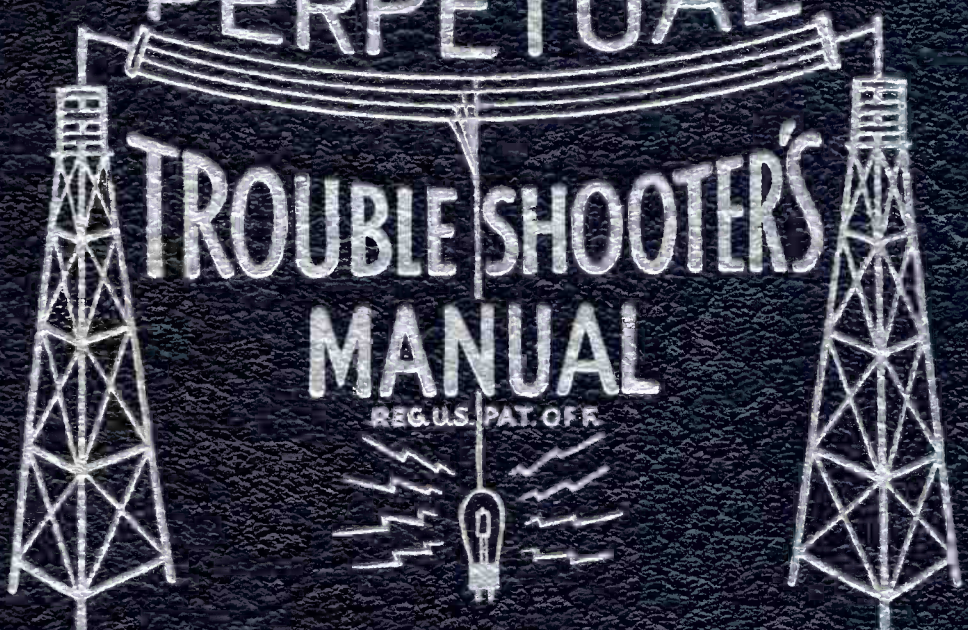
VOLUME XXI

PERPETUAL TROUBLE SHOOTER'S MANUAL

REG. U.S. PAT. OFF.



JOHN F. RIDER

TUBES:

Tube	Function
6SK7	R-F Amplifier
6SA7	Frequency Converter
6SK7	I-F Amplifier
6SQ7	2nd Detector—1st Audio Amplifier
6K6-GT	Power Amplifier
5Y3-GT	Rectifier

SPECIFICATIONS

OVERALL DIMENSIONS:

Height	35"
Width	29"
Depth	18"
Shipping Weight	100 Lbs.

ELECTRICAL RATING:

Line Voltage	110-120 volts, 50-60 C.P.S.
Power Consumption	57 watts @ 115 VAC

TUNING FREQUENCY RANGE:

540 to 1620 KC

INTERMEDIATE FREQUENCY:

455 KC

ELECTRICAL POWER OUTPUT:

Maximum	3.2 watts
Undistorted	1.7 watts

LOUDSPEAKER:

Type	Permanent Magnet
Outside Cone Diameter	10"
Voice Coil Impedance	3.2 ohms @ 400 C.P.S.
Magnet Rating	3.16 Ozs. Alnico V

SPECIAL SERVICING INFORMATION

D. C. RESISTANCE MEASUREMENTS:

Due to a variation of winding methods, the D. C. resistance on all coils is subject to a 20% tolerance.

1st I-F Coil:

Primary	17 ohms
Secondary	14.5 ohms

2nd I-F Coil:

Primary	17 ohms
Secondary	14.5 ohms*

Oscillator Coil:

Primary	1 ohms
Secondary	6 ohms

R-F Coil:

Primary	58 ohms
Secondary	4.2 ohms

*Because of the 47K resistor in series with the secondary of the 2nd I-F, the reading shown can only be obtained by removing the coil from the can.

STAGE GAIN MEASUREMENTS:

Meosurements taken with Volume and Tone Controls maximum . . . Selector Switch in Radio position . . . AVC shorted to ground.

Standard Output	50 milliwatts
Dummy Antenna	200 Mmf.

Antenna to R-F Grid—6X at 100 KC
R-F Grid to Converter Grid—7X at 1000 KC
Converter Grid to 1st I-F Grid—46X at 455 KC
1st I-F Grid to 2nd Detector—62X at 455 KC
Overall Audio Gain—320X at 500 milliwatts, 400 cycles.

OSCILLATOR CATHODE VOLTAGES:

Measured at 117 volts AC line with an AC vacuum tube voltmeter input loading above 10 megohms.

1500 KC — 2.25 VAC
1000 KC — 2.15 VAC
800 KC — 2.3 VAC
600 KC — 2.5 VAC

MODEL 601

SOCKET VOLTAGES

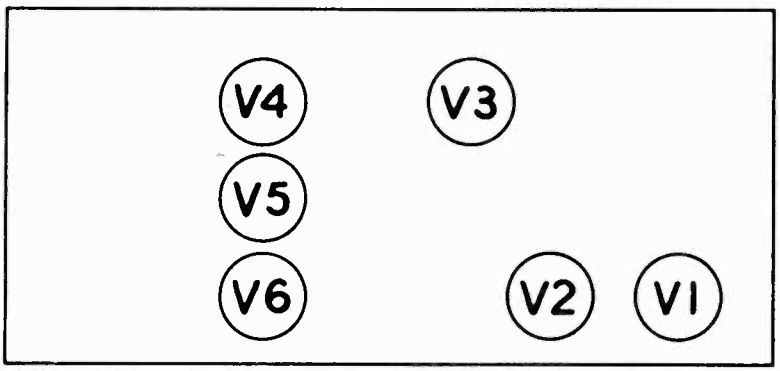


Figure 2
Tube Location Chart

The socket voltages shown were measured under the following conditions:

1. D.C. voltages measured from socket contacts to chassis with a D.C. vacuum tube voltmeter.
2. A.C. voltages measured with a 1,000 ohms per volt A.C. meter.
3. Volume and Tone Controls maximum.
4. Selector Switch in Radio position; no signal.
5. All voltages are positive D.C. unless otherwise noted.
6. Voltage readings subject to a 10% variation.

V-1—6SK7—R-F Amplifier:

Pin	Element	Voltage
1	Shield	0
2	Heater	0
3	Grid 3	0
4	Grid 1	-.7
5	Cathode	.5
6	Grid 2	74
7	Heater	6.0 VAC
8	Plate	190

V-2—6SA7—Frequency Converter:

Pin	Element	Voltage
1	Grid 5	0
2	Heater	0
3	Plate	195
4	Grids 2 & 4	74
5	Grid 1	-6.4
6	Cathode	0
7	Heater	6.0 VAC
8	Grid 3	-.8

V-3—6SK7—I-F Amplifier:

Pin	Element	Voltage
1	Shield	0
2	Heater	6.0 VAC
3	Grid 3	0
4	Grid 1	-.7
5	Cathode	2.2
6	Grid 2	74
7	Heater	0
8	Plate	195

V-4—6SQ7—2nd Detector, 1st Audio Amplifier:

Pin	Element	Voltage
1	No Connection	0
2	Grid	-.5
3	Cathode	0
4	Diode Plate	-1
5	Diode Plate	-1
6	Plate Triode	105
7	Heater	0
8	Heater	6.0 VAC

V-5—6K6-GT—Power Amplifier:

Pin	Element	Voltage
1	No Connection	0
2	Heater	0
3	Plate	240
4	Grid 2	200
5	Grid 1	-13
6	No Connection	0
7	Heater	6.0 VAC
8	Cathode	0

V-6—5Y3-GT—Rectifier:

Pin	Element	Voltage
1	No Connection	0
2	Heater	260 (5.0 VAC to pin 8)
3	No Connection	0
4	Plate	265 VAC to Pow. Trans. Center Tap
5	No Connection	0
6	Plate	265 VAC to Pow. Trans. Center Tap
7	No Connection	0
8	Heater	260 (5.0 VAC to pin 2)

ALIGNMENT PROCEDURE

Alignment procedure consists of the steps outlined in the Alignment Chart. Make certain each step is done with a minimum input signal.

Connect output meter to speaker voice coil.

ALIGNMENT CHART

STEP	CONNECT TEST OSC. TO	TEST OSC. SETTING	POINTER SETTING	ADJUST FOR MAX OUTPUT
1	Mixer grid & Ground	455 KC	540 KC	Trimmers A, B, C & D
2	R-F Grid & Ground	1500 KC	1500 KC	Trimmer G
3	R-F Grid & Ground	600 KC	600 KC	Padder E
4	R-F Grid & Ground	1500 KC	1500 KC	Trimmers F & H
5	Repeat Steps 2, 3 & 4			
6	Check Stationizing. Slide pointer on string if stations are uniformily off in one direction.			

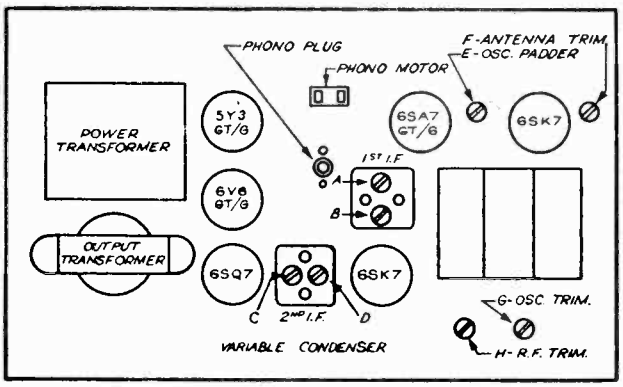


Figure 3
Trimmer Location

TABLE OF REPLACEABLE PARTS

REF. SYMBOL	DESCRIPTION	PB PART NO.
	CAPACITOR, TUBULAR,	
C-15, 17	.005 Mfd. 600 volt	23004
C-16	.02 Mfd. 600 volt	23007
C-5, 12	.05 Mfd. 600 volt	23010
C-8	.05 Mfd. 200 volt	23017
	CAPACITOR, TRIMMER,	
C-6, 11	Dual—3-30 Mmf.	23400
C-10	300-800 Mmf.	23402
C-2	3-30 Mmf.	23406
	CAPACITOR, VARIABLE,	
C-1A, B, C	3-gang	23521
	CAPACITOR, ELECTROLYTIC,	
C-18	40 Mfd. 350 volt	24063
C-19	20 Mfd. 350 volt	24064
	CONTROLS,	
R-9	Volume, 1 megohm—tapped	25010C
R-11	Tone, 5 megohms	25506C
	COILS,	
L-2	1st I-F—455 KC	29004E
L-3	2nd I-F—455 KC	29007
L-1	R-F	29102F
L-4	Oscillator	29205C
	Loop	29335A
	RESISTORS, ½ WATT, 10%,	
R-2, 8	39 ohms	73008
R-7	390 ohms	73020
R-14	1,500 ohms	73027
R-4	22,000 ohms	73041

REF. SYMBOL	DESCRIPTION	PB PART NO.
	RESISTORS, ½ WATT, 20%,	
R-12	220,000 ohms	73153
R-13	470,000 ohms	73157
R-6	1 megohm	73161
R-1, 3	2.2 megohms	73165
R-10	4.7 megohms	73169
	RESISTORS, 1 WATT, 10%,	
R-16	270 ohms	73218
	RESISTORS, 2 WATT, 10%,	
R-5	10,000 ohms	73437
	RESISTORS, WIRE WOUND,	
R-15	2,000 ohms, 5 Watt, 10%	73631
	TRANSFORMERS,	
T-2	Power, 500 volt center tap @ .070 amperes	89010D
T-1	Output, 8,500 to 3.2 ohms	89427
	MISC. PARTS	
	Cabinet (Specify Finish)	21105B
	Cord, AC	32003C
	Dial	38120A
	Knobs	52037
	Lamp, dial—T-44	54001
	Record Changer V-M 950	58037
	Plug—Antenna & Speaker	66004
	Dial Pointer	67031
	Socket, Tube, Std. Octal	79002
	Socket, Speaker	79005
	Socket, AC	79007
	Socket, Dial Light	83705
	Speaker, 10" PM	86988
	Switch—Ph-Rod	79010

MODEL 601

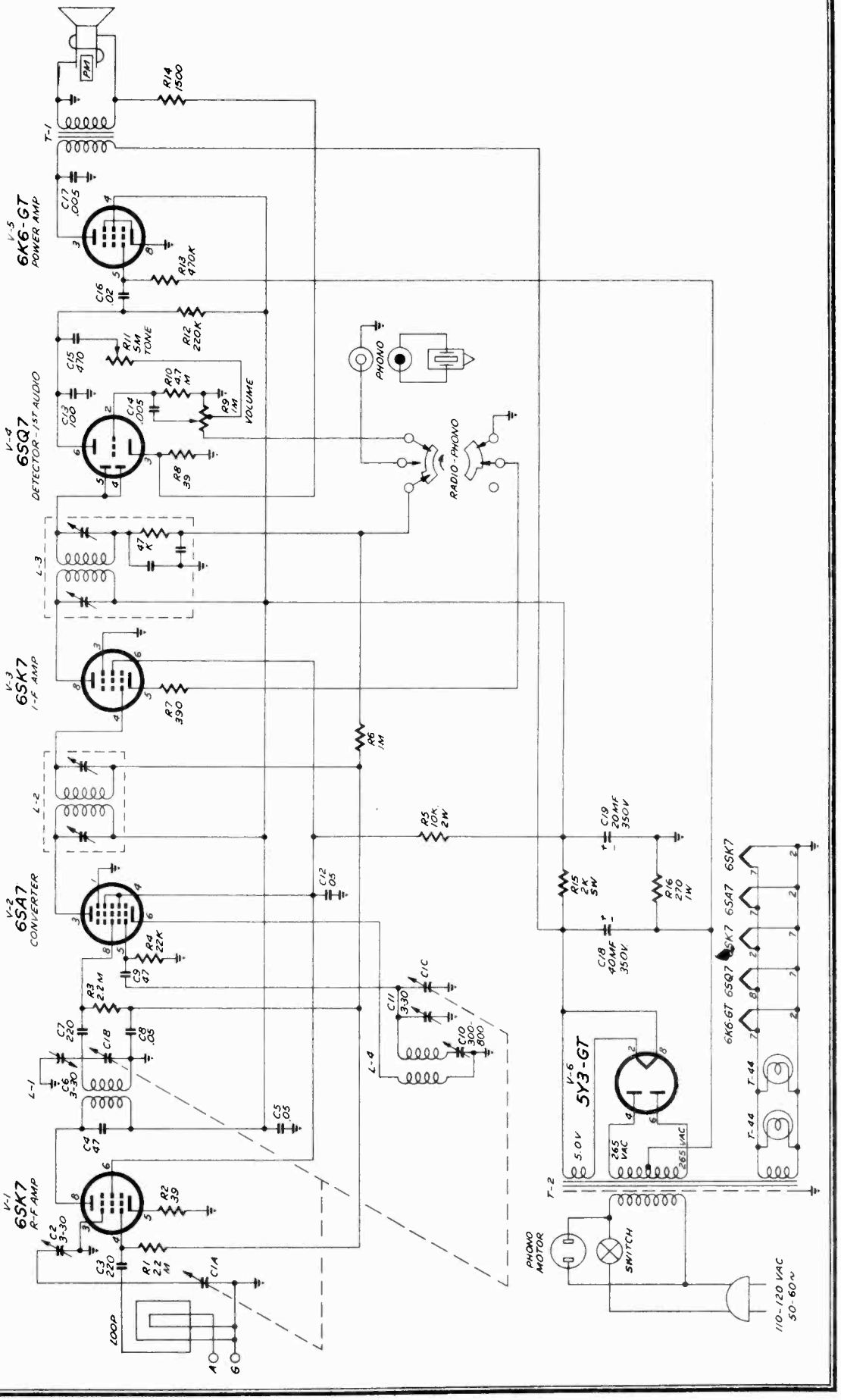


Figure 4
Schematic Diagram

SPECIFICATIONS

CABINET	
Model 50-920	Molded plastic, mahogany and gray, wide-angle dial
Model 50-921	Molded plastic, ivory, wide-angle dial
Model 50-922	Molded plastic, maroon, wide-angle dial
CIRCUIT	6-tube superheterodyne
FREQUENCY RANGE	540—1620 kc.
AUDIO OUTPUT	1.2 watts
OPERATING VOLTAGE	105—120 volts, a.c. or d.c.
POWER CONSUMPTION	30 watts
AERIAL	Built-in, high-impedance loop; provision for connection of external aerial
INTERMEDIATE FREQUENCY	455 kc.
PHILCO TUBES (6)	7B7 r-f ampl., 7A8 converter, 7B7 i-f ampl., 14B6 det.—1st audio—a.v.c., 50L6GT output, 35Z5GT rectifier

ALIGNMENT PROCEDURE

DIAL POINTER: Turn tuning condenser to full-mesh position. Adjust pointer so that center of pointer carriage coincides with first scribe line from the left.

OUTPUT METER: Connect across speaker voice coil.

SIGNAL GENERATOR: Connect as indicated in chart Use modulated output.

OUTPUT LEVEL: During alignment, attenuate signal-generator output to maintain an output-meter indication of 1.25 volts.

VOLUME CONTROL: Set to maximum.

NOTE: Run 1 sets have an i.f. of 265 kc. Otherwise alignment is as indicated.

CRITICAL DRESS: The green lead from the osc. section of C1 to C5 must be dressed away from the chassis, with all excess under the chassis.

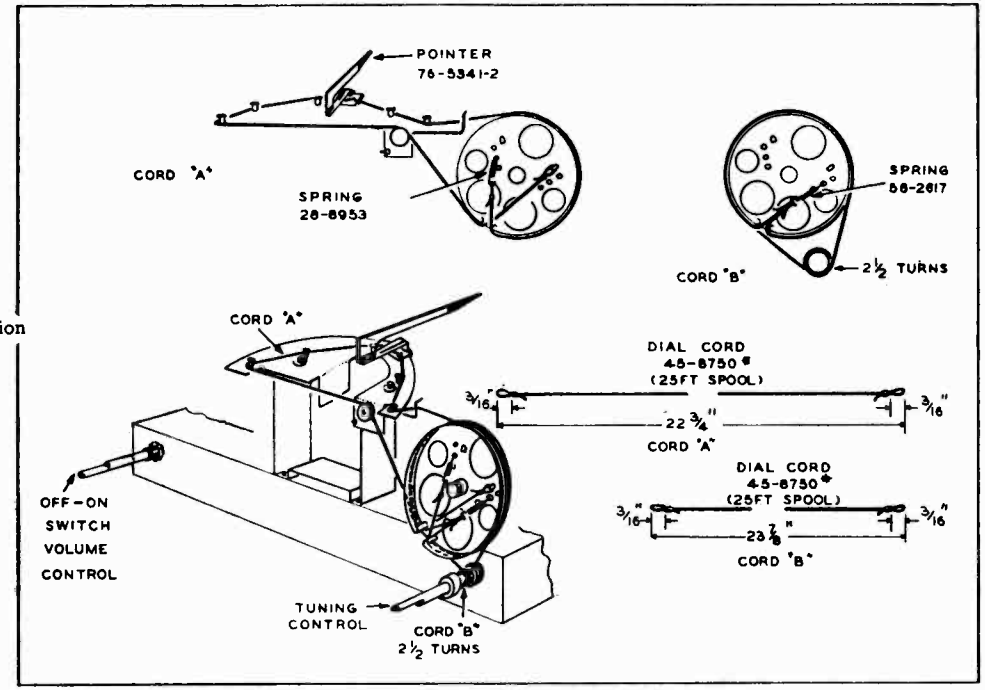


Figure 1. Dial-Cord Installation Details TP9-636A

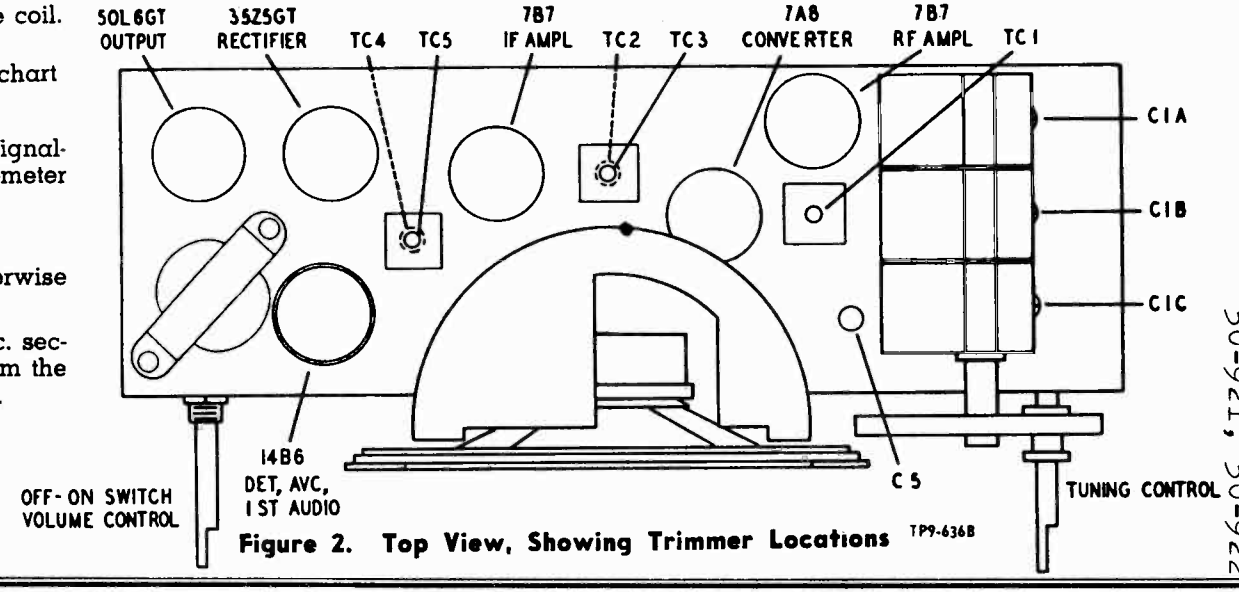


Figure 2. Top View, Showing Trimmer Locations TP9-636B

MODELS 50-920, 50-921, 50-922

ALIGNMENT CHART

STEP	SIGNAL GENERATOR		RADIO		ADJUST
	CONNECTION TO RADIO	DIAL SETTING	DIAL SETTING	SPECIAL INSTRUCTIONS	
1	Through a .1-μf. condenser to stator of r-f section of gang. Ground lead to B-.	455 kc.	Gang fully meshed.	Adjust, in order given, for maximum output.	TC5—2nd i-f sec. TC4—2nd i-f pri. TC3—1st i-f sec. TC2—1st i-f pri.
2	Radiating loop. (See note below.)			Preset 1/2 turn from tight.	C5—osc. series
3	Same as step 2.	1620 kc.	1620 kc.	Adjust for maximum.	C1B—osc. shunt
4	Same as step 2.	1500 kc.	1500 kc.	Adjust for maximum.	C1C—r-f C1A—aerial
5	Same as step 2.	580 kc.	580 kc.	Adjust for maximum while rocking tuning control.	C5—osc. series TC1—r-f core
6	Repeat steps 3 and 4.				

RADIATING LOOP: Make up a 6—8 turn, 6-inch-diameter loop from insulated wire; connect to signal-generator leads and place near radio loop aerial. The loop aerial must be connected to the radio

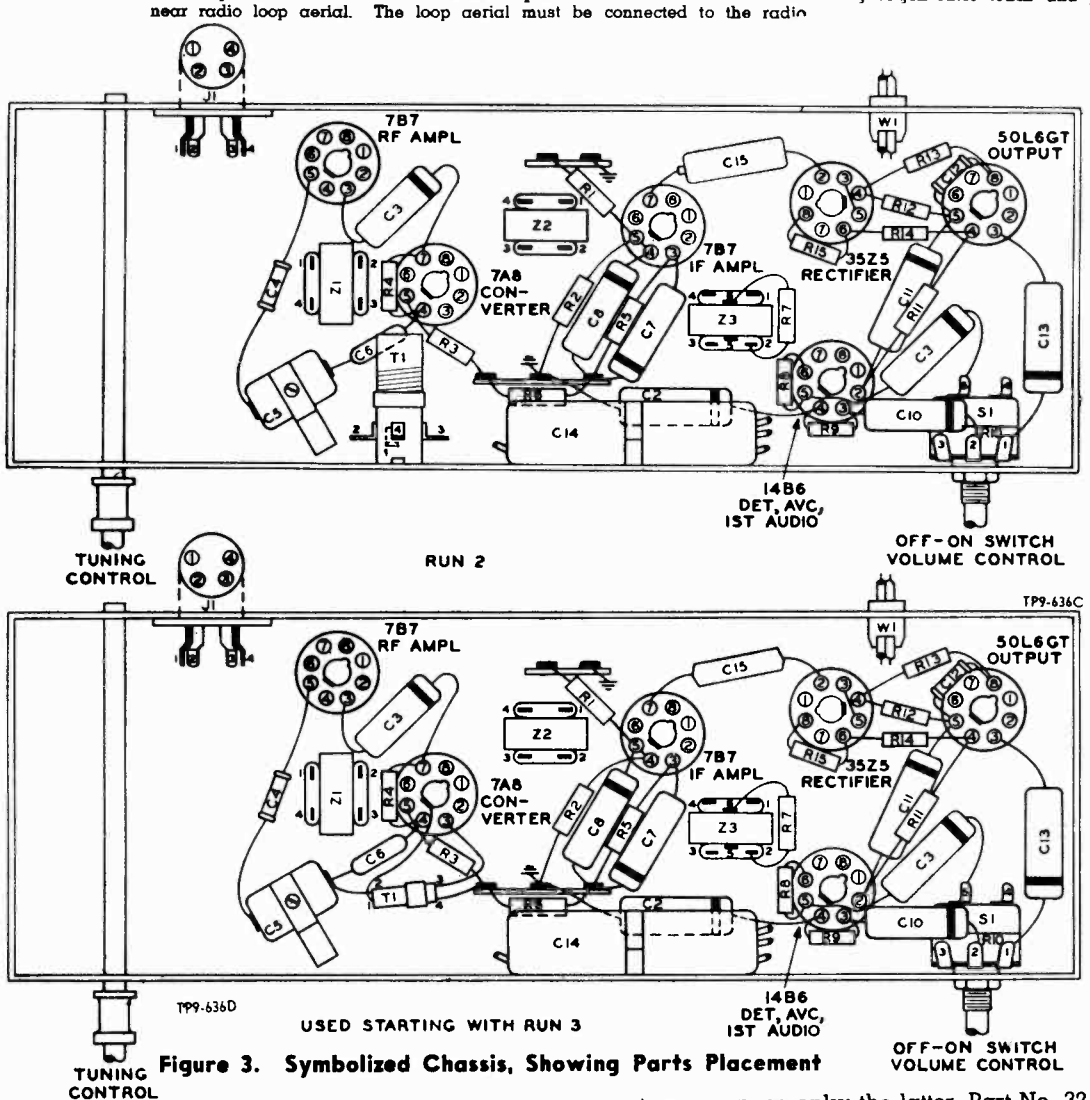


Figure 3. Symbolized Chassis, Showing Parts Placement

PRODUCTION CHANGES

Run 2: I.F. changed from 265 kc. to 455 kc.

Run 3: Oscillator coil, T1, changed from Part No. 32-4190-6 to Part No. 32-4263-3. This change was to save space only; the latter, Part No. 32-4263-3, should be ordered in either case.

Run 4: Condenser C4 changed in value from 20 $\mu\mu f$. Part No. 30-1224-56, to 13 $\mu\mu f$., Part No. 30-1224-68, to insure proper padding at 1620 kc.

MODELS 50-920, 50-921, 50-922

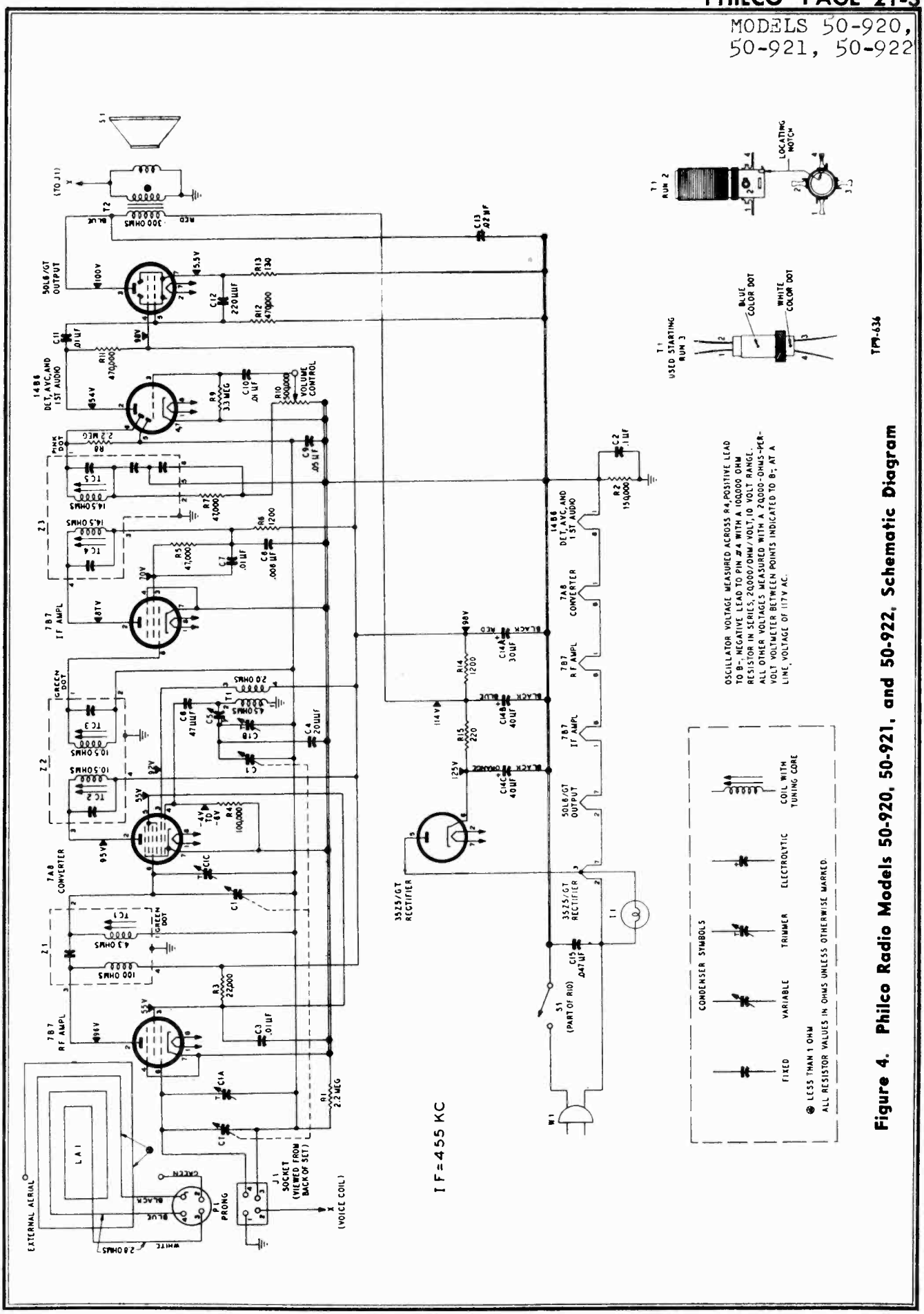


Figure 4. Philco Radio Models 50-920, 50-921, and 50-922, Schematic Diagram

MODELS 50-920,
50-921, 50-922

REPLACEMENT PARTS LIST

NOTE: Part numbers marked with an asterisk (*) are general replacement items. These numbers may not be identical with those on factory parts; also, the electrical values of some replacement items may differ from the values indicated in the schematic diagram and parts list. The values substituted in any case are so chosen that the operation of the radio will be either unchanged or improved. When ordering replacements, use only the "Service Part No."

Reference Symbol	Description	Service Part No.
C1	Condenser, tuning, 3-section	31-2748-1
C1A	Condenser, trimmer, aerial	Part of C1
C1B	Condenser, trimmer, osc.	Part of C1
C1C	Condenser, trimmer, r-f	Part of C1
C2	Condenser, by-pass, .1 μf.	61-0113*
C3	Condenser, screen by-pass, .01 μf.	61-0120*
C4	Condenser, fixed trimmer, temperature comp., 20 $\mu\mu f$.	30-1224-56
C5	Condenser, padder, osc. series	31-6473-17
C6	Condenser, d-c blocking, 47 $\mu\mu f$.	30-1227-5
C7	Condenser, screen by-pass .01 μf.	61-0120*
C8	Condenser, neutralization .006 μf.	45-3500-7*
C9	Condenser, a-v-c filter, .05 μf.	61-0122*
C10	Condenser, d-c blocking, .01 μf.	61-0120*
C11	Condenser, d-c blocking, .01 μf.	61-0120*
C12	Condenser, by-pass, 220 $\mu\mu f$.	62-122001001
C13	Condenser, tone compensation, .02 μf.	61-0108*
C14	Condenser, electrolytic, 3-section	30-2575-27
C14A	Condenser, filter, 30 μf., 150v	Part of C14
C14B	Condenser, filter, 40 μf., 150v	Part of C14
C14C	Condenser, filter, 40 μf., 150v	Part of C14
C15	Condenser, line by-pass, .047 μf.	30-4668-45
I1	Pilot lamp, 6—8v	34-2676
J1	Jack, aerial input	27-6214-1
LA1	Loop aerial, 50-920	30-4052-39
LA1	Loop aerial, 50-921 or 50-922	32-4052-40
LS1	Speaker, p-m, 4 in. by 6 in., oval	36-1633
P1	Loop-aerial plug	27-4788
R1	Resistor, a-v-c load, 2.2 megohms	66-5228340*
R2	Resistor, leakage, 150,0000 ohms	66-4158340*
R3	Resistor, dropping, 22,000 ohms	66-3228340*
R4	Resistor, grid return, 100,000 ohms	66-4108340*
R5	Resistor, screen dropping, 47,000 ohms	66-3478340*
R6	Resistor, decoupling, 1200 ohms	66-2128340*
R7	Resistor, i-f filter, 47,000 ohms	66-3478340*
R8	Resistor, diode load, 2.2 megohms	66-5228340*
R9	Resistor, grid return, 3.3 megohms	66-5338340*
R10	Volume control, 500,000 ohms, with off-on switch	33-5566-13
R11	Resistor, plate load, 470,000 ohms	66-4478340*
R12	Resistor, grid return, 470,000 ohms	66-4478340*
R13	Resistor, cathode bias, 130 ohms	66-1128340*
R14	Resistor, filter, 1200 ohms, 1 watt	66-2124340*
R15	Resistor, filter, 220 ohms, 2 watts	66-1225340*
S1	Switch, off-on	Part of R10
T1	Transformer, oscillator	32-4263-3
T2	Transformer, output	32-8310-3
W1	Line cord	L-2183
Z1	Transformer, r-f	32-4399-2A
Z2	Transformer, 1st i-f	32-4160A
Z3	Transformer, 2nd i-f	32-4240-3A

MISCELLANEOUS

Description	Service Part No.
Cabinet, 50-920 (mahogany)	10770
Cabinet, 50-920 (gray)	10770-1
Back	318-3020
Fastener, back (4)	W-2235FA9
Backplate, ornamental, mahogany cabinet	56-7426FCP
Backplate, ornamental, gray cabinet	56-7426-1FCP
Fastener, backplate mtg.	W-2235-1FA9
Baffle, cardboard	54-7938
Fastener, baffle mtg. (4)	W-2235-2FA9
Bezel, metal	56-7427
Speed nut, bezel mtg. (2)	1W60196FE7
Dial scale, mahogany cabinet	54-5070
Dial scale, gray cabinet	54-5070-2
Knob, mahogany cabinet (2)	54-4718-4
Knob, gray cabinet (2)	54-4718-7
Pointer	76-5341-1
Cabinet, 50-921	76-5378
Back	318-3021
Fastener, back (4)	W-2235FA9
Backplate, ornamental	56-7434
Fastener, backplate mtg.	W-2235-1FA9
Baffle, cardboard	54-7922
Fastener, baffle mtg. (4)	W-2235-2FA9
Dial scale	54-5071
Clip, dial mtg.	56-7808FE11
Knob (2)	54-4718-5
Pointer	76-5341-2
Cabinet, 50-922	10772
Back	318-3022
Fastener, back (4)	W-2235FA9
Backplate, ornamental	56-7435
Fastener, backplate mtg.	W-2235-1FA9
Baffle, cardboard	54-7919
Fastener, baffle mtg. (4)	W-2235-2FA9
Bezel, metal	56-7436
Speed nut, bezel mtg.	1W60196FE7
Dial scale	54-5072
Clip, dial mtg. (2)	56-7572FE11
Knob	54-4718-3
Pointer	76-5341
Backplate, pulley-and-clip assembly	76-5233
Clamp, electrolytic mtg.	56-1466FA5
Dial cord, 25-foot spool	45-8750*
Spring, gang drive	56-2617
Spring, pointer drive	28-8953
Drive shaft	76-3671-5
Bushing, drive shaft	27-9437
Spring, hairpin, drive shaft	57-1468FA3
Panel, wiring, external aerial	38-9837
Panel, wiring, 4-lug	38-9161-1
Plug, aerial, 4-pin	27-4788
Rubber mount, gang mtg. (4)	27-4771-1
Shield, tube, 14B6	56-1586
Socket, Loktal	27-6177
Socket, octal	27-6174
Socket assembly, pilot lamp	27-6233-18

MODELS 50-925
Code 123, 50-926

SPECIFICATIONS

CABINET	
Model 50-925, Code 123	Plastic, brown finish
Model 50-926	Wood, mahogany with brown leatherette, and blonde with green leatherette
CIRCUIT	6-tube superheterodyne plus selenium rectifier
FREQUENCY RANGES	
Broadcast	540—1620 kc.
FM	88—108 mc.
AUDIO OUTPUT	1 watt
OPERATING VOLTAGE	105—120 volts, a.c. or d.c.
POWER CONSUMPTION	35 watts
AERIAL	Built-in, high-impedance loop for AM, line cord for FM; provision for connection of external aerials
INTERMEDIATE FREQUENCIES	
AM	455 kc.
FM	9.1 mc.
PHILCO TUBES (6)	12BA6 FM r-f ampl., 12AT7 osc.-mixer, 12BA6 1st i-f ampl., 12BA6 2nd i-f ampl., 19C8 AM-FM det.-1st audio-a.v.c., 50C5 output, plus selenium rectifier

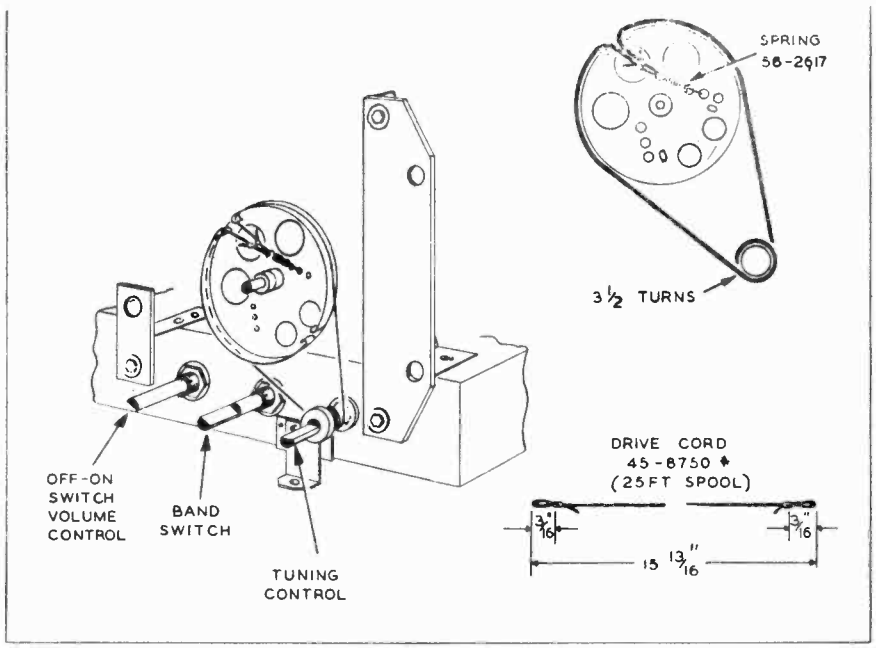


Figure 1. Dial-Cord Installation Details

AM ALIGNMENT PROCEDURE

Make alignment with loop aerial connected to radio. The AM alignment should be completed before the FM alignment is made.

DIAL POINTER — With tuning-condenser plates fully meshed, adjust pointer to coincide with index mark at low-frequency end of scale.

RADIO CONTROLS — Set volume control to maximum, set band switch for broadcast reception, and set tuning control as indicated in chart.

OUTPUT METER — Connect across voice-coil terminals.

SIGNAL GENERATOR — Use AM r-f signal generator, with modulated output. Connect generator and set frequency as indicated in chart.

OUTPUT LEVEL — During alignment, signal-generator output must be attenuated to hold output-meter reading below 1.25 volts.

MODELS 50-925
Code 123, 50-926

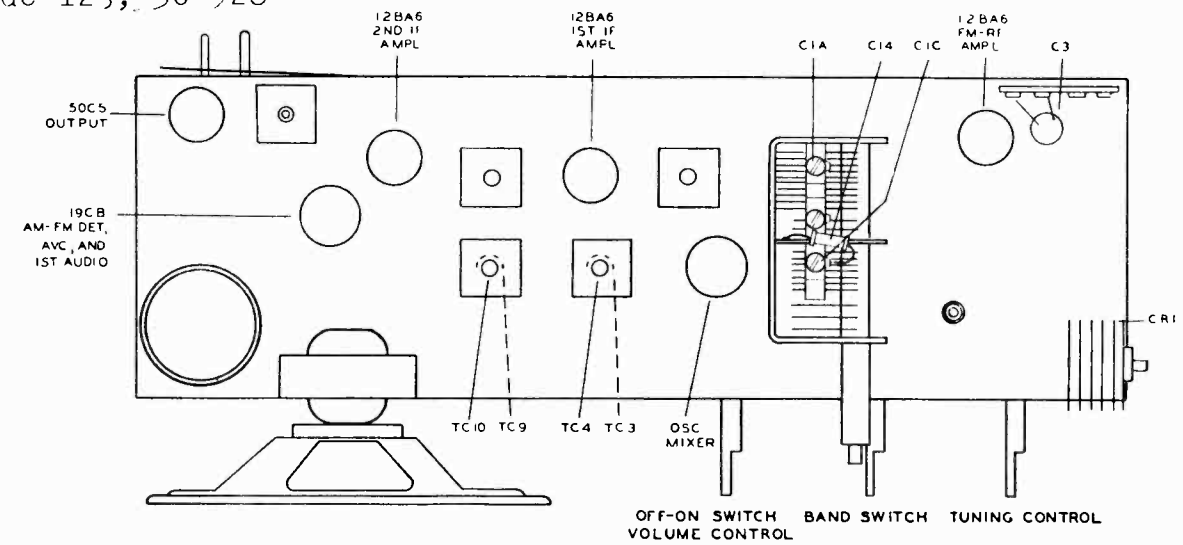


Figure 2. Top View, Showing AM Trimmer Locations

AM ALIGNMENT CHART

STEP	SIGNAL GENERATOR		RADIO		ADJUST
	CONNECTION TO RADIO	DIAL SETTING	DIAL SETTING	SPECIAL INSTRUCTIONS	
1	Ground lead to chassis. Output lead through a .1-μf. condenser to mixer grid (pin 7) of 12AT7.	455 kc.	540 kc. (gang fully meshed)	Adjust for maximum output.	TC10—2nd AM i-f sec. TC9—2nd AM i-f pri. TC4—1st AM i-f sec. TC3—1st AM i-f pri.
2	Radiating loop. (See note below.)	1600 kc.	1600 kc.	Adjust for maximum output.	C1C—osc. trimmer
3	Same as step 2.	1500 kc.	1500 kc.	Adjust for maximum output.	C1A—aerial trimmer

RADIATING LOOP: Make up a six-to-eight-turn, 6-inch-diameter loop from insulated wire; connect to generator terminals, and place near radio loop aerial. Radio loop aerial must be connected.

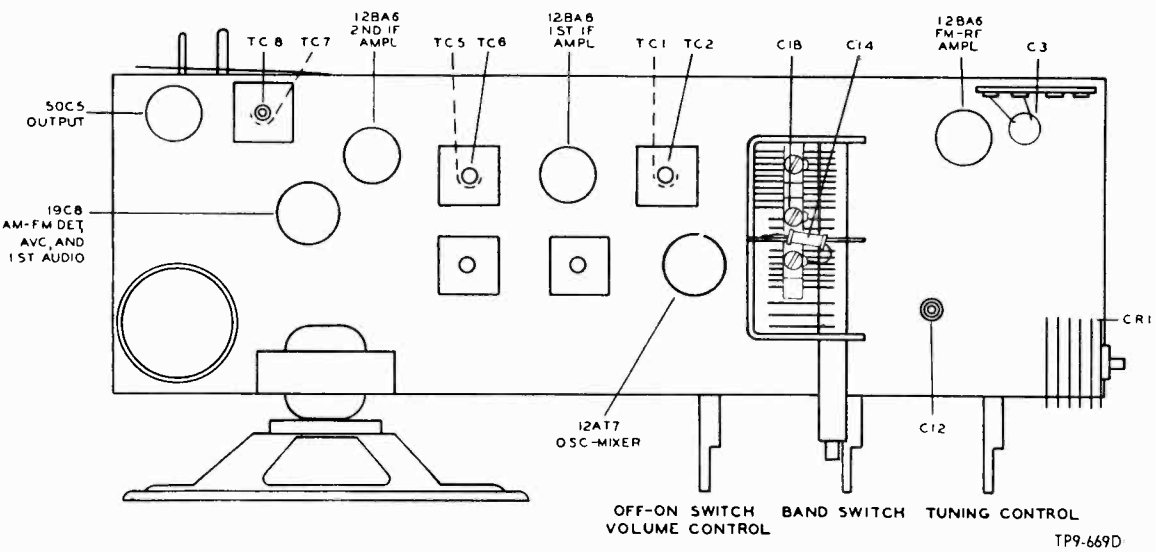


Figure 3. Top View, Showing FM Trimmer Locations

MODELS 50-925
Code 123, 50-926

FM ALIGNMENT PROCEDURE

Make AM alignment first.

RADIO CONTROLS — Set volume control to maximum, set band switch for FM reception, and set tuning control as indicated in chart.

OUTPUT METER — Connect across voice-coil terminals. (This meter is used only for step 3.)

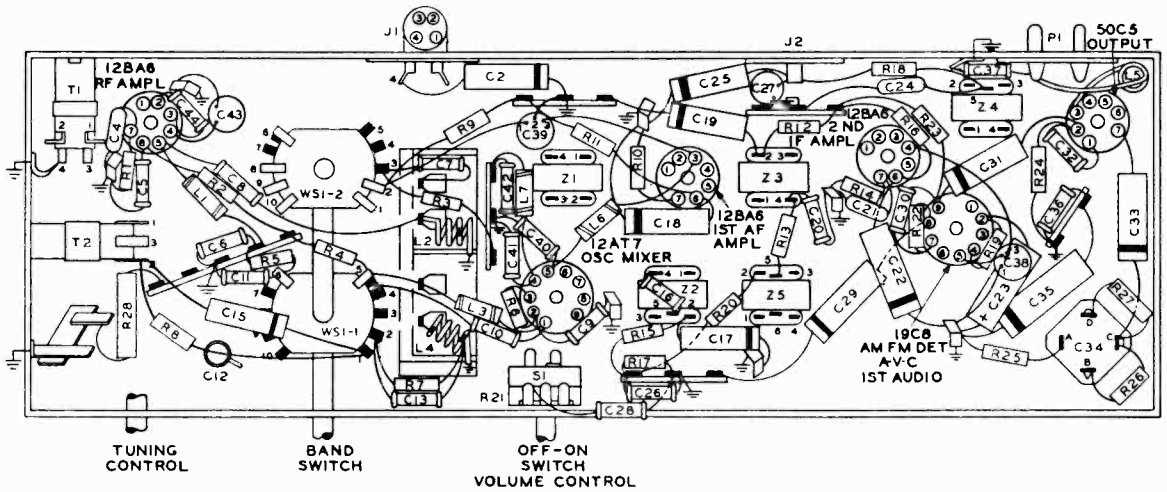
D-C VOLTMETER — Connect negative lead of d-c voltmeter (resistance of at least 20,000 ohms per volt) to pin 2 of 19C8 tube, and positive lead to chassis. Use 0—10-volt range.

SIGNAL GENERATOR — Use AM r-f signal generator, with modulated output. Connect ground lead to chassis. Connect output lead and set frequency as indicated in chart. Generator must have sufficient output to give reading of approximately 8.5 volts on d-c voltmeter; during alignment, generator output must be attenuated to hold meter reading at this value.

NOTE: Before starting FM alignment, allow radio and signal generator to warm up for 15 minutes.

FM ALIGNMENT CHART

STEP	SIGNAL GENERATOR		RADIO		ADJUST
	CONNECTION TO RADIO	DIAL SETTING	DIAL SETTING	SPECIAL INSTRUCTIONS	
1	Through a .1-μf. condenser to control grid (pin 1) of 12BA6 1st i-f ampl.	9.1 mc.	88 mc.	Adjust tuning cores for maximum reading on d-c voltmeter. Attenuate signal generator to maintain a reading of approximately 10 volts. Repeat adjustments until no further improvement is noted. After this step, do not disturb these tuning cores except as directed in step 3.	TC8—discriminator sec. TC7—discriminator pri. TC6—FM 2nd i-f sec. TC5—FM 2nd i-f pri.
2	Through a .1-μf. condenser to mixer grid (pin 7) of 12AT7.	9.1 mc.	88 mc.	Adjust tuning cores for maximum reading on d-c voltmeter. Repeat adjustments until no further improvement is noted. Do not disturb these tuning cores after this step.	TC2—FM 1st i-f sec. TC1—FM 1st i-f pri.
3	Same as step 1.	9.1 mc.	88 mc.	Adjust tuning core for minimum reading on output meter. This adjustment is critical; repeat to make certain it is correct.	TC8—discriminator sec.
4	To terminal 1 of J1.	105 mc.	105 mc.	Adjust trimmer for maximum reading on d-c voltmeter.	C12—FM osc.
5	Same as step 4.	105 mc.	105 mc.	Same as step 4.	C1B—FM r-f
6	Same as step 4.	92 mc.	92 mc.	Adjust coil for maximum reading on d-c voltmeter.	L4—osc. (tracking)
7	Same as step 4.	92 mc.	92 mc.	Same as step 6.	L2—FM r-f (tracking)
8	Same as step 4.	105 mc.	105 mc.	Same as step 4.	C12—FM osc.
9	Repeat steps 4 through 8 until no further improvement is noted.				



CRITICAL LEAD DRESS
FM IF REGENERATION WILL RESULT UNLESS
(1) THE RED B+ LEAD BETWEEN LUG 3 OF Z4 AND LUG 3 OF Z5 IS DRESSED AROUND THE GRID SIDE OF THE LAST 12BA6, AND BETWEEN THE GROUND LEAD AND THE TUBE, AND
(2) THE RED LEAD BETWEEN PIN 6 OF THE LAST 12BA6 AND LUG 4 OF Z5 IS DRESSED AWAY FROM Z3 AND HORIZONTAL TO THE CHASSIS (NOT DRESSED DOWN TO THE CHASSIS)

TP9-669B

Figure 4. Symbolized Chassis, Showing Parts Placement

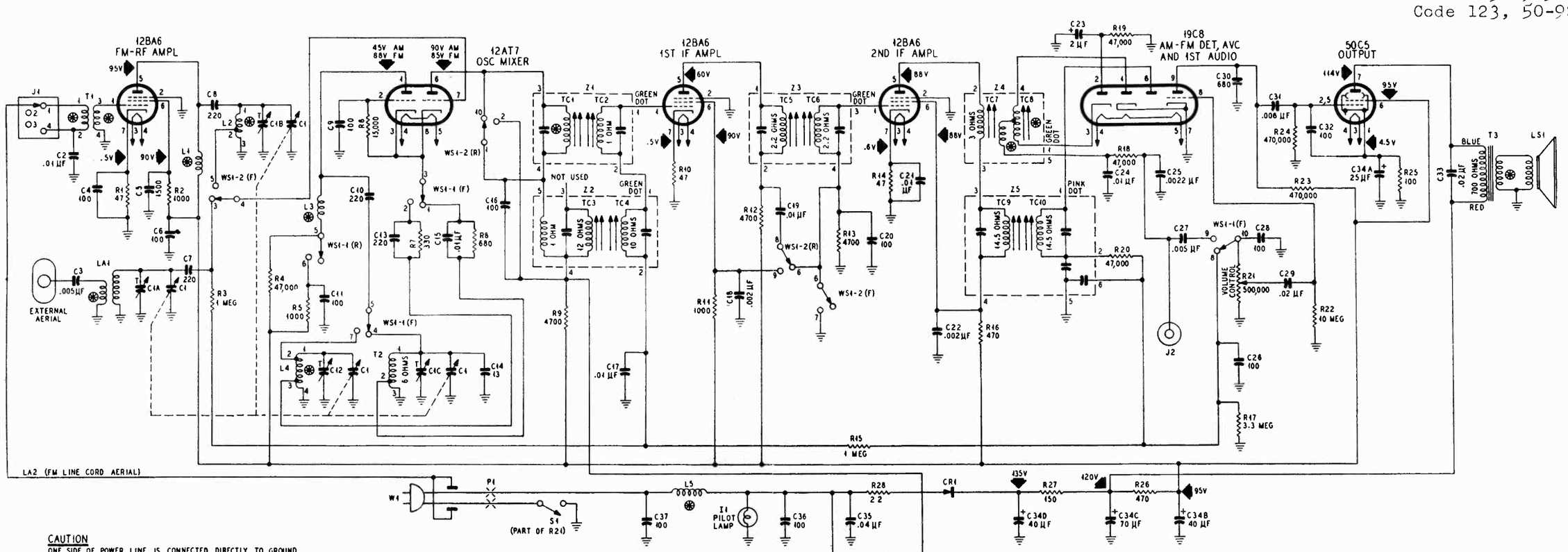
MODELS 50-925
Code 123, 50-926

REPLACEMENT PARTS LIST

NOTE: Part numbers identified by an asterisk (*) are general replacement items. These numbers may not be identical with those on factory parts; also, the electrical values of some replacement items may differ from the values indicated in the schematic diagram and parts list. The values substituted in any case are so chosen that the operation of the radio will be either unchanged or improved. When ordering replacements, use only the "Service Part No."

Reference Symbol	Description	Service Part No.
C1	Condenser, tuning, 4-section (2 for AM, 2 for FM)	31-2733-4
C1A	Condenser, trimmer, AM aerial	Part of C1
C1B	Condenser, trimmer, FM r-f	Part of C1
C1C	Condenser, trimmer, AM oscillator	Part of C1
C2	Condenser, aerial isolating, .01 $\mu f.$	61-0120*
C3	Condenser, aerial isolating, ceramic button, .005 $\mu f.$	30-1238-1
C4	Condenser, cathode by-pass, 100 $\mu\mu f.$	60-10105407*
C5	Condenser, screen by-pass, 1500 $\mu\mu f.$	62-215001011*
C6	Condenser, r-f by-pass, 100 $\mu\mu f.$	62-110009001*
C7	Condenser, d-c blocking, 220 $\mu\mu f.$	62-122001001*
C8	Condenser, d-c blocking, 220 $\mu\mu f.$	62-122001001*
C9	Condenser, by-pass, 100 $\mu\mu f.$	62-110009001*
C10	Condenser, d-c blocking, 220 $\mu\mu f.$	62-122001001*
C11	Condenser, r-f by-pass, 100 $\mu\mu f.$	62-110009001*
C12	Condenser, trimmer, FM oscillator	31-6511
C13	Condenser, cathode by-pass, FM, 220 $\mu\mu f.$	62-122001001*
C14	Condenser, fixed trimmer, AM oscillator, 13 $\mu\mu f.$	30-1224-42
C15	Condenser, cathode by-pass, AM, .01 $\mu f.$	61-0120*
C16	Condenser, fixed trimmer, i-f, 100 $\mu\mu f.$	62-110009001*
C17	Condenser, a-v-c filter, .01 $\mu f.$	61-0120*
C18	Condenser, screen by-pass, .002 $\mu f.$	61-0062*
C19	Condenser, coupling (in FM position, neutralization), .01 $\mu f.$	61-0120*
C20	Condenser, by-pass, 100 $\mu\mu f.$	62-110009001*
C21	Condenser, cathode by-pass, molded, .01 $\mu f.$	30-1226-10
C22	Condenser, screen by-pass, .002 $\mu f.$	61-0062*
C23	Condenser, electrolytic, FM-detector filter, 2 $\mu f.$, 50v	30-2417-7
C24	Condenser, de-emphasis, molded, .01 $\mu f.$	30-1226-10
C25	Condenser, de-emphasis, molded, .0022 $\mu f.$	45-3505-54
C26	Condenser, by-pass, 100 $\mu\mu f.$	62-110009001*
C27	Condenser, d-c blocking, ceramic button, .005 $\mu f.$	30-1238-1
C28	Condenser, i-f by-pass, 100 $\mu\mu f.$	62-110009001*
C29	Condenser, d-c blocking, .02 $\mu f.$	61-0108*
C30	Condenser, plate by-pass, 680 $\mu\mu f.$	62-168001001
C31	Condenser, d-c blocking, .006 $\mu f.$	45-3500-7*
C32	Condenser, by-pass, 100 $\mu\mu f.$	62-110009001*
C33	Condenser, tone compensation, .02 $\mu f.$	61-0108*
C34	Condenser, electrolytic, 4-section	30-2570-46
C34A	Condenser, cathode by-pass, 25 $\mu f.$, 25v	Part of C34
C34B	Condenser, filter, 40 $\mu f.$, 150v	Part of C34
C34C	Condenser, filter, 70 $\mu f.$, 150v	Part of C34
C34D	Condenser, filter, 40 $\mu f.$, 150v	Part of C34
C35	Condenser, line by-pass, .04 $\mu f.$	45-3500-2*
C36	Condenser, line by-pass, 100 $\mu\mu f.$	62-110009001*
C37	Condenser, line by-pass, 100 $\mu\mu f.$	62-110009001*
C38	Condenser, ceramic button, 2-section	30-1239
C38A	Condenser, filament by-pass, .004 $\mu f.$	Part of C38
C38B	Condenser, filament by-pass, .004 $\mu f.$	Part of C38
C39	Condenser, ceramic button, 2-section	30-1239
C39A	Condenser, filament by-pass, .004 $\mu f.$	Part of C39
C39B	Condenser, r-f by-pass, .004 $\mu f.$	Part of C39
C40	Condenser, filament by-pass, 100 $\mu\mu f.$	62-110009001*
C41	Condenser, filament by-pass, 100 $\mu\mu f.$	62-110009001*
C42	Condenser, filament by-pass, 100 $\mu\mu f.$	62-110009001*
C43	Condenser, filament by-pass, ceramic button, .005 $\mu f.$	30-1238-1
C44	Condenser, filament by-pass, 100 $\mu\mu f.$	62-110009001*
CR1	Selenium rectifier, 150 ma.	34-8003-2
I1	Pilot lamp, 110—125v, 7 w	34-2605
J1	Jack, FM aerial	27-6214-8
J2	Jack, FM test	27-6180
L1	Coil, FM plate load	32-4061-2
L2	Coil, FM r-f	32-4392-3
L3	Coil, r-f isolating	32-4061-2
L4	Coil, FM oscillator	32-4391-3
L5	Coil, line choke	32-4089-3
L6	Coil, filament choke	32-4061-2
L7	Coil, filament choke	32-4061-2
LA1	Loop aerial, 50-925, Code 123	32-4052-48
LA1	Loop aerial, 50-926	32-4052-47
LA2	Aerial-wire-and-plug assembly, FM	41-3791-1
LS1	Speaker, 5-inch, p.m., with output transformer, 50-925, Code 123	36-1614-4
LS1	Speaker, 5-inch, p.m., with output transformer, 50-926	36-1625-12
P1	Plug, line input	27-4785-7
R1	Resistor, cathode bias, 47 ohms	66-0478340*
R2	Resistor, screen dropping, 1000 ohms	66-2108340*
R3	Resistor, grid return, 1 megohm	66-5108340*
R4	Resistor, plate dropping, 47,000 ohms	66-3478340*
R5	Resistor, plate dropping, 1000 ohms	66-2108340*
R6	Resistor, grid return, 15,000 ohms	66-3158340*
R7	Resistor, cathode bias, 330 ohms	66-1338340*
R8	Resistor, cathode bias, 680 ohms	66-1688340*
R9	Resistor, plate dropping, 4700 ohms	66-2478340*
R10	Resistor, cathode bias, 47 ohms	66-0478340*
R11	Resistor, screen dropping, 1000 ohms	66-2108340*
R12	Resistor, plate dropping, 4700 ohms	66-2478340*
R13	Resistor, grid return, 4700 ohms	66-2478340*
R14	Resistor, cathode bias, 47 ohms	66-0478340*
R15	Resistor, a-v-c filter, 1 megohm	66-5108340*

MODELS 50-925
Code 123, 50-926



CAUTION
ONE SIDE OF POWER LINE IS CONNECTED DIRECTLY TO GROUND

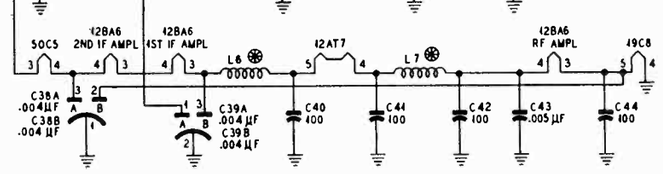
Reference Symbol	Description	Service Part No.
R16	Resistor, decoupling, 470 ohms	66-1478340*
R17	Resistor, a-v-c load, 3.3 megohms	66-5338340*
R18	Resistor, de-emphasis filter, 47,000 ohms	66-3478340*
R19	Resistor, FM-detector load, 47,000 ohms	66-3478340*
R20	Resistor, i-f filter, 47,000 ohms	66-3478340*
R21	Volume control, 500,000 ohms	33-5566-8
R22	Resistor, grid return, 10 megohms	66-6108340*
R23	Resistor, plate load, 470,000 ohms	66-4478340*
R24	Resistor, grid return, 470,000 ohms	66-4478340*
R25	Resistor, cathode bias, 100 ohms	66-1108340*
R26	Resistor, filter, 470 ohms, 1 w	66-1474340*
R27	Resistor, filter, 150 ohms, 1 w	66-1154340*
R28	Resistor, current limiting, 22 ohms, 2 w	66-0225360*
S1	Switch, off-on	Part of R21
T1	Transformer, FM aerial	32-4390
T2	Transformer, BC oscillator	32-4153-7
T3	Transformer, output	Part of LS1
W1	Line cord	L-2183*
WS	Switch, band	42-1896-1
Z1	Transformer, 1st FM i-f	32-4372A
Z2	Transformer, 1st AM i-f	32-4258-2A
Z3	Transformer, 2nd FM i-f	32-4372-2A
Z4	Transformer, FM discriminator	32-4310
Z5	Transformer, 2nd AM i-f	32-4240A

MISCELLANEOUS

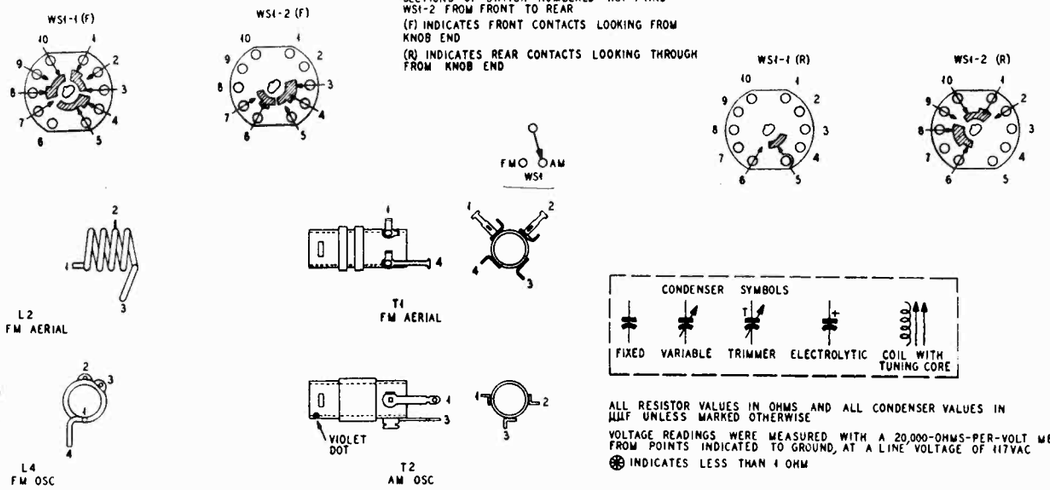
Description	Service Part No.
Cabinet (50-925, Code 123)	10714-4
Back	54-7819
Baffle-and-cloth assembly	40-7535-1
Speed nut, baffle mounting (4 required)	1W60210FE7
Knob, FM-AM	54-4527-21

IF (AM) = 455KC
IF (FM) = 9.1 MC

Knob, tuning	54-4527-1
Knob, volume-on-off	54-4527
Pointer	54-4704
Scale	54-5011-2
Window, acetate	54-4595-2
Clip, window mounting (6 required)	56-7181FE7
Cabinet (50-926 mahogany)	10786
Cabinet (50-926 blonde)	10786-1
Back	54-8028
Baffle-and-cloth assembly, masonite	40-7844
Foot, front, brass (2 required)	56-7778
Foot, rear, felt (2 required)	W2190
Jewel, telltale	54-4304-3
Knob (3 required)	54-4674-2
Pointer	54-4758
Scale	54-5080
Window	54-8034
Bracket-and-clip assembly, pilot-lamp mounting	76-5102
Clip, pilot-lamp mounting	56-3545FA3
Drive Cord	45-8750*
Spring, gang drive	56-2617
Drive-shaft assembly	76-4034-2
Pilot-lamp shield	56-6331FA3
Spring, shield mounting	28-2488FA1
Pilot-lamp-socket assembly	27-6233-53
Shield, rectifier	54-7818
Socket, female, a-c interlock	27-6200-1
Socket, 7-pin miniature (two 12BA6 i-f amplifiers)	27-6203
Socket, 7-pin miniature (50C5)	27-6203-12



Socket, 7-pin miniature, low-loss (12BA6 r-f amplifier) 27-6203-1
Socket, 9-pin miniature (19C8) 27-6203-5
Socket, 9-pin miniature, low-loss (12AT7) 27-6203-6



ALL RESISTOR VALUES IN OHMS AND ALL CONDENSER VALUES IN µµF UNLESS MARKED OTHERWISE

VOLTAGE READINGS WERE MEASURED WITH A 20,000-OHMS-PER-VOLT METER FROM POINTS INDICATED TO GROUND, AT A LINE VOLTAGE OF 117VAC

⊛ INDICATES LESS THAN 1 OHM

MODELS 50-1721,
50-1723, 50-1724

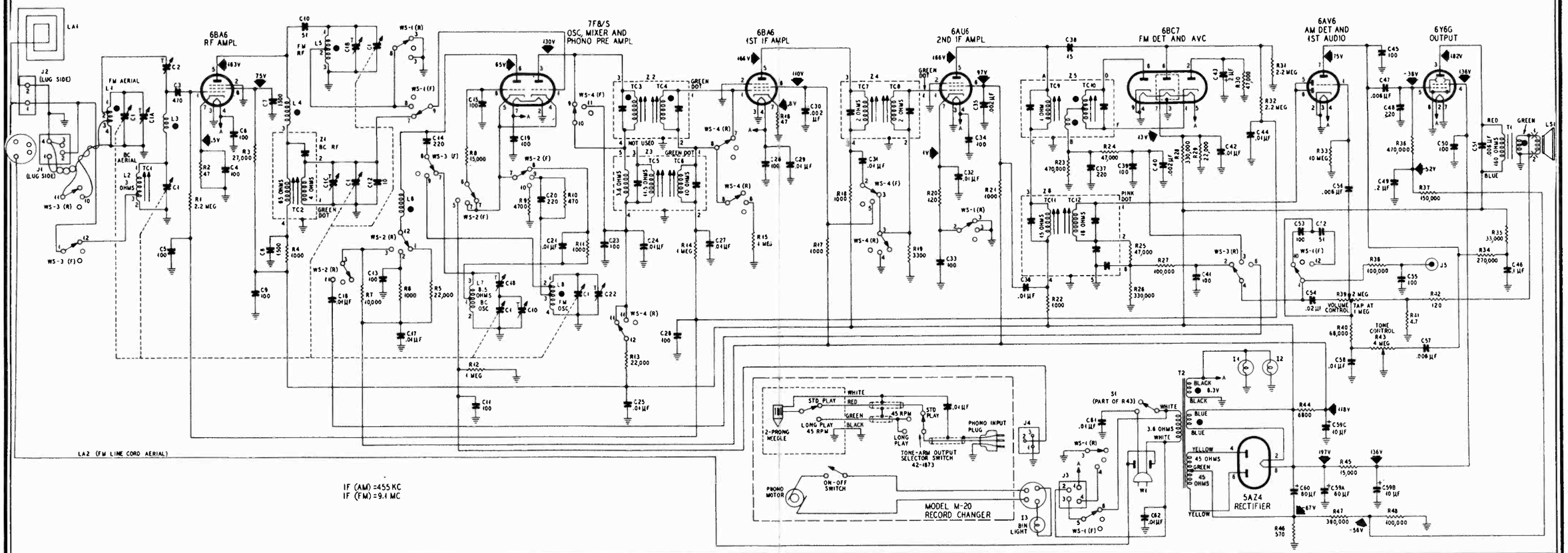


Figure 4. Philco Radio-Phonograph Models 50-1721, 50-1723, and 50-1724, Schematic Diagram

RECORD CHANGER: Model M-20, on pages RCD.CH.20-1 through RCD.CH.20-16.

MODELS 50-1721, 50-1723, 50-1724

SPECIFICATIONS

CABINET	
Model 50-1721	Wood console, mahogany finish
Model 50-1723	Wood console, mahogany finish
Model 50-1724	French provincial, mahogany finish, leather top
CIRCUIT	8-tube superheterodyne
FREQUENCY RANGES	
Standard broadcast	540—1630 kc.
FM	88—108 mc.
AUDIO OUTPUT	5 watts
OPERATING VOLTAGE	117 volts, 60 cycles, a.c.
POWER CONSUMPTION	
Radio	110 watts
Phonograph	125 watts
AERIALS	Built-in broadcast loop; FM line-cord aerial; provision for connection of external aerials
INTERMEDIATE FREQUENCIES	
AM	455 kc.
FM	9.1 mc.
PHILCO TUBES (8)	6BA6 r-f ampl., 7F8/S osc.-mixer-phono preampl., 6BA6 1st i-f ampl., 6AU6 2nd i-f ampl., 6BC7 FM det.-a.v.c., 6AV6 AM det.-1st audio, 6Y6G output, 5AZ4 rectifier
RECORD PLAYER	Philco Model M-20 All-Speed Automatic Record Changer (For service information, refer to Service Manual PR-1731.)

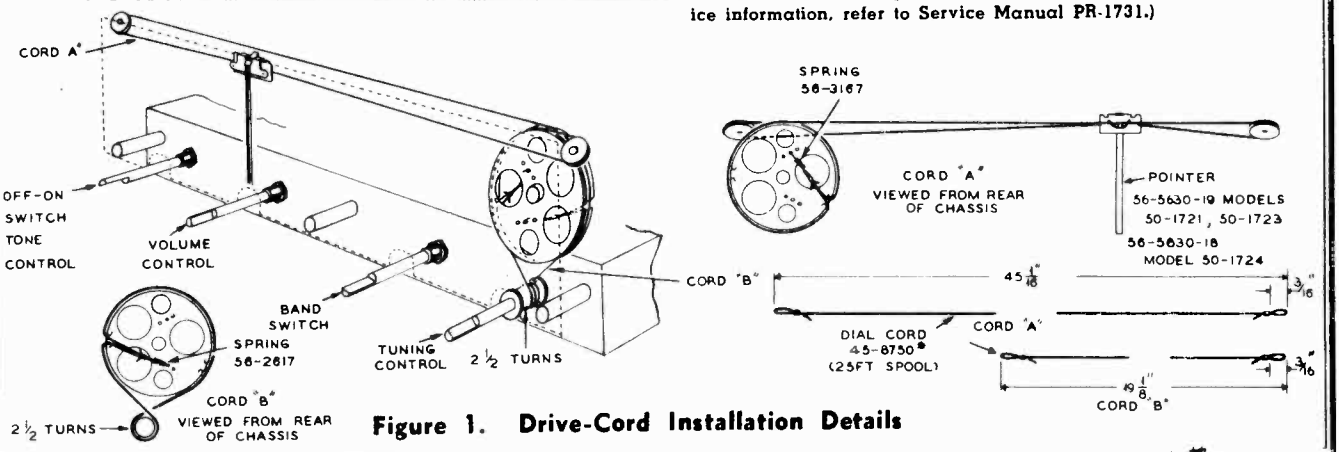


Figure 1. Drive-Cord Installation Details

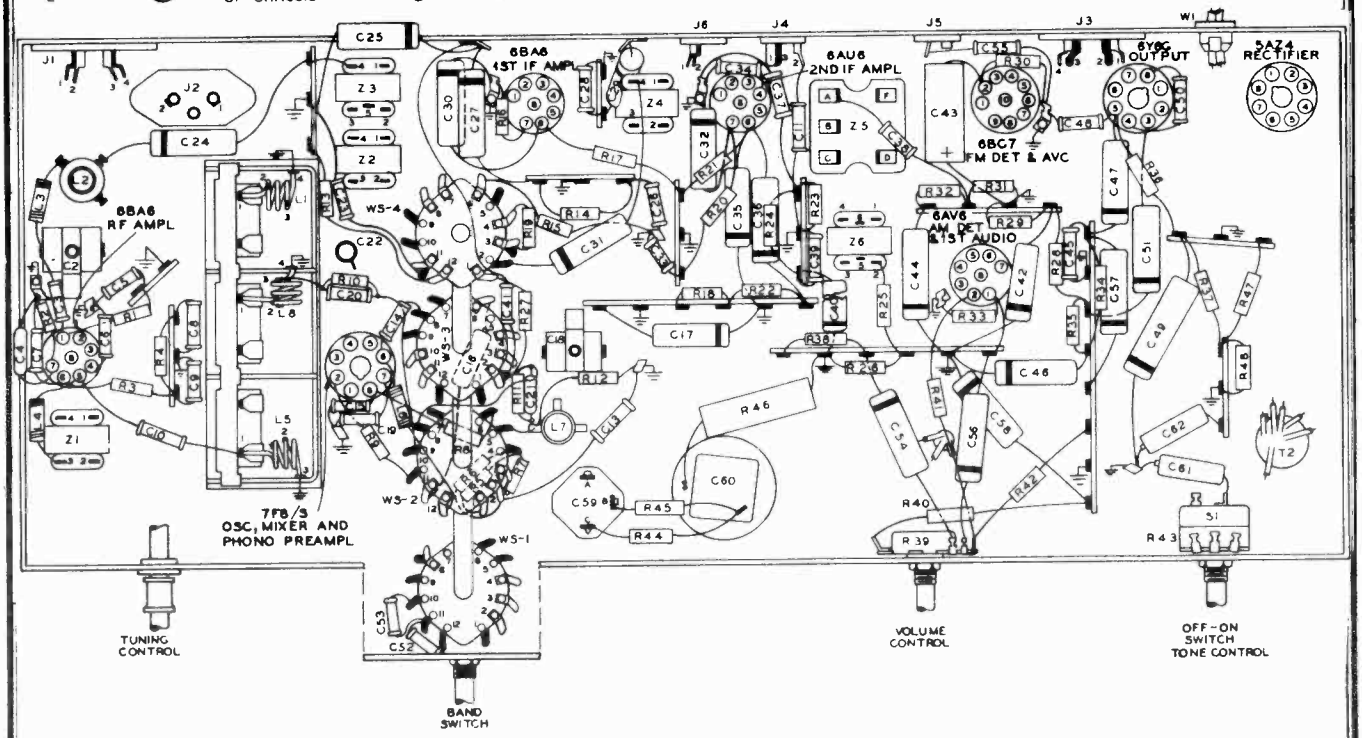


Figure 2. Symbolized Chassis, Showing Parts Placement

MODELS 50-1721,
50-1723, 50-1724

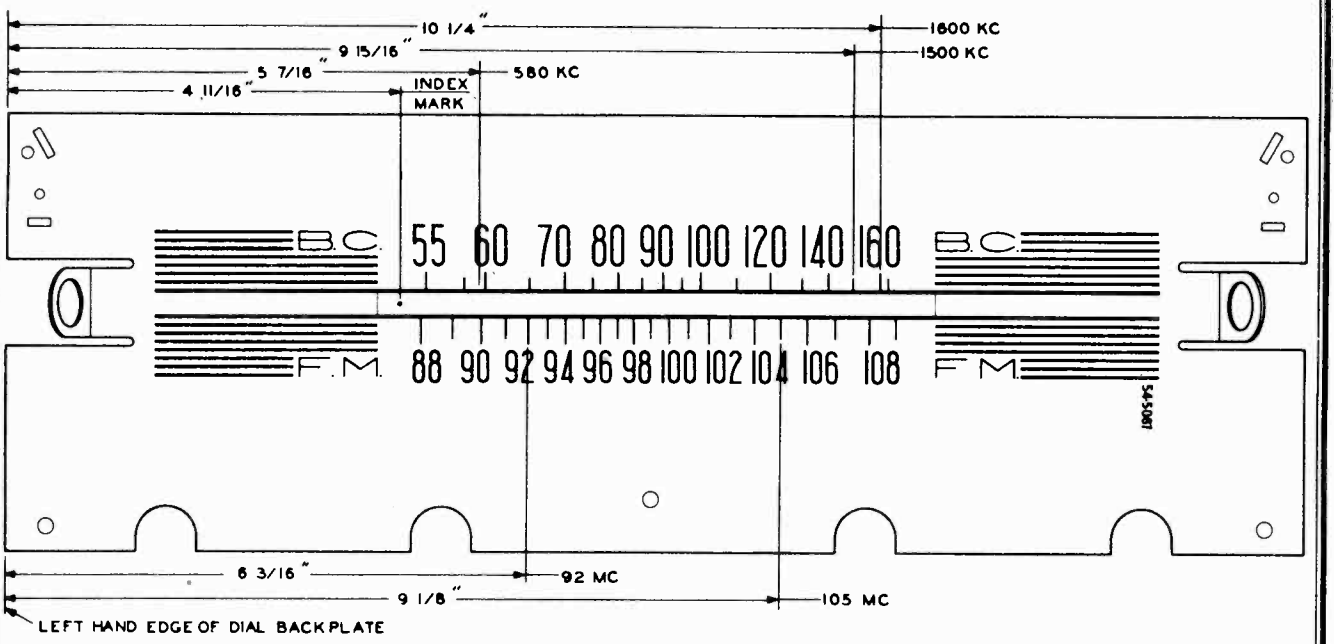


Figure 3. Dial-Backplate Calibration Measurements

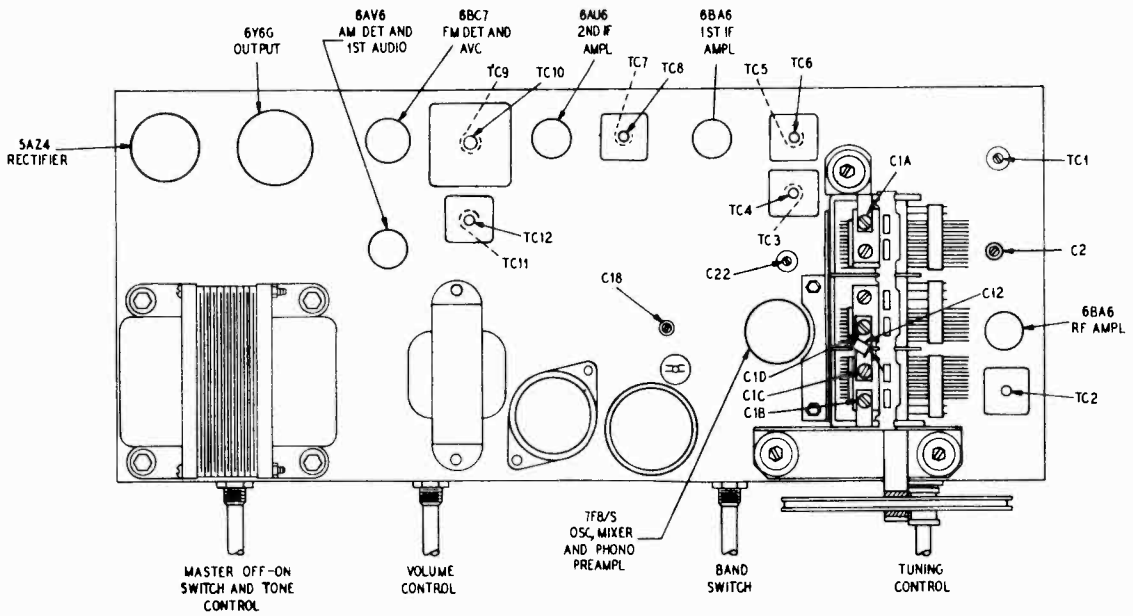


Figure 5. Top View, Showing Trimmer Locations

AM ALIGNMENT PROCEDURE

Make alignment with loop aerial connected to radio. The AM alignment should be made before the FM alignment.

DIAL POINTER: Calibration and pointer-index measurements are shown in figure 5. With tuning gang fully meshed, set pointer to index mark.

OUTPUT METER: Connect across speaker voice-coil terminals.

SIGNAL GENERATOR: Connect AM r-f signal generator as indicated in chart. Use modulated output.

RADIO CONTROLS: Set volume control to maximum, tone control counterclockwise, and band switch to broadcast position.

OUTPUT LEVEL: During alignment, adjust signal-generator output to hold output-meter indication below 1.25 volts.

MODELS 50-1721, 50-1723, 50-1724

AM ALIGNMENT CHART

STEP	SIGNAL GENERATOR		RADIO		ADJUST
	CONNECTION TO RADIO	DIAL SETTING	DIAL SETTING	SPECIAL INSTRUCTIONS	
1	Through a .1-µf. condenser to mixer grid, pin 1, of 7F8/S.	455 kc.	Gang fully meshed.	Adjust, in order given, for maximum output.	TC12—2nd AM i-f sec. TC11—2nd AM i-f pri. TC6—1st AM i-f sec. TC5—1st AM i-f pri.
2	Radiating loop. (See note below.)	1600 kc.	1600 kc.	Adjust for maximum.	C1D—AM osc. shunt
3	Same as step 2.	580 kc.	580 kc.	Adjust, in order given, for maximum while rocking tuning control.	C18—AM osc. series TC2—AM r-f tuning core TC1—AM ant. tuning core
4	Same as step 2.	1500 kc.	1500 kc.	Adjust, in order given, for maximum.	C1C—AM r-f shunt C2—AM r-f shunt
5	Repeat steps 2, 3, and 4 until no further increase is obtained.				

Radiating Loop: Make up a 6-to-8 turn, 6-inch-diameter loop using insulated wire; connect to signal generator leads, and place near radio loop aerial.

FM ALIGNMENT PROCEDURE

Make the AM alignment first.

RADIO CONTROLS: Set volume control to maximum, tone control counterclockwise, and band switch to FM position. Allow radio and signal generator to warm up for at least 15 minutes before making alignment.

SIGNAL GENERATOR: Use a signal generator capable of delivering a 9.1-mc. FM signal with a deviation of ±80 kc., and modulated AM signals of 92 mc., 105 mc., and 108 mc. Philco Model 7008 Precision Visual Alignment Generator fulfills these requirements. NOTE: Model 7008 must be well bonded to radio chassis.

OSCILLOSCOPE: Connect to FM TEST jack. Model 7008 is suggested.

OUTPUT METER: Connect across speaker voice-coil terminals.

R-F COIL NOTE: Check resonance of circuits containing coils L1, L5, and L8 by inserting each end of a tuning wand, such as Philco Part No. 45-8885, into coil. If signal strength increases when powdered-iron end is inserted, compress turns slightly. If signal strength increases when brass end is inserted, spread turns slightly. If signal strength decreases when each end is inserted, no adjustment is necessary. Do not spread or compress turns excessively; only a small change is required at these high frequencies.

FM ALIGNMENT CHART

STEP	SIGNAL GENERATOR		RADIO		ADJUST
	CONNECTION TO RADIO	DIAL SETTING	DIAL SETTING	SPECIAL INSTRUCTIONS	
1	Through a .1-µf. condenser to pin 1 of 6AU6*.	9.1 mc. ±80 kc. deviation.	Gang fully meshed.	Adjust TC4B for correct crossover. Adjust TC4A for maximum and equal peaks. Repeat.	TC4B—FM det. sec. TC4A—FM det. pri.
2	1-µf. condenser to pin 1 of 6BA6*.	9.1 mc. ±80 kc. deviation.	Gang fully meshed.	Adjust, in order given, for maximum and equal peaks. Repeat.	TC3B—FM 2nd i-f sec. TC3A—FM 2nd i-f pri.
3	Through a .1-µf. condenser to pin 1 of 7F8/S*.	9.1 mc. ±80 kc. deviation.	Gang fully meshed.	Adjust, in order given, for maximum and equal peaks. Repeat.	TC1B—FM 1st i-f sec. TC1A—FM 1st i-f pri.
4	Through a 300-ohm dummy aerial to FM aerial socket.	108 mc.	108 mc.	Adjust trimmer for maximum reading on output meter.	C22—FM osc.
5	Same as step 4.	105 mc.	105 mc.	Adjust for maximum while rocking gang.	C1B—FM r-f C1A—FM aerial
6	Same as step 4.	92 mc.	92 mc.	Adjust coils, in order given, for proper resonance (see R-F COIL NOTE).	L8—FM osc. coil L5—FM r-f coil L1—FM aerial coil

*CAUTION: Do not overload! When aligning the i-f stages, the curve will be distorted or destroyed if too great a signal is used. To check, attenuate the signal input. If the curve changes in form, rather than merely decreasing in amplitude, the stage is overloaded.

MODELS 50-1721, 50-1723, 50-1724

REPLACEMENT PARTS LIST

NOTE

Part numbers marked with an asterisk (*) are general replacement items. These numbers may not be identical to those on factory parts; also, the electrical values of some replacement items may differ from the values indicated in the schematic diagram and parts list. The values substituted in any case are so chosen that the operation of the instrument will be either unchanged or improved. When ordering replacements, use only the "Service Part No."

