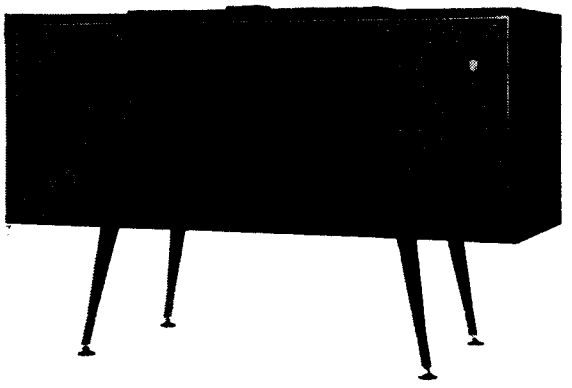
PHILIPS RADIOPLAYER

MODEL 223



SPECIFICATIONS

(Subject to alteration without notice)

Power Supply	200/230V, 240/250V, 40-50 c/s
Tuning Ranges	530-1,620 Kc/s
Intermediate Frequency	455 Kc/s
Cabinet	Radiogram
Record Changer (Stereo)	NG1020
Pick-up Head	AG3301
Power Consumption (Total)	60W approx.

Philips No. 23 speaker box may be used as an external second channel speaker unit in conjunction with Model 223.

VALVE EQUIPMENT AND VOLTAGE ANALYSIS

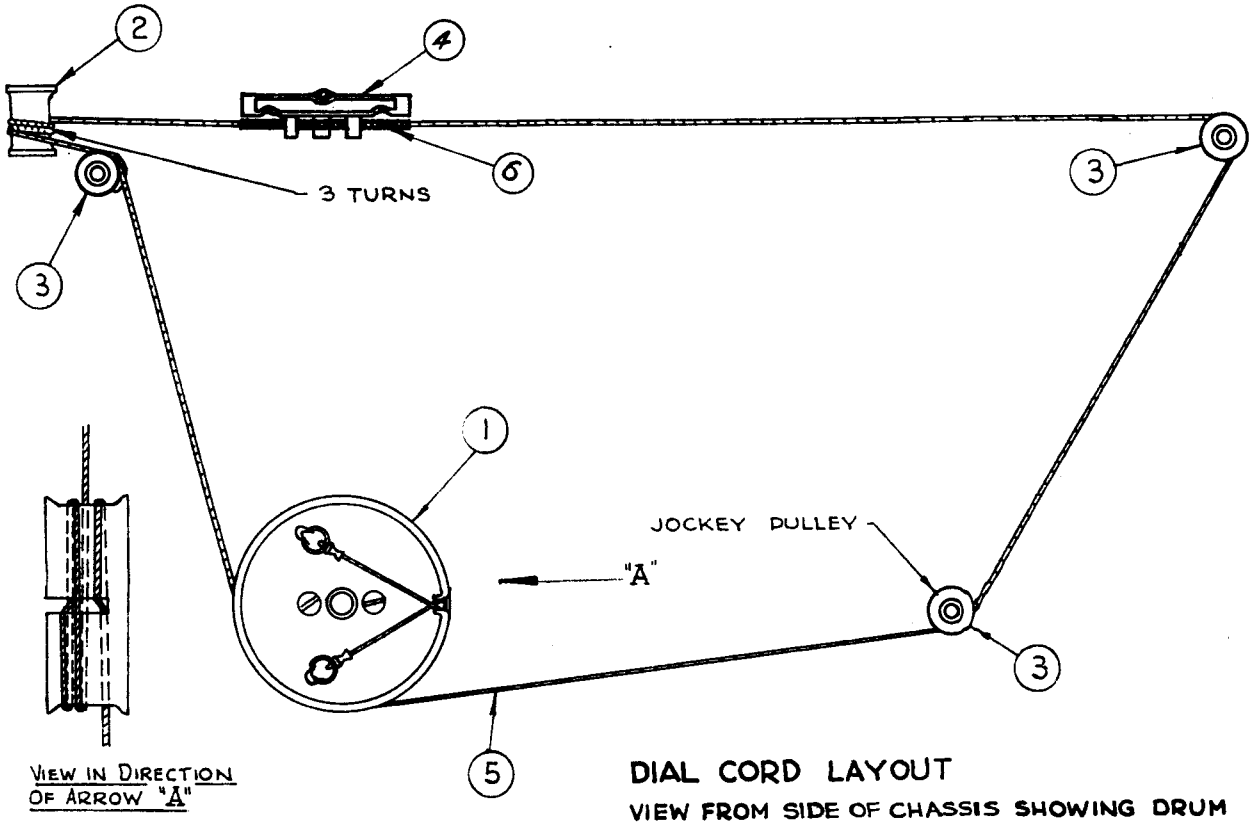
Valve Function	Valve No.	Valve Type	Plate Volts	Screen Volts	Osc. P. Volts	Cathode Volts
Frequency Converter	V1	6AN7	217	45	97	
I.F. Amplifier, A.V.C. & Demodulator	V2	6N8	217	45		
Audio Amplifier	V3A	6BM8	75	210		14
Power Amplifier	V3B		220			
Audio Amplifier	V4A	6BM8	75	210		14
Power Amplifier	V4B		220			
Rectifier	V5	6V4				260
				Unfiltered B+ 238V Filtered B+ 218V		
Dial Lamps (3)	V11, 12, 13	6.3V 0.32A Tubular screw				

