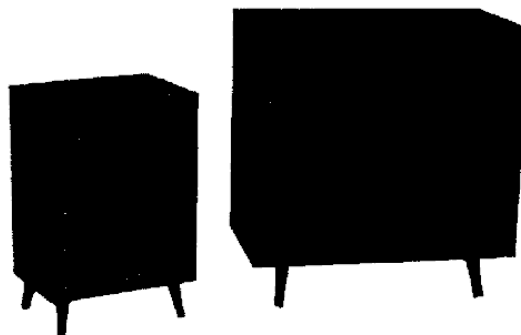


# PHILIPS RADIOPLAYER MODEL 216



## 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.						

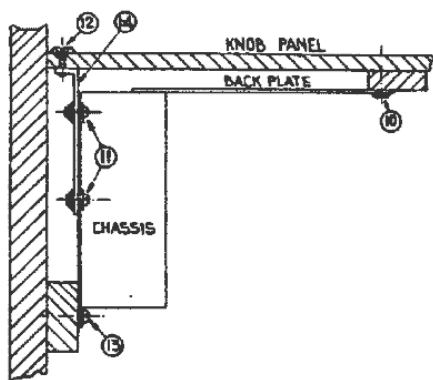
NOTE: These voltages are measured with an "1,000 $\Omega$  per volt" meter and may vary  $\pm 10\%$  from the figures quoted. They are measured from the socket points indicated to chassis, or across the resistor and condensers listed. The receiver should be in a "no signal" condition.

**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 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 tappings 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 ⊕ 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.

Drawing Reference No.	Description
6	Assem
—	Assem
3	Assem
—	Assem
—	Assem
—	Badge
9	Brack
14	Brack
—	Card,
—	Chan
—	Clamp
—	Clamp
—	Clip,
—	Clip,
—	Clip,
—	Clip,
4	Cord,
1	Drum
—	Knob,
—	Knob,

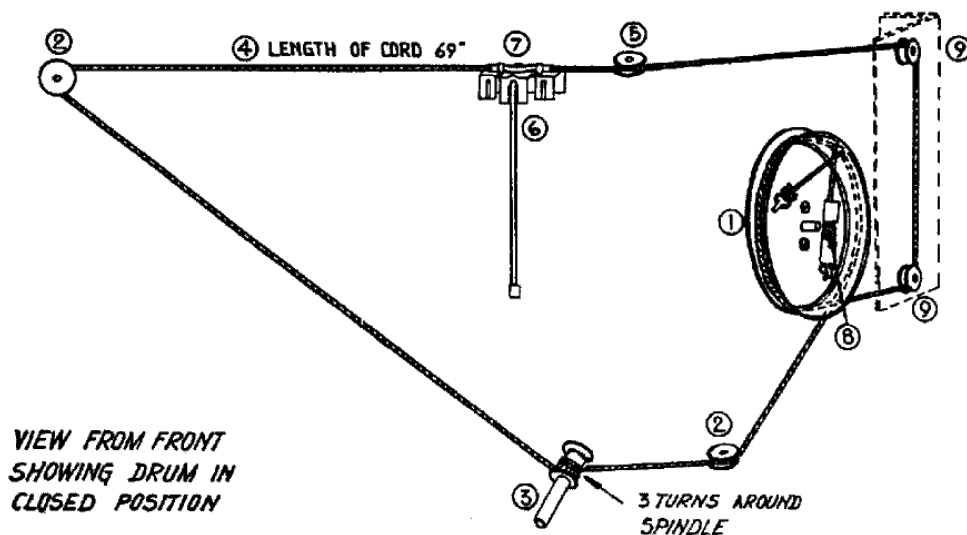


VIEW /  
SHOW//  
CLOSEL

## 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	Teletroni 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
—	Clip, spring knob, channel reversal	CS.281.850		Strip, A. & E. terminal	C/F679-2-5
4	Cord, dial drive	69" of cord requires		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	CS.430.944



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PARTS LIST

CAPACITORS

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

All tolerances are ± 20% unless otherwise specified.