Reference Symbol	Description	Service Part No.
C1	Condenser, tuning gang, 6 sections	31-2750
C1A	Condenser, trimmer, FM aerial	Part of C1
C1B	Condenser, trimmer, FM r-f	Part of C1
C1C	Condenser, trimmer, AM r-f	Part of C1
C1D	Condenser, trimmer, AM osc.	Part of C1
C2	Condenser, series padder, AM aerial	31-6473-6
C3	Condenser, d-c blocking, 470 μμf.	62-147001001*
C4	Condenser, cathode by-pass, 100 μμf.	60-10105407*
C5	Condenser, a-v-c by-pass, 100 μμf.	62-110009001*
C6	Condenser, filament by-pass, 100 μμf.	62-110009001*
C7	Condenser, screen by-pass, 1500 μμf.	62-215001011*
C8	Condenser, plate decoupling, 1500 μμf.	62-215001011*
C9	Condenser, r-f by-pass, 100 μμf.	62-110009001*
C10	Condenser, d-c blocking, 51 μμf.	62-051009001*
C11	Condenser, tone compensation, phono, 100 μμf.	62-110009001*
C12	Condenser, fixed trimmer, 10 μμf.	62-010009001
C13	Condenser, FM plate by-pass, 100 μμf.	62-110009001*
C14	Condenser, d-c blocking, 220 μμf.	62-122001001
C15	Condenser, oscillator grid, 100 μμf.	62-110009001*
C16	Condenser, d-c blocking, phono coupling, .01 μf.	61-0120*
C17	Condenser, by-pass, .01 μf.	61-0120*
C18	Condenser, series padder, broadcast	31-6473-7
C19	Condenser, filament by-pass, 100 μμf.	62-110009001*
C20	Condenser, d-c blocking, 220 μμf.	62-122001001
C21	Condenser, d-c blocking, .01 μf.	61-0120*
C22	Condenser, FM trimmer	31-6511
C23	Condenser, r-f by-pass, 100 μμf.	62-110009001*
C24	Condenser, plate decoupling, .01 μf.	61-0120*
C25	Condenser, by-pass, .01 μf.	61-0120*
C26	Condenser, a-v-c by-pass, 100 μμf.	62-110009001*
C27	Condenser, a-v-c decoupling, .01 μf.	61-0120*
C28	Condenser, filament by-pass, 100 μμf.	62-110009001*
C29	Condenser, filament by-pass, .01 μf.	61-0120*
C30	Condenser, screen by-pass, .002 μf.	61-0062*
C31	Condenser, plate decoupling, .01 μf.	61-0120*
C32	Condenser, cathode by-pass, .01 μf.	61-0120*
C33	Condenser, r-f by-pass, 100 μμf.	62-110009001*
C34	Condenser, filament by-pass, 100 μμf.	62-110009001*
C35	Condenser, screen by-pass, .002 μf.	61-0062*
C36	Condenser, neutralizing, .01 μf.	61-0120*
C37	Condenser, i-f by-pass, 220 μμf.	62-122001001*
C38	Condenser, d-c blocking, a-v-c rectifier coupling, 15 μμf.	62-015009001
C39	Condenser, i-f by-pass, 100 μμf.	62-110009001*
C40	Condenser, de-emphasis, .002 μf.	61-0062*
C41	Condenser, i-f by-pass, 100 μμf.	62-110009001*
C42	Condenser, by-pass, .01 μf.	61-0120*
C43	Condenser, electrolytic, diode load filter, 2 μf.	30-2417-7
C44	Condenser, a-v-c filter, .01 μf.	61-0120*
C45	Condenser, plate by-pass, 100 μμf.	62-110009001*
C46	Condenser, plate by-pass, .1 μf.	61-0113*
C47	Condenser, d-c blocking, .006 μf.	45-3500-7*
C48	Condenser, grid by-pass, 220 μμf.	62-122001001
C49	Condenser, bias filter, .2 μf.	45-3500-3*
C50	Condenser, screen by-pass, 100 μμf.	62-110009001*
C51	Condenser, tone compensation, .006 μf.	45-3500-7*
C52	Condenser, phono tone compensation, 51 μμf.	62-051009001
C53	Condenser, AM tone compensation, 100 μμf.	61-110009001*
C54	Condenser, d-c blocking, .02 μf.	61-0108*
C55	Condenser, i-f by-pass, 100 μμf.	61-110009001*
C56	Condenser, d-c blocking, .006 μf.	45-3500-7*
C57	Condenser, hi-cut, .006 μf.	45-3500-7*
C58	Condenser, bass boost, .01 μf.	61-0120*
C59	Condenser, electrolytic, 3 sections	30-2570-45
C59A	Condenser, filter, 60 μf., 400v	Part of C59
C58B	Condenser, filter, 10 μf., 400v	Part of C59
C59C	Condenser, filter, 10 μf., 400v	Part of C59
C60	Condenser, electrolytic, filter, 80 μf., 400v	30-2568-35
C61	Condenser, line filter, .01 μf.	45-3505-41
C62	Condenser, line filter, .01 μf.	45-3505-41
I1	Lamp, pilot, 6.3v	34-2064
I2	Lamp, pilot, 6.3v	34-2064
I3	Lamp, bin light, 6.3v	34-2064
J1	Socket, FM aerial	27-6214-1
J2	Socket, AM aerial	27-6214-14
J3	Socket, phono power	27-6182
J4	Socket, phono input	27-6126
J5	Socket, audio test	27-6180
J6	Socket, speaker	27-6214-12
L1	Coil, FM aerial	32-4415
L2	Coil, bc. aerial	32-4413
L3	Coil, r-f isolating	32-4061-2
L4	Coil, r-f isolating	32-4061-2
L5	Coil, FM r-f	32-4416
L6	Coil, r-f isolating	32-4061-2
L7	Coil, bc. oscillator	32-4153-6
L8	Coil, FM oscillator	32-4414
LA1	Loop aerial, bc., 50-1721	76-4337-7
LA1	Loop aerial, bc., 50-1723	76-4337-5
LA1	Loop aerial, bc., 50-1724	76-4337-6
LA2	Aerial wire and plug assembly, FM	41-3791-1
LS1	Speaker, 10", p.m.	36-1610-6
R1	Resistor, grid return, 2.2 megohms	66-5228340*
R2	Resistor, cathode bias, 47 ohms	66-0478340*
R3	Resistor, screen dropping, 27,000 ohms, 1 watt	66-3274340*
R4	Resistor, plate decoupling, 1000 ohms	66-2108340*

MODELS 50-1721, 50-1723, 50-1724

REPLACEMENT PARTS LIST (Cont.)

Reference Symbol	Description	Service Part No.
R5	Resistor, plate load, bc., 22,000 ohms	66-3228340*
R6	Resistor, plate load, FM, 1000 ohms	66-2108340*
R7	Resistor, plate load, phono, 10,000 ohms	66-3108340*
R8	Resistor, grid return, 15,000 ohms	66-3158340*
R9	Resistor, cathode bias, phono, 4700 ohms	66-2478340*
R10	Resistor, parasitic suppressor, 470 ohms	66-1478340*
R11	Resistor, parasitic suppressor, 1000 ohms	66-2108340*
R12	Resistor, crystal load, 1 megohm	66-5108340*
R13	Resistor, plate dropping, 22,000 ohms	66-3228340*
R14	Resistor, grid return, 1 megohm	66-5108340*
R15	Resistor, grid return, FM, 1 megohm	66-5108340*
R16	Resistor, cathode bias, 47 ohms	66-0478340*
R17	Resistor, screen decoupling, 1000 ohms	66-2108340*
R18	Resistor, plate decoupling, 1000 ohms	66-2108340*
R19	Resistor, grid return, 3300 ohms	66-2338340*
R20	Resistor, cathode bias, 120 ohms	66-1128340*
R21	Resistor, screen decoupling, 1000 ohms	66-2108340*
R22	Resistor, plate decoupling, 1000 ohms	66-2108340*
R23	Resistor, diode return, 470,000 ohms	66-4478340*
R24	Resistor, i-f filter, 47,000 ohms	66-3478340*
R25	Resistor, i-f filter, 47,000 ohms	66-3478340*
R26	Resistor, diode return, 330,000 ohms	66-4338340*
R27	Resistor, isolating, 100,000 ohms	66-4108340*
R28	Resistor, voltage divider, 330,000 ohms	66-4338340*
R29	Resistor, voltage divider, 22,000 ohms	66-3228340*
R30	Resistor, FM diode load, 47,000 ohms	66-3478340*
R31	Resistor, a-v-c load, 2.2 megohms	66-5228340*
R32	Resistor, a-v-c filter, 2.2 megohms	66-5228340*
R33	Resistor, grid return, 10 megohms	66-6108340*
R34	Resistor, plate load, 270,000 ohms	66-4278340*
R35	Resistor, plate decoupling, 33,000 ohms	66-3338340*
R36	Resistor, grid return, 470,000 ohms	66-4478340*
R37	Resistor, bias filter, 150,000 ohms	66-4158340*
R38	Resistor, isolating, 100,000 ohms	66-4108340*
R39	Volume control, 2 megohms (center tapped)	33-5535-27
R40	Resistor, tone compensation, 68,000 ohms	66-3688340*
R41	Resistor, voltage divider, inverse feedback, 4.7 ohms	66-9478340*
R42	Resistor, inverse feedback, 120 ohms	66-1128340*
R43	Tone control, 4 megohms	33-5566-12
R44	Resistor, filter, 6800 ohms, 1 watt	66-2684340*
R45	Resistor, filter, 15,000 ohms, 2 watts	66-3155340*
R46	Resistor, bias, 570 ohms, 9 watts	33-1335-88
R47	Resistor, bias dropping, 390,000 ohms	66-4398340*
R48	Resistor, bias bleeder, 100,000 ohms	66-4108340*
S1	Switch, power off-on	Part of R43
T1	Transformer, output	32-8407
T2	Transformer, power	32-8406
W1	Line cord	L-2183*
WS	Wafer switch	42-1910
Z1	Transformer, bc. r-f	32-4399-3A
Z2	Transformer, 1st FM i-f	32-4372A
Z3	Transformer, 1st AM i-f	32-4258-2A
Z4	Transformer, 2nd FM i-f	32-4372-2A
Z5	Transformer, 3rd FM i-f	32-4417
Z6	Transformer, 2nd AM i-f	32-4240A

MISCELLANEOUS

(Parts common to all models)

Description	Service Part No.
Bin mechanism, l.h.	76-3223-5
Bin mechanism, r.h.	76-3223-6
Frame assembly	76-4104
Sleeve, changer mounting (3 required)	54-7798
Spring, changer mounting, upper, heavier (3 required)	56-7059FA9
Spring, changer mounting, lower, lighter (3 required)	56-7059-1FJ47
Spring, bin mechanism	56-4978
Bullet catch	45-6002
Cable, bin light and phono power	41-3944-3

MISCELLANEOUS (Cont.)

(Parts common to all models)

Description	Service Part No.
Cable, speaker	41-3943-4
Clip, bin-light mounting	56-3545-6FA3
Clip, pilot-lamp mounting (2 required)	56-3545FA3
Coil mount, bc. oscillator	56-3752-3FA1
Dial backplate assembly	76-5161
Drive cord (25-ft. spool)	45-8750*
Spring, gang drive	56-2617
Spring, pointer drive	56-3167
Dome (4 required)	45-6190
Drive shaft	76-5139
Bushing, front, brown bakelite	54-7872
Bushing, rear, black bakelite	27-9437
Spring, hairpin, small, bushing to shaft (2 required)	57-1468FA1
Spring, hairpin, large, bushing to chassis	57-0985FA1
Fish paper	27-9111
Gang Mounting	
Bracket, copper, ground	56-7357
Mount, rubber	54-4651-1
Plate, ground bracket (to chassis)	56-7362FA3
Shield, ground bracket (against gang)	56-7439FA3
Knob (4 required)	54-4718-6
Light shield, bin light	56-6307-7FA3
Pilot-lamp assembly, l.h., 14¼" lead length	27-6233-22
Pilot-lamp assembly, r.h., 25" lead length	27-6233-33
Scale strap (2 required)	56-2234-2
Scale strap	56-4756FE11
Screw, back mounting (15 required)	1W25345FE11
Socket, Loktal, 5AZ4	27-6207
Socket, Loktal, 7F8/S	27-6207-1
Socket, 7-pin miniature	27-6203
Socket, 7-pin miniature, 6BA6 r-f ampl.	27-6203-1
Socket, 9-pin miniature	27-6203-5
Socket, octal	27-6174
Strike plate (4 required)	45-6003

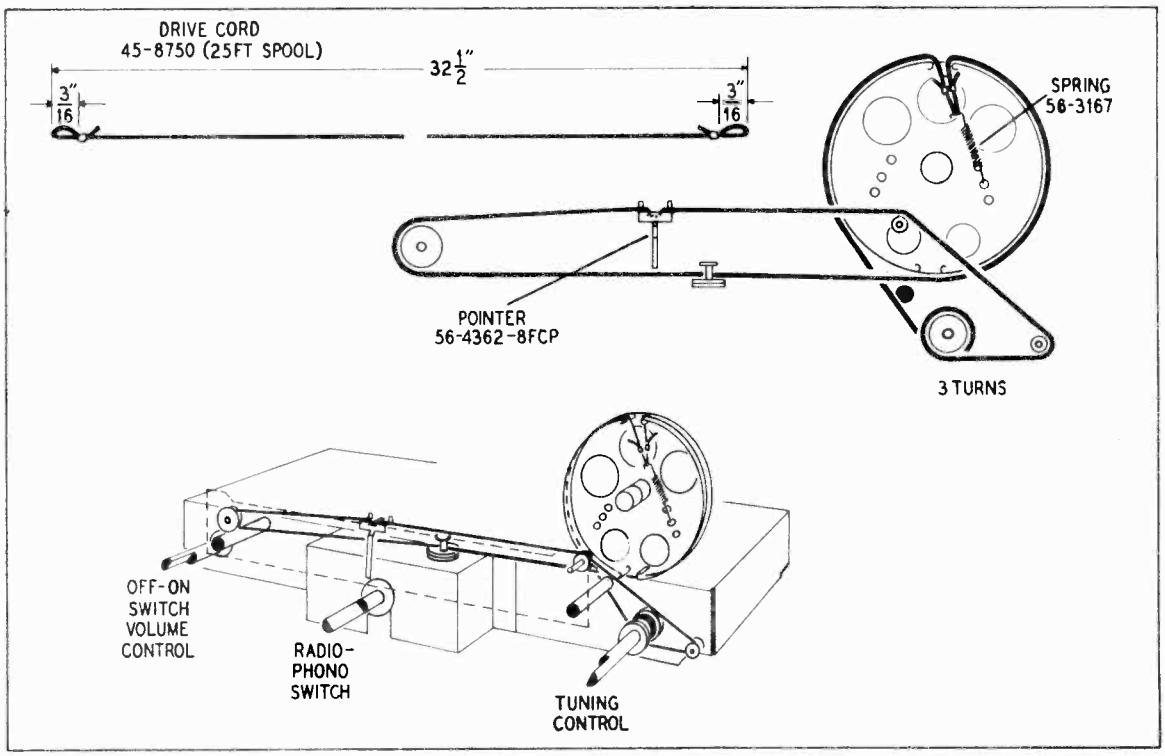
(Parts not common to all models)

Cabinet, Model 50-1721	10751-3
Back	54-7814
Baffle, wood	219-168
Bezel and scale	54-4751-1
Dial scale	54-5068
Door pull	56-6493
Drop door	45-6507
Hinge (2 required)	45-6036
Instrument panel	45-6566
Pointer	56-5630-19
Cabinet, Model 50-1723	10724-3
Back	54-7668
Baffle, wood	219-129
Baffle-and-cloth assembly	40-7548-1
Bezel and scale	54-4751-1
Doors, matched set of 2	45-1664
Door pull (2 required)	56-7128
Hinge, butt, phono drop door (2 required)	56-7127
Hinge, knife, bottom of record storage door	56-5713-3
Hinge, knife, top of record storage door	56-5713-1
Instrument panel	45-6569
Pointer	56-5630-19
Cabinet, Model 50-1724	10781
Back	54-7998
Baffle, wood	219-202
Baffle-and-cloth assembly	40-7831
Bezel	56-5855
Dial scale	54-5067
Doors, matched set of 2	45-6567
Door pull (2 required)	56-7748
Instrument panel	45-6568
Hinge, knife (2 pairs required)	56-7015
Pointer	56-5630-18

MODEL 50-1424

SPECIFICATIONS

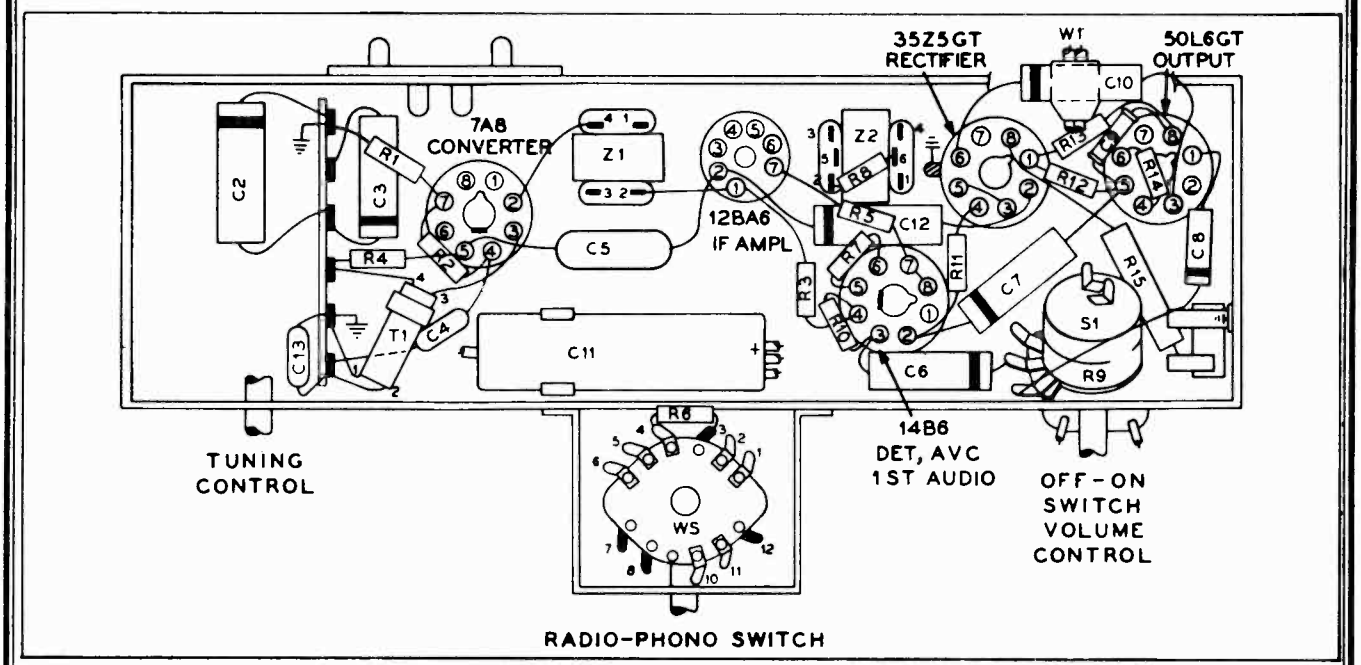
CABINET	Wood table model, mahogany finish
CIRCUIT	5-tube superheterodyne
FREQUENCY RANGE	540—1620 kc.
AUDIO OUTPUT	1.2 watts
OPERATING VOLTAGE	105—120 volts, 60 cycles, a.c.
POWER CONSUMPTION	
Radio	30 watts
Phonograph	45 watts
AERIAL	Built-in high-impedance loop; connector for external aerial
INTERMEDIATE FREQUENCY	455 kc.
PHILCO TUBES (5)	7A8 converter, 12BA6 i-f ampl., 14B6 det.-a.v.c.-1st audio ampl., 50L6GT output, 35Z5GT rectifier
PHONOGRAPH	Philco Model M-20 All-Speed Automatic Record Changer. (For service information, refer to Service Manual PR-1731.)



TPO-206

Figure 1. Drive-Cord Installation Details

MODEL 50-1424



TPO-207

Figure 2. Symbolized Chassis, Showing Parts Placement

REPLACEMENT PARTS LIST

Reference Symbol	Description	Part No. Service
C1	Condenser, tuning, 2-section	31-2751-4
C1A	Condenser, aerial trimmer	Part of C1
C1B	Condenser, oscillator trimmer	Part of C1
C2	Condenser, by-pass, .1 µf.	61-0113*
C3	Condenser, a-v-c filter, .05 µf.	61-0122*
C4	Condenser, d-c blocking, 47 µµf.	62-051009001*
C5	Condenser, screen by-pass, .003 µf.	61-0109*
C6	Condenser, d-c blocking, .01 µf.	61-0120*
C7	Condenser, d-c blocking, .01 µf.	61-0120*
C8	Condenser, tone compensation, hi-cut, .002 µf.	61-0062*
C9	Condenser, grid by-pass, 220 µµf.	62-122001001*
C10	Condenser, tone compensation, .02 µf.	61-0108*
C11	Condenser, electrolytic, 3-section	30-2573
C11A	Condenser, filter, 30 µf., 150v	Part of C11
C11B	Condenser, filter, 25 µf., 150v	Part of C11
C11C	Condenser, filter, 20 µf., 150v	Part of C11
C12	Condenser, line by-pass, .04 µf.	45-3500*
C13	Condenser, temperature compensating, 7.5 µµf.	30-1224-8
I1	Pilot lamp, 6-8 volts, brown bead	34-2068
LA1	Loop-aerial assembly	76-2127-10
LS1	Speaker, 5-¼", round, p-m	36-1629-6
R1	Resistor, leakage, 150,000 ohms	66-4158340*
R2	Resistor, grid return, 100,000 ohms	66-4108340*
R3	Resistor, a-v-c load, 1 megohm	66-5108340*
R4	Resistor, dropping, 39,000 ohms	66-3398340*
R5	Resistor, cathode bias, 68 ohms	66-0688340*
R6	Resisor, diode return, 1 megohm	66-5108340*
R7	Resistor, diode load, 2.2 megohms	66-5228340*
R8	Resistor, i-f filter, 47,000 ohms	66-3478340*
R9	Volume control (with off-on switch) 1 megohm	33-5538-37
R10	Resistor, grid return, 3.3 megohms	66-5338340*
R11	Resistor, plate load, 470,000 ohms	66-4478340*
R12	Resistor, grid return, 470,000 ohms	66-4478340*
R13	Resistor, cathode bias, 130 ohms	66-1128740*
R14	Resistor, filter, 1200 ohms	66-2128340*
R15	Resistor, filter, 220 ohms, 2 watts	66-1225340*
S1	Switch, off-on	Part of R9

Reference Symbol	Description	Part No. Service
T1	Transformer, oscillator	32-4263
T2	Transformer, output	32-8384
W1	Line cord	L-2183*
WS	Switch, radio-phono	42-1922
Z1	Transformer, 1st i-f	32-4160-6A
Z2	Transformer, 2nd i-f	32-42402A

MISCELLANEOUS

Description	Service Part No.
Cabinet	10797
Baffle-and-cloth assembly	40-7883
Bottom	54-8074
Butt hinge (2)	56-6434
Foot (4)	56-7778
Gasket, speaker	54-8089
Washer, fibre, speaker mounting (3)	27-7467
Glass dial scale	54-5086
Strap, scale mounting (2)	56-5155FA3
Knob, volume and tuning	54-4527-26
Knob, radio-phono switch	54-4527-27
Lid support	56-7947
Sleeve, changer mounting (3)	54-7798
Speed nut, changer mounting (3)	W-2554FCP
Spring, changer mounting, heavy (3)	56-7059FA9
Spring, changer mounting, light (3)	56-7059-1FJ47
Dial-Backplate Assembly	76-5705
Drive cord, 25-foot spool	45-8750*
Pointer	56-4362-8FCP
Spring, drive	56-3167
Pilot-lamp assembly	76-1179-7
Pilot-lamp bracket-and-clip assembly	76-5708
Pulley-and-shaft assembly	76-3671-1
Bushing	27-9437
Fastener, hairpin	57-1468FA1
Rubber mount, gang mounting (3)	27-4771-1
Socket, Loktal (2)	27-6177
Socket, miniature	27-6203
Socket, octal (2)	27-6174
Switch cable, shield, and guide assembly	76-5707
Terminal panel, aerial	38-9161-9

MODEL 50-1424

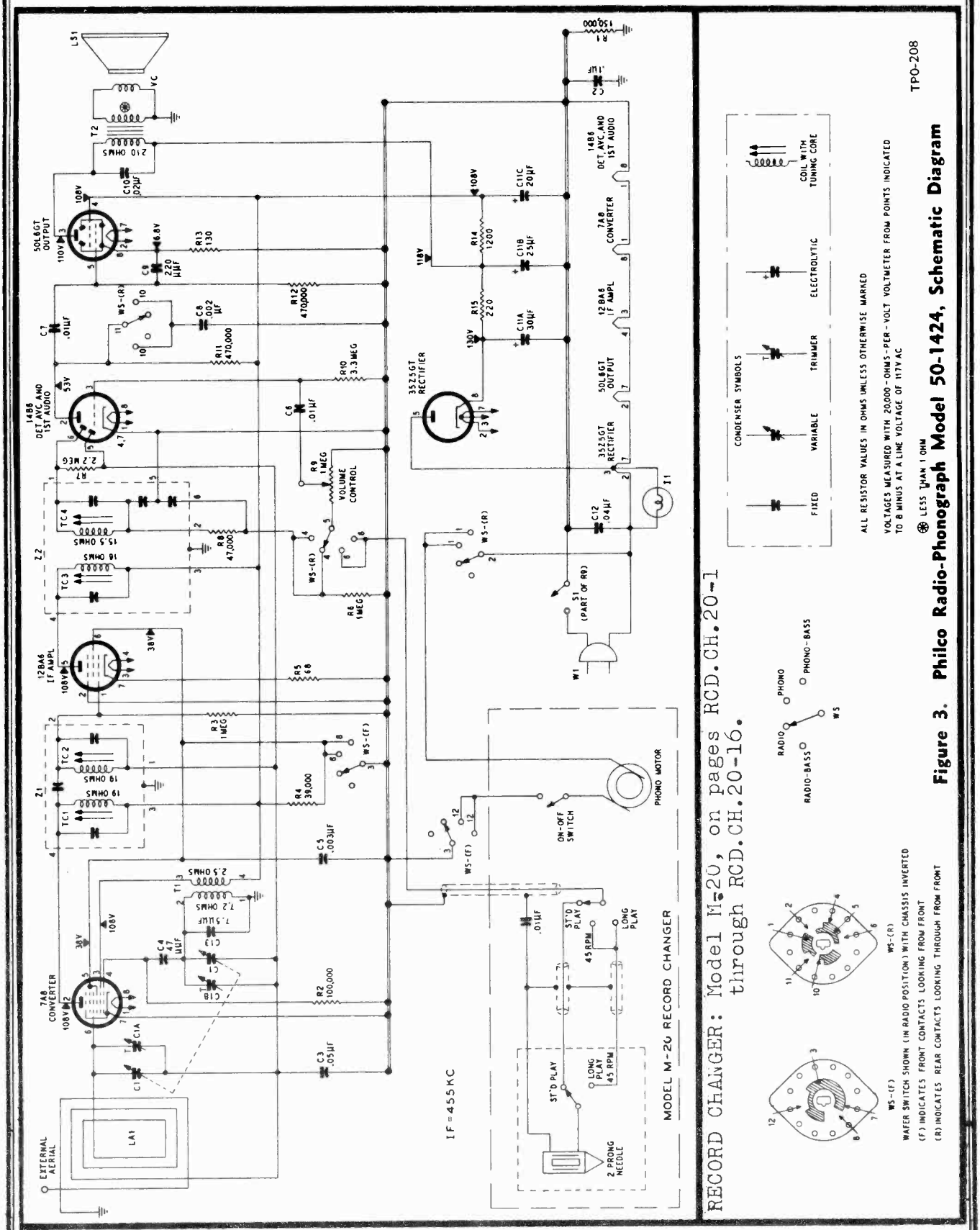


Figure 3. Philco Radio-Phonograph Model 50-1424, Schematic Diagram

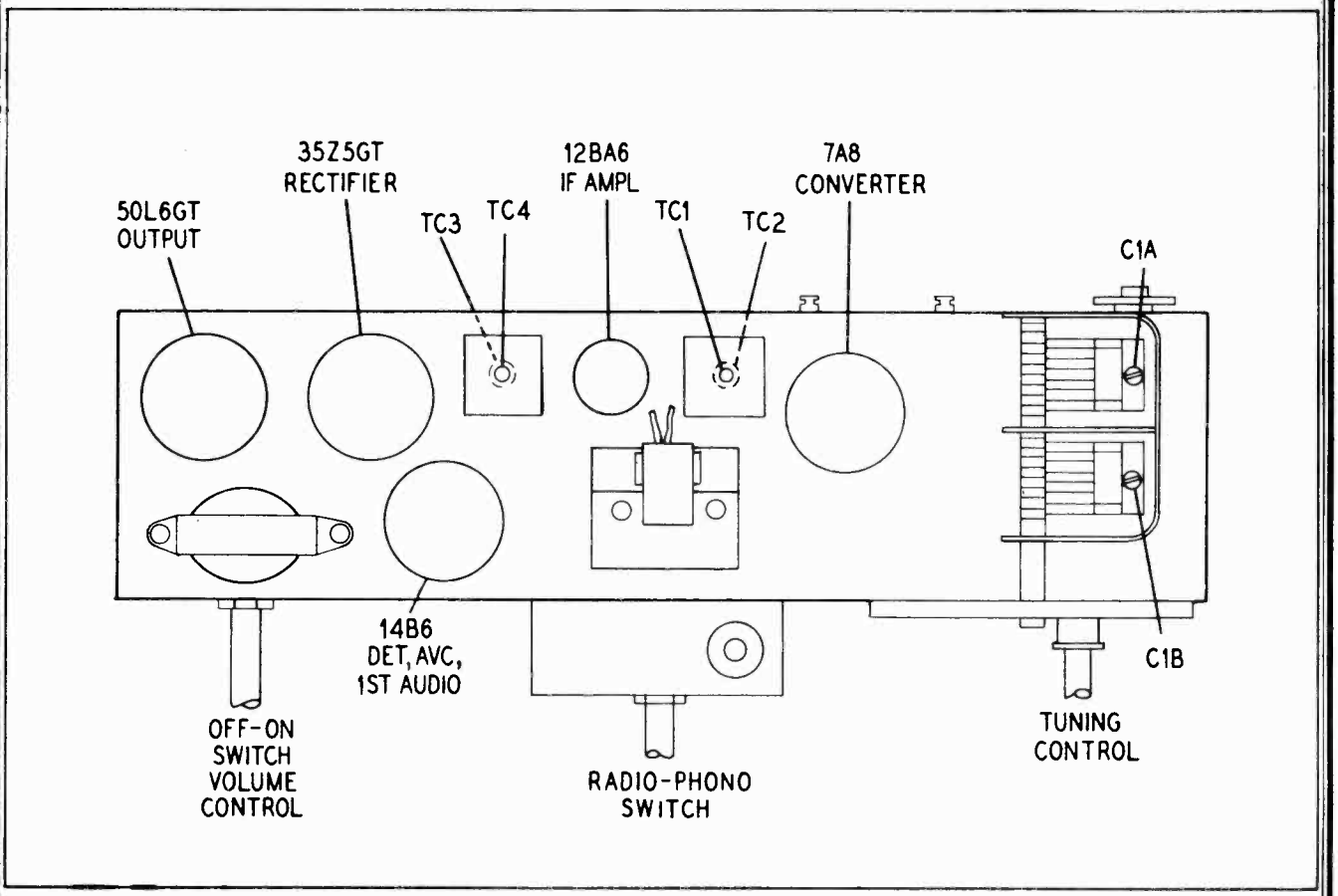
ALIGNMENT PROCEDURE

DIAL POINTER—Turn tuning condenser to full-mesh position. Set dial pointer to the index mark, located to the left of "55".

CONTROLS—Turn on power, and set volume control to maximum.
OUTPUT METER—Connect across voice-coil terminals.

SIGNAL GENERATOR—Connect as indicated in chart.

OUTPUT LEVEL—During alignment, adjust signal-generator output to hold output-meter indication below 1.25 volts.



TPO-209

Figure 4. Top View, Showing Trimmer Locations

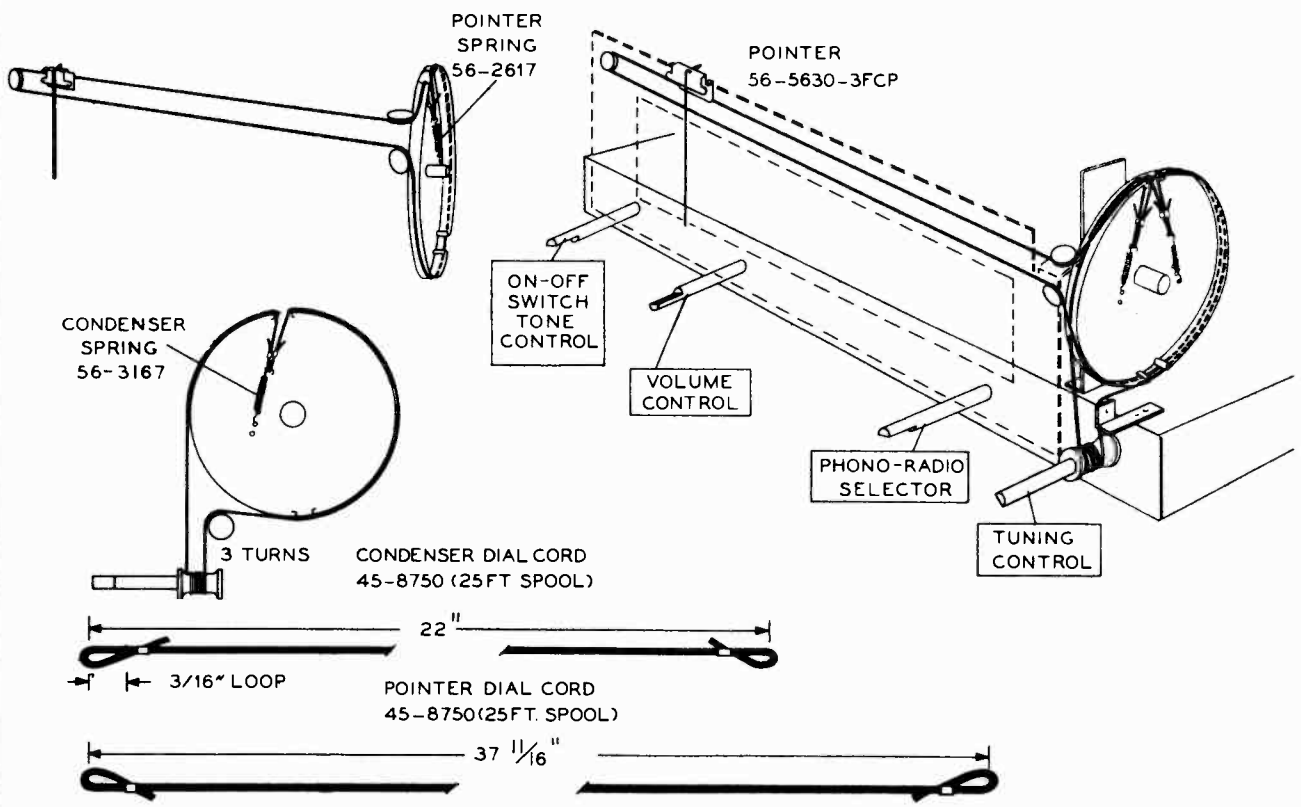
STEP	SIGNAL GENERATOR		RADIO		ADJUST
	CONNECTION TO RADIO	DIAL SETTING	DIAL SETTING	SPECIAL INSTRUCTIONS	
1	Ground lead to B-; output lead through .1-μf. condenser to pin 6 of 7A8 tube.	455 kc.	540 kc. (gang fully meshed).	Adjust tuning cores, in order given, for maximum output.	TC4—2nd i-f sec. TC3—2nd i-f pri. TC2—1st i-f sec. TC1—1st i-f pri.
2	Radiating loop (see note below).	1600 kc.	1600 kc.	Adjust for maximum.	C1B—osc.
3	Same as step 2.	1500 kc.	1500 kc.	Adjust for maximum.	C1A—aerial

RADIATING LOOP: Make up a 6-to-8 turn, 6-inch-diameter loop from insulated wire; connect to signal-generator output leads, and place near radio loop aerial.

MODEL 50-1718

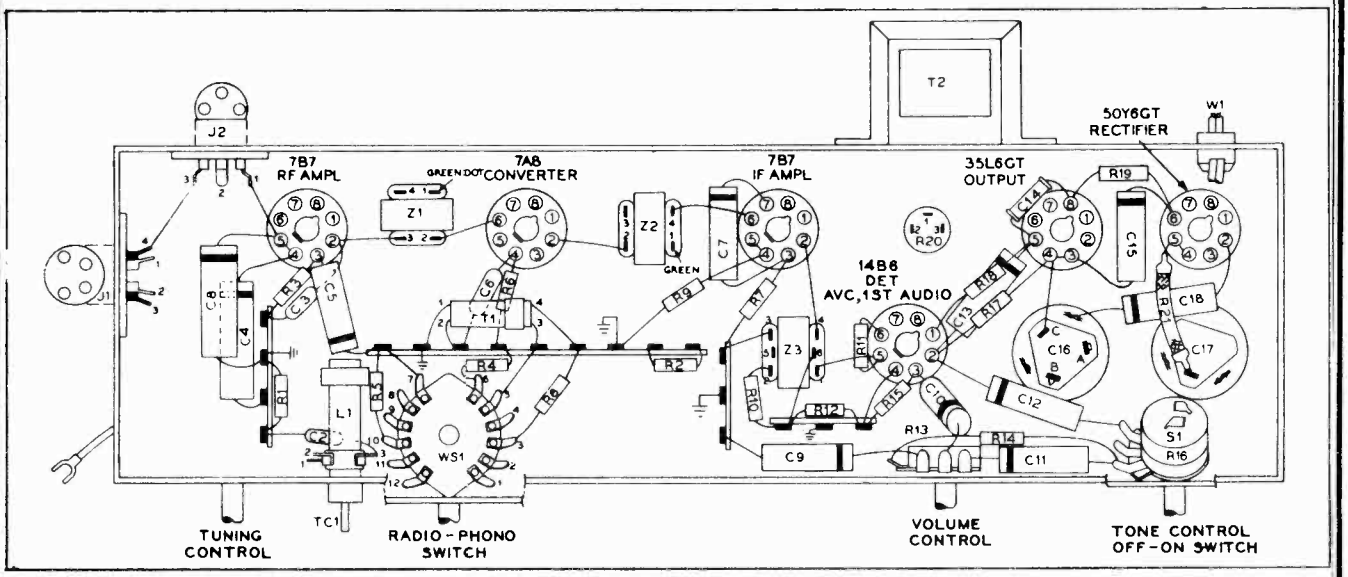
SPECIFICATIONS

CABINET	Wood console, mahogany finish
CIRCUIT	6-tube superheterodyne (with t-r-f stage)
FREQUENCY RANGE	540—1620 kc.
AUDIO OUTPUT	3 watts
OPERATING VOLTAGE	105—120 volts, 60 cycles, a.c.
POWER CONSUMPTION	
Radio	50 watts
Phonograph	65 watts, total
INTERMEDIATE FREQUENCY	455 kc.
AERIAL	Built-in low-impedance loop; provision for external aerial
PHILCO TUBES (6)	7B7 r-f ampl., 7B7 i-f ampl., 7A8 converter, 14B6 det.-a.v.c.-1st audio ampl., 35L6GT output, 50Y6GT rectifier
PHONOGRAPH	Philco Model M-20 All-Speed Automatic Record Changer. (For service information, refer to Service Manual PR-1731.)



TPO-210

Figure 1. Drive-Cord Installation Details



TPO-211

Figure 2. Symbolized Chassis, Showing Parts Placement

REPLACEMENT PARTS LIST

Reference Symbol	Description	Service Part No.
C1	Condenser, tuning gang, 3-section	31-2748-2
C1A	Condenser, aerial trimmer	Part of C1
C1B	Condenser, r-f trimmer	Part of C1
C1C	Condenser, oscillator trimmer	Part of C1
C2	Condenser, aerial (external) coupling, 4.7 μμf.	30-1221-5*
C3	Condenser, fixed trimmer, 15 μμf.	60-00155407*
C4	Condenser, a-v-c filter, .05 μf.	61-0122*
C5	Condenser, screen by-pass, .01 μf.	61-0120*
C6	Condenser, d-c blocking, 47 μμf.	60-00475417*
C7	Condenser, screen by-pass, .05 μf.	61-0122*
C8	Condenser, by-pass, B− to ground, .1 μf.	61-0113*
C9	Condenser, d-c blocking, .006 μf.	45-3500-7*
C10	Condenser, d-c blocking, .01 μf.	61-0120*
C11	Condenser, tone compensation, .006 μf.	45-3500-7*
C12	Condenser, tone compensation, high-cut, .004 μf.	61-0179*
C13	Condenser, d-c blocking, .01 μf.	61-0120*
C14	Condenser, grid by-pass, 220 μμf.	62-122001001*
C15	Condenser, tone compensation, .01 μf.	61-0120*
C16	Condenser, electrolytic, 3-section	30-2568-38
C16A	Condenser, filter, 75 μf., 250v	Part of C16
C16B	Condenser, filter, 40 μf., 250v	Part of C16
C16C	Condenser, filter, 10 μf., 250v	Part of C16
C17	Condenser, electrolytic, voltage doubler, 20 μf., 150v	30-2568-22
C18	Condenser, line by-pass, .05 μf.	61-0122*
C19	Condenser, d-c blocking, phono coupling, .01 μf.	61-0120*
I1	Pilot lamp, 110 volts, 7 watts	34-2605
J1	Socket, aerial input and speaker	27-6214-1
J2	Socket, phono input	27-6126*
L1	Coil, aerial	32-4413-1
LA1	Loop aerial	32-4394-8
LS1	Speaker, 8-inch, p-m	36-1626-1
P1	Cable-and-plug assembly, speaker and loop	41-3948-1
R1	Resistor, aerial isolating, 150,000 ohms	66-4158340*
R2	Resistor, a-v-c filter, 2.2 megohms	66-5228340*
R3	Resistor, screen dropping, 120,000 ohms	66-4128340*
R4	Resistor, cathode bias (phono), 3900 ohms	66-2398340*
R5	Resistor, grid return, 120,000 ohms	66-4128340*
R6	Resistor, grid return (phono), 1 megohm	66-5108340*
R7	Resistor, dropping, 22,000 ohms	66-3228340*
R8	Resistor, plate load (phono), 120,000 ohms	66-4128340*
R9	Resistor, leakage, 150,000 ohms	66-4158340*
R10	Resistor, i-f filter, 47,000 ohms	66-3478340*
R11	Resistor, a-v-c diode load, 2.2 megohms	66-5228340*
R12	Resistor, diode load, 470,000 ohms	66-4478340*
R13	Volume control, 2 megohms, tapped at 1 megohm	33-5535-29
R14	Resistor, tone compensation, 68,000 ohms	66-3688340*
R15	Resistor, grid return, 10 megohms	66-6108340*
R16	Tone control (with off-on switch), 5 meg-ohms	33-5566-19
R17	Resistor, plate load, 470,000 ohms	66-4478340*
R18	Resistor, grid return, 470,000 ohms	66-4478340*
R19	Resistor, cathode bias, 150 ohms	66-1154340*
R20	Resistor, 2-section, wire-wound	33-3445-1
R20A	Resistor, filter, 200 ohms 2 watts	Part of R20
R20B	Resistor, filter, 9200 ohms, 4 watts	Part of R20
R21	Resistor, current limiting, 25 ohms	33-13334-5
S1	Switch, off-on	Part of R16
T1	Transformer, oscillator	32-4263
T2	Transformer, output	32-8242-3*
W1	Line cord	L-2183*
WS1	Switch, wafer, radio-phono	42-1926
Z1	Transformer, r-f	32-4399-2A
Z2	Transformer, 1st i-f	32-4160A
Z3	Transformer, 2nd i-f	32-4240A

MISCELLANEOUS

Description	Service Part No.
Aerial lead assembly	76-1472-1
Cabinet	10713-2
Back	54-7603
Baffle and cloth	40-7512-1
Baffle, wood	219-119
Bezel and scale	54-5088
Bin mechanism, l.h.	76-3223-5
Bin mechanism, r.h.	76-3223-6
Dome (4)	45-6190
Door pull	56-7246
Frame, changer mounting	76-4104
Hinge (2)	56-5765
Dial Backplate Assembly	76-5723
Bracket-and-pulley assembly	76-4003
Bumper, rubber (2)	54-4181
Diffusing panel	54-7606-1

MODEL 50-1718

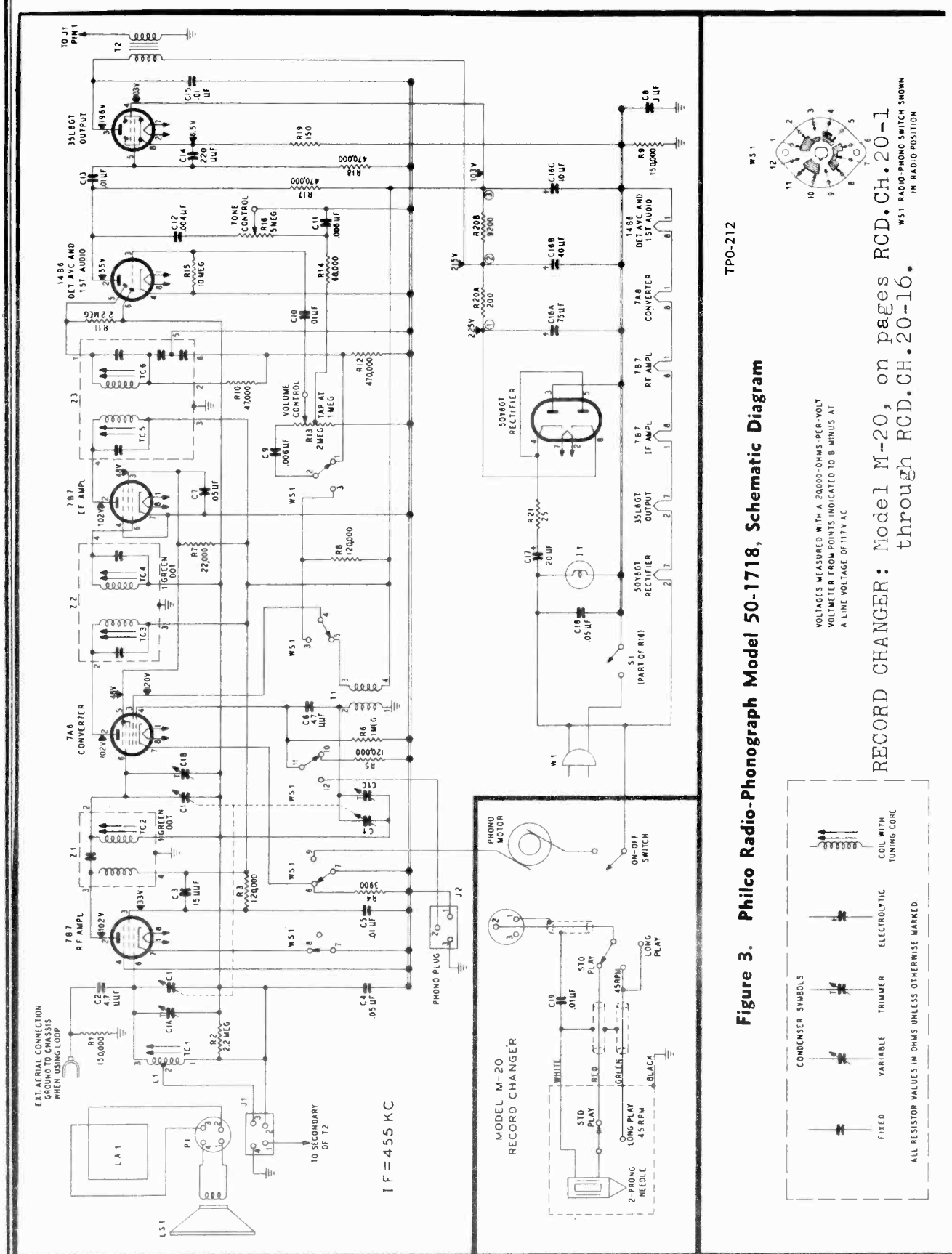


Figure 3. Philco Radio-Phonograph Model 50-1718, Schematic Diagram

ALIGNMENT PROCEDURE

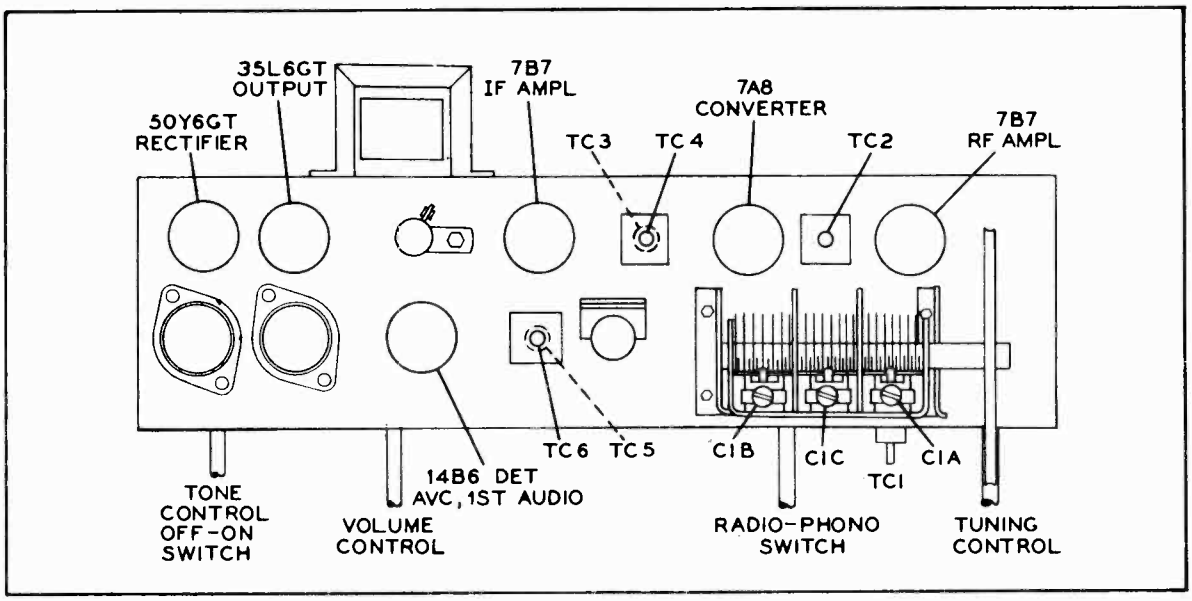
DIAL POINTER—With tuning gang fully meshed, set pointer to coincide with the first scribe mark from the left on the dial backplate.

RADIO CONTROLS—Set volume control to maximum, tone control fully counterclockwise, and RADIO-PHONO switch to RADIO position.

OUTPUT METER—Connect across voice-coil terminals.

SIGNAL GENERATOR—Connect ground lead to B−. Connect output lead as indicated in chart. Use modulated output.

OUTPUT LEVEL—During alignment, attenuate input signal to maintain an output-meter indication of 1.25 volts.



TPO-213

Figure 4. Top View, Showing Trimmer Locations

STEP	SIGNAL GENERATOR		RADIO		ADJUST
	CONNECTION TO RADIO	DIAL SETTING	DIAL SETTING	SPECIAL INSTRUCTIONS	
1	Through a .1-uf. condenser to r-f-ampl. section of C1.	455 kc.	Gang fully meshed.	Adjust, in order given, for maximum output.	TC6—2nd i-f sec. TC5—2nd i-f pri. TC4—1st i-f sec. TC3—1st i-f pri.
2	Radiating loop (see note below).	1620 kc.	1620 kc.	Adjust for maximum.	C1C—osc. trimmer
3	Same as Step 2.	1500 kc.	1500 kc.	Adjust for maximum.	C1B—r-f trimmer C1A—ant. trimmer
4	Same as Step 2.	580 kc.	580 kc.	Adjust for maximum while rocking tuning control.	TC2—r-f core TC1—ant. core*

RADIATING LOOP: Make up a 6-to-8-turn, 6-inch diameter loop of insulated wire; connect to signal-generator output leads, and place near radio loop.

* The aerial tuning core, TC1, should not be adjusted unless the coil has been replaced.

REPLACEMENT PARTS LIST (Continued)

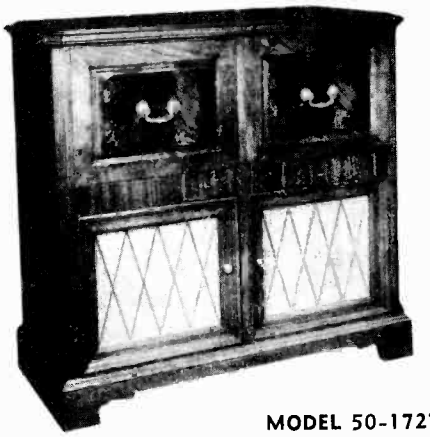
MISCELLANEOUS (Continued)

Description	Service Part No.
Fastener, snap	28-4342FA3
Spring (2)	56-3841
Drive cord, 25-foot spool	45-8750
Pointer	56-5630-3FCP
Spring, pointer drive	56-2617
Fish paper	27-9111
Knob (1)	54-4718-12
Knob (3)	54-4718-6
Mount, rubber, gang mounting (4)	27-4771-1
Pilot-lamp bracket-and-clip assembly	76-5722
Pilot-lamp-socket assembly	27-6233-53
Shaft-and-pulley assembly, drive	76-3959-3

MISCELLANEOUS (Continued)

Description	Service Part No.
Bushing	27-9437
Spring, hairpin (2)	57-1468FA1
Spring, hairpin	57-0985FA1
Sleeve, changer mounting (3)	54-7798
Socket, Loktal (4)	27-6207
Soctal, octal (2)	27-6174
Speed nut, changer mounting (3)	W-2554FCP
Spring, changer mounting, heavy (3)	56-7059FA9
Spring, changer mounting, light (3)	56-7059-1FJ47
Spring, gang drive	56-3167
Wafer, electrolytic mtg. (2)	27-9508

MODEL 50-1727



MODEL 50-1727

SPECIFICATIONS

CABINET .....Wood console, mahogany finish, Georgian style

CIRCUIT .....11-tube superheterodyne

FREQUENCY RANGES
- Broadcast .....540—1620 kc.
- FM .....88—108 mc.

AUDIO OUTPUT .....10 watts

PUSH BUTTONS .....Six: Five for broadcast stations, one for power on-off

OPERATING VOLTAGE ..105—125 volts, 60 cycles, a.c.

POWER CONSUMPTION
- Radio .....110 watts
- Phonograph .....125 watts

AERIALS .....Low-impedance broadcast loop; FM line-cord aerial; provision for external aerial

INTERMEDIATE FREQUENCIES
- AM .....455 kc.
- FM .....9.1 mc.

PHONOGRAPH .....Philco Automatic Record Changer, Model M-20 (for service information, refer to service manual PR-1731).

PHILCO TUBES (11) .... 6AU6, 7F8, 6BJ6(2), 6T8, 7A4, 6V6GT(2), 7E7, 7F7, 5U4G

TP-6098

CIRCUIT DESCRIPTION

Philco Radio-Phonograph Model 50-1727 consists of an 11-tube superheterodyne and a Model M-20 Philco Automatic Record Changer.

A low-impedance loop aerial within the cabinet normally provides adequate signal pickup on the standard broadcast band. In most localities, the built-in FM line-cord aerial provides satisfactory FM reception. In areas where FM signals are weak, an outdoor dipole aerial, such as Philco Part No. 45-1462, will provide additional pickup. To increase the pickup on both bands, use the Philco Aerial Coupler, Part No. 76-2353-1, with the outdoor dipole aerial. For increased signal pickup on the standard broadcast band only, use the coupler with an external aerial of the single-wire type, such as Philco Part No. 45-1494.

The r-f stage (FM only), the converter, and the 1st i-f amplifier are mounted on a separate chassis for improved operation at high frequencies. A 6AU6 high-frequency pentode is used as the FM r-f amplifier. A 7F8 high-frequency dual triode is employed as the converter. There are two transformer-coupled i-f stages using 6BJ6 high-frequency pentodes. Each i-f stage has a double set of transformers; one is tuned to 9.1 mc., the FM intermediate frequency, and the other is tuned to 455 kc., the AM intermediate frequency. The use of individual transformers for FM and AM gives better stability and allows more complete shielding. In FM operation, the primary and secondary of the first AM i-f transformer are shorted out, to attenuate undesirable beat frequencies; switching of other windings is unnecessary.

The multi-purpose 6T8 provides AM and FM detection and functions as the first audio amplifier. Two diodes of this tube operate in a ratio detector circuit.

The other diode acts as the AM detector and also supplies the a-v-c voltage. The triode section is the first audio amplifier for both radio and phono operation.

A 7A4 triode operates as a plate-and-cathode-loaded phase inverter, driving a pair of 6V6GT's in the push-pull output stage. Tone fidelity is obtained by the use of inverse feedback in the audio system. This feedback voltage is taken from the secondary of the output transformer and returned to the low side of the volume control.

Selective tone compensation is provided by a continuously variable bass booster and a five-step treble switch that ranges from Scratch Eliminator "on" through maximum high-cut to Hi Fidelity.

The Philco Electronic Scratch Eliminator, for phono operation, may be switched on or off, as required. In this circuit, the reactance tube (pentode section of a 7E7) functions as a variable shunt capacitance at the phono-input circuit; at low signal levels, this tube bypasses a controlled portion of the higher audio frequencies to ground. The grid bias of the reactance tube controls its effective capacitance, which becomes maximum with low bias and minimum with high bias. This control bias is developed by the audio signal itself; a proportionate amount of the signal is taken from the pickup output, amplified by each triode section of the 7F7, and rectified by the diode section of the 7E7.

PHILCO TROUBLE SHOOTING PROCEDURE

For rapid trouble shooting, the radio circuit is divided into four sections, as follows:

Section 1—the power supply
Section 2—the audio circuits
Section 3—the i-f, detector, and a-v-c circuits
Section 4—the r-f and converter circuits

Test points are specified for each section, and are indicated in the sectionalized schematic diagram. The trouble-shooting procedure given for each section includes a simplified test chart and a bottom view of the chassis showing the locations of the test points and the components of that section.

In each chart, the first step is a master check for determining whether trouble exists in that section without going through the entire test procedure.

Failure to obtain the "NORMAL INDICATION" in any given step indicates trouble within the circuit under test.

After isolating the trouble to a single stage, the defect is located by: first, testing the tube; second, measuring tube electrode voltages; third, measuring circuit resistances; fourth, substituting condensers. The trouble revealed should be corrected before testing further.

IMPORTANT!

To avoid altering FM operation, special care should be used in replacing any part. Replacement parts should be placed in the same physical positions as the original parts; connections should be of the same length, and should be soldered to the same points. The placement or length of leads should not be changed.

PRELIMINARY CHECKS

To avoid possible damage to the radio, the following preliminary checks should be made before it is turned on:

1. Inspect both the top and the bottom of the chassis. Make sure that all tubes are secure in the proper sockets, and look for any broken or shorted connections, burned resistors, or other obvious indications of trouble.

2. Measure the resistance between B+ (pin 2 of the 5U4G rectifier tube) and the radio chassis. When the ohmmeter test leads are connected in the proper polarity, the highest resistance reading will be obtained. If the reading is lower than 1400 ohms, check condensers C102, C103B, C318, C314, and C406 for leakage or shorts.

The resistance value given is much lower than normal, and is not intended as a quality check of these condensers; the value given is the lowest at which the rectifier will operate safely while the voltage checks of Section 1 (power supply) are performed.

TROUBLE SHOOTING

Section 1. POWER SUPPLY

CAUTION: Do not turn on the power with the speaker disconnected, as this may cause damage to the set.

For the tests in this section, use a d-c voltmeter, connecting the leads between the chassis, test point C, and the test points indicated in the chart. The voltage readings given were taken with a 20,000-ohms-per-volt meter at a line voltage of 117 volts, a.c.

Turn on the power, and set the volume control to minimum. Turn the bass control fully counterclockwise, and set the treble selector switch to the left-hand TREBLE position. Set the band switch to the broadcast position.

If the "NORMAL INDICATION" is obtained in step 1, proceed with the tests for Section 2 (audio circuits); if not, isolate and correct the trouble in this section.

STEP	TEST POINT	NORMAL INDICATION	ABNORMAL INDICATION	POSSIBLE CAUSE OF ABNORMAL INDICATION
1	A	230v		Trouble in this section. Isolate by the following tests.
2	B	300v	No voltage	Defective: 5U4G. Open: T100. PB100. W100. Shorted: C100. C101.
			Low voltage	Defective: 5U4G. Open: C102. L100. Shorted: C103B. C311*. C307*. Leaky: C102.
			High voltage	Open: T200*. R103. Shorted: L100.
3	A	230v	No voltage	Open: R100. Shorted: C103A. C303*
			Low voltage	Leaky: C103A. C303*. Increased resistance: R100.
			High voltage	Open: T200*.
4	D	−16v	No voltage	Open: R101. Shorted: C210*.
			Low voltage	Leaky: C210*.
			High voltage	Open: R102.
Listening Test: Abnormal hum and instability may be caused by open C102. C103A, or C103B.				

* This part, located in another section, may cause abnormal indication in this section.

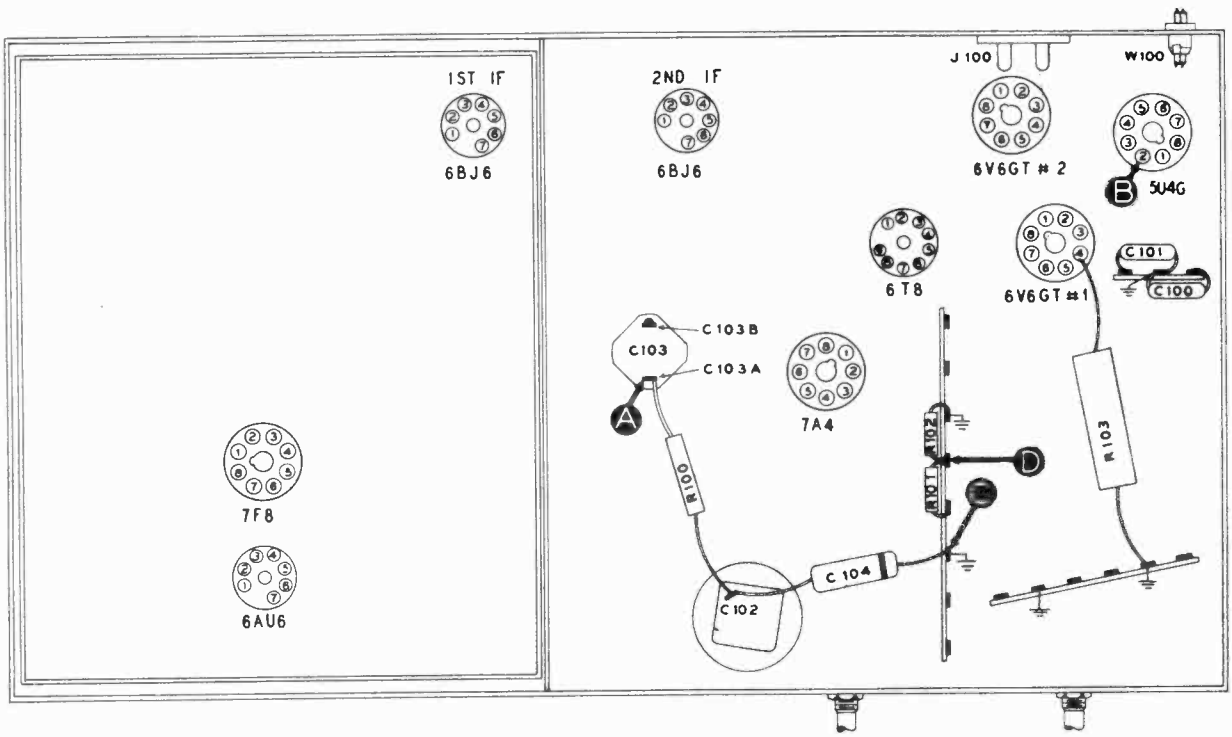


FIGURE 1. BOTTOM VIEW, SHOWING SECTION 1 TEST POINTS

TP-7673A-1

TROUBLE SHOOTING

Section 2. AUDIO CIRCUITS

AUDIO-AMPLIFIER TESTS

For the tests in this section, use an audio-frequency signal generator. Connect the generator ground lead to the chassis, test point C; connect the output lead through a .1-mf. condenser to the test points indicated in the chart.

Set the volume control to maximum, and turn the bass control fully counterclockwise. Set the treble selector switch to the second TREBLE position. Set the band switch to the broadcast position unless otherwise noted in the chart.

If the "NORMAL INDICATION" is obtained in step 1, proceed with the tests for the scratch-eliminator circuits; if not, isolate and correct the trouble in the audio-amplifier circuits.

STEP	TEST POINT	NORMAL INDICATION	POSSIBLE CAUSE OF ABNORMAL INDICATION
1	A	Loud, clear speaker output with weak signal input.	Trouble in audio-amplifier circuits. Isolate by the following tests.
2	B (Remove 7A4)	Clear output with strong input.	Defective: 6V6GT (#1), LS200. Open: C208, R213, T200. Shorted or leaky: C208, C210, C211.
3	D (7A4 removed)	Clear output with strong input.	Defective: 6V6GT (#2). Open: C209, R214. Shorted or leaky: C209.
4	E (Replace 7A4)	Loud, clear output with moderate input.	Defective: 7A4. Open: R209, R210, R211, R212. Shorted or leaky: C207.
5 (a)	F	Loud, clear output with weak input.	Defective: 6T8. Open: R208, C207, R207. Shorted or leaky: C206, C215, C320*.
5 (b)	F	Loud, clear output with weak input, for all 5 positions of treble selector switch.	Open: C212, C213, C214, C215, R215, R216, R217, WS2. Shorted or leaky: C212, C213, C214.
6 (a)	A	Loud, clear output with weak input.	Open: C203, C205, R204, R200 (rotate through range).
6 (b)	A	Loud, clear output with weak input, for any position of bass control.	Open: R203, R202, C202. Shorted: C202.
7	G (Band switch in Phono position)	Loud, clear output with weak input.	Open: WS1-3 (F), R220. Shorted: shield [illegible] cable.
Listening Test: Abnormal hum and distortion may be caused by leaky C207, C208, C209, or by open C206 or C210.			

* This part, located in another section, may cause abnormal indication in this section.

SCRATCH-ELIMINATOR TESTS

Set the bass control fully counterclockwise. Turn the treble selector switch to the high-fidelity position, maximum clockwise. Set the band switch to the phono position. For all steps except 1(b), set the volume control to maximum; for this step, adjust the volume control as directed in the chart.

Turn the scratch eliminator on or off as indicated in the chart. (The scratch eliminator is on when the treble selector switch is in the counterclockwise position.)

Connect an output meter across the primary of the output transformer, T200.

IMPORTANT! For all steps except step 4, use the 0—10-volt output-meter range; for step 4 only, use the 0—50-volt range. If the proper ranges are not used, erroneous readings will result.

Connect the ground lead of an audio signal generator to the chassis, test point C, and connect the output lead through a .1-mf. condenser to the test points indicated in the chart. Set the generator for 5000 cycles. Adjust the generator output as directed in the chart.

If normal operation is indicated by the tests in step 1, (a) and (b), proceed with the tests for Section 3 (i-f, detector, and a-v-c circuits); if not, isolate and correct the trouble in the scratch-eliminator circuits.

NOTE: For steps 2, 3, and 4, connect the positive lead of a 20,000-ohms-per-volt, d-c voltmeter to the chassis, test point C; connect the prod end of the negative lead through a 100,000-ohm isolating resistor to the "VOLTMETER" test points indicated in the chart.

TROUBLE SHOOTING

Section 2. AUDIO CIRCUITS (Cont.)

SCRATCH-ELIMINATOR TESTS

STEP	TEST POINT	SIGNAL GEN. OUTPUT	VOLT-METER	SPECIAL INSTRUCTIONS	POSSIBLE CAUSE OF ABNORMAL INDICATION
1 (a)	G	Adjust for 10v output-meter reading, with scratch eliminator off.		Turn scratch eliminator on; output voltage should drop to . 6.5v (approx.).	
1 (b)	G	Same as for 1 (a).		Reduce volume control to obtain output-meter reading of 1v. Increase generator output for output-meter reading of 10v. Turn scratch eliminator on; output voltage should not drop below 8.8v (approx.).	Trouble in scratch-eliminator circuits. Isolate by the following tests.
2	H	See SPECIAL INSTRUCTIONS.	J	With scratch eliminator on, increase generator output for voltmeter reading of 8.8v, negative; failure to obtain this value indicates trouble.	Defective: 7F7, 7E7 (diode section), WS1-4 (R). Open: R229, R227, R231, R234, C223, WS2 (F).
3	H	Same setting which produced 8.8v reading in step 2, with scratch eliminator on.	K	With scratch eliminator on, voltage at point K should be 2v, negative.	Open: R226, R225, R224. Shorted: C219, C220, C217.
4	G	Same as step 2.	J	With scratch eliminator on, voltage at point J should be approx. 28v negative.	Defective: 7F7. Open: C216, C222, R218, R219, R228. Shorted or leaky: C222.
5	G	Adjust for 10v output-meter reading, with scratch eliminator off.		Turn scratch eliminator on; output voltage should drop to 6.5v (approx.).	Defective: 7E7 (pentode section). Open: R221, R222, R223, C218, C217. Shorted: C218, C217.

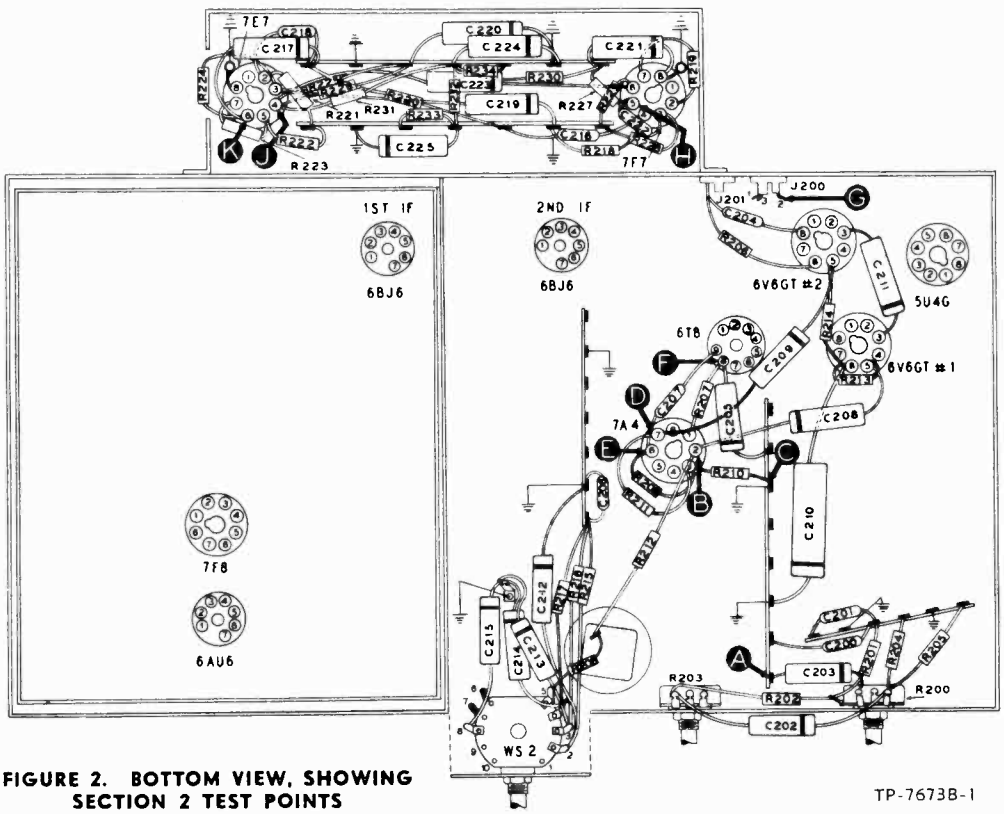


FIGURE 2. BOTTOM VIEW, SHOWING SECTION 2 TEST POINTS

TP-7673B-1

TROUBLE SHOOTING

Section 3. I-F, DETECTOR, AND A-V-C CIRCUITS

AM TESTS

For the tests in this section, use an r-f signal generator, with modulated output, set at 455 kc. Connect the generator ground lead to the chassis, test point C; connect the output lead through a .1-mf. condenser to the test points indicated in the chart.

Set the volume control to maximum, and turn the bass control fully counterclockwise. Set the treble selector switch to the second TREBLE position. Set the band switch to the broadcast position, and rotate the tuning control until the tuning condenser is fully meshed.

If the "NORMAL INDICATION" is obtained in step 1, proceed with the FM tests; if not, isolate and correct the trouble in the AM circuits.

To provide a complete i-f-amplifier check, test point A for this section is placed at the grid of the mixer in Section 4; therefore, the effectiveness of step 1 as a master check is dependent upon the condition of certain parts in the mixer circuit. These parts are listed below under "POSSIBLE CAUSE OF ABNORMAL INDICATION."

STEP	TEST POINT	NORMAL INDICATION	POSSIBLE CAUSE OF ABNORMAL INDICATION
1	A	Loud, clear speaker output with weak signal input.	Trouble in AM i-f circuits. Isolate by the following tests.
2	B	Loud, clear output with strong input.	Defective: 6BJ6 (2nd i-f ampl.), 6T8. Misaligned: Z305. Open: R310, R311, R312, R313, R314, L304A, L305B, L302B, L303B, WS1-5. Shorted: L303B, L305A, L305B. Shorted or leaky: C316, C315, C317, C318, C305A, C305B, C305C, C305D.
3	D	Loud, clear output with moderate input.	Defective: 6BJ6 (1st i-f ampl.). Misaligned: Z303. Open: L300B, L301C, L302A, L302B, R303, R309, R305, R307, R308. Shorted: L303A. Shorted or leaky: C313, C312, C310, C314, C301B, C303A.
4	A	Loud, clear output with weak input.	Defective: 7F8*. Misaligned: Z301. Open: R405*, R300, R301, L300A, L301A, L301B. Shorted: L301A, L301B, L301C, WS1-5. Shorted or leaky: C410*, C411*, C409*. C301A, C301B, C306.
Listening Test: Abnormal hum may be caused by open: C306, C310, C312, C313, C314, C316, C317, C318.			

* This part, located in another section, may cause abnormal indication in this section.

FM CIRCUITS

Set the band switch to FM position, and follow the instructions preliminary to the AM tests with these exceptions; set the signal-generator frequency to 9.1 mc., and detune to one side or the other until a satisfactory test signal is obtained.

The most satisfactory check on the operation of the discriminator circuit is the ability of the circuit to take proper alignment. See ALIGNMENT OF FM CIRCUITS.

If the "NORMAL INDICATION" is obtained in step 1, proceed with the tests for Section 4 (r-f and converter circuits); if not, isolate and correct the trouble in the FM circuits.

Usually, if a part is found to operate satisfactorily for AM it will also operate satisfactorily for FM.

MODEL 50-1727

TROUBLE SHOOTING

Section 3. I-F, DETECTOR, AND A-V-C CIRCUITS (Cont.)

FM TESTS

STEP	TEST POINT	NORMAL INDICATION	POSSIBLE CAUSE OF ABNORMAL INDICATION
1	A	Loud, clear speaker output with weak signal input.	Trouble in FM i-f circuits. Isolate by the following tests.
2	B	Loud, clear output with strong input.	Open: WS1-5, L304B, L304C, R315, C319, R316, R317, WS1-3. Shorted or leaky: C322, C323, C304A, C304B, C319, C321. Shorted: L304A, L304B. Misaligned: Z304.
3	D	Loud, clear output with moderate input.	Misaligned: Z302. Shorted: L302A, L302B, C302A, C302B. Open: R304, WS1-5.
4	A	Loud, clear output with weak input.	Misaligned: Z300. Shorted: L300A, L300B, C300A, C300B, C307, WS1-2. Open: WS1-2, WS1-5.

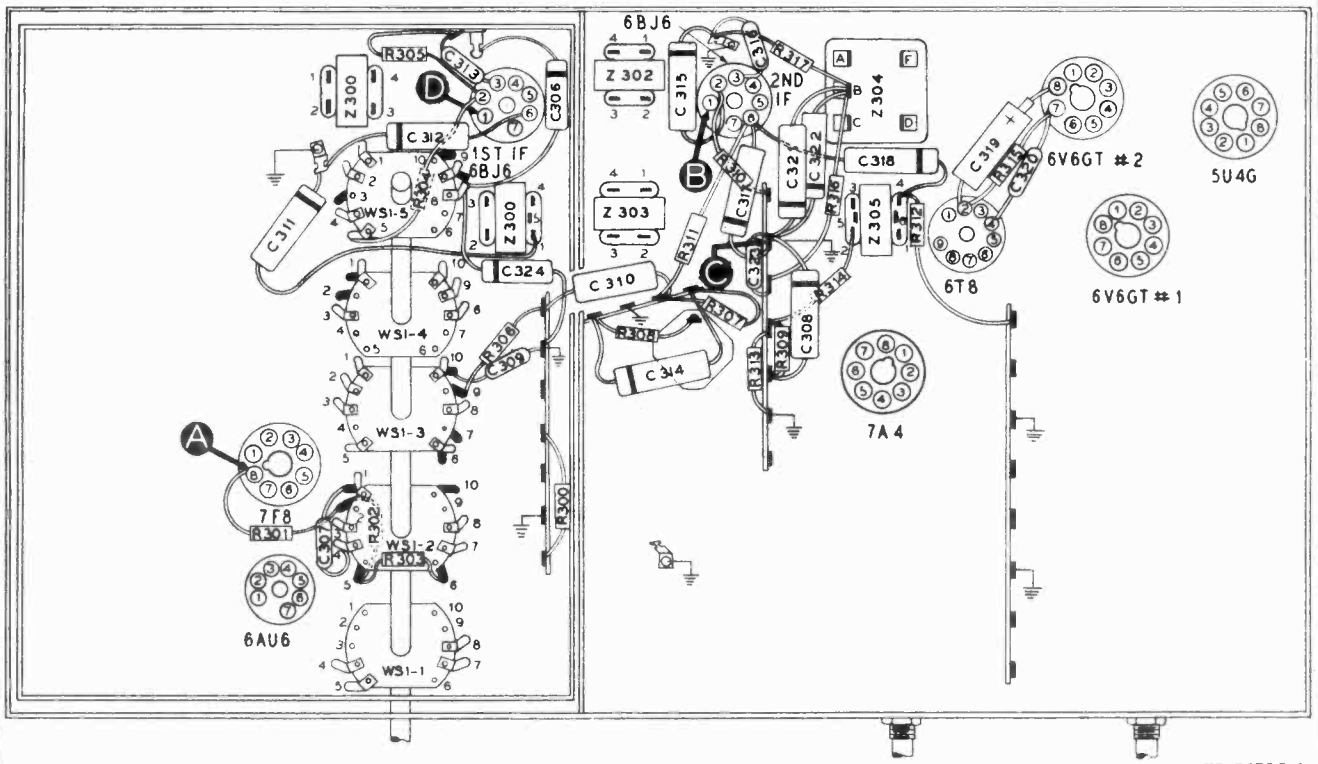


FIGURE 3. BOTTOM VIEW, SHOWING SECTION 3 TEST POINTS

TP-7673C-1

TROUBLE SHOOTING

Section 4. R-F AND CONVERTER CIRCUITS

For the tests in this section, with the exception of the oscillator test, use an r-f signal generator with modulated output. Connect the generator ground lead to the chassis, test point C; connect the output lead through a .1-mf. condenser to the test points indicated in the chart.

Set the volume control to maximum, and turn the bass control fully counterclockwise. Set the treble selector switch to the second TREBLE position. Set the band switch, tuning control, and signal-generator frequency as indicated in the chart.

If the "NORMAL INDICATION" is not obtained in step 1 of each chart, isolate and correct the trouble in this section. If the trouble is not revealed by the tests for this section, check the alignment.

OSCILLATOR TESTS: For the oscillator tests (steps 2 and 4 of the AM test chart, and step 2 of the FM test chart), connect the positive lead of a high-resistance voltmeter to the oscillator cathode, pin 4 of the 7F8 tube (test point D). Connect the prod end of the negative lead through a 100,000-ohm isolating resistor to the oscillator grid, pin 1 of the 7F8 tube (test point B). Use a suitable meter range, such as 0—10 volts. Proper operation of the oscillator is indicated by negative voltages of approximately the values given in the chart (measured with 20,000-ohms-per-volt meter) throughout the tuning ranges of the broadcast and FM bands.

AM TESTS

STEP	TEST POINT	SIGNAL GEN. FREQ.	BAND SWITCH	RADIO TUNING	NORMAL INDICATION	POSSIBLE CAUSE OF ABNORMAL INDICATION
1 (a) 1 (b)	A A	1000 kc. Tune to frequency of each push-button.	BC Push-button	Tune to signal. Depress each button, in order.	Loud, clear speaker output with weak signal input.	Trouble in AM r-f circuits. Isolate by the following tests.
2 (Osc. Test.)	B to D		BC	Tune through range.	Negative 2—5 volts.	Defective: 7F8. Open: R404, T401, L405, C412, L404, R306*, WS1-3, WS1-4. Shorted: C412, C400, C417B, C407.
3	A	1000 kc.	BC	Tune to signal.	Loud, clear output with weak input.	Open: T400, WS1-2, C413. Shorted: C400, C417A.
4 (Osc. Test.)	B to D		Push-button	Depress each button, in order.	Negative 2—5 volts.	Open: L406, PB400, R406, WS1-3, WS1-4. Shorted: C414, C415.
5	A	Tune to frequency of each push-button.	Push-button	Depress each button, in order.	Loud, clear output with weak input.	Open: WS1-2, PB400. Shorted: C416.
Listening Test: Distortion may be caused by open R301*, R302*, or R309* Hum and distortion may be caused by open C308* or C310*.						

* This part, located in another section, may cause abnormal indication in this section.

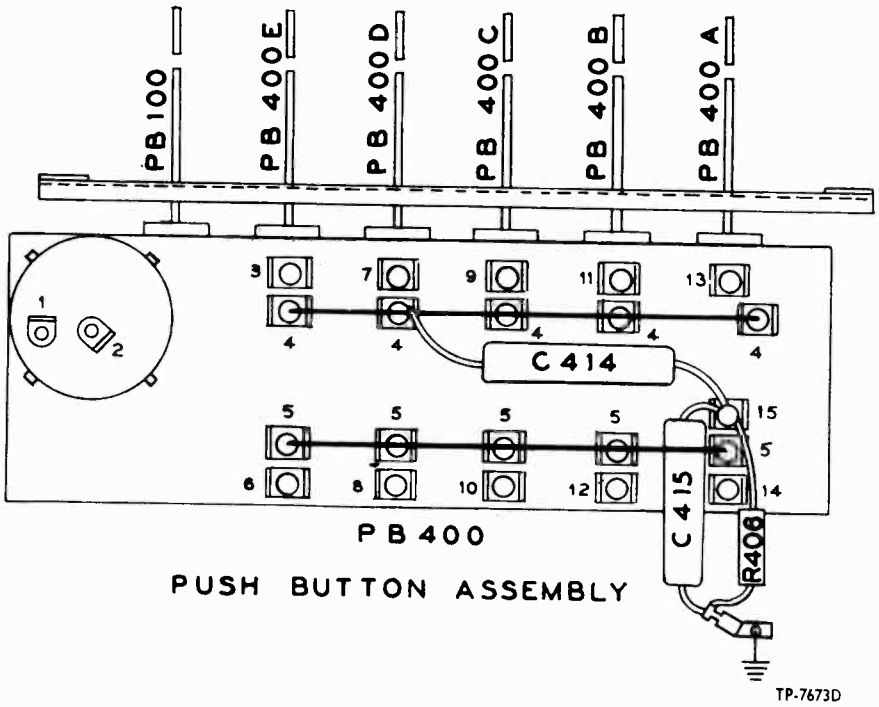
FM TESTS

STEP	TEST POINT	SIGNAL GEN. FREQ.	BAND SWITCH	RADIO TUNING	NORMAL INDICATION	POSSIBLE CAUSE OF ABNORMAL INDICATION
1	E	95 mc.	FM	Tune to signal.	Loud, clear speaker output with weak signal input.	Trouble in FM r-f circuits. Isolate by the following tests.
2 (Osc. Test.)	B to D		FM	Tune through range.	Negative 1—1.5 volts.	Defective: 7F8. Open: L402, WS1-3, WS1-4. Shorted: C400, C400C, C309*. Shorted or leaky: C407, C409.
3	E	95 mc.	FM	Tune to signal.	Loud, clear output with weak input.	Defective: 6AU6. Open: L400, C401, R400, R401, R402, R403, L403, C405, L401. Shorted: C400, C400A, L400, L401, WS1-2, C400B. Shorted or leaky: C402, C404, C403, C405, C406.
Listening Test: Hum and distortion may be caused by open C402, C406, C408, C409.						

* This part, located in another section, may cause abnormal indication in this section.

TROUBLE SHOOTING

Section 4. R-F AND CONVERTER CIRCUITS (Cont.)