Filament Volts, 6.35V. Voltage across R28 1.24V measured with a 20,000Ω per volt meter

NOTE: All D.C. voltages measured from socket pin indicated to chassis or across resistor listed, may vary ± 10%. The receiver should be in a "no signal" condition.

MAINS VOLTAGE ADJUSTMENT.

The power transformer is 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 volt tapping.



DIAL CORD LAYOUT

VIEW FROM SIDE OF CHASSIS SHOWING DRUM WITH TUNER IN OPEN POSITION.
CORD LENGTH APPROX. 44"

Published by PHILIPS ELECTRICAL INDUSTRIES PTY. LIMITED

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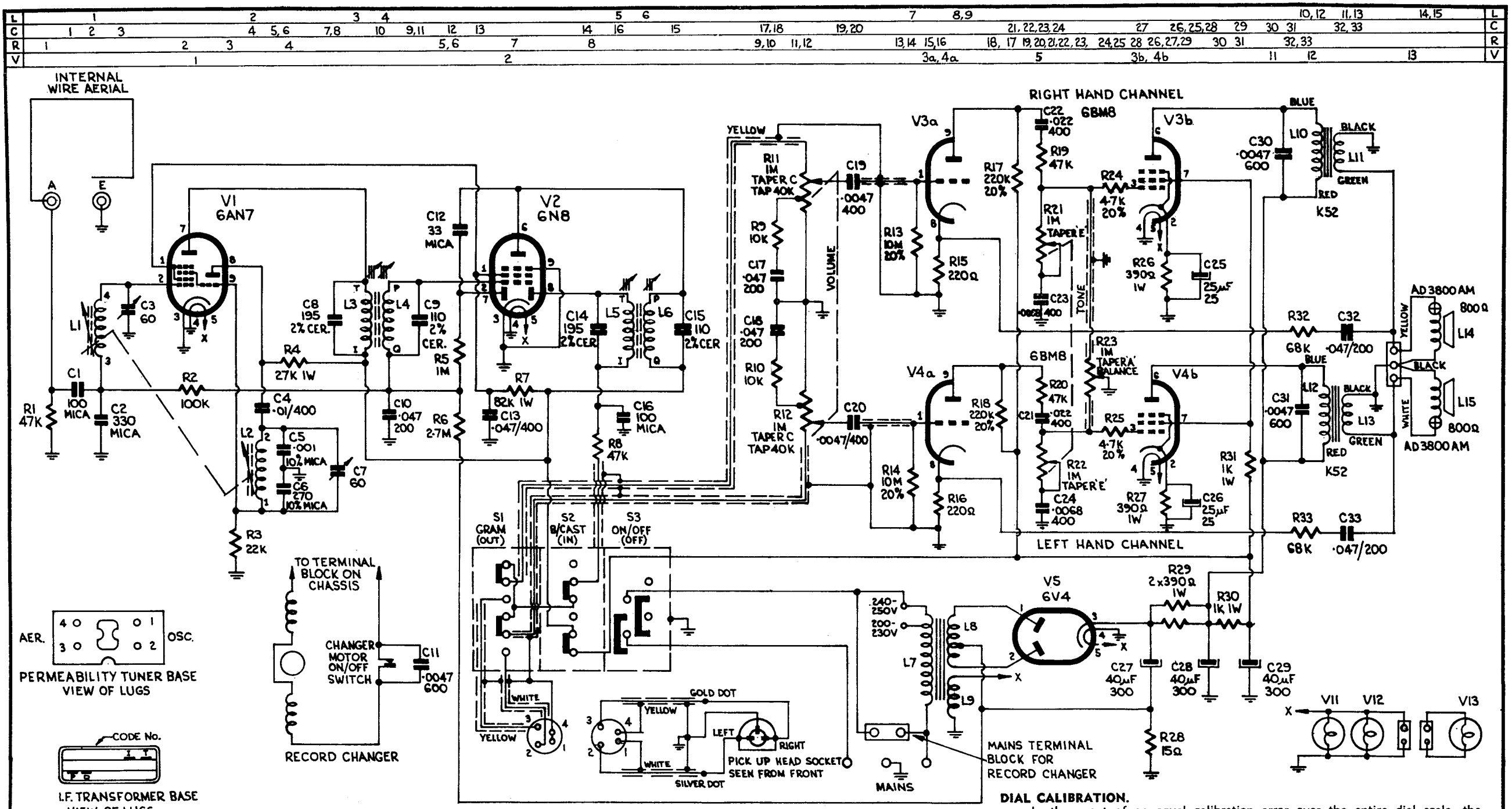
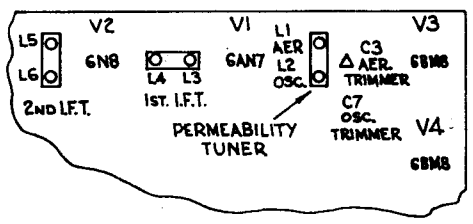


PERMEABILITY TUNER BASE
VIEW OF LUGS

I.F. TRANSFORMER BASE
VIEW OF LUGS

PRIMARY AND SECONDARY WINDINGS ARE NOT SYMMETRICAL. CORRECT CONNECTIONS ESSENTIAL



TRIMMER LAYOUT
TOP VIEW OF CHASSIS

NOTES.

1. CAPACITOR VALUES.
   WHOLE NUMBERS - pF
   DECIMALS - µF
   SECOND FIGURE - D.C.V.W.
   TOLERANCE ± 20% UNLESS OTHERWISE SHOWN
2. RESISTORS ARE ½W 10% UNLESS OTHERWISE SHOWN

VOLTAGE ANALYSIS

VALVE No.	PLATE VOLTS	SCREEN VOLTS	OSC. PL. VOLTS	CATHODE VOLTS
V1	217V	45	97	
V2	217	45		
V3a	75			
V3b	220	210		14
V4a	75			
V4b	220	210		14
V5				260V

UNFILTERED B+238V
FILTERED B+218V
FILAMENT 6·3V
MEASURED WITH 20,000Ω PER VOLT METER.

ALL D.C. VOLTAGES MEASURED FROM CHASSIS.

DIAL CALIBRATION.

In the event of an equal calibration error over the entire dial scale, the dial cursor can easily be moved on the dial drive cord to correct the error.

ALIGNMENT.

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

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

I.F. ALIGNMENT.

Set permeability tuner fully out, screw out iron core of primary (L6), 2nd I.F.T. as far as practicable.

