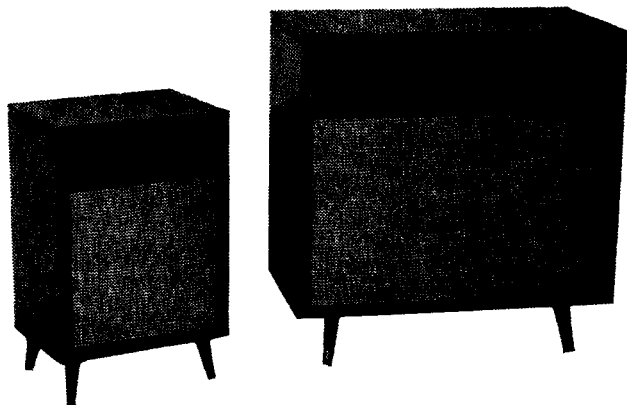


PHILIPS RADIOPLAYER MODEL 216



SPECIFICATIONS

(Subject to alteration without notice)

Power Supply	200/250V, 40-50 c/s
Tuning Range	530-1620 Kc/s
Intermediate Frequency	455 Kc/s
Cabinet	Radiogram
Record Changer (Stereo)	Philips type AG1014SX or NG1020
Pick-up Head (Stereo—78 r.p.m.)	Philips type AG3066
Pick-up Head (Stereo—Microgroove)	Philips type AG3063

VALVE EQUIPMENT AND VOLTAGE ANALYSIS

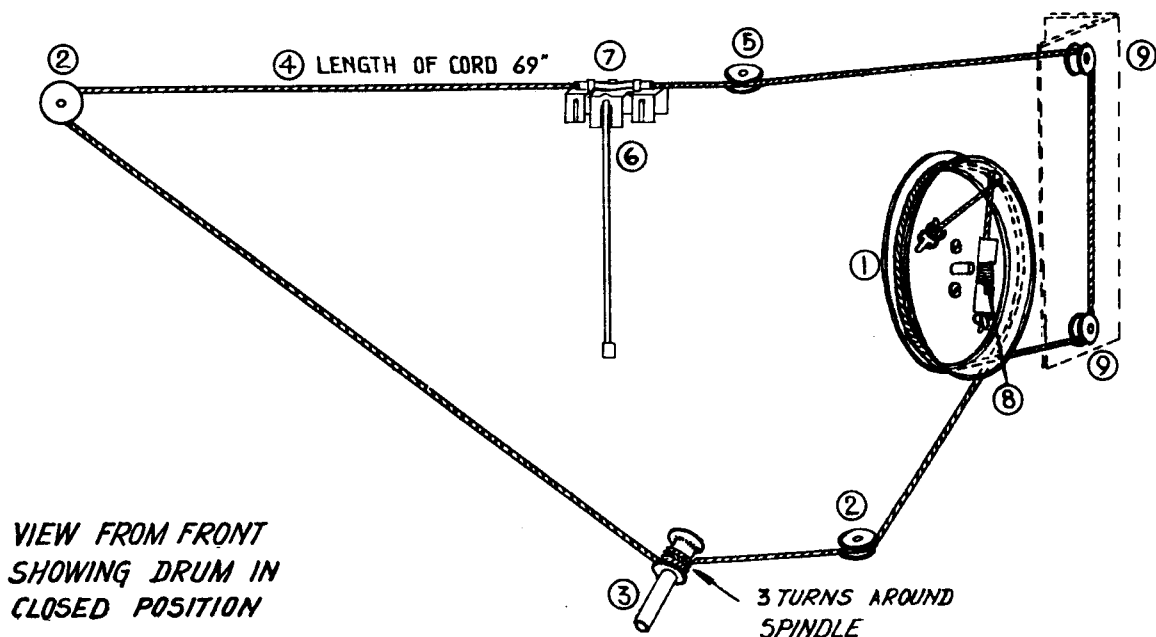
Valve Function	Valve No.	Valve Type	Plate Volts	Screen Volts	Osc.P. Volts	Cathode Volts
Frequency Converter	V1	6AN7	237	46	72	
I.F. Amplifier, A.V.C. and Demodulator	V2	6N8	237	46		
Audio Amplifier	V3a	12AX7	65			
Phase Splitter	V3b		115			31
Power Amplifier	V4	6M5	275	237		7.9
Power Amplifier	V5	6M5	275	237		7.9
Rectifier	V6	6V4	253/253V. A.C.		Unfiltered B+ 283V.= Filtered B+ 237V.=	
Audio Amplifier	V101	6BD7	75			
Power Amplifier	V102	6M5	230	231		6.6
Rectifier	V103	6V4	229/229V. A.C.		Volts across C105; 244 Volts across C104; 231	
Dial Lamps (2)	V11, 12	8045D	6.3V, 0.32A, tubular screw			
Heater Volts, 6.35V. A.C.; Voltage across R27, 2.8V. D.C.						