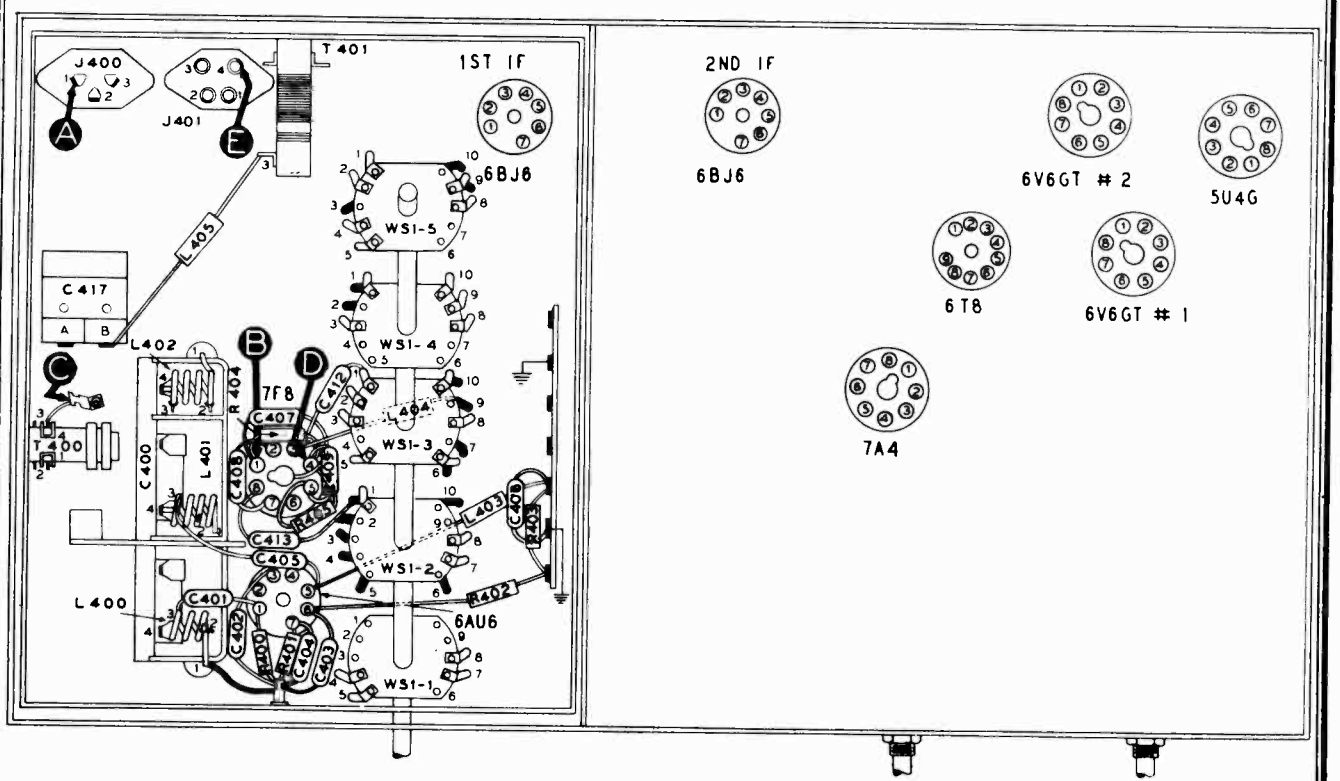


FIGURE 4. BOTTOM VIEW, SHOWING SECTION 4 TEST POINTS

TP-7673E-1

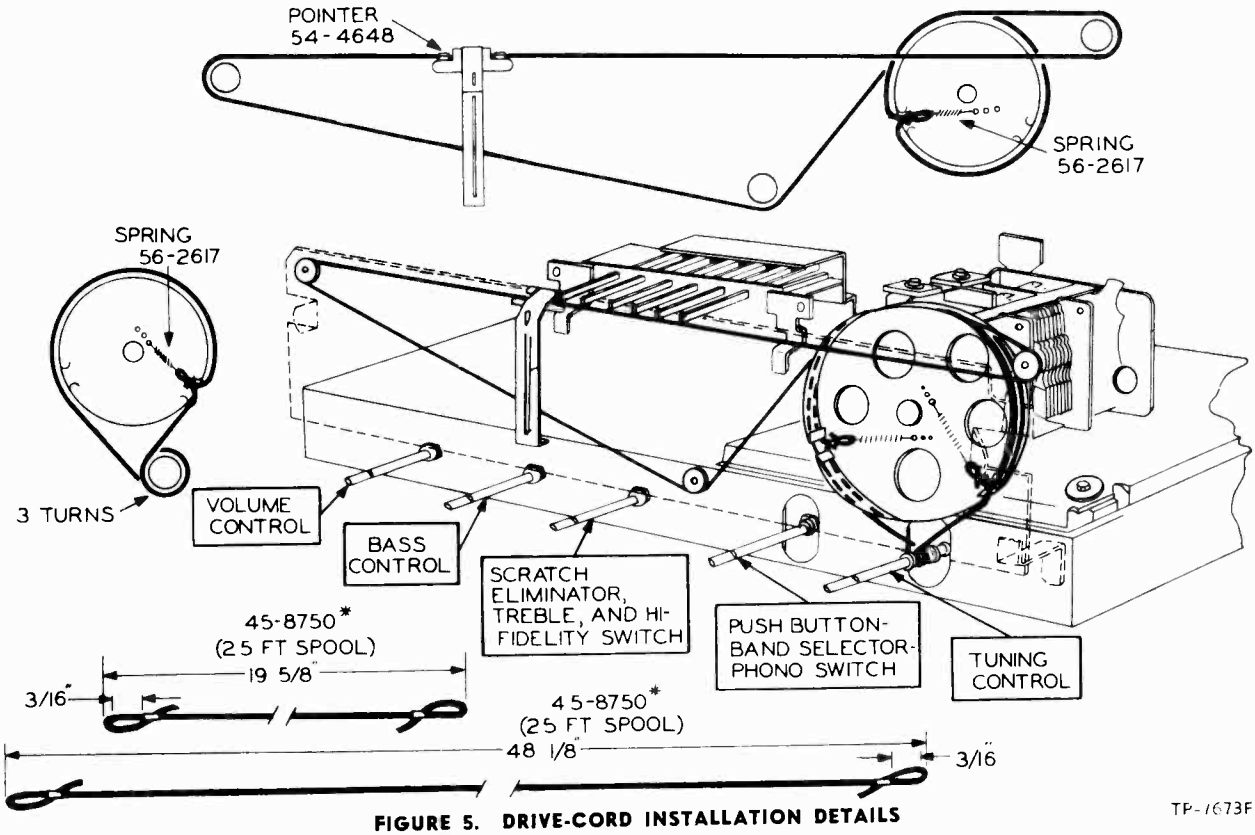


FIGURE 5. DRIVE-CORD INSTALLATION DETAILS

TP-1673F

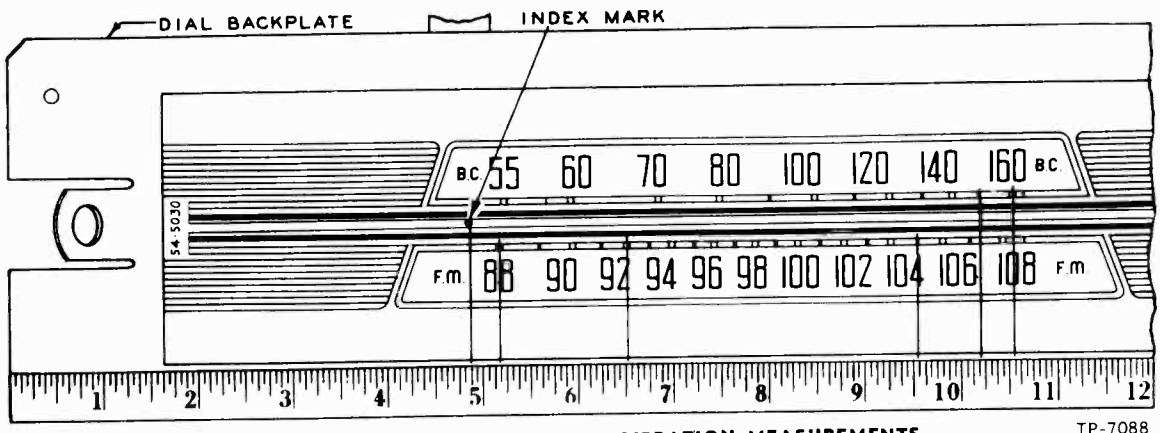


FIGURE 6. DIAL-BACKPLATE CALIBRATION MEASUREMENTS

TP-7088

CALIBRATING DIAL BACKPLATE

When the radio chassis has been removed from the cabinet, dial calibration and alignment points may be marked on the dial backplate below the pointer.

The method of measuring for these points is illustrated in figure 6. Hold a ruler against the scale backplate, with the start of the ruler at the left-hand edge of the backplate, and mark pencil dots at the proper points for the required frequency settings. When the ruler is correctly placed, the index mark is approximately 4-7/8" from the reference point indicated in figure 6.

With the tuning gang fully meshed, the pointer should be adjusted on the dial drive cord to coincide with the index mark.

After the chassis is installed in the cabinet, the tuning condenser should be fully meshed, and the dial pointer should be moved to coincide with the index mark on the dial.

MODEL 50-1727

ALIGNMENT PROCEDURE

CAUTION: Do not turn on the power with the speaker disconnected, or the radio may be damaged.

ALIGNMENT OF AM CIRCUITS

When the complete AM and FM alignment is to be made, the AM alignment should be made first; however, if AM alignment is not required, the FM alignment alone may be made.

DIAL POINTER: With the tuning condensers fully meshed, the dial pointer must coincide with the index mark at the low-frequency end of the dial. See "CALIBRATING DIAL BACKPLATE" for the method of measuring the backplate for index and calibration points.

CONTROLS: Set the volume control to maximum, and the bass control fully counterclockwise. Set the treble selector switch fully clockwise. Set the band switch to the broadcast position. Set the signal-generator dial and radio dial as indicated in the chart.

OUTPUT METER: Connect between the No. 3 terminal (voice-coil connection) of the loop aerial socket, J400, and the chassis. See figure 8.

AM SIGNAL GENERATOR: Connect the ground lead to the chassis, and the output lead as indicated in the chart. Use modulated output.

OUTPUT LEVEL: During alignment, the signal-generator output must be attenuated to hold the radio output below 1.5 volts, as read on the output meter.

ALIGNMENT OF FM CIRCUITS

BEFORE STARTING ALIGNMENT, ALLOW THE RADIO AND SIGNAL GENERATOR TO WARM UP FOR 15 MINUTES.

CONTROLS: Set the volume control to maximum, and the bass control fully counterclockwise. Set the treble selector switch fully clockwise. Set the band switch to the FM position. Set the signal-generator dial and radio dial as indicated in the chart.

OUTPUT METER: Connect between the No. 3 terminal (voice-coil connection) of the loop aerial socket, J400, and the chassis. See figure 8.

AM SIGNAL GENERATOR: Connect the ground lead to the chassis; connect the output lead through a .1-mf. condenser to the points specified in the chart. Use modulated output.

OUTPUT LEVEL: During alignment, the signal-generator output must be attenuated to hold the radio output below 1.5 volts, as read on the output meter.

LOCATIONS OF COILS: For the locations of coils L400, L401, and L402 (steps 8, 9, and 10), refer to figure 4.

Note 1. Check the tracking of oscillator and r-f circuits with a tuning wand. If placing the brass end in or near the coil increases the output-meter reading, spread the turns; if the powdered-iron end increases the output reading, compress the turns. If both ends cause a decrease in the output, the coil is correctly tuned. Do not change the coils excessively, since only a small adjustment is required at these frequencies.

Note 2. Make two simple dipole aerials to feed the signals from the signal generator to the radio. Each dipole aerial may consist of two 30-inch lengths of rubber-covered wire. Connect one dipole aerial to terminals 3 and 4 on the FM aerial socket, J401, of the radio. See figure 8. Connect the other dipole aerial to the output leads of the signal generator. Place the two dipoles several feet apart.

Note 3. The use of a signal generator for steps 5 through 11 is recommended only if the available generator is sufficiently accurate to insure correct frequency settings. Otherwise, an alternative procedure employing FM broadcast-station signals is recommended. For the adjustments at the high-frequency end of the band, use the station nearest 105 mc.; for the adjustments at the low-frequency end of the band, use the station nearest 88 mc. or 92 mc., as indicated. If the radio is greatly misaligned, it may be necessary to adjust the trimmers and coils for maximum noise at each end of the band before station signals can be heard.

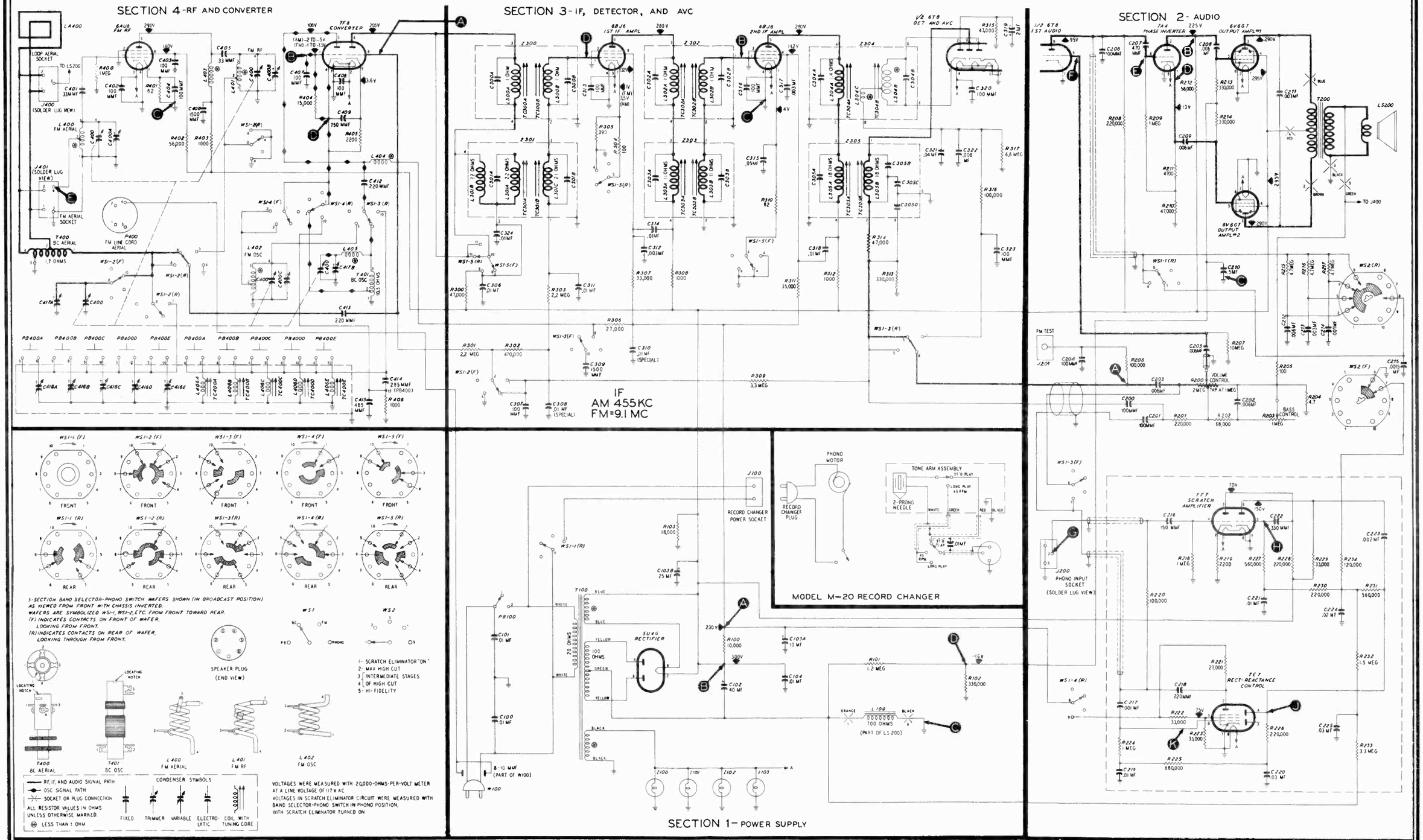


FIGURE 9. PHILCO RADIO-PHONOGRAPH MODEL 50-1727, SECTIONALIZED SCHEMATIC DIAGRAM, SHOWING TEST POINTS

RECORD CHANGER: Model M-20, on pages RCD.CH.20-1 through RCD.CH.20-16.

TP-7673-1

AM ALIGNMENT CHART

STEP	SIGNAL GENERATOR		RADIO		ADJUST
	CONNECTION TO RADIO	DIAL SETTING	DIAL SETTING	SPECIAL INSTRUCTIONS	
1	Through .1-mf. condenser to pin 8 of 7F8 tube.	455 kc.	Gang fully closed.	Adjust each trimmer, in order given, for maximum output. Do not repeat adjustments.	TC305B—3rd i-f sec. TC305A—3rd i-f pri. TC303B—2nd i-f sec. TC303A—2nd i-f pri. TC301B—1st i-f sec. TC301A—1st i-f pri.
2	Loosely coupled with radiating loop. See note below.	1600 kc.	1600 kc.	Adjust for maximum output.	C417B—Osc.
3	Same as step 2.	1500 kc.	1500 kc.	Adjust for maximum output.	C417A—Aerial
4	Repeat steps 2 and 3 until no further increase in output is obtained.				

RADIATING LOOP: Make up a six-to-eight turn, 6-inch-diameter loop, using insulated wire; connect to signal generator leads and place near radio loop. Radio loop must be connected to set during alignment.

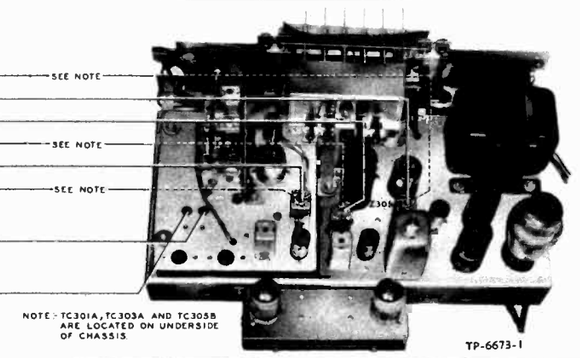


FIGURE 7. TOP VIEW, SHOWING AM TRIMMER LOCATIONS

FM ALIGNMENT CHART

STEP	SIGNAL GENERATOR		RADIO		ADJUST
	CONNECTION TO RADIO	DIAL SETTING	DIAL SETTING	SPECIAL INSTRUCTIONS	
1	Through .1-mf. condenser to pin 1 of 6BJ6 2nd i-f ampl.	9.1 mc.	88 mc.	Adjust trimmers, in order given, for maximum output.	TC304B—3rd i-f sec. TC304A—3rd i-f pri.
2	Through .1-mf. condenser to pin 1 of 6BJ6 1st i-f ampl.	9.1 mc.	88 mc.	Same as step 1.	TC302B—2nd i-f sec. TC302A—2nd i-f pri.
3	Through .1-mf. condenser to pin 8 of 7F8 converter.	9.1 mc.	88 mc.	Same as step 1.	TC300B—1st i-f sec. TC300A—1st i-f pri.
4	To FM aerial terminal (terminal 4 of J401).	105 mc.	105 mc.	Adjust for maximum.	C400C—Osc.
5	Same as step 4.	92 mc.	92 mc.	Adjust L402 for maximum (see Note 1).	L402—Osc. tracking
6	Same as step 4.	105 mc.	105 mc.	Adjust for maximum while rocking tuning control.	C400B—R.f.
7	Same as step 4.	105 mc.	105 mc.	Adjust for maximum.	C400A—Aerial
8	Dipole radiator (see Note 3).	92 mc.	92 mc.	Adjust L401 for maximum while rocking tuning control (see Note 1).	L401—R-f tracking
9	Same as step 8.	92 mc.	92 mc.	Adjust L400 for maximum (see Note 1).	L400—Aerial tracking
10	Repeat steps 5 through 10 until no further increase is obtained.				

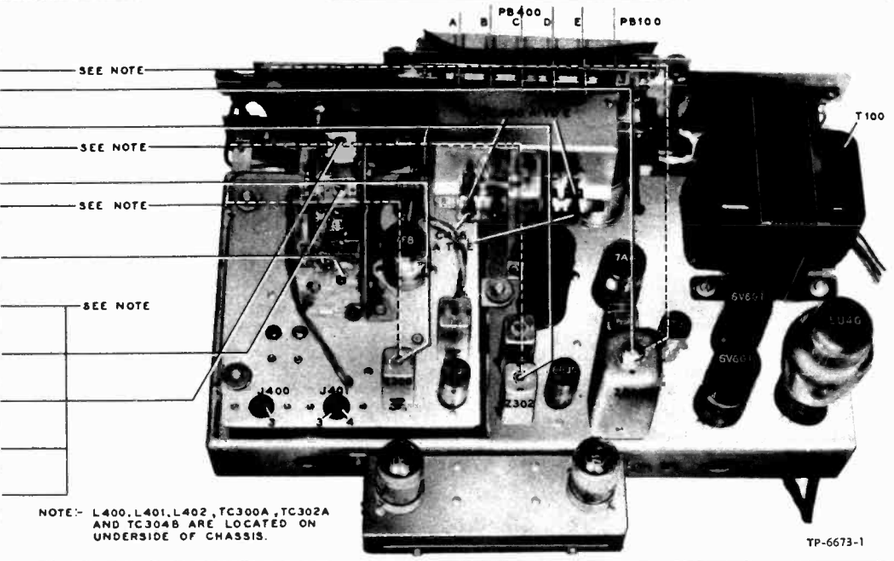


FIGURE 8. TOP VIEW, SHOWING FM TRIMMER LOCATIONS

SETTING THE PUSH BUTTONS

1. Connect the output meter between the No. 3 pin of the aerial input jack, J400, and the chassis. See figure 8.

2. Turn the volume control to maximum, and the bass control fully counterclockwise. Turn the treble selector switch fully clockwise. Set the band switch to the push-button position.

3. Couple the signal generator loosely to the loop aerial (see RADIATING LOOP note under AM ALIGNMENT CHART).

4. Turn on the power, and allow the radio to warm up for 15 minutes before starting the adjustments.

5. Starting with the lowes frequency desired, set the signal generator to the frequency (modulation on), push the station-selector push button, and adjust the associated oscillator tuning core and aerial trimmer condenser (marked on rear of chassis) for maximum indication on the output meter.

6. Reset the signal-generator frequency, and repeat the procedure for each remaining station-selector push button.

7. Turn off the signal generator, and make a final adjustment of all tuning cores and trimmer condensers while listening to the stations for which the adjustments are being made.

REPLACEMENT PARTS LIST

NOTE: Part numbers identified by an asterisk (*) are general replacement items. These numbers may not be identical with those on factory assemblies; also, the electrical values of some replacement items may differ from the values indicated in the schematic diagram and parts list. The values substituted in any case are so chosen that the operation of the radio will be either unchanged or improved. When ordering replacements, use only the "Service Part No."

SECTION 1
POWER SUPPLY

Reference Symbol	Description	Service Part No.
C100	Condenser, line filter, .01 mf.	60-0120*
C101	Condenser, line filter, .01 mf.	60-0120*
C102	Condenser, electrolytic, filter, 40 mf., 450v	30-2568-20
C103	Condenser, electrolytic, 2-section	30-2556
C103A	Condenser, filter, 10 mf., 450v	Part of C103
C103B	Condenser, filter, 25 mf., 450v	Part of C103
C104	Condenser, filter, .01 mf.	61-0120*
L100	Field coil, filter choke	Part of LS200
I100	Lamp, bin light, 6.3-volt	34-2040
I101	Lamp, jewel light, 6.3-volt	34-2040
I102	Lamp, pilot light, 6.3-volt	34-2040
I103	Lamp, pilot light, 6.3-volt	34-2040
J100	Socket, phono power	27-6200
PB100	Switch, power off-on	Part of 42-1881†
R100	Resistor, filter, 10,000 ohms, 10w	33-1336-21
R101	Resistor, bias divider, 1.2 megohms	66-5123340*
R102	Resistor, bias divider, 330,000 ohms	66-4333340*
R103	Resistor, bleeder, 18,000 ohms, 10 watts	33-1335-85
T100	Transformer, power	32-8378
W100	Line cord and plug	L-2183*
WS1-1(R)	Switch-wafer section	Part of 42-1877‡

SECTION 2
AUDIO CIRCUITS

C200	Condenser, AM tone compensation 100 mmf.	62-110009001
C201	Condenser, AM tone compensation, 100 mmf.	62-110009001
C202	Condenser, bass tone compensation, .006 mf.	45-3500-7*
C203	Condenser, d-c blocking, .006 mf.	45-3500-7*
C204	Condenser, r-f by-pass, 100 mmf.	62-110009001
C205	Condenser, d-c blocking, .006 mf.	45-3500-7*
C206	Condenser, r-f by-pass, 100 mmf.	62-110009001
C207	Condenser, d-c blocking, 470 mmf.	60-10515307*
C208	Condenser, d-c blocking, .006 mf.	45-3500-7*
C209	Condenser, d-c blocking, .006 mf.	45-3500-7*
C210	Condenser, bias filter, .5 mf.	45-3500-10*
C211	Condenser, tone compensation, .033 mf.	61-0117*
C212	Condenser, tone compensation, .006 mf.	45-3500-7*
C213	Condenser, tone compensation, .033 mf.	61-0117*
C214	Condenser, tone compensation, .001 mf.	45-3500-5*
C215	Condenser, tone compensation, .0015 mf.	45-3500-6*
C216	Condenser, high-pass filter, 150 mmf.	60-10155407*
C217	Condenser, d-c blocking, .001 mf.	45-3500-5*
C218	Condenser, reactance feedback, 220 mmf.	60-10205307*
C219	Condenser, bias filter, .01 mf.	61-0120*

†42-1881 Push-button switch assembly

SECTION 2 (Continued)
AUDIO CIRCUITS

Reference Symbol	Description	Service Part No.
C220	Condenser, bias filter, .03 mf.	45-3500-1*
C221	Condenser, bias filter, .01 mf.	61-0120*
C222	Condenser, d-c blocking, 330 mmf.	60-10335407*
C223	Condenser, d-c blocking, .002 mf.	61-0062*
C224	Condenser, bias filter, .02 mf.	61-0108*
C225	Condenser, bias filter, .03 mf.	45-3500-1*
J200	Socket, phono input	27-6126
J201	Socket, FM test	27-6180
LS200	Speaker, electrodynamic, 12" (including L100)	36-1630
R200	Volume control, 2 megohms, tap at 1 megohm	33-5535-19
R201	Resistor, bass boost, 220,000 ohms	66-4223340*
R202	Resistor, tone compensation, 68,000 ohms	66-3683340*
R203	Tone control, bass, 1 megohm	33-5539-52
R204	Resistor, voltage divider, inverse feedback, 4.7 ohms	66-9473340*
R205	Resistor, voltage divider, inverse feedback, 100 ohms	66-1103340*
R206	Resistor, isolating, 100,000 ohms	66-4103340*
R207	Resistor, grid return, 10 megohms	66-6103340*
R208	Resistor, plate load, 220,000 ohms	66-4223340*
R209	Resistor, grid return, 1 megohm	66-5103340*
R210	Resistor, cathode bias, 47,000 ohms	66-3473340*
R211	Resistor, cathode load, 4700 ohms	66-2473340*
R212	Resistor, plate load, 56,000 ohms	66-3563340*
R213	Resistor, grid return, 330,000 ohms	66-4333340*
R214	Resistor, grid return, 330,000 ohms	66-4333340*
R215	Resistor, tone compensation, 4.7 megohms	66-5473340*
R216	Resistor, tone compensation, 4.7 megohms	66-5473340*
R217	Resistor, tone compensation, 4.7 megohms	66-5473340*
R218	Resistor, grid return, 1 megohm	66-5103340*
R219	Resistor, cathode bias, 2200 ohms	66-2223340*
R220	Resistor, low-pass filter, 100,000 ohms	66-4103340*
R221	Resistor, plate load, 27,000 ohms	66-3273340*
R222	Resistor, screen voltage divider, 33,000 ohms	66-3333340*
R223	Resistor, screen voltage divider, 33,000 ohms	66-3333340*
R224	Resistor, grid return, 1 megohm	66-5103340*
R225	Resistor, bias filter, 680,000 ohms	66-4683340*
R226	Resistor, bias filter, 220,000 ohms	66-4223340*
R227	Resistor, grid return, 560,000 ohms	66-4563340*
R228	Resistor, plate load, 220,000 ohms	66-4223340*
R229	Resistor, plate load, 33,000 ohms	66-3333340*
R230	Resistor, bias filter, 220,000 ohms	66-4223340*
R231	Resistor, diode load, 560,000 ohms	66-4563340*

‡42-1877 Band switch, 5-section

MODEL 50-1727

REPLACEMENT PARTS LIST

SECTION 2 (Continued)
AUDIO CIRCUITS

Reference Symbol	Description	Service Part No.
R232	Resistor, bias filter, 1.5 megohms	66-5153340*
R233	Resistor, bias filter, 3.3 megohms	66-5333340*
R234	Resistor, diode load, 120,000 ohms	66-4123340*
T200	Transformer, output	32-8379
WS1-1(R)	Switch-wafer section	Part of 42-1877‡
WS1-3(F)	Switch-wafer section	Part of 42-1877‡
WS1-4(R)	Switch-wafer section	Part of 42-1877‡
WS2	Switch, wafer, scratch eliminator off-on and fidelity (treble selector) switch	42-1876

SECTION 3
I-F, DETECTOR, AND A-V-C CIRCUITS

C300A	Condenser, fixed trimmer, pri., 1st FM i-f	Part of Z300
C300B	Condenser, fixed trimmer, sec., 1st FM i-f	Part of Z300
C301A	Condenser, fixed trimmer, pri., 1st AM i-f	Part of Z301
C301B	Condenser, fixed trimmer, sec., 1st AM i-f	Part of Z301
C302A	Condenser, fixed trimmer, pri., 2nd FM i-f	Part of Z302
C302B	Condenser, fixed trimmer, sec., 2nd FM i-f	Part of Z302
C303A	Condenser, fixed trimmer, pri., 2nd AM i-f	Part of Z303
C303B	Condenser, fixed trimmer, sec., 2nd AM i-f	Part of Z303
C304A	Condenser, fixed trimmer, pri., 3rd FM i-f	Part of Z304
C304B	Condenser, fixed trimmer, sec., 3rd FM i-f	Part of Z304
C305A	Condenser, fixed trimmer, pri., 3rd AM i-f	Part of Z305
C305B	Condenser, fixed trimmer, sec., 3rd AM i-f	Part of Z305
C305C	Condenser, r-f by-pass	Part of Z305
C305D	Condenser, r-f by-pass	Part of Z305
C306	Condenser, plate decoupling, .01 mf.	61-0120*
C307	Condenser, r-f by-pass, 100 mmf.	62-110009001
C308	Condenser (special), a-v-c filter, .01 mf.	30-4641
C309	Condenser, r-f by-pass, 1500 mmf.	62-215001011
C310	Condenser, (special), r-f by-pass, .01 mf.	30-4641
C311	Condenser, r-f by-pass, .01 mf.	61-0120*
C312	Condenser, screen by-pass, .003 mf.	61-0109*
C313	Condenser, filament by-pass, 100 mmf.	62-110009001
C314	Condenser, plate by-pass, .01 mf.	61-0120*
C315	Condenser, cathode by-pass, .05 mf.	61-0170*
C316	Condenser, filament by-pass, 100 mmf.	62-110009001
C317	Condenser, screen by-pass, .003 mf.	61-0109*
C318	Condenser, plate by-pass, .01 mf.	61-0120*
C319	Condenser, electrolytic, diode-load filter, 2 mf., 50v	30-2417-7
C320	Condenser, filament by-pass, 100 mmf.	62-110009001
C321	Condenser, de-emphasis, .04 mf.	45-3500-2
C322	Condenser, de-emphasis, .008 mf.	30-4112*
C323	Condenser, r-f by-pass, 100 mmf.	62-110009001
C324	Condenser, plate decoupling, .01 mf.	61-0120*
L300A	Coil, primary winding, 1st FM i-f	Part of Z300

(SECTION 3 (Continued)
I-F, DETECTOR, AND A-V-C CIRCUITS

Reference Symbol	Description	Service Part No.
L300B	Coil, secondary winding, 1st FM i-f	Part of Z300
L301A	Coil, primary winding, 1st AM i-f	Part of Z301
L301B	Coil, tertiary winding, 1st AM i-f	Part of Z301
L301C	Coil, secondary winding, 1st AM i-f	Part of Z301
L302A	Coil, primary winding, 2nd FM i-f	Part of Z302
L302B	Coil, secondary winding, 2nd FM i-f	Part of Z302
L303A	Coil, primary winding, 2nd AM i-f	Part of Z303
L303B	Coil, secondary winding, 2nd AM i-f	Part of Z303
L304A	Coil, primary winding, 3rd FM i-f	Part of Z304
L304B	Coil, secondary winding, 3rd FM i-f	Part of Z304
L304C	Coil, tertiary winding, 3rd FM i-f	Part of Z304
L305A	Coil, primary winding, 3rd AM i-f	Part of Z305
L305B	Coil, secondary winding, 3rd AM i-f	Part of Z305
R300	Resistor, plate dropping, 47,000 ohms	66-3473340*
R301	Resistor, grid return, 2.2 megohms	66-5223340*
R302	Resistor, a-v-c voltage divider, 470,000 ohms	66-4473340*
R303	Resistor, grid return, 2.2 megohms	66-5223340*
R304	Resistor, cathode bias (FM), 100 ohms	66-1103340*
R305	Resistor, cathode bias, 390 ohms	66-1393340*
R306	Resistor, plate dropping, 27,000 ohms	66-3273340*
R307	Resistor, screen dropping, 33,000 ohms	66-3333340*
R308	Resistor, plate decoupling, 1000 ohms	66-2103340*
R309	Resistor, a-v-c filter, 3.3 megohms	66-5333340*
R310	Resistor, cathode bias, 82 ohms	66-0823340*
R311	Resistor, screen dropping, 33,000 ohms	66-3333340*
R312	Resistor, plate decoupling, 1000 ohms	66-2103340*
R313	Resistor, diode load, 330,000 ohms	66-4333340*
R314	Resistor, i-f filter, 47,000 ohms	66-3473340*
R315	Resistor, FM diode load, 47,000 ohms	66-3473340*
R316	Resistor, isolating, 100,000 ohms	66-4103340*
R317	Resistor, FM detector load, 6.8 megohms	66-5683340*
TC300A	Tuning core, pri., 1st FM i-f	Part of Z300
TC300B	Tuning core, sec., 1st FM i-f	Part of Z300
TC301A	Tuning core, pri., 1st AM i-f	Part of Z301
TC301B	Tuning core, sec., 1st AM i-f	Part of Z301
TC302A	Tuning core, pri., 2nd FM i-f	Part of Z302
TC302B	Tuning core, sec., 2nd FM i-f	Part of Z302
TC303A	Tuning core, pri., 2nd AM i-f	Part of Z303
TC303B	Tuning core, sec., 2nd AM i-f	Part of Z303
TC304A	Tuning core, pri., 3rd FM i-f	Part of Z304
TC304B	Tuning core, sec., 3rd FM i-f	Part of Z304
TC305A	Tuning core, pri., 3rd AM i-f	Part of Z305
TC305B	Tuning core, sec., 3rd AM i-f	Part of Z305
WS1-2(F)	Switch-wafer section	Part of 42-1877‡
WS1-3(F)	Switch-wafer section	Part of 42-1877‡
WS1-3(R)	Switch-wafer section	Part of 42-1877‡
WS1-5(F)	Switch-wafer section	Part of 42-1877‡
WS1-5(R)	Switch-wafer section	Part of 42-1877‡
Z300	Transformer, 1st FM i-f	32-4257A
Z301	Transformer, 1st AM i-f	32-4258A
Z302	Transformer, 2nd FM i-f	32-4257-1A
Z303	Transformer, 2nd AM i-f	32-4160-3A
Z304	Transformer, 3rd FM i-f	32-4261-1
Z305	Transformer, 3rd AM i-f	32-4240-2A

‡42-1877 Band switch, 5-section

REPLACEMENT PARTS LIST

SECTION 4
R-F AND CONVERTER CIRCUITS

Reference Symbol	Description	Service Part No.
C400	Condenser, tuning gang (AM, 2-section; FM, 3-section)	31-2724-6
C400A	Condenser, trimmer, FM aerial	Part of C400
C400B	Condenser, trimmer, FM r.f.	Part of C400
C400C	Condenser, trimmer, FM osc.	Part of C400
C401	Condenser, d-c blocking, 33 mmf.	30-1224
C402	Condenser, filament by-pass, 100 mmf.	62-110009001
C403	Condenser, screen by-pass, 100 mmf.	62-110009001
C404	Condenser, cathode by-pass, 100 mmf.	62-110009001
C405	Condenser, d-c blocking, 33 mmf.	30-1224
C406	Condenser, r-f by-pass, 1500 mmf.	62-215001011
C407	Condenser, oscillator grid, 100 mmf.	62-110009001
C408	Condenser, filament by-pass, 100 mmf.	62-110009001
C409	Condenser, d-c blocking, 750 mmf.	60-10755301
C412	Condenser, d-c blocking, 220 mmf.	62-122001001
C413	Condenser, d-c blocking, 220 mmf.	62-122001001
C414	Condenser, ceramic, r-f voltage divider, 285 mmf.	30-1224-14
C415	Condenser, ceramic, r-f voltage divider, 485 mmf.	30-1224-15
C416	Condenser, aerial trimmer assembly, push-button (including C416A to C416E)	31-6479-3
C417	Condenser, trimmer assembly, 2-section	31-6476-8
C417A	Condenser, trimmer, Bc. aerial	Part of C417
C417B	Condenser, trimmer, Bc. oscillator	Part of C417
J400	Socket, loop aerial	27-6214-6
J401	Socket, FM dipole	27-6214-1
LA400	Loop aerial, Bc.	76-4337-1
L400	Coil, FM aerial	32-4158-1
L401	Coil, FM r-f	32-4159-1
L402	Coil, FM oscillator	32-4018-5
L403	Coil, r-f choke, FM plate load	32-4061-2
L404	Coil, r-f choke	32-4061-2
L405	Coil, r-f choke	32-4061-2
L406	Coil, oscillator assembly, push-button	
L406A	Coil, oscillator, 900—1600 kc.	32-3779
L406B	Coil, oscillator, 850—1500 kc.	32-3779
L406C	Coil, oscillator, 650—1300 kc.	32-4059-3
L406D	Coil, oscillator, 600—1200 kc.	32-4059-3
L406E	Coil, oscillator, 540—1000 kc.	32-4059-3
P400	Plug, wire, and lug assembly, FM aerial	41-3791-1
PB400A to PB400E	Push-button switch assembly	42-1881
R400	Resistor, grid return, 1 megohm	66-5103340*
R401	Resistor, cathode bias, 82 ohms	66-0823340*
R402	Resistor, screen dropping, 56,000 ohms	66-3563340*
R403	Resistor, plate decoupling, 1000 ohms	66-2103340*
R404	Resistor, grid return, 15,000 ohms	66-3153340*
R405	Resistor, cathode bias, 2200 ohms	66-2223340*
R406	Resistor, cathode bias, 1000 ohms	66-2103340*
T400	Transformer, Bc. aerial	32-4049-3
T401	Transformer, Bc. oscillator	32-4221-3
TC400A to TC400E	Tuning cores, push-button oscillator	Part of Z400

‡42-1877 Band switch, 5-section

SECTION 4 (Continued)
R-F AND CONVERTER CIRCUITS

Reference Symbol	Description	Service Part No.
WS1-2(F)	Switch-wafer section	Part of 42-1877‡
WS1-2(R)	Switch-wafer section	Part of 42-1877‡
WS1-3(R)	Switch-wafer section	Part of 42-1877‡
WS1-4(F)	Switch-wafer section	Part of 42-1877‡
WS1-4(R)	Switch-wafer section	Part of 42-1877‡

MISCELLANEOUS

Description	Service Part No
Cabinet and Cabinet Hardware	
Back assembly, wood	76-4344
Back, cabinet, masonite	54-7702
Baffle and cloth, speaker	40-7575
Baffle (cardboard) and cloth assembly, dummy	40-7575-1
Baffle, speaker	219138
Bezel	56-6375
Bin mechanism, R.H.	76-3223-6
Bin mechanism, L.H.	76-3223-5
Spring (2) bin mechanism, phono mtg.	56-4978
Bullet catch (2)	45-6002
Strike plate (2), bullet catch	45-6003
Cabinet	10731
Dome	45-6042
Door, record album	45-6473
Doors, matched set	45-6472
Door pull (2)	56-5398-1
Frame assembly, changer mounting	76-4104
Grommet (3) changer mtg.	54-4313
Spring (6) changer mtg.	56-3045FA15
Hinge, phono door	56-5713-3
Hinge, phono door	56-5713-4
Hinge, knife (stop), top, radio door	56-5713
Hinge, knife (stop), bottom, radio door	56-5713-2
Hinge, knife, R.H., top, record door	45-6449
Hinge, knife, L.H., bottom, record door	45-6449-1
Instrument panel	45-6474
Knob, door	56-5282-1
Metal grille (2)	56-6370
Cable-and-plug assembly, speaker	41-3896
Dial Scale Parts and Hardware	
Cord, drive (25-ft. spool)	45-8750*
Dial backplate-and-pulley assembly	76-4309
Knob (5)	54-4486
Pointer	54-4648
Carriage, pointer	56-6408
Spring (2), gang and pointer	56-2617
Push-button knob (6)	54-4292
Cap, plastic (6), push-button knob	54-4294
Tab kit	40-7583
Scale-and-backplate assembly	76-4298
Scale strap (2), end, scale mounting	56-2234-2
Scale strap, middle, scale mtg.	56-4756
Jewel	54-4304
Jewel-and-bin-lamp assembly	41-3896
Pilot-lamp-socket assembly, L.H.	27-6233-22
Pilot-lamp-socket assembly, R.H.	27-6233-25
Shaft assembly, tuning	76-4245
Socket, Loktal, 7A4	27-6177
Socket, Loktal, 7F8 (r-f section, mica-filled bakelite)	27-6213
Socket, Loktal, 7E7, 7F7	27-6138
Socket, miniature, 6BA6 (2)	27-6226
Socket, miniature, 6AU6 (r-f section, mica-filled bakelite)	27-6203-1
Socket, miniature 6T8	27-6203-5
Socket, octal (3)	27-6174
Spring, changer mounting (3)	56-7059FA9
Spring, changer mounting (3)	56-7059-1FJ47

MODELS 51-530, 51-530-I,
51-532, 51-532-E, 51-532-I,
51-534, 51-534-I

SPECIFICATIONS

CABINET

Model 51-530	molded plastic, mottled mahogany
Model 51-530-I	molded plastic, ivory
Model 51-532	molded plastic, mottled mahogany
Model 51-532-E	molded plastic, ebony
Model 51-532-I	molded plastic, ivory
Model 51-534	molded plastic, mottled mahogany
Model 51-534-I	molded plastic, ivory

CIRCUIT	5-tube superheterodyne
FREQUENCY RANGE	540—1630 kc.
AUDIO OUTPUT	1.2 watts
OPERATING VOLTAGE	105—125 volts, a.c. or d.c.
POWER CONSUMPTION	30 watts
AERIAL	high impedance loop; connector for external aerial
INTERMEDIATE FREQUENCY	455 kc.
PHILCO TUBES	7A8, 12BA6, 14B6, 50L6GT, 35Z5GT

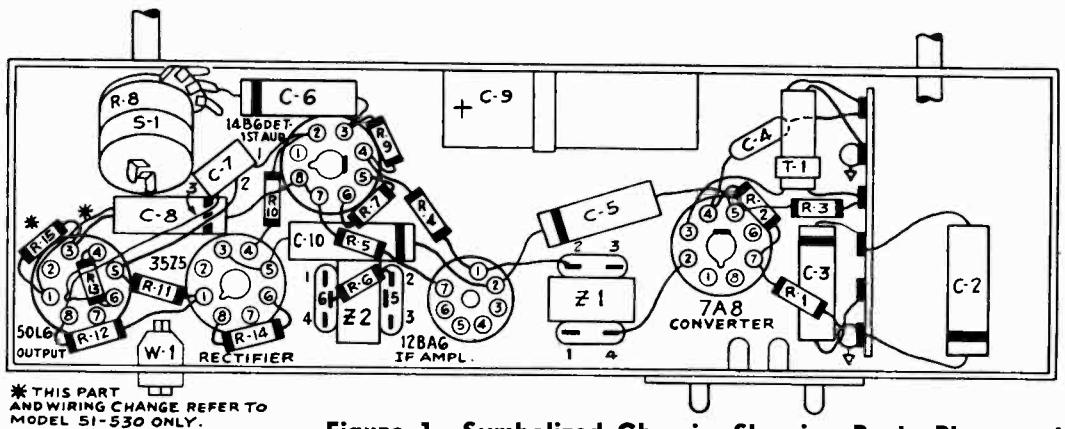


Figure 1. Symbolized Chassis, Showing Parts Placement

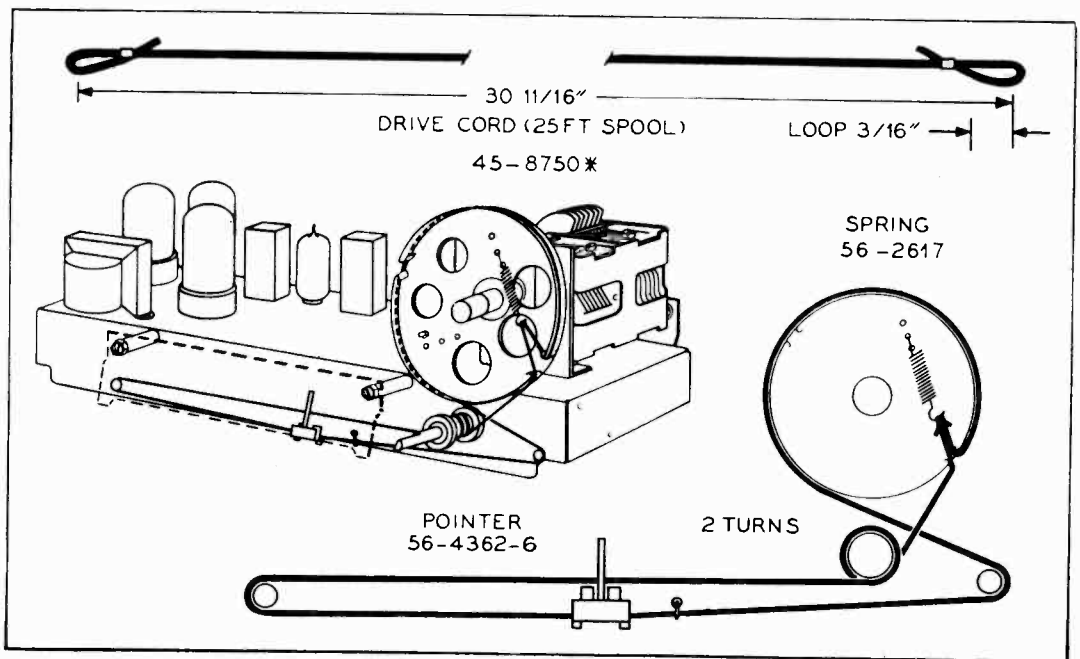


Figure 2. Drive-Cord Installation Details, Model 51-530

MODELS 51-530, 51-530-I,
51-532, 51-532-E, 51-532-I,
51-534, 51-534-I

ALIGNMENT PROCEDURE

CONTROLS: Turn on radio and set volume control to maximum.

DIAL POINTER: Turn tuning condenser to full-mesh position. Set dial pointer to index mark, located to left of "55."

OUTPUT METER: Connect across voice-coil terminals.

SIGNAL GENERATOR: Connect as indicated in chart. Use modulated output.

OUTPUT LEVEL: During alignment, attenuate signal-generator output to maintain output-meter indication below 1.25 volts.

STEP	SIGNAL GENERATOR		RADIO		ADJUST
	CONNECTION TO RADIO	DIAL SETTING	DIAL SETTING	SPECIAL INSTRUCTIONS	
1	Ground lead to B—; output lead through .1-μf. condenser to pin 6 of 7A8 converter	455 kc.	540 kc. (gang fully meshed)	Adjust tuning cores, in order given for maximum output.	TC4—2nd i-f sec. TC3—2nd i-f pri. TC2—1st i-f sec. TC1—1st i-f pri.
2	Radiating loop; see note below.	1600 kc.	1600 kc.	Adjust trimmer for maximum output.	C1B—osc.
3	Same as step 2.	1500 kc.	1500 kc.	Adjust trimmer for maximum output.	C1A—aerial

RADIATING LOOP: Make up a 6—8 turn, 6-inch-diameter loop from insulated wire; connect to signal-generator leads and place near radio loop antenna.

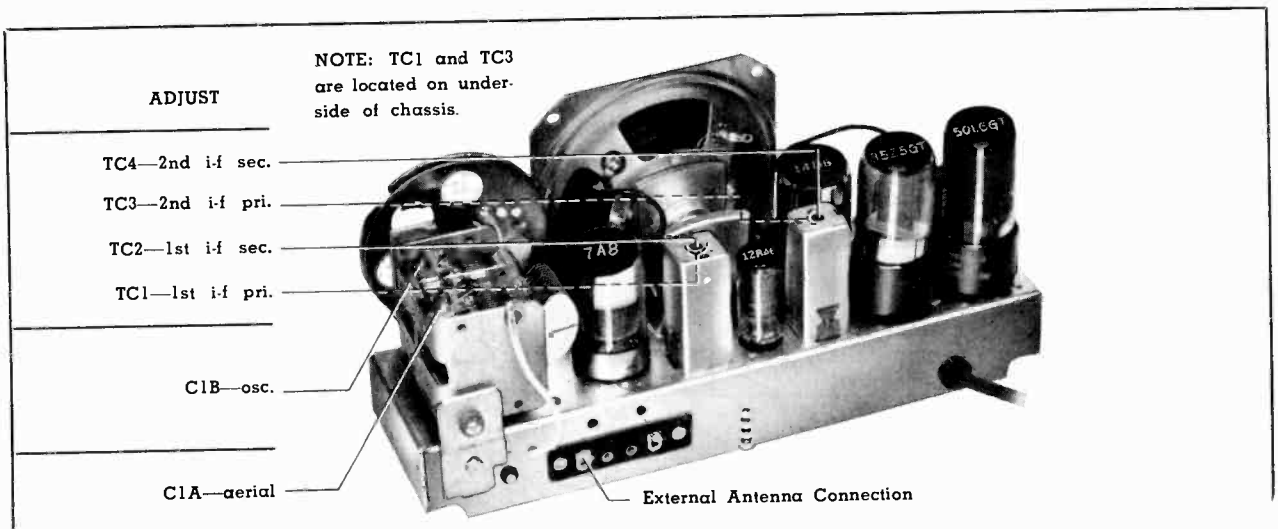


Figure 3. Top View, Showing Trimmer Locations

MODELS 51-530,
51-532, 51-534

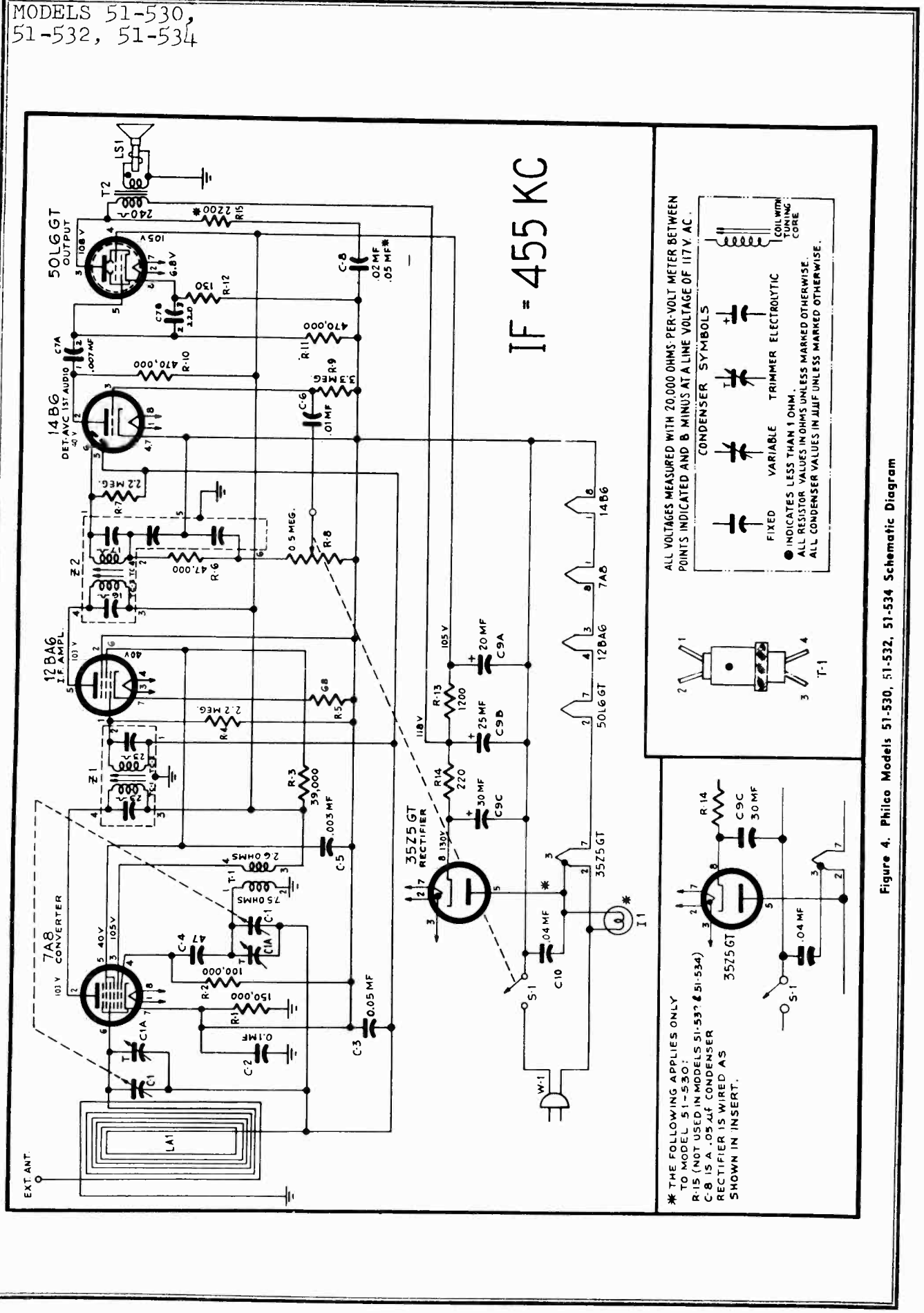


Figure 4. Philco Models 51-530, 51-532, 51-534 Schematic Diagram

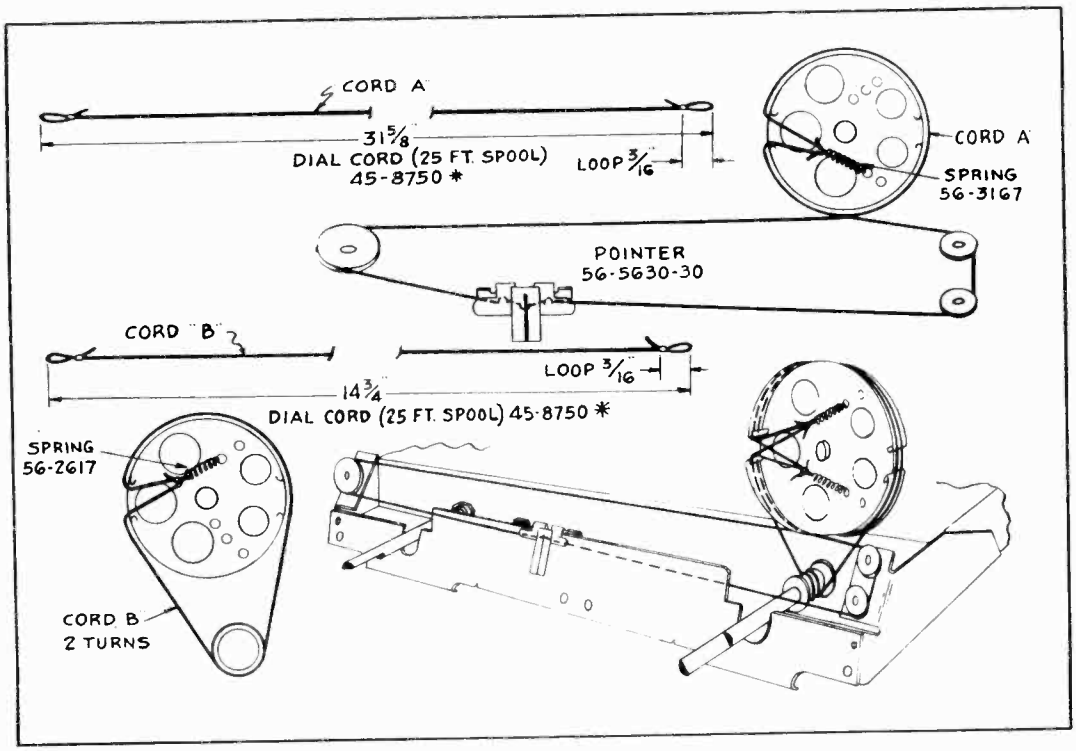


Figure 5. Drive-Cord Installation Details, Model 51-532

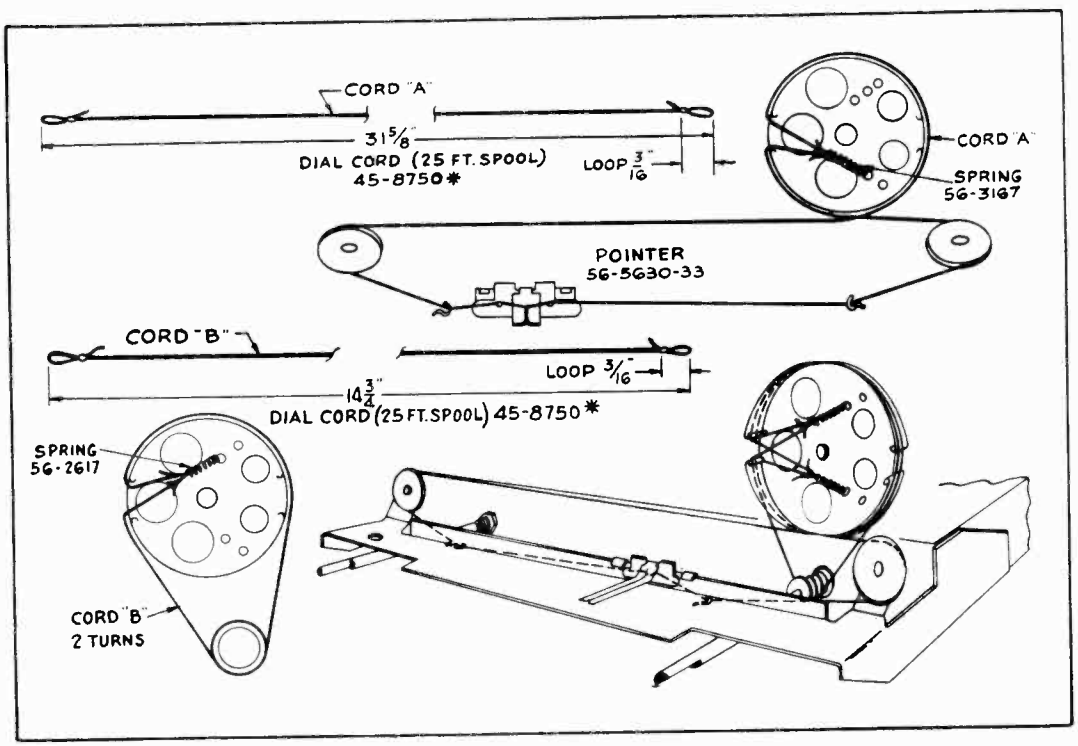


Figure 6. Drive-Cord Installation Details, Model 51-534

MODELS 51-530, 51-530-I,
51-532, 51-532-E, 51-532-I,
51-534, 51-534-I

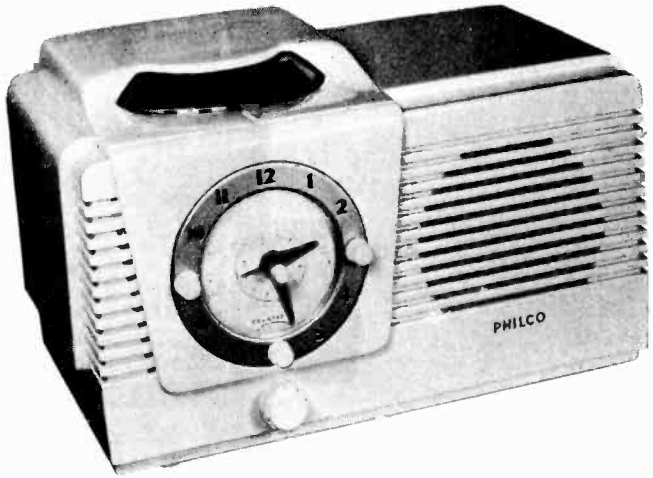
REPLACEMENT PARTS LIST

NOTE: Part numbers identified by an asterisk (*) are general replacement items. These numbers may not be identical with those on factory parts. Also, the electrical values of some replacement items may differ from the values indicated in the schematic diagram and parts list. The values substituted in any case are so chosen that the operation will be either unchanged or improved. When ordering replacements, use only the "Service Part No."

Reference Symbol	Description	Service Part No.
C1	Condenser, tuning gang	
	Model 51-530	31-2751-6
	Models 51-532 and 51-534	31-2751
C2	Condenser, i-f by-pass, .1 μf.	61-0113*
C3	Condenser, a-v-c by-pass, .05 μf.	61-0122*
C4	Condenser, d-c blocking, 47 $\mu\mu f$.	60-00475417*
C5	Condenser, screen by-pass, .003 μf.	61-0109*
C6	Condenser, d-c blocking, .01 μf.	61-0120*
C7	Condenser, dual ceramic	30-1239-4
C7A	Condenser, d-c blocking, .007 μf.	Part of C7
C7B	Condenser, grid by-pass, 220 $\mu\mu f$.	Part of C7
C8	Condenser, tone compensation,	
	Model 51-530, .05 μf.	61-0122*
	Models 51-532 and 51-534, .02 μf.	61-0108*
C9	Condenser, electrolytic, 3-section	30-2573
C9A	Condenser, filter, 20 μf., 150v	Part of C9
C9B	Condenser, filter, 25 μf., 150v	Part of C9
C9C	Condenser, filter, 30 μf., 150v	Part of C9
C10	Condenser, line by-pass, .04 μf.	45-3500-2*
I1	Pilot lamp—Models 51-532 and 51-534 only	34-2068
LA1	Loop antenna	
	Model 51-530	32-4052-33
	Model 51-532	32-4052-38
	Model 51-534	32-4052-51
LS1	Speaker, 4" p.m.	
	Models 51-530 and 51-532	36-1627-5
	Model 51-534	36-1625-3
R1	Resistor, leakage, 150,000 ohms	66-4158340*
R2	Resistor, grid return, 100,000 ohms	66-4108340*
R3	Resistor, screen dropping, 39,000 ohms	66-3398340*
R4	Resistor, grid return, 2.2 megohms	66-5228340*
R5	Resistor, cathode bias, 68 ohms	66-0688340*
R6	Resistor, i-f filter, 47,000 ohms	66-3478340*
R7	Resistor, diode load, 2.2 megohms	66-5228340*
R8	Volume control, 500,000 ohms	
	Model 51-530	33-5538-7
	Model 51-532	33-5566-4
	Model 51-534	33-5566-30
R9	Resistor, grid return, 3.3 megohms	66-5338340*
R10	Resistor, plate load, 470,000 ohms	66-4478340*
R11	Resistor, grid return, 470,000 ohms	66-4478340*
R12	Resistor, cathode bias, 130 ohms	66-1128340*
R13	Resistor, filter, 1200 ohms	66-2128340*
R14	Resistor, filter, 220 ohms, 1 watt	66-1224340*
S1	Switch, off-on	Part of R8
T1	Transformer, oscillator	32-4263
T2	Transformer, output	32-8384
W1	Line cord	L-2183*
Z1	Transformer, 1st i-f	32-4160-6A
Z2	Transformer, 2nd i-f	32-4240-2A

MISCELLANEOUS

Description	Service Part No.
MODEL 51-530	
Cabinet, mottled mahogany	10750
Cabinet, ivory	10750-1
Back	54-7777
Fastener, back mounting (4)	W2235-2FA9
Knob (2)	54-4527-11
Dial backplate assembly	76-4658
Pointer	56-4362-6
Pulley and shaft assembly	76-3671-3
MODEL 51-532	
Cabinet, mahogany	10769-3
Dial scale	54-5069-1
Knob (2)	54-4718-2
Cabinet, ebony	10769-4
Dial scale	54-5069-2
Knob (2)	54-4718-2
Cabinet, ivory	10769-5
Dial scale	54-5069-3
Knob (2)	54-4718-22
Back	54-7911
Fastener, back mounting (4)	W2235FA9
Baffle, speaker	54-7761
Backplate, bracket and pulley assembly	76-6235
Fastener, pilot lamp shield mounting (2)	W2235-1FA9
Grille, plastic	54-4728-2
Speed clip, grille mounting (4)	1W56920FE7
Pointer	56-5630-30
Spring, pointer drive	56-3167
Pulley and shaft assembly	76-3671-2
Scale strap, dial mounting	
LH	56-7373
RH	56-7373-1
Socket assembly, pilot lamp	27-6233-18
MODEL 51-534	
Cabinet, mahogany	10836
Cabinet, ivory	10836-1
Back	54-8249
Fastener, back mounting (4)	W2235FA9
Clips, baffle mounting	1W56920FE7
Dial scale	54-5104
Screw, scale mounting (2)	1W14504FA1
Knob (2)	54-4718-3
Backplate, bracket, and pulley assembly	76-6317
Fastener, pilot lamp shield mounting (2)	W2235-1FA9
Pointer	56-5630-33
Spring, pointer drive	56-3167
Pulley and shaft assembly	76-3671-8
Socket assembly, pilot lamp	27-6233-18
PARTS COMMON TO ALL MODELS	
Bushing, pulley and shaft	27-9437
Clamp, electrolytic mounting	56-1466
Drive cord, 25 foot spool	45-8750*
Fastener, hairpin, pulley and shaft	57-1468FA3
Screw and washer combination, set mounting (3)	1W37654FA3
Socket, loctal (2)	27-6269
Socket, miniature	27-6265
Socket, octal (2)	27-6174
Spring, gang drive	56-2617



SPECIFICATIONS

CABINET	
Model 51-537	Molded Phenolic, brown
Model 51-537-I	Molded Phenolic, Ivory
FREQUENCY RANGE	540—1600 kc.
AUDIO OUTPUT	1 watt
OPERATING VOLTAGE	117 volts, a.c.
POWER CONSUMPTION	30 watts
AERIAL	High-impedance loop, connector for external aerial
INTERMEDIATE FREQUENCY	455 kc.
PHILCO TUBES (5)	7A8, 14A7, 14B6, 50L6GT, 35Y4

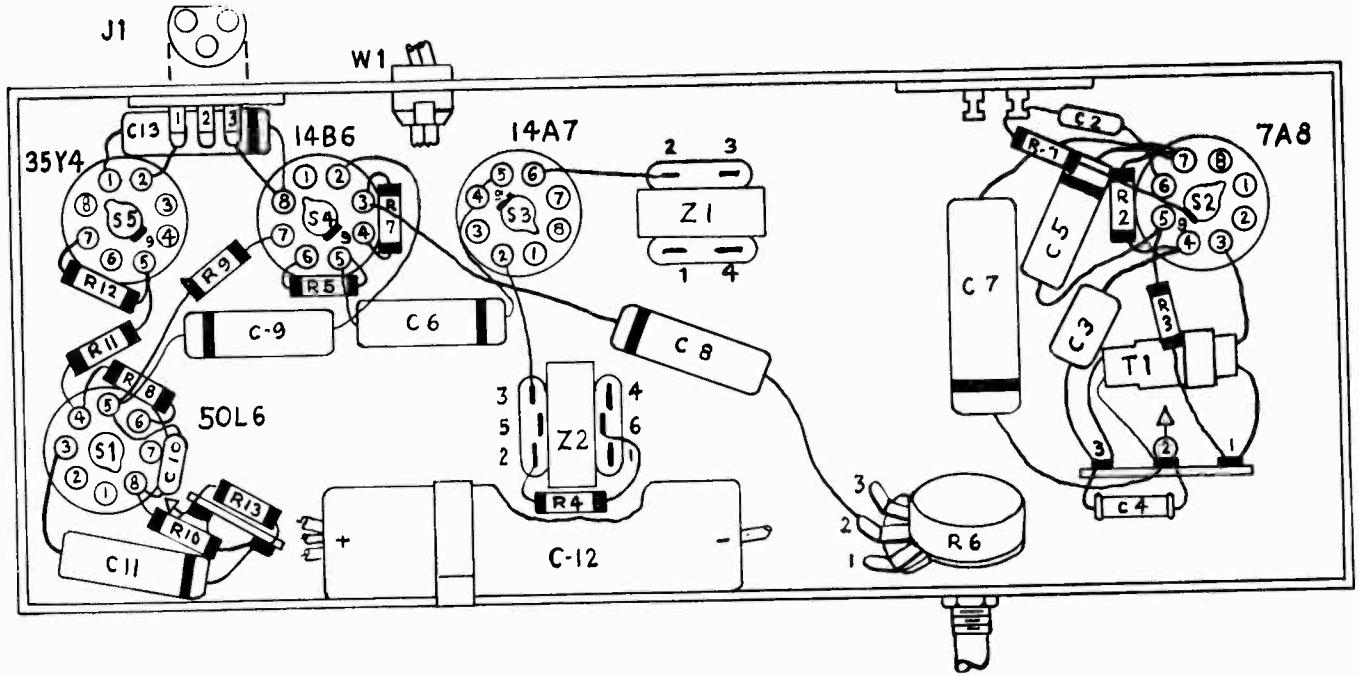


Figure 1. Base View, Showing Symbolized Chassis

MODELS 51-537,
51-537-I

ALIGNMENT PROCEDURE

RADIO CONTROLS — Set volume control to maximum. Set tuning control as indicated in chart.

OUTPUT METER — connect across voice-coil terminals.

SIGNAL GENERATOR — Connect generator and set frequency as indicated in chart. Use modulated output.

OUTPUT LEVEL — During alignment, adjust signal-generator output to hold output-meter reading below 1.25 volts.

STEP	SIGNAL GENERATOR		RADIO		ADJUST
	CONNECTION TO RADIO	DIAL SETTING	DIAL SETTING	SPECIAL INSTRUCTIONS	
1	Connect ground lead to B—; output lead through .1-μf. condenser to grid (pin 6) of 7A8.	455 kc.	Tuning condenser fully meshed.	Adjust tuning cores, in order given, for maximum output.	TC4—2nd i-f sec. TC3—2nd i-f pri. TC2—1st i-f sec. TC1—1st i-f pri.
2	Radiating loop (see note below).	1600 kc.	1600 kc.	Adjust trimmer for maximum output.	C1B—Osc.
3	Same as step 2.	1500 kc.	1500 kc.	Adjust trimmer for maximum output.	C1A—Aerial

RADIATING LOOP: Make up a 6—8 turn, 6-inch-diameter loop, from insulated wire; connect to signal-generator leads and place near radio loop aerial.

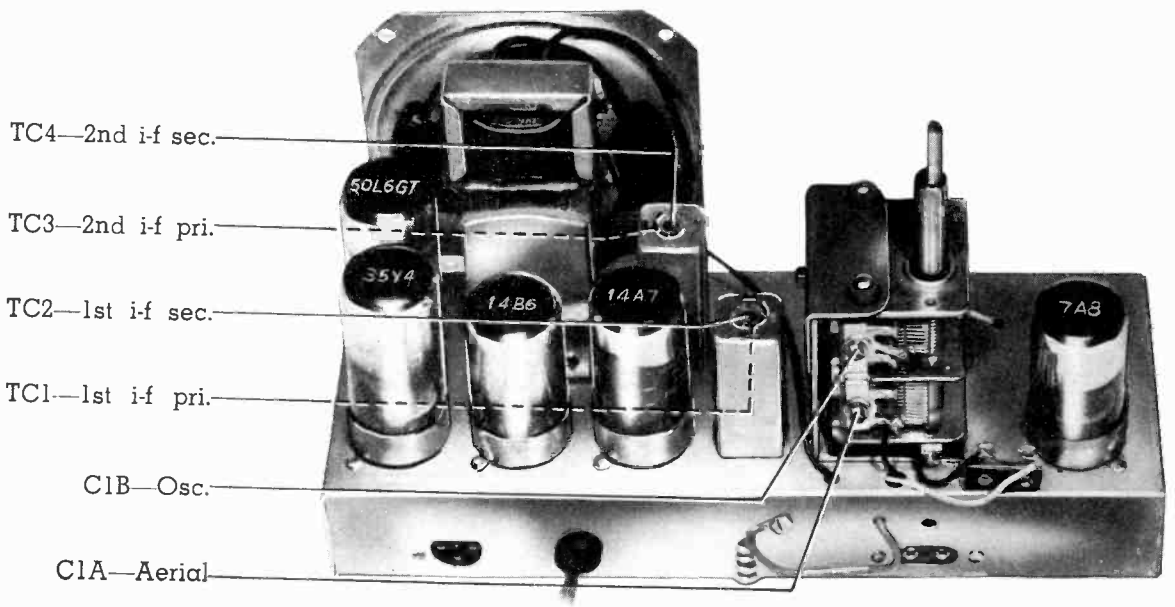


Figure 2. Top View, Showing Trimmer Location

NOTE: TC1 and TC3 are located on underside of chassis.

MODELS 51-537,
51-537-I

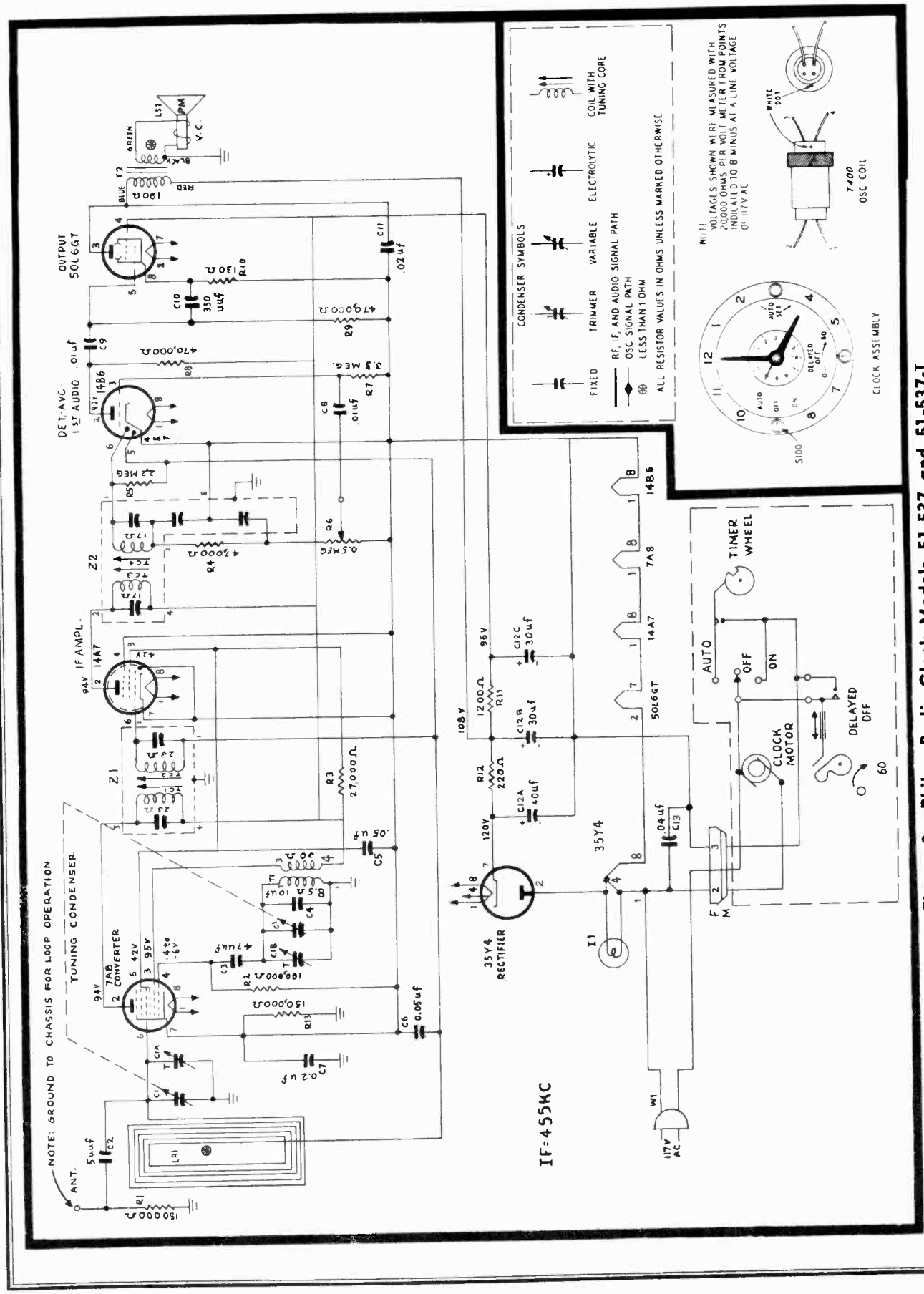


Figure 3. Philco Radio-Clock Models 51-537 and 51-537-I

MODELS 51-537,
51-537-I

REPLACEMENT PARTS LIST

NOTE: Part numbers marked with an asterisk (*) are general replacement items. These numbers may not be identical with those on factory parts; also, the electrical values of some replacement items may differ from the values indicated in the schematic diagram and parts list. The values substituted in any case are so chosen that the operation of the radio will be either unchanged or improved. When ordering replacements, use only the "Service Part No."

Reference Symbol	Description	Service Part No.
C1	Condenser, tuning gang, 2-section	31-2751-5
C1A	Condenser, trimmer, aerial	Part of C1
C1B	Condenser, trimmer, oscillator	Part of C1
C2	Condenser, aerial coupling, 5 $\mu\mu f$.	30-1230
C3	Condenser, d-c blocking, 47 $\mu\mu f$.	60-00475417*
C4	Condenser, temperature compensating, 7.5 $\mu\mu f$.	30-1224-65
C5	Condenser, screen by-pass, .05 μf.	61-0122*
C6	Condenser, a-v-c by-pass, .05 μf.	61-0122*
C7	Condenser, by-pass, .2 μf.	45-3500-3*
C8	Condenser, d-c blocking, .01 μf.	61-0120*
C9	Condenser, d-c blocking, .01 μf.	61-0120*
C10	Condenser, parasitic suppressor, 330 $\mu\mu f$.	62-133001001*
C11	Condenser, tone compensation, .02 μf.	61-0108*
C12	Condenser, electrolytic, 3-section	30-2575-27
C12A	Condenser, filter, 30 μf., 150 wvdc	Part of C12
C12B	Condenser, filter, 25 μf., 150 wvdc	Part of C12
C12C	Condenser, filter, 20 μf., 150 wvdc	Part of C12
C13	Condenser, line filter, .04 μf.	45-3500-2*
I1	Pilot lamp	34-2068
J1	Socket, clock motor and switch	27-6126
LA1	Loop aerial	32-4052-32
LS1	Speaker, p-m	36-1627
R1	Resistor, isolating, 150,000 ohms	66-4158340*
R2	Resistor, grid return, 100,000 ohms	66-4108340*
R3	Resistor, screen dropping, 27,000 ohms	66-3278340*
R4	Resistor, i-f filter, 47,000 ohms	66-3478340*
R5	Resistor, diode load, 2.2 megohms	66-5228340*
R6	Volume control, 500,000 ohms	33-5565-6
R7	Resistor, grid return, 3.3 megohms	66-5338340*
R8	Resistor, plate load, 470,000 ohms	66-4478340*
R9	Resistor, grid return, 470,000 ohms	66-4478340*
R10	Resistor, cathode bias, 130 ohms	66-1128340*
R11	Resistor, filter, 1200 ohms	66-2128340*
R12	Resistor, filter, 220 ohms, 1 watt	66-1224340*
R13	Resistor, leakage, 150,000 ohms	66-4158340*
S1	Switch, AUTO-OFF-ON	Part of clock assembly
T1	Transformer, oscillator	32-4263
T2	Transformer, output	Part of LS1
W1	Line cord	L-2183*
Z1	Transformer, 1st IF	32-4160-6A
Z2	Transformer, 2nd IF	32-4240A

MISCELLANEOUS

Description		Service Part No.
Cabinet		
	Model 51-537	10745
	Model 51-537-I	10745-1
Back		54-7631
	Fastener (4), back mounting	W2235-2FA9
Baffle and cloth assembly		
	Model 51-537	40-7730
	Model 51-537-I	40-7730-1
Jewel		54-4304
Knobs		
	Model 51-537 Volume control	27-4820
	"AUTO-OFF-ON" and "DELAYED OFF"	54-4736
	"AUTO SET"	54-4733-2
	"TIME SET"	54-4736-4
	Model 51-537-I Volume control	54-4118
	"AUTO-OFF-ON" and "DELAYED OFF"	54-4736-1
	"AUTO SET"	54-4736-3
	"TIME SET"	54-4736-4
Clamp, electrolytic mounting		56-1466
Clip, pilot lamp mounting		56-3545-6FA3
Clock and cable assembly		
	Model 51-537, 60v	76-4640
	50v	76-5117
	Model 51-537-I, 60v	76-4840
	50v	76-5118
Clock cover		56-6710
Dial scale, tuning knob		54-5055-2
Leak assembly, aerial		76-1472
Mounts, rubber, gang mounting (3)		27-4771-1
Pilot lamp assembly		27-6233-6
Shield, pilot lamp		56-6307-4FA3
Socket, Loktal (4)		27-6207
Socket, octal		27-6174

MODELS 51-629, 51-632

SPECIFICATIONS

CABINET	Plastic, portable
CIRCUIT	Four-tube superheterodyne plus selenium rectifier
FREQUENCY RANGE	540—1620 kc.
AUDIO OUTPUT	
A-C Operation	150 mw.
Battery Operation	150 mw.
OPERATING VOLTAGE	117 volts, a.c./d.c., or 1.5-volt "A" and 90-volt "B" battery
POWER CONSUMPTION	
A-C Operation	11 watts
Battery Operation	13 ma. from 90-volt "B" 250 ma. from 1.5-volt "A"
AERIAL	Built-in high-impedance loop; provision for connecting external aerial.
INTERMEDIATE FREQUENCY	455 kc.
PHILCO TUBES (4)	1R5 converter, 1U4 i-f ampl., 1U5 det.-a.v.c.-1st audio, 3V4 output
BATTERY TYPE	P-364

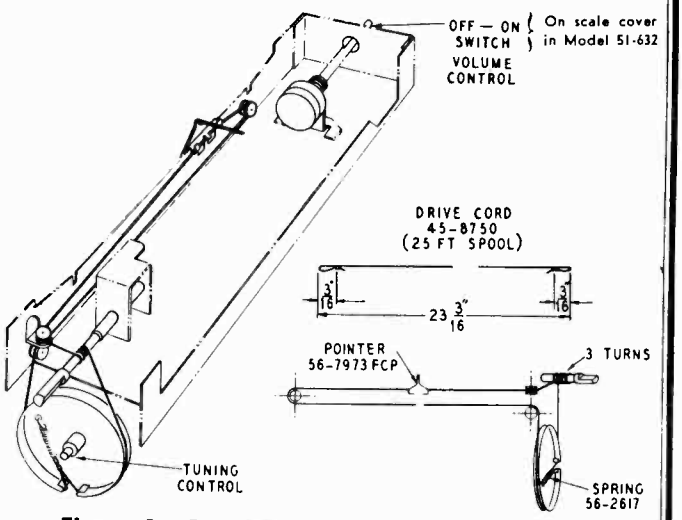


Figure 1. Drive-Cord Installation Details

STEP	SIGNAL GENERATOR		RADIO		ADJUST
	CONNECTION TO RADIO	DIAL SETTING	DIAL SETTING	SPECIAL INSTRUCTIONS	
1	Through .1-μf. condenser to antenna section of tuning condenser.	455 kc.	Tuning gang fully meshed	Adjust, in order given, for maximum output.	TC4—2nd i-f sec. TC3—1st i-f sec. TC2—1st i-f pri.
2	Radiating loop. See note below.	1620 kc.	1620 kc.	Adjust for maximum output.	C1B—osc. trimmer C1A—aerial trimmer
3	Same as step 2.	535 kc.	Tuning gang fully meshed	Adjust for maximum output; then repeat steps 2 and 3 until no further increase in output is obtained. This step SHOULD NOT be necessary unless the oscillator transformer has been replaced.	TC1—osc. core

RADIATING LOOP: Make up a six-to-eight turn, 6-inch-diameter loop, using insulated wire; connect to signal-generator leads, and place near radio loop aerial.

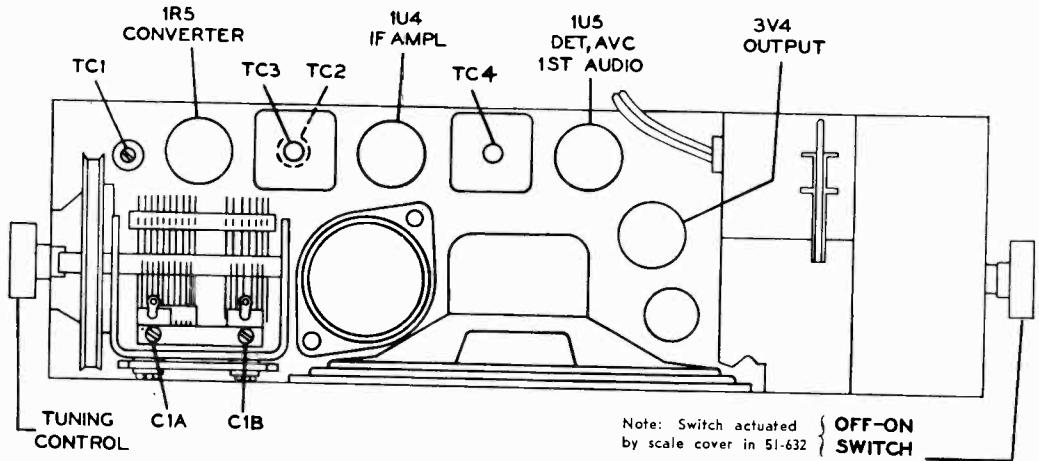


Figure 2. Top View, Showing Trimmer Locations

ALIGNMENT PROCEDURE

DIAL POINTER—With tuning-condenser plates fully meshed, set pointer to coincide with first index hole above pointer.

OUTPUT METER—Connect across speaker voice coil terminals.

SIGNAL GENERATOR—Connect signal generator as indicated in chart. Use modulated output.

RADIO CONTROLS—Set volume control to maximum. Set tuning control and signal-generator frequency as indicated in chart.

MODELS 51-629, 51-632

OUTPUT LEVEL—During alignment, signal-generator output must be attenuated to maintain output-meter reading below .5 volt.

NOTE: While the radio is being aligned, the batteries (if used) should be in the same position with respect to the chassis and loop as they are in the cabinet.