Apply a modulated 455 kc/s via a .01µF capacitor to control grid (pin 2) of V1 and peak I.F.T. cores in the following order:—

Secondary of 2nd I.F.T. (L5) — Primary of 1st I.F.T. (L3)
Secondary of 1st I.F.T. (L4) — Primary of 2nd I.F.T. (L6)

Do not repeat any adjustments.

R.F. ALIGNMENT.

Use a standard dummy aerial and apply a modulated R.F. signal to aerial terminal.

Alignment frequencies are as follows, commencing with permeability tuner fully in 530 kc/s peak oscillator trimmer (C7), 1,500 kc/s peak aerial trimmer (C3), and 1,000 kc/s set cursor at this point.

CAPACITORS

No.	Description	Code No.
C1	100pF mica	
C2	330pF mica	
C3	60pF trimmer	49.005.58
C4	0.01μF 400VW paper	
C5	0.001μF ± 10% mica	
C6	270pF ± 10% mica	
C7	60pF trimmer	49.005.58
C8	195pF ± 2% ceramic }	
C9	110pF ± 2% ceramic }	
	Part of 1st I.F. Transformer	
C10	0.047μF 200VW paper	
C11	0.0047μF 600VW paper (anti-click capacitor incorporated in record changer)	
C12	33pF mica	
C13	0.047μF 400VW paper	
C14	195pF ± 2% ceramic }	
C15	110pF ± 2% ceramic }	
	Part of 2nd I.F. Transformer	
C16	100pF mica	
C17, 18	0.047μF 200VW paper	
C19, 20	0.0047μF 400VW paper	
C21, 22	0.022μF 400VW paper	
C23, 24	0.0068μF 400VW paper	
C25, 26	25μF 25VW electrolytic	
C27,28, 29	40μF 300VW electrolytic	
C30, 31	0.0047μF 600VW paper	
C32, 33	0.047μF 200VW paper	

RESISTORS

No.	Description	Code No.
R1	47,000Ω ½W carbon	
R2	100,000Ω ½W carbon	
R3	22,000Ω ½W carbon	
R4	27,000Ω 1W carbon	
R5	1MΩ ½W carbon	
R6	2.7MΩ ½W carbon	
R7	82,000Ω 1W carbon	
R8	47,000Ω ½W carbon	
R9, 10	10,000Ω ½W carbon	
R11, 12	2 x 1MΩ ganged potentiometer (volume) tapped @ 40kΩ	CZ.029.339.1
R13, 14	10MΩ ½W carbon	
R15, 16, 17, 18	220Ω ½W carbon	
R19, 20	47,000Ω ½W carbon	
R21, 22	2 x 1MΩ ganged potentiometer (tone)	CZ.029.606
R23	1MΩ potentiometer (balance)	CZ.029.338
R24, 25	4,700Ω ½W carbon	
R26, 27	390Ω 1W	
R28	15Ω ½W WW	
R29	390Ω 2W x 2 (in parallel)	
R30, 31	1kΩ 1W	
R32, 33	68,000 ½W	

INDUCTORS

No.	Ohms.	Description	Type or Code No.
L1	15-16 }	Permeability tuner	CZ.109.002.1
L2	5.8-6.2 }		
L3	8.0-9.0 }	1st I.F. Transformer	A3.126.84.PA5K
L4	4.7-5.2 }		
L5	4.7-5.2 }	2nd I.F. Transformer	CZ.320.444.3K
L6	8.3-9.2 }		
L7	19.0 }		
L8	180.0 }	Power Transformer	CZ.344.126.2
L9	0.5 }		

No.	Ohms.	Description	Type or Code No.
L10	630.0 }	Output Transformer	Rola type K52
L11	65.0 }		CZ.345.070
L12	630.0 }	Output Transformer	Rola type K52
L13	65.0 }		CZ.345.070
L14		Loudspeaker 8" (High Z)	Philips AD3800AM CZ.161.226
L15		Loudspeaker 8" (Impedance 800Ω)	Philips AD3800AM CZ.161.226

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.