NOTE: These voltages are measured with an "1,000Ω 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 and condensers listed. The receiver should be in a "no signal" condition.

SERVICE DATA

MISCELLANEOUS COMPONENTS

Drawing Reference No.	Description	Type or Code No.	Drawing Reference No.	Description	Type or Code No.
6	Assembly, cursor	CR.480.664		Name "Philips"	CR.531.428
—	Assembly, lampholder, x2	C/F733-5-4		Name "Stereophonic"	CS.436.460
3	Assembly, tuning spindle	CR.371.335		Plug, power, male x2	CZ.365.115
—	Assembly, leg maple, x4	CR.600.666		Plug, 2 pin polarized, x2	C/F691-5-1
—	Assembly, leg walnut, x4	CR.600.667		Plug, 4 pin, x2	Teletron PS14
—	Badge	A3.357.10		Pick-up head holder	P4.380.35
9	Bracket assy., cord support	CR.262.465	5	Pulley, dial, large	CS.359.618
14	Bracket, chassis mtg., x2	CS.233.565	2	Pulley, dial, small, x2	CS.359.617
—	Card, knob	CS.439.220		Scale, dial	CS.412.414.4
—	Channel, rubber scale mtg. x2	CS.424.194		Socket, power, chassis, x2	CZ.365.116
—	Clamp, dial R.H.	CS.233.584		Socket, 2 pin polarised, x2	C/F733-16-1
—	Clamp, dial L.H.	CS.233.582		Socket, 4 pin, x2	Teletron 4Q MS/C
—	Clip, scale border trim x2	CS.430.950	7	Spring, cursor	CS.212.016
—	Clip, spring I.F.T. mtg. x2	A3.652.58	8	Spring, dial cord	CS.210.043
—	Clip, spring knob x5	CS.281.832		Stay, cabinet lid EFFCO C41	CR.285.809
—	Clip, spring knob, channel reversal	CS.281.850		Strip, A. & E. terminal	C/F679-2-5
4	Cord, dial drive	69" of cord required		Surround, badge	CS.430.943
1	Drum, dial	CS.360.006		Switch (A1), channel reversal	OAK37011
	Knob, x5	CR.523.753		Switch (A2), gram/radio	M.S.P. Type 26
	Knob, channel reversal switch	CR.523.773		Trim, dial scale border x2	CZ.200.255
					CS.430.944