REPLACEMENT PARTS LIST

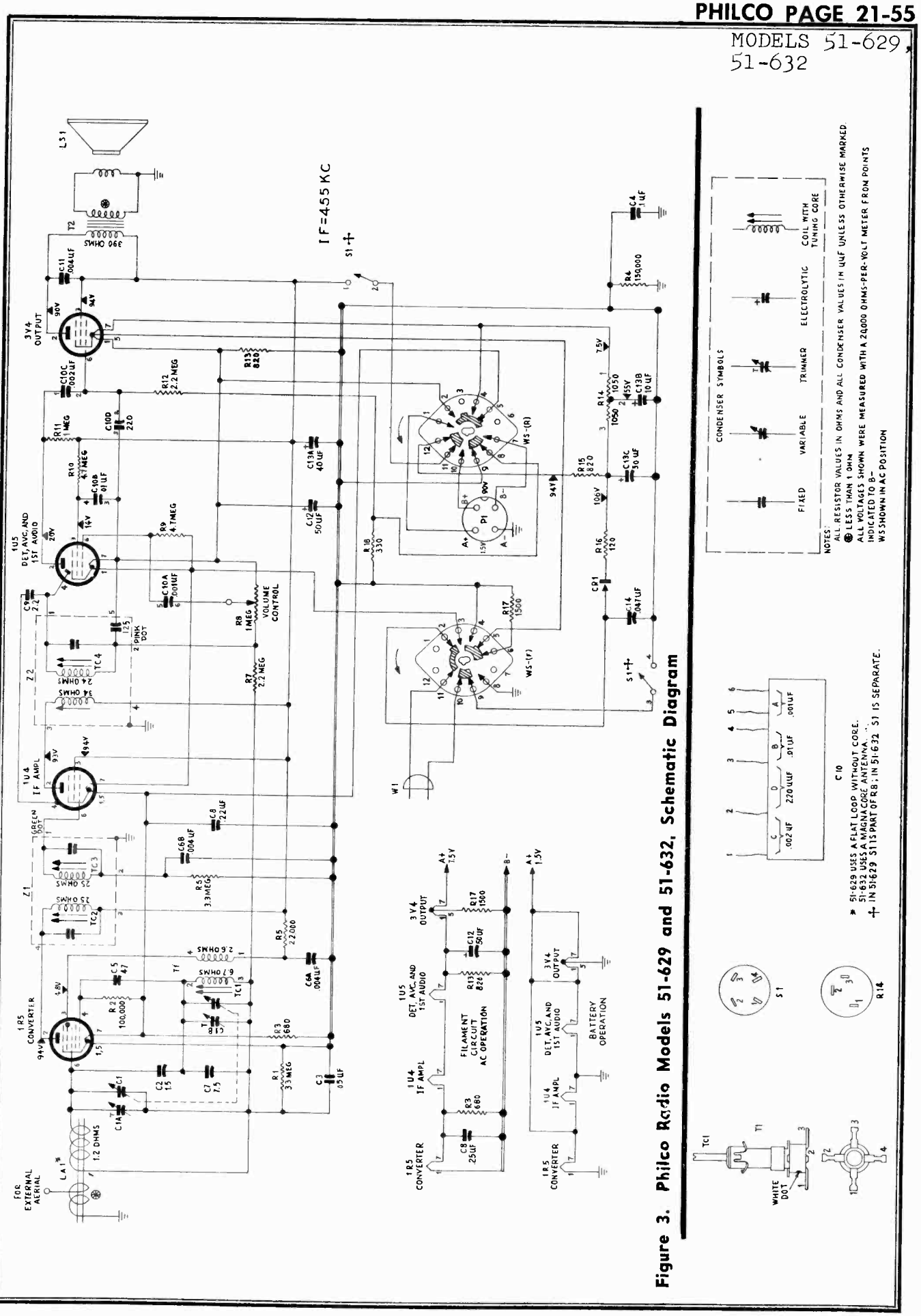
NOTE: Part numbers identified by an asterisk (*) are general replacement items. These numbers may not be identical with those on factory parts; also, the electrical values of some replacement items may differ from the values indicated in the schematic diagram and parts list. The values substituted in any case are so chosen that the operation of the radio will be either unchanged or improved. When ordering replacements, use only the "Service Part No."

Reference Symbol	Description	Service Part No.
C1	Condenser, tuning gang, 2-section	
	Model 51-629	31-2735-3
	Model 51-632	31-2735-2
C1A	Condenser, trimmer, antenna	Part of C1
C1B	Condenser, trimmer, oscillator	Part of C1
C2	Condenser, neutralizing, 1.5 $\mu\mu f$.	30-1221-3
C3	Condenser, a-v-c by-pass, .05 μf.	61-0122*
C4	Condenser, i-f by-pass, .1 μf.	61-0113*
C5	Condenser, d-c blocking, 47 $\mu\mu f$.	62-051009001*
C6	Condenser, dual ceramic	30-1239
C6A	Condenser, osc. B+ by-pass, .004 μf.	Part of C6
C6B	Condenser, grid by-pass, .004 μf.	Part of C6
C7	Condenser, temperature compensation, 7.5 $\mu\mu f$.	30-1224-65
C8	Condenser, filament by-pass, .22 μf.	45-3505-49
C9	Condenser, neutralizing, 2.2 $\mu\mu f$.	30-1221-4
C10	Condenser, ceramic, 4-section	30-1237
C10A	Condenser, d-c blocking, .001 μf.	Part of C10
C10B	Condenser, screen by-pass, .01 μf.	Part of C10
C10C	Condenser, d-c blocking, .002 μf.	Part of C10
C10D	Condenser, grid by-pass, 220 $\mu\mu f$.	Part of C10
C11	Condenser, tone compensation, .004 μf.	61-0179*
C12	Condenser, electrolytic, filament by-pass, 50 μf., 25v	30-2417-12
C13	Condenser, electrolytic, 3-section	30-2568-39
C13A	Condenser, filter, 40 μf., 150v	Part of C13
C13B	Condenser, filter, 10 μf., 150v	Part of C13
C13C	Condenser, filter, 50 μf., 150v	Part of C13
C14	Condenser, line by-pass, .047 μf.	45-3505-45*
CR1	Selenium rectifier, 75 ma. at 117 volts	34-8003-1*
LA1	Loop aerial	
	Model 51-629 (flat loop)	32-4052-52
	Model 51-632 (Magna core)	32-4455-1
LS1	Speaker, 4-inch p-m	33-1627-11
R1	Resistor, grid return, 3.3 megohms	66-5338340*
R2	Resistor, grid return, 100,000 ohms	66-4108340*
R3	Resistor, bias, 680 ohms	66-1688340*
R4	Resistor, leakage, 150,000 ohms	66-4158340*
R5	Resistor, oscillator dropping, 22,000 ohms	66-3228340*
R6	Resistor, grid return, 3.3 megohms	66-5338340*
R7	Resistor, a-v-c filter, 2.2 megohms	66-5228340*
R8	Volume control, 1 megohm	
	Model 51-629 (with "off-on" switch)	33-5566-21
	Model 51-632 (control only)	33-5565-23
R9	Resistor, grid return, 4.7 megohms	66-5478340*
R10	Resistor, screen dropping, 4.7 megohms	66-5478340*
R11	Resistor, plate load, 1 megohm	66-5108340*
R12	Resistor, grid return, 2.2 megohms	66-5228340*
R13	Resistor, bias, 820 ohms	66-1828340*
R14	Resistor, filament dropping and filter, 2100 ohms (center-tapped)	33-3445
R15	Resistor, filter, 820 ohms	66-1828340*
R16	Resistor, current limiting, 120 ohms	33-1334-14
R17	Resistor, bias, 1500 ohms	66-2158340*
R18	Resistor, bias, 330 ohms	66-1338340*
S1	Switch, off-on	
	Model 51-629	Part of R8
	Model 51-632	42-1941
T1	Transformer, oscillator	32-4453
T2	Transformer, output	32-8434
W1	Line cord	41-3821-6*
WS	Wafer switch, voltage change-over	42-1925
Z1	Transformer, 1st i-f	32-4160-4A
Z2	Transformer, 2nd i-f	32-4454-1A

MISCELLANEOUS

Description	Service Part No.
Cabinet (Maroon), 51-629	10816
Back, maroon	54-4810
Cabinet (Green), 51-629	10816-1
Back, green	54-4810-1
Clip, back (2)	56-3807
Fastener, back (2)	1W60660FE7
Handle and bracket assembly	76-6198
Hinge (2)	56-7968
Knob (2)	76-6206
Pointer	56-7973-1FCP
Scale, dial	54-5098
Clip (2), scale mounting	56-8449FA3
Cabinet (Maroon), 51-632	10815
Back	54-4806
Baffle and cloth assembly	40-7924
Clip, back (2)	56-3807-3
Cover and lid assembly	76-6146
Fastener, back (2)	1W60660FE7
Handle	76-6177
Hinge (2)	56-7968
Knob and escutcheon assembly (2)	76-6210
Pointer	56-7973-1FCP
Scale, dial	54-5097
Cable and plug, battery	41-3477-2
Insulator, electrolytic-condenser mounting	27-9508
Mount, rubber, tuning gang (3)	27-4099-3
Spring, drive cord	56-2617
Socket, tube, 1R5 and 1U4 (2)	27-6203
Socket, tube, 1U5 and 3V4 (2)	27-6203-12
Tube shield, 1U5	56-3978-1FA3
Tuning shaft	56-7906FA42
Retaining ring	1W60978FA3

MODELS 51-629, 51-632



NOTES:
ALL RESISTOR VALUES IN OHMS AND ALL CONDENSER VALUES IN UUF UNLESS OTHERWISE MARKED
Ⓜ LESS THAN 1 OHM
ALL VOLTAGES SHOWN WERE MEASURED WITH A 20,000 OHMS-PER-VOLT METER FROM POINTS INDICATED TO B−
WS SHOWN IN AC POSITION

* 51-629 USES A FLAT LOOP WITHOUT CORE.
51-632 USES A MAGNACORE ANTENNA.
† IN 51-629 S1 IS PART OF R8; IN 51-632 S1 IS SEPARATE.

Figure 3. Philco Radio Models 51-629 and 51-632, Schematic Diagram

MODEL 51-631

SPECIFICATIONS

CABINET	Plastic, personal portable
CIRCUIT	Four-tube superheterodyne plus selenium rectifier
FREQUENCY RANGE	540—1620 kc.
AUDIO OUTPUT	
A-C Operation	150 mw.
Battery Operation	75 mw.
OPERATING VOLTAGE	117 volts, a.c./d.c., or 1.5-volt "A" battery and 67.5-volt "B" battery
POWER CONSUMPTION	
A-C Operation	11 watts
Battery Operation	9.5 ma. from 67.5-volt "B" battery 250 ma. from 1.5-volt "A" battery
AERIAL	Built-in high-impedance loop with iron core; provision for connecting external aerial.
INTERMEDIATE FREQUENCY	455 kc.
PHILCO TUBES (4)	1R5 converter, 1U4 i-f ampl., 1U5 det.-a.v.c.-1st audio, 3V4 output

ALIGNMENT PROCEDURE

RADIO CONTROLS—Set volume control to maximum. Set tuning control and signal-generator frequency as indicated in chart.

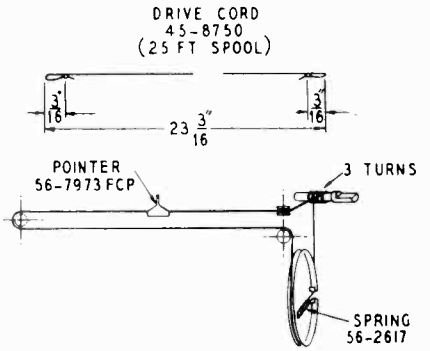
OUTPUT LEVEL—During alignment, signal-generator output must be attenuated to maintain output-meter reading below .5 volt.

NOTE: While the radio is being aligned, the batteries (if used) should be in the same position with respect to the chassis and loop as they are in the cabinet.

DIAL POINTER—With tuning-condenser plates fully meshed, set pointer to coincide with first index hole above pointer.

OUTPUT METER—Connect across speaker voice coil terminals.

SIGNAL GENERATOR—Connect signal generator as indicated in chart. Use modulated output.



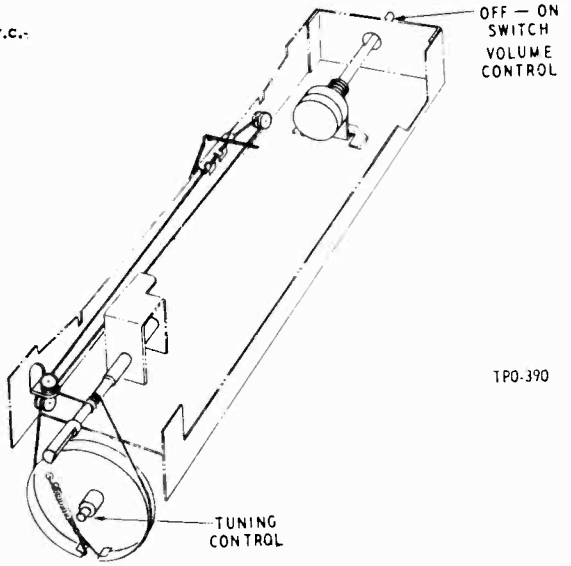


Figure 1. Drive-Cord Installation Details

STEP	SIGNAL GENERATOR		RADIO		ADJUST
	CONNECTION TO RADIO	DIAL SETTING	DIAL SETTING	SPECIAL INSTRUCTIONS	
1	Through .1-μf. condenser to antenna section of tuning condenser.	455 kc.	Tuning gang fully meshed	Adjust, in order given, for maximum output.	TC5—2nd i-f sec. TC4—2nd i-f pri. TC3—1st i-f sec. TC2—1st i-f pri.
2	Radiating loop. See note below.	1620 kc.	1620 kc.	Adjust for maximum output.	C1B—osc. trimmer C1A—aerial trimmer
3	Same as step 2.	535 kc.	Tuning gang fully meshed	Adjust for maximum output; then repeat steps 2 and 3 until no further increase in output is obtained. This step SHOULD NOT be necessary unless the oscillator transformer has been replaced.	TC1—osc. core

RADIATING LOOP: Make up a six-to-eight turn, 6-inch-diameter loop, using insulated wire; connect to signal-generator leads, and place near radio loop aerial.

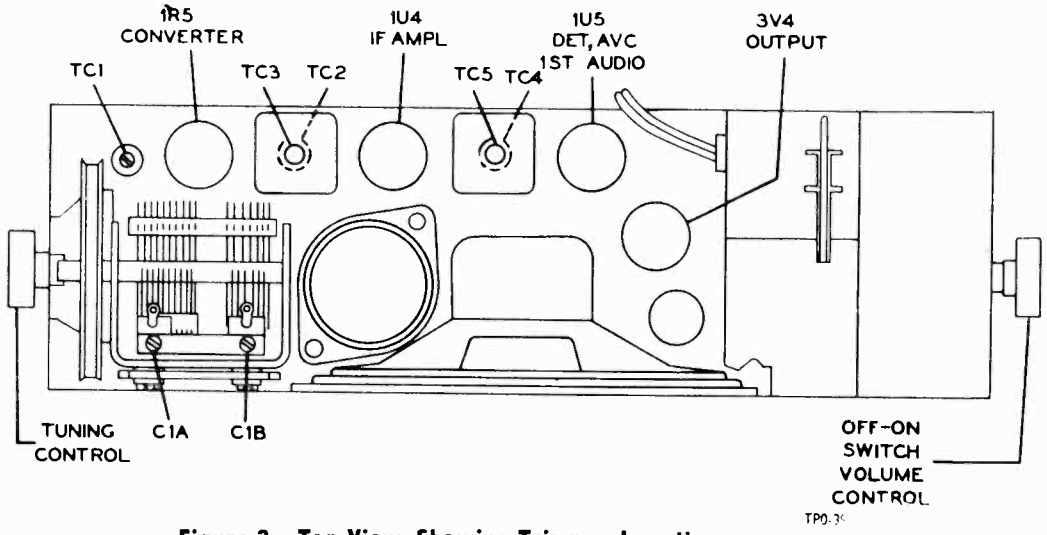


Figure 2. Top View, Showing Trimmer Locations

REPLACEMENT PARTS LIST

NOTE: Part numbers identified by an asterisk (*) are general replacement items. These numbers may not be identical with those on factory parts; also, the electrical values of some replacement items may differ from the values indicated in the schematic diagram and parts list. The values substituted in any case are so chosen that the operation of the radio will be either unchanged or improved. When ordering replacements, use only the "Service Part No."

Reference Symbol	Description	Service Part No.
C1	Condenser, tuning gang, 2-section	31-2735-2
C1A	Condenser, trimmer, antenna	Part of C1
C1B	Condenser, trimmer, oscillator	Part of C1
C2	Condenser, neutralizing, 1.5 $\mu\mu f$.	30-1221-3
C3	Condenser, a-v-c by-pass, .05 μf.	61-0122*
C4	Condenser, i-f by-pass, .1 μf.	61-0113*
C5	Condenser, d-c blocking, 47 $\mu\mu f$.	62-051009001*
C6	Condenser, dual ceramic	30-1239
C6A	Condenser, osc. B+ by-pass, .004 μf.	Part of C6
C6B	Condenser, grid by-pass, .004 μf.	Part of C6
C7	Condenser, temperature compensation, 7.5 $\mu\mu f$.	30-1224-65
C8	Condenser, filament by-pass, .22 μf.	45-3505-49
C9	Condenser, neutralizing, 2.2 $\mu\mu f$.	30-1221-4
C10	Condenser, ceramic, 4-section	30-1237
C10A	Condenser, d-c blocking, .001 μf.	Part of C10
C10B	Condenser, screen by-pass, .01 μf.	Part of C10
C10C	Condenser, d-c blocking, .002 μf.	Part of C10
C10D	Condenser, grid by-pass, 220 $\mu\mu f$.	Part of C10
C11	Condenser, tone compensation, .004 μf.	61-0179*
C12	Condenser, electrolytic, filament by-pass, 50 μf., 25v	30-2417-12
C13	Condenser, electrolytic, 3-section	30-2568-39
C13A	Condenser, filter, 40 μf., 150v	Part of C13
C13B	Condenser, filter, 10 μf., 150v	Part of C13
C13C	Condenser, filter, 50 μf., 150v	Part of C13
C14	Condenser, line by-pass, .047 μf.	45-3505-45*
CR1	Selenium rectifier, 75 ma. at 117 volts	34-8003-1*
LA1	Loop aerial	32-4455
LS1	Speaker, 4-inch p-m	36-1637
R1	Resistor, grid return, 3.3 megohms	66-5338340*
R2	Resistor, grid return, 100,000 ohms	66-4108340*
R3	Resistor, bias, 680 ohms	66-1688340*
R4	Resistor, leakage, 150,000 ohms	66-4158340*
R5	Resistor, oscillator dropping, 22,000 ohms	66-3228340*
R6	Resistor, grid return, 3.3 megohms	66-5338340*
R7	Resistor, a-v-c filter, 2.2 megohms	66-5228340*
R8	Volume control (with off-on switch) 1 megohm	33-5566-21
R9	Resistor, grid return, 4.7 megohms	66-5478340*
R10	Resistor, screen dropping, 4.7 megohms	66-5478340*
R11	Resistor, plate load, 1 megohm	66-5108340*
R12	Resistor, grid return, 2.2 megohms	66-5228340*
R13	Resistor, bias, 820 ohms	66-1828340*
R14	Resistor, filament dropping and filter, 2100 ohms (center-tapped)	33-3445
R15	Resistor, filter, 820 ohms	66-1828340*
R16	Resistor, current limiting, 120 ohms	33-1334-14
R17	Resistor, bias, 1500 ohms	66-2158340*
R18	Resistor, bias, 330 ohms	66-1338340*
S1	Switch, off-on	Part of R8
T1	Transformer, oscillator	32-4453
T2	Transformer, output	32-8434
W1	Line cord	4-3821-6*
WS	Wafer switch, voltage change-over	42-1925
Z1	Transformer, 1st i-f	32-4160-4A
Z2	Transformer, 2nd i-f	32-4454-1A

MISCELLANEOUS

Description	Service Part No.
Cabinet	10799
Baffle and cloth assembly	40-7884
Fastener (4)	W2235-7FA9
Battery holder and loop assembly	76-5740
Battery cradle and rivet assembly	76-5815
Handle	56-7940FCP
Bushing (2)	54-4776
Hinge (l.h.)	56-7915
Hinge (r.h.)	56-7915-1
Screw (2)	W2537-15FA1
Knob (2)	54-4773
Pointer	56-7973FCP
Scale	54-5087
Cable and connector assembly, battery	41-3988
Insulator, electrolytic condenser mounting	27-9509
Mount, rubber, tuning gang (3)	27-4099 3
Spring, drive cord	56-2617
Socket, tube, 1R5 and 1U4 (2)	27-6203
Socket, tube, 1U5 and 3V4 2	27-6203-12
Tube shield, 1U5	56-3978-1FA3
Tuning shaft	56-7906FA42

MODEL 51-631

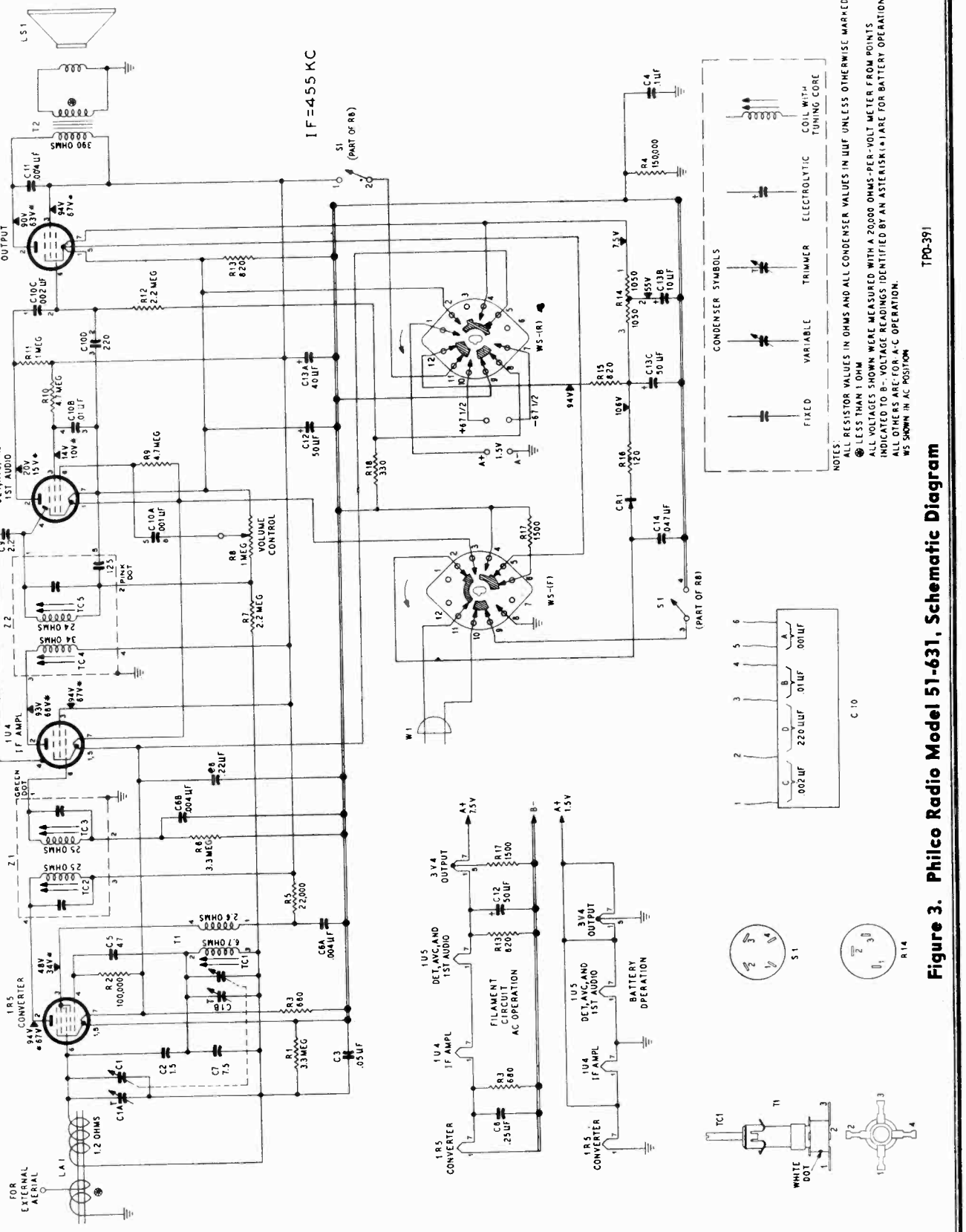


Figure 3. Philco Radio Model 51-631, Schematic Diagram

MODELS 51-930, 51-931, 51-932

SPECIFICATIONS

CABINET	
Model 51-930	Molded plastic, mahogany and gray, wide-angle dial
Model 51-931	Molded plastic, ivory, wide-angle dial
Model 51-932	Molded plastic, maroon, wide-angle dial
CIRCUIT	6-tube superheterodyne
FREQUENCY RANGE	540—1620 kc.
AUDIO OUTPUT	1 watt
OPERATING VOLTAGE	105—120 volts, a.c. or d.c.
POWER CONSUMPTION	30 watts
AERIAL	Built-in, high-impedance loop; provision for connection of external aerial
INTERMEDIATE FREQUENCY	455 kc.
PHILCO TUBES (6)	7B7 r-f ampl., 7A8 converter, 7B7 i-f ampl., 14B6 det.—1st audio—a.v.c., 35L6GT output, 35Z5GT rectifier

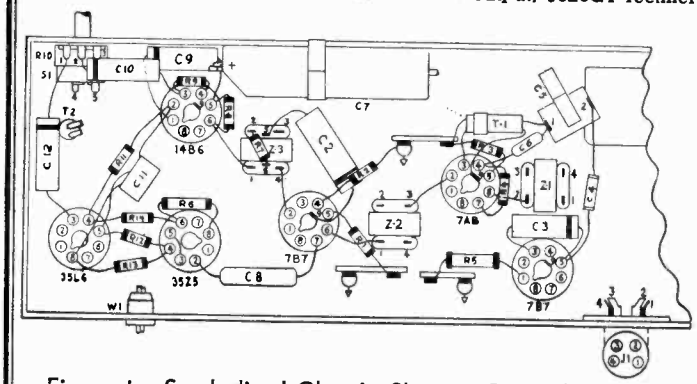


Figure 1. Symbolized Chassis, Showing Parts Placement

ALIGNMENT PROCEDURE

DIAL POINTER: Turn tuning condenser to full-mesh position. Adjust pointer so that center of pointer carriage coincides with first scribe line from the left.

OUTPUT LEVEL: During alignment, attenuate signal-generator output to maintain an output-meter indication of 1.25 volts.

OUTPUT METER: Connect across speaker voice coil.

SIGNAL GENERATOR: Connect as indicated in chart. Use modulated output.

VOLUME CONTROL: Set to maximum.

CRITICAL DRESS: The green lead from the osc. section of C1 to C5 must be dressed away from the chassis, with all excess under the chassis.

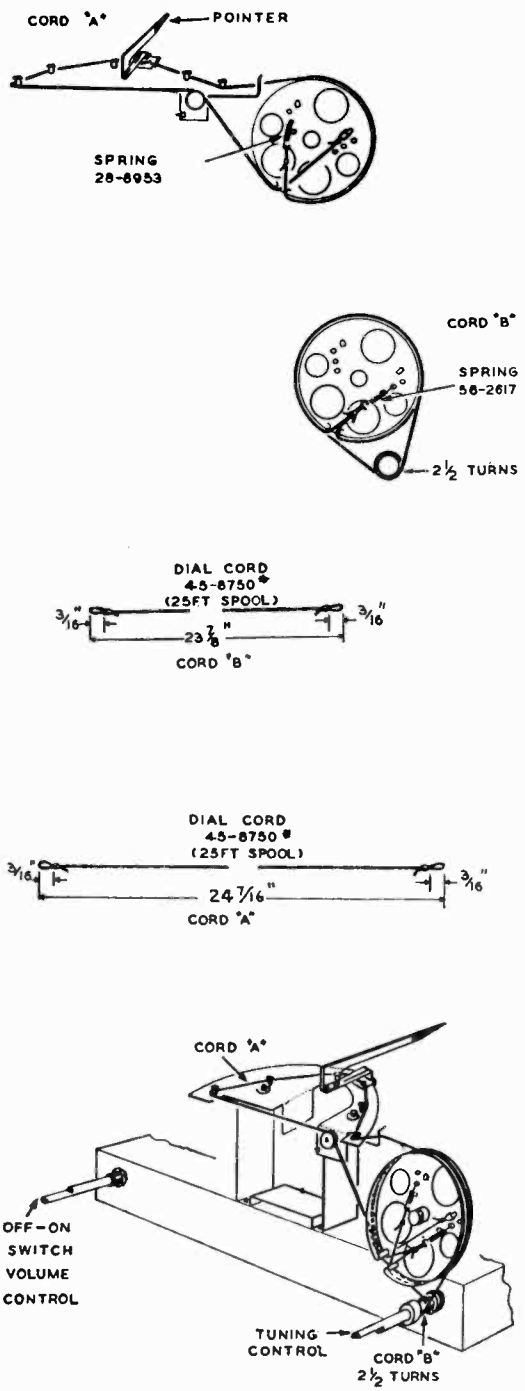


Figure 2. Dial-Cord Installation Details

MODELS 51-930,
51-931. 51-932

ALIGNMENT CHART

STEP	SIGNAL GENERATOR		RADIO		ADJUST
	CONNECTION TO RADIO	DIAL SETTING	DIAL SETTING	SPECIAL INSTRUCTIONS	
1	Through a .1-μf. condenser to stator of r-f section of gang. Ground lead to B–.	455 kc.	Gang fully meshed	Adjust, in order given, for maximum output.	TC5—2nd i-f sec. TC4—2nd i-f pri. TC3—1st i-f sec. TC2—1st i-f pri.
2	Radiating loop. (See note below.)			Preset 1/2 turn from tight.	C5—osc. series
3	Same as step 2.	1620 kc.	1620 kc.	Adjust for maximum.	C1B—osc. shunt
4	Same as step 2.	1500 kc.	1500 kc.	Adjust for maximum.	C1C—r-f C1A—aerial
5	Same as step 2.	580 kc.	580 kc.	Adjust for maximum while rocking tuning control.	C5—osc. series TC1—r-f core
6	Repeat steps 3 and 4.				

RADIATING LOOP:

Make up a 6—8 turn, 6-inch-diameter loop from insulated wire; connect to signal-generator leads and place near radio loop aerial. The loop aerial must be connected to the radio.

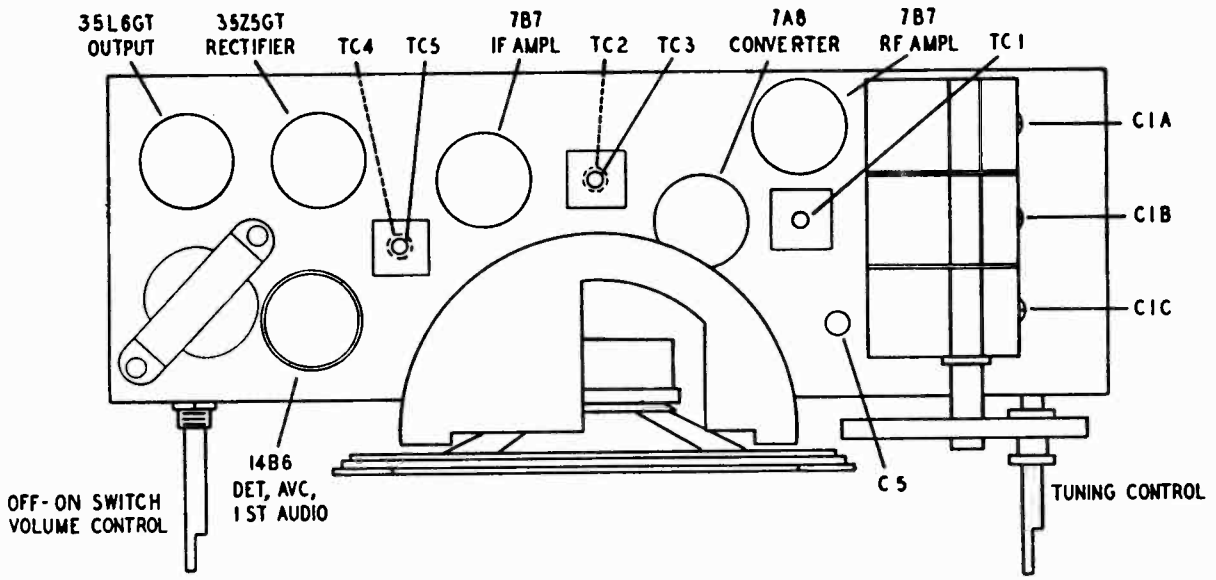


Figure 3. Top View, Showing Trimmer Locations

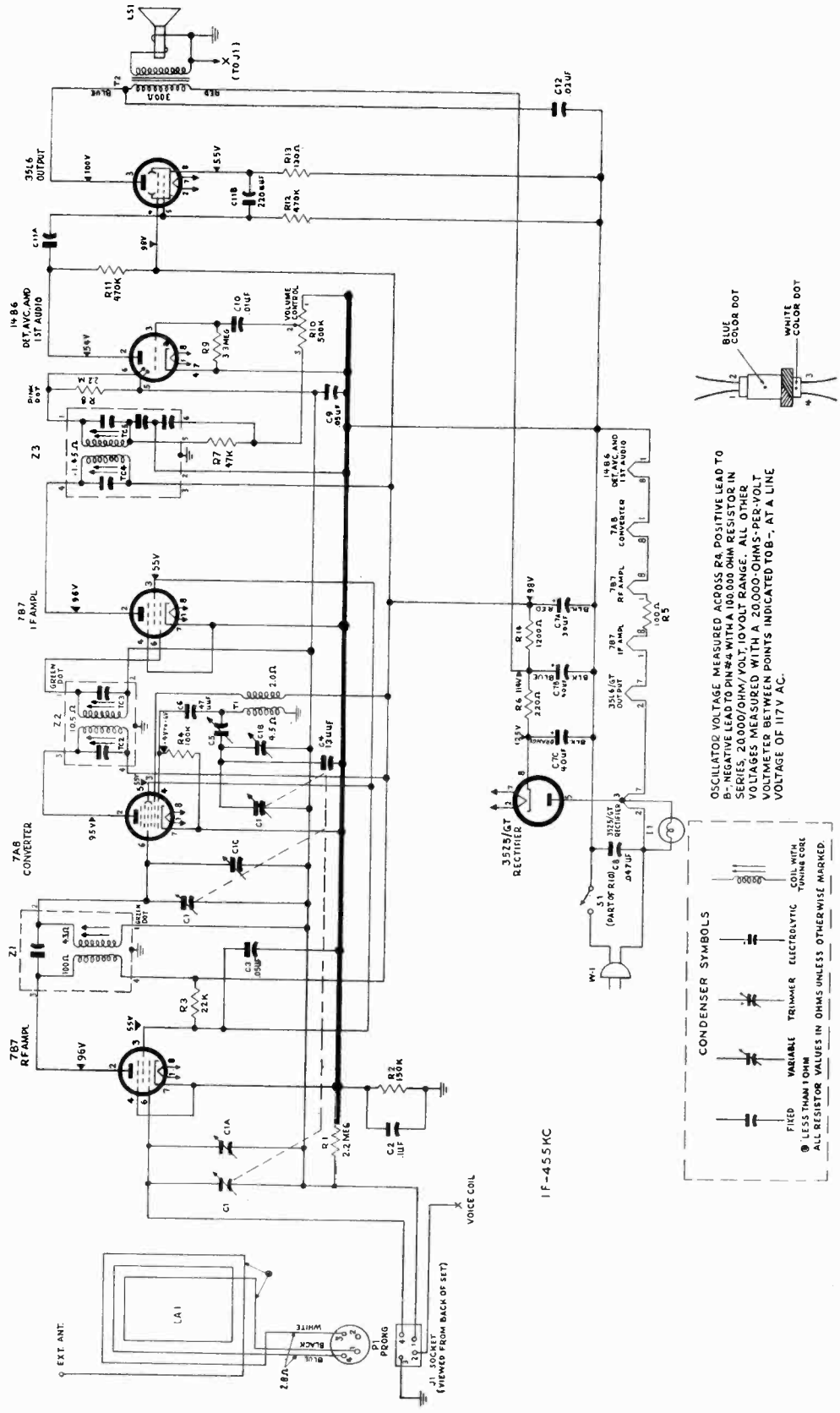


Figure 4. Philco Radio Models 51-930, 51-931, and 51-932, Schematic Diagram

MODELS 51-930, 51-931, 51-932

REPLACEMENT PARTS LIST

NOTE: Part numbers marked with an asterisk (*) are general replacement items. These numbers may not be identical with those on factory parts; also, the electrical values of some replacement items may differ from the values indicated in the schematic diagram and parts list. The values substituted in any case are so chosen that the operation of the radio will be either unchanged or improved. When ordering replacements, use only the "Service Part No."

Reference Symbol	Description	Service Part No.
C1	Condenser, tuning, 3-section	31-2748-1
C1A	Condenser, trimmer, aerial	Part of C1
C1B	Condenser, trimmer, osc.	Part of C1
C1C	Condenser, trimmer, r-f	Part of C1
C2	Condenser, by-pass, .1 $\mu f.$	61-0113*
C3	Condenser, by-pass, .05 $\mu f.$	61-0122*
C4	Condenser, fixed trimmer, temperature comp., 13 $\mu\mu f.$	30-1224-68
C5	Condenser, padder, osc. series	31-6473-17
C6	Condenser, d-c blocking, 47 $\mu\mu f.$	60-00475417
C7	Condenser, electrolytic, 3-section	30-2575-27
C7A	Condenser, filter, 30 $\mu f.$, 150v	Part of C7
C7B	Condenser, filter, 40 $\mu f.$, 150v	Part of C7
C7C	Condenser, filter, 40 $\mu f.$, 150v	Part of C7
C8	Condenser, line by-pass, .047 $\mu f.$	45-3505-45
C9	Condenser, a-v-c filter, .05 $\mu f.$	61-0122*
C10	Condenser, d-c blocking, .01 $\mu f.$	61-0120*
C11	Condenser, dual ceramic	30-1239-4
C11A	Condenser, d-c blocking, .007 $\mu f.$	Part of C11
C11B	Condenser, by-pass, 220 $\mu\mu f.$	Part of C11
C12	Condenser, tone compensation, .02 $\mu f.$	61-0108*
I1	Pilot lamp, 6—8v	34-2676
J1	Jack, aerial input	27-6214-1
LA1	Loop aerial, 50-930	32-4052-39
LA1	Loop aerial, 50-931 or 50-932	32-4052-40
LS1	Speaker, p-m, 4 in. x 6 in., oval	36-1633-3
P1	Loop-aerial plug	27-4788
R1	Resistor, a-v-c load, 2.2 megohms	66-5228340*
R2	Resistor, leakage, 150,000 ohms	66-4158340*
R3	Resistor, dropping, 22,000 ohms	66-3228340*
R4	Resistor, grid return, 100,000 ohms	66-4108340*
R5	Resistor, filament dropping, 100 ohms	33-1343-3
R6	Resistor, filter, 220 ohms, 1w	66-1224340*
R7	Resistor, i-f filter, 47,000 ohms	66-3478340*
R8	Resistor, diode load, 2.2 megohms	66-5228340*
R9	Resistor, grid return, 3.3 megohms	66-5338340*
R10	Volume control, 500,000 ohms, with off-on switch	33-5566-13
R11	Resistor, plate load, 470,000 ohms	66-4478340*
R12	Resistor, grid return, 470,000 ohms	66-4478340*
R13	Resistor, cathode bias, 130 ohms	66-1128340*
R14	Resistor, filter, 1200 ohms, 1 watt	66-2124340*
S1	Switch, off-on	Part of R10
T1	Transformer, oscillator	32-4263-3
T2	Transformer, output	32-8310-3
W1	Line cord	L-2183*
Z1	Transformer, r-f	32-4399-2A
Z2	Transformer, 1st i-f	32-4160A
Z3	Transformer, 2nd i-f	32-4240-3A

MISCELLANEOUS

Description	Service Part No.
Cabinet, 50-930 (mahogany)	10770-2
Cabinet, 50-930 (gray)	10770-3
Back	318-3020
Fastener, back (4)	W-2235FA9
Backplate, ornamental, mahogany cabinet	56-7426FCP
Backplate, ornamental, gray cabinet	56-7426-1FCP
Fastener, backplate mtg.	W-2235-1FA9
Baffle and cloth assy.	40-7892
Fastener, baffle mtg. (4)	W-2235-2FA9
Bezel, metal	56-7427
Speed nut, bezel mtg. (2)	1W60196FE7
Dial scale, mahogany cabinet	54-5070-3
Dial scale, gray cabinet	54-5070-4
Clip, scale mtg.	36-7886FE9
Knob, mahogany cabinet (2)	54-4718-4
Knob, gray cabinet (2)	54-4718-7
Pointer	76-5341-1
Cabinet, 50-931	76-5378
Back	318-3021
Fastener, back (4)	W-2235FA9
Backplate, ornamental	56-7434-1
Fastener, backplate mtg.	W-2235-1FA9
Baffle, cardboard	54-7922
Fastener, baffle mtg. (4)	W-2235-2FA9
Dial scale	54-5071
Clip, dial mtg.	56-7808FE11
Knob (2)	54-4718-5
Pointer	76-5341-4
Cabinet, 50-932	10772
Back	318-3022
Fastener, back (4)	W-2235FA9
Backplate, ornamental	56-7435
Fastener, backplate mtg.	W-2235-1FA9
Baffle, cardboard	54-7919
Fastener, baffle mtg. (4)	W-2235-2FA9
Bezel, metal	56-7436
Speed nut, bezel mtg.	1W60196FE7
Dial scale	54-5072
Clip, dial mtg. (2)	56-7572FE11
Knob	54-4718-3
Pointer	76-5341-3
Backplate, pulley-and-clip assembly	76-5233
Clamp, electrolytic mtg.	56-1466FA5
Dial cord, 25-foot spool	45-8750*
Spring, gang drive	56-2617
Spring, pointer drive	28-8953
Drive shaft	76-3671-6
Bushing, drive shaft	27-9437
Spring, hairpin, drive shaft (2)	57-1468FA3
Panel, wiring, external aerial	38-9837
Panel, wiring, 4-lug	38-9161-1
Plug, aerial, 4-pin	27-4788
Rubber mount, gang mtg. (4)	27-4771-1
Shield, tube, 14B6	56-1566
Socket, Loktal	27-6207
Socket, octal	27-6174
Socket assembly, pilot lamp	27-6233-6

SPECIFICATIONS

CABINET	Plastic table model
CIRCUIT	Six-tube superheterodyne plus selenium rectifier
FREQUENCY RANGES	
Broadcast	540—1630 kc.
FM	88—108 mc.
AUDIO OUTPUT	1 watt
OPERATING VOLTAGE	105—125 volts, a.c./d.c.
POWER CONSUMPTION	35 watts
AERIAL	Built-in high-impedance loop for AM, line cord for FM; provision for connecting external aerial.
INTERMEDIATE FREQUENCY	
AM	455 kc.
FM	9.1 mc.
PHILCO TUBES (6)	12AU6 r-f ampl., 12AT7 converter, 12BA6 1st i-f ampl., 12AU6 2nd i-f ampl., 19C8 det.—a.v.c.—1st audio, 50C5 output

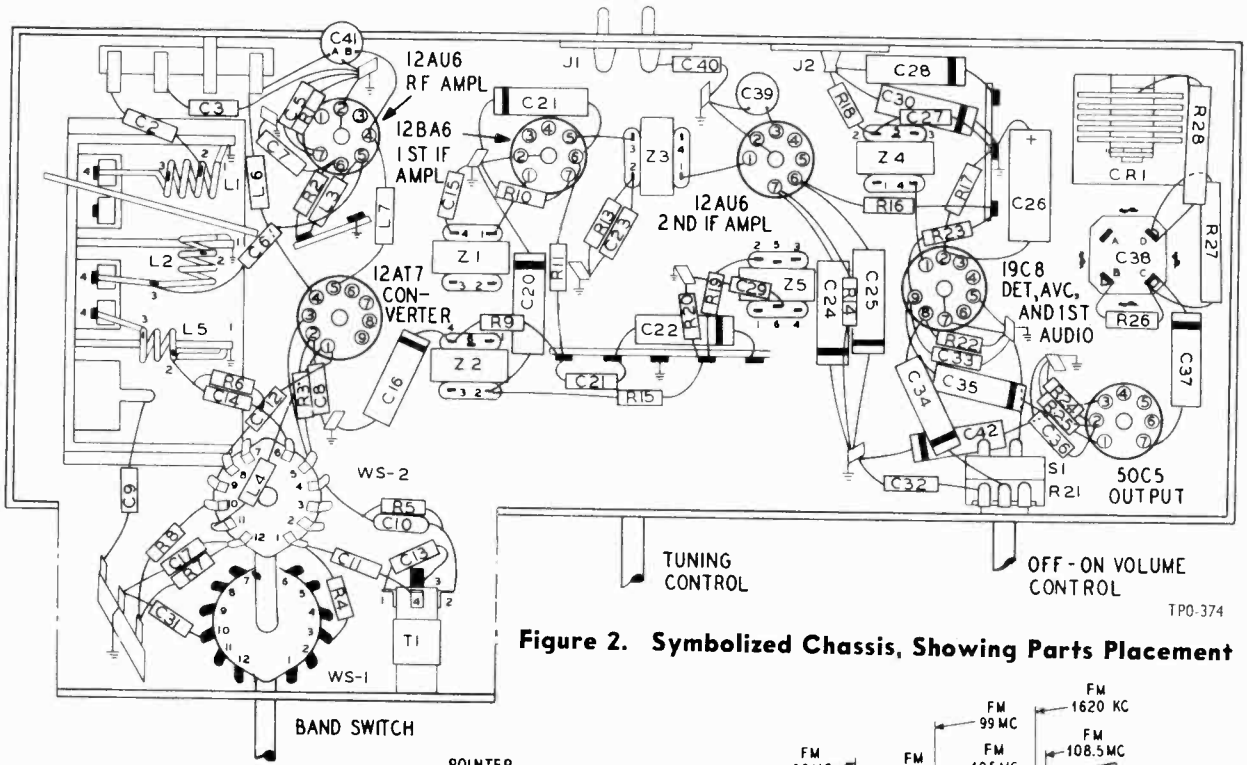


Figure 2. Symbolized Chassis, Showing Parts Placement

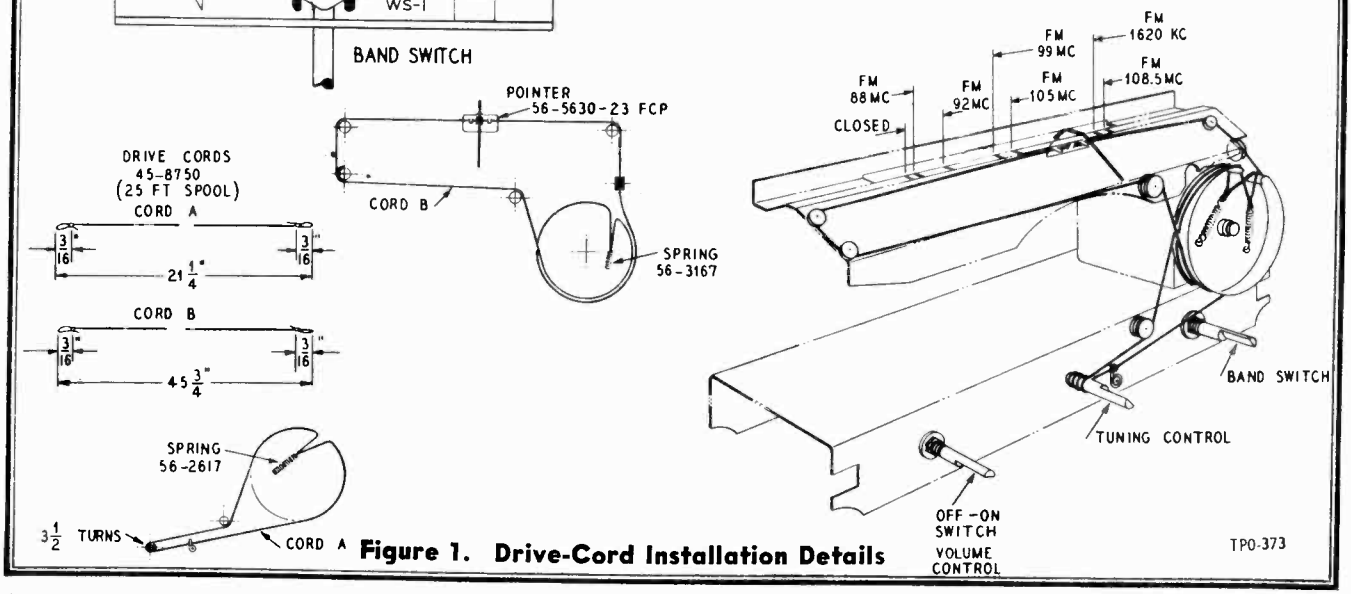


Figure 1. Drive-Cord Installation Details

MODEL 51-934

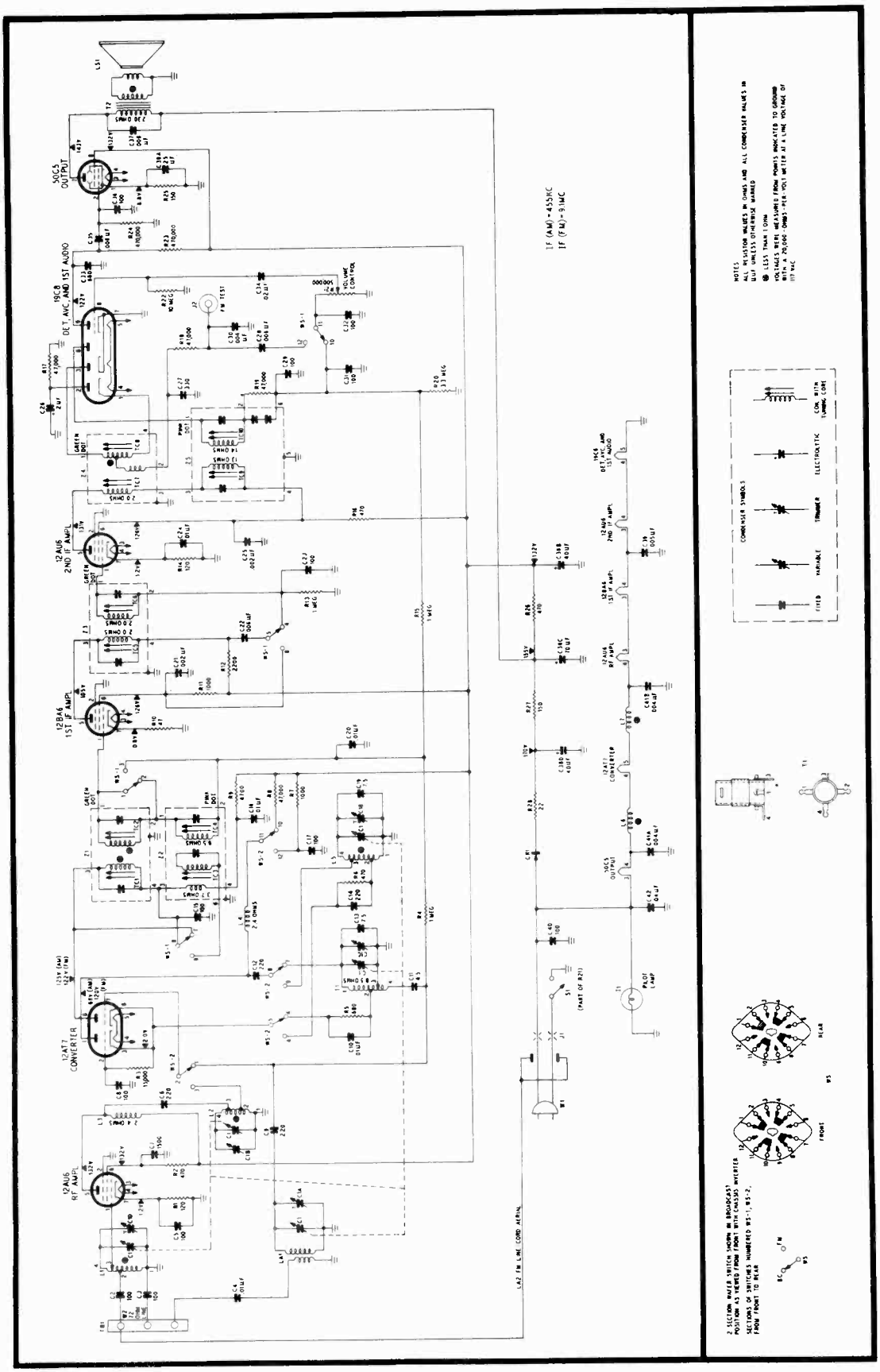


Figure 3. Philco Radio Model 51-934, Schematic Diagram

TPO-375

AM ALIGNMENT PROCEDURE

Make alignment with loop aerial connected to radio. The AM alignment should be completed before the FM alignment is made.

DIAL POINTER—With tuning-condenser plates fully meshed, adjust pointer to coincide with index mark at low-frequency end of dial backplate.

RADIO CONTROLS—Set volume control to maximum, set band switch for broadcast reception, and set tuning control as indicated in chart.

OUTPUT METER—Connect across voice-coil terminals.

SIGNAL GENERATOR—Use AM r-f signal generator, with modulated output. Connect generator and set frequency as indicated in chart.

OUTPUT LEVEL—During alignment, signal-generator output must be attenuated to hold output-meter reading below 1.25 volts.

AM ALIGNMENT CHART

STEP	SIGNAL GENERATOR		RADIO		ADJUST
	CONNECTION TO RADIO	DIAL SETTING	DIAL SETTING	SPECIAL INSTRUCTIONS	
1	Ground lead to chassis. Output lead through a .1-μf. condenser to mixer grid (pin 7) of 12AT7.	455 kc.	540 kc. (gang fully meshed)	Adjust for maximum output.	TC10—2nd AM i-f sec. TC9—2nd AM i-f pri. TC4—1st AM i-f sec. TC3—1st AM i-f pri.
2	Radiating loop. See note below.	1620 kc.	1600 kc.	Adjust for maximum output.	C1C—osc. trimmer
3	Same as step 2.	1500 kc.	1500 kc.	Adjust for maximum output.	C1A—aerial trimmer

RADIATING LOOP: Make up a six-to-eight-turn, 6-inch-diameter loop from insulated wire; connect to generator terminals, and place near radio loop aerial. Radio loop aerial must be connected.

FM ALIGNMENT PROCEDURE

Make AM alignment first.

RADIO CONTROLS—Set volume control to maximum, set band switch for FM reception, and set tuning control as indicated in chart.

OUTPUT METER—Connect across voice-coil terminals. (This meter is used only for step 3).

D-C VOLTMETER—Connect negative lead of d-c voltmeter (resistance of at least 20,000 ohms per volt) to pin 2 of 19C8 tube, and positive lead to chassis. Use 0—10-volt range.

SIGNAL GENERATOR—Use AM r-f signal generator, with modulated output. Connect ground lead to chassis. Connect output lead and set frequency as indicated in chart. Generator must have sufficient output to give reading of approximately 8.5 volts on d-c voltmeter; during alignment, generator output must be attenuated to hold meter reading at this value.

NOTE: Before starting FM alignment, allow radio and signal generator to warm up for 15 minutes.

FM ALIGNMENT CHART

STEP	SIGNAL GENERATOR		RADIO		ADJUST
	CONNECTION TO RADIO	DIAL SETTING	DIAL SETTING	SPECIAL INSTRUCTIONS	
1	Through a .1-μf. condenser to control grid (pin 1) of 12BA6 1st i-f ampl.	9.1 mc.	88 mc.	Adjust tuning cores for maximum reading on d-c voltmeter. Attenuate signal generator to maintain a reading of approximately 10 volts. Repeat adjustments until no further improvement is noted. After this step, do not disturb these tuning cores except as directed in step 3.	TC8—discriminator sec. TC7—discriminator pri. TC6—FM 2nd i-f sec. TC5—FM 2nd i-f pri.

MODEL 51-934

FM ALIGNMENT CHART (Cont.)

STEP	SIGNAL GENERATOR		RADIO		ADJUST
	CONNECTION TO RADIO	DIAL SETTING	DIAL SETTING	SPECIAL INSTRUCTIONS	
2	Through a .1-μf. condenser to mixer grid (pin 7) of 12AT7.	9.1 mc.	88 mc.	Adjust tuning cores for maximum reading on d-c voltmeter. Repeat adjustments until no further improvement is noted. Do not disturb these tuning cores after this step.	TC2—FM 1st i-f sec. TC1—FM 1st i-f pri.
3	Same as step 1.	9.1 mc.	88 mc.	Adjust tuning core for minimum reading on output meter. This adjustment is critical; repeat to make certain it is correct.	TC8—discriminator sec.
4	To terminal 1 of TB1.	105 mc.	105 mc.	Adjust trimmer for maximum reading on d-c voltmeter.	C18—FM osc.
5	Same as step 4.	105 mc.	105 mc.	Same as step 4.	C1B—FM r-f C1D—FM aerial.
6	Same as step 4.	92 mc.	92 mc.	Adjust coil for maximum reading on d-c voltmeter.	L5—osc. (tracking)
7	Same as step 4.	92 mc.	92 mc.	Same as step 6.	L2—FM r-f (tracking) L1—FM aerial. (tracking)
8	Same as step 4.	105 mc.	105 mc.	Same as step 4.	C18—FM osc.
9	Repeat steps 4 through 8 until no further improvement is noted.				

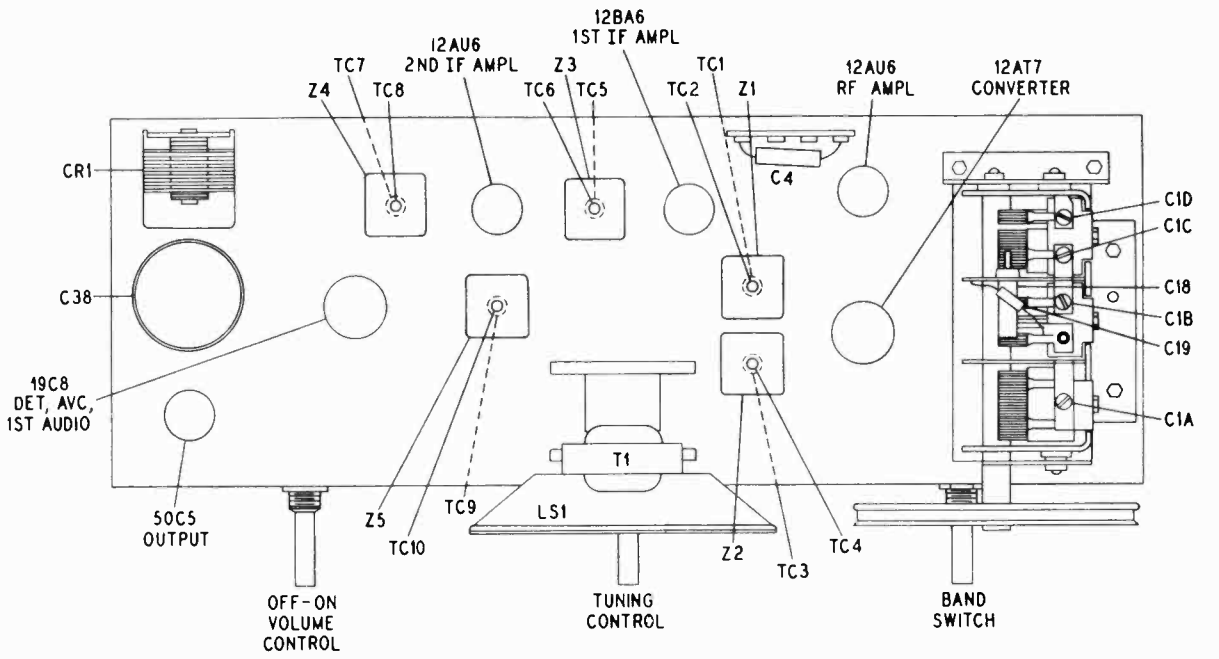


Figure 4. Top View, Showing Trimmer Locations

TP0-376

MODEL 51-934

REPLACEMENT PARTS LIST

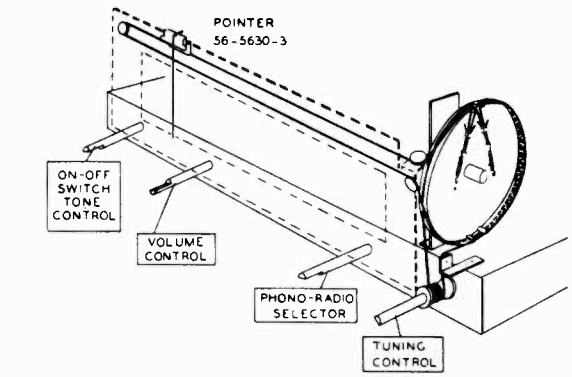
NOTE: Part numbers identified by an asterisk (*) are general replacement items. These numbers may not be identical with those on factory parts; also, the electrical values of some replacement items may differ from the values indicated in the schematic diagram and parts list. The values substituted in any case are so chosen that the operation of the radio will be either unchanged or improved. When ordering replacements, use only the "Service Part No."

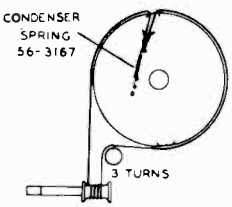
Reference Symbol	Description	Service Part No.
C1	Condenser, tuning gang, 5-section	31-2756
C1A	Condenser, trimmer, BC aerial	Part of C1
C1B	Condenser, trimmer, FM r-f	Part of C1
C1C	Condenser, trimmer, BC oscillator	Part of C1
C1D	Condenser, trimmer, FM aerial	Part of C1
C2	Condenser, aerial isolating, 100 $\mu\mu f$.	62-110009001*
C3	Condenser, aerial isolating, 100 $\mu\mu f$.	62-110009001*
C4	Condenser, aerial isolating, .01 μf.	45-3505-41
C5	Condenser, cathode by-pass, 100 $\mu\mu f$.	62-110009001*
C6	Condenser, d-c blocking, 220 $\mu\mu f$.	62-122001001
C7	Condenser, screen by-pass, 1500 $\mu\mu f$.	62-215001011*
C8	Condenser, oscillator grid, 100 $\mu\mu f$.	62-110009001*
C9	Condenser, d-c blocking, 220 $\mu\mu f$.	62-122001001
C10	Condenser, d-c blocking, .01 μf.	30-1226-10
C11	Condenser, neutralizing, 6.5 $\mu\mu f$.	30-1224-6
C12	Condenser, d-c blocking, 220 $\mu\mu f$.	62-122001001
C13	Condenser, fixed trimmer, temperature compensating, 7.5 $\mu\mu f$.	30-1224-8
C14	Condenser, d-c blocking, 220 $\mu\mu f$.	62-122001001*
C15	Condenser, r-f by-pass, 100 $\mu\mu f$.	62-110009001*
C16	Condenser, plate decoupling, .01 μf.	30-4572
C17	Condenser, r-f by-pass, 100 $\mu\mu f$.	62-110009001*
C18	Condenser, trimmer, FM oscillator	31-6511
C19	Condenser, fixed trimmer, temperature compensating, 7.5 $\mu\mu f$.	30-1224-8
C20	Condenser, a-v-c decoupling, .01 μf.	30-4572
C21	Condenser, screen by-pass, .002 μf.	61-0062*
C22	Condenser, neutralizing, .006 μf.	45-3500-7*
C23	Condenser, i-f by-pass, 100 $\mu\mu f$.	62-110009001*
C24	Condenser, cathode by-pass, .01 μf.	30-4572
C25	Condenser, screen by-pass, .002 μf.	61-0062*
C26	Condenser, electrolytic diode-load filter, 2 μf., 50v	30-2417-7
C27	Condenser, i-f by-pass, 330 $\mu\mu f$.	62-133001001
C28	Condenser, d-c blocking, .006 μf.	45-3500-7*
C29	Condenser, i-f by-pass, 100 $\mu\mu f$.	62-110009001*
C30	Condenser, de-emphasis, .004 μf.	61-0179*
C31	Condenser, i-f by-pass, 100 $\mu\mu f$.	62-110009001*
C32	Condenser, i-f by-pass, 100 $\mu\mu f$.	62-110009001*
C33	Condenser, plate by-pass, 680 $\mu\mu f$.	62-168001001
C34	Condenser, d-c blocking, .02 μf.	61-0108*
C35	Condenser, d-c blocking, .006 μf.	61-0105*
C36	Condenser, grid by-pass, 100 $\mu\mu f$.	62-110009001*
C37	Condenser, tone compensation, .006 μf.	61-0105*
C38	Condenser, electrolytic, 4-section	30-2570-46
C38A	Condenser, cathode by-pass, 25 μf., 25v	Part of C38
C38B	Condenser, filter, 40 μf., 150v	Part of C38
C38C	Condenser, filter, 70 μf., 150v	Part of C38
C38D	Condenser, filter, 40 μf., 150v	Part of C38
C39	Condenser, filament by-pass, .005 μf.	30-1238-1
C40	Condenser, line by-pass, 100 $\mu\mu f$.	62-110009001*
C41	Condenser, ceramic, 2-section	30-1239
C41A	Condenser, filament by-pass, .004 μf.	Part of C41
C41B	Condenser, filament by-pass, .004 μf.	Part of C41
C42	Condenser, line by-pass, .04 μf.	45-3500
CR1	Selenium rectifier, 100 ma., 117v	34-8003-1
I1	Pilot lamp, frosted, 117v, 7 watts	34-2605
J1	Jack, male, a-c	27-4785-13
J2	Socket, FM test	27-6180
L1	Coil, FM aerial	32-4415-1
L2	Coil, FM r-f	32-4416-1
L3	Choke, r-f, 3.3 mh.	32-4422-10
L4	Choke, r-f, 3.3 mh.	32-4422-10
L5	Coil, FM oscillator	32-4414-1
L6	Choke, filament, 2.2 mh.	32-4422-8
L7	Choke, filament, 2.2 mh.	32-4422-8
LA1	Loop aerial, AM	32-4052-49
LA2	Line-cord aerial, FM	Part of W1
LS1	Speaker, 4" p-m, including output transformer	32-1614-6
R1	Resistor, cathode bias, 120 ohms	66-1128340*
R2	Resistor, screen decoupling, 470 ohms	66-1478340*
R3	Resistor, grid return, 15,000 ohms	66-3158340*
R4	Resistor, grid return, 1 megohm	66-5108340*
R5	Resistor, parasitic suppressor, 680 ohms	66-1688340*
R6	Resistor, parasitic suppressor, 470 ohms	66-1478340*
R7	Resistor, plate dropping, FM, 1000 ohms	66-2108340*
R8	Resistor, plate dropping, AM, 47,000 ohms	66-3478340*
R9	Resistor, plate dropping, 4700 ohms	66-2478340*
R10	Resistor, cathode bias, 47 ohms	66-0478340*
R11	Resistor, screen decoupling, 1000 ohms	66-2108340*
R12	Resistor, plate decoupling, 2200 ohms	66-2228340*
R13	Resistor, grid return, 1 megohm	66-5108340*
R14	Resistor, cathode bias, 120 ohms	66-1128340*
R15	Resistor, a-v-c filter, 1 megohm	66-5108340*
R16	Resistor, decoupling, 470 ohms	66-1478340*
R17	Resistor, FM diode load, 47,000 ohms	66-3478340*
R18	Resistor, de-emphasis, 47,000 ohms	66-3478340*
R19	Resistor, i-f filter, 47,000 ohms	66-3478340*
R20	Resistor, a-v-c load, 3.3 megohms	66-5338340*
R21	Volume control (with off-on switch), 500,000 ohms	33-5566-20
R22	Resistor, grid return, 10 megohms	66-6108340*
R23	Resistor, plate load, 470,000 ohms	66-4478340*
R24	Resistor, grid return, 470,000 ohms	66-4478340*
R25	Resistor, cathode bias, 150 ohms	66-1158340*
R26	Resistor, filter, 470 ohms, 1 watt	66-1474340*
R27	Resistor, filter, 150 ohms, 2 watts	66-1185340*
R28	Resistor, current limiting, 22 ohms, 2 watt	66-0225360
S1	Switch, off-on	Part of R21
T1	Transformer, AM oscillator	32-4458
T2	Transformer, output	Part of LS1
W1	Line cord	41-3791-2
W2	Cable, FM aerial, 72-ohm twin lead	41-3987
WS	Switch, band, 2-wafer	42-1924
Z1	Transformer, FM, 1st i-f	32-4372A
Z2	Transformer, AM, 1st i-f	32-4258-3A
Z3	Transformer, FM, 2nd i-f	32-4372-2A
Z4	Transformer, FM, 3rd i-f	32-4310-1A
Z5	Transformer, AM, 2nd i-f	32-4240A

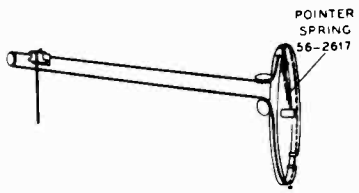
MISCELLANEOUS

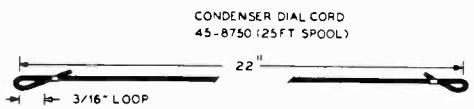
Cabinet	10796
Back, flange, and socket assembly	76-5738
Fastener, back mtg. (4)	W-2235FA9
Baffle	54-8069
Fastener, baffle mtg. (2)	W-2235-2FA9
Dial Scale	54-5089
Clip, scale mtg. (4)	56-7808FE11
Knob, FM-AM	54-4774-2
Knob, tuning	54-4774
Knob, volume-off-on	54-4774-1
Dial Backplate Assembly	76-5733
Drive cord, 25-foot spool	45-8750*
Pointer	56-5630-23FCP
Shaft, drive	56-7931FA11
Spring, gang drive	56-2617
Spring, pointer drive	56-3167
Rubber mounts, gang (5)	27-4771-1
Rubber mounts, speaker (2)	54-4651-1
Socket, 12BA6, 12AU6 (i-f ampl.), 50C5	27-6203
Socket, 12AU6 (r-f ampl.)	27-6203-1
Socket, 12AT7	27-6203-6
Socket, 19C8	27-6203-5
Spacer, "T", speaker mtg. (2)	1W29155FA3
Washer, speaker mtg. (2)	1W52224FA3

MODELS 51-1730,
51-1730(L)









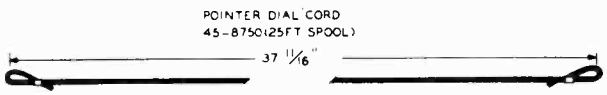


Figure 1. Drive-Cord Installation Details

SPECIFICATIONS

CABINET	Wood console, mahogany or white oak finish
CIRCUIT	8-tube superheterodyne (with t-r-f stage)
FREQUENCY RANGE	540—1620 kc.
AUDIO OUTPUT	3 watts
OPERATING VOLTAGE	105—120 volts, 60 cycles, a.c.
POWER CONSUMPTION	
Radio	50 watts
Phonograph	65 watts, total
INTERMEDIATE FREQUENCY	455 kc.
AERIAL	Built-in low-impedance loop; provision for external aerial
PHILCO TUBES (6)	7B7 r-f ampl., 7B7 i-f ampl., 7A8 converter, 7B6 det.-a.v.c.-1st audio ampl., 6W6GT output, 7X6 rectifier
PHONOGRAPH	Philco Model M-22 All-Speed Automatic Record Changer. (For service information, refer to Service Manual PR-1864.)

ALIGNMENT PROCEDURE

SIGNAL GENERATOR—Connect ground lead to B—. Connect output lead as indicated in chart. Use modulated output.

OUTPUT LEVEL—During alignment, attenuate input signal to maintain an output-meter indication of 1.25 volts.

DIAL POINTER—With tuning gang fully meshed, set pointer to coincide with the first scribe mark from the left on the dial backplate.

RADIO CONTROLS—Set volume control to maximum, tone control fully counterclockwise, and RADIO-PHONO switch to RADIO position.

OUTPUT METER—Connect across voice-coil terminals.

MODELS 51-1730, 51-1730(L)

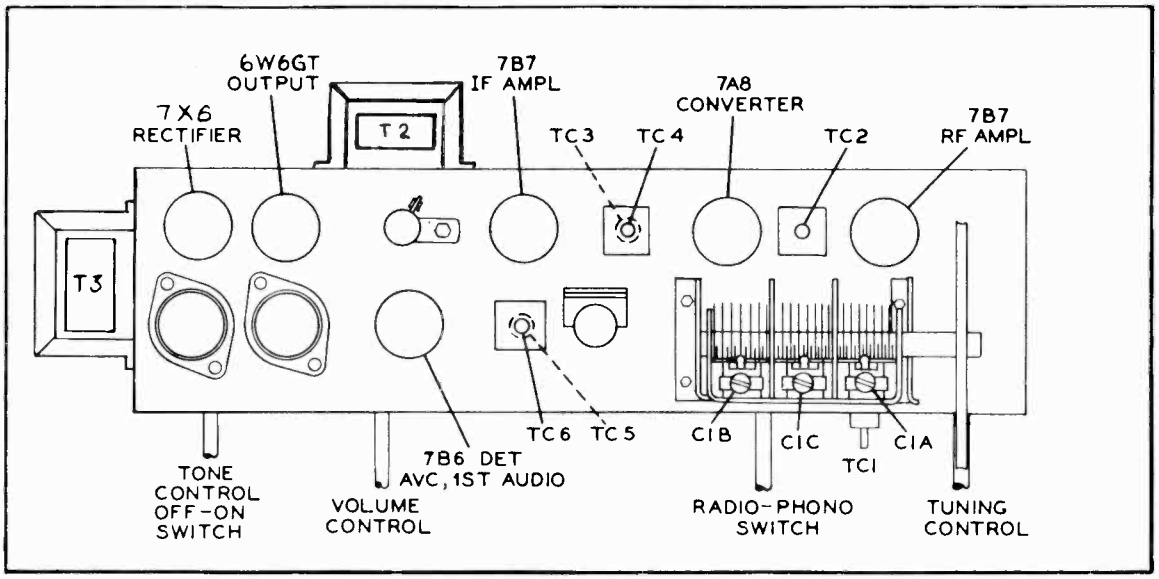


Figure 2. Top View, Showing Trimmer Locations

STEP	SIGNAL GENERATOR		RADIO		ADJUST
	CONNECTION TO RADIO	DIAL SETTING	DIAL SETTING	SPECIAL INSTRUCTIONS	
1	Through a .1-μf. condenser to r-f ampl. section of C1.	455 kc.	Gang fully meshed.	Adjust, in order given, for maximum output.	TC6—2nd i f sec. TC5—2nd i f pri. TC4—1st i-f sec. TC3—1st i f pri.
2	Radiating loop (see note below).	1620 kc.	1620 kc.	Adjust for maximum.	C1C—osc. trimmer
3	Same as Step 2.	1500 kc.	1500 kc.	Adjust for maximum.	C1B—r-f trimmer C1A—ant. trimmer
4	Same as Step 2.	580 kc.	580 kc.	Adjust for maximum while rocking tuning control.	TC2—r-f core TC1 ant. core*

RADIATING LOOP: Make up a 6-to-8 turn, 6-inch diameter loop of insulated wire; connect to signal-generator output leads, and place near radio loop.

* The aerial tuning core, TC1, should NOT be adjusted unless the coil has been replaced.

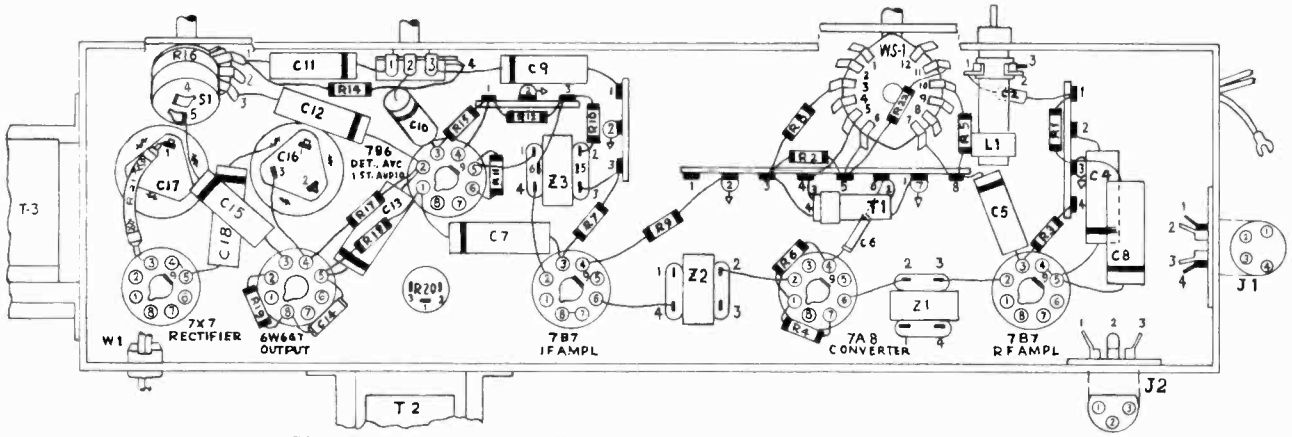


Figure 3. Symbolized Chassis, Showing Parts Placement

MODELS 51-1730,
51-1730(L)

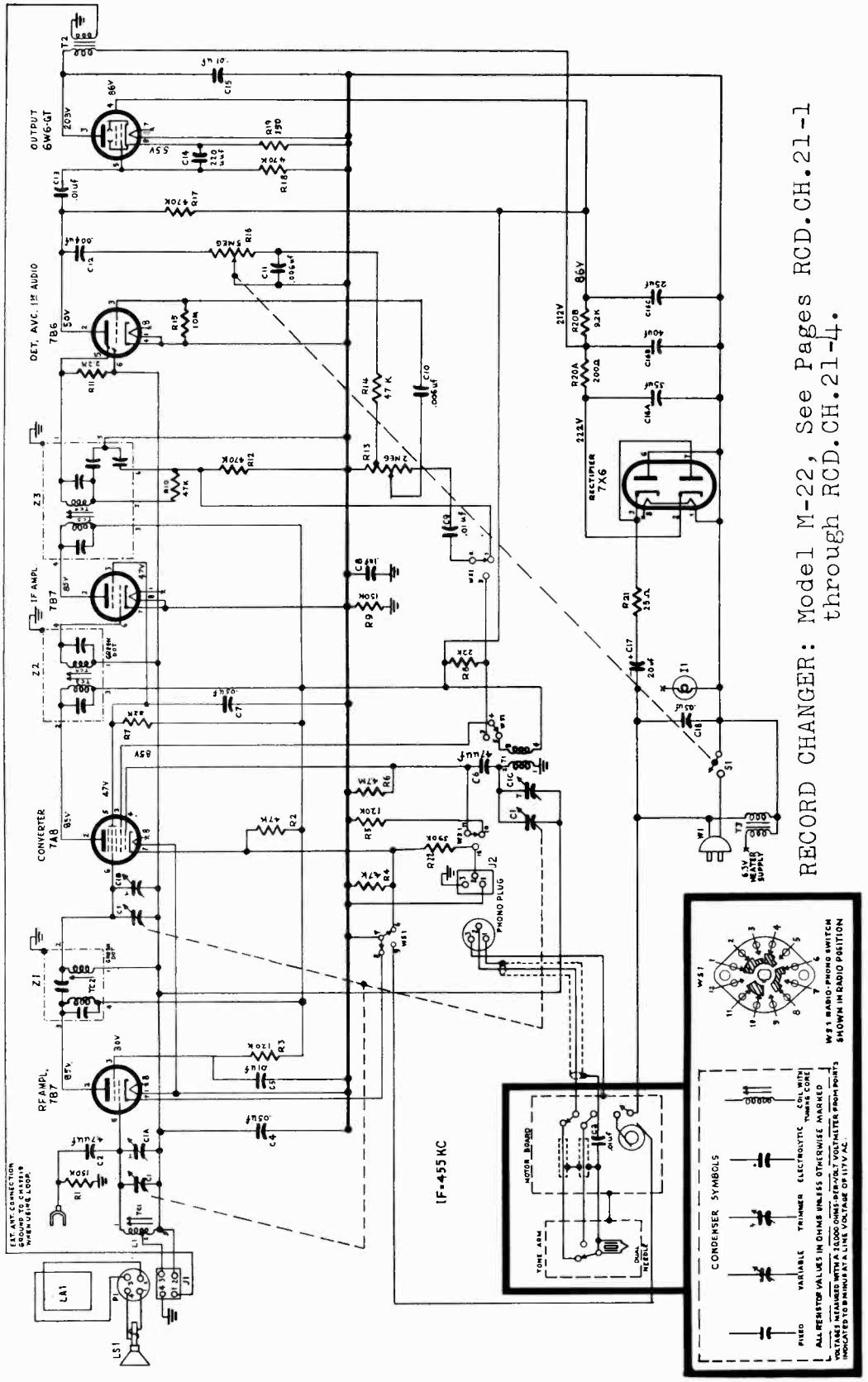


Figure 4. Philco Radio-Phonograph Models 51-1730 and 51-1730 (L), Schematic Diagram

Run No. 2 C4 changed in value to .1 $\mu f.$, part no. 61-0113
C9 changed in value to .006 $\mu f.$, part no. 45-3500-7*

MODELS 51-1730, 51-1730(L)

REPLACEMENT PARTS LIST

NOTE: Part numbers marked with an asterisk (*) are general replacement items. These numbers may not be identical with those on factory parts; also, the electrical values of some replacement items may differ from the values indicated in the schematic diagram and parts list. The values substituted in any case are so chosen that the operation of the radio will be either unchanged or improved. When ordering replacements, use only the "Service Part No."

Symbol	Description	Part No.
C1	Condenser, tuning gang, 3-section	31-2748-2
C1A	Condenser, aerial trimmer	Part of C1
C1B	Condenser, r-f trimmer	Part of C1
C1C	Condenser, oscillator trimmer	Part of C1
C2	Condenser, aerial (external) coupling, 4.7 $\mu\mu f$.	30-1221-5*
C3	Condenser, d-c blocking, phono isolation, .01 μf.	61-0120*
C4	Condenser, a-v-c filter, .05 μf.	61-0122*
C5	Condenser, screen by-pass, .01 μf.	61-0120*
C6	Condenser, d-c blocking, 47 $\mu\mu f$.	60-00475417*
C7	Condenser, screen by-pass, .05 μf.	61-0122*
C8	Condenser, by-pass, B– to ground, .1 μf.	61-0113*
C9	Condenser, d-c blocking, .01 μf.	61-0120*
C10	Condenser, d-c blocking, .006 μf.	61-0105*
C11	Condenser, tone compensation, .01 μf.	61-0120*
C12	Condenser, tone compensation, high-cut, .004 μf.	61-0179*
C13	Condenser, d-c blocking, .01 μf.	61-0120*
C14	Condenser, grid by-pass, 220 $\mu\mu f$.	62-122001001*
C15	Condenser, tone compensation, .01 μf.	61-0120*
C16	Condenser, electrolytic, 3-section	30-2568-45
C16A	Condenser, filter, 35 μf., 250v	Part of C16
C16B	Condenser, filter, 40 μf., 250v	Part of C16
C16C	Condenser, filter, 25 μf., 250v	Part of C16
C17	Condenser, electrolytic, voltage doubler, 20 μf., 150v	30-2568-22
C18	Condenser, line by-pass, .05 μf.	61-0122*
I1	Pilot lamp	34-2064
J1	Socket, aerial input and speaker	27-6214-1
J2	Socket, phono input	27-6126*
L1	Coil, aerial	32-4413-1
LA1	Loop aerial	32-4394-8
LS1	Speaker, 8-inch, p-m	36-1626-1
P1	Cable-and-plug assembly, speaker and loop	41-3948-3
R1	Resistor, aerial isolating, 150,000 ohms	66-4158340*
R2	Resistor, voltage divider, 47,000 ohms	66-3478340*
R3	Resistor, screen dropping, 120,000 ohms	66-4128340*
R4	Resistor, voltage divider (phono), 4700 ohms	66-2478340*
R5	Resistor, grid return, 120,000 ohms	66-4128340*
R6	Resistor, grid return (phono), 4.7 megohms	66-5478340*
R7	Resistor, dropping, 22,000 ohms	66-3228340*
R8	Resistor, plate load (phono), 22,000 ohms	66-3228340*
R9	Resistor, leakage, 150,000 ohms	66-4158340*
R10	Resistor, i-f filter, 47,000 ohms	66-3478340*
R11	Resistor, a-v-c diode load, 2.2 megohms	66-5228340*
R12	Resistor, diode load, 470,000 ohms	66-4478340*
R13	Volume control, 2 megohms, tapped at 1 megohm	33-5535-29
R14	Resistor, tone compensation, 47,000 ohms	66-3478340*
R15	Resistor, grid return, 10 megohms	66-6108340*
R16	Tone control (with off-on switch), 5 megohms	33-5566-19
R17	Resistor, plate load, 470,000 ohms	66-4478340*
R18	Resistor, grid return, 470,000 ohms	66-4478340*
R19	Resistor, cathode bias, 150 ohms	66-1154340*
R20	Resistor, 2-section, wire-wound	33-3445-1
R20A	Resistor, filter, 200 ohms, 2 watts	Part of R20
R20B	Resistor, filter, 9200 ohms, 4 watts	Part of R20
R21	Resistor, current limiting, 25 ohms	33-1334-5
R22	Resistor, phono tone compensation, 390,000 ohms	66-4398340*
S1	Switch, off-on	Part of R16
T1	Transformer, oscillator	32-4263
T2	Transformer, output	32-8460-1
T3	Transformer, filament	32-8961
W1	Line cord	L-2183*
WS1	Switch, wafer, radio-phono	42-1926
Z1	Transformer, r-f	32-4399-4A
Z2	Transformer, 1st i-f	32-4160A
Z3	Transformer, 2nd i-f	32-4240A

MISCELLANEOUS

Description	Service Part No.
Cabinet, 51-1730	10821
Cabinet, 51-1730 (L)	10821-1
Dial scale	54-5100
Domes (4)	45-6190
Door pull	56-6493
Door pull, light cabinet	56-6493-1
Door support	76-6275
Frame, changer mounting	76-6264
Knife hinge (2), RH and LH	45-6036
Knife, hinge (2), RH and LH, light cabinet	45-6036-1
Rubber band (2), scale mounting	54-4480
Scale strap (2), ends	56-4860
Scale, strap, middle	56-4756FE11
Screw (6), scale strap mounting	1W25328FE11
Speaker bolts (4)	W-700-2
Tapped stud (2)	56-6296
Washer, fiber (4), speaker mounting	27-7467
Dial backplate assembly	76-5723
Bracket-and-pulley assembly	76-4003
Bumper, rubber (2)	54-4181
Diffusing panel	54-7606-1
Fastener, snap	28-4342FA3
Spring (2)	56-3841
Drive cord, 25-foot spool	48-8750*
Pointer	56-5630-3
Spring, pointer drive	56-2617
Fish paper	27-9111
Knob (1)	54-4718-12
Knob (3)	54-4718-6
Mount, rubber, gang mounting (4)	27-4771-1
Pilot-lamp bracket-and-clip assembly	76-5722
Pilot-lamp-socket assembly	27-6233-2
Rubber band, around electrolytic	54-4480
Shaft-and-pulley assembly, drive	76-3959-3
Bushing	27-9437
Spring, hairpin (2)	57-1468FA1
Spring, hairpin	57-0985
Sleeve, changer mounting (3)	54-7798
Socket, Loktal (5)	27-6207
Socket, octal	27-6174
Speed nut, changer mounting (3)	W-2554FCP
Spring, changer mounting, heavy (3)	56-7059FA9
Spring, changer mounting, light (3)	56-7059-1FJ47
Spring, gang drive	56-3167
Wafer, electrolytic mtg. (2)	27-9508

MODELS 51-1731,
51-1732

SPECIFICATIONS

CABINET	Wood console, mahogany finish
CIRCUIT	8-tube superheterodyne
FREQUENCY RANGES	
Standard broadcast	540—1630 kc.
FM	88—108 mc.
AUDIO OUTPUT	
Model 51-1731	3.0 watts
Model 51-1732	5.0 watts
OPERATING VOLTAGE	117 volts, 60 cycles, a.c.
POWER CONSUMPTION	
Radio	110 watts
Phonograph	125 watts
AERIALS	Built-in broadcast loop; FM line-cord aerial; provision for connection of external aerials.
INTERMEDIATE FREQUENCIES	
AM	455 kc.
FM	9.1 mc.
PHILCO TUBES (7)	6AU6 r-f ampl., 7F8/S osc.-mixer-phono preamp., 6BA6 1st i-f ampl., 6AU6 2nd i-f ampl., 6V8 det.-a.v.c.-1st audio, 6W6GT (51-1731) or 6Y6GT (51-1732) output, 5AZ4 rectifier.
RECORD PLAYER	Philco Model M-22 All-Speed Automatic Record Changer (for service information, refer to Service Manual PR-1864).