MISCELLANEOUS COMPONENTS

Drawing Ref. No.	Description	Code No.
4	Assy, cursor	CR.480.674
	Assy., jockey pulley	CR.371.233
2	Assy., spindle tuning	CR.371.232
	Assy., bracket aerial/earth	CR.262.473
	Back cabinet	CS.462.732
	Back cabinet, speaker comp. R.H.	CS.462.735
	Back cabinet, speaker comp. L.H.	CS.462.736
	Badge "Philips"	A3.357.10
	Bezel (amber)	CS.430.053
3	Bracket assy., pulley	CR.382.401
3	Bracket assy., pulley	CR.382.400
	Channel dial scale mtg., x2	CS.424.240
	Channel dial scale mtg.	CS.424.239
	Clamp, channel mtg., x4	CS.282.490
	Clamp, chassis mtg.	CS.282.489
5	Dial cord	44" approx.
1	Drum dial	CS.360.015
	Dial scale	CS.412.440
	Escutcheon badge	CS.436.464
	Grommet clamp (power cord to chassis) Ceeco type C/12	CS.282.484
	Grommet (R/C power cord to chassis) Ceeco type C/2	CS.422.499
	Handle, top flap	CR.523.209
	Handle, record compartment	CR.523.210
	Knob, assy., tickler	CR.523.776
	Knob, assy., balance	CR.523.775
	Knob assy., volume/tone, x2	CR.523.774

Drawing Ref. No.	Description	Code No.
	Leg assy., (maple), x4	CR.700.128
	Leg assy., (walnut), x4	CR.700.068
	Leg assy., (rose mahogany), x4	CR.700.069
	Lid stay assy., (top flap)	CR.285.812
	Lid stay assy., (record compart.)	CR.285.813
	Nut special (handle), x2	CS.271.039
	Overlay dial assy.	CR.520.009
	Plate, dial back	CS.034.023
	Push button switch assy.	A3.298.48
	Ring, dial cord, x2	CS.281.807
	Ring 'C' tuning spindle	CS.281.802
	Spacer hex (dial back plate mtg.), x4	CS.213.804
	Spacer (switch assy. to bracket), x2	CS.284.213
	Shield, dial lamp, x2	CS.050.204
	Socket, dial lamp, x2 C/F type 733-8-7	CZ.367.952
	Screw, special, overlay mtg., x6	CS.258.622
	Spring, jockey pulley	CS.210.069
	Socket 4 pin (pick-up) Teletron type 4QMS/C	
	Socket, 2 pin bezel light C/F type 733-16-1	
	Spring, I.F.T. retaining, x2	A3.652.58
	Terminal panel speakers	CZ.375.090
	Terminal block (R/C main supply)	CZ.374.205
	Washer, thrust jockey pulley, x2	CS.467.150
	Wingscrew chassis mtg., x3	CS.258.868
	Wordmark "Stereofidelity"	CS.436.464

CHASSIS REMOVAL.

Disconnect receiver from mains supply and remove centre and L.H. speaker cabinet backs. Detach speaker leads from terminal strip, record changer mains supply from terminal block and aerial and earth terminal spades. Remove pick-up and bezel lamp lead plugs (trap bezel lead plug behind small slot in speaker compartment side to facilitate chassis replacement).

The three chassis retaining wingscrews (one in L.H. speaker compartment and two under record changer compartment) should now be removed, together with the chassis clamp bracket on L.H. side. Raise chassis from underneath, sufficiently to enable a firm grasp to be obtained underneath the dial back plate, and lift chassis out; care should be taken not to damage the lid during this operation.

NOTE: For dial lamp replacement it is necessary to remove chassis. Replacement is a reversal of the foregoing.

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 movment is out or forward. Speakers must be connected as in the circuit diagram.

EXTERNAL SPEAKER BOX No. 23.

The No. 23 external speaker box is available, if required, to provide a wider sound picture for stereo application. Installation requires the removal of the appropriate loudspeaker from its fitted position in the receiver cabinet, and refitting into the speaker box, also extending the connecting leads to suit the required position.