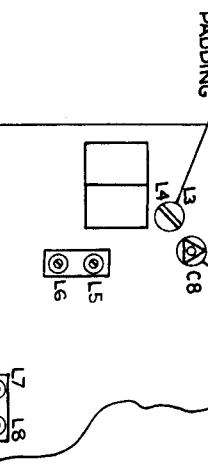
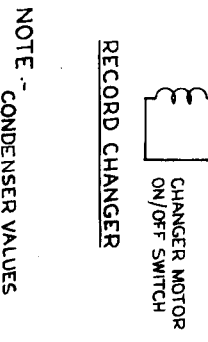
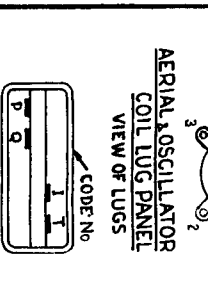
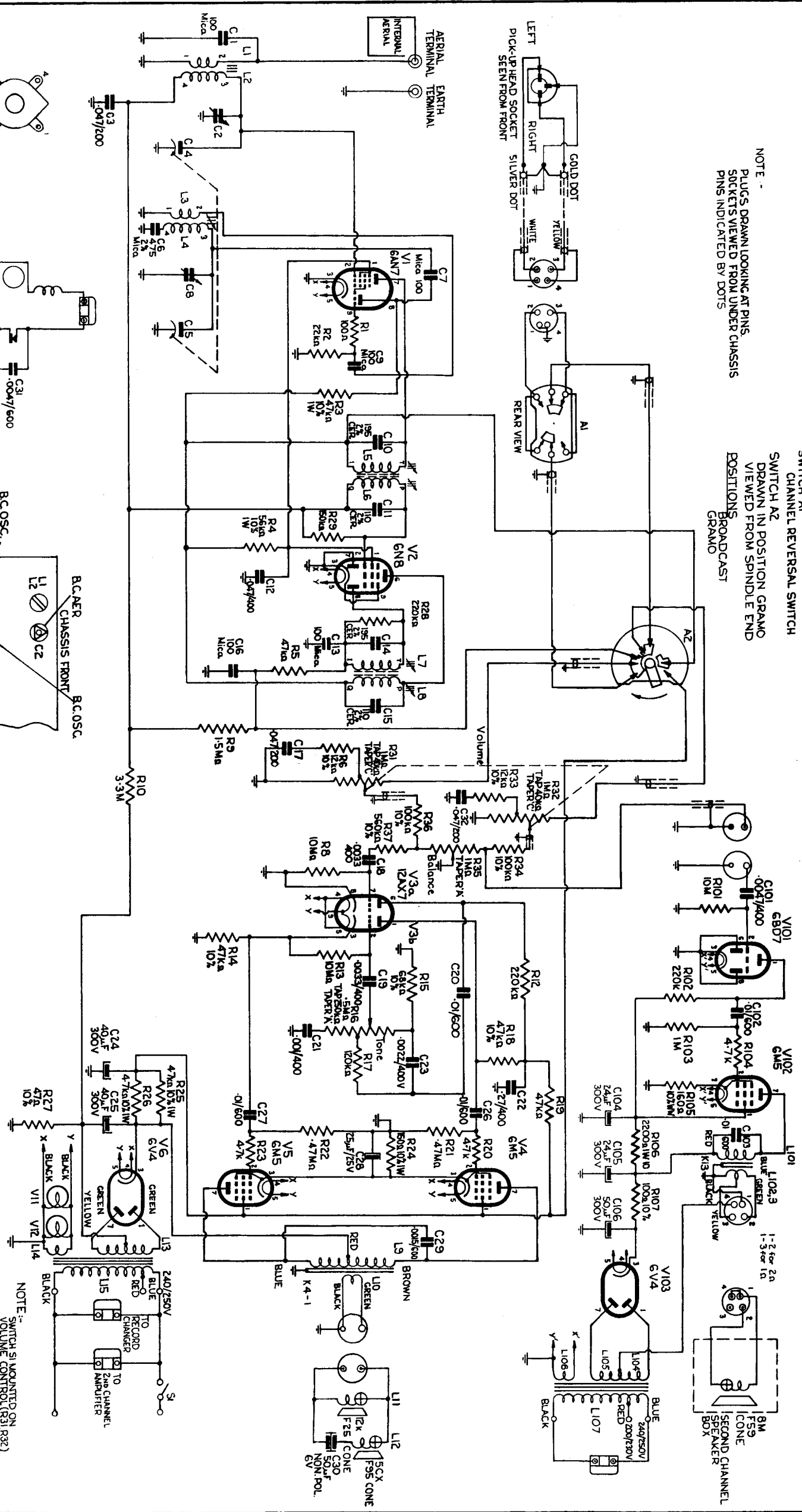