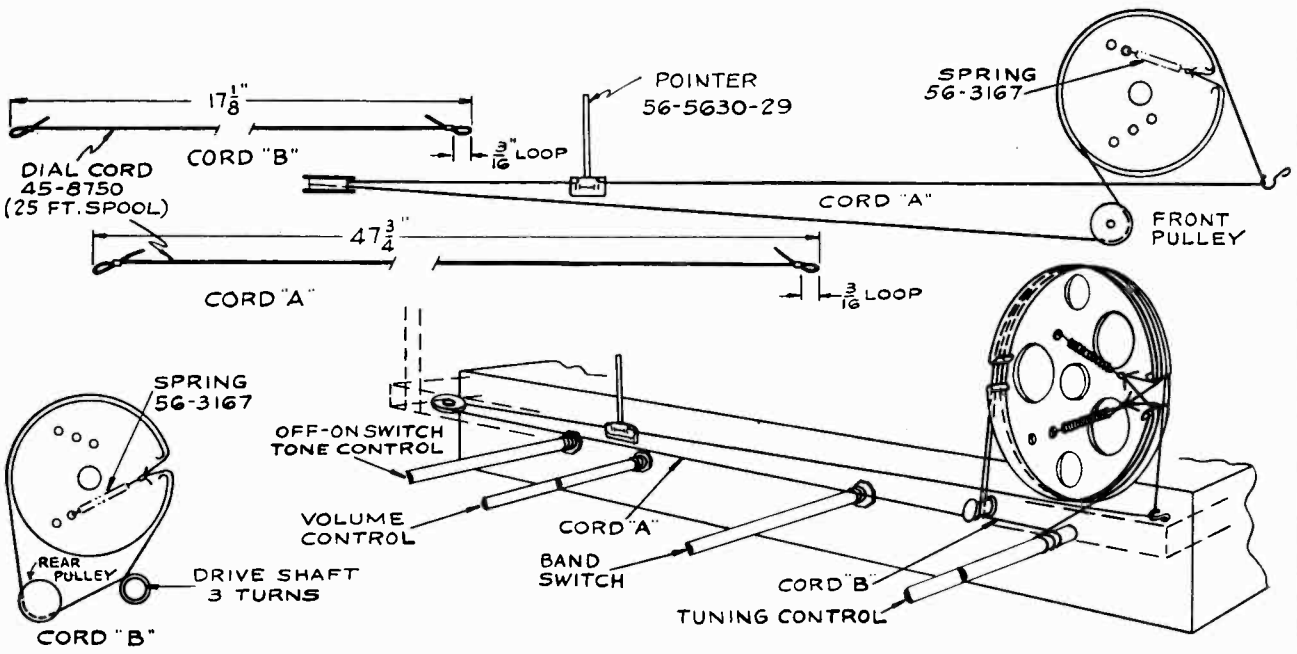


Figure 1. Drive-Cord Installation Details

AM ALIGNMENT PROCEDURE

Make alignment with loop aerial connected to radio. The AM alignment should be made before the FM alignment.

DIAL POINTER: Calibration and pointer-index measurements are shown in figure 3. With tuning gang fully meshed, set pointer to index mark.

OUTPUT METER: Connect across speaker voice-coil terminals.

SIGNAL GENERATOR: Connect AM r-f signal generator as indicated in chart. Generator ground lead to chassis. Use modulated output.

RADIO CONTROLS: Set volume control to maximum, tone control counterclockwise, and band switch to broadcast position.

OUTPUT LEVEL: During alignment, adjust signal-generator output to hold output meter indication below 1.25 volts.

MODELS 51-1731, 51-1732

AM ALIGNMENT CHART

STEP	SIGNAL GENERATOR		RADIO		ADJUST TRIMMER
	CONNECTION TO RADIO	DIAL SETTING	DIAL SETTING	SPECIAL INSTRUCTIONS	
1	Through a .01-μf. condenser to mixer grid, pin 1, of 7F8/S.	455 kc.	Gang fully meshed.	Adjust, in order given, for maximum output.	TC11—2nd AM i-f sec. TC10 2nd AM i-f pri. TC5—1st AM i-f sec. TC4—1st AM i-f pri.
2	Radiating loop. (See Note below.)	1600 kc.	1600 kc.	Adjust for maximum output.	C1D—AM osc. shunt
3	Same as step 2.	1500 kc.	1500 kc.	Adjust for maximum output.	C1B—AM ant. shunt
4	Same as step 2.	580 kc.	580 kc.	Adjust for maximum output. This should not be necessary unless T1 (aerial transformer) has been replaced.	TC1—AM ant. tuning core

RADIATING LOOP: Make up a 6-to-8 turn, 6-inch-diameter loop, using insulated wire; connect to signal generator leads and place near radio loop aerial.

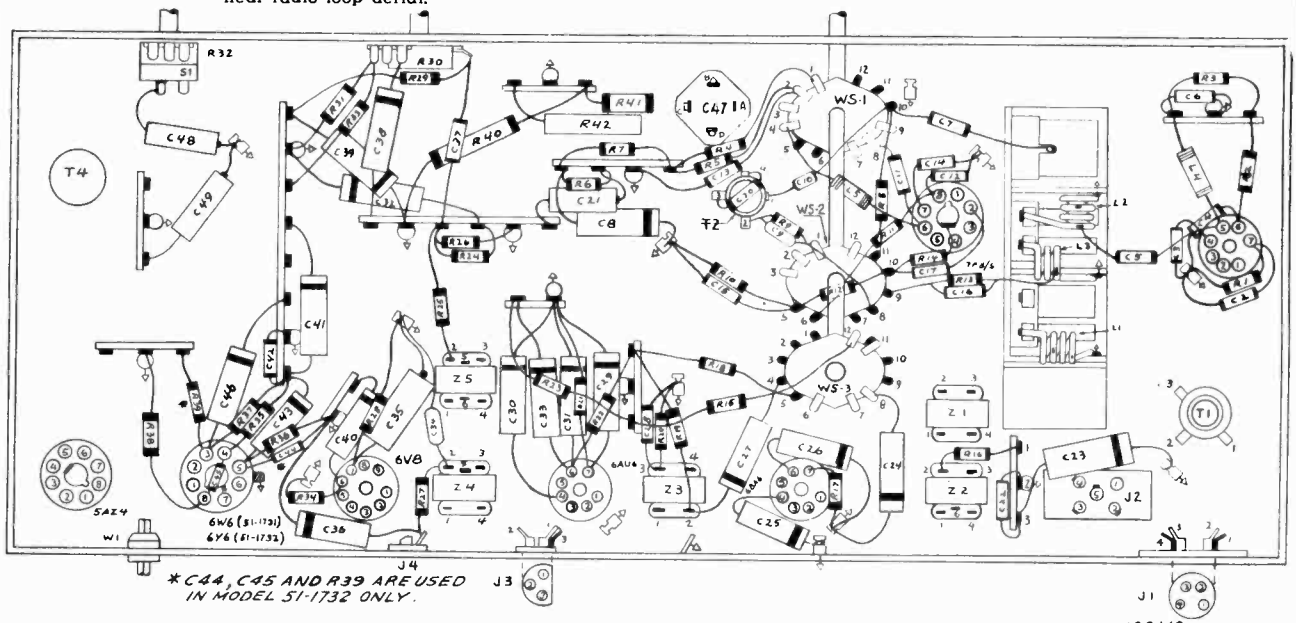


Figure 2. Symbolized Chassis, Showing Parts Placement

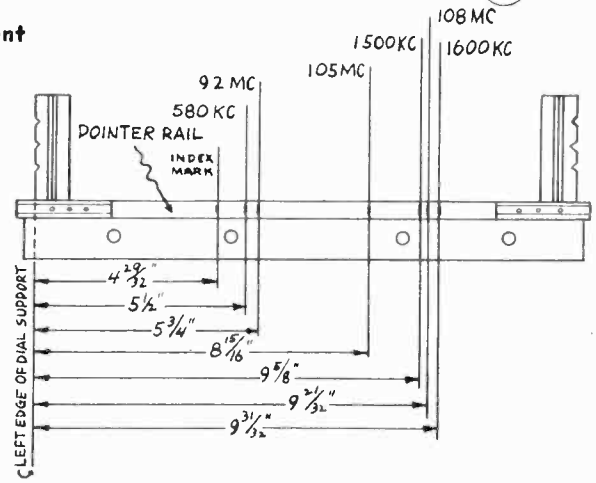


Figure 3. Dial-Backplate Calibration Measurements

MODELS 51-1731,
51-1732

FM ALIGNMENT PROCEDURE

Make the AM alignment first.

RADIO CONTROLS: Set volume control to maximum, tone control counterclockwise, and band switch to FM position. Allow radio and signal generator to warm up for at least 15 minutes before making alignment.

SIGNAL GENERATOR: Use a signal generator capable of delivering a 9.1-mc. FM signal with a deviation of ±80 kc., and modulated AM signals of 92 mc., 105 mc., and 108 mc. Philco Model 7008 Precision Visual Alignment Generator fulfills these requirements. NOTE: The signal generator must be well bonded to radio chassis.

OSCILLOSCOPE: Connect to FM Test jack. Model 7008 is suggested.

OUTPUT METER: Connect across speaker voice-coil terminals.

R-F COIL NOTE: Check resonance of circuits containing coils L1, L2, and L3 by inserting each end of a tuning wand, such as Philco Part No. 45-8885, into coil. If signal strength increases when powdered-iron end is inserted, compress turns slightly. If signal strength increases when brass end is inserted, spread turns slightly. If signal strength decreases when each end is inserted, no adjustment is necessary. Do no spread or compress turns excessively; only a small change is required at these high frequencies.

FM ALIGNMENT CHART

STEP	SIGNAL GENERATOR		RADIO		ADJUST TRIMMER
	CONNECTION TO RADIO	DIAL SETTING	DIAL SETTING	SPECIAL INSTRUCTIONS	
1	Through a .01-μf. condenser to pin 1 of 6AU6 I-F amplifier.*	9.1 mc. ± 80 kc. deviation.	Gang fully meshed.	Adjust TC9 for correct crossover. Adjust TC8 for maximum and equal peaks. Repeat.	TC9—FM det. sec. TC8—FM det. pri.
2	.01-μf. condenser to pin 1 of 6BA6.*	9.1 mc. ± 80 kc. deviation.	Gang fully meshed.	Adjust, in order given, for maximum and equal peaks. Repeat.	TC7—FM 2nd i-f sec. TC6—FM 2nd i-f pri.
3	.01-μf. condenser to pin 1 of 7F8/S.*	9.1 mc. ± 80 kc. deviation.	Gang fully meshed.	Adjust, in order given, for maximum and equal peaks. Repeat.	TC3—FM 1st i-f sec. TC2—FM 1st i-f pri.
4	Through a 300 ohm dummy aerial to FM aerial socket, J1.	108 mc.	108 mc.	Adjust trimmer for maximum reading on output meter.	C18—FM osc.
5	Same as step 4.	105 mc.	105 mc.	Adjust for maximum output while rocking gang.	C1C—FM r-f C1A—FM aerial
6	Same as step 4.	92 mc.	92 mc.	Adjust coils, in order given, for proper resonance (see R-F COIL NOTE).	L3—FM osc. coil L2—FM r-f coil L1—FM aerial coil

*CAUTION: Do not overload! When aligning the i-f stages, the curve will be distorted or destroyed if too great a signal is used. To check, attenuate the signal input. If the curve changes in form, rather than merely decreasing in amplitude, the stage is overloaded.

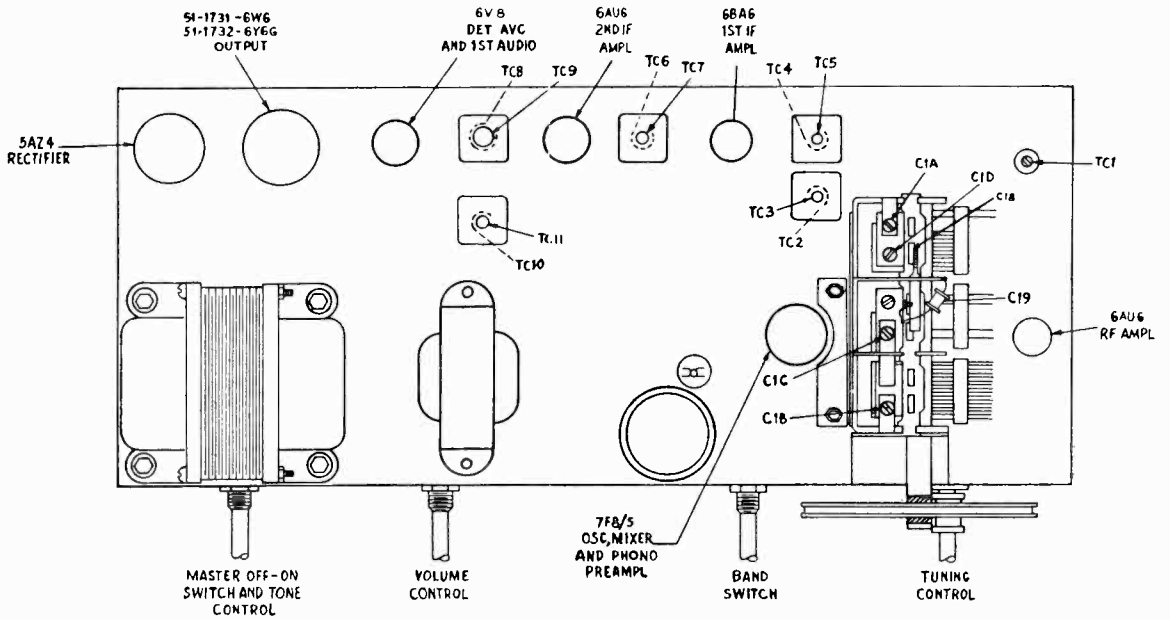


Figure 5. Top View, Showing Trimmer Locations

MODELS 51-1731, 51-1732

REPLACEMENT PARTS LIST

NOTE: Part numbers identified by an asterisk (*) are general replacement items. These numbers may not be identical with those on factory parts; also, the electrical values of some replacement items may differ from the values indicated in the schematic diagram and parts list. The values substituted in any case are so chosen that the operation of the radio will be either unchanged or improved. When ordering replacements, use only the "Service Part No."

Reference Symbol	Description	Service Part No.
C1	Condenser, tuning gang, five section	31-2756-2
C2	Condenser, cathode by-pass, 100 $\mu\mu f$.	62-110001001
C3	Condenser, filament by-pass, 100 $\mu\mu f$.	62-110001001
C4	Condenser, screen by-pass, 1500 $\mu\mu f$.	62-215001001
C5	Condenser, d-c blocking, 220 $\mu\mu f$.	62-122001001
C6	Condenser, plate decoupling, 100 $\mu\mu f$.	62-110001001
C7	Condenser, d-c blocking, 220 $\mu\mu f$.	62-122001001
C8	Condenser, plate decoupling (Phono), .05 μf.	61-0122*
C9	Condenser, d-c blocking, .01 μf. mica	30-1226-10
C10	Condenser, neutralization, 3.3 $\mu\mu f$.	30-1224-59
C11	Condenser, d-c blocking, 220 $\mu\mu f$.	62-122001001
C12	Condenser, grid by-pass, 100 $\mu\mu f$.	62-110001001
C13	Condenser, plate decoupling (FM), 100 $\mu\mu f$.	62-110001001
C14	Condenser, filament by-pass, 100 $\mu\mu f$.	62-110001001
C15	Condenser, grid by-pass (Phono), 1500 $\mu\mu f$.	62-215001001
C16	Condenser, d-c blocking, 47 $\mu\mu f$.	62-051009001*
C17	Condenser, cathode by-pass, 100 $\mu\mu f$.	62-110001001
C18	Condenser, trimmer (FM)	31-6511-10
C19	Condenser, temperature compensating, 4.7 $\mu\mu f$.	30-1224-29
C20	Condenser, temperature compensating, 7.5 $\mu\mu f$.	30-1224-65
C21	Condenser, d-c blocking, phono coupling, .001 μf.	45-3505-55*
C22	Condenser, plate decoupling, 100 $\mu\mu f$.	62-110001001
C23	Condenser, plate decoupling, .01 μf.	61-0120*
C24	Condenser, a-v-c by-pass, .01 μf.	61-0120*
C25	Condenser, filament by-pass, .01 μf.	61-0120*
C26	Condenser, screen by-pass, .002 μf.	61-0062*
C27	Condenser, plate decoupling, .006 μf.	45-3500-7*
C28	Condenser, by-pass, 100 $\mu\mu f$.	62-110001001
C29	Condenser, cathode by-pass, .01 μf.	61-0120*
C30	Condenser, filament by-pass, .01 μf.	61-0120*
C31	Condenser, screen by-pass, .002 μf.	61-0062*
C33	Condenser, plate decoupling, .01 μf.	61-0120*
C34	Condenser, i-f filter, 150 $\mu\mu f$.	60-10155407
C35	Condenser, electrolytic, diode load filter, 2 μf., 50v	30-2417-7
C36	Condenser, de-emphasis, .002 μf.	61-0062*
C37	Condenser, tone compensation, 100 $\mu\mu f$.	62-110001001
C38	Condenser, d-c blocking, .02 μf.	61-0108*
C39	Condenser, tone compensation, Model 51-1731—.02 μf.	61-0108*
	Model 51-1732—.03 μf.	30-4517
C40	Condenser, d-c blocking, .006 μf.	45-3500-7*
C41	Condenser, tone control, hi-cut, .006 μf.	45-3500-7*
C42	Condenser, plate by-pass, 100 $\mu\mu f$.	62-110001001
C43	Condenser, d-c blocking, .006 μf.	45-3500-7*
C44	Condenser, grid by-pass, parasitic suppression, 51 $\mu\mu f$., Model 51-1732 only	62-051009001
C45	Condenser, screen by-pass, parasitic suppression, 51 $\mu\mu f$., Model 51-1732 only	62-051009001
C46	Condenser, tone compensation, .006 μf.	45-3500-7*
C47	Condenser, electrolytic, 4 section, Model 51-1731	30-2570-63
	Model 51-1732	30-2570-64
C47A	Condenser, cathode by-pass, 10 μf., 25wv	Part of C47
C47B	Condenser, filter, 40 μf., Model 51-1731—300wv	Part of C47
	Model 51-1732—350wv	Part of C47
C47C	Condenser, filter, 60 μf., Model 51-1731—350wv	Part of C47
	Model 51-1732—400wv	Part of C47
C47D	Condenser, filter, 40 μf., Model 51-1731—350wv	Part of C47
	Model 51-1732—400wv	Part of C47
C48	Condenser, line filter, .01 μf.	45-3505-41*
C49	Condenser, line filter, .01 μf.	45-3505-41*
I1	Pilot lamp	34-2065
J1	Socket, FM antenna	27-6214-1
J2	Socket, AM antenna	27-6252-9
J3	Socket, phono input	27-6126
J4	Jack, FM test	27-6180
L1	Coil, FM aerial	32-4489
L2	Coil, FM r-f	32-4490
L3	Coil, FM oscillator	32-4488
L4	Choke, plate load	32-4422-10
L5	Choke, plate load	32-4422-10
LA1	Loop aerial, Model 51-1731	32-4394-10
	Model 51-1732	32-4394-11
LA2	Aerial, FM line cord	41-3791-1
LS1	Speaker, Model 51-1731	36-1626-5
	Model 51-1732	36-1610-6
R1	Resistor, cathode bias, 120 ohms	66-1128340*
R2	Resistor, screen dropping, 27,000 ohms	66-3278340*
R3	Resistor, plate decoupling, 1000 ohms	66-2108340*
R4	Resistor, plate dropping (AM), Model 51-1731—22,000 ohms	66-3228340*
	Model 51-1732—47,000 ohms	66-3478340*
R5	Resistor, plate dropping (FM), Model 51-1731—1000 ohms	66-2108340*
	Model 51-1732—10,000 ohms	66-3108340*
R6	Resistor, plate load (Phono), 27,000 ohms	66-3278340*
R7	Resistor, plate decoupling (Phono), 33,000 ohms	66-3338340*
R8	Resistor, grid return, 1 megohm	66-5108340*
R9	Resistor, parasitic suppressor, Model 51-1731—680 ohms	66-1688340*
	Model 51-1732—1000 ohms	66-2108340*
R10	Resistor, grid return, 1 megohm	66-5108340*
R11	Resistor, grid return, 15,000 ohms	66-3158340*
R12	Resistor, grid return, 330,000 ohms	66-4338340*
R13	Resistor, parasitic suppressor, Model 51-1731—330 ohms	66-1338340*
	Model 51-1732—470 ohms	66-1478340*

MODELS 51-1731,
51-1732

REPLACEMENT PARTS LIST (Cont.)

Reference Symbol	Description	Service Part No.
R14	Resistor, cathode bias (phono), 6800 ohms	66-2688340*
R15	Resistor, plate dropping,	
	Model 51-1731—22,000 ohms	66-3228340*
	Model 51-1732—33,000 ohms	66-3338340*
R16	Resistor, grid return, 1 megohm	66-5108340*
R17	Resistor, cathode bias, 47 ohms	66-0478340*
R18	Resistor, screen dropping,	
	Model 51-1731—22,000 ohms	66-3228340*
	Model 51-1732—10,000 ohms	66-3108340*
R19	Resistor, plate decoupling, 2200 ohms	66-2228340*
R20	Resistor, grid return, 1 megohm	66-5108340*
R21	Resistor, cathode bias, 120 ohms	66-1128340*
R22	Resistor, screen dropping, 15,000 ohms	66-3158340*
R23	Resistor, plate decoupling, 1000 ohms	66-2108340*
R24	Resistor, a-v-c filter, 3.3 megohms	66-5338340*
R25	Resistor, i-f filter, 47,000 ohms	66-3478340*
R26	Resistor, a-v-c voltage divider, 470,000 ohms	66-4478340*
R27	Resistor, de-emphasis, 47,000 ohms	66-3478340*
R28	Resistor, diode load (FM), 47,000 ohms	66-3478340*
R29	Resistor, base boost,	
	Model 51-1731—27,000 ohms	66-3278340*
	Model 51-1732—18,000 ohms	66-3188340*
R30	Volume control	33-5535-27
R31	Resistor, feed-back voltage divider, 4.7 ohms	66-9478340*
R32	Tone control, 4 megohms	33-5566-12
R33	Resistor, inverse feedback, 120 ohms	66-1128340*
R34	Resistor, grid return, 10 megohms	66-6108340*
R35	Resistor, plate load, 470,000 ohms	66-4478340*
R36	Resistor, grid return, 470,000 ohms	66-4478340*
R37	Resistor, inverse feedback, 2.7 megohms	66-5278340*
R38	Resistor, cathode bias,	
	Model 51-1731—120 ohms, 1w	66-1124340*
	Model 51-1732—180 ohms, 1w	66-1184340*
R39	Resistor, parasitic suppressor, 10 ohms, Model 51-1732 only	66-0108340*
R40	Resistor, bleeder,	
	Model 51-1731—22,000 ohms	66-3225340*
	Model 51-1732—120,000 ohms	66-4125340*
R41	Resistor, filter,	
	Model 51-1731—3300 ohms, 2w	66-2335340*
	Model 51-1732—2500 ohms, 2w	33-1335-93
R42	Resistor, filter, 330 ohms, 7w	33-1335-90
S1	Switch, off-on	Part of R32
T1	Transformer, aerial, AM	32-4413-1
T2	Transformer, oscillator, AM,	
	Model 51-1731	32-4458-2
	Model 51-1732	32-4458-3
T3	Transformer, output, Model 51-1731	32-8460-1
	Model 51-1732	32-8407
T4	Transformer, power, Model 51-1731	32-8459
	Model 51-1732	32-8462
W1	Line cord	L-2183*
WS	Wafer switch	42-1942
Z1	Transformer, 1st FM	32-4372A
Z2	Transformer, 1st AM	32-4258-3A
Z3	Transformer, 2nd FM	32-4372-2A
Z4	Transformer, 3rd FM	32-4310-3A
Z5	Transformer, 2nd AM	32-4240-3A

MISCELLANEOUS

Description	Service Part No.
Cabinet, Model 51-1731	10822
Dial scale	54-5101
Domes (4)	45-6190
Door pull	76-6241
Knife hinge (2)	45-6036
Lid support	76-6275
Spring	56-8510
Tapped stud (2)	56-6296
Cabinet, Model 51-1732	10824
Bullet catch (2)	45-6002
Dial scale	54-5102
Domes (4)	3363-2
Doors, matched set of 2	45-6621
Door pull (2)	56-7062
Knife hinge, left hand (2)	56-8479
Knife hinge, right hand (2)	56-8479-1
Strike plate (2)	45-6003
Cable and plug assembly, speaker and loop	41-3948-4
Changer mounting parts	
Bumper (2)	55-0890
Clip, bottom mounting (4)	W2235-1FA9
Drive screws (8)	1W19432FA1
Frame	76-6257
Knob, pull	56-8496FCP
Screw, knob mounting	1W10078FA3
Rail assembly, LH	76-6258
Rail assembly, RH	76-6259
Sleeve, rubber (3)	54-7798
Speed nut (3)	W-2554FCP
Spring, changer mounting (3), top (heavy)	56-7059FA9
Spring, changer mounting (3), bottom (light)	56-7059-1FCP
Clip, pilot lamp socket mounting	56-3545FA3
Diffusing panel	54-8171-1
Spring, diffusing panel mounting	56-3587-1
Drive cord, 25 foot spool	45-8750
Frame assembly, changer mounting	76-6264
Knob (3)	54-4718-6
Knob, with brown dot	54-4718-12
Pointer	56-5630-29
Spring, gang and pointer drive (2)	56-3167
Pointer rail assembly, backplate	76-6195
Rubber band, scale mounting (2)	54-4480
Rubber mounts, gang (5)	27-4771-1
Scale strap	56-4756FE11
Scale straps (2)	56-2234-2
Socket, Loktal, 5AZ4	27-6207
Socket, Loktal, 7F8	27-6207-1
Socket, 7-pin miniature (3)	27-6265-1
Socket, 9-pin miniature	27-6203-5
Socket, octal	27-6174
Socket, pilot lamp	27-6233-16
Speaker bolts (4)	W700-2
Tuning shaft	56-8429
Bushing	27-9437
Spring, hairpin	57-1468FA3
Washer, fibre, speaker mounting (4)	27-7467

MODELS 51-1731, 51-1732

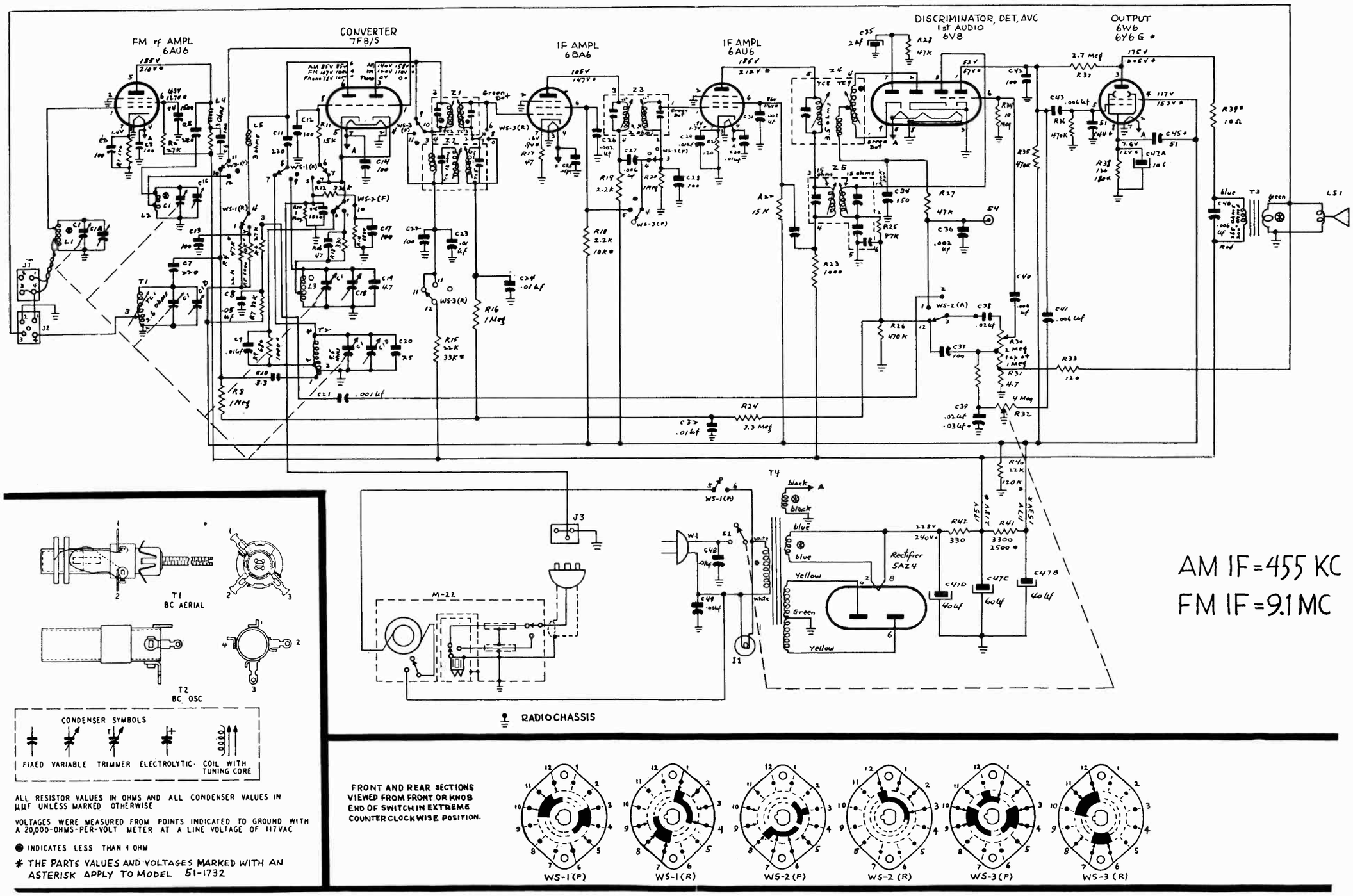


Figure 4. Philco Radio-Phonograph Models 51-1731 and 51-1732, Schematic Diagram

RECORD CHANGER: Model M-22, on Pages RCD.CH.21-1 through RCD.CH.21-4.

MODELS 51-1733,
51-1733(L), 51-1734

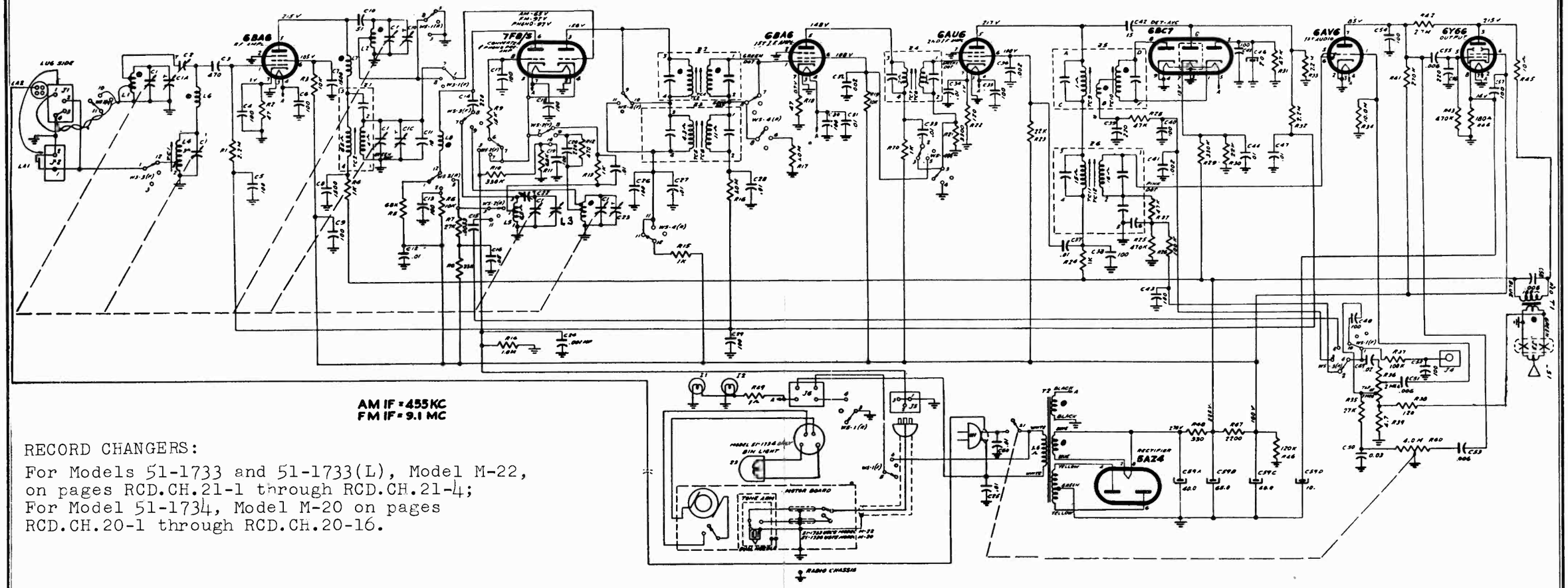


Figure 4. Philco Radio-Phonograph Models 51-1733, 51-1733(L), and 51-1734, Schematic Diagram

MODELS 51-1733,
51-1733(L), 51-1734

SPECIFICATIONS

CABINET	
Model 51-1733	Wood console, mahogany finish
Model 51-1733 (L)	Wood console, light oak finish
Model 51-1734	Mahogany finish
CIRCUIT	8-tube superheterodyne
FREQUENCY RANGES	
Standard broadcast	540—1630 kc.
FM	88—108 mc.
AERIALS	Built-in broadcast loop; FM line-cord aerial; provision for connection of external aerials
INTERMEDIATE FREQUENCIES	
AM	455 kc.
FM	9.1 mc.
PHILCO TUBES (8)	6BA6 r-f ampl., 7F8/S osc.-mixer-phono preampl., 6BA6 1st i-f ampl., 6AU6 2nd i-f ampl., 6BC7 FM det.-a.v.c., 6AV6 AM det.-1st audio, 6Y6G output, 5AZ4 rectifier
RECORD PLAYER	Models 51-1733 and 51-1733(L). Philco Model M-22 All-Speed Automatic Record Changer (For service information, refer to Service Manual PR-1864).
	Model 51-1734. Philco Model M-20 All-Speed Automatic Record Changer (for service information, refer to Service Manual PR-1731).

AUDIO OUTPUT	5 watts
OPERATING VOLTAGE	117 volts, 60 cycles, a.c.
POWER CONSUMPTION	
Radio	95 watts
Phonograph	110 watts

Figure 1. Drive-Cord Installation Details

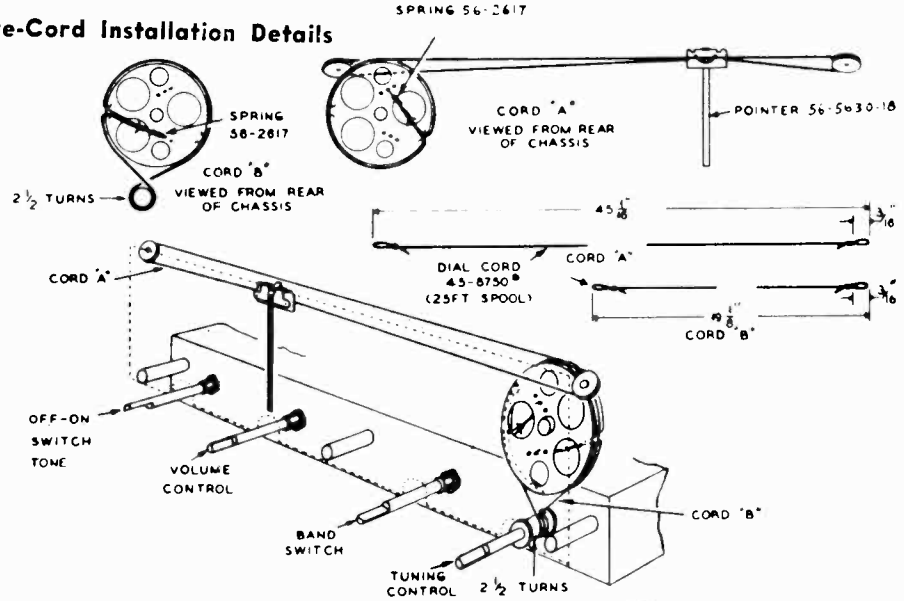
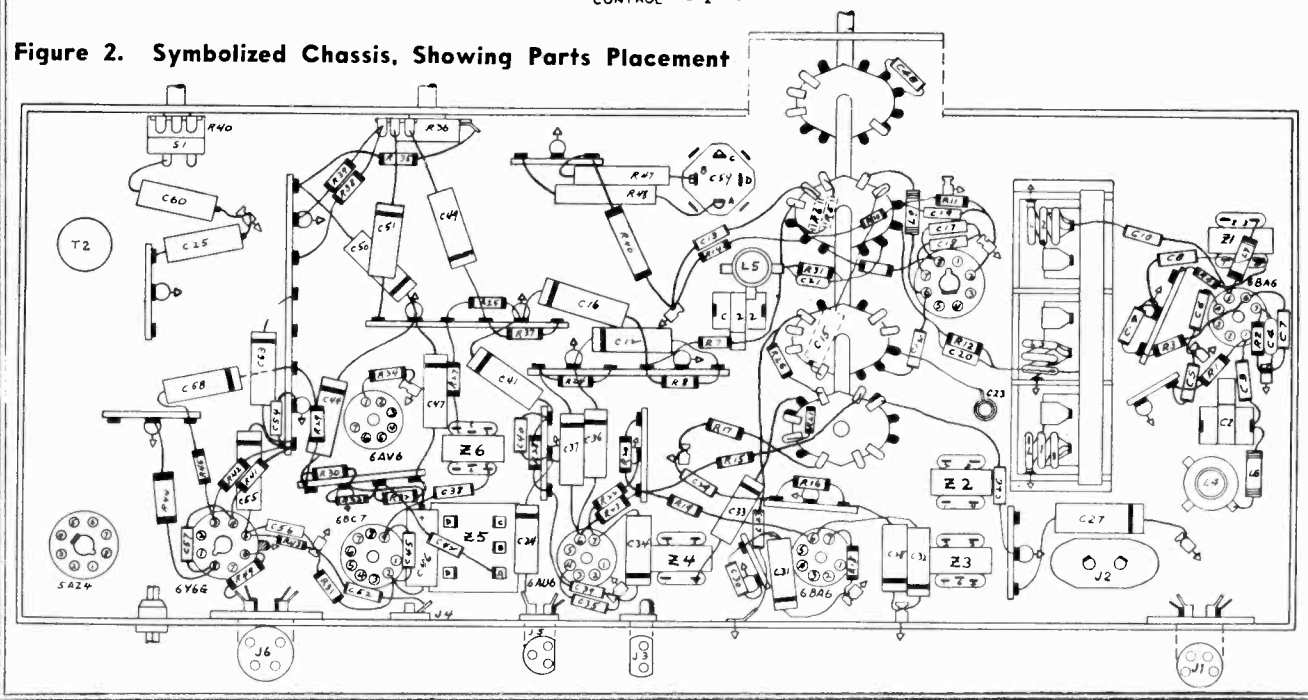


Figure 2. Symbolized Chassis, Showing Parts Placement



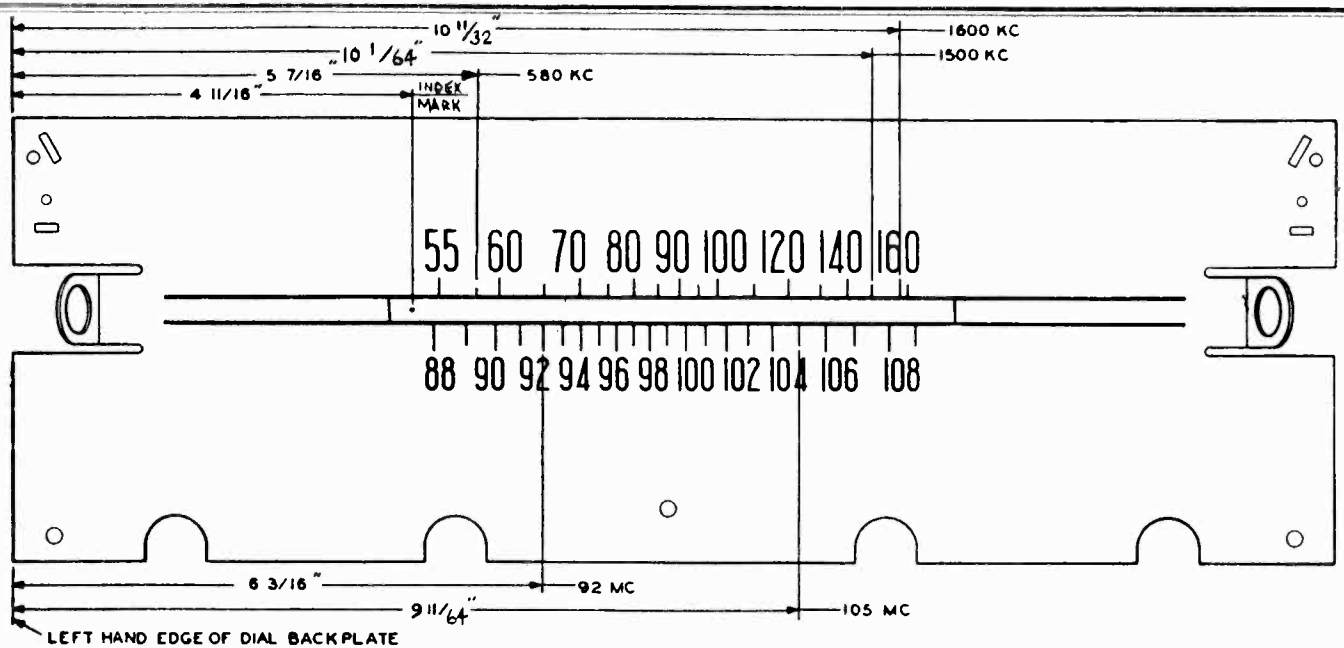


Figure 3. Dial-Backplate Calibration Measurements

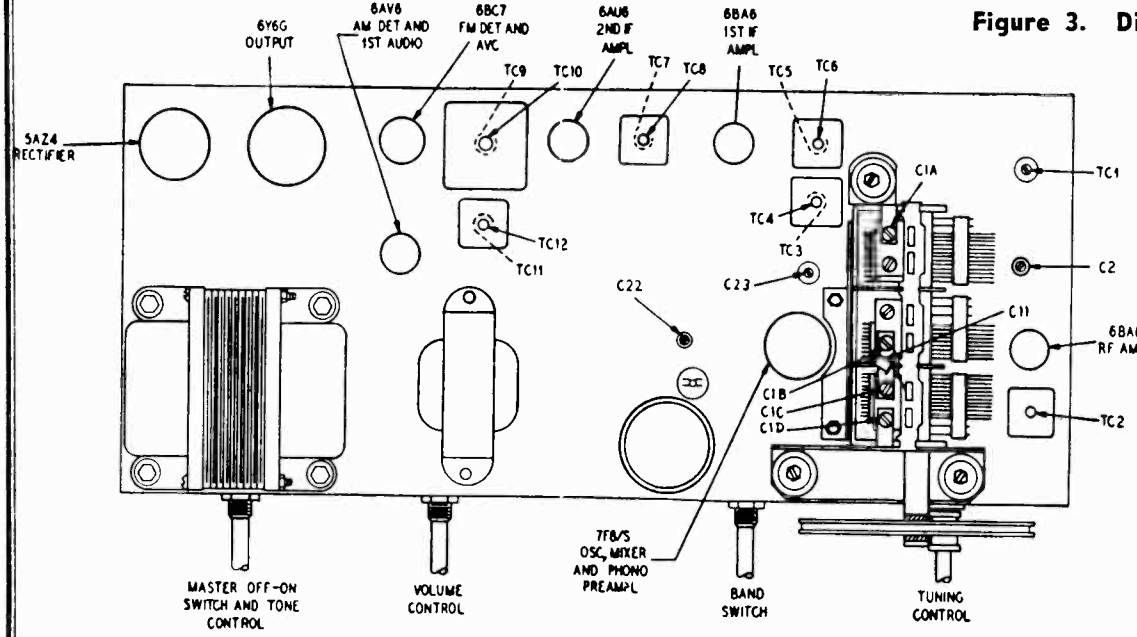


Figure 5. Top View, Showing Trimmer Locations

AM ALIGNMENT PROCEDURE

Make alignment with loop aerial connected to radio. The AM alignment should be made before the FM alignment.

DIAL POINTER: Calibration and pointer-index measurements are shown in figure 5. With tuning gang fully meshed, set pointer to index mark.

OUTPUT METER: Connect across speaker voice-coil terminals.

SIGNAL GENERATOR: Connect AM r-f signal generator as indicated in chart. Use modulated output.

RADIO CONTROLS: Set volume control to maximum, tone control counterclockwise, and band switch to broadcast position.

OUTPUT LEVEL: During alignment, adjust signal-generator output to hold output-meter indicator below 1.25 volts.

MODELS 51-1733, 51-1733(L), 51-1734

AM ALIGNMENT CHART

STEP	SIGNAL GENERATOR		RADIO		ADJUST
	CONNECTION TO RADIO	DIAL SETTING	DIAL SETTING	SPECIAL INSTRUCTIONS	
1	Through a .1-μf. condenser to mixer grid, pin 1, of 7F8/S.	455 kc.	Gang fully meshed	Adjust, in order given, for maximum output.	TC12—2nd AM i-f sec. TC11—2nd AM i-f pri. TC6—1st AM i-f sec. TC5—1st AM i-f pri.
2	Radiating loop. (See note below.)	1600 kc.	1600 kc.	Adjust for maximum.	C1B—AM osc. shunt
3	Same as step 2.	580 kc.	580 kc	Adjust, in order given, for maximum while rocking tuning control.	C22—AM osc. series TC2—AM r-f tuning core TC1—AM ant. tuning core
4	Same as step 2.	1500 kc.	1500 kc.	Adjust, in order given, for maximum.	C1C—AM r-f shunt C2—AM ant. shunt
5	Repeat steps 2, 3, and 4 until no further increase is obtained.				

Radiating Loop: Make up a 6-to-8 turn, 6-inch-diameter loop, using insulated wire; connect to signal generator leads, and place near radio loop aerial.

FM ALIGNMENT PROCEDURE

Make the AM alignment first.

RADIO CONTROLS: Set volume control to maximum, tone control counterclockwise, and band switch to FM position. Allow radio and signal generator to warm up for at least 15 minutes before making alignment.

SIGNAL GENERATOR: Use a signal generator capable of delivering a 9.1-mc. FM signal with a deviation of ±80 kc., and modulated AM signals of 92 mc., 105 mc., and 108 mc. Philco Model 7008 Precision Visual Alignment Generator fulfills these requirements. NOTE: Model 7008 must be well bonded to radio chassis.

OSCILLOSCOPE: Connect to FM TEST jack. Model 7008 is suggested.

OUTPUT METER: Connect across speaker voice-coil terminals.

R-F COIL NOTE: Check resonance of circuits containing coils L1, L2, and L3 by inserting each end of a tuning wand, such as Philco Part No. 45-8885, into coil. If signal strength increases when powdered-iron end is inserted, compress turns slightly. If signal strength increases when brass end is inserted, spread turns slightly. If signal strength decreases when each end is inserted, no adjustment is necessary. Do not spread or compress turns excessively; only a small change is required at these high frequencies.

FM ALIGNMENT CHART

STEP	SIGNAL GENERATOR		RADIO		ADJUST
	CONNECTION TO RADIO	DIAL SETTING	DIAL SETTING	SPECIAL INSTRUCTIONS	
1	Through a .1-μf. condenser to pin 1 of 6AU6*.	9.1 mc. ±80 kc. deviation.	Gang fully meshed.	Adjust TC10 for correct crossover. Adjust TC 9 for maximum and equal peaks. Repeat.	TC10—FM det. sec. TC9—FM det. pri.
2	1-μf. condenser to pin 1 of 6BA6*.	9.1 mc. ±80 kc. deviation.	Gang fully meshed.	Adjust, in order given, for maximum and equal peaks. Repeat.	TC8—FM 2nd i-f sec. TC7—FM 2nd i-f pri.
3	Through a .1-μf. condenser to pin 1 of 7F8/S*.	9.1 mc. ±80 kc. deviation.	Gang fully meshed.	Adjust, in order given, for maximum and equal peaks. Repeat.	TC4—FM 1st i-f sec. TC3—FM 1st i-f pri.
4	Through a 300-ohm dummy aerial to FM aerial socket.	108 mc.	108 mc.	Adjust trimmer for maximum reading on output meter.	C23—FM osc.
5	Same as step 4.	105 mc.	105 mc.	Adjust for maximum while rocking gang.	C1D—FM r-f C1A—FM aerial
6	Same as step 4.	92 mc.	92 mc.	Adjust coils, in order given, for proper resonance (see R-F COIL NOTE).	L3—FM osc. coil L2—FM r-f coil L1—FM aerial coil

*CAUTION: Do not overload! When aligning the i-f stages, the curve will be distorted or destroyed if too great a signal is used. To check, attenuate the signal input. If the curve changes in form, rather than merely decreasing in multitude, the stage is overloaded.

MODELS 51-1733,
51-1733(L), 51-1734

REPLACEMENT PARTS LIST

NOTE

Part numbers marked with an asterisk (*) are general replacement items. These numbers may not be identical to those on factory parts; also, the electrical values of some replacement items may differ from the values indicated in the schematic diagram and parts list. The values substituted in any case are so chosen that the operation of the instrument will be either unchanged or improved. When ordering replacements, use only the "Service Part No."

Reference Symbol	Description	Service Part No.
C1	Condenser, 6-gang tuning	31-2750
C2	Condenser, trimmer, ant. shunt	31-6473-6
C3	Condenser, d-c blocking, 470 $\mu\mu f$.	62-147001001
C4	Condenser, cathode by-pass, 100 $\mu\mu f$.	60-10105017
C5	Condenser, a-v-c filter, 100 $\mu\mu f$.	62-110001001
C6	Condenser, filament by-pass, 100 $\mu\mu f$.	62-110001001
C7	Condenser, screen by-pass, 1500 $\mu\mu f$.	62-215001001
C8	Condenser, plate decoupling, 1500 $\mu\mu f$.	62-215001001
C9	Condenser, by-pass, 100 $\mu\mu f$.	62-110001001
C10	Condenser, d-c blocking, 51 $\mu\mu f$.	62-051009001
C11	Condenser, temperature compensating, 10 $\mu\mu f$.	62-010009001
C12	Condenser, by-pass, .01 μf.	61-0120*
C13	Condenser, plate decoupling, 100 $\mu\mu f$.	62-110001001
C14	Condenser, d-c blocking, 220 $\mu\mu f$.	62-122001001
C15	Condenser, d-c blocking, phono coupling, .0033 μf.	45-3505-55*
C16	Condenser, plate decoupling, .05 μf.	61-0122*
C17	Condenser, grid by-pass, 100 $\mu\mu f$.	62-110001001
C18	Condenser, filament by-pass, 100 $\mu\mu f$.	62-110001001
C19	Condenser, cathode by-pass, 100 $\mu\mu f$.	62-110001001
C20	Condenser, d-c blocking, 220 $\mu\mu f$.	62-122001001
C21	Condenser, d-c blocking, .01 μf.	30-1226-10
C22	Condenser, osc. series padder	31-6473-7
C23	Condenser, trimmer, FM osc.	31-6511
C24	Condenser, phono tone compensation, .001 μf.	45-3500-5*
C25	Condenser, line by-pass, .01 μf.	45-3505-41*
C26	Condenser, plate decoupling, 100 $\mu\mu f$.	62-110001001
C27	Condenser, plate decoupling, .01 μf.	61-0120*
C28	Condenser, a-v-c decoupling, .01 μf.	61-0120*
C29	Condenser, a-v-c filter, 100 $\mu\mu f$.	62-110001001
C30	Condenser, filament by-pass, 100 $\mu\mu f$.	62-110001001
C31	Condenser, filament by-pass, .01 μf.	61-0120*
C32	Condenser, screen by-pass, .002 μf.	61-0062*
C33	Condenser, plate decoupling, .01 μf.	61-0120*
C34	Condenser, cathode by-pass, .01 μf.	61-0120*
C35	Condenser, filament by-pass, 100 $\mu\mu f$.	62-110001001
C36	Condenser, screen by-pass, .002 μf.	61-0062*
C37	Condenser, neutralization, .01 μf.	61-0120*
C38	Condenser, plate decoupling, 100 $\mu\mu f$.	62-110001001
C39	Condenser, i-f filter, 220 $\mu\mu f$.	62-122001001
C40	Condenser, i-f filter, 100 $\mu\mu f$.	62-110001001
C41	Condenser, de-emphasis, .002 μf.	61-0062*
C42	Condenser, d-c blocking, a-v-c rectifier coupling, 15 $\mu\mu f$.	62-015400021*
C43	Condenser, i-f filter, 100 $\mu\mu f$.	62-110001001
C44	Condenser, by-pass, .01 μf.	61-0120*
C45	Condenser, by-pass, 100 $\mu\mu f$.	62-110001001
C46	Condenser, electrolytic, diode load filter, 2 μf.	30-2417-7
C47	Condenser, a-v-c filter, .01 μf.	61-0120*
C48	Condenser, tone compensation, 100 $\mu\mu f$.	62-110001001
C49	Condenser, d-c blocking, .02 μf.	61-0108*
C50	Condenser, bass boost, .03 μf.	30-4517
C51	Condenser, d-c blocking, .006 μf.	45-3500-7*
C52	Condenser, i-f by-pass, 100 $\mu\mu f$.	62-110001001
C53	Condenser, treble out, .006 μf.	45-3500-7*
C54	Condenser, plate by-pass, 100 $\mu\mu f$.	62-110001001
C55	Condenser, d-c blocking, .006 μf.	45-3500-7*
C56	Condenser, grid by-pass, 220 $\mu\mu f$.	62-122001001
C57	Condenser, neutralization, 100 $\mu\mu f$.	62-110001001
C58	Condenser, tone compensation, .006 μf.	45-3500-7*
C59	Condenser, electrolytic, 4-section	30-2570-64
C59A	Condenser, filter, 40 μf., 400 wv.	Part of C59
C59B	Condenser, filter, 60 μf., 400 wv.	Part of C59
C59C	Condenser, filter, 40 μf., 350 wv.	Part of C59
C59D	Condenser, cathode by-pass, 10 μf., 25 wv.	Part of C59
C60	Condenser, line by-pass, .01 μf.	45-3505-41*
I1	Pilot lamp	34-2064
I2	Pilot lamp	34-2064
I3	Bin lamp, model 51-1734 only	34-2064
J1	Socket, FM aerial	27-6214-1
J2	Socket, AM aerial	27-6214-14
J3	Socket, speaker	27-6214-12
J4	Socket, FM test	27-6180
J5	Socket, phono input	27-6126*
J6	Socket, phono power	27-6182
L1	Coil, FM aerial	32-4415
L2	Coil, FM r-f	32-4416
L3	Coil, FM osc.	32-4414
L4	Coil, AM aerial	32-4413
L5	Coil, AM osc.	32-4153-6
L6	Choke, aerial isolating	32-4081-2
L7	Choke, plate load	32-4061-2
L8	Choke, plate load	32-4061-2
LA1	Loop aerial, AM	
	Model 51-1733	76-4337-8
	Model 51-1734	76-4337-13
LA2	Line cord aerial FM	41-3791-1
LS1	Speaker	
	Model 51-1733	36-1610-6
	Model 51-1734	36-1610-7
R1	Resistor, grid return, 2.2 megohms	66-5228340*
R2	Resistor, cathode bias, 47 ohms	66-0478340*
R3	Resistor, screen dropping, 10,000 ohms	66-3108340*
R4	Resistor, plate isolating, 1000 ohms	66-2108340*
R5	Resistor, plate load, 68,000 ohms	66-3688340*

MODELS 51-1733, 51-1733(L), 51-1734

REPLACEMENT PARTS LIST (Cont.)

Reference Symbol	Description	Service Part No.
R6	Resistor, plate load, 10,000 ohms	66-3108340*
R7	Resistor, plate load, 27,000 ohms	66-3278340*
R8	Resistor, plate isolating, 33,000 ohms	66-3338340*
R9	Resistor, grid return, 15,000 ohms	66-3158340*
R10	Resistor, grid return (phono), 330,000 ohms	66-4338340*
R11	Resistor, cathode bias, 6800 ohms	66-2688340*
R12	Resistor, parasitic suppressor, 470 ohms	66-1478340*
R13	Resistor, parasitic suppressor, 1000 ohms	66-2108340*
R14	Resistor, crystal load, 1 megohm	66-5108340*
R15	Resistor, plate isolating, 1000 ohms	66-2108340*
R16	Resistor, a-v-c isolating, 1 megohm	66-5108340*
R17	Resistor, grid return, 1 megohm	66-5108340*
R18	Resistor, cathode bias, 47 ohms	66-0478340*
R19	Resistor, screen dropping, 10,000 ohms	66-3108340*
R20	Resistor, plate isolating, 1000 ohms	66-2108340*
R21	Resistor, grid return, 3300 ohms	66-2338340*
R22	Resistor, cathode bias, 120 ohms	66-1128340*
R23	Resistor, screen dropping, 22,000 ohms	66-3228340*
R24	Resistor, plate isolating, 1000 ohms	66-2108340*
R25	Resistor, diode load, 470,000 ohms	66-4478340*
R26	Resistor, audio filter, 100,000 ohms	66-4108340*
R27	Resistor, i-f filter, 47,000 ohms	66-3478340*
R28	Resistor, i-f filter, 47,000 ohms	66-3478340*
R29	Resistor, voltage divider, 330,000 ohms	66-4338340*
R30	Resistor, voltage divider, 22,000 ohms	66-3228340*
R31	Resistor, FM diode load, 47,000 ohms	66-3478340*
R32	Resistor, a-v-c load, 2.2 megohms	66-5228340*
R33	Resistor, a-v-c filter, 2.2 megohms	66-5228340*
R34	Resistor, grid return, 10 megohms	66-6108340*
R35	Resistor, bass boost, 27,000 ohms	66-3278340*
R36	Volume control	33-5535-27
R37	Resistor, isolating, 100,000 ohms	66-4108340*
R38	Resistor, feedback, 120 ohms	66-1128340*
R39	Resistor, voltage divider, feedback, 4.7 ohms	66-9478340*
R40	Tone control, 4 megohms with switch	33-5566-12
R41	Resistor, plate load, 270,000 ohms	66-4278340*
R42	Resistor, inverse feedback, 2.7 megohms	66-5278340*
R43	Resistor, grid return, 470,000 ohms	66-4478340*
R44	Resistor, cathode bias, 180 ohms, 1 watt	66-1184340*
R45	Resistor, parasitic suppressor, 10 ohms	66-0108340*
R46	Resistor, bleeder, 120,000 ohms, 2 watts	63-4125340*
R47	Resistor, filter, 2200 ohms, 2 watts	33-1335-97
R48	Resistor, filter, 330 ohms, 7 watts	33-1335-90
R49	Resistor, pilot lamp dropping, 1 ohm	66-9108340*
S1	Switch, on-off	Part of R40
T1	Transformer, output	32-8407
T2	Transformer, power	32-8406
W1	Line cord	L-2183*
WS	Wafer switch	42-1910
Z1	Transformer, AM r-f	32-4399-3A
Z2	Transformer, 1st FM i-f	32-4372A
Z3	Transformer, 1st AM i-f	32-4258-3A
Z4	Transformer, 2nd FM i-f	32-4372-2A
Z5	Transformer, 3rd FM i-f	32-4417
Z6	Transformer, 2nd AM i-f	32-4240-3A

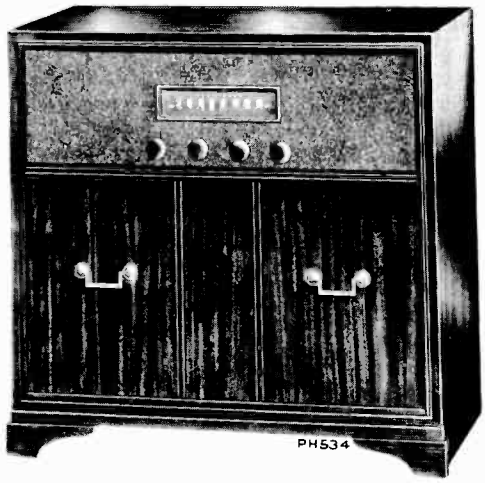
MISCELLANEOUS

Description	Service Part No.
Cabinet, Model 51-1733	10825
Cabinet, Model 51-1733 (L)	10825-1
Bullet catch (2)	45-6002
Changer mounting frame	76-6264
Dial scale	54-5103-1
Dome (4)	45-6190
Doors, matched set, Model 51-1733	45-6622
Model 51-1733 (L)	45-6623
Door pull	56-7998
Door pull plate	56-7999
Knife hinge (LH) (2), Model 51-1733	56-8479
Model 51-1733 (L)	56-8479-2
Knife hinge (RH) (2), Model 51-1733	56-8479-1
Model 51-1733 (L)	56-8479-3
Phono power cable and plug assembly	41-3944-5
Strike plate, Model 51-1733	45-6003
Model 51-1733 (L)	45-6003-1
Cabinet, Model 51-1734	10847
Bezel	56-5855FCP
Bin light and phono power socket and cable assembly	41-3944-6
Clip, bin light mounting	56-3545-6
Dial scale	54-5108

(Parts common to all models)

Changer mounting parts	
Bumper (2)	55-0890
Clip, bottom mounting (4)	W2235-1FA9
Drive screws (8)	JW19432FA1
Frame, Model 51-1733	76-6257
Model 51-1734	76-6296
Knob, pull	56-8496FCP
Screw, knob mounting	1W10078FA3
Rail assembly, (LH), Model 51-1733	76-6258
Model 51-1734	76-6258-1
Rail Assembly, (RH), Model 51-1733	76-6259
Model 51-1734	76-6259-1
Sleeve, rubber (3)	54-7798
Speed nut (3)	W-2554FCP
Spring, changer mounting (3) top (heavy)	56-7059FA9
Spring, changer mounting (3) bottom (light)	56-7059-1FCP
Dial backplate assembly	76-6311
Pilot lamp socket assembly (2)	27-6233-33
Drive shaft assembly	76-5139-1
Bushing, drive shaft	27-9437
Dial cord, 25 foot spool	45-8750*
Spring, drive cords (2)	56-2617
Spring, hairpin, drive shaft retainer	57-1468FA3
Knob (3)	54-4718-6
Knob, band switch	54-4718-12
Pointer	56-5630-18
Scale strap	56-4756FE11
Scale strap (2)	56-2234-2
Socket, Loktal, 5AZ4	27-6207
Socket, Loktal, 7F8/s	27-6207-1
Socket, miniature, 7 pin (4)	27-6265-1
Socket, miniature, 9 pin	27-6203-5
Socket, octal	27-6174
Speaker bolts (4)	W-7002
Washer, fibre, speaker mounting (4)	27-7467

MODEL A55,
Ch. RC-1087



Specifications

Tuning Range .....540-1600 kc

Intermediate Frequency .....455 kc

Tube Complement
(1) RCA 12SA7 .....Converter
(2) RCA 12BA6 .....I.F. Amplifier
(3) RCA 12SQ7.....Det.—AVC.—A.F. Amp.
(4) RCA 50L6GT .....Output
(5) RCA 35Z5GT .....Rectifier

Power Supply Rating .....115 volts, 60 cycles, 50 watts

Loudspeaker
Type 92586-2 ..... 8 in. P.M.
Voice coil impedance .....3.2 ohms at 400 cycles

Tuning Drive Ratio .....12½:1 (6¼ turns of knob)

Dial Lamps (2) .....Type No. 1490, 3.2 volts, .16 amp.

Power Output
Maximum 1.5 watts Undistorted 1 watt

Weight .....67 lbs.

Cabinet Dimensions
Height 29⅛" Width 30⅜" Depth 17"

Record Players (2)
RP 168 .....45 RPM
Record capacity .....up to ten RCA 7 in fine groove
960282-1 ..... 78 or 33 1/3 RPM
Record capacity .....up to ten 12 in. or twelve 10 in.

Alignment Procedure

Output Meter Alignment.—If this method is used, connect the meter across the voice coil and turn the receiver volume control to maximum.

Signal Generator.—For all alignment operations, connect the low side of the signal generator to the receiver chassis and keep the output as low as possible to avoid AVC action.

It may be desirable to use an isolation transformer (117v./117v.) for the receiver if the signal generator is also a.c. operated.

* Alternate loading involves the use of a 22,000 ohm resistor to load the plate winding while the grid winding of the SAME TRANSFORMER is being peaked. Then the grid winding is loaded with the resistor while the plate winding is peaked. Only one winding is loaded at any one time. Remove the 22,000 ohm resistor after T2 and T1 have been aligned.

NOTE: If "alternate loading" is not used during I-F alignment, it may result in non-symmetrical response. This is due to the characteristics of the I-F transformers used in this chassis.

Alignment Tabulation

Steps	Connect high side of sig. gen. to—	Adjust sig. gen. to—	Turn radio dial to—	Adjust for max. output—
1	Converter grid (pin #8 of 12SA7) thru a .1 mf. capacitor	455 kc	Quiet point near 1600 kc	T2 top & bottom 2nd I.F.
2				T1 top & bottom 1st I.F.
3	Repeat Steps 1 and 2 using alternate loading*			
4	Short wire placed near loop for radiated signal	1620 kc	Gang fully open	C6 (osc.)
5		1400 kc	1400 kc signal	C3 (ant.)
6		600 kc	600 kc signal	L 2 (osc.) (rock gang)
7	Repeat Steps 4, 5 and 6			

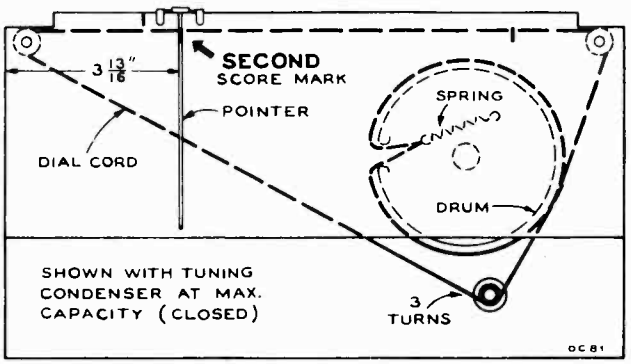
MODEL A55,
Ch. RC-1087

Dial Pointer Position

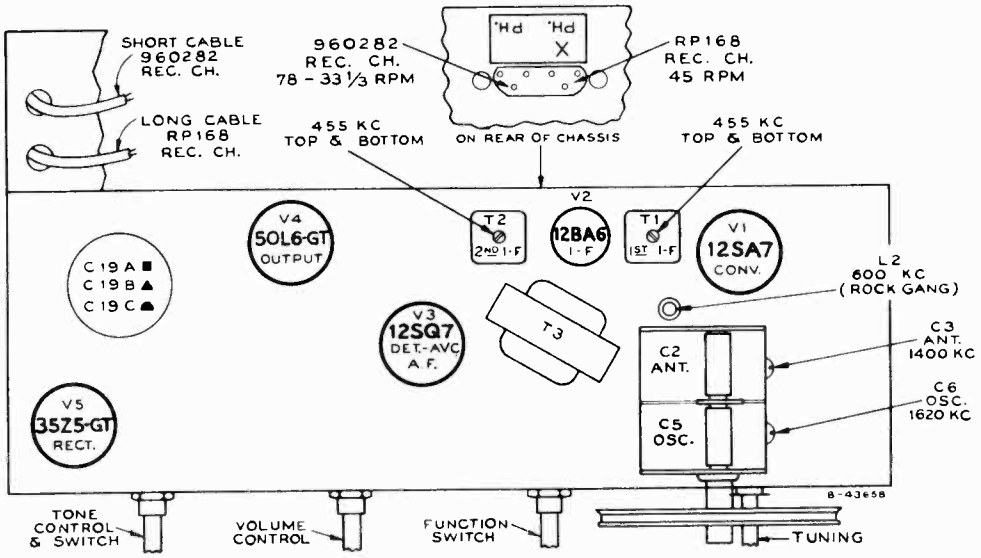
With the tuning condenser fully meshed, set the dial pointer to the SECOND score mark from the left hand edge of the dial back plate.

Lead Dress

1. Dress all heater leads down to chassis and as far as possible from all audio grid and plate winding.
2. Dress power cord to side apron and away from tone control.
3. Dress capacitor C22 down to chassis and keep leads as short as possible.
4. Dress pilot light leads and phono. power cables to side apron and away from tone control.
5. Dress phono. A.C. leads on function switch away from all other terminals and run leads directly through to front apron.
6. Dress output transformer leads down to chassis.
7. Dress C20 away from chassis and wire with as short leads as possible.
8. Dress excess loop leads away from tubes and clear of gang condenser.
9. Dress lead from tone control to S-1 terminal #7 along chassis base and front apron.

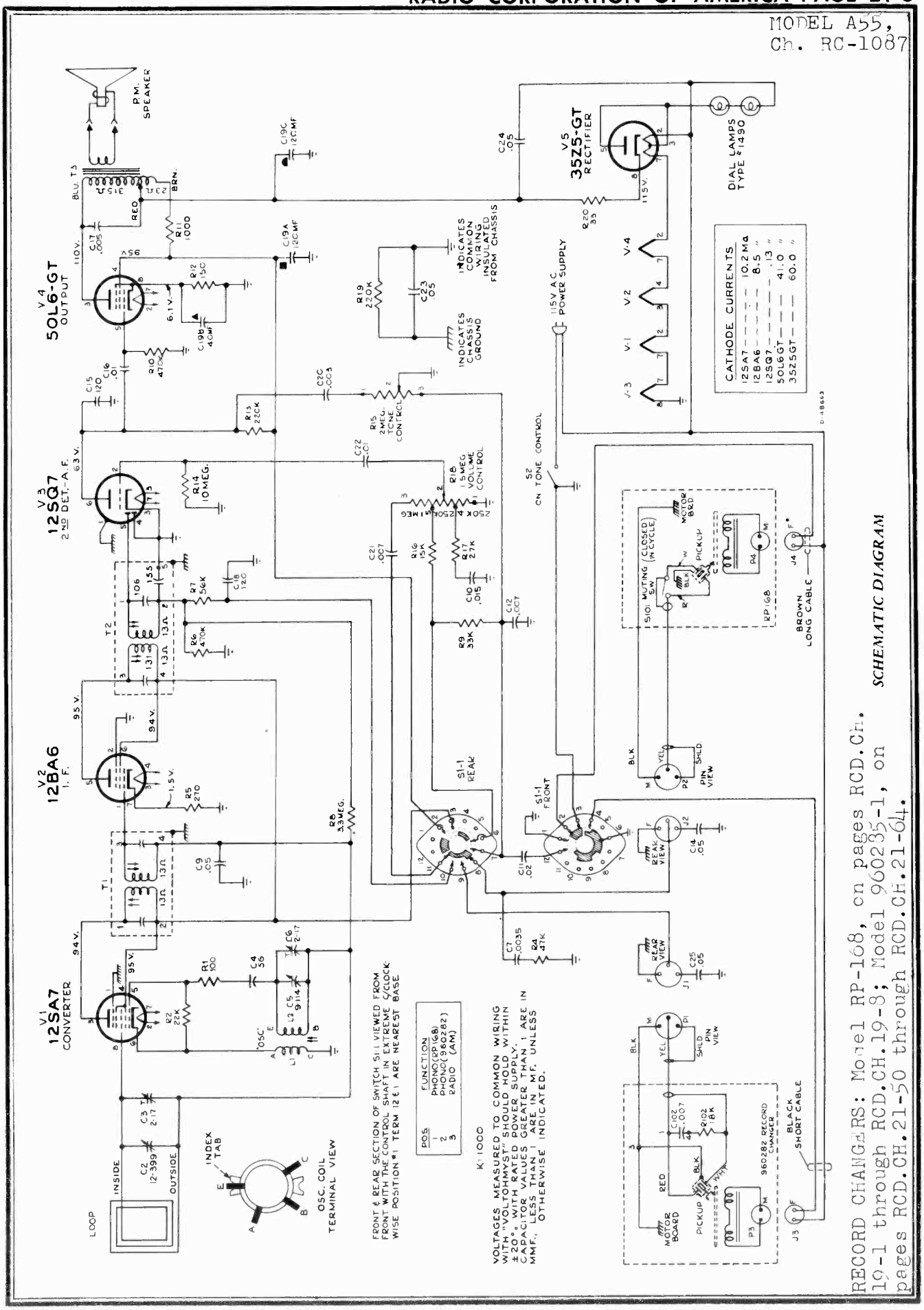


Dial-Indicator and Drive Mechanism



Tube and Trimmer Locations

MODEL A55,
Ch. RC-1087



RECORD CHANGERS: Model RP-168, on pages RCD.Ch. 19-1 through RCD.CH.19-8; Model 960285-1, on pages RCD.CH.21-50 through RCD.CH.21-64.

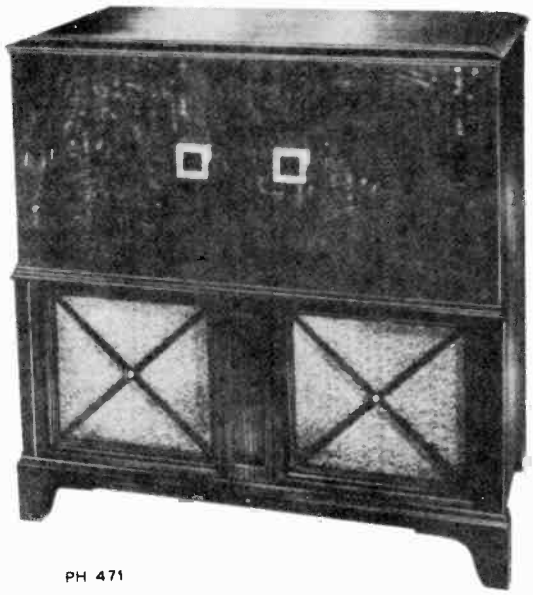
MODEL A55,
Ch. RC-1087

Replacement Parts

STOCK NO.	DESCRIPTION
	CHASSIS ASSEMBLIES RC 1087
74763	Capacitor—Variable tuning capacitor, C2, C3, C5, C6
71924	Capacitor—Ceramic, 56 mmf. C4
39630	Capacitor—Mica, 120 mmf. C15, C18
74678	Capacitor—Electrolytic, comprising 2 sections of 120 mfd., 150 volts and 1 section of 40 mfd., 25 volts C19A, C19B, C19C
70603	Capacitor—Tubular, paper, .003 mfd., 400 volts C20
70604	Capacitor—Tubular, paper, .0035 mfd., 400 volts....C7
73920	Capacitor—Tubular, paper, .005 mfd., 400 volts ..C17
70608	Capacitor—Tubular, paper, .007 mfd., 400 volts C12, C21
73561	Capacitor—Tubular, paper, .01 mfd., 400 volts, C16, C22
70572	Capacitor—Tubular, paper, .015 mfd., 400 volts ..C10
70611	Capacitor—Tubular, paper, .02 mfd., 400 volts C11
73553	Capacitor—Tubular, paper, .05 mfd., 400 volts, C9, C14, C23, C24, C25
73935	Clip—Mounting clip for I.F. transformer
74448	Coil—Oscillator coil L1, L2
30868	Connector—2 contact female connector for motor cable J3, J4
71596	Control—Volume control R18
74761	Control—Tone control and power switch R15, S2
71457	Cord—Power cord and plug
†72953	Cord—Drive cord (approx. 48" overall length required.)
74838	Grommet—Power cord strain relief (1 set)
72283	Grommet—Rubber grommet to mount tuning capacitor.
74765	Indicator—Station selector indicator
71116	Lamp—Dial lamp—Type #1490
74766	Loop—Antenna loop assembly
72776	Pin—Contact pin for speaker lead
75047	Plate—Dial back plate complete with two (2) pulleys less dial
18469	Plate—Bakelite mounting plate for electrolytic capacitor
74767	Receptacle—Dual phono input receptacle J1, J2
74768	Resistor—Wire wound, 33 ohms, 1 watt R20
	Resistors—Fixed, composition:—
	100 ohms, ±20%, ½ watt R1
	150 ohms, ±10%, ½ watt R12
	270 ohms, ±10%, ½ watt R5
	1000 ohms, ±10%, 1 watt R11
	15,000 ohms, ±10%, ½ watt R16
	22,000 ohms, ±10%, ½ watt R2
	27,000 ohms, ±10%, ½ watt R17
	33,000 ohms, ±10%, ½ watt R9
	47,000 ohms, ±10%, ½ watt R4
	56,000 ohms, ±10%, ½ watt R7
	220,000 ohms, ±10%, ½ watt R13, R19
	470,000 ohms, ±10%, ½ watt R6, R10
	3.3 megohm, ±20%, ½ watt R8
	10 megohm, ±20%, ½ watt R14
74764	Shaft—Tuning knob shaft
73117	Socket—Tube socket, miniature for 12BA6
31251	Socket—Tube socket, octal wafer
74014	Socket—Dial lamp socket
74038	Spring—Drive cord tension spring
74762	Switch—Function switch S1
74918	Transformer—First I.F. transformer T1
73037	Transformer—Second I.F. transformer T2
74677	Transformer—Output transformer T3
33726	Washer—"C" washer for tuning knob shaft
	SPEAKER ASSEMBLIES 92586-2 RL 105C2
74758	Cone—Cone and voice coil assembly
74679	Speaker—8" P.M. speaker complete with cone and voice coil
	NOTE:—If stamping on speaker in instrument does not agree with above speaker number, order replacement parts by referring to model number of instrument, number stamped on speaker and full description of part required.
	MISCELLANEOUS
74205	Bezel—Dial bezel less dial
70608	Capacitor—Tubular, paper, .007 mfd., 400 volts ..C102
74298	Clamp—Dial clamp (2 req'd)
X3115	Cloth—Grille cloth for mahogany or walnut instruments
X3116	Cloth—Grille cloth for oak instruments
74192	Connector—3 contact male connector for pickup cables P1, P2
74581	Cover—Mounting screw cover—use with #74582 screw (3 req'd)
71910	Decal—Trade mark decal
74771	Decal—Control panel function decal for mahogany or walnut instruments
74772	Decal—Control panel function decal for oak instruments
74769	Dial—Glass dial scale
74206	Grommet—Rubber grommet to mount 960282 record changer
74931	Knob—Tuning control, volume control or tone control and power switch knob—maroon—for mahogany or walnut instruments
72824	Knob—Tuning control, volume control, function switch or tone control and power switch knob—brown—for oak instruments
74934	Knob—Function switch knob—maroon—for mahogany or walnut instruments
74208	Nut—Tee nut to mount RP168 record changer (3 req'd)
74770	Pull—Door pull
	Resistor—Fixed, composition:
	18,000 ohms, ±10%, ½ watt R102
74582	Screw—#8-32 x 1¾" special head screw to mount RP168 record changer (3 req'd)
74269	Screw—#8-32 x ¾" trimit head screw for door pull
74422	Spring—Conical spring to mount RP168 record changer—upper—L.H.—(2 req'd)
74421	Spring—Conical spring to mount RP168 record changer—upper—R.H.—(1 req'd)
74423	Spring—Conical spring to mount RP168 record changer—lower—(3 req'd)
30900	Spring—Retaining spring for knobs
75040	Spring—Mounting spring for 960282 record changer

†Stock No. 72953 is a reel containing 250 feet of cord.

MODELS A78,
9W78, Ch. RC-1084A



PH 471

Specifications

Tuning Ranges

Standard Broadcast (AM) ..... 540-1,600 kc.
Frequency Modulation (FM) ..... 88-108 mc.

Intermediate Frequency..... AM—455 kc., FM—10.7 mc.

Tube Complement

(1) 6J6..... Mixer and Oscillator
(2) 6BA6..... I. F. Amplifier
(3) 6AU6..... Driver
(4) 6AL5..... Ratio Detector
(5) 6AV6..... AM Det.—AVC—A. F. Amp.
(6) 6V6GT..... Output
(7) 6X5GT..... Rectifier

Power Supply Rating..... 115 volts, 60 cycles, 70 watts

Loudspeaker

Type 92569-9 .....12 in. P.M.
Voice coil impedance at 400 cycles .....3.2 ohms

Tuning Drive Ratio .....18:1 (9 turns of knob)

Pilot Lamps (3) .....Type No. 51, 6-8 volts, 0.2 amp.

Power Output

Maximum .....5 watts
Undistorted .....2 watts

Antennas:

This receiver has built-in antennas for standard broadcast (AM) and frequency modulation (FM) reception.

Under average conditions the (FM) antenna will provide satisfactory reception. However, provision is made for the use of external antennas if desired—connect as indicated below:

FM Antenna: Connect the transmission line from an external FM dipole antenna to "FM" and "G" terminals. Remove the internal FM antenna wire from terminal "FM."

Record Player (2)

RP168 ..... 45 RPM
RP178 ..... 78 RPM

For information on 45 RPM changer refer to RCA Victor RP168 Series Service Data 3rd Ed.

For information on 78 RPM changer refer to RCA Victor RP178 Series Service Data.

Circuit Description

The chassis used in these receivers have a 6J6 tube (V1) (twin triode), one section of which is used as mixer and the other section as oscillator. The FM antenna coil and the FM oscillator coil are placed in such position as to provide coupling between them. A section of the AM oscillator coil is connected in series with the mixer grid input when the range switch is in AM position.

Dual I-F transformers are used, each transformer containing both AM and FM windings. The I-F amplifier is V2 (6BA6).

The range switch has four functions:

(1) Selection of AM, FM ranges or Phono.

(2) Selection of AVC supply voltages to be applied to the controlled tubes. Simple AVC is applied to the grids of V1 and V2 on AM. Delayed AVC is used on FM and is applied only to the grid of V2.

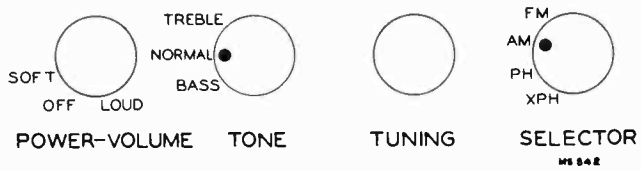
(3) Controls application of B+ voltage to the plate circuits of V1 (disconnected for PHONO operation).

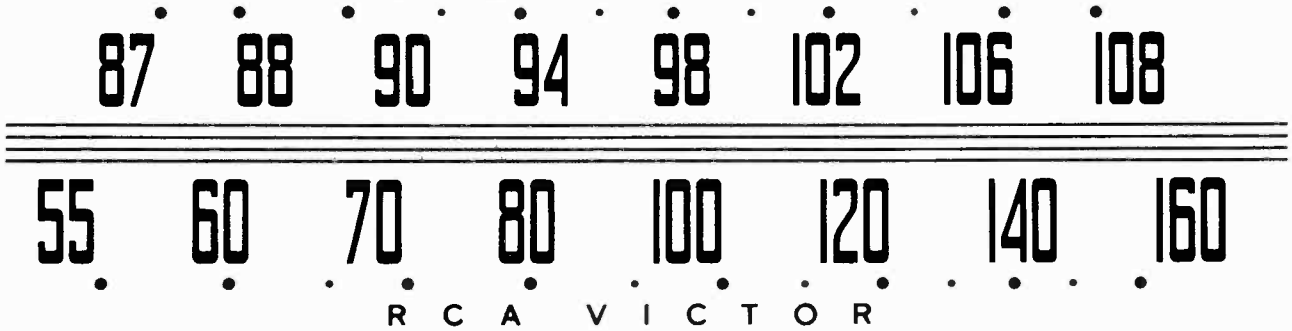
(4) Controls audio input to volume control.

The driver V3 (6AU6) and ratio detector V4 (6AL5) circuits are similar to those used in other RCA Victor AM-FM receivers.

The audio voltage controlled by the volume control is amplified by V5 (6AV6) and V6 (6V6GT).

The rectifier V7 is type 6X5GT.





Dial Scale Actual Size

MODELS A78,
9W78, Ch. RC-1084A

Alignment Procedure

CORRECT ALIGNMENT OF THE FM BAND REQUIRES THAT THE AM BAND BE ALIGNED FIRST

Alignment Indicators:

An RCA VoltOhmyst or equivalent meter is necessary for measuring developed d-c voltage during FM alignment. Connections are specified in the alignment tabulation. An output meter is also necessary to indicate minimum audio output during FM Ratio Detector alignment. Connect the output meter across the speaker voice coil.

The RCA VoltOhmyst can also be used as an AM alignment indicator, either to measure audio output or to measure a-v-c voltage.

When audio output is being measured the volume control should be turned to maximum.

Signal Generator:

For all alignment operations connect the low side of the signal generator to the receiver chassis. The output should be adjusted to provide accurate resonance indication at all times. If output measurement is used for AM alignment the output of the signal generator should be kept as low as possible to avoid a-v-c action.

Oscilloscope Alignment:

The FM I. F. alignment may be checked using a sweep generator and an oscilloscope. Shunt terminals B and C of T4 with a 1200 ohm resistor. Connect the high side of the oscilloscope to term. C of T4 in series with a diode probe. Apply the output of the sweep generator (10.7 mc with ±250 kc sweep) to pin No. 1 of V2 (6BA6) in series with .01 mf., low side of the oscilloscope and sweep generator to chassis. This will show the response of T3.

To check the combined response of T2 and T3; connect the sweep generator to the antenna terminal board—high side to "FM" term. in series with 300 ohms and low side to "G" terminal. Oscilloscope connections as previously connected.

To check the ratio detector response; remove the 1200 ohm resistor previously used, connect the high side of the oscilloscope direct to term. No. 9 of S1, low side to chassis. Apply the output of the sweep generator to pin No. 1 of V3 (6AU6) in series with .01 mf. **Note:** It is difficult to observe marker signals in this step—center frequency and sweep width should be previously observed.

