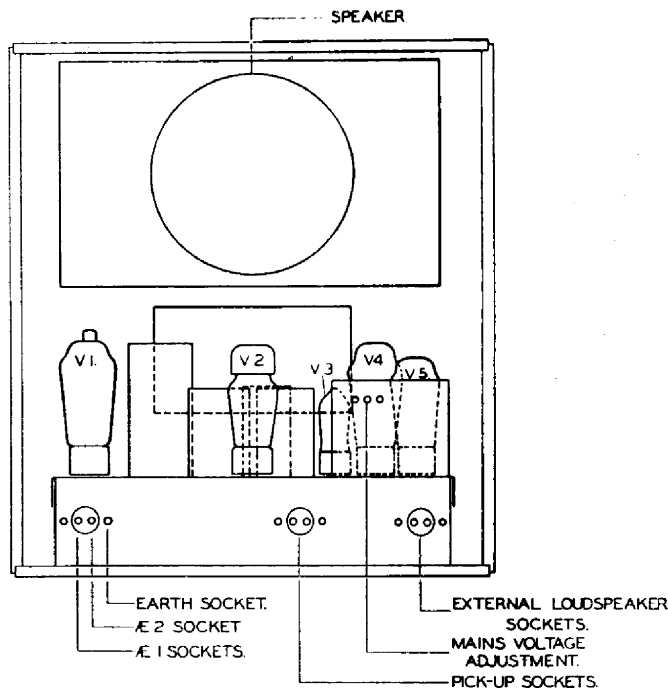
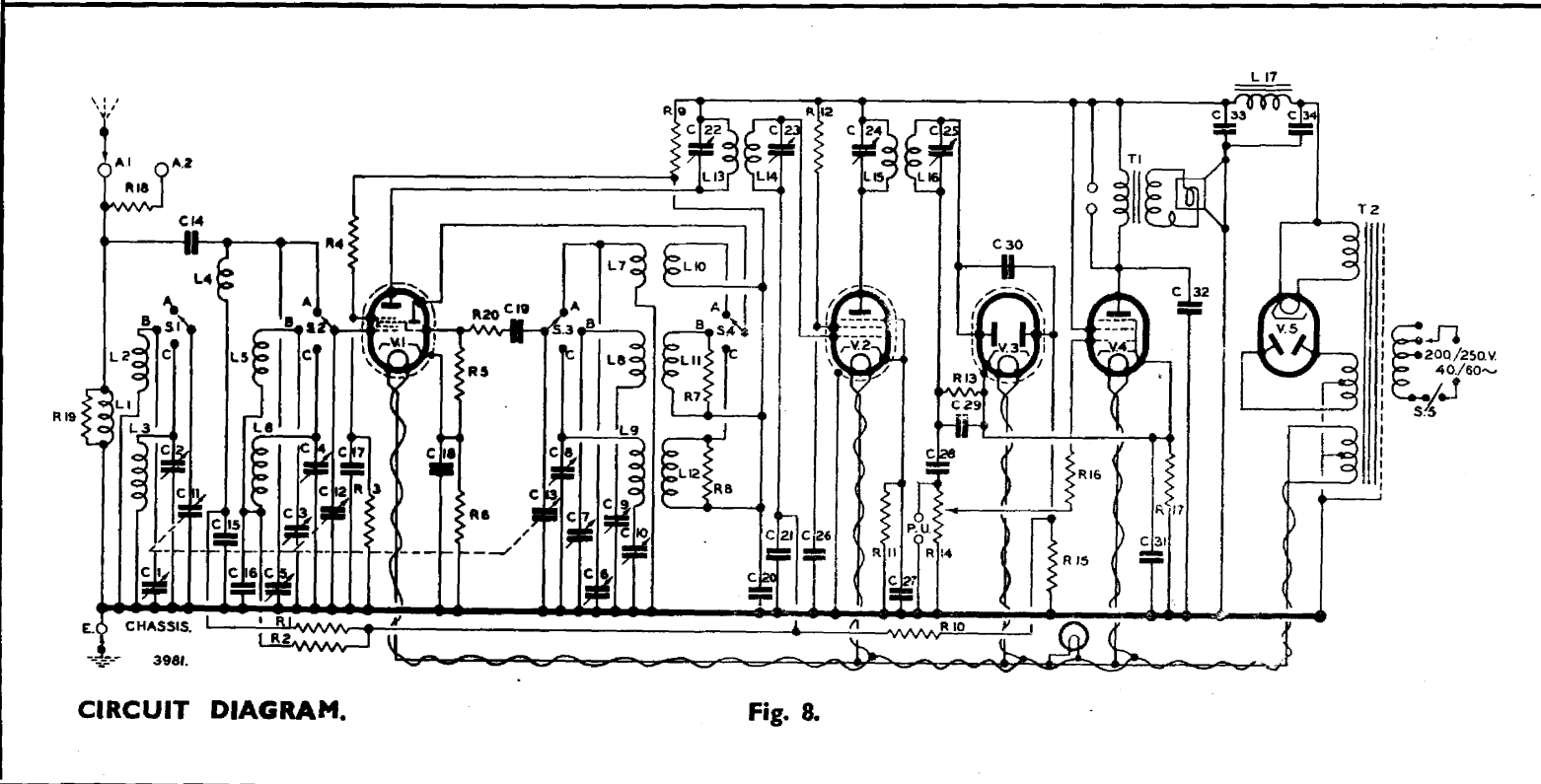
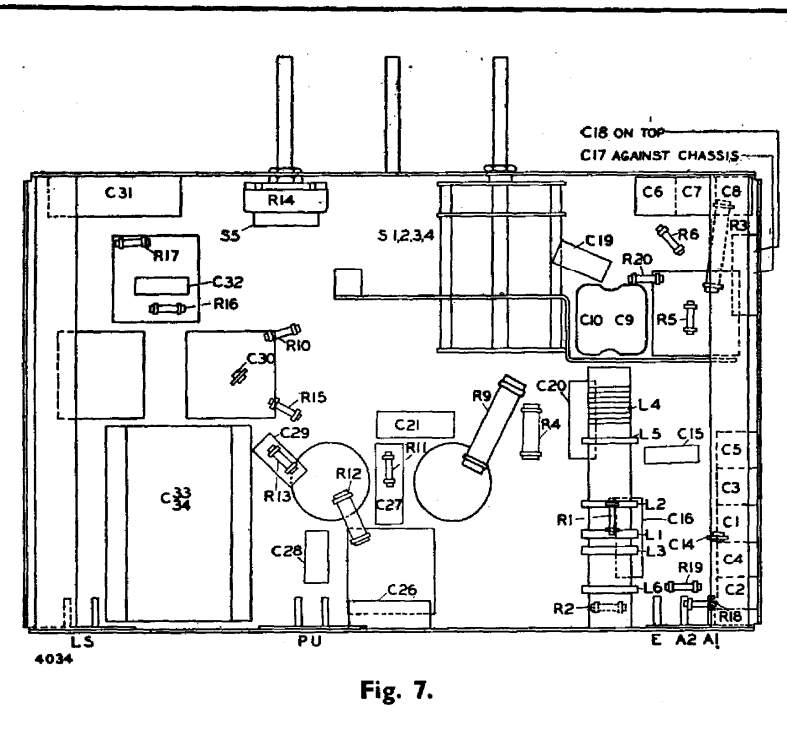
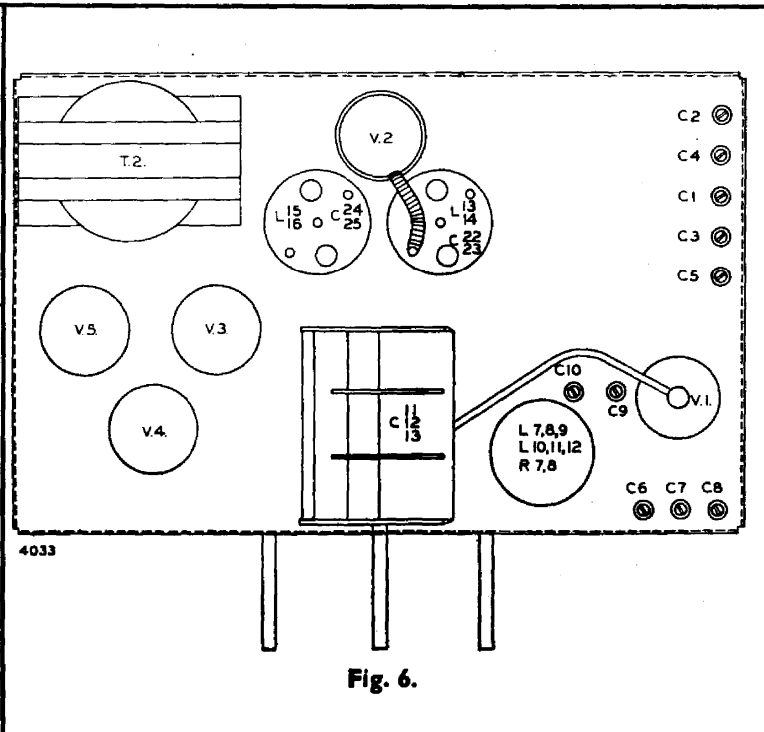
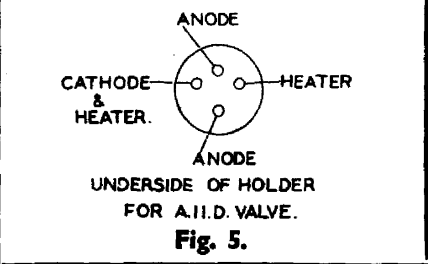