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2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
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NOTE -
PLUGS DRAWN LOOKING AT PINS
SOCKETS VIEWED FROM UNDER CHASSIS
PINS INDICATED BY DOTS

SWITCH A1
CHANNEL REVERSAL SWITCH
SWITCH A2
DRAWN IN POSITION GRAMO
VIEWED FROM SPINDLE END
POSITIONS
BROADCAST
GRAMO



VOLTAGE ANALYSIS

VALVE No.	PLATE VOLTS	SCREENOSC. VOLTS	OSC. PL. VOLTS	CATH. VOLTS	GRID VOLTS	ANODE VOLTS
V1	237	4.8	4.8	72		
V2	237	4.8				
V3a	65					
V3b	115					
V4	275	237				
V5	275	237				
V6	253	253 A.C.				
V101	75					
V102	230					
V103	229/229					

ALL VOLTAGES MEASURED FROM CHASSIS.



PRIMARY AND SECONDARY WINDINGS
ARE NOT SYMMETRICAL. CORRECT
CONNECTION AS SHOWN IS ESSENTIAL.

NOTE -
CONDENSER VALUES
WHOLE NUMBERS = μF
DECIMALS = μF
SECOND FIGURE = D.C. V.W.
TOLERANCE % UNLESS OTHERWISE SHOWN
OTHERWISE SHOWN.

NOTE -
CONDENSER VALUES
WHOLE NUMBERS = μF
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TOLERANCE % UNLESS OTHERWISE SHOWN
OTHERWISE SHOWN.

PARTS LIST

CAPACITORS

No.	Description	Code No.
C1, 7, 9, 13, 16	100pF mica	
C2	30pF air trimmer	CZ.113.700
C3, 17	0.047 μ F 200V paper	
C4, 5	2 gang tuning condenser	CZ.107.755
C6	475pF \pm 2% mica	CZ.066.119
C8	60pF air trimmer	49.005.58
C10, 11	Part of 1st I.F. transformer	
C12	0.047 μ F 400V paper	
C14, 15	Part of 2nd I.F. transformer	
C18, 19	0.0033 μ F 400V paper	
C20	0.01 μ F 600V paper	
C21	0.001 μ F 400V paper	
C22	0.27 μ F 400V paper	
C23	0.0022 μ F 400V paper	
C24, 25	40 μ F 350VP electrolytic	
C26, 27	0.01 μ F 600V paper	
C28	25 μ F 25VW electrolytic	
C29	0.0015 μ F 600V paper	
C30	50 μ F 6VW N.P. electrolytic	CZ.099.870
C31	0.0047 μ F 600V paper (anti-click)	
C32	0.047 μ F 200V paper	
C101	0.0047 μ F 400V paper	
C102, 103	0.01 μ F 600V paper	
C104, 105	24 μ F 300VW electrolytic	
C106	50 μ F 300VW electrolytic	

All tolerances are \pm 20% unless otherwise specified.

