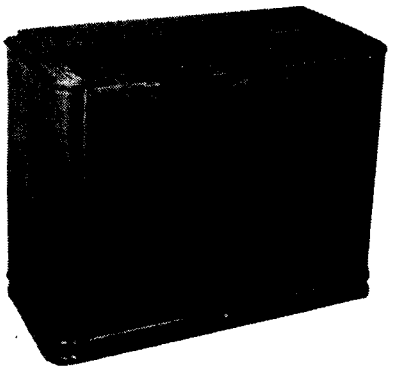
PHILIPS RADIOPLAYER

MODEL 178



SPECIFICATIONS

(Subject to alteration without notice)

Power Supply	200-250V, 40-50 c/s.
Tuning Ranges	530-1,620 kc/s. (B/C) 5.9-7.5 Mc/s (SW2) 9.3-12.4 Mc/s (SW1)
Intermediate Frequency	455 kc/s.
Cabinet	Radiogram
Record Changer	Philips type AG1000.

VALVE EQUIPMENT AND VOLTAGE ANALYSIS

Valve Function	Valve No.	Valve Type	Plate Volts	Screen Volts	Osc. P. Volts	Bias Volts
Frequency Converter	V1	6AN7	230	50	95	
I.F. Amplifier, A.V.C. and Demodulator	V2	6N8	230	75		
1st Audio Amplifier	V3	EF86	50	70		
2nd Audio Amplifier	V4A	12AT7	100	—		
Phase Splitter	V4B	12AT7	120	—		
Power Amplifier	V5	6M5	250	230		6.4
Power Amplifier	V6	6M5	250	230		6.4
H.F. Audio Amplifier	V9	6BD7	100	—		1.4
H.F. Power Amplifier	V10	6M5	215	225		7.6
Rectifier	V7	5V4G	Cathode — L15 C.T.,-255V.			
Tuning Indicator	V8	EM34	Target 230V.			
Dial Lamps (2), bezel lamp and gramo. lamp	V11, 12, 13 & 14		6.3V, 0.32A tubular screw			
Voltage across R42, –2.2V.						

NOTE: These voltages are measured with an "1,000 ohms per volt" meter and may vary ± 10% from the figures quoted. They are measured from the socket points indicated to chassis, or across the resistor listed. The receiver should be in a "no signal" condition.