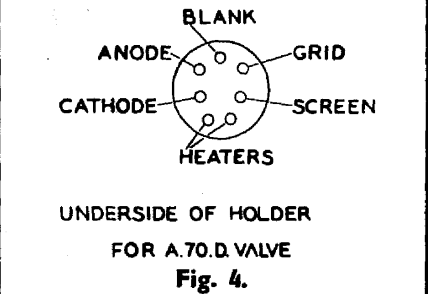
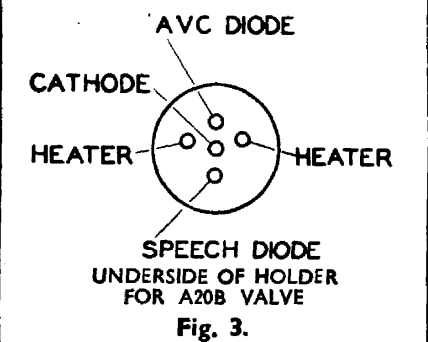
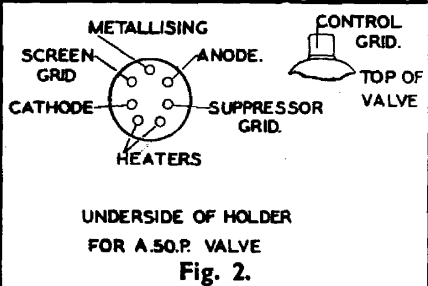
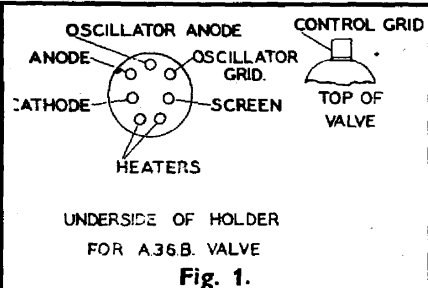