Critical Lead Dress

1. Short leads on C7.
2. Dress R27 away from switch and Pin 5 of V1.
3. Ground lead on Pin 2 of V2 & V3 should be down against chassis. Its length is critical.
4. A.V.C. lead from R26 to switch should be dressed against chassis and on front apron side of output transformer.
5. C43 should have short leads and color code end of capacitor should go to coil. Capacitor is to be cemented down with polystyrene cement the same time L2 is.
6. High side loop lead should be dressed away from tubes.
7. Lead from Pin 2 and V1 to terminal A of first dual I.F. transformer should be dressed against chassis.
8. Wire C40 directly between gang condenser and Pin 1 of V1.
9. Keep all the F.M. leads as short as possible.
10. Dress lead from Pin 5 of V2 to terminal A of T3 down against chassis.
11. Dress resistor R15 near chassis base.
12. Dress all A.C. leads away from volume control.
13. Run lead from F.M. Terminal on the antenna terminal board to L2 tap around the can of T2 and away from V2.
14. The taps on L1 & L2 are critical.
15. The lead from R32 to terminal 10 of S1 should be dressed away from the output transformer, T5.
16. Dress C25 and C26 against chassis with the shortest lead length possible..
17. Coupling between pins 5 & 6 of VI, and the components attached, should be kept to a minimum.
18. Coupling between L1 & L2 should be adjusted to give the proper oscillator injection voltage to the mixer grid.

AM Alignment

RANGE SWITCH IN BC POSITION

Steps	Connect high side of sig. gen. to—	Sig. gen. output	Turn radio dial to—	Adjust for peak output
1	C3 in series with .01 mfd.	455 kc.	Quiet point at low freq. end.	AM windings.† T3 bottom core (sec.). T3 top core (pri.).
2				AM windings.† T2 top core (sec.). T2 bottom core (pri.).
3	"A" terminal of terminal board at rear of chassis in series with 220 mmf.	1400 kc.	1400 kc.	C13 osc. C4 ant.
4		600 kc.	600 kc.	L4 osc. (Rock gang.)
5	Repeat Steps 3 and 4.			

† Use alternate loading.

Alternate loading involves the use of a 47,000 ohm resistor to load the AM plate winding while the AM grid winding of the SAME TRANSFORMER is being peaked. Then the grid winding is loaded with the resistor while the plate winding is peaked. Only one winding is loaded at any one time. Remove the 47,000 ohm resistor after T3 and T2 have been aligned.

Oscillator frequency is above signal frequency on both AM and FM.

FM Alignment

RANGE SWITCH IN FM POSITION—VOLUME CONTROL MAXIMUM

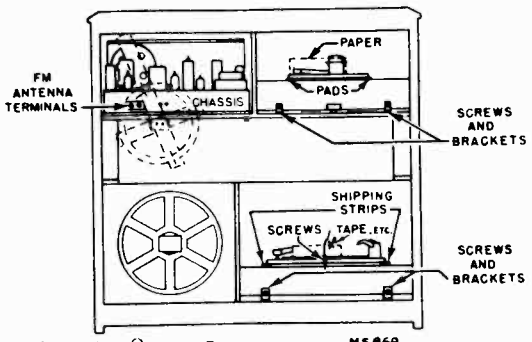
Steps	Connect high side of sig. gen. to—	Sig. gen. output	Turn radio dial to—	Adjust for peak output
1	Connect the d-c probe of a VoltOhmyst to the negative lead of the 2 mfd. capacitor C33 and the common lead to chassis. Turn gang condenser to max. capacity (fully meshed).			
2	Pin 1 of 6AU6 in series with .01 mfd.	10.7 mc. modulated 30% 400 cycles AM (Approx. .05 volt).	Max. capacity (fully meshed)	T4 top core for max. d-c voltage across C33. T4 bottom core for min. audio output.*
3	FM ant. term in series with a 300 ohm resistor. (Remove ant. lead from "FM" term.)	10.7 mc. Adjust to provide 2 to 3 volts indication on VoltOhmyst during alignment.		FM windings.†† T3 top core (sec.). T3 bottom core (pri.).
4				FM windings.†† T2 top core (sec.). T2 bottom core (pri.).
5		106 mc.	106 mc.	L2 osc.** C2 ant. Set C2 at max. capacity while adjusting L2.
6		90 mc.	90 mc.	L1 ant.** (Rock gang.)
7	Repeat Steps 5 and 6 until further adjustment does not improve calibration.			

* Two or more points may be found which lower the audio output. At the correct point the minimum audio output is approached rapidly and is much lower than at any incorrect point.

†† Align T3 and T2 by means of alternate loading as explained under AM alignment. Use a 680 ohm resistor instead of a 47,000 ohm resistor and load the FM windings.

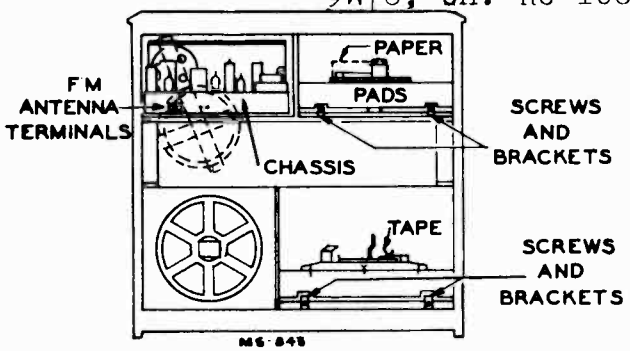
** L1 and L2 are adjustable by increasing or decreasing the spacing between turns.

MODELS A78, 9W78, Ch. RC-1084A

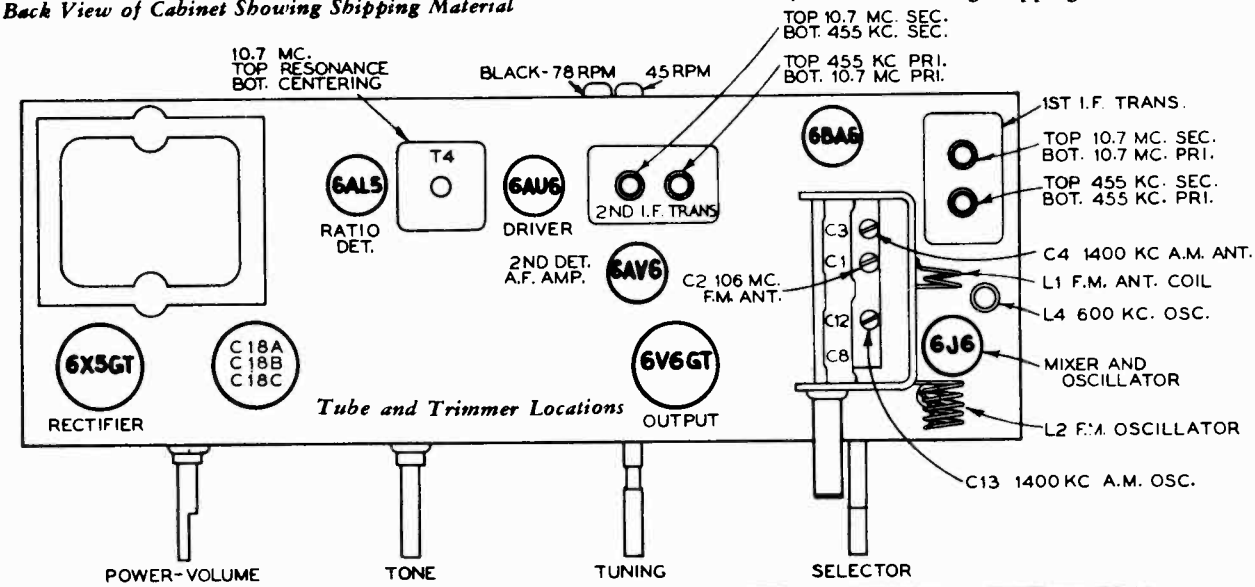


MODEL A78 only

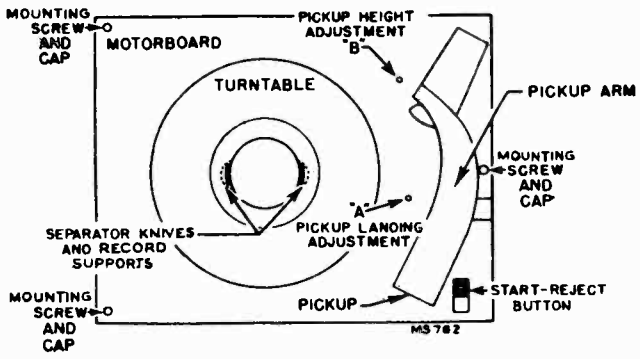
Back View of Cabinet Showing Shipping Material



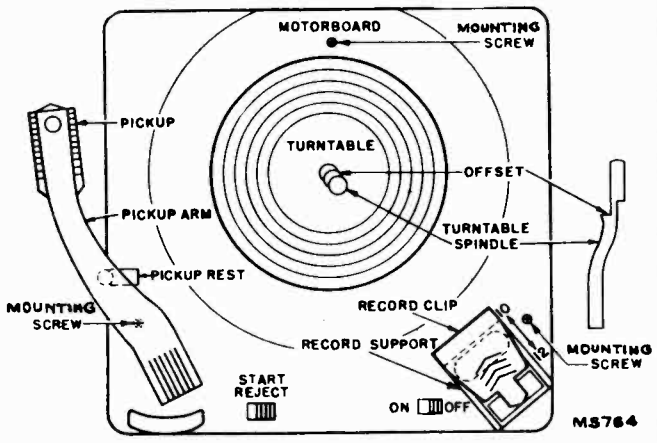
Back View of Cabinet Showing Shipping Material



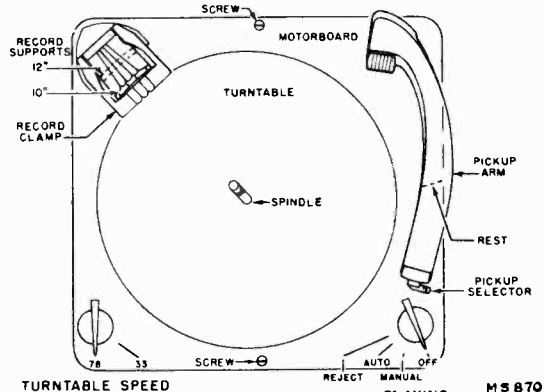
Tube and Trimmer Locations



Top View—RP-168A-1 Record Changer

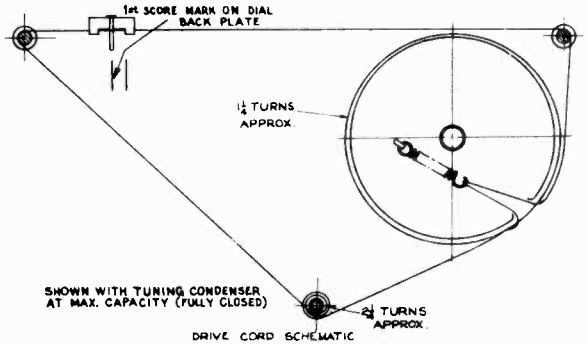


Top View—RP-178 Record Changer



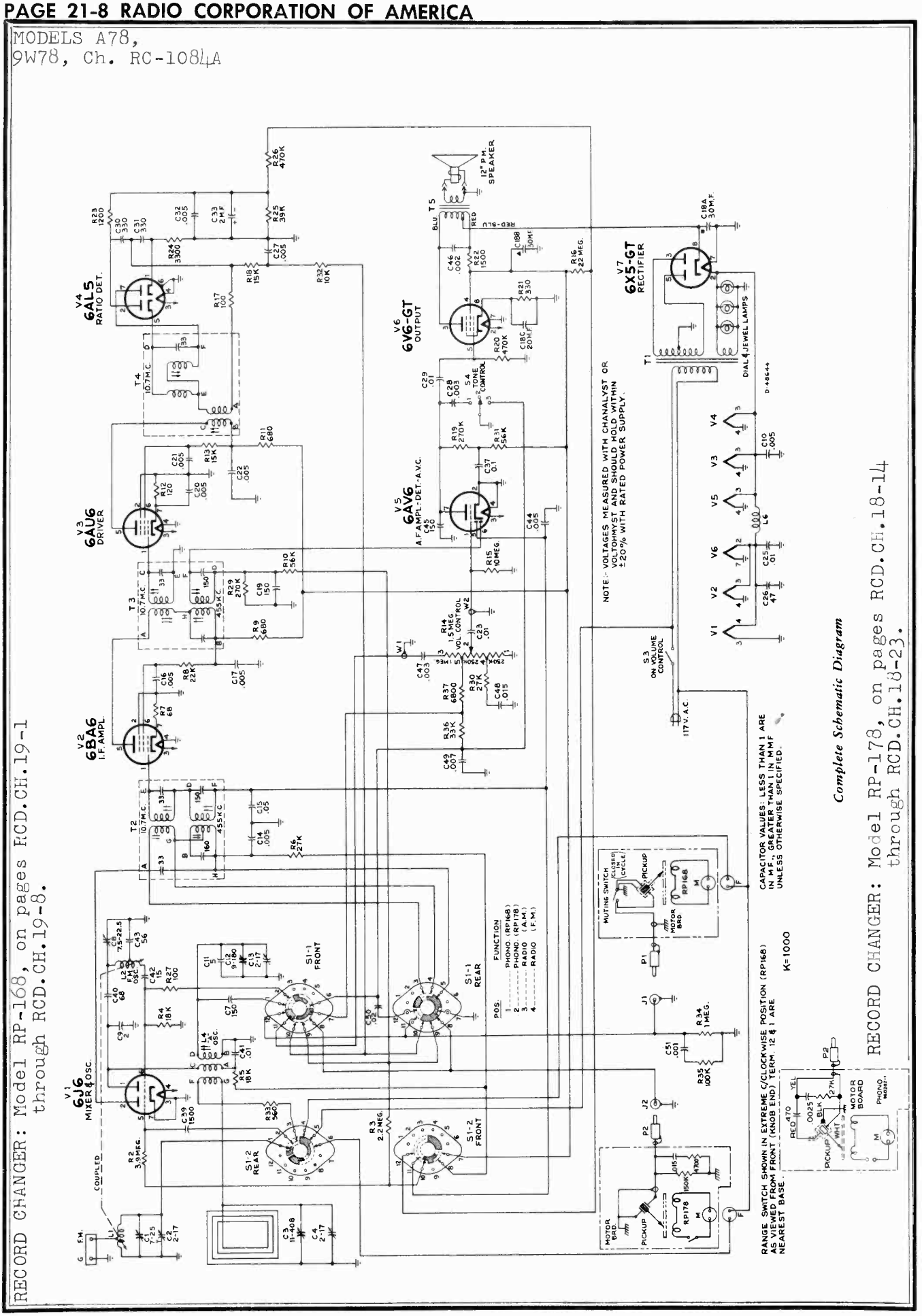
MODEL A78 only

Top View—RP-178 Record Changer

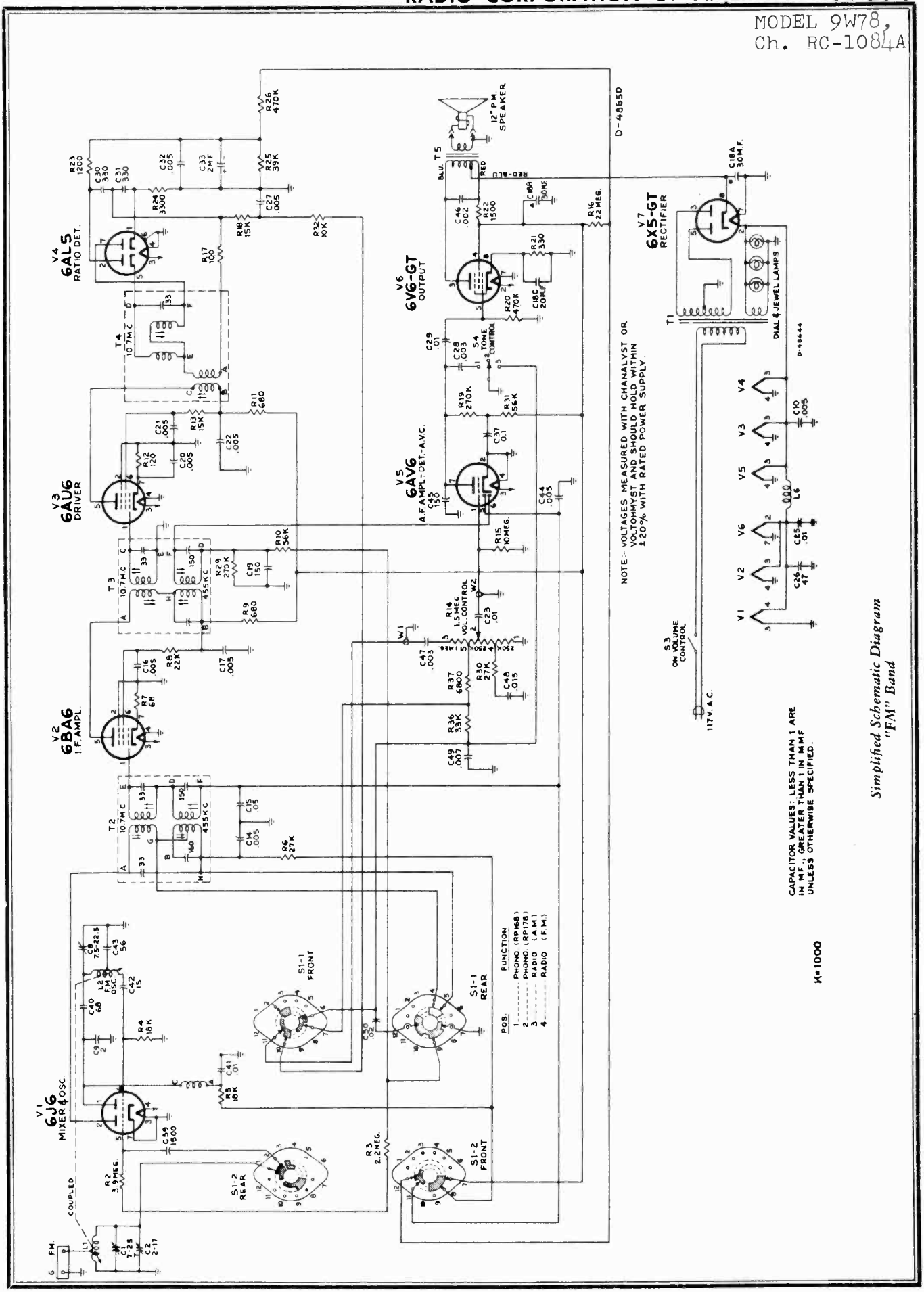


Dial Indicator and Drive Mechanism

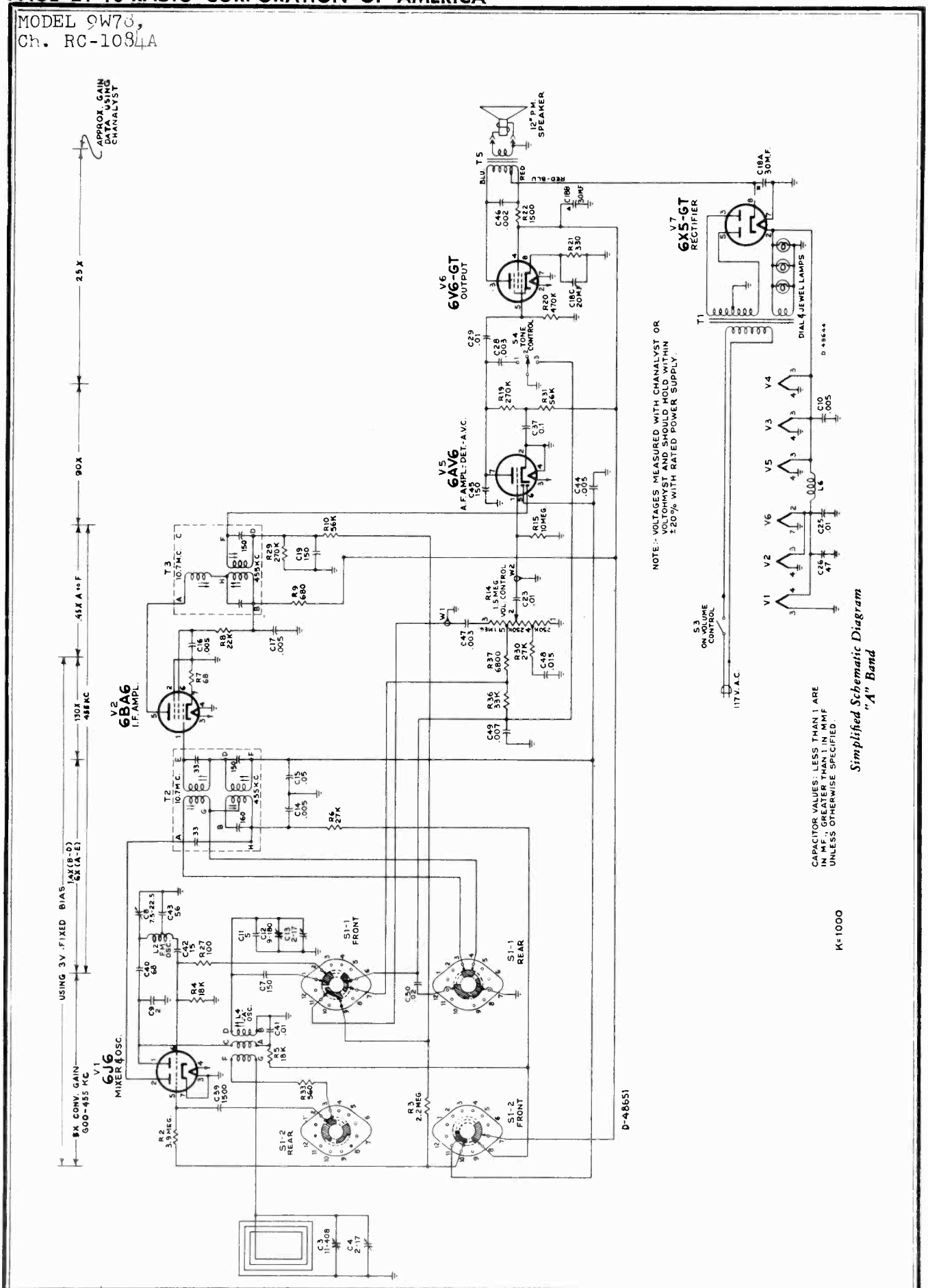
MODELS A78,
9W78, Ch. RC-1084A



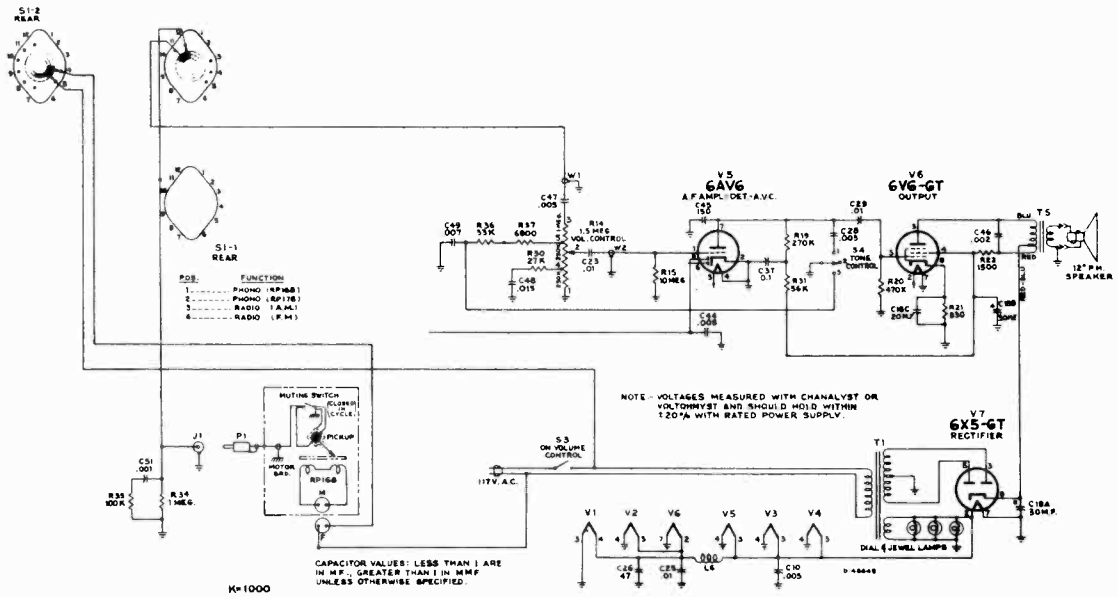
MODEL 9W78,
Ch. RC-1084A



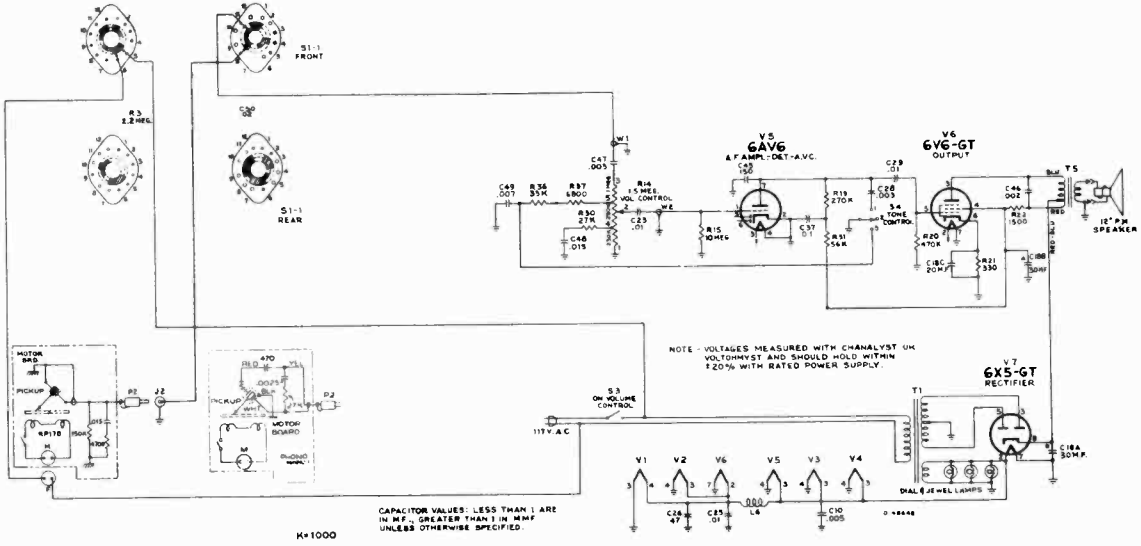
MODEL 9W73,
Ch. RC-1084A



Simplified Schematic Diagram "A" Band



Simplified Schematic Diagram
45 RPM Phono



Simplified Schematic Diagram
78 RPM Phono

Voltage Chart

Tube	Type		Pin No.	"A"	"FM"	Phono
1	6J6	Plate Plate Grid Grid	1 2 6 5	108 94 −6.8 −3.0	106 109 −6.7 −2.5	—— —— —— ——
2	6BA6	Plate Screen Cathode Grid	5 6 7 1	185 110 0.75 −1.6	180 94 0.88 −0.5	—— —— —— ——
3	6AU6	Plate Screen Cathode	5 6 7	184 132 1.1	180 130 1.1	—— —— ——
4	6AL5	——	—	——	——	——
5	6AV6	Plate Grid	7 1	74 −0.8	74 −0.8	90 ——
6	6V6GT	Plate Screen Cathode	3 4 8	243 193 9.7	242 190 9.5	250 263 14.5
7	6X5GT	Cathode	8	250	250	270

Cathode Currents (MA)

1	6J6		7	8.6	8	——
2	6BA6		7	12	13	——
3	6AU6		7	13.5	13.5	——
4	6AL5		1 & 2	——	——	——
5	6AV6		2	0.3	0.3	0.55
6	6V6GT		8	28.2	27.6	44.5
7	6X5GT		8	63	62.2	45

Voltages and currents measured with tuning condenser closed and no signal input should hold within ±20% with rated line voltage.

Note: Plate voltage removed from 6J6 mixer and oscillator tube during "Phono" operation.

MODELS A78,
9W78, Ch. RC-1084A

Replacement Parts

STOCK NO.	DESCRIPTION
	CHASSIS ASSEMBLIES RC1084A
73893	Board—"F. M." terminal board
73889	Capacitor—Variable tuning capacitor (C1, C2, C3, C4, C8, C12, C13)
73866	Capacitor—Ceramic, 2 mmf. (C9)
93056	Capacitor—Ceramic, 5 mmf. (C11)
39044	Capacitor—Ceramic, 15 mmf. (C42)
73372	Capacitor—Electrolytic comprising 1 section of 30 mfd., 350 volts, 1 section of 30 mfd., 300 volts and 1 section of 20 mfd., 25 volts (C18A, C18B, C18C)
39042	Capacitor—Ceramic, 47 mmf. (C26)
73867	Capacitor—Ceramic, 56 mmf. (C43)
33379	Capacitor—Ceramic, 68 mmf. (C40)
48125	Capacitor—Ceramic, 150 mmf. (C7, C19, C45)
39640	Capacitor—Mica, 330 mmf. (C30, C31)
73748	Capacitor—Ceramic, 1500 mmf. (C39)
73473	Capacitor—Ceramic, 5,000 mmf. (C44, C10)
73747	Capacitor—Electrolytic, 2mfd., 50 volts (C33)
73186	Capacitor—Tubular, paper, .001 mfd., 400 volts (C51)
71927	Capacitor—Tubular, paper, .002 mfd., 400 volts (C46)
72573	Capacitor—Tubular, paper, .003 mfd., 400 volts (C28, C47)
71926	Capacitor—Tubular, paper, .005 mfd., 200 volts (C20, C27, C32)
71553	Capacitor—Tubular, paper, .005 mfd., 400 volts (C14, C16, C17, C21, C22)
70608	Capacitor—Tubular, paper, .007 mfd., 400 volts (C49)
71923	Capacitor—Tubular, paper, .01 mfd., 200 volts (C23, C25)
71925	Capacitor—Tubular, paper, .01 mfd., 400 volts (C29, C41)
72120	Capacitor—Tubular, paper, .015 mfd., 200 volts (C48)
71928	Capacitor—Tubular, paper, .02 mfd., 200 volts (C50)
72596	Capacitor—Tubular, paper, .05 mfd., 200 volts (C15)
70617	Capacitor—Tubular, paper, 0.1 mfd., 400 volts (C37)
73744	Coil—Oscillator coil—A. M. (L4)
71942	Coil—Filament choke coil (L6)
73918	Coil—Antenna coil—F. M. (L1)
73916	Coil—Oscillator coil—F. M. (L2)
30868	Connector—2 contact female connector for motor cable
70342	Control—Volume control and power switch (B14, S3)
72953	Cord—Drive cord (approx. 48" overall)
74839	Fastener—Push fastener to mount R. F. shelf (4 required)
16058	Grommet—Rubber grommet to mount R. F. shelf (4 required)
73895	Indicator—Station selector indicator
11765	Lamp—Dial lamp—Mazda 51
74297	Plate—Dial back plate complete with 2 pulleys less dial
33514	Receptacle—Phono input socket—dual
52436	Resistor—Wire wound, 1500 ohms, 4 watts (R22)
	Resistor—Fixed, composition:—
	68 ohms, ±10%, ½ watt (R7)
	100 ohms, ±10%, ½ watt (R17, R27)
	120 ohms, ±10%, ½ watt (R12)
	330 ohms, ±10%, 1 watt (R21)
	560 ohms, ±10%, ½ watt (R33)
	680 ohms, ±20%, ½ watt (R9, R11)
	1200 ohms, ±5%, ½ watt (R23)
	3300 ohms, ±5%, ½ watt (R24)
	6800 ohms, ±10%, ½ watt (R37)
	10,000 ohms, ±10%, ½ watt (R32)
	15,000 ohms, ±10%, ½ watt (R13, R18)
	18,000 ohms, ±10%, ½ watt (R4)
	18,000 ohms, ±10%, 1 watt (R5)
	22,000 ohms, ±10%, ½ watt (R8)
	27,000 ohms, ±10%, ½ watt (R6, R30)
	33,000 ohms, ±10%, ½ watt (R36)
	39,000 ohms, ±10%, ½ watt (R25)
	56,000 ohms, ±10%, ½ watt (R31)
	56,000 ohms, ±10%, 1 watt (R10)
	100,000 ohms, ±10%, ½ watt (R35)
	270,000 ohms, ±10%, ½ watt (R19, R29)
	470,000 ohms, ±10%, ½ watt (R20, R26)
	1 megohm, ±10%, ½ watt (R34)
	2.2 megohms, ±20%, ½ watt (R3)
	3.9 megohms, ±10%, ½ watt (R2)
	10 megohms, ±20%, ½ watt (R15)
	22 megohms, ±20%, ½ watt (R16)
73894	Shaft—Tuning shaft
72516	Socket—Tube socket, 7 contact, miniature, for V4 and V5
73606	Socket—Tube socket, 7 contact, miniature, for V1, V2, and V3
31251	Socket—Tube socket, octal, wafer, for V6 and V7
31364	Socket—Lamp socket
74038	Spring—Drive cord tension spring
74202	Support—Polystyrene coil support complete with bracket
73891	Switch—Tone control switch (S4)
74913	Switch—Selector switch (S1)
73415	Transformer—Output transformer (T5)
73743	Transformer—Ratio detector transformer (T4)
70127	Transformer—Power transformer 117v/60c (T1)
73745	Transformer—First I. F. transformer—dual (T2)
74019	Transformer—Second I. F. transformer—dual (T3)
33726	Washer—"C" washer for tuning shaft
73333	Washer—Insulating washer (extruded) for mounting output transformer (2 required)
73332	Washer—Insulating washer (flat) for mounting output transformer (2 required)
	SPEAKER ASSEMBLY 92569-9 RMA 274 RL 111—14
13867	Cap—Dust cap
74901	Cone and voice coil assembly
74974	Speaker—12" P. M. speaker (3.16 oz.) complete with cone and voice coil (3.2 ohms)
	NOTE: If stamping on speaker does not agree with above number, order replacement parts by referring to model number of instrument, number stamped on speaker and full description of part required.
	MISCELLANEOUS
72555	Antenna—F. M. antenna
74205	Bezel—Dial scale bezel less dial
74579	Bumper—Rubber bumper (black) for RP168 changer drawer (2 required) for mahogany or walnut instruments
74580	Bumper—Rubber bumper (white) for RP168 changer drawer (2 required) for oak instruments
71599	Bracket—Pilot lamp bracket
72437	Cable—Shielded pickup cable for RP168 changer
74296	Cable—Shielded pickup cable for RP 178 changer
13103	Cap—Pilot lamp cap
72120	Capacitor—Tubular, paper, .015 mfd., 200 volts for RP 178 changer
71892	Catch—Bullet catch and strike for doors
74298	Clamp—Dial clamp
X3046	Cloth—Grille cloth for mahogany or walnut instruments
X3047	Cloth—Grille cloth for oak instruments
30868	Connector—2 contact female connector for motor cable (RP 178 changer)
30870	Connector—2 contact male connector for motor cable (RP 178 changer)
74581	Cover—Mounting screw cover for RP168 changer (3 required)
74273	Decal—Trade mark decal (Victrola)
71768	Decal—Trade mark decal (RCA Victor)
74915	Decal—Control function decal for mahogany or walnut instruments
74916	Decal—Control function decal for oak instruments
74203	Dial—Glass dial scale
74836	Grommet—Power and strain relief
72856	Grommet—Rubber grommet for mounting RP 178 changer (3 required)
74308	Hinge—Cabinet door hinge (1 set)
74931	Knob—Volume control or tuning control—knob—maroon—for walnut or mahogany instruments
74934	Knob—Tune control switch or selector switch—knob—maroon—for walnut or mahogany instruments
72824	Knob—Control knob—brown—for oak instruments
73896	Loop—Antenna loop complete
74730	Nail—Decorative nail for grille
74208	Nut—Tee nut for mounting RP 168 changer (3 required)
73109	Nut—Tee nut for mounting RP 178 changer (3 required)
74914	Pull—Door pull
	Resistor—Fixed, composition:— 4700 ohms, ±10%, ½ watt for RP 178 changer 150,000 ohms, ±10%, ½ watt for RP 178 changer
74582	Screw—#8-32 x 1¾" special screw for mounting RP 168 changer (3 required)
73110	Screw—¼-20 x 1¾" fillister head screw for mounting RP 178 changer (3 required)
74835	Slide—Slide mechanism for RP 168 changer
74736	Slide—Slide mechanism for RP 178 changer
74121	Spring—Conical spring for mounting RP 168 changer (upper—R. H.)
74422	Spring—Conical spring for mounting RP 168 changer (upper—L. H.) (2 required)
30900	Spring—Retaining spring for knobs
74423	Spring—Conical spring for mounting RP 168 changer (lower) (3 required)
72936	Stop—Door stop

MODEL A-82,
Ch. RC-1094

PH570

Tuning Range ..... 540-1600 kc
Intermediate Frequency ..... 455 kc
Tube Complement
1. RCA-6BA6 ..... R.F. Amplifier
2. RCA-6BE6 ..... Converter
3. RCA-6BA6 ..... I.F. Amplifier
4. RCA-6AV6 ..... Det.—1st Audio—A.V.C.
5. RCA-6C4 ..... Phase inverter
6. RCA-6V6GT ..... Output
7. RCA-6V6GT ..... Output
8. RCA-5Y3GT ..... Rectifier

Dial Lamps (2) ..... Type No. 51, 6-8 volts, 0.2 amps.
Jewel Lamp ..... Type No. 51, 6-8 volts, 0.2 amps.
Tuning Drive Ratio ..... 9:1 (4½ turns of knob)
Power Supply Rating ..... 115 volts, 60 cycles, 105 watts
Loudspeaker (92569-9)
Size and type ..... 12 in. P.M.
Voice coil impedance ..... 3.2 ohms at 400 cycles
Power Output
Undistorted ..... 9.5 watts
Power Output
Maximum ..... 10.5 watts
Cabinet Dimensions
Height 32⅛ in. Width 30¼ in. Depth 19¼ in.
Record Changer
(RP168) or (RP190-2)
Turntable Speed ..... 45 r.p.m.
Record Capacity ... up to 10 RCA 7-in. fine groove records
Pickup ..... Crystal (medium output)
Record Changer (960282-4) or (960282-5)
Turntable Speed ..... 78/33⅓ r.p.m.
Record Capacity ..... Twelve 10-in. or Ten 12-in.
Pickup ..... Crystal

For record changer information refer to the following RCA Service Data.
RP168 Series 4th edition first printing
RP190 Series 1st edition first printing
960282 Second edition first printing

Either roll-out is limited in travel by a stop pin at the back end of each slide. To remove roll-out carriage first remove the retaining spring and then the stop pins. Removing the connecting cable permits the roll-out to slide out from the front of the cabinet.

Misalignment of the ball bearings in the carriage slides may cause the roll-out to have excessive drag. If this condition should exist exert a slight additional force in sliding the roll-out to its limit. This should automatically correct the condition.

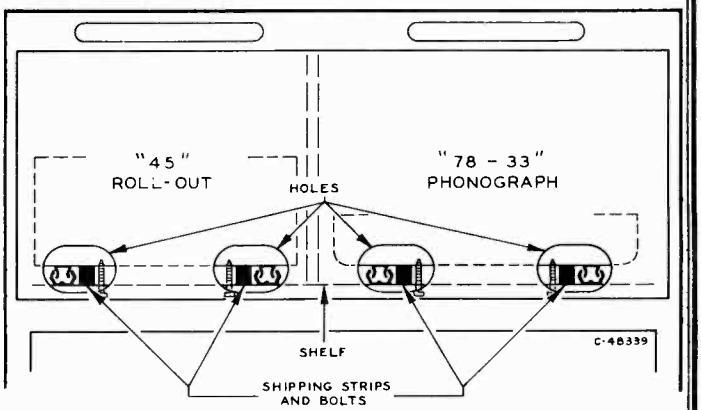


Fig. 1—Rear View of Cabinet

Before attempting to operate mechanism remove shipping bolts and strips. Slide shipping strips out through the elongated holes which have been cut in the cabinet back cover.

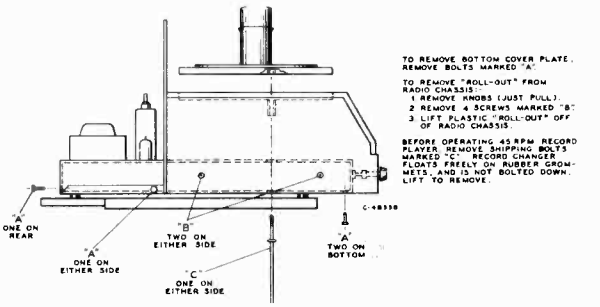


Fig. 2—Roll-out Assembly

Note: It is not necessary to remove the "roll-out" from the radio chassis when aligning the set. Having the "roll-out" fast to the chassis keeps the dial scale in place for dial calibration reference. Simply remove bottom cover as shown in Figure 2.

MODEL A-82,
Ch. RC-1094

CRITICAL LEAD DRESS

1. Dress all A.C. leads at function switch away from audio terminals.
2. Dress phono and A.M. audio leads to function switch away from A.C. leads.
3. Dress all A.C. leads at volume control away from audio leads.
4. Dress R16 down next to chassis.
5. Dress R14 away from A.C. terminals on V.C.
6. Dress lead from top of V.C. to S1 front, terminal 7 down to chassis along front apron.
7. Dress C17 down to chassis and away from components to Pin 1 of V4.

Socket Voltages

Voltages measured with Chanalyst or VoltOhmyst and should hold within ±20% with rated line voltage. Tuning condenser closed—no signal input Volume Control Min.

Tube	Terminal	Voltage Phono	Voltage A.M.
V1 6BA6 R.F. Amp.	Plate 5	—	212
	Screen 6	—	100
	Cathode 7	—	1.23
	Grid 1	—	-.28
V2 6BE6 Converter	Plate 5	—	238
	Screen 6	—	88
	Grid 7	—	-.25
	Cathode 2	—	-7.2
V3 6BA6 I.F. Amp.	Plate 5	—	238
	Screen 6	—	125
	Cathode 7	—	4.2
	Grid 1	—	-.28
V4 6AV6 Det. A.F. Amp.	Plate 7	105	96
	Grid 1	-.9	-.93
V5 6C4 Inverter	Plate 1-5	122	99
	Grid 6	-18.9	-18.5
	Cathode 7	-12.2	-13
V6 6V6GT Output	Plate 3	299	305
	Screen 4	292	238
	Grid 5	-18.9	-18.5
	Cathode 8	-18.9	-18.4
V7 6V6GT Output	Plate 3	299	305
	Screen 4	292	238
	Grid 5	-18.9	-18.5
	Cathode 8	-18.9	-18.4
V8 5Y3GT Rectifier	Cathode 8	309	310
Total Current V8		69 ma.	66 ma.

Alignment Procedure

Output Meter Alignment.—If this method is used, connect the meter across the voice coil and turn the receiver volume control to maximum.

Signal Generator.—For all alignment operations, connect the low side of the signal generator to the receiver chassis and keep the output as low as possible to avoid AVC action.

Dial Pointer Adjustment.—Rotate tuning condenser until the plates are fully closed. Adjust indicator pointer to the score mark at the left hand end of the dial.

Steps	Connect the high side of the test oscillator to—	Tune test-osc. to—	Turn radio dial to—	Adjust the following for maximum output
1	Converter grid in series with a .01 mfd. cap. to Pin #7 of V2	455 kc	Min. cap.	Top and bottom of T1 and T2
2	Short piece of wire placed near loop for radiated signal	1620 kc	1620 kc	OSC-C1-2T
3		1400 kc	1400 kc	RF C1-1T ANT C1-3T
4		600 kc	600 kc	OSC coil L3 RF coil L2 Adj. simultaneously while rocking gang
5		Repeat steps 2, 3 and 4 for greatest sensitivity		

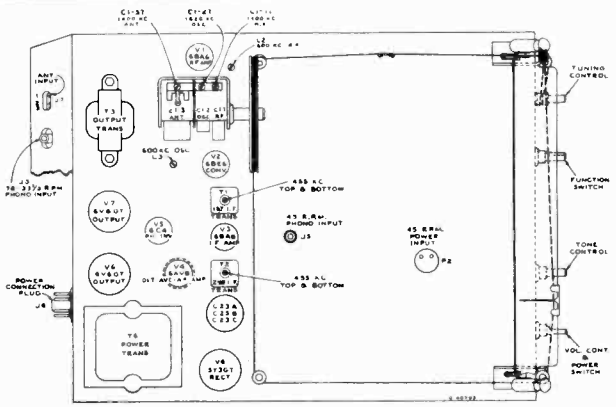


Fig. 3—Chassis Top View

REPLACEMENT PARTS

STOCK No.	DESCRIPTION	STOCK No.	DESCRIPTION
	Chassis Assemblies RC 1094	73803	Capacitor—Tubular, paper, .002 mfd., 1000 volts (C21, C22)
75541	Bracket—Pulley bracket complete with drive cord pulley	70603	Capacitor—Tubular, paper, .003 mfd., 400 volts (C17)
75595	Capacitor—Variable tuning capacitor, complete with drive drum (C1-1, C1-2, C1-3)	73920	Capacitor—Tubular, paper, .005 mfd., 400 volts (C3, C15)
39042	Capacitor—Ceramic, 47 mmf. (C6)	73561	Capacitor—Tubular, paper, .01 mfd., 400 volts (C4, C9, C13, C18)
71924	Capacitor—Ceramic, 56 mmf. (C8)	73797	Capacitor—Tubular, paper, .015 mfd., 400 volts (C11)
39632	Capacitor—Mica, 150 mmf. (C2, C7, C16, C20)	58476	Capacitor—Tubular, paper, oil impregnated, .018 mfd., 400 volts (C12)
73801	Capacitor—Tubular, paper, .001 mfd., 400 volts (C5)	73562	Capacitor—Tubular, paper, .02 mfd., 400 volts (C19)
71394	Capacitor—Tubular, paper, .0015 mfd., 600 volts (C10)		
73851	Capacitor—Tubular, paper, oil impregnated, .0018 mfd., 1600 volts (C24)		

MODEL A-82,
Ch. RC-1094

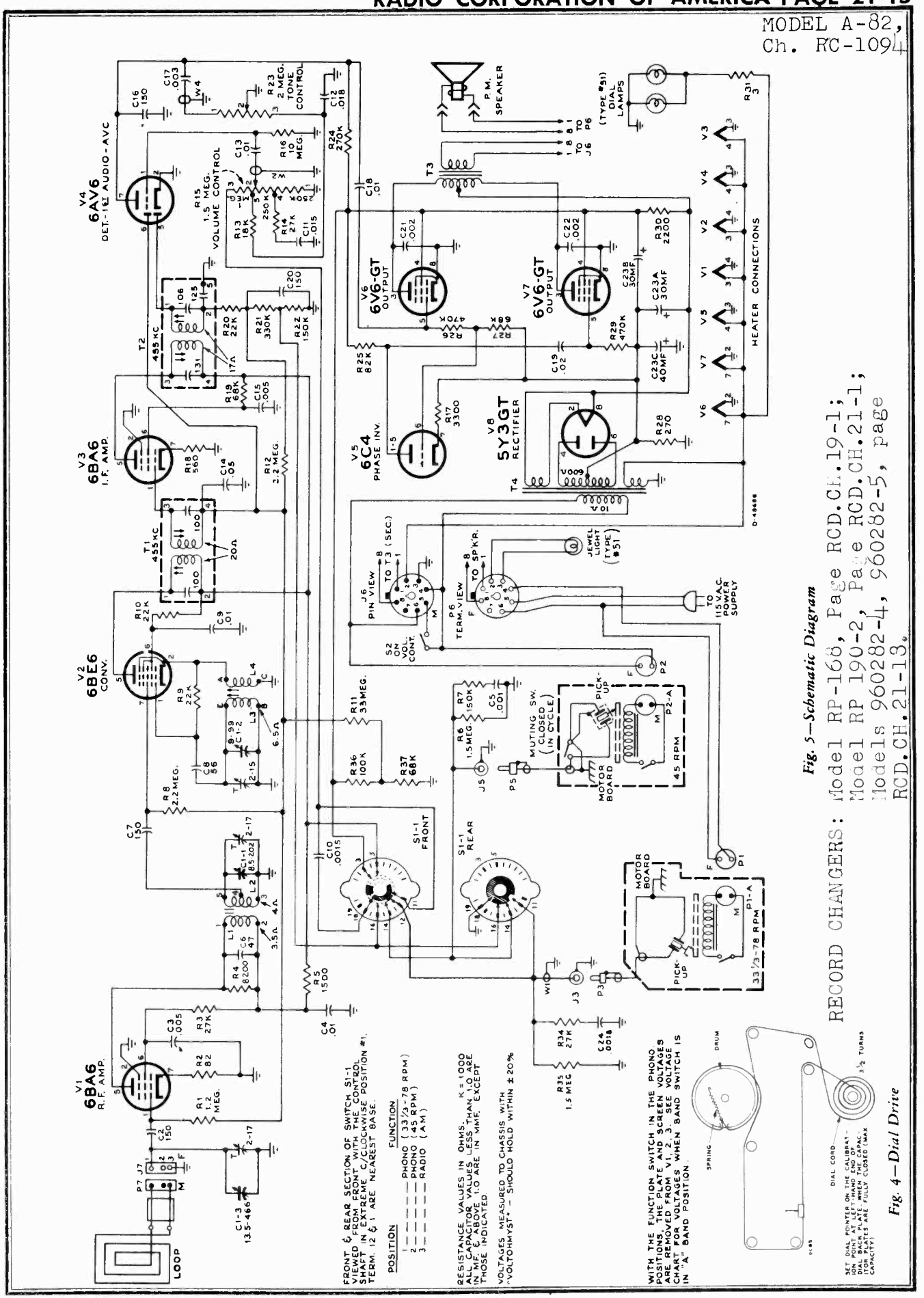


Fig. 5—Schematic Diagram

RECORD CHANGERS: Model RP-168, Page RCD.CH.19-1;
Model RP 190-2, Page RCD.CH.21-1;
Models 960282-4, 960282-5, page RCD.CH.21-13.

Fig. 4—Dial Drive

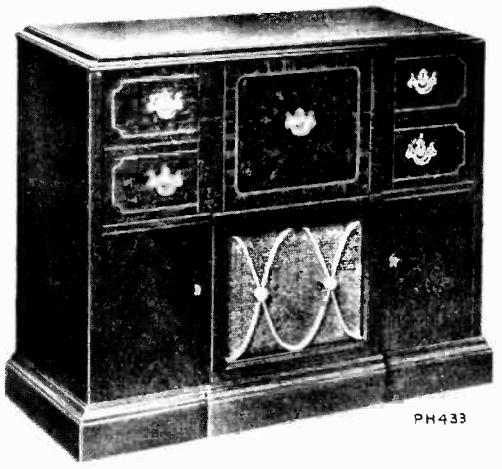
MODEL A-82,
Ch. RC-1094

REPLACEMENT PARTS (continued)

STOCK No.	DESCRIPTION
73553	Capacitor—Tubular, paper, .05 mfd., 400 volts (C14)
72052	Capacitor—Electrolytic comprising 1 section of 30 mfd., 450 volts, 1 section of 30 mfd., 350 volts and 1 section of 40 mfd., 25 volts (C23A, C23B, C23C)
73935	Clip—Mounting clip for i-f transformer
75627	Clip—Clip for main cable—on rear of chassis
75596	Coil—R-F coil complete with adjusting screws (L1, L2)
73516	Coil—Oscillator coil complete with adjustable core (L3, L4)
35787	Connector—Single contact female connector for 33⅓/78 RPM changer input (J5)
75542	Connector—8 contact male connector for power input cable (J6)
75543	Connector—2 contact female connector for 45 RPM motor cable (P2)
74879	Connector—2 contact (polarized) female connector for antenna leads (J7)
33742	Connector—Single contact female connector for 45 RPM changer input (J3)
75537	Control—Volume control and power switch (R15, S2)
75538	Control—Tone control (R23)
†72953	Cord—Drive cord (approx. 60" over-all length required)
75547	Grommet—Rubber grommet to mount slides to bottom—rear (2 req'd)
75548	Grommet—Rubber grommet to mount slides to bottom—front (2 req'd)
11765	Lamp—Dial lamp—Mazda #51
75544	Nut—Rivnut to fasten screw for mounting chassis (4 req'd)
75535	Plate—Dial back plate complete with three (3) pulleys
18469	Plate—Bakelite mounting plate for electrolytic capacitor
75536	Pointer—Station selector pointer
72602	Pulley—Drive cord pulley
72323	Resistor—Wire wound, 3 ohms, ½ watt (R31)
73637	Resistor—Wire wound, 2200 ohms, 5 watts (R30)
	Resistor—Fixed, composition:—
	82 ohms, ±10%, ½ watt (R2)
	270 ohms, ±10%, 2 watts (R28)
	560 ohms, ±10%, ½ watt (R18)
	1500 ohms, ±20%, ½ watt (R5)
	3300 ohms, ±5%, ½ watt (R17)
	8200 ohms, ±10%, ½ watt (R4)
	18,000 ohms, ±10%, ½ watt (R13)
	22,000 ohms, ±10%, ½ watt (R9, R20)
	22,000 ohms, ±10%, 2 watts (R10)
	27,000 ohms, ±10%, ½ watt (R14, R34)
	27,000 ohms, ±10%, 1 watt (R3)
	68,000 ohms, ±10%, ½ watt (R19, R27, R37)
	82,000 ohms, ±10%, ½ watt (R25)
	100,000 ohms, ±10%, ½ watt (R36)
	150,000 ohms, ±10%, ½ watt (R7, R22)
	270,000 ohms, ±10%, ½ watt (R24)
	330,000 ohms, ±10%, ½ watt (R21)
	470,000 ohms, ±10%, ½ watt (R26, R29)
	1.5 megohm, ±10%, ½ watt (R6, R35)
	2.2 megohm, ±20%, ½ watt (R1, R8, R12)
	10 megohm, ±20%, ½ watt (R16)
	33 megohm, ±20%, ½ watt (R11)
75540	Shaft—Tuning knob shaft
73584	Shield—Tube shield
75546	Slide—Slide mechanism complete for radio chassis bottom
31251	Socket—Tube socket, octal, wafer
73117	Socket—Tube socket, 7 pin, miniature
31364	Socket—Dial lamp socket
74038	Spring—Drive cord spring
75597	Switch—Function switch (S1-1)
75486	Transformer—First I-F transformer complete with adjustable cores (T1)
75487	Transformer—Second I-F transformer complete with adjustable cores (T2)
73636	Transformer—Output transformer (T3)
75566	Transformer—Power transformer 117 volts, 60 cycle (T4)
33726	Washer—"C" washer for tuning knob shaft
	RADIO ROLLOUT CARRIAGE
75598	Decal—Function decal for controls
75550	Dial—Polystyrene dial scale
75549	Frame—Moulded frame (maroon) for mounting radio chassis and 45 RPM changer for mahogany and walnut instruments
75683	Frame—Moulded frame (light brown) for mounting radio chassis and 45 RPM changer for oak instruments
75551	Handle—Metal pullout handle for mounting frame
75555	Screw—#8-32 x ⅝" cross recessed pan head machine screw to mount radio chassis (4 req'd)
	SPEAKER ASSEMBLY 92569-9 RMA 274 RL 111—14
13867	Cap—Dust cap
74901	Cone—Cone and voice coil assembly
74974	Speaker—12" P.M. speaker complete with cone and voice coil (3.2 ohms) NOTE: If stamping on speaker does not agree with above number, order replacement parts by referring to model number of instrument, number stamped on speaker and full description of part required.
	MISCELLANEOUS
75706	Antenna—Antenna loop complete less cable
75898	Back—Back cover—maroon—for 33⅓/78 RPM changer compartment for mahogany or walnut instruments (assembled to rollout)
75899	Back—Back cover—light brown—for 33⅓/78 RPM changer compartment for oak instruments (assembled to rollout)
75900	Back—Back cover—maroon—for radio—45 RPM changer compartment for mahogany or walnut instruments (assembled to rollout)
75901	Back—Back cover—light brown—for radio—45 RPM changer compartment for oak instruments (assembled to rollout)
75694	Bracket—Stop bracket less rubber bumper for rollout compartments
71599	Bracket—Pilot lamp bracket
75696	Bumper—Rubber bumper for rollout compartment stop bracket
74296	Cable—Shielded pickup cable complete with pin plug for 33⅓/78 RPM changer (P3)
72437	Cable—Shielded pickup cable complete with pin plug for instruments using RP190-2 changer
13103	Cap—Pilot lamp cap
71892	Catch—Bullet catch and strike for cabinet doors
X3144	Cloth—Grille cloth for mahogany or walnut instruments
X3093	Cloth—Grille cloth for oak instruments
74882	Connector—2 contact (polarized) male connector for antenna loop cable (P7)
75709	Connector—8 contact female connector for main cable less shell (P6)
30868	Connector—2 contact female connector for 33⅓/78 RPM changer motor cable (P1)
75474	Connector—Single contact male connector for speaker (2 req'd)
30870	Connector—2 contact male connector for motor leads for instruments using RP190-2 changer
71984	Decal—Trade mark decal (RCA Victor)
74273	Decal—Trade mark decal (Victrola)
74838	Grommet—Power cord strain relief (1 set)
37396	Grommet—Rubber grommet for speaker mounting
75697	Grommet—Rubber grommet to mount 45 RPM changer
75551	Handle—Metal pullout handle for 33⅓/78 RPM changer compartment
74308	Hinge—Cabinet door hinge (1 set)
75712	Knob—Tuning control, tone control or volume control and power switch knob—maroon—for mahogany or walnut instruments
75713	Knob—Tuning control, tone control or volume control and power switch knob—tan—for oak instruments
75714	Knob—Function switch knob—maroon—for mahogany or walnut instruments
75715	Knob—Function switch knob—tan—for oak instruments
11765	Lamp—Pilot lamp—Mazda #51
73634	Nut—Speed nut for speaker mounting screws
74276	Pull—Door pull
75907	Screw—#10-32 x 5¼" cross recessed round head (special shipping screws) screw to mount 45 RPM changer
74113	Screw—#8-32 x 1" trimit head screw for door pull
75708	Shell—Shell for 8 contact female connector
75546	Slide—Slide mechanism complete for 33⅓/78 RPM changer mounting frame
31364	Socket—Pilot lamp socket and load
74734	Spring—Retaining spring for knobs
75902	Spring—Suspension spring for main cable
72936	Stop—Cabinet door stop

†Stock No. 72953 is a reel containing 250 feet of cord.

MODEL A106,
Ch. RC-622



Antennas

This receiver has built-in antenna for standard broadcast (AM) and frequency modulation (FM) reception.

Provision is made for the use of an external antenna for FM reception if desired. To use external FM antenna — remove the built-in FM antenna lead from the "FM" terminals of the antenna terminal board. Connect the transmission line of an external FM dipole antenna to these two "FM" terminals.

FOR RECORD CHANGER SERVICE INFORMATION REFER TO RP-168 SERIES SERVICE DATA FOR 45 R.P.M. AND MODEL 960285-1 SERVICE DATA for 78/33⅓ R.P.M.

Tuning Range

Standard Broadcast (AM)	540-1,600 kc.
Frequency Modulation (FM)	88-108 mc.
Intermediate Frequencies	AM—455 kc., FM—10.7 mc.

Tube Complement

(1) RCA 6BJ6	R-F Amplifier
(2) RCA 6J6	Mixer and Oscillator
(3) RCA 6BA6	I-F Amplifier
(4) RCA 6AU6	Driver
(5) RCA 6AL5	Ratio Detector
(6) RCA 6AV6	AM Det.—AVC—A-F Amplifier
(7) RCA 6AV6	Ph. Inv.
(8) RCA 6V6GT	Output
(9) RCA 6V6GT	Output
(10) RCA 6X5GT	Rectifier

Dial Lamps (2)	Type No. 51, 6-8 volts, 0.2 amp.
Jewel Lamp	Type No. 51, 6-8 volts, 0.2 amp.
Tuning Drive Ratio	18:1 (9 turns of knob)
Power Supply Rating	115 volts, 60 cycles, 90 watts

Loudspeaker (92569-6W)

Size and type	12 in. PM
Voice coil impedance	3.2 ohms at 400 cycles

Power Output

(Radio) Undistorted 5 watts	Maximum 6.4 watts
(Phono.) Undistorted 8 watts	Maximum 9 watts

Cabinet Dimensions

Height 31½ in. Width 39¾ in. Depth 17½ in.

Record Changer (RP-168)

Turntable speed	45 r.p.m.
Record capacity	Up to 10 RCA 7-in. fine groove records
Pickup	Crystal (medium output)

Record Changer (960285-1)

Turntable speed	78/33⅓ r.p.m.
Record capacity	Twelve 10-in., ten 12-in. or ten intermix
Pickup	Crystal

Circuit Description

This instrument has a ten-tube (including rectifier) chassis which is very similar to those used in other RCA Victor radio-phonograph combinations designed for AM-FM reception.

The selector switch has five functions:

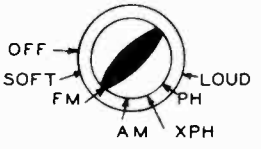
(1) Selection of tuning range.

(2) Selection and distribution of a.v.c. voltages.

(3) Application of B+ voltage to tubes V1, V2, V3 and V4.

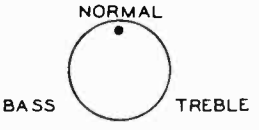
(4) Selection of audio input applied to the volume control.

(5) Application of a.c. power to the record changer motors.



POWER-VOLUME SELECTOR

TUNING



TONE

MS-836

Operating Controls

CRITICAL LEAD DRESS

Note: The leads listed may not be critical in all receivers. However, by dressing the leads as specified, unusual difficulties will be minimized.

1. The plate lead of the second IF transformer should be dressed down against the chassis to obtain max. capacity between the lead and chassis. This lead is specified to be two inches long.

RECORD CHANGERS: For Model RP-168, See Pages RCD.CH.19-1 to RCD.CH.19-8. For Model 960285-1, See Pages RCD.CH.21-50 to RCD.CH.21-64.

MODEL A106, Ch. RC-622

2. The "A" band RF transformer plate, and grid leads should be dressed so as to minimize coupling to the RF amplifier grid circuit, and kept close to chassis when possible.
3. The 2.2 meg. grid resistors connecting to the RF and mixer grids should have a minimum practicable amount of lead extending on the grid end. The leads should be cut off short on the grid end and long on the A.V.C. end.
4. The unshielded plate lead from the function switch to the 1st IF transformer should be dressed away from the switch wafer audio lugs as much as possible.
5. The ground strap between the RF shelf and chassis should be well soldered and kept as short as practicable. FM instability may be caused by having this ground strap too long, particularly when no input is connected to the FM antenna terminal.
6. The lead from the 2nd IF to the grid of the 6BA6 1st IF amplifier should be kept short, and dressed against the chassis as much as practicable.
7. The lead from the 2nd IF to the AM detector diode should be dressed to minimize coupling to the 6AV6 1st AF grid and kept close to chassis.
8. Leads from the volume control taps should be kept clear of all filament and output plate wires as in the wiring sample.
9. The loop cable when connected tc the AM sec. gang stator should be dressed to have minimum capacity coupling to the stator lug on the RF section of gang condenser.
10. The oscillator coupling condenser C10 should be dressed to have minimum capacity to the mixer grid, Pin No. 5 on V2.
11. The shielding on the shielded lead from the volume control to the function switch should have the minimum practicable exposed wire at the function switch end.

Alignment Procedure

CORRECT ALIGNMENT OF THE FM BAND REQUIRES THAT THE AM BAND BE ALIGNED FIRST

Alignment Indicators:

An RCA VoltOhmyst or equivalent meter is necessary for measuring developed d-c voltage during FM alignment. Connections are specified in the alignment tabulation. An output meter is also necessary to indicate minimum audio output during FM Ratio Detector alignment. Connect the output meter across the speaker voice coil.

The RCA VoltOhmyst can also be used as an AM alignment indicator, either to measure audio output or to measure a-v-c voltage.

When audio output is being measured the volume control should be turned to maximum.

Signal Generator:

For all alignment operations connect the low side of the signal generator to the receiver chassis. The output should be adjusted to provide accurate resonance indication at all times. If output measurement is used for AM alignment the output of the signal generator should be kept as low as possible to avoid a-v-c action.

Oscilloscope Alignment:

The FM I-F alignment may be checked using a sweep generator and an oscilloscope. Shunt terminals B and C of T4 with a 1200 ohm resistor. Connect the high side of an oscilloscope to terminal C of T4 in series with a diode probe. Apply the output of the sweep generator (10.7 mc. with ±250 kc. sweep) to pin No. 1 of V3 (6BA6) in series with .01 mf. Low side of the oscilloscope and sweep generator to chassis. This will show the response of T3.

To check the combined response of T2 and T3: connect the sweep generator to the FM antenna terminals (remove FM antenna lead) in series with 300 ohms. **Note:** One FM terminal is grounded—it may be necessary to reverse the sweep generator connections. Oscilloscope connections remain as connected.

To check the ratio detector response: connect the high side of the oscilloscope direct to terminal No. 9 of S1, low side to chassis. Apply the output of the sweep generator to pin No. 1 of V4 (6AU6) in series with .01 mf. Driver plate circuit connected for normal operation (1200 ohm resistor removed). **Note:** It is difficult to observe marker signals in this step—center frequency and sweep width should be previously observed.

AM Alignment

RANGE SWITCH IN BC POSITION

Steps	Connect high side of sig. gen. to—	Sig. gen. output	Turn radio dial to—	Adjust for peak output
1	Pin No. 5 of V2 in series with .01 mfd.	455 kc.	Quiet point at low freq. end.	AM windings.† T3 bottom core (sec.). T3 top core (pri.).
2				AM windings.† T2 top core (sec.). T2 bottom core (pri.).
3	Short wire placed near loop for radiated signal	1400 kc.	1400 kc.	C1-2T (osc.). C1-5T (ant.). C1-4T (rf.).
4		600 kc.	600 kc.	L8 (osc.) with 10,000 ohms resistor from RF stator to gnd. (rocking gang)
5				L5 (RF) with the 10,000 ohms removed.
6	Repeat steps 3, 4 and 5 until no improvement in sensitivity is obtained.			

† Use alternate loading.

Alternate loading involves the use of a 47,000 ohm resistor to load the AM plate winding while the AM grid winding of the SAME TRANSFORMER is being peaked. Then the grid winding is loaded with the resistor while the plate winding is peaked. Only one winding is loaded at any one time. Remove the 47,000 ohm resistor after T3 and T2 have been aligned.

Oscillator frequency is above signal frequency on both AM and FM.

FM Alignment

RANGE SWITCH IN FM POSITION—VOLUME CONTROL MAXIMUM

Steps	Connect high side of sig. gen. to—	Sig. gen. output	Turn radio dial to—	Adjust for peak output
1	Connect the d-c probe of a VoltOhmyst to the negative lead of the 2 mfd. capacitor C42 and the common lead to chassis. Turn gang condenser to max. capacity (fully meshed). Volume Control max.			
2	Pin 1 of V4 6AU6 in series with 470 ohm resistor.	10.7 mc. modulated 30% 400 cycles AM (Approx. .05 volt).	Max. capacity (fully meshed).	T4 top core for max. d-c voltage across C42. T4 bottom core for min. audio output. *
3		10.7 mc. Adjust to provide about 4 volts indication on VoltOhmyst during alignment.		FM windings.†† T3 top core (sec.). T3 bottom core (pri.).
4				FM windings.†† T2 top core (sec.). T2 bottom core (pri.).
5	High and low side of signal gen. through two 120 ohm resistors. To ant. terminals.	90 mc.	90 mc.‡	L9 (osc.).**
6		106 mc.	106 mc.	C1-6T (ant.). C1-3T (rf.).
7		90 mc.	90 mc.	L1 (ant.).** L3 (rf.).**
8	Repeat steps 6 and 7 until no improvement in sensitivity is obtained.			

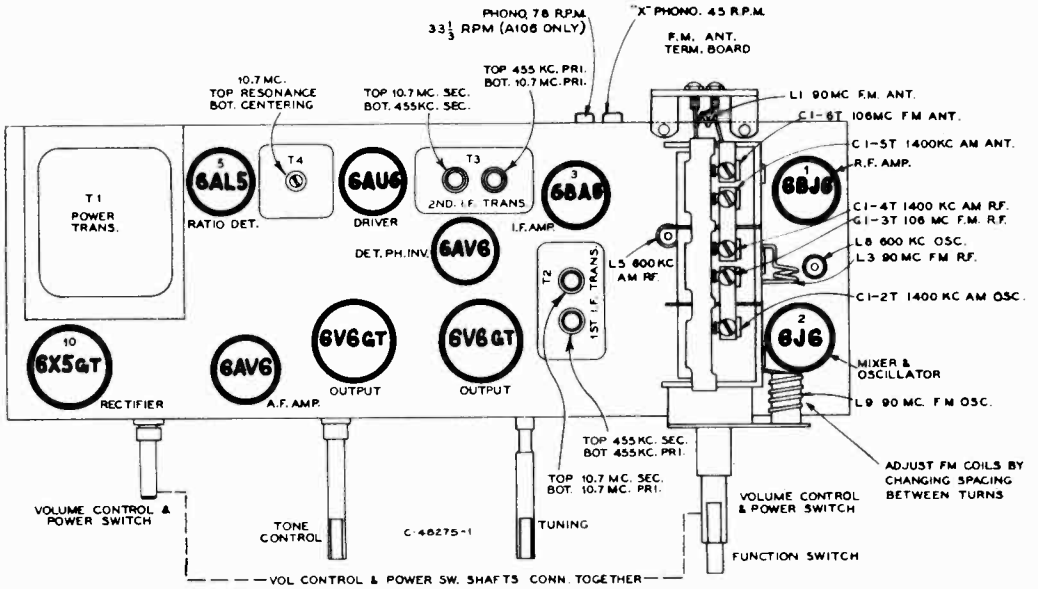
* Two or more points may be found which lower the audio output. At the correct point the minimum audio output is approached rapidly and is much lower than at any incorrect point.

†† Align T3 and T2 by means of alternate loading as explained under AM alignment. Use a 680 ohm resistor instead of a 47,000 ohm resistor and load the FM windings.

** L1, L3 and L9 are adjustable by increasing or decreasing the spacing between turns.

‡ After dial pointer has been set accurately on calibration point for "A" band (see dial indicator and drive drawing) tune receiver to 90 mc. on FM using dial scale as reference or use dial scale drawing

MODEL A106,
Ch. RC-622

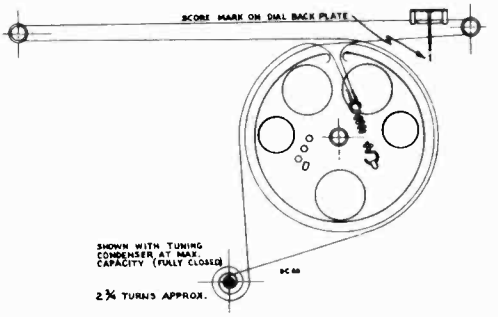


Tube and Trimmer Locations

Socket Voltages

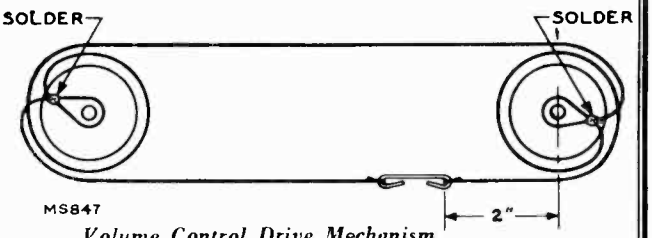
Voltages measured with Chanalyst or VoltOhmyst and should hold within ±20% with rated line voltage. Tuning condenser closed—no signal input.

Tube	Terminal		Voltage		
			Phono	A.M.	F.M.
V1 6BJ6 R.F. Amp.	Plate	5	—	185	110
	Screen	6	—	120	100
	Cathode	2	—	0.8	0.8
	Grid	1	-0.9	-0.0	-0.6
V2 6J6 Mixer and Osc.	Plate	1	—	73	80
	Grid	6	-1.07	-2	-3.4
	Plate	2	—	56	56
	Grid	5	-0.54	-5.4	-3.6
V3 6BA6 I.F. Amp.	Plate	5	—	180	178
	Screen	6	—	115	111
	Cathode	7	—	0.9	0.9
	Grid	1	-0.95	-1.1	-.75
V4 6AU6 Driver	Plate	5	—	174	175
	Screen	6	—	125	175
	Cathode	7	—	0.9	0.9
V5 6AL5 Ratio Det.	——	—	—	—	—
V6 6AV6 A.F. Amp.	Plate	7	97	85	80
	Grid	1	-.72	-.75	-0.75
V7 6AV6 Inverter	Plate	7	140	110	110
	Grid	1	-18.7	-17.8	-17.3
	Cathode	2	-18	-17	-16.6
V8 6V6GT Output	Plate	3	262	270	270
	Screen	4	262	190	190
	Grid	5	-18	-17	-16
V9 6V6GT Output	Plate	3	262	270	270
	Screen	4	262	190	190
	Grid	5	-18	-17	-16
V10 6X5GT Rectifier	Cathode	8	271	275	275



Dial Indicator and Drive Mechanism

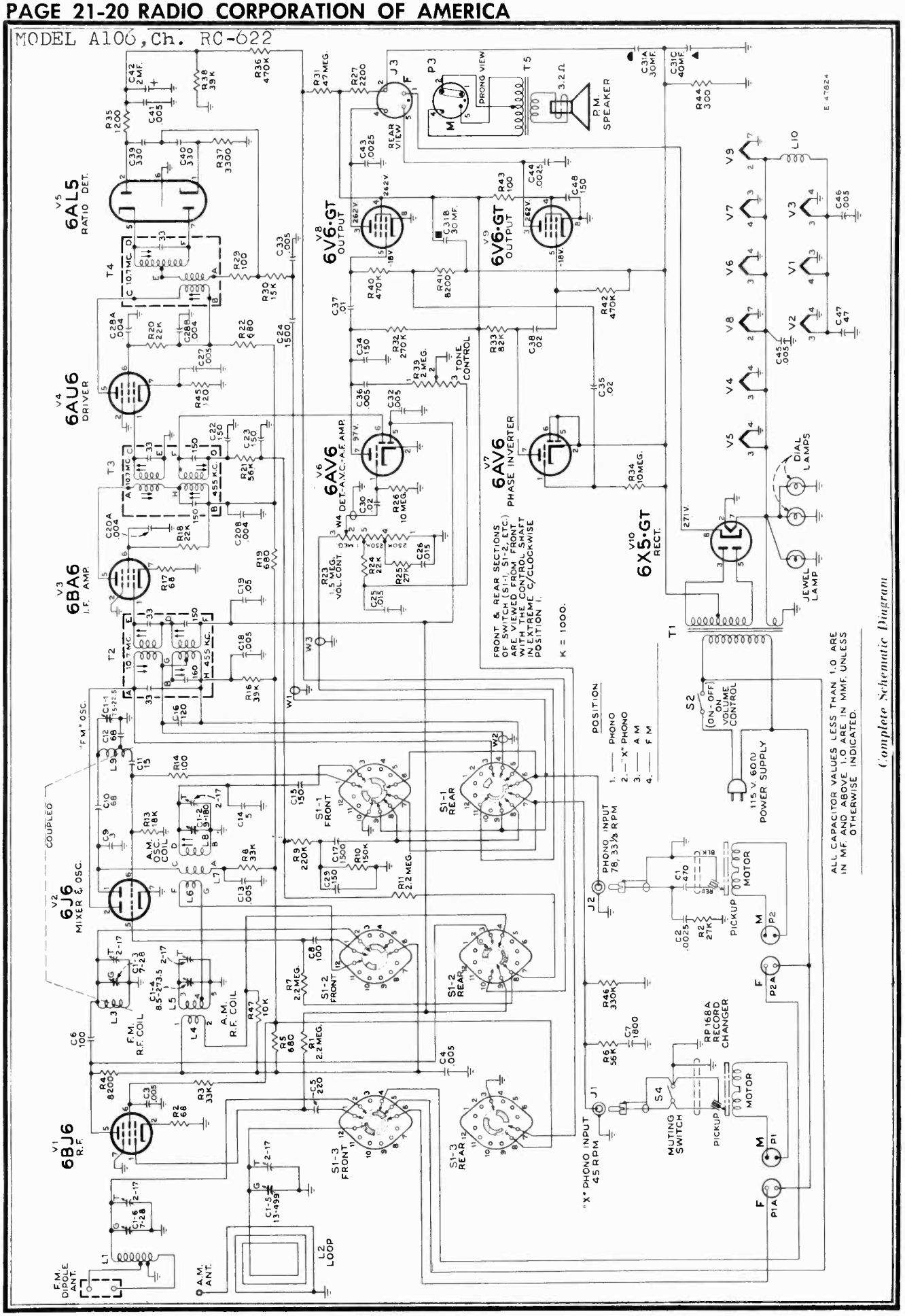
CABLE SHOWN IN EXTREME COUNTER CLOCKWISE POSITION

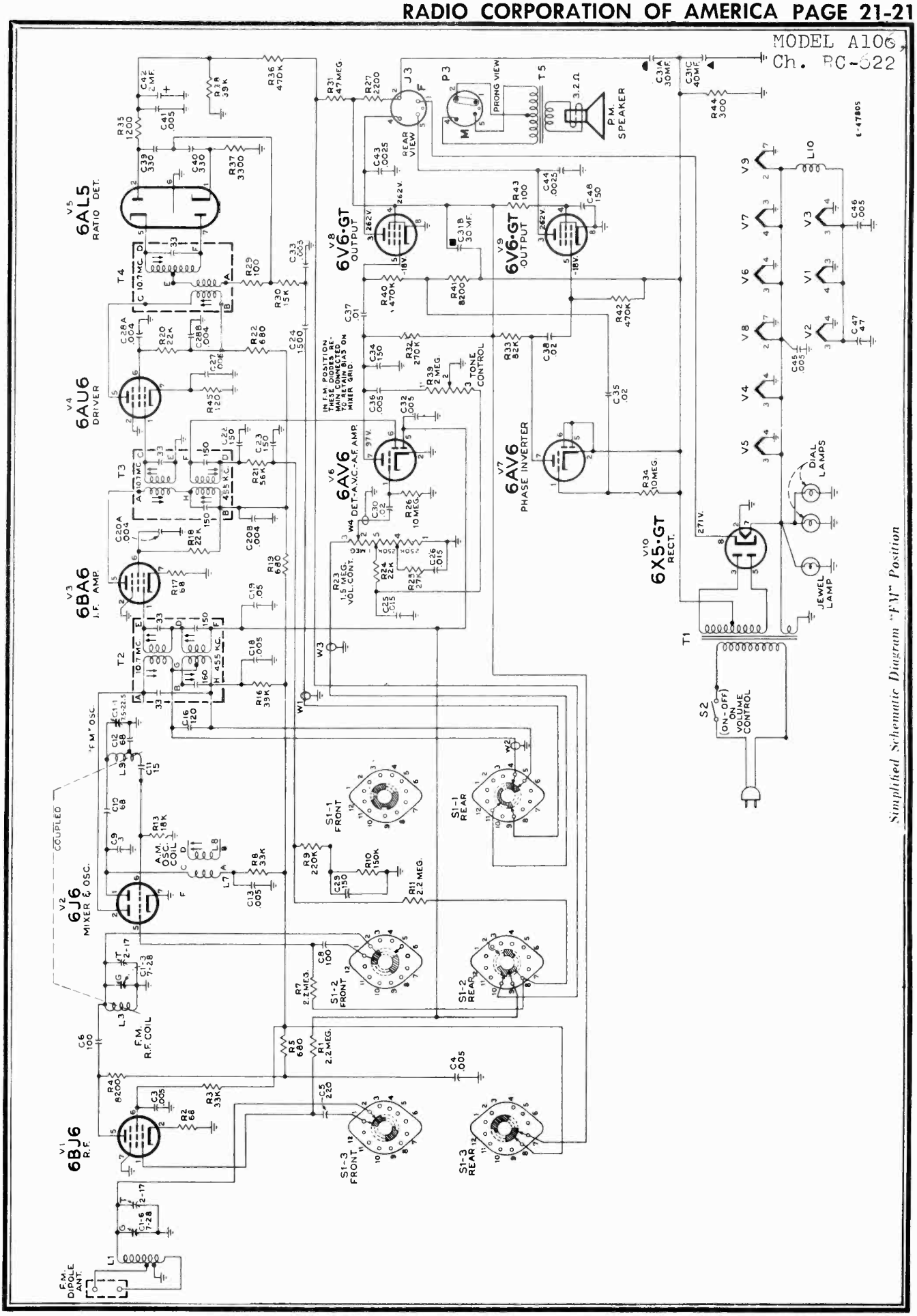


Volume Control Drive Mechanism

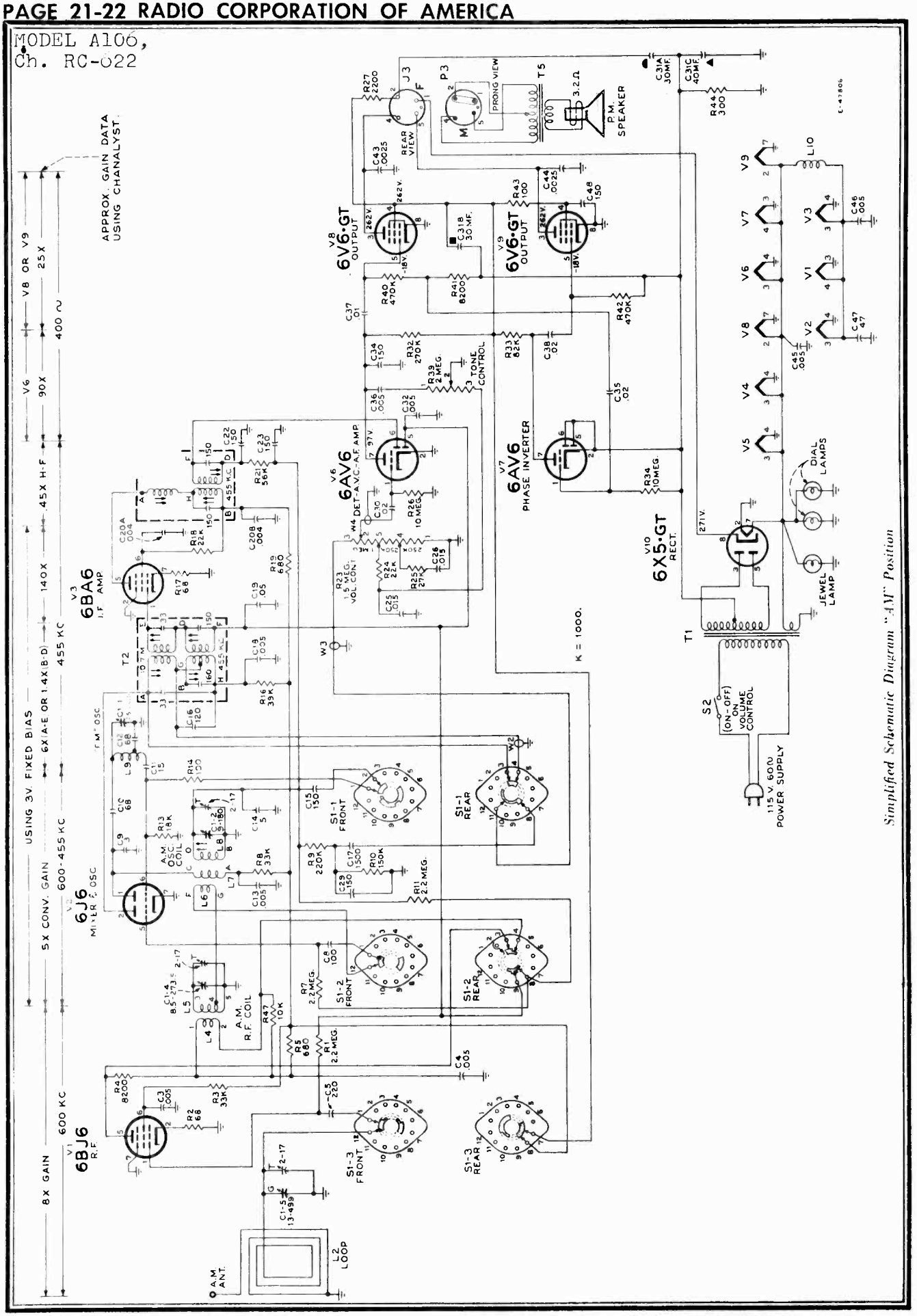
Cathode Currents (MA)

Tube	Terminal	Phono	A.M.	F.M.
V1 6BJ6	2	—	11.1	11.4
V2 6J6	7	—	6.8	6.6
V3 6BA6	7	—	13.1	13.7
V4 6AU6	7	—	8.2	8.1
V5 6AL5	1 & 5	—	—	—
V6 6AV6	2	0.68	.44	.43
V7 6AV6	2	1.7	1.4	1.35
V8 6V6GT	8	33	11.2	11
V9 6V6GT	8	33	11	11
V10 6X5GT	8	66	63	63

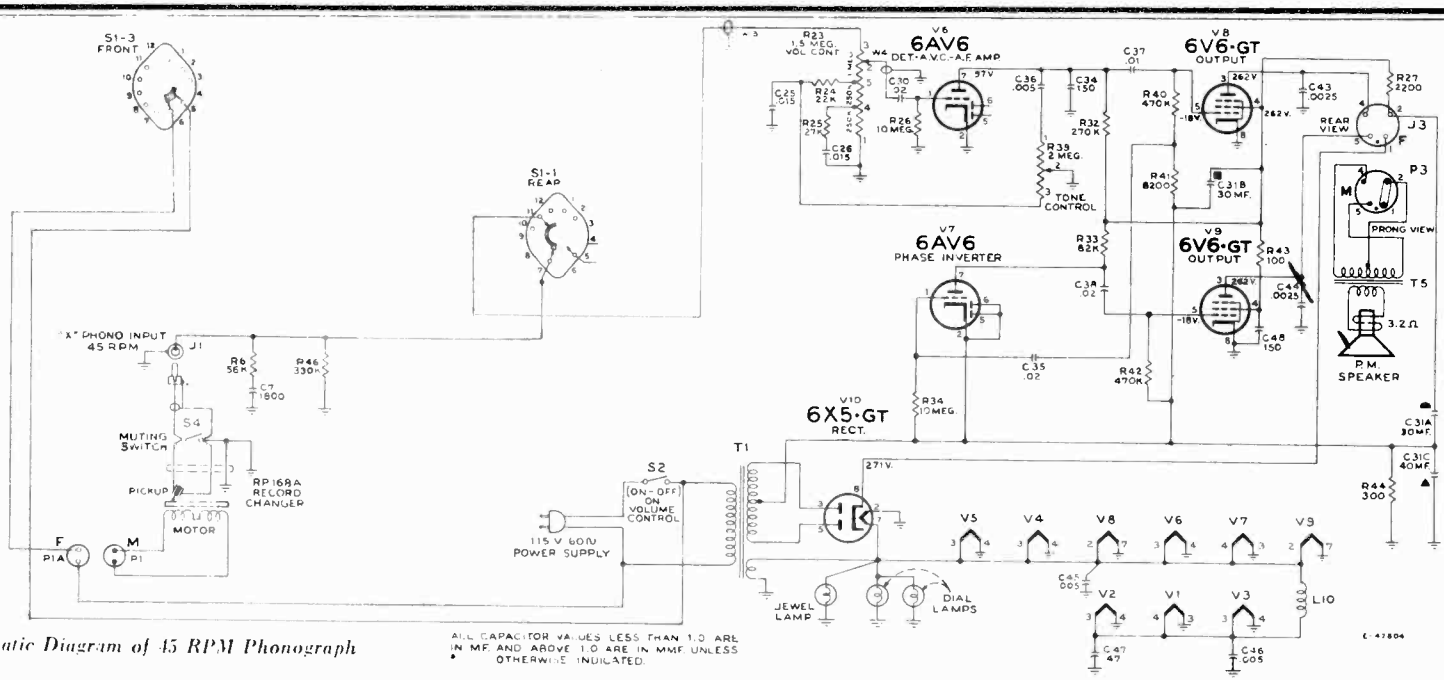




MODEL A106,
Ch. RC-622



Simplified Schematic Diagram "AW" Position



Simplified Schematic Diagram of 45 RPM Phonograph

SHIPPING SCREWS

The radio chassis of these instruments is secured to the cabinet with shipping screws (painted red) which, together with spacing strips, should be **REMOVED** at the time of installation.