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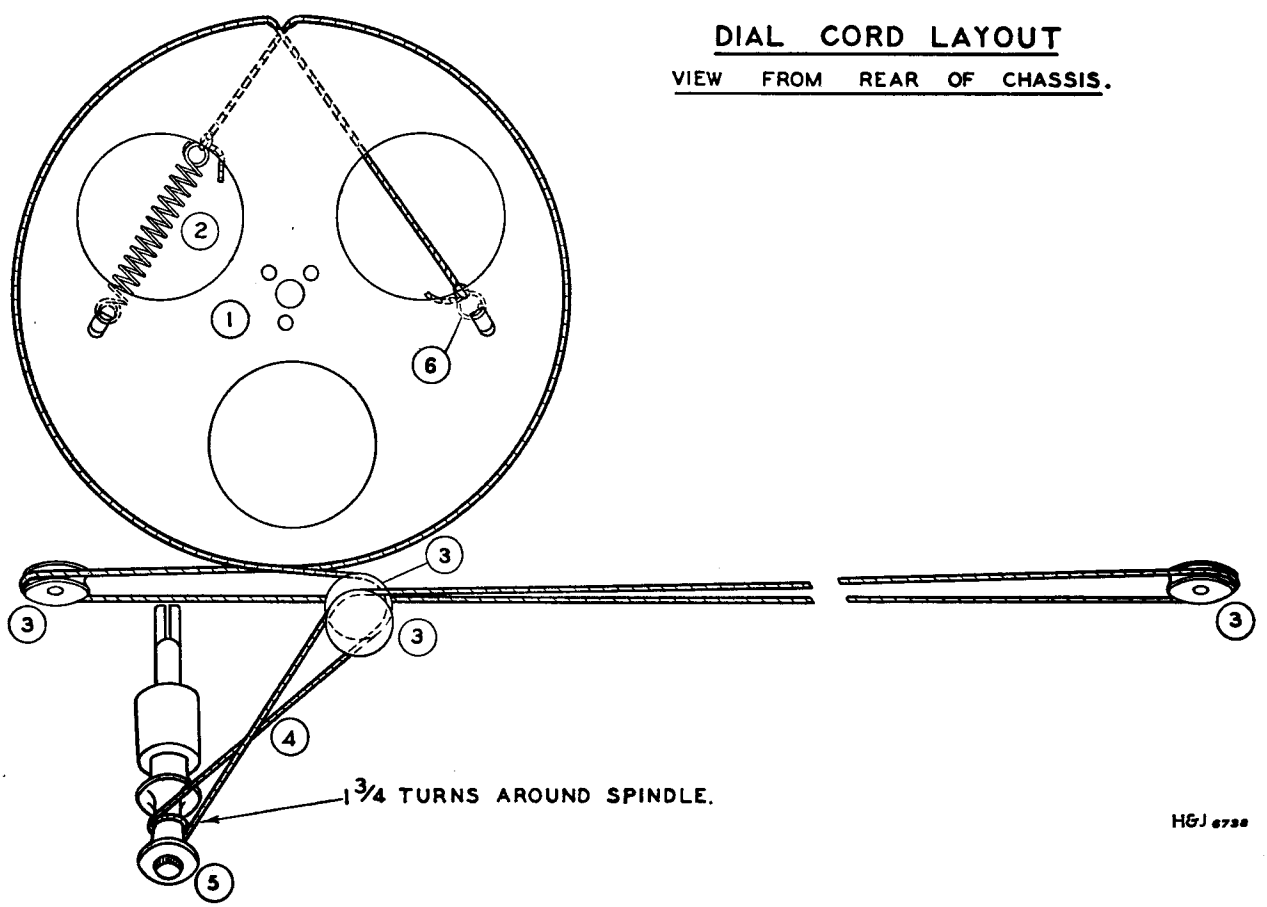
SERVICE DATA