Fig. 9.



SPARE PARTS PRICE LIST FOR MODEL 8317.

Prices are subject to alteration without notice. Postage and Packing extra.

Part No.	Description and Circuit Indication	List Price
63532	Cabinet, complete with Baffle, etc.	37/6
73613	Card Back for Cabinet	1/6
78505	Coil, Aerial (L1, L2, L3, L4, L5, L6)	6/6
78509	" Anode (L7, L8, L9, L10, L11, L12, R7, R8)	6/-
67005	Condenser, Tubular 50 mfd. (C31)	2/3
68020	" (C26) (C27) " 1 mfd. (C16) (C17) (C18) (C20) (C21)	1/4
68005	Condenser, Tubular .01 mfd. (C15)	1/-
68502	" " .005 mfd. (C32)	1/-
71262	" Mica 10 mmfd. (C14) (C30)	1/6
68014	" " .05 mfd. (C28)	1/-
66035	" " .0001 mfd. (C19)	8d.
66038	" " .0002 mfd. (C29)	8d.
67031	" " Block 8 + 8 mfd. (C33, C34)	7/6
80503	Gang Condenser, 3-stage (C11, C12, C13)	18/9
55006	Knob, Tuning... ..	3d.
57040	" L.M.S.	3d.
55023	" Volume and Off	3d.
60504	Mains Lead	9d.
71012	Plug for Earth	3d.
71013	" " Aerial	3d.
77505	Transformer, Mains (T2)	25/-
4093	Valve (V1) Ever Ready A36B	15/-
4083	" (V2) " " A50P	12/6
4066	" (V3) " " A20B	5/6
4085	" (V4) " " A70D	13/6
4084	" (V5) " " A11D	10/6
82500	Trimmer 5—40 mmfd. (C1) (C3) (C5) (C6) (C7)	8d.
82501	" " 40—100 mmfd. (C2) (C4) (C8)	1/-
82502	Padder 300—600 and 200—400 mmfd. (C9, C10)	3/-
77501	1st I.F. Transformer (L13, L14)	7/-
77503	2nd I.F. Transformer (L15, L16)	7/-
71935	Resistor, 5,000 ohms 1/2 watt (R4)	1/-
71974	" 26,000 ohms 1/2 watt (R5)	1/-
71957	" 100 ohms 1/2 watt (R11)	1/-
71944	" 510,000 ohms 1/2 watt (R15) (R13)	1/-
71978	" 21,000 ohms 1/2 watt (R16)	1/-
71963	" 11,000 ohms 1/2 watt (R19)	1/-
71962	" 110,000 ohms 1/2 watt (R1) (R2) (R10) (R18)	1/-
71928	" 20,000 ohms 1 watt (R3)	1/-
24756	" 25,000 ohms 1/2 watt (R12)	1/-
72011	" 10,000 ohms 2 watt (R9)	1/-
71969	" 150 ohms 1/2 watt (R17) (R6)	1/-
71943	" 200 ohms 1/2 watt (R20)	1/-
50060	Scale Pointer	3d.
73622	" Lamp 12 m/m., 4.5 volt, .3 amp.	6d.
71245	" Lamp Holder	6d.
73603	" Window (Glass)	3d.
90006	Socket Plate, P.U.	3d.
90002	" " L.S.	3d.
75516	" " Aerial	3d.
85508	Speaker, including Transformer	22/6
83502	Switch, Wave-change... ..	6/-
75505	Valve Holder, 4-pin	3d.
75506	" " 5-pin	4d.
75507	" " 7-pin	6d.
81502	Volume Control and Switch, On-Off	5/-
69517/21	Carton and Liner	5/6
74001	Instruction Booklet	1/-

