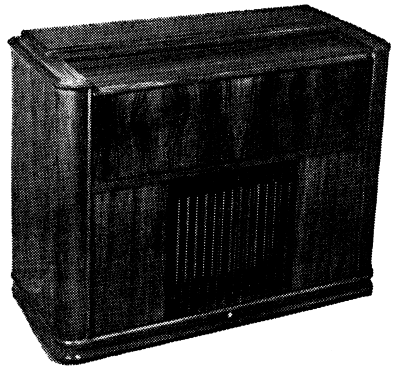
PHILIPS RADIOPLAYER

MODEL 178 B-C-D



Note: The different versions vary in types of record changer and I.F. transformers. Refer to "Specifications," "Parts Lists" and "Miscellaneous Components."

SPECIFICATIONS

(Subject to alteration without notice)

Power Supply	200-250V, 40-50 c/s.
Tuning Ranges	530-1620 kc/s. (B/C) 4.7-9.2 Mc/s. (SW2) 9.1-18.4 Mc/s. (SW1)
Intermediate Frequency	455 kc/s.
Cabinet	Radiogram
Record Changer (178B-C)	Philips type AG1000
Record Changer (178D)	Philips type AG1003

VALVE EQUIPMENT AND VOLTAGE ANALYSIS

Valve Function	Valve No.	Valve Type	Plate Volts	Screen Volts	Osc. P. Volts	Bias Volts
Frequency Converter	V1	6AN7	235	50	100	
I.F. Amplifier, A.V.C. and Demodulator	V2	6N8	235	65		
1st Audio Amplifier	V3	EF86	55	70		
2nd Audio Amplifier	V4A	12AT7	95	—		
Phase Splitter	V4B	12AT7	125	—		
Power Amplifier	V5	6M5	265	235		6.9
Power Amplifier	V6	6M5	265	235		6.9
H.F. Audio Amplifier	V9	6BD7	105	—		1.7
H.F. Power Amplifier	V10	6M5	225	240		7.7
Rectifier	V7	5V4G	Cathode — L15 C.T., 270V			
Tuning Indicator	V8	EM34	Target 235V			
Dial Lamps (2), bezel lamp and gramo. lamp	V11, 12, 13 & 14		6.3V, 0.32 A tubular screw			
Voltage across R54, –2.3V						

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 resistors listed. The receiver should be in a "no signal" condition.

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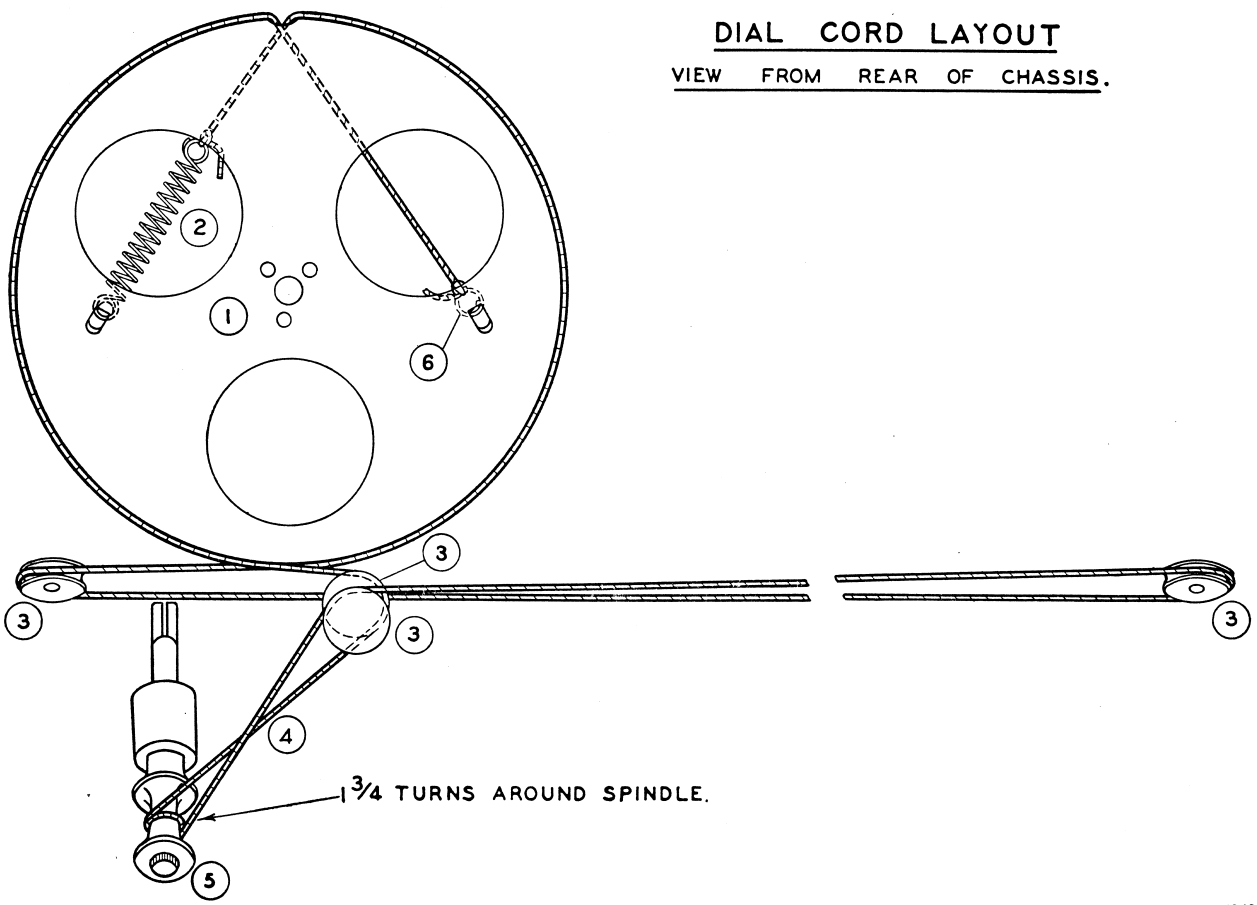
MISCELLANEOUS COMPONENTS