The record changers are each mounted with three screws which should be **LOOSENED** at the time of installation.

On the RP-168 record changer decorative caps cover the mounting screws. Remove the caps for access to the screws.

RP-168 RECORD CHANGER

Pickup Landing Adjustment "A"

The pickup point should land half-way between the outer edge of the record and the first music groove.

If the pickup lands inside the starting grooves—turn screw "A" slightly clockwise. If pickup lands outside the starting grooves—turn screw "A" slightly counterclockwise.

Pickup Height Adjustment "B"

During cycle the pickup arm must rise high enough to clear a stack of ten records on the turntable, but not high enough to cause the top of the arm to touch records resting on the record supports.

If pickup does not clear a stack of ten records—turn screw "B" slightly clockwise. If pickup arm touches records on record supports—turn screw "B" slightly counterclockwise.

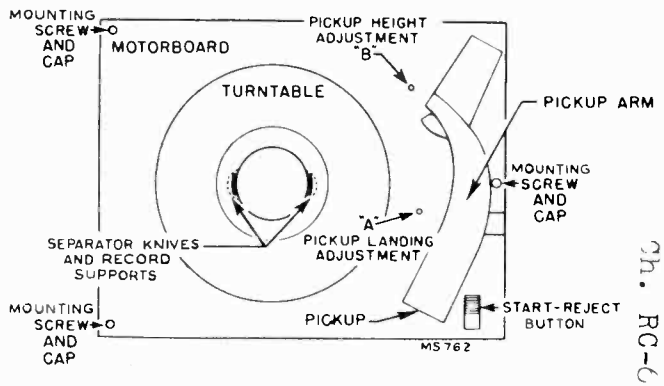
Record Separators

During service, the position of the star wheel on the underside of the record changer may be accidentally shifted; this may cause the separator knives to be extended when they should be concealed.

If the separator knives are thus extended—turn the power on so that the turntable is revolving, push the "start-reject" knob and allow the mechanism to complete a change cycle. If the knives remain extended while the turntable is still revolving, gently press fingers against the extended knives until they disappear inside the center post. DO THIS ONLY WHILE MECHANISM IS OUT OF CYCLE.

CARE OF SAPPHIRE

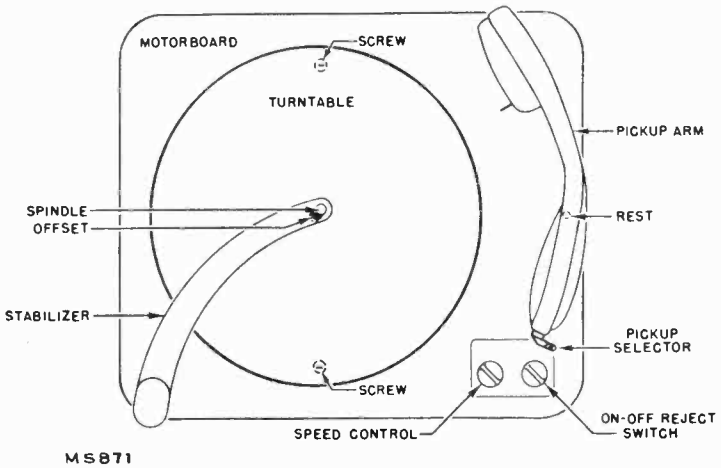
The sapphire point on the pickup is protected with a permanent metal guard. Lint may collect to clog the opening in the guard at the sapphire point and cause poor record reproduction. Occasional cleaning may be necessary; brush carefully with a small soft brush.



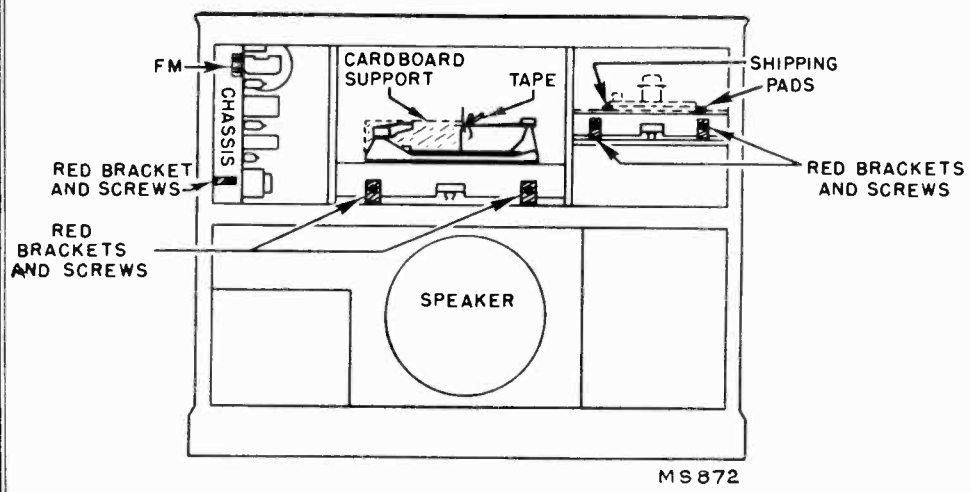
Top View—RP-168 Record Changer

MODEL A10[illegible] Ch. RC-622

MODEL A106,
Ch. RC-622

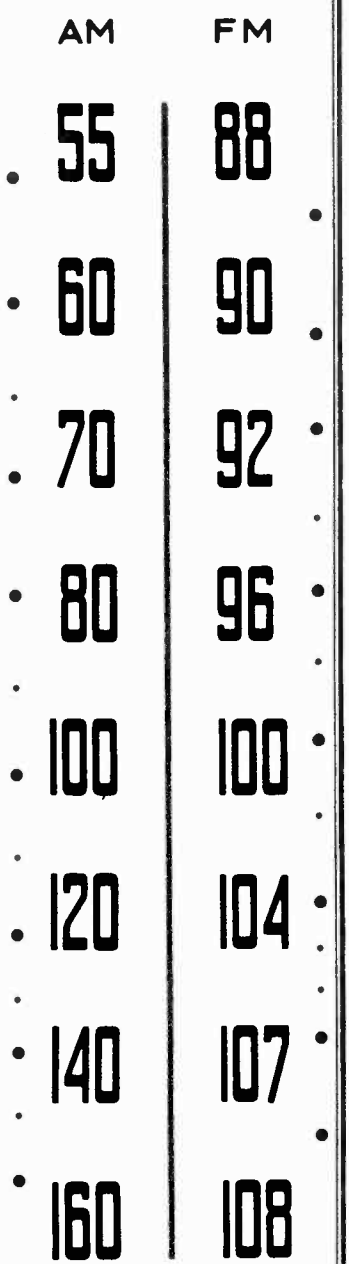


Top View—960285-1 Record Changer



Rear View Showing Location of Various Units

NOTE: When instrument is used in steel constructed building or in very poor signal areas an outside antenna can be attached to terminal in middle of loop antenna. This applies to "A" band operation.



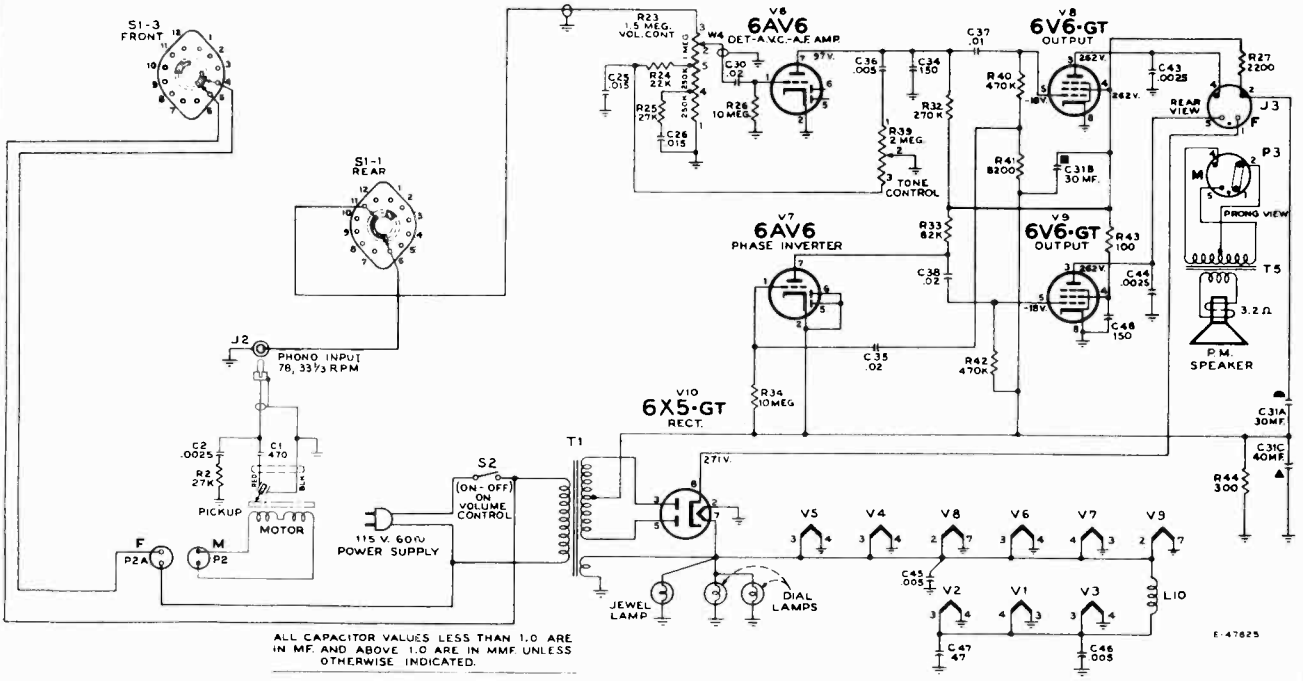
Dial Scale (Actual Size)

933773

RCA VICTOR

MODEL A106,
Ch. RC-622

Simplified Schematic Diagram of 78, 33⅓ RPM Phonograph



REPLACEMENT PARTS

STOCK No.	DESCRIPTION
	CHASSIS ASSEMBLIES RC 622
*74848	Board—"F.M." terminal board
*74641	Cable—Flexible cable to operate volume control
*74849	Capacitor—Variable tuning capacitor (C1-1, 1-2, 1-3, 1-4, 1-5, 1-6)
73747	Capacitor—Electrolytic, 2 mmf., 50 volts (C42)
*74733	Capacitor—Ceramic, 3 mmf. (C9)
93056	Capacitor—Ceramic, 5 mmf. (C14)
39044	Capacitor—Ceramic, 15 mmf. (C11)
39042	Capacitor—Ceramic, 47 mmf. (C47)
33379	Capacitor—Ceramic, 68 mmf. (C10, C12)
39396	Capacitor—Ceramic, 100 mmf. (C6, C8)
71614	Capacitor—Ceramic, 120 mmf. (C16)
44704	Capacitor—Ceramic, 150 mmf. (C15, C22, C23, C34, C48)
48125	Capacitor—Ceramic, 150 mmf. (C29)
71920	Capacitor—Ceramic, 220 mmf. (C5)
39640	Capacitor—Mica, 330 mmf. (C39, C40)
74093	Capacitor—Ceramic, 1,500 mmf. (C17, C24)
*74850	Capacitor—Ceramic, 1,800 mmf. (C7)
74009	Capacitor—Ceramic, dual, 4,000 mmf. (C20A, C20B, C28A, C28B)
73473	Capacitor—Ceramic, 5,000 mmf. (C3, C4, C13, C18, C32, C46)
72052	Capacitor—Electrolytic, comprising 1 section of 30 mfd, 450 volts, 1 section of 30 mfd, 350 volts and 1 section of 40 mfd, 25 volts (C31A, C31B, C31C)
71926	Capacitor—Tubular, paper, .005 mfd, 200 volts (C27, C33, C41, C45)
71553	Capacitor—Tubular, paper, .005 mfd, 400 volts (C36)
70644	Capacitor—Tubular, paper, .0025 mfd, 1,000 volts (C43, C44)
71925	Capacitor—Tubular, paper, .01 mfd, 400 volts (C37)
71928	Capacitor—Tubular, paper, .02 mfd, 200 volts (C30, C35)
73638	Capacitor—Tubular, paper, .02 mfd, 400 volts (C38)
73553	Capacitor—Tubular, paper, .05 mfd, 400 volts (C19)
72120	Capacitor—Tubular, paper, .015 mfd, 200 volts (C25, C26)
73744	Coil—Oscillator coil—A.M. (L6, L7, L8)
*74841	Coil—R.F. coil — A.M. — complete with adjustable core and stud (L4, L5)
*74815	Coil—R.F. coil—F.M. (L3)
*74816	Coil—Antenna coil—F.M. (L1)
*73817	Coil—Oscillator coil—F.M. (L9)
71942	Coil—Filament choke coil (L10)
5040	Connector—4 contact female connector for speaker cable (P3)
30868	Connector—2 contact female connector for motor cables (P2A)
*74837	Control—Tone control (R39)
74639	Control—Volume control and power switch (R23, S2)
72953	Cord—Drive cord (approx. 58" overall length)
*74839	Fastener—Push fastener to hold R.F. shelf assembly (4 required)
*74838	Grommet—Power cord strain relief grommet (1 set)
16058	Grommet—Rubber grommet for mounting R.F. shelf assembly (4 required)
72069	Grommet—Rubber grommet for rear mounting feet (2 required)
*73895	Indicator—Station selector indicator
74645	Nut—8-32 hex retainer nut between R.F. shelf and volume control knob
74297	Plate—Dial back plate complete with two (2) drive cord pulleys less dial
18469	Plate—Bakelite mounting plate for electrolytic
74640	Pulley—Pulley and hub assembly for volume control
33514	Receptacle—Phono input receptacle
73637	Resistor—Wire wound, 2,200 ohms, 5 watt (R27)
	Resistor—Fixed, composition:
	68 ohms, ±10%, ½ watt (R2, R17)
	100 ohms, ±5%, ½ watt (R29)
	100 ohms, ±10%, ½ watt (R14, R43)
	120 ohms, ±10%, ½ watt (R45)
	300 ohms, ±5%, 2 watt (R44)
	680 ohms, ±10%, ½ watt (R19)
	680 ohms, ±20%, ½ watt (R5, R22)
	1,200 ohms, ±5%, ½ watt (R35)
	3,300 ohms, ±5%, ½ watt (R37)
	8,200 ohms, ±10%, ½ watt (R41)
	8,200 ohms, ±10%, 1 watt (R4)
	10,000 ohms, ±10%, ½ watt (R47)

MODEL A106,
Ch. RC-622

STOCK No.	DESCRIPTION
	15,000 ohms, ±10%, ½ watt (R30)
	18,000 ohms, ±10%, ½ watt (R13)
	22,000 ohms, ±10%, ½ watt (R18, R20, R24)
	27,000 ohms, ±10%, ½ watt (R25)
	33,000 ohms, ±10%, ½ watt (R3, R8)
	39,000 ohms, ±5%, ½ watt (R38)
	39,000 ohms, ±10%, 1 watt (R16)
	56,000 ohms, ±10%, ½ watt (R6, R21)
	82,000 ohms, ±10%, ½ watt (R33)
	150,000 ohms, ±10%, ½ watt (R10)
	220,000 ohms, ±10%, ½ watt (R9)
	270,000 ohms, ±10%, ½ watt (R32)
	330,000 ohms, ±10%, ½ watt (R46)
	470,000 ohms, ±10%, ½ watt (R36, R40, R42)
	2.2 megohm, ±20%, ½ watt (R1, R7, R11)
	10 megohm, ±20%, ½ watt (R26, R34)
	47 megohm, ±20%, ½ watt (R31)
73894	Shaft—Tuning knob shaft
73584	Shield—Tube shield for V1
74646	Sleeve—Sleeve and pulley assembly for volume control knob
74179	Socket—Tube socket, 7 pin, miniature for V1, V2, V3, V4
73117	Socket—Tube socket, 7 pin, miniature for V5, V6, V7
31251	Socket—Tube socket, octal, wafer for V8, V9, V10
31364	Socket—Lamp socket
74038	Spring—Drive cord spring
*74847	Support—Polystyrene support for F.M. oscillator coil complete with mounting bracket
*74840	Switch—Selector switch (S1)
73743	Transformer—Ratio detector transformer (T4)
73745	Transformer—First I.F. transformer—dual (T2)
74019	Transformer—Second I.F. transformer—dual (T3)
73601	Transformer—Power transformer—117 volt, 60 cycle (T1)
33726	Washer—"C" washer for tuning shaft
	SPEAKER ASSEMBLIES 92569-6W RL111-13 RMA 274
13867	Cap—Dust cap
74901	Cone—Cone and voice coil assembly
5039	Connector—4 contact male connector for speaker
74753	Speaker—12" P.M. speaker complete with cone and voice coil less plug and transformer
73636	Transformer—Output transformer
	NOTE: If stamping on speaker in instruments does not agree with above speaker number, order replacement parts by referring to model number of instrument, number stamped on speaker and full description of part required.
	MISCELLANEOUS
74844	Antenna—F.M. antenna
74205	Bezel—Dial scale bezel less dial
71599	Bracket—Pilot lamp bracket
74296	Cable—Shielded pickup cable complete with pin plug for 33/78 RPM changer
71105	Cable—Shielded, pickup cable complete with pin plug for 45 RPM changer
13103	Cap—Pilot lamp cap
39644	Capacitor—Mica, 470 mmf. (on 78/33⅓ RPM record changer)
70602	Capacitor—Tubular, paper, .0025 mfd (on 78/33⅓ RPM record changer), 400 volts

STOCK No.	DESCRIPTION
71892	Catch—Bullet catch and strike for doors (3 required)
73897	Clamp—Dial clamp (2 required)
X3057	Cloth—Grille cloth for mahogany or walnut instruments
X1649	Cloth—Grille cloth for blonde instruments
30868	Connector—2 contact female connector for motor cables
30870	Connector—2 contact male connector for motor cables
74581	Cover—Mounting screw cover for 45 RPM changer (3 required)
74853	Decal—Control function decal for mahogany or walnut instruments
74854	Decal—Control function decal for blonde instruments
74273	Decal—Trade mark decal (Victrola)
71984	Decal—Trade mark decal (RCA Victor)
74842	Dial—Glass dial scale
74851	Grille—Metal grille
11889	Grommet—Rubber grommet for front apron of chassis
74838	Grommet—Power cord strain relief grommet (1 set)
36610	Hinge—Door hinge (1 set) for radio compartment or R.H. record storage compartment
36817	Hinge—Door hinge (1 set) for L.H. record storage compartment
71821	Knob—Tuning control knob—maroon—for mahogany or walnut instruments
72824	Knob—Tuning control or tone control knob—brown—for blonde instruments
71822	Knob—Tone control knob—maroon—for mahogany or walnut instruments
73995	Knob—Volume control knob—brown—for blonde instruments
73994	Knob—Volume control knob—maroon—for mahogany or walnut instruments
73230	Knob—Selector switch knob—maroon—for mahogany or walnut instruments
73231	Knob—Selector switch knob—brown—for blonde instruments
11765	Lamp—Dial or pilot lamp—Mazda 51
74843	Loop—Antenna loop complete
74208	Nut—Tee nut to mount 45 RPM changer (3 required)
74852	Pull—Door pull for record changer drawers or radio compartment (5 required)
74451	Pull—Door pull for record storage compartments
	Resistor—Fixed, composition, 27,000 ohms (on 78, 33⅓ RPM record changer), ±10%, ½ watt
74582	Screw—No. 8-32 x 1¾" special head screw to mount 45 RPM changer (3 required)
74279	Screw—No. 8-32 x ⅞" trimit head screw for pull No. 74451
74269	Screw—No. 8-32 x ¾" trimit head screw for pull No. 74852
74835	Slide—Slide mechanism for 45 RPM changer drawer
74736	Slide—Slide mechanism for 33/78 RPM changer drawer
30900	Spring—Retaining spring for knobs No. 71821, 71822 and 71824
72845	Spring—Retaining spring for knobs No. 73994 and 73995
74421	Spring—Conical spring to mount 45 RPM changer—upper—R.H. (1 required)
74422	Spring—Conical spring to mount 45 RPM changer—upper—L.H. (2 required)
74423	Spring—Conical spring to mount 45 RPM changer—lower (3 required)
72936	Stop—Door stop for record storage compartments (2 required)
75146	Washer—"C" washer to mount 33/78 RPM changer (2 required)

MODEL BX6,
Ch. RC-1082

Model BX6

Specifications

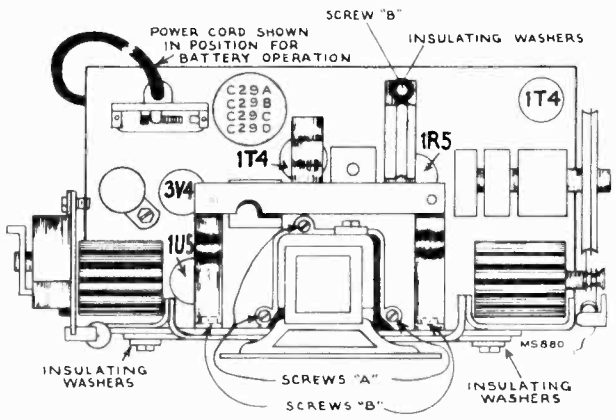
Tuning Range ..... 540-1,600 kc
Intermediate Frequency ..... 455 kc

Power Supply Rating
Power Line Operation
115 volts, d. c. or 50 to 60 cycles a. c. ..... 15 watts
or
Battery Operated ..... using RCA VS 019 Battery
(Average battery life—125 hrs. intermittent service)

Battery current ..... "A" 50 ma., "B" 13 ma.

Tube Complement
(1) RCA 1T4 ..... R.F. Amplifier
(2) RCA 1R5 ..... Converter
(3) RCA 1T4 ..... I.F.-Amplifier
(4) RCA 1U5 ..... 2nd Det.—AVC—1st A.F.
(5) RCA 3V4 ..... Output

A selenium rectifier is used.



Chassis Assembly

To Remove Back Cover:

Push the wire latch on the bottom of the case to the right. Open the back about 3" and remove by easily lifting and sliding the top edge of the cover out of the case.

To Replace Back Cover:

Insert the top edge of the back cover into the case. Hold the top edge in position with one hand and press the bottom edge in place with the other hand until it is latched.

Weight (Approx.)
Without battery ..... 7 lbs. With battery ..... 10½ lbs.

Power Output
Undistorted ..... .150 watt
Maximum ..... .325 watt

Loudspeaker ..... 4 in. P.M.

Voice coil impedance ..... 3.2 ohms at 400 cycles

Cabinet Dimensions
Height ..... 10 in. Width ..... 13 in. Depth ..... 5½ in.

CAUTION.—

1. **Do not remove any tubes from the chassis with the set operating and the plug connected to the power line. Damage to tubes may result.**
2. **When cleaning the aluminum portion of the case use soap and water or cleaning fluid. Do not use abrasive cleansers.**

To Remove Chassis:

1. Loosen battery clamps, pull out battery and disconnect battery plug.
2. Unsolder the two loop antenna leads.
3. Remove the two large screws (under handle) in the top of the case (do not loosen small screws).
4. Lay receiver on table with face down.
5. Remove the two screws holding chassis to case sides.
6. The chassis may now be lifted from the case.

To Remove Speaker:

1. Remove chassis from case as described above.
2. Unsolder output transformer leads from speaker.
3. Un-hook dial cord tension spring.
4. Remove the two screws "B" holding dial bracket to chassis support bracket.
5. Remove the four screws holding dial bracket to chassis base.
6. Tilt dial bracket forward and remove three screws "A" holding speaker bracket to chassis base.

Insulating Washers:

The mounting bracket and dial frame are insulated from the chassis with insulating washers. This serves to insulate the case from the chassis. In servicing make certain that these washers are in place and properly positioned.

MODEL BX6,
Ch. RC-1082

Alignment Procedure

Output Meter Alignment.—If this method is used, connect the meter across the voice coil and turn the receiver volume control to maximum.

Test Oscillator.—For all alignment operations, connect the low side of the test oscillator to the receiver chassis and keep the oscillator output as low as possible to avoid AVC action.

Battery operation of the receiver is preferable during alignment; on AC operation an isolation transformer (117v./117v.) may be necessary for the receiver if the test oscillator is also AC operated.

Calibration Scale.—The calibrated dial scale is attached to the chassis. It can be used directly as a reference for alignment.

With the gang at full mesh set the dial pointer so that the pointer is ¼" to the left of the 55 calibration on the dial scale.

Alignment Tabulation

Step	Connect High Side of Sig. Gen. to—	Sig. Gen. Output	Dial Pointer Setting	Adjust for Max. Output
1	Pin #6 of 1T4 I.F. Amplifier thru .005 mf.	455 kc	Quiet point near 1600 kc	2nd I.F. Trans. T2 Top & Bottom
2	Pin #6 of 1R5 Converter thru .005 mf.			1st I.F. Trans. T1 Top & Bottom
3	Replace bottom cover. Install chassis in case, connect loop and battery. Place "Dummy"* back cover on case.			
4	Short wire placed near loop for radiated signal	1600 kc	1600 kc	C11 (osc.)
5		1400 kc	1400 kc	C10 (r. f.) C1 (loop)
6		600 kc	600 kc	L4 (osc.) L3 (r. f.) Alternately while rocking gang
7	Repeat steps 4, 5, and 6			

* A "dummy" back cover is one having holes provided to permit alignment with the cover in place. The battery and back cover affect loop alignment. The battery should be in place. If a "dummy" back cover is not available, an improvised cover should be made of sheet aluminum. It should not make contact with any metal portion of the case or chassis.

Critical Lead Dress

1. Dress all filament leads next to chassis.
2. Keep the leads short on the end of the three components, (R1, R2, C2) which connect to the grid terminal (#6) of the r.f. socket.
3. Dress tuning condenser leads direct and avoid excess lead length.
4. Dress loop leads away from tuning drum and battery.
5. Dress r.f. plate lead against chassis base.
6. Dress a.v.c. lead against chassis base.
7. Dress +B lead to output transformer against chassis base.
8. Dress 1st a.f. plate resistor (R13) up and away from other wiring.
9. Dress all leads away from the ballast resistor.
10. Dress ON-OFF switch leads clear of switch actuating lever and shutter.
11. Dress 1st a.f. grid resistor (R11) close to chassis.
12. Dress capacitor C4 in air between end apron and r.f. coil and away from selenium rectifier, with foil end to tuning condenser frame.

Power Line Operation.—

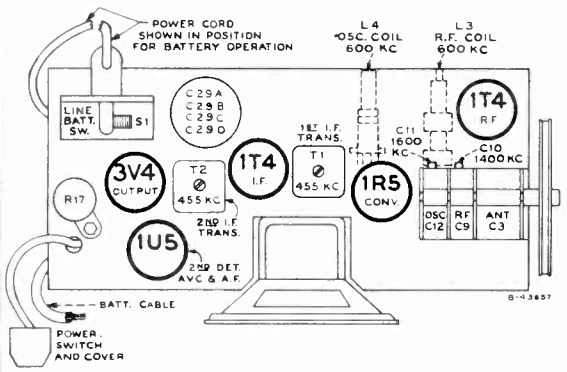
A power cord is stored in the fiber tube which is clamped above the chassis inside the cabinet. To open the cabinet, push the wire latch on the bottom of the case to the right, and lift the back cover up and off. Then pull the power cord plug out of the socket on the top of the chassis as shown, and take out and unroll the power cord. A slot in the bottom of the cabinet allows the closing of the cabinet with the power cord passing through. Replace the back cover with the cord extending through the slot and insert the plug into a convenient electrical outlet.

When returning to battery operation, be sure to replace the power plug in its socket inside the case with the cord stored in the fiber tube.

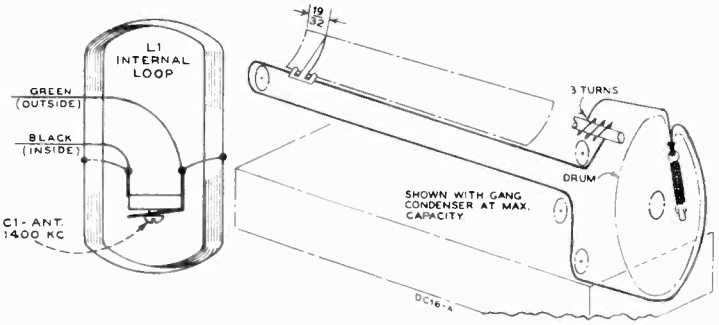
NOTE: If reception is not obtained on DC, reverse plug in outlet receptacle. This may also reduce hum on AC operation.

To Replace Top Cover:

Assemble handle to cover and case front but do not tighten screws (small). Replace and tighten chassis mounting screws (large). Tighten the screws holding handle to top cover and case front.

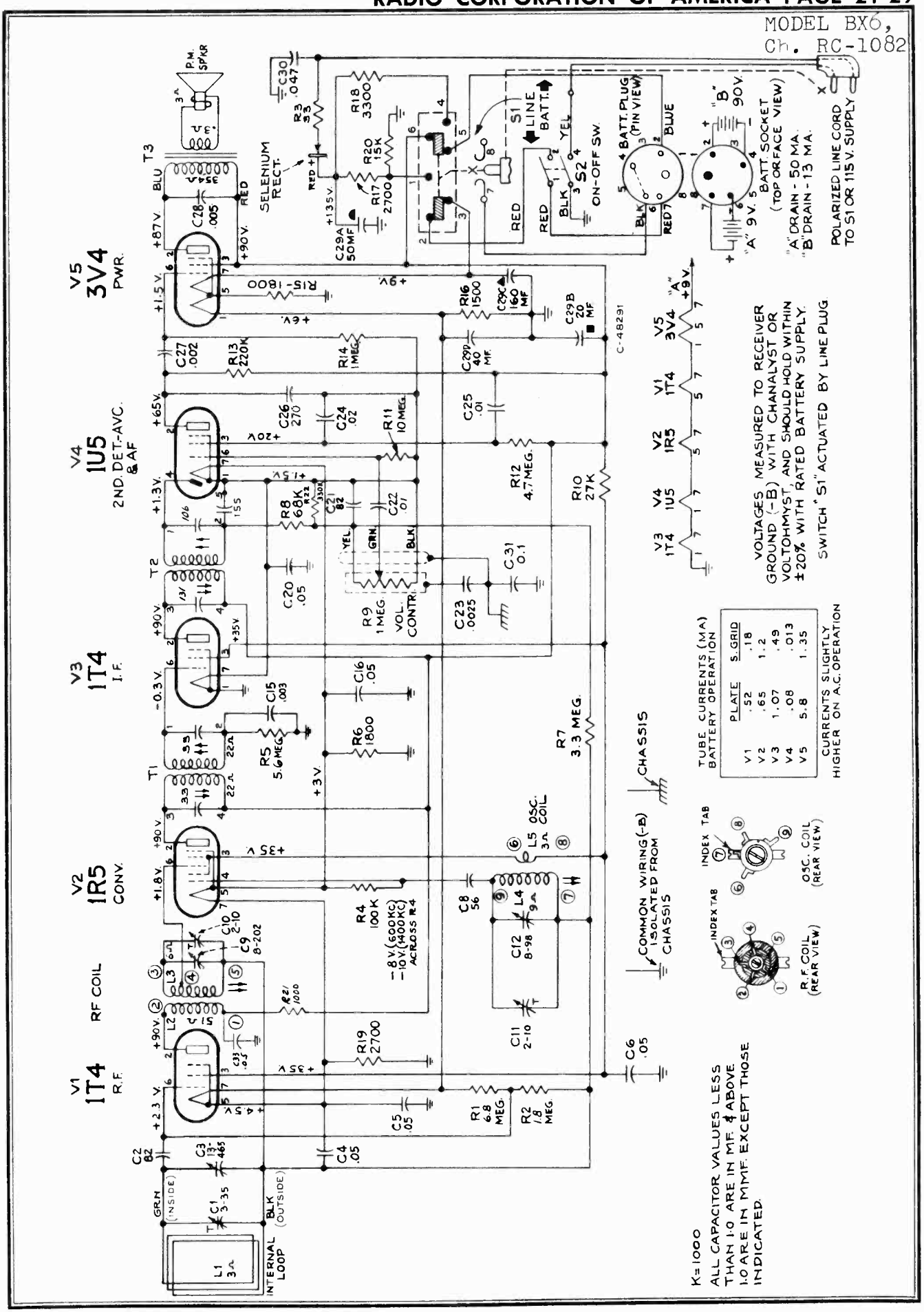


Tube and Trimmer Locations



Dial-Indicator and Drive Mechanism

MODEL BX6,
Ch. RC-1082



MODEL BX6,
Ch. RC-1082

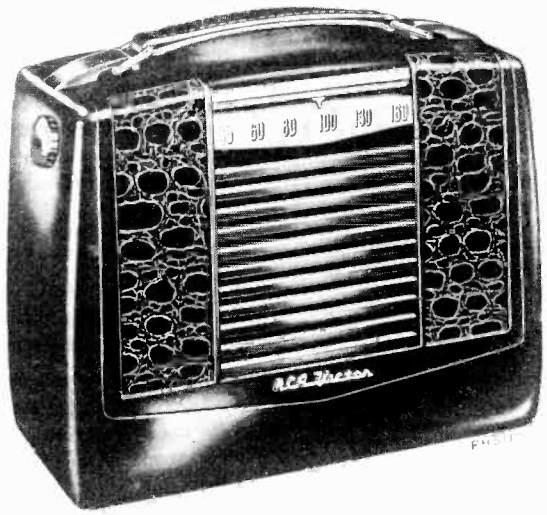
Replacement Parts

STOCK No.	DESCRIPTION
	CHASSIS ASSEMBLIES RC 1082
71044	Bracket—Power switch bracket complete with actuating lever less switch
71056	Bracket—Drive cord pulley bracket complete with pulley (volume control side)
74995	Bracket—Drive cord pulley bracket complete with 2 pulleys
74991	Capacitor—Variable tuning capacitor complete with drum C3, C9, C10, C11, C12
71924	Capacitor—Ceramic, 56 mmf. C8
71514	Capacitor—Ceramic, 82 mmf. C2, C21
73922	Capacitor—Ceramic, 270 mmf. C26
73113	Capacitor—Electrolytic, comprising 1 section of 50 mfd., 150 volts, 1 section of 20 mfd., 150 volts, 1 section of 160 mfd., 25 volts and 1 section of 40 mfd., 25 volts C29A, C29B, C29C, C29D
73750	Capacitor—Tubular, paper, .002 mfd., 200 volts C27
70602	Capacitor—Tubular, paper, .0025 mfd., 400 volts C23
73961	Capacitor—Tubular, paper, .003 mfd., 200 volts C15
71553	Capacitor—Tubular, paper, .005 mfd., 400 volts C28
71923	Capacitor—Tubular, paper, .01 mfd., 200 volts C22, C25
71928	Capacitor—Tubular, paper, .02 mfd., 200 volts C24
75071	Capacitor—Tubular, moulded paper, .047 mfd., 400 volts C30
71551	Capacitor—Tubular, paper, .05 mfd., 200 volts C5, C16, C20
73553	Capacitor—Tubular, paper, .05 mfd., 400 volts C4, C6, C33
70617	Capacitor—Tubular, paper, 0.1 mfd., 400 volts C31
73935	Clip—Mounting clip for I.F. transformer
73114	Coil—Oscillator coil complete with adjustable core L4, L5
74992	Coil—R.F. coil complete with adjustable core L2, L3
71041	Connector—4 contact male connector for battery cable
71057	Control—Volume control R9
†72953	Cord—Drive cord (approx. 38" overall length required)
70022	Cord—Power cord
74998	Dial—Dial scale and window assembly
74838	Grommet—Power cord strain relief grommets (1 set)
72283	Grommet—Rubber grommet to mount tuning capacitor
71031	Holder—Power cord holder (fibre tube)
73111	Indicator—Station selector indicator
74994	Knob—Tuning or volume control knob (roller type)
18469	Plate—Bakelite mounting plate for electrolytic capacitor
72602	Pulley—Drive cord pulley (removable)
74322	Rectifier—Selenium rectifier
73237	Resistor—Wire wound, fuse type, 33 ohms, 150 MA R3
74993	Resistor—Molded ceramic, 2700 ohms, 10 watts R17
	Resistor—Fixed, composition:—
	1000 ohms, ±10%, ½ watt R21
	1500 ohms, ±10%, ½ watt R16
	1800 ohms, ±10%, ½ watt R6, R15
	2700 ohms, ±10%, ½ watt R19
	3300 ohms, ±10%, 1 watt R18
	15,000 ohms, ±20%, ½ watt R20
	27,000 ohms, ±10%, ½ watt R10
	68,000 ohms, ±20%, ½ watt R8
	100,000 ohms, ±20%, ½ watt R4
	220,000 ohms, ±20%, ½ watt R13
	330,000 ohms, ±10%, ½ watt R22
	1 megohm, ±20%, ½ watt R14
	1.8 megohm, ±10%, ½ watt R2
	3.3 megohm, ±10%, ½ watt R7
	4.7 megohm, ±20%, ½ watt R12
	5.6 megohm, ±10%, ½ watt R5
	6.8 megohm, ±10%, ½ watt R1
	10 megohm, ±20%, ½ watt R11

STOCK No.	DESCRIPTION
73122	Shaft—Tuning knob shaft
74996	Shield—End shield for dial—L.H.
74997	Shield—End shield for dial—R.H.
73117	Socket—Tube socket
74038	Spring—Drive cord spring
30900	Spring—Retaining spring for knob
71039	Switch—"Line-Battery" change switch S1
71045	Switch—Power switch less cover and actuating lever S2
73129	Transformer—First I.F. transformer T1
73037	Transformer—Second I.F. transformer T2
71047	Transformer—Output transformer T3
73332	Washer—Insulating washer (flat) for mounting base holder bracket (1 req'd) and dial support to chassis (4 req'd)
73333	Washer—Insulating washer (extruded) for mounting base holder bracket (1 req'd) and dial support to chassis (4 req'd)
71081	Washer—Spring washer to hold removable drive cord pulley
	SPEAKER ASSEMBLIES 92577-3W
71059	Gasket—Speaker gasket (black tubing)
73123	Speaker—4" P.M. speaker complete with cone and voice coil
	MISCELLANEOUS
71074	Arm—Shutter arm lever
74999	Back—Case back complete with latch
71073	Bracket—Bearing bracket for shutter arm lever
71070	Bracket—Mounting bracket for #71069 adjustable capacitor
71069	Capacitor—Adjustable trimmer capacitor 3-35 mmf. C1
75001	Clip—Clip to hold battery (2 req'd)
75005	Clip—"C" clip (threaded) for battery holder clip (2 req'd)
75009	Clip—Clip to hold chassis to case (end plates) (2 req'd)
75010	Clip—"C" clip and screw for fastening case front (4 req'd)
71080	Clip—Case side spring clip and screw (2 req'd)
75013	Clip—Spring clip with tab for fastening case front to case sides (4 req'd)
75011	Emblem—"RCA Victor" emblem
75006	Front—Case front complete with insulating strip and support feet—less shutter
75016	Handle—Carrying handle—less links
75004	Latch—Spring latch for back cover
75018	Link—Carrying handle link—less mounting plate
71079	Loop—Antenna loop L1
75003	Nut—Speed nut to mount carrying handle
75015	Pin—Pivot pin (stud) for case shutter
75000	Plate—Case top plate—less handle
75017	Plate—Mounting plate for carrying handle (2 req'd)
75002	Screw—#4 x 3/8" round head cross recessed self-tapping screw to mount carrying handle
71066	Screw—#8-32 x 1/2" cross recessed binder head screw to hold chassis to top plate (2 req'd)
75014	Screw—#4 x 1/4" pan head screw for #75013 spring clip (4 req'd) or capacitor bracket (2 req'd)
71071	Shutter—Case shutter
75012	Side—Case side only—less pivot pin
71072	Spring—Case shutter compression spring
75007	Strip—Case front insulating strip complete with latch plate
75008	Support—Moulded support foot for case (2 req'd)
74353	Washer—Spring washer for shutter shafts

†Stock No. 72953 is a reel containing 250 feet of cord.

MODEL BX55
Ch. RC-1088



Specifications

Tuning Range ..... 540-1600 kc.

Intermediate Frequency ..... 455 kc.

Tube Complement

(1) RCA 1R5 ..... Converter
(2) RCA 1T4 ..... I. F. Amplifier
(3) RCA 1U5 ..... Det.—A.V.C.—A. F. Amp.
(4) RCA 3V4 ..... Output

A selenium rectifier is used

Power Supply Rating

Power Line Operation

115 volts, d. c. or 50 to 60 cycles a. c. ..... 18 watts

or

Battery Operated ..... VS 050 Battery
(Average life—100 hrs. intermittent service)

Loudspeaker (92577-3)

Size and type ..... 4 in. P.M. dynamic
Voice coil impedance ..... 3.2 ohms at 400 cycles

Tuning Drive Ratio ..... 8:1 (4 turns of knob)

Power Output

Undistorted—170 milliwatts Maximum—350 milliwatts
(Output is slightly lower on battery operation)

Cabinet Dimensions

Height 8¼ in. Width 10¾ in. Depth 5 in.

Weight (Approx.)

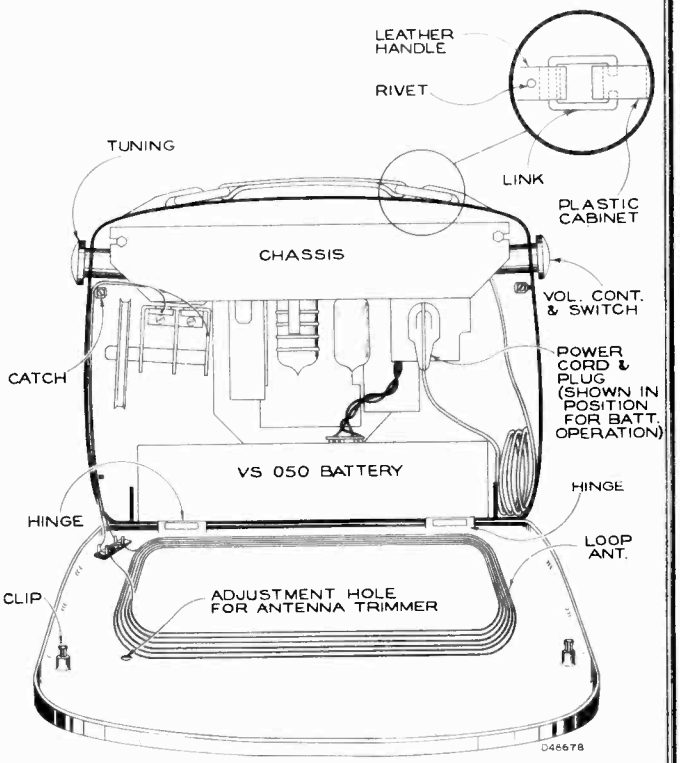
5 lb. less battery 8 lb. 2 oz. with battery

AC-DC Operation

A power cord is stored inside the cabinet. To open the cabinet, pull backwards on the top of the cabinet back. It is secured by means of two spring clips and catches on the inside of the cabinet. Remove the plug of the power cord from its socket on the chassis and insert the plug into a convenient electrical power outlet. A notch in the right side of the cabinet allows the back to be closed with the cord passing through.

Notes: 1. Maximum performance is obtained with the battery in place. Receiver sensitivity will be lowered if the battery is not in place during AC-DC operation since the battery affects the loop inductance.

2. If reception is not obtained on DC, reverse plug in power outlet. On AC operation, reversal of the plug may reduce hum.



To Remove Carrying Handle

1. Remove rivets from handle.
2. Turn link and slip out of handle and cabinet.

Cabinet Back and Hinges

The cabinet back and hinges may be readily detached from the cabinet. See back page for detailed instructions on their removal.

Battery Operation

Replace the power cord plug in the socket provided on the back of the chassis. Coil up the power cord and place it alongside of the battery. Make certain that it will not interfere with the tuning condenser.

Note: Make certain that the plug is fully inserted (base of plug touching chassis) to assure proper operation of the Batt-Line switch.

MODEL BX55,
Ch. RC-1088

Alignment Procedure

Signal Generator.—For all alignment operations, connect the low side of the signal generator to the receiver chassis and keep the output as low as possible to avoid AVC action.

Battery operation of the receiver is preferable during alignment; on a. c. operation an isolation transformer (117v./117v.) may be necessary for the receiver if the signal generator is also a. c. operated.

Note: Battery must be in place for ant. alignment (step 6).

Dial Pointer Position.—With the tuning condenser fully meshed the center of the dial pointer should be in line with the score mark on the chassis.

Alignment Tabulation

Step	Connect high side of signal generator to—	Signal generator output	Dial pointer setting	Adjust for maximum output—
1	Disconnect loop — remove chassis — remove bottom plate, connect a 10,000 ohm resistor from C1-1 stator terminal to tuning condenser frame.			
2	Grid of 1T4 (pin No. 6) thru .01 mf. capacitor	455 kc	Quiet point near 1600 kc	T2 (top) 2nd. I-F trans.
3	Stator term. of C1-1 thru .01 mf. capacitor			T1 (top & bottom) 1st. I-F trans.
4	Remove the 10,000 ohm resistor. Replace bottom cover and install chassis in cabinet. Re-connect loop.			
5	Short wire placed near receiver (for radiated signal)	1620 kc	Tuning condenser fully open	C1-2 trimmer (osc.)
6		1300 kc	1300 kc signal	†C1-1 trimmer (ant.)

† With back closed. Trimmer is accessible thru hole in back.

NOTE:
The magnetite cores of T2 and T1 may not have visible adjusting screws. The cores have screw driver slots to permit adjustment (use non-metallic screwdriver).

Critical Lead Dress

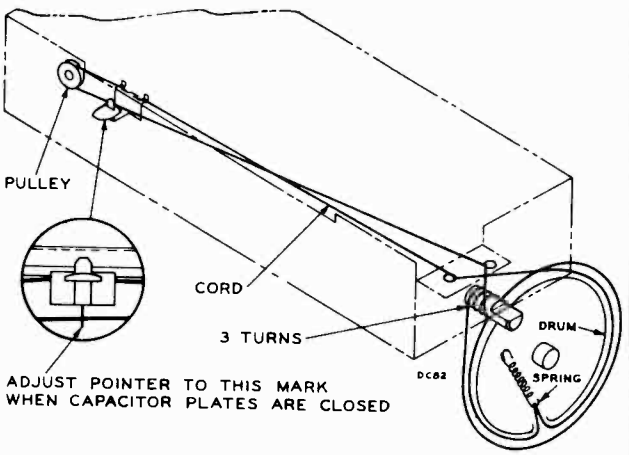
1. Dress antenna loop leads away from adjusting screws on tuning condenser.
2. Dress all capacitors against chassis base.
3. Dress oscillator coil away from chassis and bottom cover.
4. Dress output transformer primary leads against chassis.
5. Dress all leads and components away from selenium rectifier.
6. Dress loop antenna leads into recesses provided in the side of the cabinet. Leave slack at hinged edge of cabinet.

Note: This instrument is designed to be operated with a battery in position inside the cabinet. Reception will be below normal unless the battery is in its normal location.

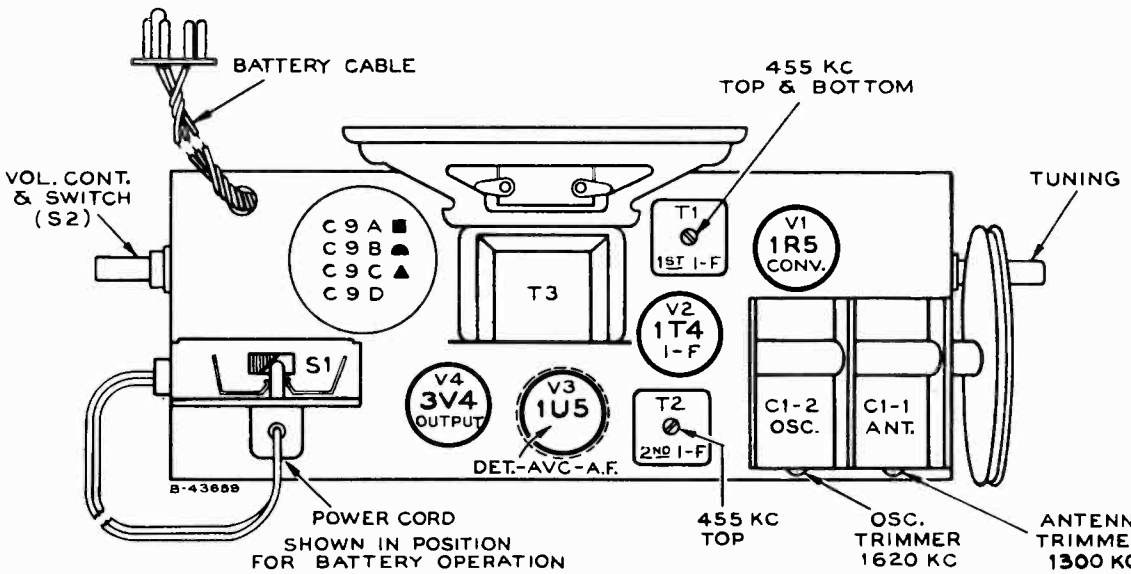
The position of the battery pack affects the loop inductance. Therefore, when the battery is removed, the loop inductance will change (increase) and the sensitivity will be slightly worse because of improper electrical tracking of the loop circuit with the heterodyne oscillator of the receiver.

CAUTION.—

Do not remove any tubes from the chassis with the set operating and the plug connected to the power line. Damage to tubes may result.

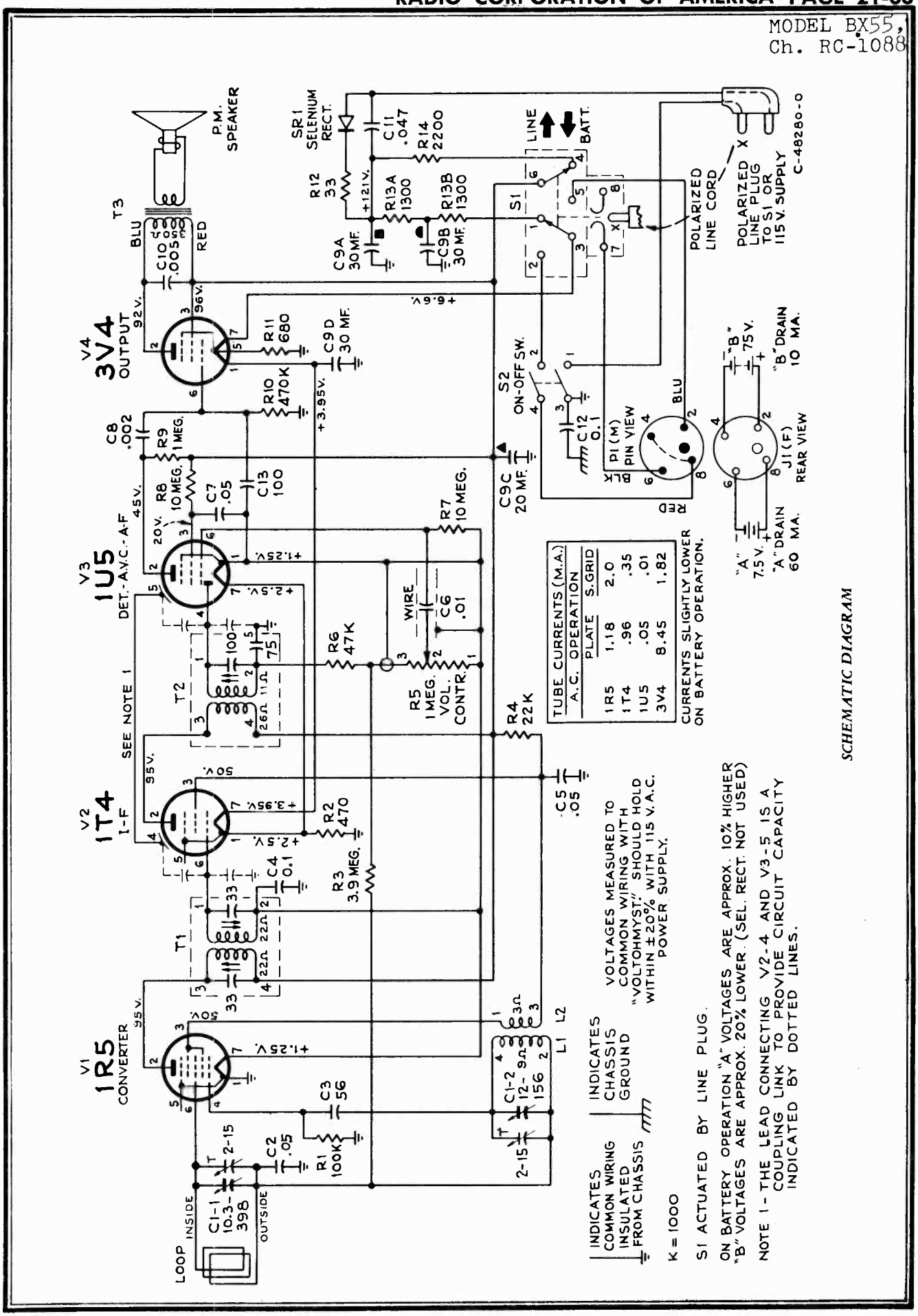


Dial Indicator and Drive Mechanism



Tube and Trimmer Locations

MODEL BX55,
Ch. RC-1088



SCHEMATIC DIAGRAM

MODEL BX55,
Ch. RC-1088

Replacement Parts

STOCK No.	DESCRIPTION
	CHASSIS ASSEMBLIES
	RC 1088
74778	Capacitor—Variable tuning capacitor C1-1,C1-2
39622	Capacitor—Mica, 56 mmf. C3
39628	Capacitor—mica, 100 mmf. C13
74774	Capacitor—Electrolytic, comprising 2 sections of 30 mfd., 150 volts, 1 section of 20 mfd., 150 volts and 1 section of 30 mfd., 25 volts..C9A, C9B, C9C, C9D
72315	Capacitor—Tubular, paper, .002 mfd., 200 volts C8
73920	Capacitor—Tubular, paper, .005 mfd., 400 volts C10
73561	Capacitor—Tubular, paper, .01 mfd., 400 volts C6
75071	Capacitor—Tubular, moulded paper, .047 mfd., 400 volts C11
73553	Capacitor—Tubular, paper, .05 mfd., 400 volts C2, C5, C7
70617	Capacitor—Tubular, paper, 0.1 mfd., 400 volts C4, C12
73935	Clip—Mounting clip for I.F. transformer
74780	Coil—Oscillator coil L1, L2
73275	Connector—5 contact male connector for battery cable P1
73125	Control—Volume control and power switch R5, S2
71457	Cord—Power cord and plug
†72953	Cord—Drive cord (approx. 40" overall length req'd)
72283	Grommet—Rubber grommet to mount tuning capacitor (3 required)
74838	Grommet—Power cord strain relief grommet (1 set)
74776	Indicator—Station selector indicator
18469	Plate—Mounting plate for electrolytic capacitor
72602	Pulley—Drive cord pulley
74322	Rectifier—Selenium rectifier SR1
73237	Resistor—Wire wound (fuse type) 33 ohms R12
74777	Resistor—Voltage divider, dual, 1300 ohms, 3.5 watts R13A, R13B
	Resistor—Fixed, composition:—
	470 ohms, ±20%, ½ watt R2
	680 ohms, ±20%, ½ watt R11
	2200 ohms, ±10%, ½ watt R14
	22,000 ohms, ±20%, ½ watt R4
	47,000 ohms, ±20%, ½ watt R6
	100,000 ohms, ±20%, ½ watt R1
	470,000 ohms, ±20%, ½ watt R10
	1 megohm, ±20%, ½ watt R9
	3.9 megohm, ±10%, ½ watt R3
	10 megohm, ±20%, ½ watt R7, R8
74773	Shaft—Tuning knob shaft
73103	Shield—Tube shield for 1U5 tube
73117	Socket—Tube socket, miniature
74038	Spring—Drive cord tension spring
71039	Switch—"Line-Battery" change switch S1
73129	Transformer—First I.F. transformer T1
74775	Transformer—Second I.F. transformer T2
74779	Transformer—Output transformer T3
33726	Washer—"C" washer for tuning knob shaft
	SPEAKER ASSEMBLY
	92577-3
74165	Speaker—4" P.M. speaker complete with cone and voice coil
	MISCELLANEOUS
75048	Back—Cabinet back complete with loop
74787	Board—Terminal board—2 contact
Y2220	Case—Cabinet front less back, emblem, handle, and dial
74339	Catch—Cabinet back catch (part of cabinet front)
74734	Clip—Spring clip for knob
74792	Clip—Striking clip for catch (part of cabinet back) (2 required)
74784	Dial—Metal dial scale
74782	Emblem—"RCA Victor" emblem
74785	Handle—Carrying handle
74790	Hinge—Cabinet hinge (2 required)
74666	Knob—Tuning or volume control and power switch knob
74786	Link—Link for carrying handle (2 required)
74789	Loop—Antenna loop winding
74788	Nut—Speed nut to mount terminal board
73203	Nut—Speed nut to fasten dial (2 required) or decorative plate (2 required) to cabinet
75448	Rivet—Bevel pointed rivet for handle (2 required)
75435	Screen—Crinoline screen for speaker grille
74783	Plate—Decorative plate (satin finish) for cabinet (above dial)
74301	Screw—No. 8-32 x 3/8" pan head cross recessed screw for chassis mounting (2 required)
74791	Screw—No. 4 x 5/16" pan head cross recessed screw to fasten catch to cabinet front.

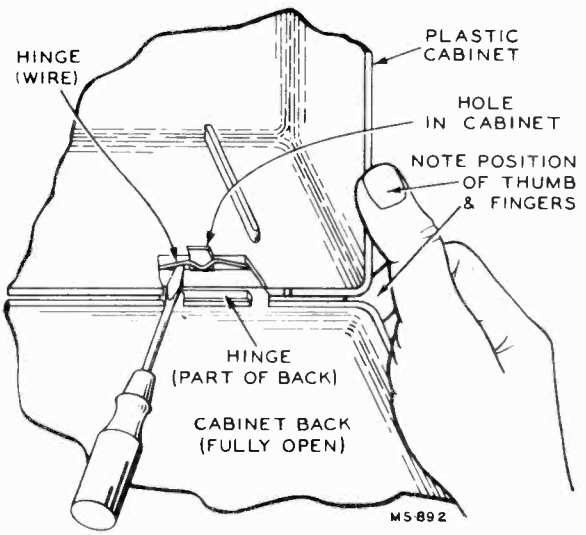
† Stock No. 72953 is a reel which contains 250 ft. of cord.

To Remove Cabinet Back

Disconnect the loop antenna leads. With the back fully open, grip the cabinet as illustrated. Insert a screwdriver under one hinge and pry the center of the hinge out of the opening in the cabinet while maintaining pressure on the back with the fingers and on the cabinet with the thumb. Repeat this procedure with the other hinge. Pull the back straight to the rear using both hands.

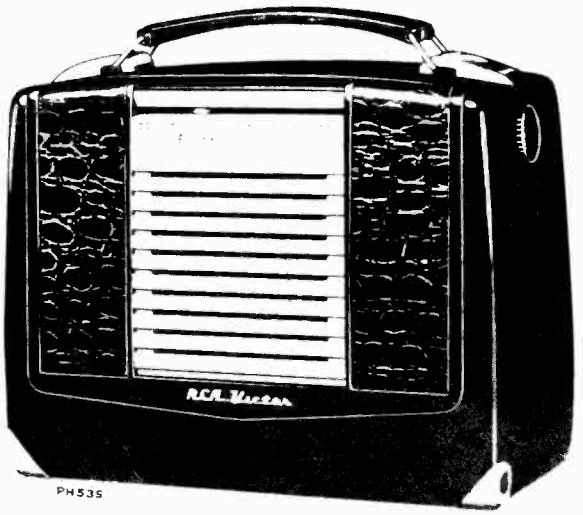
To Remove Hinges

Remove back from cabinet as described above. Spread the hinge apart to remove it from the cabinet back.



Removal of Cabinet Back

MODEL BX57,
Ch. RC-1088A



Specifications

Tuning Range ..... 540-1600 kc.

Intermediate Frequency ..... 455 kc.

Tube Complement

(1) RCA 1R5 ..... Converter
(2) RCA 1U4 ..... I. F. Amplifier
(3) RCA 1U5 ..... Det.—A.V.C.—A. F. Amp.
(4) RCA 3V4 ..... Output

A selenium rectifier is used

Power Supply Rating

Power Line Operation

115 volts, d. c. or 50 to 60 cycles a. c. ..... 18 watts

or

Battery Operated ..... VS 050 Battery

(Average battery life—100 hrs. intermittent service)

Loudspeaker (92577-3)

Size and type ..... 4 in. P.M. dynamic
Voice coil impedance ..... 3.2 ohms at 400 cycles

Tuning Drive Ratio ..... 8:1 (4 turns of knob)

Power Output

Undistorted—170 milliwatts Maximum—350 milliwatts

(Output is slightly lower on battery operation)

Cabinet Dimensions

Height 8¼ in. Width 10¾ in. Depth 5 in.

Weight (Approx.)

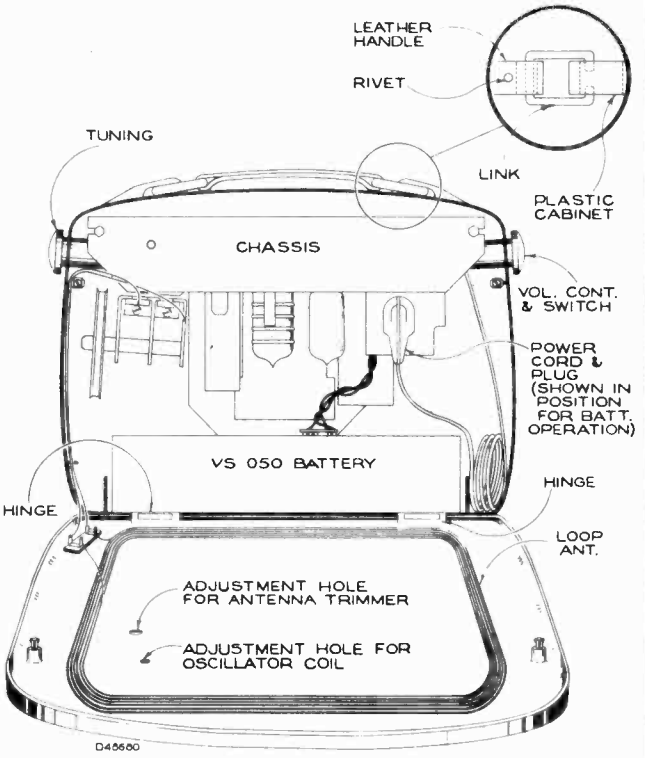
5 lb. less battery 8 lb. 2 oz. with battery

AC-DC Operation

A power cord is stored inside the cabinet. To open the cabinet, pull backwards on the top of the cabinet back. It is secured by means of two spring clips and catches on the inside of the cabinet. Remove the plug of the power cord from its socket on the chassis and insert the plug into a convenient electrical power outlet. A notch in the right side of the cabinet allows the back to be closed with the cord passing through.

Notes: 1. Maximum performance is obtained with the battery in place. Receiver sensitivity will be lowered if the battery is not in place during AC-DC operation since the battery affects the loop inductance.

2. If reception is not obtained on DC, reverse plug in power outlet. On AC operation, reversal of the plug may reduce hum.



To Remove Carrying Handle

1. Remove rivets from handle.
2. Turn link and slip out of handle and cabinet.

Cabinet Back and Hinges

The cabinet back and hinges may be readily detached from the cabinet. See back page for detailed instructions on their removal.

Battery Operation

Replace the power cord plug in the socket provided on the back of the chassis. Coil up the power cord and place it alongside of the battery. Make certain that it will not interfere with the tuning condenser.

Note: Make certain that the plug is fully inserted (base of plug touching chassis) to assure proper operation of the Batt-Line switch.

MODEL BX57,
Ch. RC-1088A

Alignment Procedure

Signal Generator—For all alignment operations, connect the low side of the signal generator to the receiver chassis and keep the output as low as possible to avoid AVC action.

Battery operation of the receiver is preferable during alignment; on a. c. operation an isolation transformer (117v./117v.) may be necessary for the receiver if the signal generator is also a. c. operated.

Note: Battery must be in place for ant. alignment (step 6).

Dial Pointer Position.—With the tuning condenser fully meshed the center of the dial pointer should be in line with the score mark on the chassis.

Alignment Tabulation

Step	Connect high side of signal generator to—	Signal generator output	Dial pointer setting	Adjust for maximum output—
1	Disconnect loop — remove chassis — remove bottom plate, connect a 10,000 ohm resistor from C1-1 stator terminal to tuning condenser frame.			
2	Grid of 1U4 (pin No. 6) thru .01 mf. capacitor	455 kc	Quiet point near 1600 kc	T2 (top & bottom) 2nd. I-F trans.
3	Stator term. of C1-1 thru .01 mf. capacitor			T1 (top & bottom) 1st. I-F trans.
4	Remove the 10,000 ohm resistor. Replace bottom cover and install chassis in cabinet. Re-connect loop.			
5	Short wire placed near receiver (for radiated signal)	1620 kc	Tuning condenser fully open	C1-2 trimmer (osc.)
6		1400 kc	1400 kc signal	†C1-1 trimmer (ant.)
7		600 kc	600 kc signal	†L1 (osc.) rock gang
8	Repeat steps 5 and 6.			

† With back closed. Trimmer is accessible thru hole in back.

NOTE:
The magnetite cores of T2 and T1 may not have visible adjusting screws. The cores have screwdriver slots to permit adjustment (use non-metallic screwdriver).

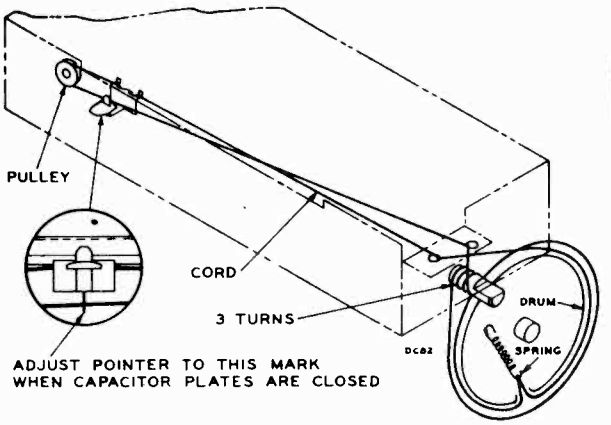
Critical Lead Dress

1. Dress antenna loop leads away from adjusting screws on tuning condenser.
2. Dress all capacitors against chassis base.
3. Dress oscillator coil away from chassis and bottom cover.
4. Dress output transformer primary leads against chassis.
5. Dress all leads and components away from selenium rectifier.
6. Dress the 4 mmf. capacitor (C15) down against the .003 mf. capacitor (C14).
7. Capacitor C15 must be connected to the plate terminal of the 1U4 socket with as short lead as possible.
8. Dress loop antenna leads into recesses provided in the side of the cabinet. Leave slack at hinged edge of cabinet.

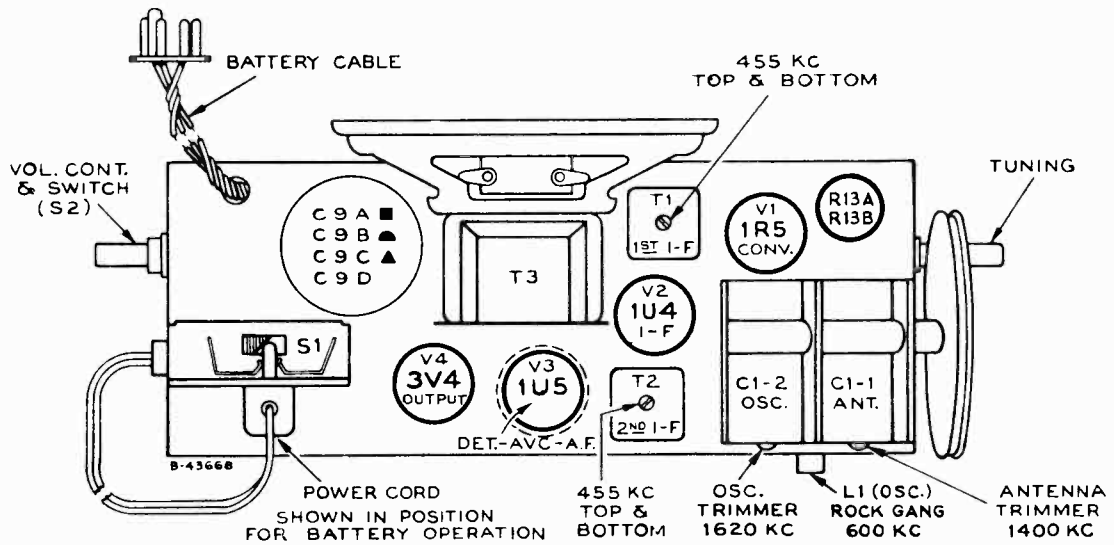
Note: This instrument is designed to be operated with a battery in position inside the cabinet. Reception will be below normal unless the battery is in its normal location.

The position of the battery pack affects the loop inductance. Therefore, when the battery is removed, the loop inductance will change (increase) and the sensitivity will be slightly worse because of improper electrical tracking of the loop circuit with the heterodyne oscillator of the receiver.

CAUTION.—
Do not remove any tubes from the chassis with the set operating and the plug connected to the power line. Damage to tubes may result.

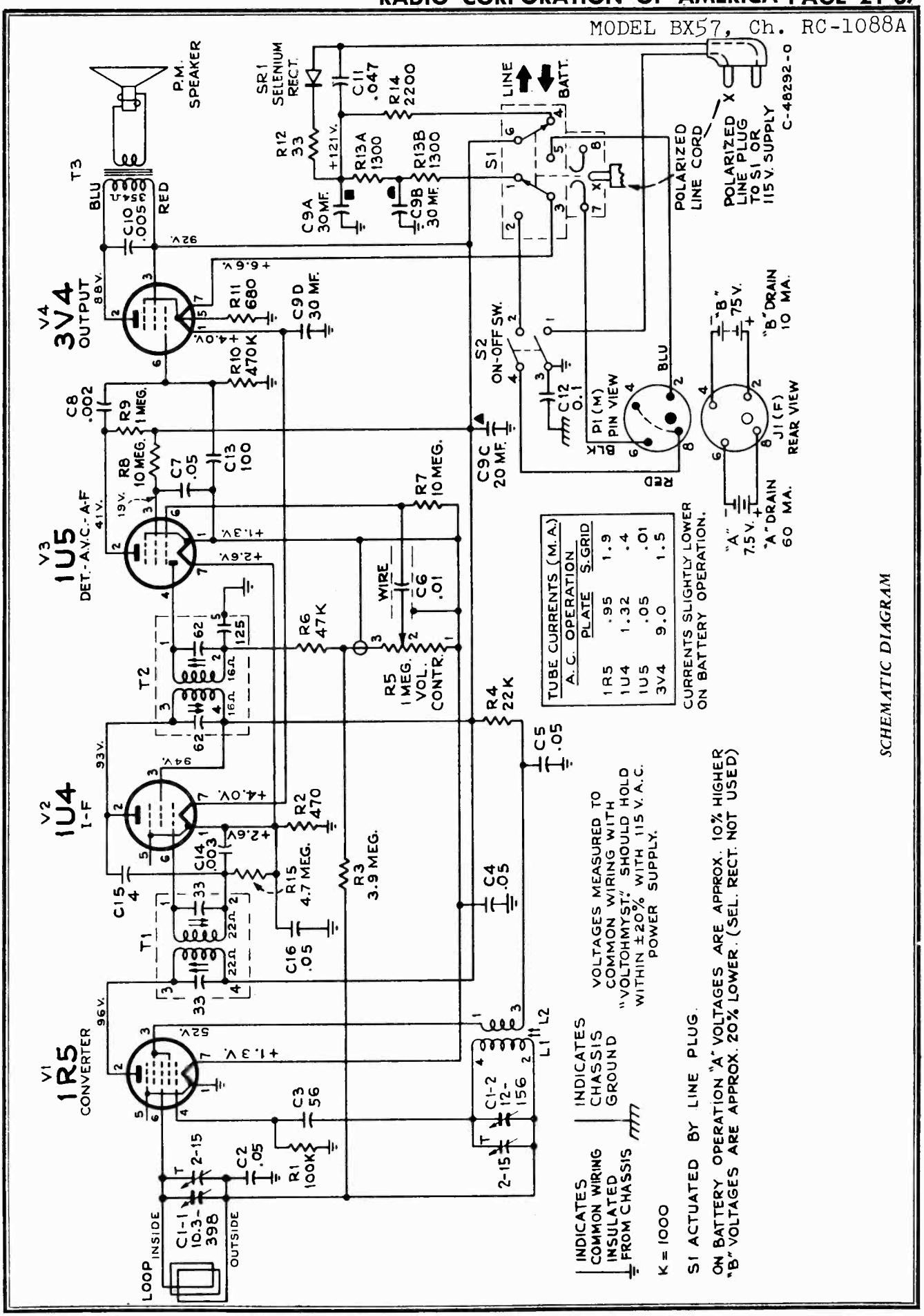


Dial Indicator and Drive Mechanism



Tube and Trimmer Locations

MODEL BX57, Ch. RC-1088A



SCHEMATIC DIAGRAM

MODEL BX57,
Ch. RC-1088A

Replacement Parts

STOCK No.	DESCRIPTION
	CHASSIS ASSEMBLIES RC 1088A
75149	Capacitor—Variable tuning capacitor C1-1, C1-2
73153	Capacitor—Ceramic, 4 mmf. C15
39622	Capacitor—Mica, 56 mmf. C3
39628	Capacitor—Mica, 100 mmf. C13
74774	Capacitor—Electrolytic, comprising 2 sections of 30 mfd., 150 volts, 1 section of 20 mfd., 150 volts and 1 section of 30 mfd., 25 volts C9A, C9B, C9C, C9D
72315	Capacitor—Tubular, paper, .002 mfd., 200 volts C8
73961	Capacitor—Tubular, paper, .003 mfd., 200 volts C14
73920	Capacitor—Tubular, paper, .005 mfd., 400 volts C10
73561	Capacitor—Tubular, paper, .01 mfd., 400 volts C6
75071	Capacitor—Tubular, moulded paper, .047 mfd., 400 volts C11
73553	Capacitor—Tubular, paper, .05 mfd., 400 volts C2, C4 C5, C7, C16
70617	Capacitor—Tubular, paper, 0.1 mfd., 400 volts C12
73935	Clip—Mounting clip for I.F. transformer
74405	Coil—Oscillator coil L1, L2
73275	Connector—5 contact male connector for battery cable
73125	Control—Volume control and power switch R5, S2
71457	Cord—Power cord and plug
†72953	Cord—Drive cord (approx. 40" overall length req'd)
72283	Grommet—Rubber grommet to mount tuning capacitor
74838	Grommet—Power cord strain relief grommet (1 set)
74776	Indicator—Station selector indicator
18469	Plate—Mounting plate for electrolytic capacitor
72602	Pulley—Drive cord pulley
74322	Rectifier—Selenium rectifier SR1
73237	Resistor—Wire wound (fuse type) 33 ohms R12
75148	Resistor—Ceramic, 2600 ohms, tapped at 1300 ohms, 10 watts R13
	Resistors—Fixed, composition:-
	470 ohms, ±20%, ½ watt R2
	680 ohms, ±20%, ½ watt R11
	2200 ohms, ±10%, ½ watt R14
	22,000 ohms, ±20%, ½ watt R4
	47,000 ohms, ±20%, ½ watt R6
	100,000 ohms, ±20%, ½ watt R1
	470,000 ohms, ±20%, ½ watt R10
	1 megohm, ±20%, ½ watt R9
	3.9 megohm, ±10%, ½ watt R3
	4.7 megohm, ±20%, ½ watt R15
	10 megohm, ±20%, ½ watt R7, R8

STOCK No.	DESCRIPTION
74773	Shaft—Tuning knob shaft
73103	Shield—Tube shield for 1U5 tube
73117	Socket—Tube socket, miniature
74038	Spring—Drive cord tension spring
71039	Switch—"Line-Battery" change switch S1
73129	Transformer—First I.F. transformer T1
73130	Transformer—Second I.F. transformer T2
71047	Transformer—Output transformer T3
33726	Washer—"C" washer for tuning knob shaft
	SPEAKER ASSEMBLIES 92577-3
74165	Speaker—4" P.M. speaker complete with cone and voice coil
	MISCELLANEOUS
75080	Back—Cabinet back complete with loop
74787	Board—Terminal board—2 contact
Y2227	Cabinet—Cabinet front including corners and link caps—less dial and plate
75156	Cap—Carrying handle link cap (2 required)
74339	Catch—Cabinet back catch (part of cabinet front)
74734	Clip—Spring clip for knob
74792	Clip—Striking clip for catch (part of cabinet back) (2 required)
75153	Cover—Cabinet corner cover—L.H.
75154	Cover—Cabinet corner cover—R.H.
75157	Dial—Metal dial scale and bezel
74782	Emblem—"RCA Victor" emblem
75150	Handle—Carrying handle
74790	Hinge—Cabinet hinge (2 required)
74781	Knob—Tuning or volume control and power switch knob
75151	Link—Link for carrying handle (2 required)
75152	Loop—Antenna loop winding
74788	Nut—Speed nut to mount terminal board
73203	Nut—Speed nut to fasten dial, corner covers, decorative plate or link caps
74783	Plate—Decorative plate (satin finish) for cabinet (above dial)
75448	Rivet—Bevel pointed rivet for handle (2 required)
75435	Screen—Crinoline screen for speaker grille
74301	Screw—No. 8-32 x ⅜" pan head cross recessed screw for chassis mounting (2 required)
74791	Screw—No. 4 x 5/16" pan head cross recessed screw to fasten catch to cabinet front

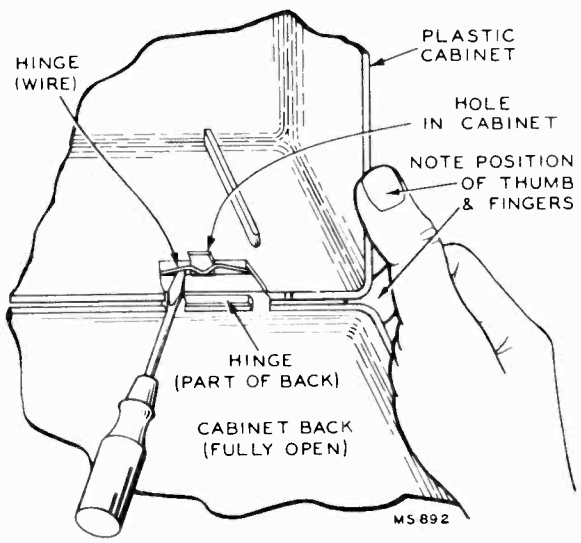
† Stock No. 72953 is a reel which contains 250 ft. of cord.

To Remove Cabinet Back

Disconnect the loop antenna leads. With the back fully open, grip the cabinet as illustrated. Insert a screwdriver under one hinge and pry the center of the hinge out of the opening in the cabinet while maintaining pressure on the back with the fingers and on the cabinet with the thumb. Repeat this procedure with the other hinge. Pull the back straight to the rear using both hands.

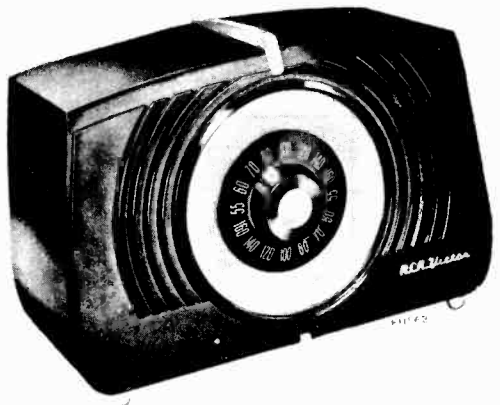
To Remove Hinges

Remove back from cabinet as described above. Spread the hinge apart to remove it from the cabinet back.



Removal of Cabinet Back

MODELS X551, Ch. RC-1089B;
X552, Ch. RC-1089C



X551
Maroon

X552
Ivory

Specifications

Tuning Range ..... 540-1600 kc

Intermediate Frequency ..... 455 kc

Tube Complement
- (1) RCA 12BE6 ..... Converter
- (2) RCA 12BA6 ..... I-F Amplifier
- (3) RCA 12AV6 ..... Det.—A.V.C.—A-F Amp.
- (4) RCA 50L6GT ..... Output
- (5) RCA 35W4 ..... Rectifier

Power Supply Rating
- 115 volts a.c., 50 to 60 cycles or d.c. ..... 30 watts

Dial Lamps (2) ..... type 47, 6-8 volts, .15 amp.

Power Output
- Undistorted ..... 1.25 watts
- Maximum ..... 1.5 watts

Loudspeaker (92577-1 or 92577-7)
- Size and type ..... 4 in. PM
- Voice coil impedance ..... 3.2 ohms at 400 cycles

Cabinet Dimensions
- Height 8⅝" Width 12¼" Depth 6"

Weight ..... 6 lbs.

Replacement Parts

Stock No.	DESCRIPTION
	CHASSIS ASSEMBLIES RC 1089B—Model X551 RC 1089C—Model X552
75481	Back—Back cover and loop assembly (maroon) (Model X551)
75604	Back—Back cover and loop assembly (ivory) (Model X552)
75658	Bracket—Lamp bracket
75484	Capacitor—Variable tuning capacitor C1-1, C1-2
39624	Capacitor—Mica, 68 mmf. C2
39632	Capacitor—Mica, 150 mmf. C12
39642	Capacitor—Mica, 390 mmf. C6
73500	Capacitor—Electrolytic comprising 1 section of 50 mfd., 150 volts and 1 section of 30 mfd., 150 volts C9A, C9B
73920	Capacitor—Tubular, paper, .005 mfd., 400 volts C4, C7
73562	Capacitor—Tubular, paper, .02 mfd., 400 volts C5
70613	Capacitor—Tubular, paper, .03 mfd., 400 volts C8
73553	Capacitor—Tubular, paper, .05 mfd., 400 volts C3, C11
73551	Capacitor—Tubular, paper, 0.1 mfd., 400 volts C10
73935	Clip—Mounting clip for i-f transformer
75485	Coil—Oscillator coil complete with adjustable core L1, L2
75482	Connector—Phono input connector less mounting bracket J1
75483	Control—Volume control and power switch R5, S1
70392	Cord—Power cord and plug
72283	Grommet—Rubber grommet for variable tuning capacitor (3 req'd)
74838	Grommet—Power cord strain relief grommets (1 set)
	Resistor—Fixed, composition:—
	47 ohms, ±20%, ½ watt R13
	100 ohms, ±20%, ½ watt R3
	150 ohms, ±20%, ½ watt R9
	1200 ohms, ±10%, 1 watt R10
	22,000 ohms, ±20%, ½ watt R1
	47,000 ohms, ±20%, ½ watt R12
	220,000 ohms, ±20%, ½ watt R7
	470,000 ohms, ±20%, ½ watt R8
	1 megohm, ±20%, ½ watt R2
	3.3 megohm, ±20%, ½ watt R4
	4.7 megohm, ±20%, ½ watt R6

Stock No.	DESCRIPTION
73584	Shield—Tube shield
73117	Socket—Tube socket, 7 pin, miniature
70827	Socket—Tube socket, octal
74697	Socket—Pilot lamp socket
75486	Transformer—First I-F transformer complete with adjustable cores T1
75487	Transformer—Second I-F transformer complete with adjustable cores T2
75488	Transformer—Output transformer T3
	SPEAKER ASSEMBLIES 92577-1 or 92577-7
74165	Speaker—4" P.M. speaker complete with cone and voice coil
	MISCELLANEOUS
Y2231	Cabinet—Plastic cabinet—maroon—complete with grille screen, dial markings, top and bottom decorative strips, feet and "Phono" decal (Model X551)
Y2261	Cabinet—Plastic cabinet—ivory—complete with grille screen, dial markings, top and bottom decorative strips, feet and "Phono" decal (Model X552)
75659	Cap—Pilot lamp cap
75492	Decal—"Phono" decal
74782	Emblem—"RCA Victor" emblem
75495	Foot—Cabinet foot—(2 req'd)
75493	Knob—Tuning control knob—maroon—(Model X551)
75494	Knob—Volume control and power switch knob—maroon (Model X551)
75605	Knob—Volume control and power switch knob—ivory (Model X552)
75606	Knob—Tuning control knob—ivory— (Model X552)
31480	Lamp—Pilot lamp—Mazda 47
74336	Nut—Spring nut to attach top decorative strip to cabinet (2 req'd) or bottom decorative strip to cabinet (1 req'd)
74340	Nut—Speed nut to attach foot
75489	Screen—Grille screen
74734	Spring—Retaining spring for knob
75490	Strip—Decorative strip (gold) for cabinet top
75491	Strip—Decorative strip (gold) for cabinet front bottom

MODELS X551, Ch. RC-1089B;
X552, Ch. RC-1089C

Alignment Procedure

Test-Oscillator—For all alignment operations, connect the low side of the test-oscillator to the receiver chassis, and keep the oscillator output as low as possible to avoid a-v-c action.

On a.c. operation an isolation transformer (115 v./115 v.) may be necessary for the receiver if the test oscillator is also a.c. operated.

Lead Dress

1. Dress all capacitors down against chassis.
2. Connect outside foil of all capacitors as indicated on schematic diagram.
3. Locate C9 in its mounting clip so that it butts against chassis.
4. Dress power cord leads away from R11.