RESISTORS

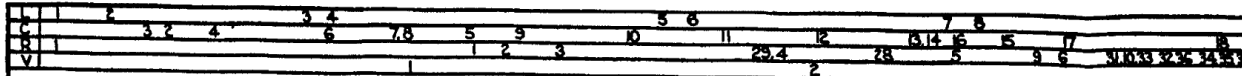
No.	Description	Code No.
R1	100Ω ½W W/W	
R2	22,000Ω ½W carbon	
R3	47,000Ω ± 10% 1W carbon	
R4	56,000Ω ± 10% 1W carbon	
R5, 19	47,000Ω ½W carbon	
R6	10,000Ω ± 10% ½W carbon	
R8	10MΩ ½W carbon	
R9	1.5MΩ ½W carbon	
R10	3.3MΩ ½W carbon	
R12	220,000Ω ½W carbon	
R13	10MΩ ½W carbon	
R14, 18	47,000Ω ± 10% ½W carbon	
R15	68,000Ω ± 10% ½W carbon	
R16	0.5MΩ potentiometer taper 'A' tapped at 0.25MΩ	CZ.029.151
R17	120,000Ω ± 10% ½W carbon	
R20, 23	4,700Ω ½W carbon	
R21, 22	0.47MΩ ½W carbon	
R24	150Ω ± 10% 1W W/W	
R25, 26	4,700Ω ± 10% 1W carbon	
R27	47Ω ± 10% ½W W/W	
R28	220,000Ω ½W carbon	
R29	150,000Ω ½W carbon	
R30	180,000Ω ± 10% ½W carbon	
R31, 32	2x1MΩ ganged potentiometer taper 'C' tapped at 40,000Ω with S.P.S.T. switch	CZ.032.304
R33	12,000Ω ± 10% ½W carbon	
R34	100,000Ω ± 10% ½W carbon	
R35	1MΩ potentiometer taper 'A'	CZ.029.332
R36	100,000Ω ± 10% ½W carbon	
R37	560,000Ω ± 10% ½W carbon	
R101	10MΩ ½W carbon	
R102	220,000Ω ½W carbon	
R103	1MΩ ½W carbon	
R104	4,700Ω ½W carbon	
R105	160Ω ± 10% ½W W/W	
R106	2,200Ω ± 10% 1W carbon	
R107	100Ω ± 10% ½W W/W	

All tolerances are ± 20% unless otherwise specified.