No. on Dial Cord Layout Drawing	Description	Code No.
—	Assembly, cursor	CR.480.659
5	Assembly, tuning spindle	CR.371.331
—	Assembly, W/C clicker	CR.450.046
—	Badge, Philips	CR.531.408
—	Bank, W/C switch (A1)	CZ.200.062
—	Bank, W/C switch (A2)	CZ.200.063
—	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.412.396
—	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
—	Switch, lid	Alpha type S
—	Switch, on/off	CZ.210.113 (178D)



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PARTS LISTS

CAPACITORS

No.	Description	Code No.
C1, 3, 8, 16, 17	30 pF air trimmer	CZ.113.700
C2	180 pF mica 1%	CZ.065.722
C4	120 pF mica 2½%	CZ.066.139
C5–6	2 gang tuning	CZ.107.746
C7, 24	100 pF mica	
C9, 51	0.02 mF 400V paper	
C10, 28, 64	0.05 mF 200V paper	
C11, 12	100 pF mica 10%	
C13	0.0045 mF mica 10%	
C14	170 pF mica 1%	CZ.065.727
C15	110 pF mica 2½%	CZ.066.140
C18	475 pF mica 2%	CZ.066.119
C19	60 pF air trimmer	49.005.58
C20, 21	Part of 1st I.F.T.	
C22, 49	0.01 mF 400V paper	
C23	30 pF mica	
C25, 30, 48, 52	0.02 mF 200V paper	
C26, 27	Part of 2nd I.F.T.	
C29, 32	0.001 mF 600V paper	
C31	0.1 mF 400V paper	
C33, 57, 58, 59	0.01 mF 600V paper	
C34, 60	0.1 mF 200V paper	
C36	0.002 mF 600V paper	
C37	500 pF mica	
C38	0.05 mF 400V paper	
C39	8 mF 350V electrolytic	
C40	20 pF mica	
C41	0.05 mF 400V paper	
C42	150 pF mica 10%	
C43	0.0015 mF mica	
C44, 54	25 mF 10V electrolytic	
C45, 53, 55, 56	24 mF 450V electrolytic	
C46	16 mF 450V electrolytic	
C47	0.002 mF 400V paper	
C61	50 pF mica	

All tolerances are ± 20% unless otherwise specified.

RESISTORS

No.	Description	Code No.
R1	33,000 ohms 1W carbon 10%	
R2, 3	33,000 ohms 1W carbon	
R4	100 ohms ½W carbon	
R5	33,000 ohms ½W carbon 10%	
R5	22,000 ohms ½W carbon (178D)	
R6	82,000 ohms 1W carbon 10%	
R7, 8, 11	2.2 megohms ½W carbon	
R9, 12, 13, 14, 22, 23	1 megohm ½W carbon	
R10, 15, 18, 19, 24, 29, 34, 37	100,000 ohms ½W carbon	
R16	0.5 megohm, tapped at 40,000 ohms, carbon potentiometer	CZ.029.148
R17	22,000 ohms ½W carbon	
R20	3,300 ohms ½W carbon 10%	
R21, 30	0.33 megohm ½W carbon	
R25, 42, 45, 46	0.47 megohm ½W carbon	
R26, 31, 38, 44, 47	47,000 ohms ½W carbon	
R27, 53	0.22 megohm ½W carbon	
R28	270 ohms ½W carbon 10%	
R32	1 megohm carbon potentiometer	CZ.029.312
R33, 52	1,000 ohms 1W carbon 10%	
R35	1 megohm carbon potentiometer	CZ.029.311
R36	10,000 ohms ½W carbon	
R39	1,000 ohms ½W carbon 10%	
R40, 43	47,000 ohms ½W carbon 10%	
R41	2,200 ohms ½W carbon 10%	
R48	82 ohms 1W W/W 10%	
R49	10,000 ohms 1W carbon	
R50, 51	47 ohms ½W W/W 10%	
R54	15 ohms ½W W/W 10%	
R55	1.5 megohms ½W carbon	
R56	22,000 ohms ½W carbon 10%	

All tolerances are ± 20% unless otherwise specified.