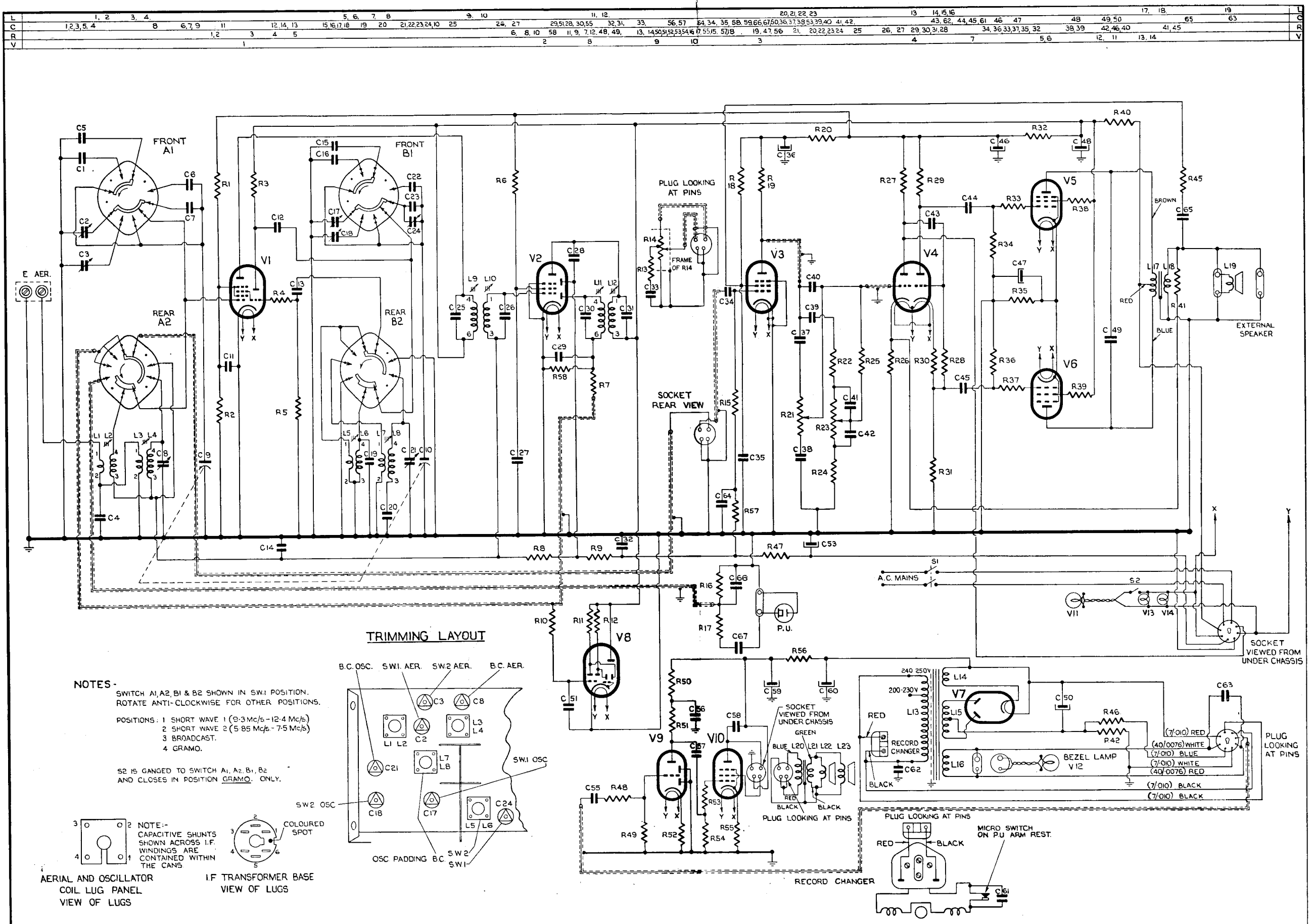
MISCELLANEOUS COMPONENTS

No. on Dial Cord Layout Drawing	Description	Code No.
—	Assembly, cursor	CR.480.659
5	Assembly, tuning spindle	CR.371.331
—	Assembly, W/C switch	CZ.201.401
—	Badge, Philips	CR.531.408
—	Bank, component lamp	CZ.210.107
—	Bank, on/off switch	CZ.210.108
—	Bezel (green)	CS.430.025
—	Clip, spring (on/off knob)	CS.281.832
4	Cord, dial drive	63" of cord required
1	Drum, dial	CS.360.007
—	Knob, control, 4x	CR.523.693
—	Knob, volume control	CS.432.629
—	Knob, on/off switch	CR.523.711
—	Lampholder, dial lamps, 2x	CZ.367.900
—	Lampholder, compartment lamp	C/F733-8-1
—	Lampholder, bezel lamp	CZ.367.920
—	Plug, male (gramo. unit power)	CZ.365.115
—	Plug, 2 pin polarised, 4x	C/F691-5-1
—	Plug, 4 pin (speaker)	*PS14
3	Pulley, dial, 4x	CS.359.602
—	Scale, dial	CS.412.386
—	Socket, female (gramo. unit power)	CZ.365.116
—	Socket, valve (noval)	C/F732-2-14
—	Socket, valve (octal)	C/F733-2-11
—	Socket, 2 pin polarised, 4x	C/F733-16-1
—	Socket, 4 pin (speaker)	SS24
2	Spring, dial drum	CS.210.021

DIAL CORD LAYOUT

VIEW FROM REAR OF CHASSIS.





TRIMMING LAYOUT

NOTES -

SWITCH A1, A2, B1 & B2 SHOWN IN SW.1 POSITION.
ROTATE ANTI-CLOCKWISE FOR OTHER POSITIONS.

POSITIONS: 1 SHORT WAVE 1 (9·3 Mc/s - 12·4 Mc/s)
2 SHORT WAVE 2 (5·85 Mc/s - 7·5 Mc/s)
3 BROADCAST.
4 GRAMO.

S2 IS GANGED TO SWITCH A1, A2, B1, B2 AND CLOSES IN POSITION GRAMO. ONLY.