INDUCTORS

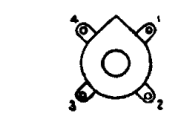
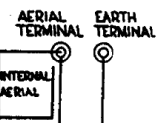
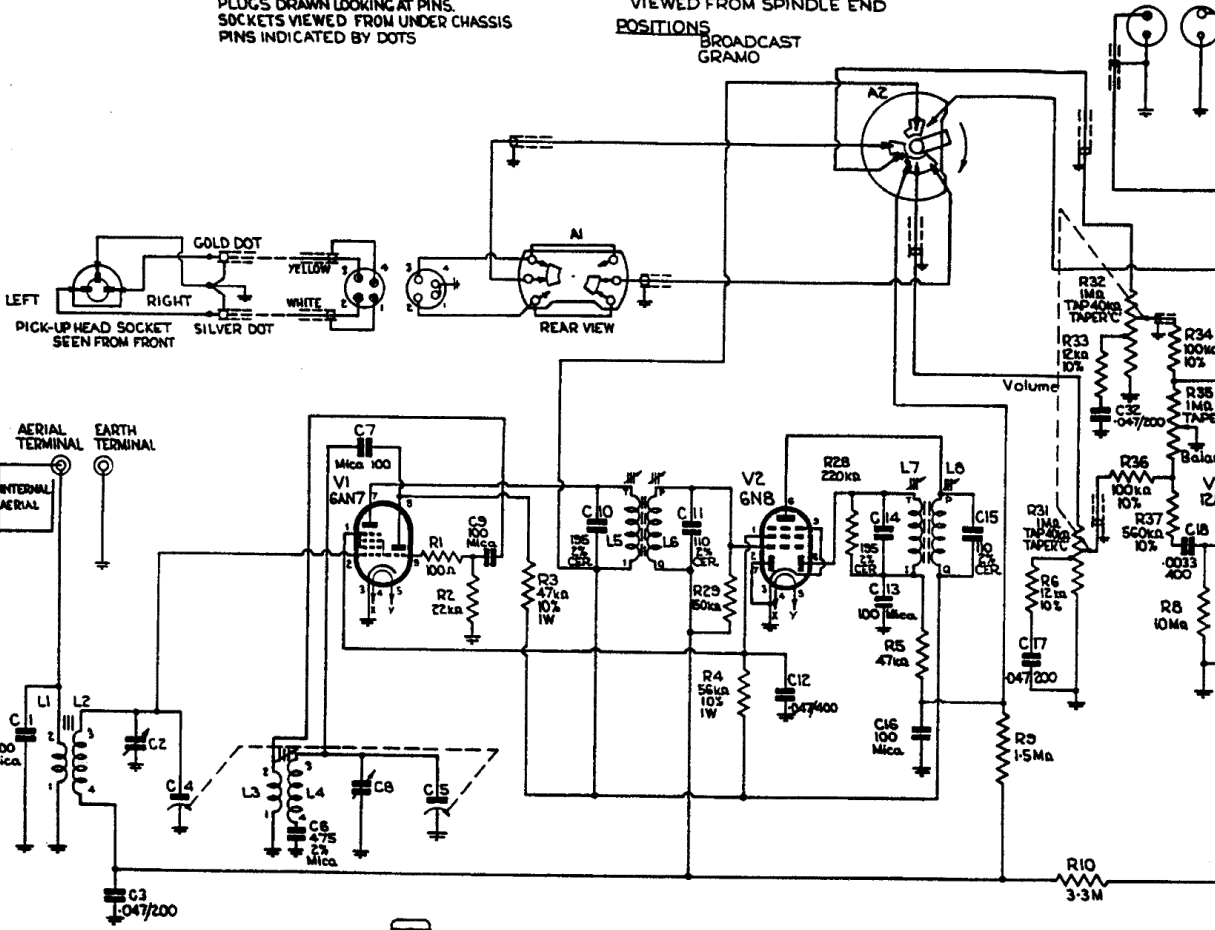
No.	Ohms	Description	Type or Code No.	No.	Ohms	Description	Type or Code No.
L1	19.6-26.4	B/C aerial coil	CZ.323.026	L13	315-425	Power transformer	CZ.344.089
L2	1.5-2.0			L14	<0.5		
L3	1.2-1.7	B/C oscillator coil	CZ.330.613	L15	26-36		
L4	<0.5						
L5	4.7-5.2	1st I.F. transformer	A3.126.84	L101	356-435	Output transformer	Rola type K13-1
L6	8.0-9.0			L102	<0.5		
L7	4.7-5.2	2nd I.F. transformer	CZ.320.444	L104	630-850		
L8	8.3-9.2			L105	<1	2nd amplifier	
L9	150-158	Output transformer	Rola type K4-1	L106	<1	2nd amplifier	CZ.344.084
L10	<0.5			L107	55-75		
L11	—	Loudspeaker 12"	Rola type 12K F25	L108	—	2nd channel loudspeaker	Rola type 8M F59
L12	—	Loudspeaker 5"	Rola type 5CX F95				

**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**.

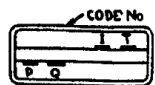


NOTE  
PLUGS DRAWN LOOKING AT PINS.  
SOCKETS VIEWED FROM UNDER CHASSIS  
PINS INDICATED BY DOTS

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

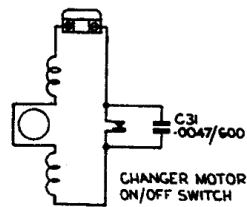


AERIAL + OSCILLATOR  
COIL LUG PANEL  
VIEW OF LUGS



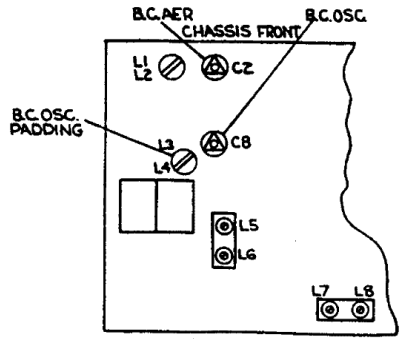
I.F. TRANSFORMER BASE  
VIEW OF LUGS

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



RECORD CHANGER

NOTE -  
CONDENSER VALUES  
WHOLE NUMBERS \*MF  
DECIMALS \*UF  
SECOND FIGURE \*D.C.V.W.  
TOLERANCE ±20% UNLESS OTHERWISE SHOWN  
RESISTORS ARE ±20% 1/2 W UNLESS  
OTHERWISE SHOWN.



TRIMMING LAYOUT  
TOP VIEW OF CHASSIS

VALVE No.	PLAT VOLT
V1	237
V2	237
V3a	65
V3b	115
V4	275
V5	275
V6	253
V10	75
V102	130
V103	225/225
ALL VOLTAGES	