CIRCUIT ALIGNMENT PROCEDURE FOR LISSEN 8317.

Note.—C1 and C2, etc., refer to trimmers as indicated in Service Manual, Fig. Nos. 6, 7 and 8.

I.F. Circuit Alignment.

(1) Short circuit the oscillator by clip leads across front section of gang condenser, C13.

(2) Apply a signal of 455 Kc/s. between frequency changer (V1) control grid and chassis. Trim each I.F. circuit to peak in the following order :—
C25, C24, C23, C22.

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

(4) Remove shorting clip from gang condenser.

R.F. Circuit Alignment.

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

Medium Waveband Alignment.

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

(2) Set condenser C9 approximately two-thirds in.

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

(4) Apply a signal of 214 metres to the A1 and E sockets of the receiver and adjust condenser C7 to receive the signal, then adjust condenser C3 to give maximum output, then adjust condenser C1 to give maximum output.

(5) Set pointer against 500-metre mark on the scale.

(6) Apply a signal of 500 metres and adjust condenser C9 to give maximum output on that signal.

(7) Re-set pointer against 214-metre mark and re-adjust condensers, C7, C3, C1 to give maximum output on the 214-metre signal.

(8) 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 slight adjustment to condenser C9.

(9) Check calibration at 214 metres, 300 metres and 500 metres.

Long Waveband Alignment.

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

(2) Set condenser C10 approximately one-third in.

(3) Set pointer against 1,200-metre mark on scale.

(4) Apply a signal of 1,200 metres to the A1 and E sockets of the receiver and adjust condenser C8 to receive the signal, then adjust condenser C4 to give maximum output and adjust C2 to give maximum output.

(5) Set pointer against 1,700-metre mark on scale.

(6) Apply a signal of 1,700 metres and adjust condenser C10 to give maximum output on that signal.

(7) Re-set pointer against 1,200-metre mark and re-adjust condensers C8, C4, C2 to give maximum output on the 1,200-metre signal.

(8) 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 condenser C10.

(9) Check calibration at 1,200 metres and 1,700 metres.

Short Waveband Alignment.

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

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

(3) Screw condenser C6 right in and then apply a signal of 15 Mc/s. Slowly unscrew C6 until this signal is heard. Care should be taken that the right peak is selected. Two peaks will be found with this trimmer. The correct one is the one with C6 at the higher capacity, in other words, it is the first peak found when unscrewing C6. Having selected the right peak adjust condenser C5 to give maximum output.

(4) Apply a signal of 7.5 Mc/s. and tune the receiver to this signal and adjust the end turn of inductance L4 (on signal frequency coil) to give maximum output on this signal.

(5) Re-set pointer to 15 Mc/s. mark and re-adjust condenser C6 and C5 to give maximum output on the 15 Mc/s. signal.

(6) Check calibration at 15 Mc/s.

Note.—On the short waveband the oscillator runs at the lower frequency and performance on this band depends upon the selection of the right peak of trimmer C6 when aligning at 15 Mc/s.