NOTE:- CAPACITIVE SHUNTS SHOWN ACROSS I.F. WINDINGS ARE CONTAINED WITHIN THE CANS.

AERIAL AND OSCILLATOR COIL LUG PANEL VIEW OF LUGS

I.F TRANSFORMER BASE VIEW OF LUGS

PARTS LISTS

CAPACITORS

No.	Description	Code No.
C1, 16	310 pF mica 1%	CZ.065.719
C2, 3, 8, 17, 18, 21, 24	30 pF air trimmer	CZ.113.700
C4, 29	100 pF mica	
C5	105 pF mica 1%	CZ.065.723
C6, 22	900 pF mica 1%	CZ.065.720
C7	220 pF mica 1%	CZ.065.724
C9–10	2 gang tuning	CZ.107.746
C11, 44	0.02 mF 400V paper	
C12, 13	100 pF mica 10%	
C14, 32	0.05 mF 200V paper	
C15	65 pF mica 1%	CZ.064.111
C19	20 pF ceramic 1%	CZ.096.405
C20	475 pF mica 2%	CZ.066.119
C23	180 pF mica 1%	CZ.065.722
C25, 26	Part of I.F. transformer	
C27, 43	0.01 mF 400V paper	
C28	30 pF mica	
C30, 31	Part of I.F. transformer	
C33, 42,45, 51	0.02 mF 200V paper	
C34, 49, 61, 65	0.01 mF 600V paper	
C35	0.03 mF 400V paper	
C36	8 mF 300V electrolytic	
C37	150 pF mica 10%	
C38	0.0015 mF mica	
C39	0.05 mF 400V paper	
C40	20 pF mica	
C41	0.002 mF 400V paper	
C46, 48, 50, 59	24 mF 450V electrolytic	
C47, 53	25 mF 10V electrolytic	
C55, 57	0.001 mF 600V paper	
C56	0.1 mF 400V paper	
C58	500 pF mica	
C60	16 mF 450V electrolytic	
C62	0.005 mF 600V paper	
C63, 64	0.1 mF 200V paper	
C66	700 pF mica 10%	
C67	0.002 mF 600V paper	

All tolerances are 20% unless otherwise specified.

RESISTORS

No.	Description	Code No.
R1	47,000 ohms 1W carbon 10%	
R2, 3	33,000 ohms 1W carbon	
R4	100 ohms ½W carbon	
R5	39,000 ohms ½W carbon 10%	
R6	82,000 ohms 1W carbon 10%	
R7, 16, 19, 22,25, 49, 50, 51	100,000 ohms ½W carbon	
R8, 9, 10	2.2 megohms ½W carbon	
R11, 12, 15, 48, 57, 58	1 megohm ½W carbon	
R13	22,000 ohms ½W carbon	
R14	0.5 megohm carbon potentiometer, tapped at 50,000 ohms	CZ.029.148
R17, 28, 34, 36, 47	0.47 megohm ½W carbon	
R18	0.33 megohm ½W carbon	
R20, 27, 33, 37, 53	47,000 ohms ½W carbon	
R21	1 megohm carbon potentiometer	CZ.029.312
R23	1 megohm carbon potentiometer	CZ.029.311
R24	10,000 ohms ½W carbon	
R26	1,000 ohms ½W carbon 10%	
R29, 31	47,000 ohms ½W carbon 10%	
R30	2,200 ohms ½W carbon 10%	
R32	10,000 ohms 1W carbon	
R35	82 ohms 1W W/W 10%	
R38, 39	47 ohms ½W carbon	
R40, 56	1,000 ohms 1W carbon 10%	
R41	22,000 ohms ½W carbon 10%	
R42	18 ohms ½W W/W 10%	
R45	1.5 megohms ½W carbon	
R46, 54	0.22 megohm ½W carbon	
R52	3,300 ohms ½W carbon 10%	
R55	330 ohms 1W carbon 10%	

All tolerances are 20% unless otherwise specified.