RESISTORS

No.	Description	Code No.
R1	100 Ω $\frac{1}{2}$ W W/W	
R2	22,000 Ω $\frac{1}{2}$ W carbon	
R3	47,000 Ω \pm 10% 1W carbon	
R4	56,000 Ω \pm 10% 1W carbon	
R5, 19	47,000 Ω $\frac{1}{2}$ W carbon	
R6	10,000 Ω \pm 10% $\frac{1}{2}$ W carbon	
R8	10M Ω $\frac{1}{2}$ W carbon	
R9	1.5M Ω $\frac{1}{2}$ W carbon	
R10	3.3M Ω $\frac{1}{2}$ W carbon	
R12	220,000 Ω $\frac{1}{2}$ W carbon	
R13	10M Ω $\frac{1}{2}$ W carbon	
R14, 18	47,000 Ω \pm 10% $\frac{1}{2}$ W carbon	
R15	68,000 Ω \pm 10% $\frac{1}{2}$ W carbon	
R16	0.5M Ω potentiometer taper 'A' tapped at 0.25M Ω	CZ.029.151
R17	120,000 Ω \pm 10% $\frac{1}{2}$ W carbon	
R20, 23	4,700 Ω $\frac{1}{2}$ W carbon	
R21, 22	0.47M Ω $\frac{1}{2}$ W carbon	
R24	150 Ω \pm 10% 1W W/W	
R25, 26	4,700 Ω \pm 10% 1W carbon	
R27	47 Ω \pm 10% $\frac{1}{2}$ W W/W	
R28	220,000 Ω $\frac{1}{2}$ W carbon	
R29	150,000 Ω $\frac{1}{2}$ W carbon	
R30	180,000 Ω \pm 10% $\frac{1}{2}$ W carbon	
R31, 32	2x1M Ω ganged potentiometer taper 'C' tapped at 40,000 Ω with S.P.S.T. switch	CZ.032.304
R33	12,000 Ω \pm 10% $\frac{1}{2}$ W carbon	
R34	100,000 Ω \pm 10% $\frac{1}{2}$ W carbon	
R35	1M Ω potentiometer taper 'A'	CZ.029.332
R36	100,000 Ω \pm 10% $\frac{1}{2}$ W carbon	
R37	560,000 Ω \pm 10% $\frac{1}{2}$ W carbon	
R101	10M Ω $\frac{1}{2}$ W carbon	
R102	220,000 Ω $\frac{1}{2}$ W carbon	
R103	1M Ω $\frac{1}{2}$ W carbon	
R104	4,700 Ω $\frac{1}{2}$ W carbon	
R105	160 Ω \pm 10% $\frac{1}{2}$ W W/W	
R106	2,200 Ω \pm 10% 1W carbon	
R107	100 Ω \pm 10% $\frac{1}{2}$ W W/W	

All tolerances are \pm 20% unless otherwise specified.

INDUCTORS

No.	Ohms	Description	Type or Code No.
L1	19.6-26.4	B/C aerial coil	CZ.323.026
L2	1.5-2.0		
L3	1.2-1.7	B/C oscillator coil	CZ.330.613
L4	<0.5		
L5	4.7-5.2	1st I.F. transformer	A3.126.84
L6	8.0-9.0		
L7	4.7-5.2	2nd I.F. transformer	CZ.320.444
L8	8.3-9.2		
L9	150-158	Output transformer	Rola type K4-1 CZ.345.043
L10	<0.5		
L11	—	Loudspeaker 12"	Rola type 12K F25
L12	—	Loudspeaker 5"	Rola type 5CX F95

No.	Ohms	Description	Type or Code No.
L13	315-425	Power transformer	CZ.344.089
L14	<0.5		
L15	26-36		
L101	356-435	Output transformer	Rola type K13-1 CZ.345.060
L102	<0.5		
L103	<0.5		
L104	630-850	Power transformer	CZ.344.084
L105	<1		
L106	<1		
L107	55-75		
L108	—	2nd channel loudspeaker	Rola type 8M F59