PHILIPS Service notes

To be read in conjunction with MODEL 223 SERVICE DATA

GENERAL

Model 223R consists of the Standard 223 Radiogram with the addition of Reverberation Unit, Reverberation Amplifier and Two 10" x 3" Loudspeakers. A Remote Unit, to control the degree of Reverberation applied, is also fitted to the Receiver.

RESISTORS

No.	Description	Type or Code No.
1	820,000 Ω ½w carbon, 10%	
2	820,000 Ω ½w carbon, 10%	
3	33,000 Ω ½w carbon, 10%	
4	4,700 Ω ½w carbon, 10%	
5	150 Ω ½w W/W 10%	IRC BW½
6	270,000 Ω ½w carbon, 10%	
7	1,000 Ω ½w carbon, 10%	
8	220,000 Ω ½w carbon, 10%	
9	500,000 Ω carbon potentiometer, taper C, type Q, with reverse action S.P.S.T. switch	CZ.032.039
10	22,000 Ω ½w carbon, 10%	
11	10M Ω ½w carbon 10%	
12	270,000 Ω ½w carbon, 10%	
13	47,000 Ω ½w carbon, 10%	
14	470,000 Ω ½w carbon, 10%	
15	4,700 Ω ½w carbon, 10%	
16	180 Ω 1w W/W 10%	IRC BW1
17	180 Ω 1w W/W 10%	IRC BW1
18	3,300 Ω 1w carbon, 10%	
19	3,300 Ω 1w carbon, 10%	
20	56 Ω ½w carbon, 10%	
21	56 Ω ½w carbon, 10%	

CAPACITORS

No.	Description	Type or Code No.
1	0.001μF 600V paper 20%	Ducon TPB
2	1μF 350W electrolytic	Ducon ET1B
3	0.001μF 600V paper 20%	Ducon TPB
4	4.7nF 600V paper 20%	Ducon TPB
5	15nF 600V paper 20%	Ducon TPB
6	3.3nF 600V paper 20%	Ducon TPB
7	40μF 300VW electrolytic	Ducon EE5G
8	40μF 300VW electrolytic	Ducon EE5G
9	40μF 300VW electrolytic	Ducon EE5G

(Note—nF = nanofarad, i.e. 10^{-9} farad.)

INDUCTORS

No.	Ohms	Description	Type or Code No.
L1	600	13,500Ω/800Ω reverb. unit driver transformer	CZ.345.081
L2	160		Rola Q27-1
L5	375	6,000Ω/7.5Ω output transformer	CZ.345.080
L6	0.75		Rola K54-1
L9	19.0	Power transformer	CZ.344.126
L10	180.0		
L11	0.5		
L21	14.0	Speaker	Rola 10-3G, F16, 15Ω CZ.162.520
L22	14.0	Speaker	Rola 10-3G, F16, 15Ω CZ.162.520

MISCELLANEOUS COMPONENTS

Description	Code No.
Plug, reverb. unit input and output	CZ.365.029 (C/F.691-10-1)
Plug, speaker	CZ.365.108 (C/F.691-5-1)
Socket, speaker	CZ.370.107 (C/F.733-16-1)
Socket, valve, 3x	CZ.369.718 (C/F.733-2-25)

Description	Code No.
Remote Control Unit Items	
Complete unit	CZ.401.202
Body	CS.461.830
Cap	CS.462.749
Knob, control	CR.523.548
Stand	CS.233.076
Switch potentiometer	CZ.032.039
Reverberation Unit	CZ.171.000 Hammond type IV