COILS

No.	Ohms	Description	Code No.
L1	1.2-1.7	S/W aerial coil	CZ.323.029
L2	<0.5		
L3	19.6-26.4	B/C aerial coil	CZ.323.026
L4	1.5-2.0		
L5	<0.5	S/W oscillator coil	CZ.330.614
L6	<0.5		
L7	0.8-1.2	B/C oscillator coil	CZ.330.613
L8	2.7-3.7		
L9 (178B)	11.5-15.5	1st I.F. transformer	A3.124.25
L10	11.5-15.5		
L9 (178C-D)	4.7-5.2	1st I.F. transformer	A3.126.84
L10	8.0-9.0		
L11 (178B)	11.5-15.5	2nd I.F. transformer	CZ.320.434
L12	11.5-15.5		
L11 (178C-D)	4.7-5.2	2nd I.F. transformer	CZ.320.444
L12	8.3-9.2		
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 CZ.345.030
L18			
L19		Speaker	type 12-0 F22
L20		Output transformer 7,000 ohms	type EBG68
L21			
L22		Speaker	type 5FX
L23		Speaker	type 5FX

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. ALIGNMENT.

Model 178B Only.

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

Connect 100 pF capacitor from V2 signal grid to chassis. Adjust iron cores for maximum output in following order—

1. Second I.F.T. secondary (nearer V3).
2. First I.F.T. primary (nearer V2).
3. First I.F.T. primary (nearer V1).

Repeat above operations.

Remove detuning capacitor and adjust iron core of first I.F.T. secondary only (nearer V2) for maximum output.

Model 178C-D Only.

Screw out iron core of the primary of the 2nd I.F.T. (nearer V2) as far as possible. Adjust iron cores for maximum output in the following order—

1. Second I.F.T. secondary (nearer V3).
2. First I.F.T. secondary (nearer V2).
3. First I.F.T. primary (nearer V1).
4. Second I.F.T. primary (nearer V2).

Do not re-adjust iron cores.

R.F. ALIGNMENT.

The trimmer layout drawing is shown as an inset on 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 band the oscillator operates on a frequency above signal frequency, so that of the two signals tunable on the receiver, the high ferquency one is correct. In short wave alignment, SW2 band (4.7-9.2 Mc/s) should be done first before attempting alignment of SW1 band.

On SW2 band (4.7-9.2 Mc/s) alignment frequencies are: 4.825 Mc/s (114 on relocation scale), (oscillator coil slug), and 8.9 Mc/s (16 on relocation scale), (oscillator and aerial trimmers). Rock the tuning gang while adjusting the aerial trimmer.

SW1 band (9.1-18.4 Mc/s) alignment frequency is 17.8 Mc/s (small green triangle), (oscillator and aerial trimmers). Rock gang while adjusting aerial trimmer. Calibration should be checked at 9.65 Mc/s (small green triangle).

Do not attempt to adjust the iron cores of the aerial coils.

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.