COILS

No.	Ohms	Description	Code No.
L1	1.3-1.7	S/W aerial coil	CZ.323.025
L2	<0.5		
L3	25-33	B/C aerial coil	CZ.323.024
L4	1.7-2.3		
L5	<0.5	S/W oscillator coil	CZ.330.601
L6	<0.5		
L7	1.0-1.4	B/C oscillator coil	CZ.330.600
L8	2.9-3.9		
L9	11.5-12.5	1st I.F. transformer	CZ.320.429
L10	11.5-12.5		
L11	11.5-12.5	2nd I.F. transformer	CZ.320.430
L12	11.5-12.5		
L13	13-18	Power transformer	CZ.344.090
L14	<0.5		
L15	105-145		
L16	<0.5		
L17		Output transformer 7,000 ohms p-p	type BRL33
L18			
L19		Speaker	type 12-0, F22
L20	480-640	Output transformer	CZ.345.037
L21	<0.5		
L22		Speaker	49.240.55
L23		Speaker	CZ.161.138

IMPORTANT ! In ordering spare parts, quote CODE NUMBER of part and MODEL NUMBER of Receiver. In claiming free replacement under GUARANTEE, return defective part PROMPTLY and quote MODEL and SERIAL NUMBER of Receiver and DATE OF PURCHASE.

ALIGNMENT.

During alignment, set volume control at maximum and both tone controls in their mid-position. With the tuning gang fully closed, set the dial cursor at 120 on the relocation scale.

I.F. channel alignment is carried out in the following manner—

Connect a shunt capacitor of 100 pF from 6N8 signal grid to chassis.
Trim in order:
Secondary 2nd I.F.T.
Primary 2nd I.F.T.
Primary 1st I.F.T.
Check the above adjustments.
Remove the capacitive shunt and trim secondary 1st I.F.T.

Adjustable cores for the secondaries of the I.F. transformers are located in the tops of the cans, those for the primaries are in the bottom of the cans.

The trimmer layout drawing is shown as an inset to the circuit diagram drawing.

B/C band alignment frequencies are : 1,420 kc/s, 3XY (oscillator and aerial trimmers) and 600 kc/s, 7ZL (slug padding with gang rocking).

On the short wave bands the oscillator frequency is higher than signal frequency, so of the two signals tunable on the receiver, the high frequency one is correct. In short wave alignment, SW2 band (5.9 Mc/s-7.5 Mc/s) should be adjusted first before attempting alignment of SW1 band.

SW2 band alignment frequencies are 6.1 Mc/s (slug padding) and 7.2 Mc/s (oscillator and aerial trimmers).

SW1 band alignment frequencies are 9.65 Mc/s (small white triangle) (oscillator padding capacitor) and 11.85 Mc/s (small white triangle) (oscillator and aerial trimmers).

No attempt should be made to alter the adjustment of the cores of either aerial coil.

DIAL CALIBRATION.

If it is required to correct dial calibrations for an equal error on all stations, provision is made for moving the cursor assembly with respect to the dial cord. Loosen the clamping screw, make the necessary adjustment to the cursor position and securely retighten the clamping screw.

MAINS VOLTAGE ADJUSTMENT.

The power transformer is provided with two mains voltage tappings—200/230 volts and 240/250 volts—for adjustment to the supply voltage at the point of installation. The receiver is adjusted at the factory to the 240/250 volts tapping.

TO REMOVE CHASSIS FROM CABINET.

Remove the power plug from the mains outlet socket. Remove the six control knobs (a firm pull is all that is necessary). Remove the cabinet back and aerial and earth terminal panel. Withdraw the five plugs along the back of the chassis from their respective sockets. The chassis is held to the cabinet by four screws, two at the top of the dial back plate and two at the rear of the chassis. Removal of these four screws allows the chassis to be withdrawn.

To remove the sub-chassis, withdraw the three plugs from their respective sockets, remove the four screws which mount the sub-chassis.

To remove the volume control potentiometer, remove the strip panel at the back of the cabinet; after the volume knob is removed it is possible to remove the potentiometer mounting nut. The potentiometer may now be withdrawn from the housing.

Replacement of these units is a reversal of the above procedure.