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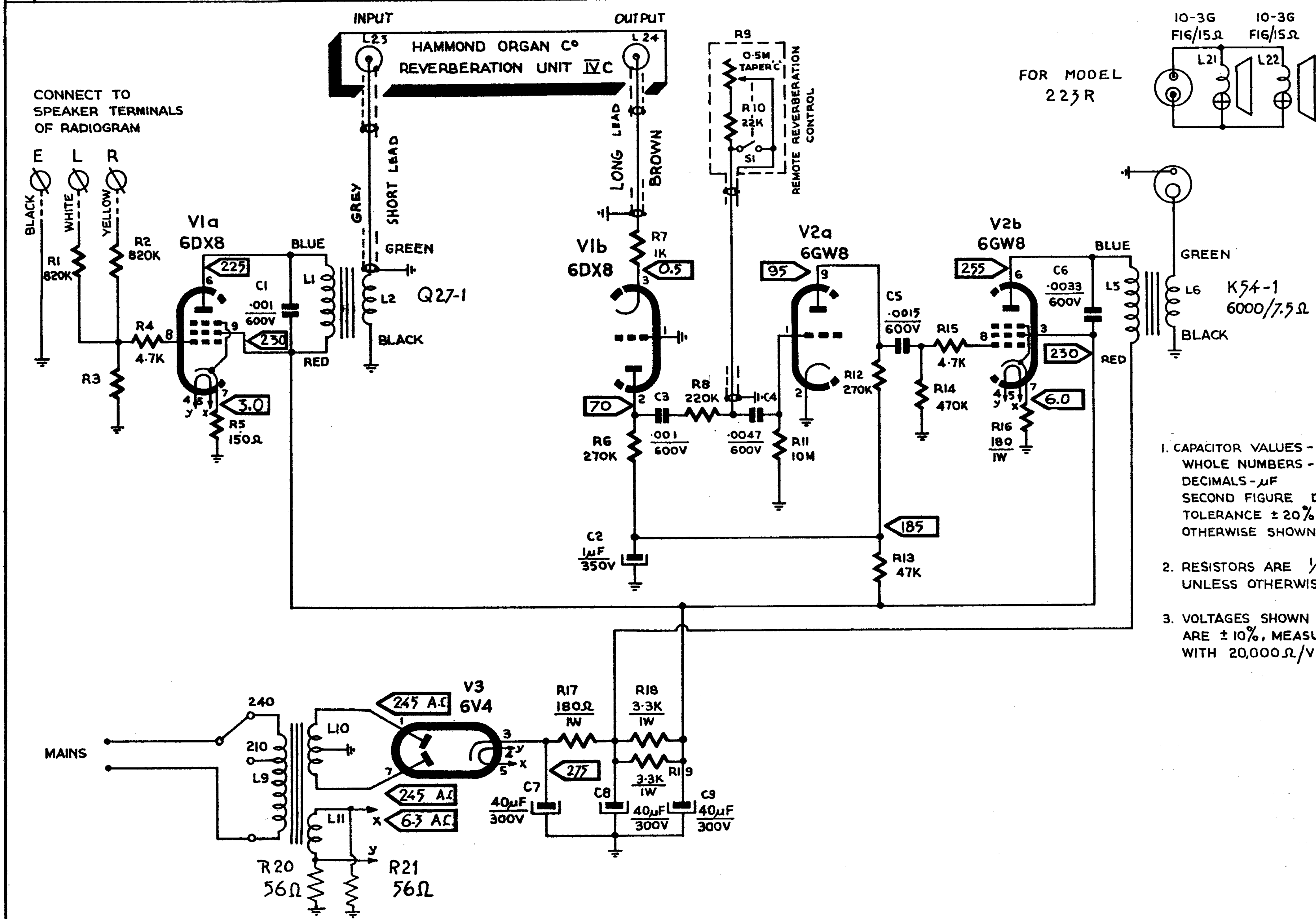
DECEMBER, 1961

RCP 3M 12/61

R	1	2,3	4	5	20	21	17	6,7, 18,19	8,9,10	11	12,13	14	15	16	R
C	1	7	8	2	3	9	4	5	6						C
L	9,10,11	1,2	3	4	5,6	7	8								L
V	1a	3	1b	2a	2b										V



1. CAPACITOR VALUES -
WHOLE NUMBERS - pF
DECIMALS - µF
SECOND FIGURE DCWW
TOLERANCE ± 20% UNLESS
OTHERWISE SHOWN.

2. RESISTORS ARE 1/2 W ± 10%
UNLESS OTHERWISE SHOWN.

3. VOLTAGES SHOWN [arrow symbol]
ARE ± 10%, MEASURED
WITH 20,000Ω/V METER.