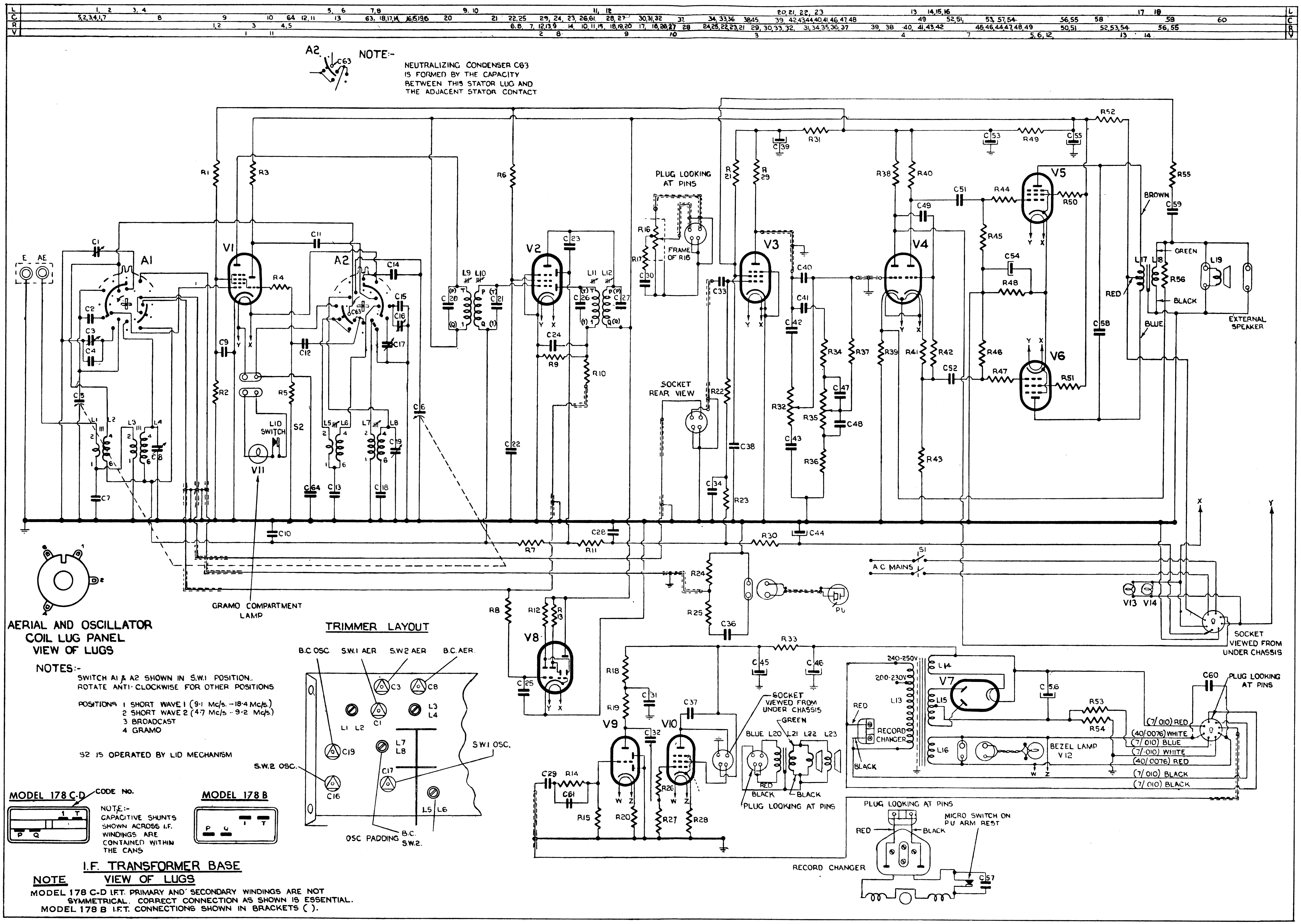
TO REMOVE CHASSIS FROM CABINET.

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.


NOTE:-
NEUTRALIZING CONDENSER C63 IS FORMED BY THE CAPACITY BETWEEN THIS STATOR LUG AND THE ADJACENT STATOR CONTACT
PLUG LOOKING AT PINS
FRAME OF R16
SOCKET REAR VIEW
LID SWITCH
GRAMO COMPARTMENT LAMP
EXTERNAL SPEAKER
A C MAINS
SOCKET VIEWED FROM UNDER CHASSIS
RECORD CHANGER
BEZEL LAMP V12
PLUG LOOKING AT PINS
MICRO SWITCH ON PU ARM REST
AERIAL AND OSCILLATOR COIL LUG PANEL VIEW OF LUGS
NOTES:-
SWITCH A1 & A2 SHOWN IN S.W.1 POSITION.
ROTATE ANTI-CLOCKWISE FOR OTHER POSITIONS
POSITIONS 1 SHORT WAVE 1 (9·1 Mc/s. -18·4 Mc/s.)
2 SHORT WAVE 2 (4·7 Mc/s - 9·2 Mc/s.)
3 BROADCAST
4 GRAMO
S2 IS OPERATED BY LID MECHANISM
TRIMMER LAYOUT
B.C OSC. S.W.1 AER S.W.2 AER B.C. AER.
S.W.2 OSC.
S.W.1 OSC.
OSC PADDING B.C. S.W.2.
MODEL 178 C-D CODE NO.
MODEL 178 B
NOTE:-
CAPACITIVE SHUNTS SHOWN ACROSS I.F. WINDINGS ARE CONTAINED WITHIN THE CANS
I.F. TRANSFORMER BASE VIEW OF LUGS
NOTE
MODEL 178 C-D I.F.T. PRIMARY AND SECONDARY WINDINGS ARE NOT SYMMETRICAL. CORRECT CONNECTION AS SHOWN IS ESSENTIAL.
MODEL 178 B I.F.T. CONNECTIONS SHOWN IN BRACKETS ( ).