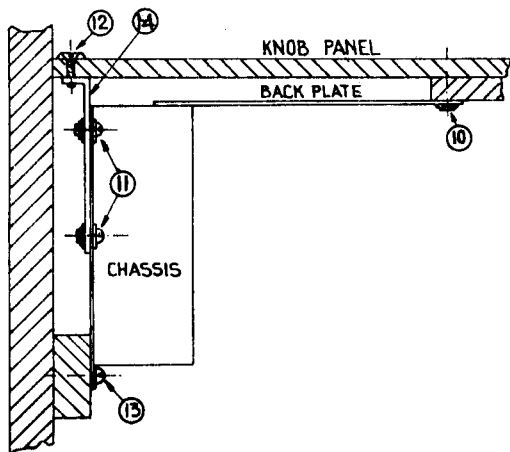
IMPORTANT! When ordering spare parts, quote **CODE NUMBER** of part and **MODEL NUMBER** of Receiver. In claiming free replacement under **GUARANTEE**, return defective part **PROMPTLY** and quote **MODEL** and **SERIAL NUMBER** of Receiver and **DATE OF PURCHASE**.

TO REMOVE CHASSIS FROM CABINET.

Remove receiver power plug, back panel and the five push fitted functional control knobs. Withdraw the loudspeaker and pick-up plugs from rear of receiver chassis together with the two mains lead plug connections. Remove 2 pin polarized plug (braided lead) from 2nd Amplifier chassis and release from P.V.C. sleeving attached to side of cabinet. Unscrew the aerial and earth terminal strip and disconnect the internal aerial.

To withdraw chassis initially remove the two $\frac{1}{8}$ " Whit. brass countersunk screw (12) threaded into each mounting bracket (14) through receiver knob panel adjacent to the tuning and volume control knobs. Removal of the two wood screws and washers (10) supporting dial back plate and the two metal thread screws and washers (13) securing chassis rear flange will now enable the chassis complete with dial scale, etc., to be withdrawn. This latter procedure can be simplified and the requirement for chassis support largely eliminated if receiver is first placed face downwards on a suitable protective surface. Note that separation of mounting brackets (14) from chassis end flanges is not required for chassis withdrawal.

The replacement of the chassis is a reversal of the above procedure.



MAINS VOLTAGE ADJUSTMENT.

The power transformers are provided with two mains voltage tapplings on the primary winding—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.

DIAL CALIBRATION.

Ensure that the line of pointer is square relative to scale. The pointer should lie inside the two parallel marks approximately adjacent station 7ZL on the R.H. scale border when set midway between similar markings on the opposite side.

An equal calibration error over entire dial scale range can be corrected by simply sliding the cursor on drive cord in the appropriate direction. Calibration is correct when a gang closed setting (tuning knob fully clockwise) corresponds with a pointer position over the stop mark on L.H. border line.

ALIGNMENT.

Check dial calibration and if necessary adjust cursor position as described in the foregoing.

For I.F.T. and R.F. trimmer locations refer to circuit diagram inset drawing.

Set volume control to maximum, tone and balance control to a central position.

I.F. ALIGNMENT.

Screw out iron core at 2nd I.F.T. primary.

Apply modulated 455 Kc/s signal via a 100 pF capacitor to control grid (pin 2) of V1 and peak I.F.T. cores in the following sequence: —

Secondary 2nd I.F.T.

Secondary 1st I.F.T.

Primary 1st I.F.T.

Primary 2nd I.F.T.

Do not repeat any adjustments.

R.F. ALIGNMENT.

Use a Standard R.M.A. dummy aerial and apply a modulated R.F. signal to aerial terminal.

Alignment frequencies are: 1,420 Kc/s, 3XY (peak oscillator (C8) and aerial (C2) trimmers), and 600 Kc/s, 7ZL (peak L3, 4 oscillator slug while rocking gang).

Do not attempt to adjust the iron core of the aerial coil.

SPEAKER PHASING.

When speaker replacement is necessary, it is essential to determine correct phasing before connecting new speakers into circuit. Reference to the circuit diagram will show that one voice coil terminal of each speaker is marked with \oplus sign, which is designated as the positive side.

To determine the positive terminal, connect a battery across the voice coil; the positive terminal will be connected to the positive side of the battery when the cone movement is out or forward. Speakers must be connected as in the circuit diagram.