Attachment of Record Player

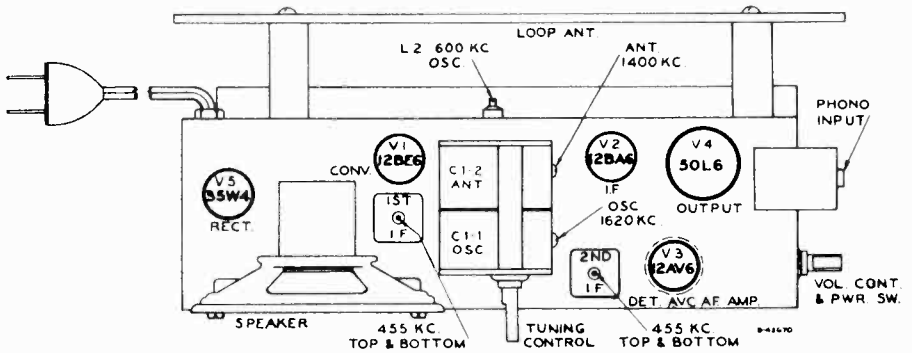
The audio output cable of the record player should be terminated with a pin plug.

Plug the cable into the receptacle which is accessible through the side of the cabinet.

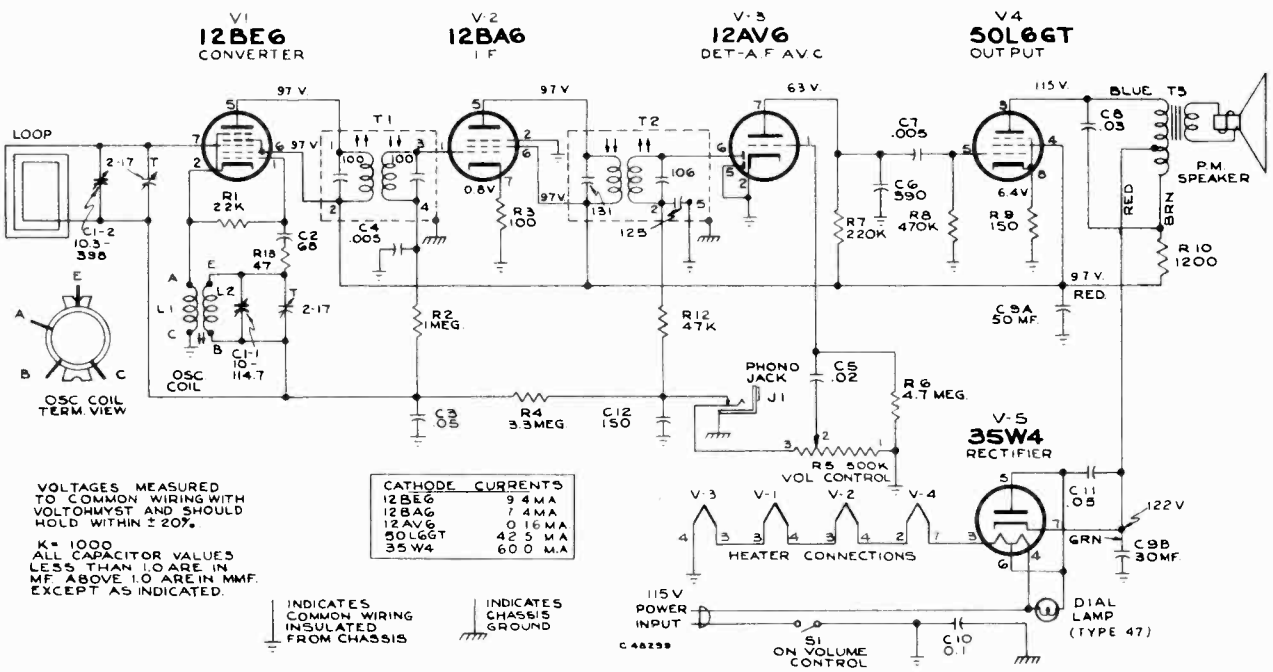
Insertion of the cable plug into the receptacle removes radio signal from the volume control. The record player cable must be removed from the receptacle to permit radio operation.

Steps	Connect the high side of test-oscillator to—	Tune test-osc. to—	Turn radio dial to—	Adjust the following for max. output
1	12BA6 I-F grid through .01 mfd. capacitor	455 kc	Quiet-point 1600 kc end of dial	T2 (top and bottom) 2nd I-F trans.
2	Stator of C1-2 through .01 mfd.			T1 (top and bottom) 1st I-F trans.
3	Short wire placed near loop to radiate signal	1620 kc	Min. cap.	osc. trimmer
4		1400 kc	1400 kc signal	ant. trimmer
5		600 kc	600 kc signal	L2 (osc.) Rock gang
6		Repeat steps 3, 4 and 5.		

POWER SUPPLY POLARITY.—For operation on d.c., the power plug must be inserted in the outlet for correct polarity. If the set does not function, reverse the plug. On a.c., reversal of the plug may reduce hum.

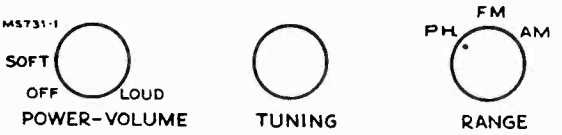


Tube and Trimmer Locations



Schematic Circuit Diagram

MODEL X711,
Ch. RC-1070A



Controls

Specifications

Tuning Ranges

Standard Broadcast (AM)	540-1,600 kc.
Frequency Modulation (FM)	88-108 mc.

Intermediate Frequencies ..... AM—455 kc., FM—10.7 mc.

Tube Complement

(1) RCA 19J6	Mixer and Oscillator
(2) RCA 6BJ6	I. F. Amplifier
(3) RCA 12AU6	Driver
(4) RCA 12AL5	Ratio Detector
(5) RCA 6AQ6	AM Det.—A. F. Amp.
(6) RCA 35C5	Output
(7) RCA 35W4	Rectifier

Dial Lamp ..... Type No. 47, 6-8 volts, 0.15 amp.

Loudspeaker

Type 92572-4W	5 inch P.M.
Voice coil impedance	3.2 ohms at 400 cycles

Tuning Drive Ratio ..... 11½:1 (5¾ turns of knob)

Power Supply Rating

115 volts d.c. or 50 to 60 cycles a.c. ..... 30 watts

Power Output

Maximum	1.65 watts
Undistorted	1.0 watt

Cabinet Dimensions

Height.....8⅜ in. Width.....12⅞ in. Depth.....7 5/16 in.

Power Supply:

This instrument will operate on 115 volts d.c. or 50 to 60 cycles a.c.

If the receiver does not operate on d.c., reverse the power cord. On a.c., reversal of the cord may reduce hum or improve FM reception.

Antennas:

These receivers have built-in antennas for standard broadcast (AM) and frequency modulation (FM) reception.

Under average conditions these antennas will provide satisfactory reception—however provision is made for the use of an external antenna for FM reception if desired.

To use external FM antenna:

1. Remove the wire from under the No. 2 terminal screw of the antenna terminal board. The bare end of this wire should be taped to prevent contact with the antenna terminal screws.
2. Connect the transmission line from an external FM dipole antenna to the No. 1 and No. 2 terminals of the antenna terminal board.

To use built-in FM antenna:

1. The wire extending thru the back of the cabinet must be connected to No. 2 terminal of the antenna terminal board.
2. The power cord should be fully extended and must not be coiled or hanked up.
3. Reversal of the line cord plug may improve reception.

DO NOT USE EXTERNAL GROUND.

CAUTION:

THE CHASSIS IS CONNECTED TO ONE SIDE OF THE POWER SUPPLY. Use caution to prevent contact with pipes, radiators, etc., when servicing with chassis removed from cabinet.

Control Knobs:

DO NOT ATTEMPT TO REMOVE THE CONTROL KNOBS FROM THE CABINET. The knobs have spring retainers on the inside of the cabinet to prevent their removal. The retainers are accessible only after the chassis has been removed from the cabinet.

Removal of Chassis:

1. Remove the four screws at the corners of the back cover—pull back cover off carefully—the power cord plug and socket at the bottom right-hand corner will pull apart but the antenna leads remain connected.
2. Unhook the dial cord from the pointer.
3. Remove the four screws which hold the chassis to the cabinet (two at sides of chassis base and two on dial cord pulley brackets above the chassis base).
4. Pull the chassis to the rear—the knobs will be retained with the cabinet.

If removal of the chassis is not necessary when servicing, the back cover may be placed on the supports molded into the upper part of the cabinet.

MODEL X711, Ch. RC-1070A

Alignment Procedure

CORRECT ALIGNMENT OF THE FM BAND REQUIRES THAT THE AM BAND BE ALIGNED FIRST

Output Indicators:

An RCA VoltOhmyst or equivalent meter is necessary for measuring developed d-c voltage during FM alignment. Connections are specified in the alignment tabulation. An output meter is also necessary to indicate minimum audio output during FM Ratio Detector alignment. Connect the output meter across the speaker voice coil.

The RCA VoltOhymst can also be used as an AM alignment indicator, either to measure audio output or to measure a-v-c voltage.

When audio output is being measured the volume control should be turned to maximum.

Signal Generator:

For all alignment operations except as stated in the tabulation connect the low side of the signal generator to the receiver chassis. The output should be adjusted to provide accurate resonance indication at all times. If output measurement is used for AM alignment the output of the signal generator should be kept as low as possible to avoid a-v-c action.

CAUTION:

The chassis is connected to one side of the power supply. On a.c operation it is recommended that an isolation transformer (115 v./115 v.) be used for the receiver when servicing.

Oscilloscope Alignment:

The FM I. F. alignment may be checked using a sweep generator and an oscilloscope. Shunt terminals B and C of T3 with a 1,200 ohm resistor. Connect the high side of the oscilloscope to terminal C of T3 in series with a diode probe. Apply the output of the sweep generator (10.7 mc with ±250 kc. sweep) to pin No. 1 of V2 (6BJ6) in series with .01 mf. Low side of the oscilloscope and sweep generator to chassis. This will show the response of T2.

To check the combined response of T1 and T2; connect the sweep generator to the antenna terminal board—high side to No. 2 terminal in series with 300 ohms and low side to No. 1 terminal. Oscilloscope connections as previously connected.

To check the ratio detector response; connect the high side of the oscilloscope direct to terminal No. 5 of S1-1 rear, low side to chassis, apply the output of the sweep generator to pin No. 1 of V3 (12AU6) in series with .01 mf. Driver plate circuit connected for normal operation (1200 ohm resistor removed). **Note:** It is difficult to observe marker signals in this step—center frequency and sweep width should be previously observed.

Alignment Indicator:

The dial and dial back plate are not attached to the chassis. During alignment a substitute frequency indication must be used. We suggest attaching a paper clip to the dial drive cord so that its movement may be measured—refer to the "Dial Scale" illustration on page 5.

CRITICAL LEAD DRESS

1. All connections in the mixer-oscillator circuit are extremely critical both in regard to lead length and lead dress. Do not disturb unless necessary—make careful notation before servicing if it becomes necessary to disturb this wiring.
2. The ground lead from pin No. 2 of V3 (12AU6 Driver) is critical in length and must be dressed down against chassis.
3. Dress audio coupling capacitor C23 away from output transformer.
4. Dress diode filter unit away from alignment hole in T-2.
5. Dress grid lead of V3 (pin 1 of 12AU6) against chassis apron.
6. Dress plate lead of V1 (pin No. 2 of 19J6) against chassis.
7. Dress loop antenna leads so as to prevent contact with external antenna terminal board.
8. All ground connections to chassis should be restored to the original places of connection if disturbed.
9. Dress capacitor C13 down close to range switch so as to clear the projection on the bottom of the cabinet.
10. The FM ant. and osc. coils must be cemented to the coil support to prevent microphonic howl on FM. Amphenol No. 912 cement is recommended for this purpose. Amphenol No. 916 solvent is recommended as solvent if it becomes necessary to loosen the windings.

AM Alignment

RANGE SWITCH IN AM POSITION

Steps	Connect high side of sig. gen. to—	Sig. gen. output	Turn radio dial to—	Adjust for peak output
1	AM ant. section (C2) of tuning cond. in series with .01 mfd.	455 kc.	Quiet point at low freq. end.	AM windings.† T2 bottom core (sec.). T2 top core (pri.).
2				AM windings.† T1 top core (sec.). T1 bottom core (pri.).
3	Short wire placed near loop antenna for radiated signal.	1620 kc.	Extreme high frequency end.	C12 osc.
4		1400 kc.	1400 kc.	C4 ant.
5		600 kc.	600 kc.	L4 osc. (Rock gang.)
6	Repeat Steps 3, 4 and 5.			

†Use alternate loading.

Alternate loading involves the use of a 10,000 ohm resistor to load the AM plate winding while the AM grid winding of the SAME TRANSFORMER is being peaked. Then the grid winding is loaded with the resistor while the plate winding is peaked. Only one winding is loaded at any one time. Remove the 10,000 ohm resistor after T2 and T1 have been aligned.

Oscillator frequency is above signal frequency on both AM and FM.

FM Alignment

RANGE SWITCH IN FM POSITION—VOLUME CONTROL MAXIMUM

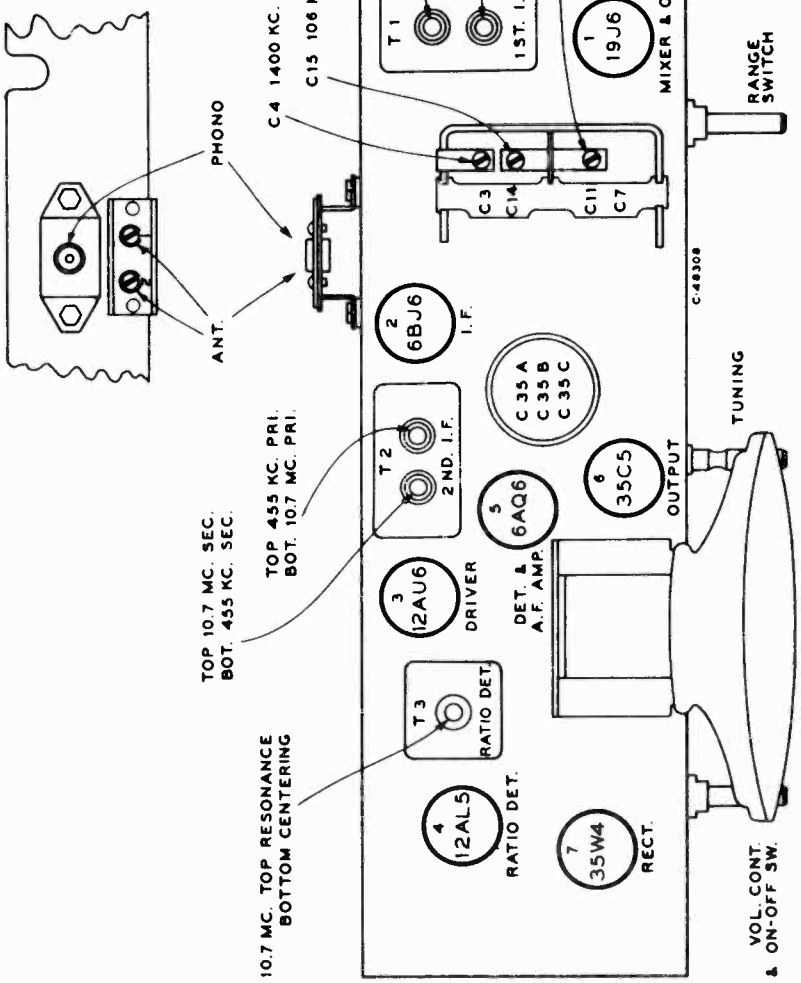
Steps	Connect high side of sig. gen. to—	Sig. gen. output	Turn radio dial to—	Adjust for peak output
1	Connect the d-c probe of a VoltOhmyst to the negative lead of the 2 mfd. capacitor C32 and the common lead to chassis. Adjust sig. gen. output to provide approx.—3 v. indication during alignment.			
2	Pin 1 of 12AU6 in series with .01 mfd.			T3 top core for max. d-c voltage across C32. T3 bottom core for min. audio output.*
3	No. 2 ant. term in series with a 300 ohm resistor. Connect low side to No. 1 terminal. (Remove ant. lead from No. 2 term.)	10.7 mc. modulated 30% 400 cycles AM.	Max. capacity (fully meshed).	FM Windings.†† T2 top core (sec.). T2 bottom core (pri.).
4				FM Windings.†† T1 top core (sec.). T1 bottom core (pri.).
5		106 mc.	106 mc.	L1 osc.** C15 ant.
6		90 mc.	90 mc.	L5 ant.** (Rock gang.)
7	Repeat Steps 5 and 6 until further adjustment does not improve calibration.			

* Two or more points may be found which lower the audio output. At the correct point the minimum audio output is approached rapidly and is much lower than at any incorrect point.

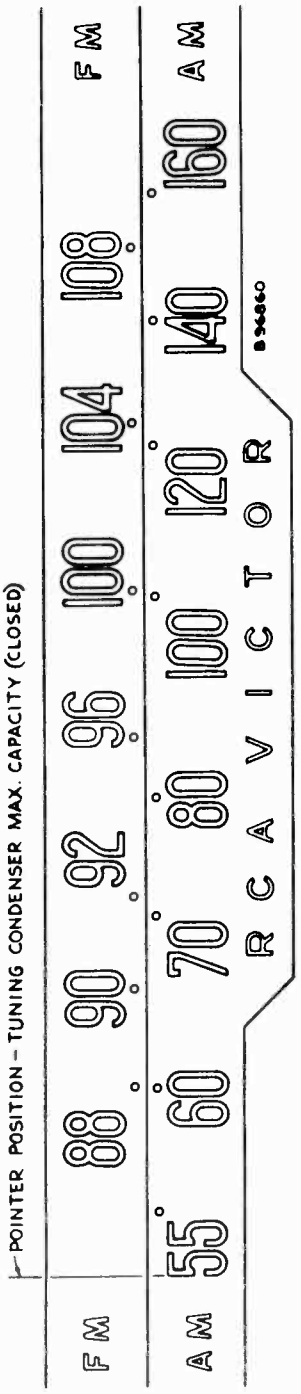
†† Align T2 and T1 by means of alternate loading as explained under AM alignment. Use a 680 ohm resistor instead of a 10,000 ohm resistor and load the FM windings.

** L1 and L5 are adjustable by increasing or decreasing the spacing between turns.

MODEL X711,
Ch. RC-1070A



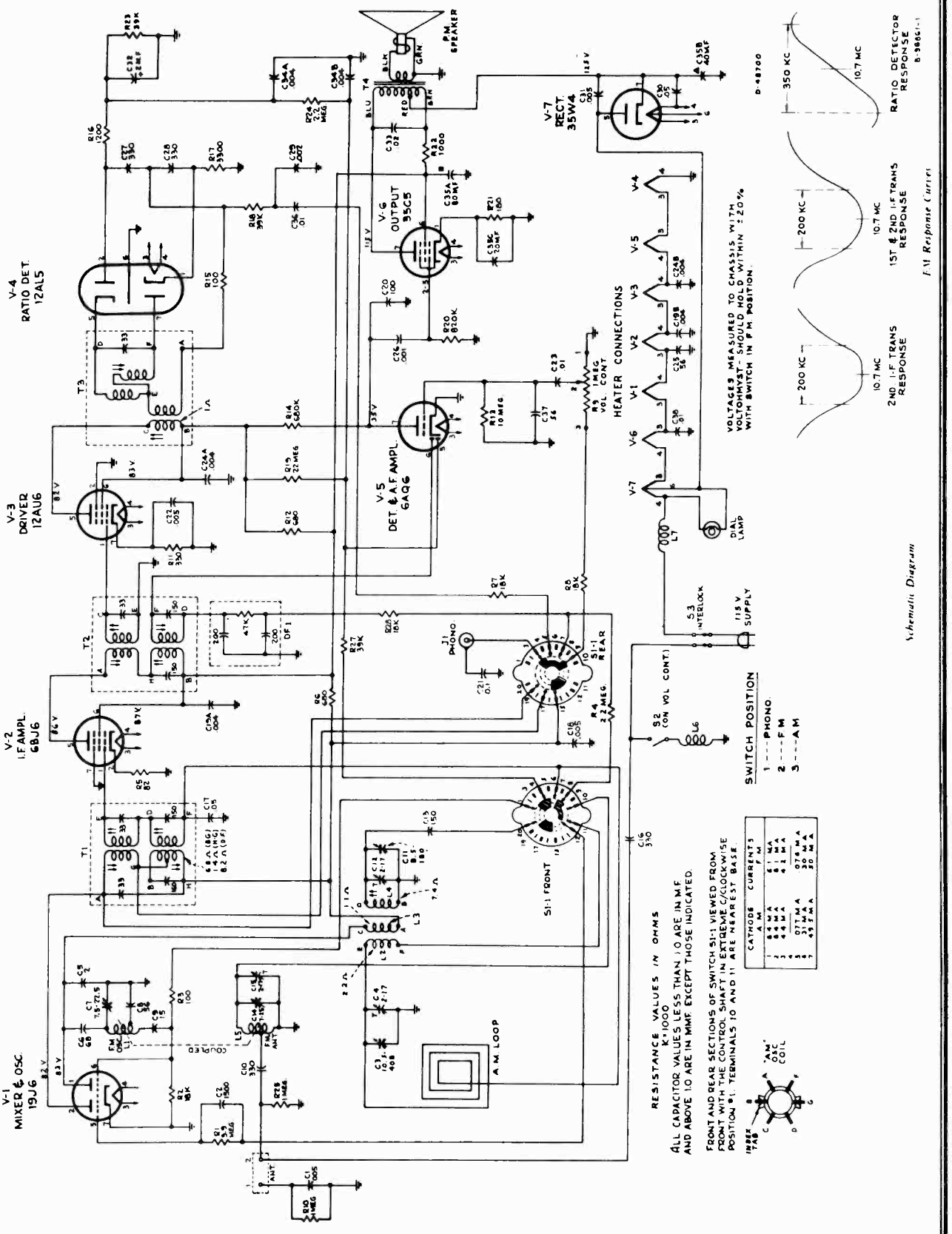
Tube and Trimmer Locations (Top View)



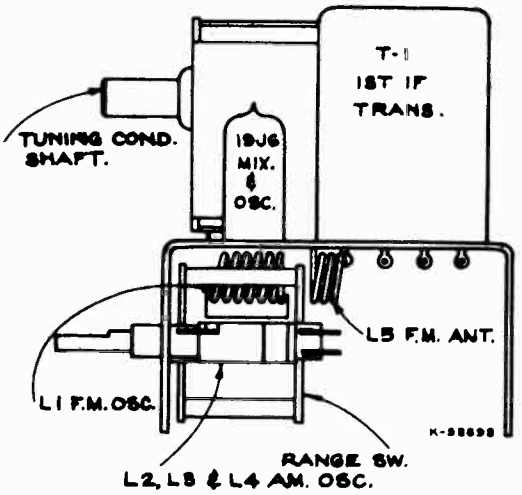
Dial Scale

The dial scale drawing shown is a full size reproduction. It can be used as a reference in alignment procedure.

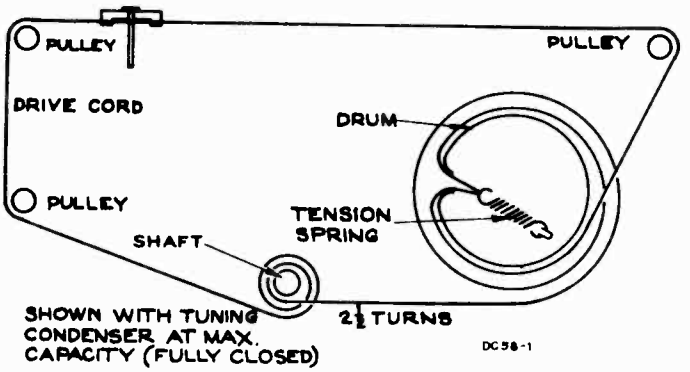
MODEL X711,
Ch. RC-1070A



MODEL X711,
Ch. RC-1070A



Ant. and Osc. Coil Locations (Side View)



Dial Indicator and Drive Mechanism

Replacement Parts

Stock No.	DESCRIPTION
	CHASSIS ASSEMBLIES RC 1070A
73973	Capacitor—Variable tuning capacitor (C3, C4, C7, C11, C12, C14 C15)
73866	Capacitor—Ceramic, 2 mmf. (C5)
39044	Capacitor—Ceramic, 15 mmf. (C9)
73867	Capacitor—Ceramic, 56 mmf. (C8)
73499	Capacitor—Ceramic, 56 mmf. (C25, C37)
75612	Capacitor—Ceramic, 68 mmf. (C6)
39628	Capacitor—Mica, 100 mmf. (C20)
44202	Capacitor—Ceramic, 150 mmf. (C13)
75792	Capacitor—Ceramic, 330 mmf. (C10)
39640	Capacitor—Mica, 330 mmf. (C16, C27, C28)
71501	Capacitor—Ceramic, 1500 mmf. (C2)
74009	Capacitor—Ceramic, dual 4000 mmf. (C19A, C19B, C24A, C24B, C34A, C34B)
73473	Capacitor—Ceramic, 5000 mmf. (C1, C18, C31)
73747	Capacitor—Electrolytic, 2 mfd, 50 volts (C32)
73975	Capacitor—Electrolytic, comprising 1 section of 80 mfd, 150 volts, 1 section of 40 mfd, 150 volts and 1 section of 20 mfd, 25 volts (C35A, C35B, C35C)
73186	Capacitor—Tubular, paper, .001 mfd, 400 volts (C26)
73750	Capacitor—Tubular, paper, .002 mfd, 200 volts (C29)
71926	Capacitor—Tubular, paper, .005 mfd, 200 volts (C22)
71923	Capacitor—Tubular, paper, .01 mfd, 200 volts (C23, C36, C38)
74010	Capacitor—Tubular, paper, .02 mfd, 400 volts (C33)
73553	Capacitor—Tubular, paper, .05 mfd, 400 volts (C17, C30)
73551	Capacitor—Tubular, paper, 0.1 mfd, 400 volts (C21)
73744	Coil—Oscillator coil—A-M (L2, L3, L4)
74012	Coil—Oscillator coil—F-M (L1)
74013	Coil—Antenna coil—F-M (L5)
	Coil—Line choke coil (#18 gauge solid wire, 1/32" plastic insulation, standard hook-up wire, 10 turns, close wind) (L6, L7)
73981	Connector—2 contact male connector for power input
38406	Control—Volume control and power switch (R9, S2)
†72953	Cord—Drive cord (approx. 50" overall length required)
74011	Filter—Diode filter comprising 2 sections of 200 mmf. and 1 section of 47,000 ohms (DF-1)
72283	Grommet—Rubber grommet for mounting tuning capacitor (4 req'd)
	Resistors—Fixed, composition:—
	82 ohms, ±10%, ½ watt (R5)
	100 ohms, ±5%, ½ watt (R15)
	100 ohms, ±20%, ½ watt (R3)
	180 ohms, ±10%, ½ watt (R21)
	330 ohms, ±10%, ½ watt (R11)
	680 ohms, ±20%, ½ watt (R6, R12)
	1000 ohms, ±10%, 1 watt (R22)
	1200 ohms, ±5%, ½ watt (R16)
	3300 ohms, ±5%, ½ watt (R17)
	18,000 ohms, ±10%, ½ watt (R2, R7, R8, R28)
	39,000 ohms, ±5%, ½ watt (R23)
	39,000 ohms, ±10%, ½ watt (R18, R27)
	680,000 ohms, ±20%, ½ watt (R14)
	820,000 ohms, ±10%, ½ watt (R20)
	1 megohm, ±20%, ½ watt (R10, R25)
	2.2 megohm, ±20%, ½ watt (R4, R24)
	3.9 megohm, ±10%, ½ watt (R1)
	10 megohm, ±20%, ½ watt (R13)
	22 megohm, ±20%, ½ watt (R19)
73978	Shaft—Tuning knob shaft
74179	Socket—Tube socket, 7 pin, miniature for V1
73117	Socket—Tube socket, 7 pin, miniature for V2, V3, V4, V5, V6, V7
75790	Socket—Phono input socket and terminal board assembly (J1)
74014	Socket—Dial lamp socket
74038	Spring—Drive cord spring
73979	Support—Dial drive cord pulley support complete with two (2) pulleys—L. H.
73980	Support—Dial drive cord pulley support complete with pulley—R. H.
75789	Switch—Range switch (S1-1)
73745	Transformer—First I-F transformer—dual (T1)
73974	Transformer—Second I-F transformer—dual (T2)
73743	Transformer—Ratio detector transformer (T3)
73976	Transformer—Output transformer (T4)
33726	Washer—"C" washer for tuning knob shaft
75791	Washer—Insulating washer (shoulder type) for mounting phono input socket and terminal board assembly (2 req'd)
73332	Washer—Insulating washer (flat) for mounting phono input socket and terminal board assembly (2 req'd)
	SPEAKER ASSEMBLIES 92572-4
73900	Speaker—5" speaker complete with cone and voice coil
	MISCELLANEOUS
75793	Back—Cabinet back complete with power cord, connector and loop
75797	Bezel—Cabinet bezel and grille cloth assembly less "RCA Victor" emblem
Y2275	Cabinet—Maroon plastic cabinet
75795	Dial—Polystyrene dial scale
74782	Emblem—"RCA Victor" emblem
75794	Knob—Range switch knob—maroon
75885	Knob—Tuning control or volume control knob—maroon
31480	Lamp—Dial lamp—Mazda #47
72765	Nut—Speed nut for mounting dial
73989	Plate—Dial back plate
73991	Pointer—Station selector pointer
73992	Retainer—Knob retainer (knob to cabinet)
14270	Spring—Retaining spring for knobs (knob to shaft)

† Stock No. 72953 is a reel containing 250 feet of cord.

MODEL 9W106,
Ch. RC-622

Antennas

This receiver has built-in antenna for standard broadcast (AM) and frequency modulation (FM) reception.

Provision is made for the use of an external antenna for FM reception if desired. To use external FM antenna — remove the built-in FM antenna lead from the "FM" terminals of the antenna terminal board. Connect the transmission line of an external FM dipole antenna to these two "FM" terminals.

FOR RECORD CHANGER SERVICE INFORMATION REFER TO RP-168 SERIES SERVICE DATA AND RP-178 SERIES SERVICE DATA.

Tuning Range

Standard Broadcast (AM) ..... 540-1,600 kc.
Frequency Modulation (FM)..... 88-108 mc.
Intermediate Frequencies..... AM—455 kc., FM—10.7 mc.

Tube Complement

(1) RCA 6BJ6..... R-F Amplifier
(2) RCA 6J6..... Mixer and Oscillator
(3) RCA 6BA6..... I-F Amplifier
(4) RCA 6AU6..... Driver
(5) RCA 6AL5 ..... Ratio Detector
(6) RCA 6AV6..... AM Det.—AVC—A-F Amplifier
(7) RCA 6AV6..... Ph. Inv.
(8) RCA 6V6GT..... Output
(9) RCA 6V6GT..... Output
(10) RCA 6X5GT ..... Rectifier

Dial Lamps (2)..... Type No. 51, 6-8 volts, 0.2 amp.
Jewel Lamp ..... Type No. 51, 6-8 volts, 0.2 amp.

Tuning Drive Ratio..... 18:1 (9 turns of knob)

Power Supply Rating..... 115 volts, 60 cycles, 90 watts

Loudspeaker (92569-6W)

Size and type..... 12 in. PM
Voice coil impedance..... 3.2 ohms at 400 cycles

Power Output

(Radio) Undistorted 5 watts..... Maximum 6.4 watts
(Phono.) Undistorted 8 watts..... Maximum 9 watts

Cabinet Dimensions

Height 31½ in. **Width 39¾ in.** **Depth 17½ in.**

Record Changer (RP-168)

Turntable speed..... 45 r.p.m.
Record capacity..... Up to 10 fine groove records
Pickup ..... Crystal (medium output)

Record Changer (RP-178)

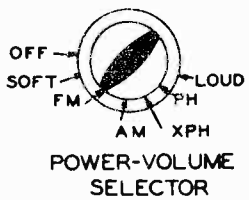
Turntable speed..... 78 r.p.m.
Record capacity..... Twelve 10-in. or ten 12-in.
Pickup..... Crystal (standard output)

Circuit Description

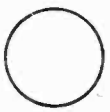
This instrument has a ten-tube (including rectifier) chassis which is very similar to those used in other RCA Victor radio-phonograph combinations designed for AM-FM reception.

The selector switch has five functions:

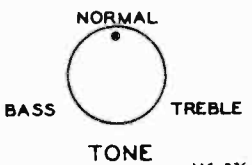
(1) Selection of tuning range.
(2) Selection and distribution of a.v.c. voltages.
(3) Application of B+ voltage to tubes V1, V2, V3 and V4.
(4) Selection of audio input applied to the volume control.
(5) Application of a.c. power to the record changer motors.



POWER-VOLUME SELECTOR



TUNING



TONE

M6-836

Operating Controls

MODEL 9W106,
Ch. RC-622

CRITICAL LEAD DRESS
Model 9W106 — RC622

Note: The leads listed may not be critical in all receivers. However, by dressing the leads as specified, unusual difficulties will be minimized.

1. The plate lead of the **second** IF transformer should be dressed down against the chassis to obtain max. capacity between the lead and chassis. This lead is specified to be two inches long.
2. The "A" band RF transformer plate, and grid leads should be dressed so as to minimize coupling to the RF amplifier grid circuit, and kept close to chassis when possible.
3. The 2.2 meg. grid resistors connecting to the RF and mixer grids should have a minimum practicable amount of lead extending on the grid end. The leads should be cut off short on the grid end and long on the A.V.C. end.
4. The unshielded plate lead from the function switch to the 1st IF transformer should be dressed away from the switch wafer audio lugs as much as possible.
5. The ground strap between the RF shelf and chassis should be well soldered and kept as short as practicable. FM instability may be caused by having this ground strap too long, particularly when no input is connected to the FM antenna terminal.
6. The lead from the 2nd IF to the grid of the 6BA6 1st IF amplifier should be kept short, and dressed against the chassis as much as practicable.
7. The lead from the 2nd IF to the AM detector diode should be dressed to minimize coupling to the 6AV6 1st AF grid and kept close to chassis.
8. Leads from the volume control taps should be kept clear of all filament and output plate wires as in the wiring sample.
9. The loop cable when connected to the AM sec. gang stator should be dressed to have minimum capacity coupling to the stator lug on the RF section of gang condenser.
10. The oscillator coupling condenser C10 should be dressed to have minimum capacity to the mixer grid, Pin No. 5 on V2.
11. The shielding on the shielded lead from the volume control to the function switch should have the minimum practicable exposed wire at the function switch end.

Alignment Procedure

CORRECT ALIGNMENT OF THE FM BAND REQUIRES THAT THE AM BAND BE ALIGNED FIRST

Alignment Indicators:

An RCA VoltOhmyst or equivalent meter is necessary for measuring developed d-c voltage during FM alignment. Connections are specified in the alignment tabulation. An output meter is also necessary to indicate minimum audio output during FM Ratio Detector alignment. Connect the output meter across the speaker voice coil.

The RCA VoltOhmyst can also be used as an AM alignment indicator, either to measure audio output or to measure a-v-c voltage.

When audio output is being measured the volume control should be turned to maximum.

Signal Generator:

For all alignment operations connect the low side of the signal generator to the receiver chassis. The output should be adjusted to provide accurate resonance indication at all times. If output measurement is used for AM alignment the output of the signal generator should be kept as low as possible to avoid a-v-c action.

Oscilloscope Alignment:

The FM I-F alignment may be checked using a sweep generator and an oscilloscope. Shunt terminals B and C of T4 with a 1200 ohm resistor. Connect the high side of an oscilloscope to terminal C of T4 in series with a diode probe. Apply the output of the sweep generator (10.7 mc. with ±250 kc. sweep) to pin No. 1 of V3 (6BA6) in series with .01 mf. Low side of the oscilloscope and sweep generator to chassis. This will show the response of T3.

To check the combined response of T2 and T3: connect the sweep generator to the FM antenna terminals (remove FM antenna lead) in series with 300 ohms. **Note:** One FM terminal is grounded—it may be necessary to reverse the sweep generator connections. Oscilloscope connections remain as connected.

To check the ratio detector response: connect the high side of the oscilloscope direct to terminal No. 9 of S1, low side to chassis. Apply the output of the sweep generator to pin No. 1 of V4 (6AU6) in series with .01 mf. Driver plate circuit connected for normal operation (1200 ohm resistor removed). **Note:** It is difficult to observe marker signals in this step—center frequency and sweep width should be previously observed.

AM Alignment

RANGE SWITCH IN BC POSITION

Steps	Connect high side of sig. gen. to—	Sig. gen. output	Turn radio dial to—	Adjust for peak output
1	Pin No. 5 of V2 in series with .01 mfd.	455 kc.	Quiet point at low freq. end.	AM windings.† T3 bottom core (sec.). T3 top core (pri.).
2				AM windings.† T2 top core (sec.). T2 bottom core (pri.).
3	Short wire placed near loop for radiated signal	1400 kc.	1400 kc.	C1-2T (osc.). C1-5T (ant.). C1-4T (rf.).
4		600 kc.	600 kc.	L8 (osc.) with 10,000 ohms resistor from RF stator to gnd. (rocking gang)
5				L5 (RF) with the 10,000 ohms removed.
6	Repeat steps 3, 4 and 5 until no improvement in sensitivity is obtained.			

† Use alternate loading.

Alternate loading involves the use of a 47,000 ohm resistor to load the AM plate winding while the AM grid winding of the SAME TRANSFORMER is being peaked. Then the grid winding is loaded with the resistor while the plate winding is peaked. Only one winding is loaded at any one time. Remove the 47,000 ohm resistor after T3 and T2 have been aligned.

Oscillator frequency is above signal frequency on both AM and FM.

FM Alignment

RANGE SWITCH IN FM POSITION—VOLUME CONTROL MAXIMUM

Steps	Connect high side of sig. gen. to—	Sig. gen. output	Turn radio dial to—	Adjust for peak output
1	Connect the d-c probe of a VoltOhmyst to the negative lead of the 2 mfd. capacitor C42 and the common lead to chassis. Turn gang condenser to max. capacity (fully meshed). Volume Control max.			
2	Pin 1 of V4 6AU6 in series with 470 ohm resistor.	10.7 mc. modulated 30% 400 cycles AM (Approx. .05 volt).	Max. capacity (fully meshed).	T4 top core for max. d-c voltage across C42. T4 bottom core for min. audio output. *
3		10.7 mc. Adjust to provide about 4 volts indication on VoltOhmyst during alignment.		FM windings.†† T3 top core (sec.). T3 bottom core (pri.).
4				FM windings.†† T2 top core (sec.). T2 bottom core (pri.).
5	High and low side of signal gen. through two 120 ohm resistors. To ant. terminals.	90 mc.	90 mc.‡	L9 (osc.).**
6		106 mc.	106 mc.	C1-6T (ant.). C1-3T (rf.).
7		90 mc.	90 mc.	L1 (ant.).** L3 (rf.).**
8	Repeat steps 6 and 7 until no improvement in sensitivity is obtained.			

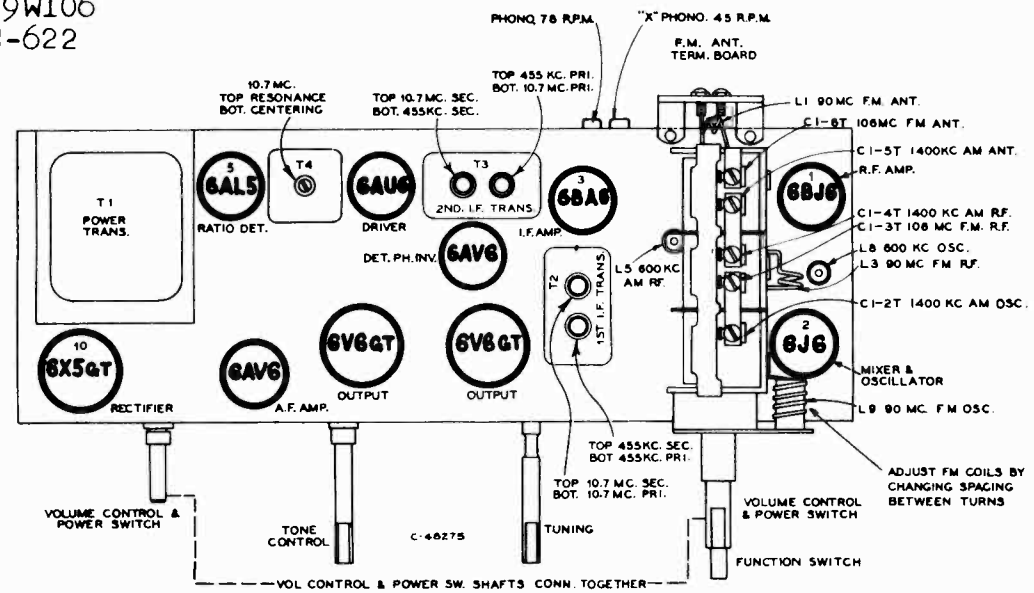
* Two or more points may be found which lower the audio output. At the correct point the minimum audio output is approached rapidly and is much lower than at any incorrect point.

†† Align T3 and T2 by means of alternate loading as explained under AM alignment. Use a 680 ohm resistor instead of a 47,000 ohm resistor and load the FM windings.

** L1, L3 and L9 are adjustable by increasing or decreasing the spacing between turns.

‡ After dial pointer has been set accurately on calibration point for "A" band (see dial indicator and drive drawing) tune receiver to 90 mc. on FM using dial scale as reference or use dial scale drawing on page 8.

MODEL 9W106
Ch. RC-622

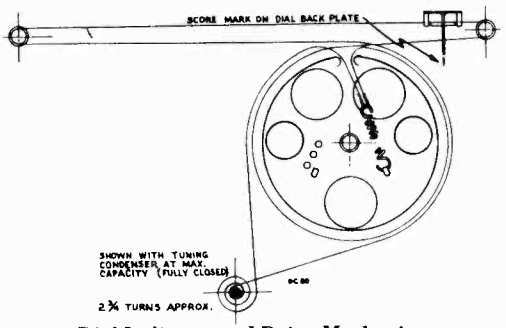


Tube and Trimmer Locations

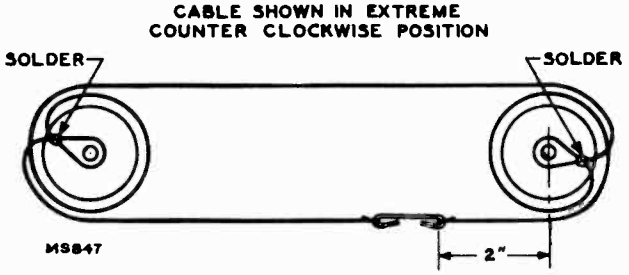
Socket Voltages

Voltages measured with Chanalyst or VoltOhmyst and should hold within ±20% with rated line voltage. Tuning condenser closed—no signal input.

Tube	Terminal	Voltage		
		Phono	A.M.	F.M.
V1 6BJ6 R.F. Amp.	Plate 5	—	185	110
	Screen 6	—	120	100
	Cathode 2	—	0.8	0.8
	Grid 1	-0.9	-0.0	-0.6
V2 6J6 Mixer and Osc.	Plate 1	—	73	80
	Grid 6	-1.07	-2	-3.4
	Plate 2	—	56	56
	Grid 5	-0.54	-5.4	-3.6
V3 6BA6 I.F. Amp.	Plate 5	—	180	178
	Screen 6	—	115	111
	Cathode 7	—	0.9	0.9
	Grid 1	-0.95	-1.1	-.75
V4 6AU6 Driver	Plate 5	—	174	175
	Screen 6	—	126	175
	Cathode 7	—	0.9	0.9
V5 6AL5 Ratio Det.	—— —	—	—	—
V6 6AV6 A.F. Amp.	Plate 7	97	85	80
	Grid 1	-.72	-.75	-0.75
V7 6AV6 Inverter	Plate 7	140	110	110
	Grid 1	-18.7	-17.8	-17.3
	Cathode 2	-18	-17	-16.6
V8 6V6GT Output	Plate 3	262	270	270
	Screen 4	262	190	190
	Grid 5	-18	-17	-16
V9 6V6GT Output	Plate 3	262	270	270
	Screen 4	262	190	190
	Grid 5	-18	-17	-16
V10 6X5GT Rectifier	Cathode 8	271	275	275



Dial Indicator and Drive Mechanism

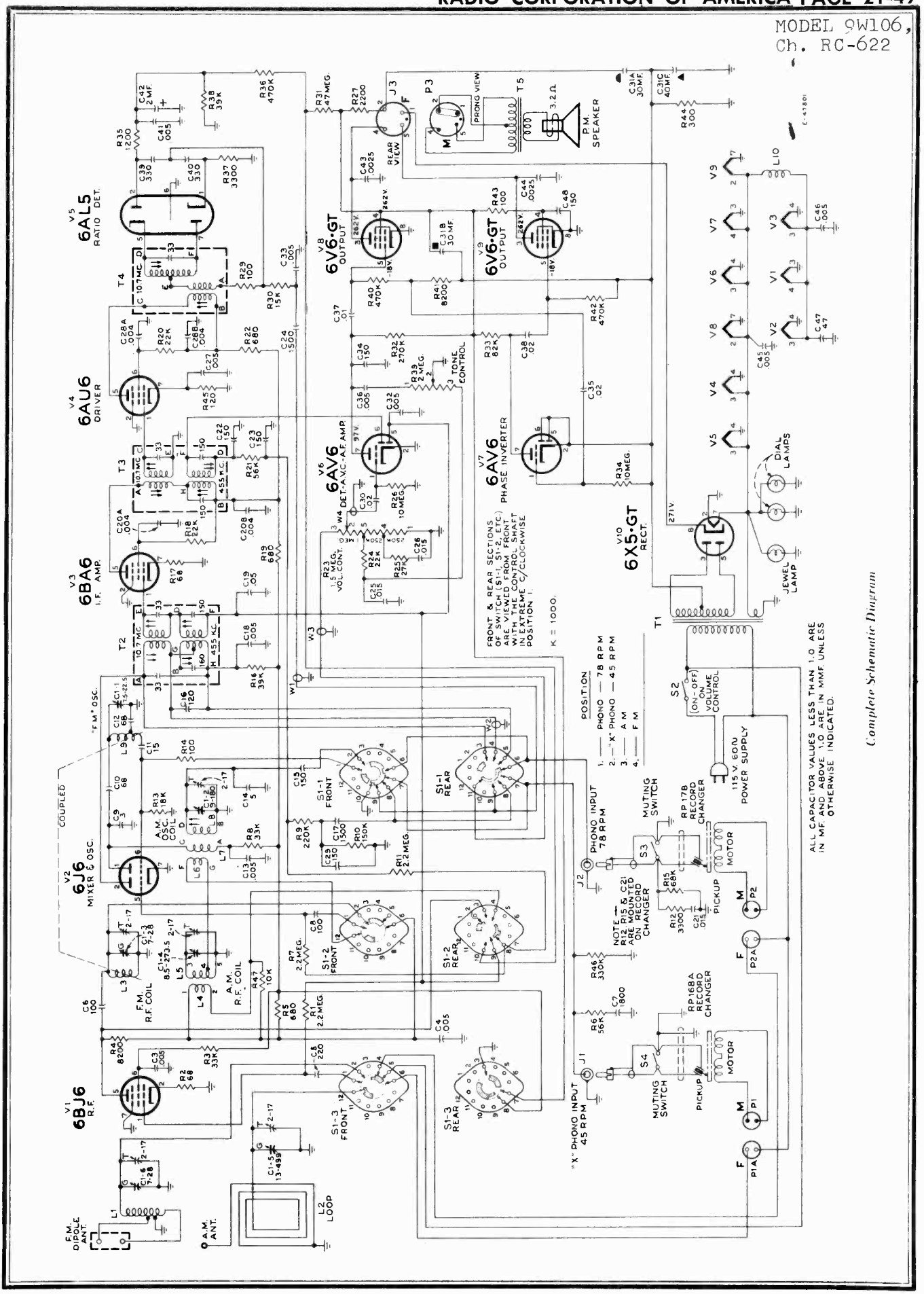


Volume Control Drive Mechanism

Cathode Currents (MA)

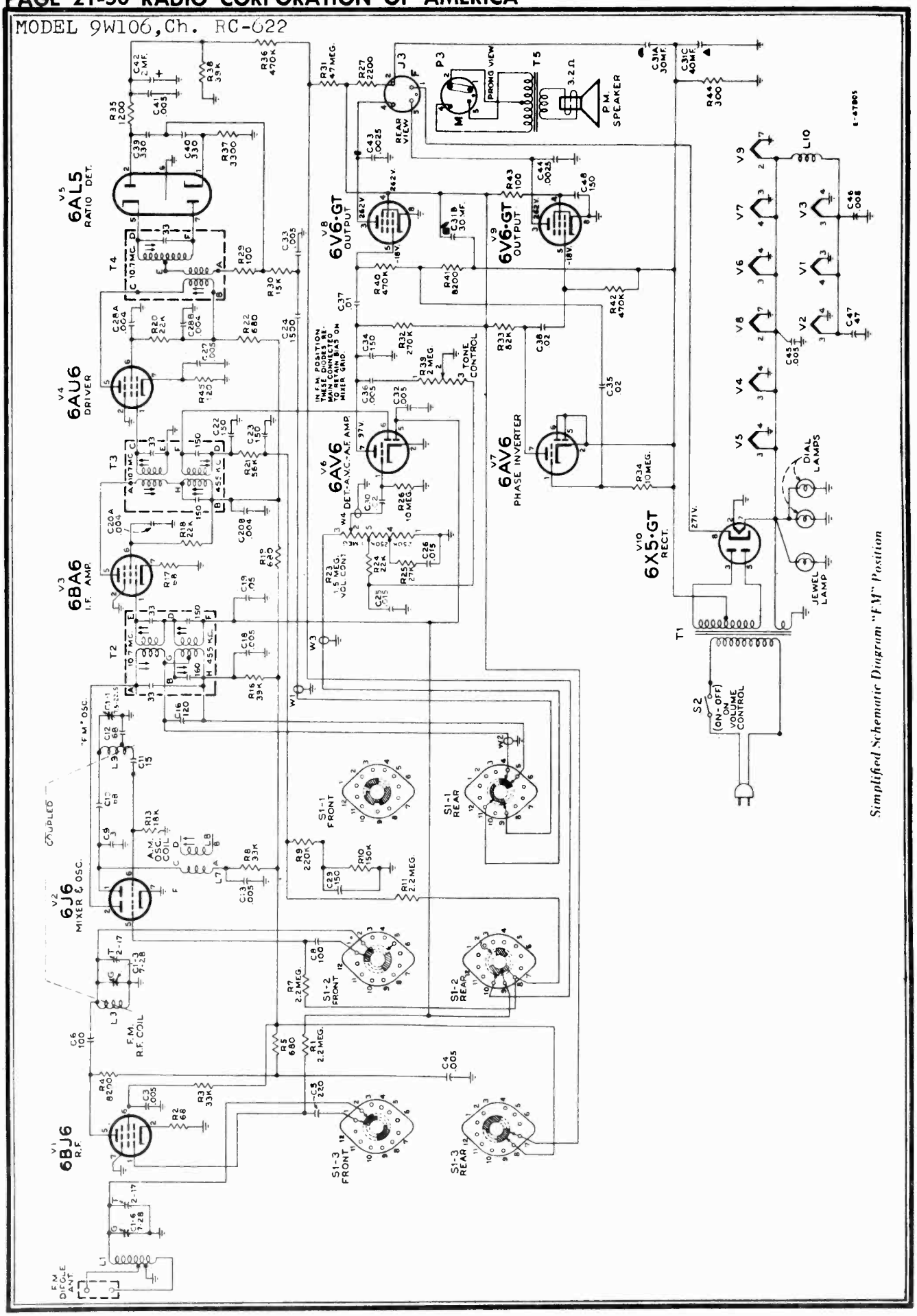
Tube	Terminal	Phono	A.M.	F.M.
V1 6BJ6	2	—	11.1	11.4
V2 6J6	7	—	6.8	6.6
V3 6BA6	7	—	13.1	13.7
V4 6AU6	7	—	8.2	8.1
V5 6AL5	1 & 5	—	—	—
V6 6AV6	2	0.68	.44	.43
V7 6AV6	2	1.7	1.4	1.35
V8 6V6GT	8	33	11.2	11
V9 6V6GT	8	33	11	11
V10 6X5GT	8	66	63	63

MODEL 9W106,
Ch. RC-622



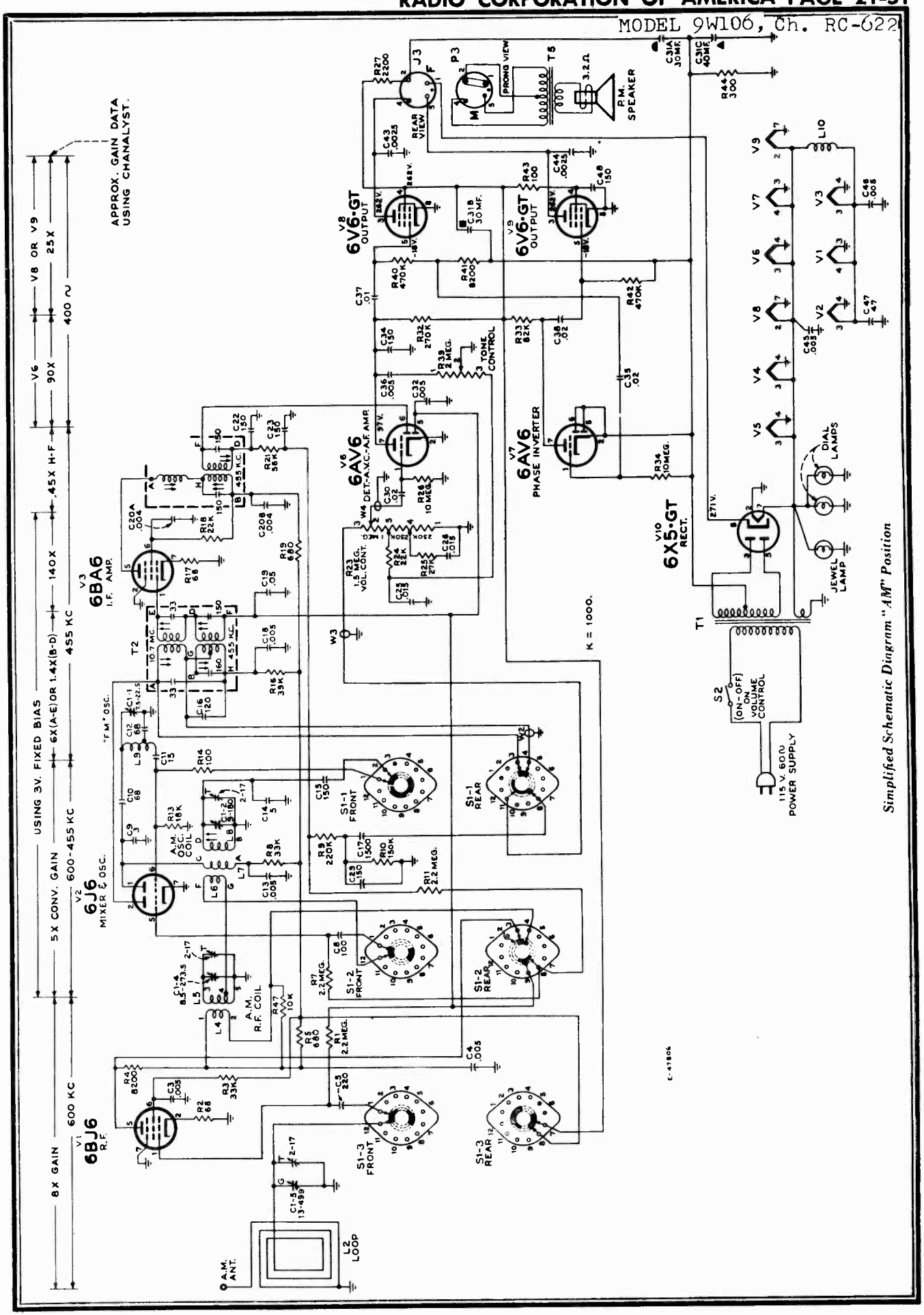
Complete Schematic Diagram

MODEL 9W106, Ch. RC-622



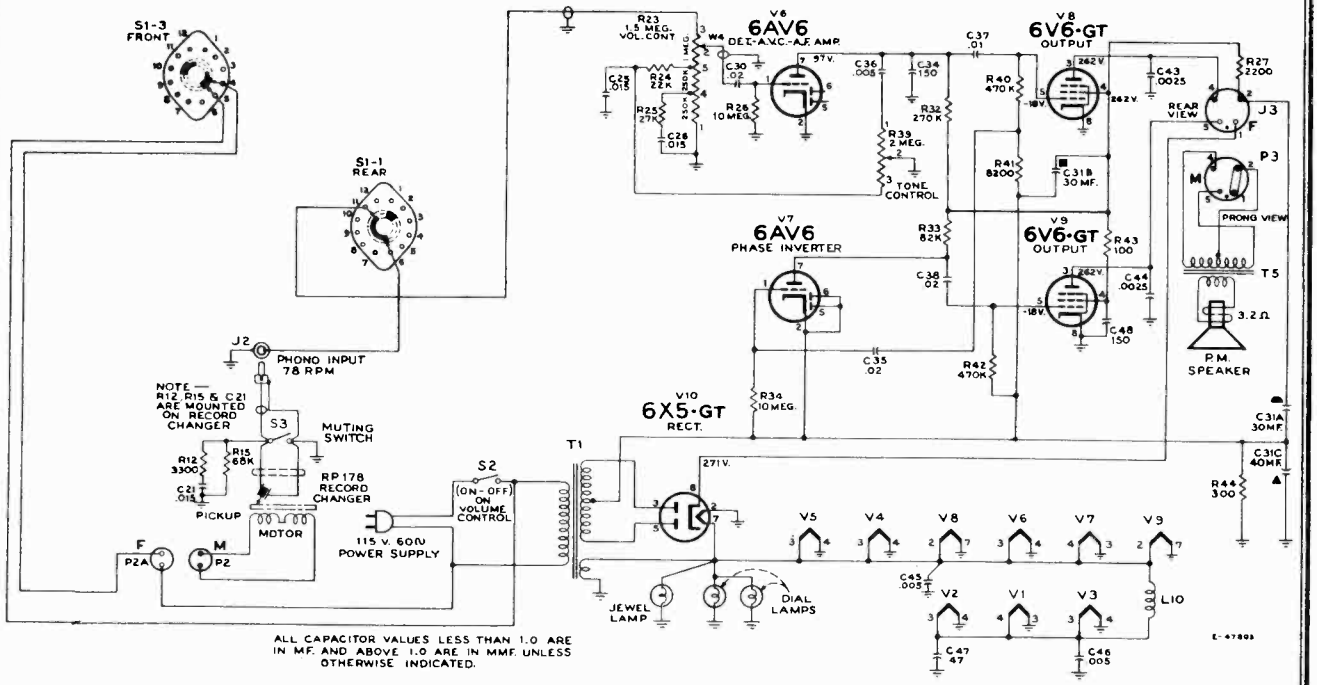
Simplified Schematic Diagram "FM" Position

MODEL 9W106, Ch. RC-622

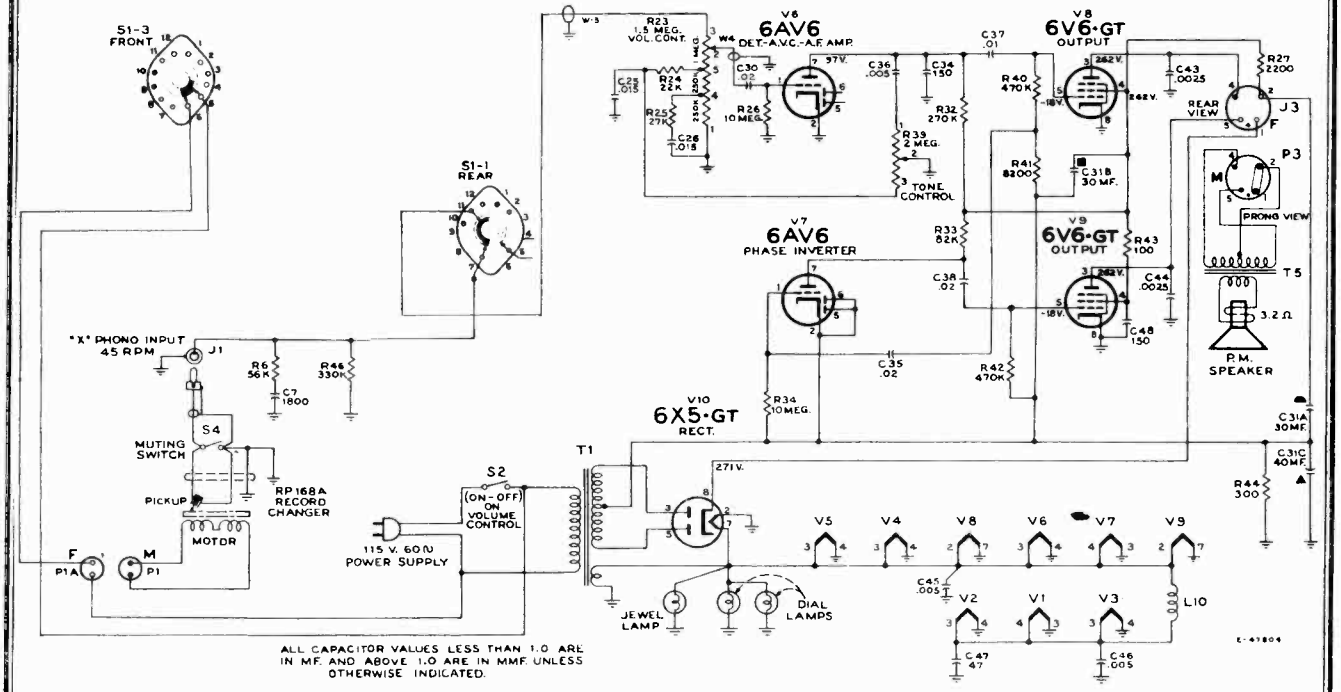


MODEL 9W106,
Ch. RC-622

RECORD CHANGER: Model RP-178, on Pages RCD.CH.18-1 through RCD.CH.18-13.



Simplified Schematic Diagram of 78 RPM Phonograph



Simplified Schematic Diagram of 45 RPM Phonograph

RECORD CHANGER: Model RP-168, on Pages RCD.CH.19-1 through RCD.CH.19-8.

MODEL 9W106,
Ch. RC-622

SHIPPING SCREWS

The radio chassis of these instruments is secured to the cabinet with shipping screws (painted red) which, together with spacing strips, should be **REMOVED** at the time of installation.

The record changers are each mounted with three screws which should be **LOOSENED** at the time of installation.

On the RP-168A-1 record changer decorative caps cover the mounting screws. Unscrew the caps for access to the screws.

RP-168 RECORD CHANGER

Pickup Landing Adjustment "A"

The pickup point should land half-way between the outer edge of the record and the first music groove.

If the pickup lands inside the starting grooves—turn screw "A" slightly clockwise. If pickup lands outside the starting grooves—turn screw "A" slightly counterclockwise.

Pickup Height Adjustment "B"

During cycle the pickup arm must rise high enough to clear a stack of eight records on the turntable, but not high enough to cause the top of the arm to touch records resting on the record supports.

If pickup does not clear a stack of eight records—turn screw "B" slightly clockwise. If pickup arm touches records on record supports—turn screw "B" slightly counterclockwise.

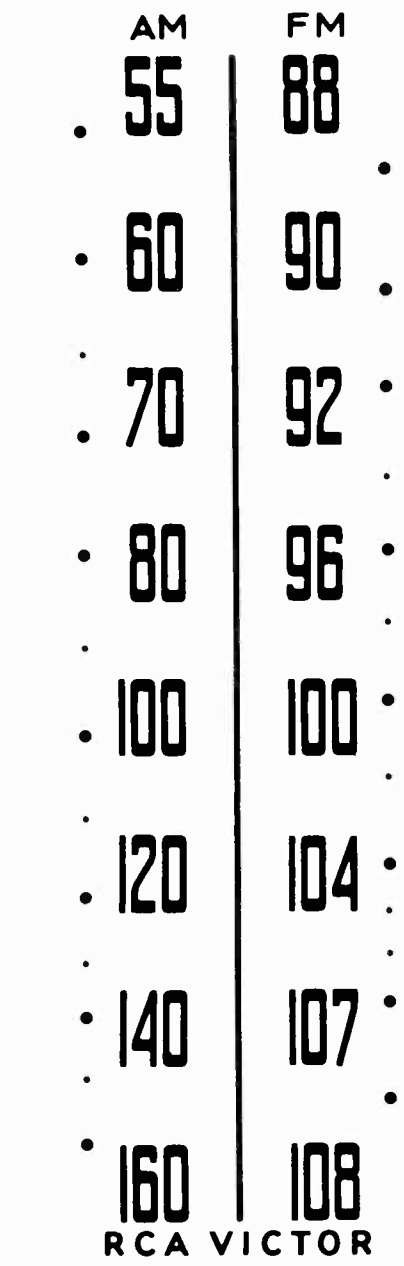
Record Separators

During service work the position of the star wheel on the underside of the record changer may be accidentally shifted; this may cause the record separator knives to be extended when in the out of cycle position.

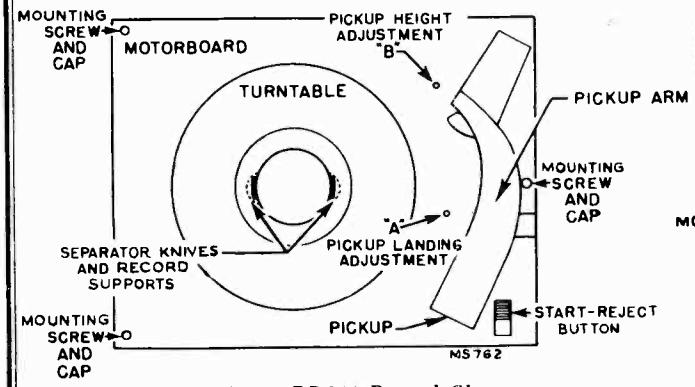
If the separator knives are thus extended—turn the power on so that the turntable is revolving, gently press fingers against the extended knives until they disappear inside the center post—DO THIS ONLY WHILE MECHANISM IS OUT OF CYCLE.

CARE OF SAPPHIRE

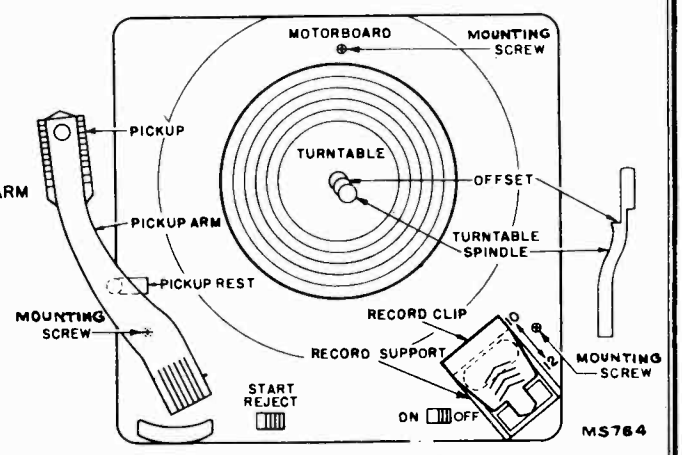
The sapphire point on the pickup is protected with a permanent metal guard. Lint may collect to clog the opening in the guard at the sapphire point and cause poor record reproduction. Occasional cleaning may be necessary; brush carefully with a small soft brush.



Dial Scale (Actual Size)

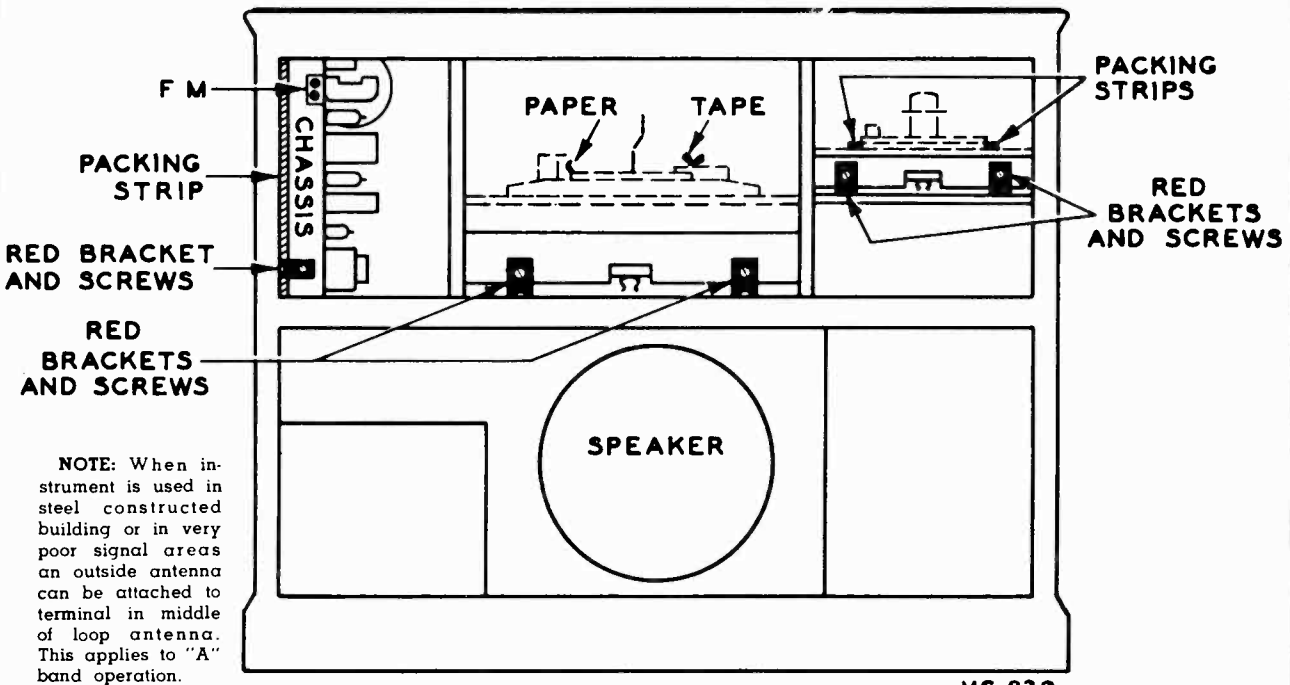


Top View—RP-168 Record Changer



Top View—RP-178 Record Changer

MODEL 9W106,
Ch. RC-622



NOTE: When instrument is used in steel constructed building or in very poor signal areas an outside antenna can be attached to terminal in middle of loop antenna. This applies to "A" band operation.

Rear View Showing Location of Various Units

REPLACEMENT PARTS

STOCK No.	DESCRIPTION
	CHASSIS ASSEMBLIES RC 622
*74848	Board—"F.M." terminal board
*74641	Cable—Flexible cable to operate volume control
*74849	Capacitor—Variable tuning capacitor (C1-1, 1-2, 1-3, 1-4, 1-5, 1-6)
73747	Capacitor—Electrolytic, 2 mmf., 50 volts (C42)
*74733	Capacitor—Ceramic, 3 mmf. (C9)
93056	Capacitor—Ceramic, 5 mmf. (C14)
39044	Capacitor—Ceramic, 15 mmf. (C11)
39042	Capacitor—Ceramic, 47 mmf. (C47)
33379	Capacitor—Ceramic, 68 mmf. (C10, C12)
39396	Capacitor—Ceramic, 100 mmf. (C6, C8)
71614	Capacitor—Ceramic, 120 mmf. (C16)
44704	Capacitor—Ceramic, 150 mmf. (C15, C22, C23, C34, C48)
48125	Capacitor—Ceramic, 150 mmf. (C29)
71920	Capacitor—Ceramic, 220 mmf. (C5)
39640	Capacitor—Mica, 330 mmf. (C39, C40)
74093	Capacitor—Ceramic, 1,500 mmf. (C17, C24)
*74850	Capacitor—Ceramic, 1,800 mmf. (C7)
74009	Capacitor—Ceramic, dual, 4,000 mmf. (C20A, C20B, C28A, C28B)
73473	Capacitor—Ceramic, 5,000 mmf. (C3, C4, C13, C18, C32, C46)
72052	Capacitor—Electrolytic, comprising 1 section of 30 mfd, 450 volts, 1 section of 30 mfd, 350 volts and 1 section of 40 mfd, 25 volts (C31A, C31B, C31C)
71926	Capacitor—Tubular, paper, .005 mfd, 200 volts (C27, C33, C41, C45)
71553	Capacitor—Tubular, paper, .005 mfd, 400 volts (C36)
70644	Capacitor—Tubular, paper, .0025 mfd, 1,000 volts (C43, C44)
71925	Capacitor—Tubular, paper, .01 mfd, 400 volts (C37)
71928	Capacitor—Tubular, paper, .02 mfd, 200 volts (C30, C35)
73638	Capacitor—Tubular, paper, .02 mfd, 400 volts (C38)
73553	Capacitor—Tubular, paper, .05 mfd, 400 volts (C19)
72120	Capacitor—Tubular, paper, .015 mfd, 200 volts (C25, C26)
73744	Coil—Oscillator coil—A.M. (L6, L7, L8)
*74841	Coil—R.F. coil—A.M.—complete with adjustable core and stud (L4, L5)
*74815	Coil—R.F. coil—F.M. (L3)
*74816	Coil—Antenna coil—F.M. (L1)
*73817	Coil—Oscillator coil—F.M. (L9)
71942	Coil—Filament choke coil (L10)
5040	Connector—4 contact female connector for speaker cable (P3)
30868	Connector—2 contact female connector for motor cables (P2A)
*74837	Control—Tone control (R39)
74639	Control—Volume control and power switch (R23, S2)
72953	Cord—Drive cord (approx. 58" overall length)
*74839	Fastener—Push fastener to hold R.F. shelf assembly (4 required)
*74838	Grommet—Power cord strain relief grommet (1 set)
16058	Grommet—Rubber grommet for mounting R.F. shelf assembly (4 required)
72069	Grommet—Rubber grommet for rear mounting feet (2 required)
*73895	Indicator—Station selector indicator
74645	Nut—8-32 hex retainer nut between R.F. shelf and volume control knob
74297	Plate—Dial back plate complete with two (2) drive cord pulleys less dial
18469	Plate—Bakelite mounting plate for electrolytic
74640	Pulley—Pulley and hub assembly for volume control
33514	Receptacle—Phono input receptacle
73637	Resistor—Wire wound, 2,200 ohms, 5 watt (R27)
	Resistor—Fixed, composition:
	68 ohms, ±10%, ½ watt (R2, R17)
	100 ohms, ±5%, ½ watt (R29)
	100 ohms, ±10%, ½ watt (R14, R43)
	120 ohms, ±10%, ½ watt (R45)
	300 ohms, ±5%, 2 watt (R44)
	680 ohms, ±10%, ½ watt (R19)
	680 ohms, ±20%, ½ watt (R5, R22)
	1,200 ohms, ±5%, ½ watt (R35)
	3,300 ohms, ±5%, ½ watt (R37)
	8,200 ohms, ±10%, ½ watt (R41)
	8,200 ohms, ±10%, 1 watt (R4)
	10,000 ohms, ±10%, ½ watt (R47)

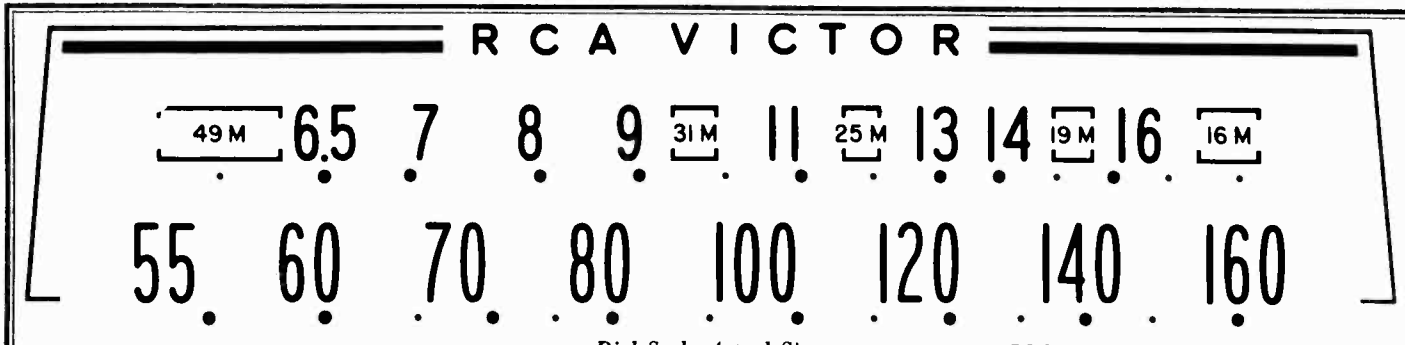
REPLACEMENT PARTS — Continued

MODEL 9W106, Ch. RC-622

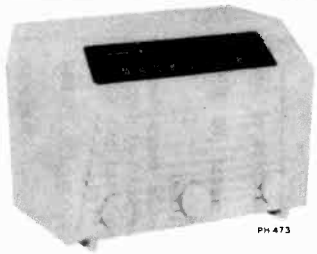
STOCK No.	DESCRIPTION
	15,000 ohms, ±10%, ½ watt (R30)
	18,000 ohms, ±10%, ½ watt (R13)
	22,000 ohms, ±10%, ½ watt (R18, R20, R24)
	27,000 ohms, ±10%, ½ watt (R25)
	33,000 ohms, ±10%, ½ watt (R3, R8)
	39,000 ohms, ±5%, ½ watt (R38)
	39,000 ohms, ±10%, 1 watt (R16)
	56,000 ohms, ±10%, ½ watt (R6, R21)
	82,000 ohms, ±10%, ½ watt (R33)
	150,000 ohms, ±10%, ½ watt (R10)
	220,000 ohms, ±10%, ½ watt (R9)
	270,000 ohms, ±10%, ½ watt (R32)
	330,000 ohms, ±10%, ½ watt (R46)
	470,000 ohms, ±10%, ½ watt (R36, R40, R42)
	2.2 megohm, ±20%, ½ watt (R1, R7, R11)
	10 megohm, ±20%, ½ watt (R26, R34)
	47 megohm, ±20%, ½ watt (R31)
73894	Shaft—Tuning knob shaft
73584	Shield—Tube shield for V1
74646	Sleeve—Sleeve and pulley assembly for volume control knob
74179	Socket—Tube socket, 7 pin, miniature for V1, V2, V3, V4
73117	Socket—Tube socket, 7 pin, miniature for V5, V6, V7
31251	Socket—Tube socket, octal, wafer for V8, V9, V10
31364	Socket—Lamp socket
74038	Spring—Drive cord spring
*74847	Support—Polystyrene support for F.M. oscillator coil complete with mounting bracket
*74840	Switch—Selector switch (S1)
73743	Transformer—Ratio detector transformer (T4)
73745	Transformer—First I.F. transformer—dual (T2)
74019	Transformer—Second I.F. transformer—dual (T3)
73601	Transformer—Power transformer—117 volt, 60 cycle (T1)
33726	Washer—"C" washer for tuning shaft
	SPEAKER ASSEMBLY 92569-6W
13867	Cap—Dust cap
73934	Cone—Cone and voice coil assembly
5039	Connector—4 contact male connector for speaker
74753	Speaker—12" P.M. (6.8 oz.) speaker complete with cone and voice coil (3.2 ohm), less output transformer and plug
71145	Suspension—Metal cone suspension
73636	Transformer—Output transformer
	NOTE: If stamping in instruments does not agree with above speaker number, order replacement parts by referring to model number of instrument, number stamped on speaker and full description of part required.
	MISCELLANEOUS
*74844	Antenna—F.M. antenna
74205	Bezel—Dial scale bezel less dial
71599	Bracket—Pilot lamp bracket
74296	Cable—Shielded pickup cable complete with pin plug
13103	Cap—Pilot lamp jewel
72120	Capacitor—Tubular, .015 mfd (C21)
71892	Catch—Bullet catch and strike for cabinet doors (3 required)
73897	Clamp—Dial clamp (2 required)
X3057	Cloth—Grille cloth for mahogany or walnut instruments
X1649	Cloth—Grille cloth for blonde instruments
30870	Connector—2 contact female connector for motor cables
30868	Connector—2 contact male connector for motor cables
74581	Cover—Mounting screw cover (plug-in type) for 45 RPM changer (3 required)
*74853	Decal—Control panel decal for mahogany or walnut instruments
*74854	Decal—Control panel decal for blonde instruments
74273	Decal—Trade mark decal (Victrola)
71984	Decal—Trade mark decal (RCA Victor)
*74842	Dial—Glass dial scale
*74851	Grille—Metal grille

STOCK No.	DESCRIPTION
11889	Grommet—Rubber grommet for front apron of chassis (2 required)
72856	Grommet—Rubber grommet to mount 78 RPM changer (3 required)
74838	Grommet—Strain relief grommet (1 set)
36610	Hinge—Door hinge (1 set) for radio compartment door or R.H. record storage compartment door
36817	Hinge—L.H. record storage compartment door hinge (1 set)
71821	Knob—Tuning control knob—maroon—for mahogany or walnut instruments
72824	Knob—Tuning control knob—brown—for blonde instruments
71822	Knob—Tone control knob—maroon—for mahogany or walnut instruments
72824	Knob—Tone control knob—brown—for blonde instruments
73994	Knob—Volume control knob—maroon—for mahogany or walnut instruments
73995	Knob—Volume control knob—brown—for blonde instruments
73230	Knob—Selector switch knob—maroon—for mahogany or walnut instruments
73231	Knob—Selector switch knob—brown—for blonde instruments
11765	Lamp—Dial or pilot lamp—Mazda 51
*74843	Loop—Antenna loop complete (L2)
73109	Nut—Tee nut to mount 78 RPM changer (3 required)
74208	Nut—Tee nut to mount 45 RPM changer (3 required)
*74852	Pull—Door pull for record changer drawers or radio compartment door (5 required)
74451	Pull—Door pull for record storage compartment doors (2 required)
	Resistor—Fixed, composition: 3,300 ohms, ±10%, ½ watt (R12) 68,000 ohms, ±10%, ½ watt (R15)
73110	Screw—No. ¼-20 x 1¾" fillister head screw to mount 78 RPM changer (3 required)
74582	Screw—No. 8-32 x 1¾" special head screw to mount 45 RPM changer (3 required)
74269	Screw—No. 8-32 x ¾" trimit head screw for door pull No. 74852
74279	Screw—No. 8-32 x ⅞" trimit head screw for door pull No. 74451
74835	Slide—Slide mechanism for 45 RPM changer drawer
74736	Slide—Slide mechanism for 78 RPM changer drawer
30900	Spring—Retaining spring for knobs No. 71821, 71822 and 72824
72845	Spring—Retaining spring for knobs No. 73994 and 73995
14270	Spring—Retaining spring for knobs No. 73230 and 73231
74421	Spring—Conical spring to mount 45 RPM changer—upper—R.H. (1 required)
74222	Spring—Conical spring to mount 45 RPM changer—upper—L.H. (2 required)
74423	Spring—Conical spring to mount 45 RPM changer—lower (3 required)
72936	Stop—Door stop for record storage compartment doors (2 required)
X3048	Doors—Set of doors (2) for Model "X" changer compartment and radio compartment for Model 9W106—mahogany
X3049	Doors—Set of doors (2) for Model "X" changer compartment and radio compartment for Model 9W106—walnut
X3050	Doors—Set of doors (2) for Model "X" changer compartment and radio compartment for Model 9W106—toasted mahogany
X3054	Doors—Set of doors (2) for record storage compartment for Model 9W106—mahogany
X3055	Doors—Set of doors (2) for record storage compartment for Model 9W106—walnut
X3056	Doors—Set of doors (2) for record storage compartment for Model 9W106—toasted mahogany
X3051	Panel—Center drawer panel for Model 9W106—mahogany
X3052	Panel—Center drawer panel for Model 9W106—walnut
X3053	Panel—Center drawer panel for Model 9W106—toasted mahogany

MODELS 9X651, Ch. RC-1085; 9X652, Ch. RC-1085A

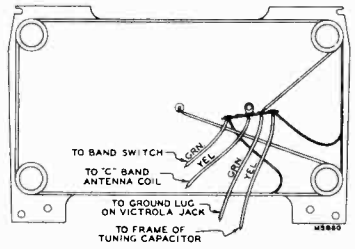


Dial Scale Actual Size DS-9

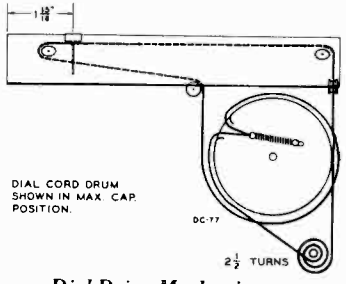


9X652—(Ivory Plastic)

9X651—(Brown Plastic)



Loop Antenna



Dial Drive Mechanism

Alignment Procedure

Test Oscillator.—Connect high side of test oscillator as shown in chart. Connect low side to chassis. Keep the output low to avoid A.V.C. action.

Note.—If the test oscillator is A.C. operated it may be necessary to use an isolation transformer (115v./115 v.) for the receiver during alignment, and the low side of the test oscillator connected to common wiring. Reverse line plug if hum is excessive.

Output Meter.—Connect meter across speaker voice coil. Turn volume control to maximum.

Dial Pointer Adjustment.—Rotate tuning condenser to maximum capacity position (plates fully meshed). Adjust dial to position indicated in drawing.

With the dial adjusted as described above mark the dial pan assembly with a pencil to provide a tuning indicator during alignment.

Cathode Currents

	"A" Band	"C" Band
(1) 12BA6	9.7 ma	9.6 ma
(2) 12BE6	7.8 ma	8.1 ma
(3) 12BA6	8.7 ma	8.4 ma
(4) 12SQ7	0.15 ma	0.15 ma
(5) 35LL	37 ma	37 ma
(6) 35Z5	65 ma	65 ma

Specifications

Tuning Ranges

Standard Broadcast ("A" Band)...540-1600 kc
Short Wave ("C" Band)..... 5.9-17.9 mc

Intermediate Frequency..... 455 kc

Tube Complement

(1) RCA 12BA6 .....R. F. Amplifier
(2) RCA 12BE6 ..... Converter
(3) RCA 12BA6 ..... I. F. Amplifier
(4) RCA 12SQ7..... Det. - A.F. - A.V.C.
(5) RCA 35L6GT ..... Output
(6) RCA 35Z5 ..... Rectifier

Dial Lamp..... Type 51, 6.3 volts, 0.25 amp.

Power Supply Rating

115 volts, D.C. or 50 to 60 cycles, A.C..... 35 watts

Loudspeaker

Type 92572-4 ..... 5 in. P.M.
V. C. Impedance.....3.2 ohms at 400 cycles

Power Output

Undistorted ..... 0.8 watts
Maximum ..... 1.2 watts

Tuning Drive Ratio .....11:1 (5½ turns of knob)

NOTE: If reception is not obtained on DC, reverse plug in outlet receptacle. This may also reduce hum on AC operation.

To Remove Chassis from Cabinet

1. Remove knobs (just pull).
2. Remove four screws holding back.
3. Remove two screws in both ends of rear apron and slide chassis out.

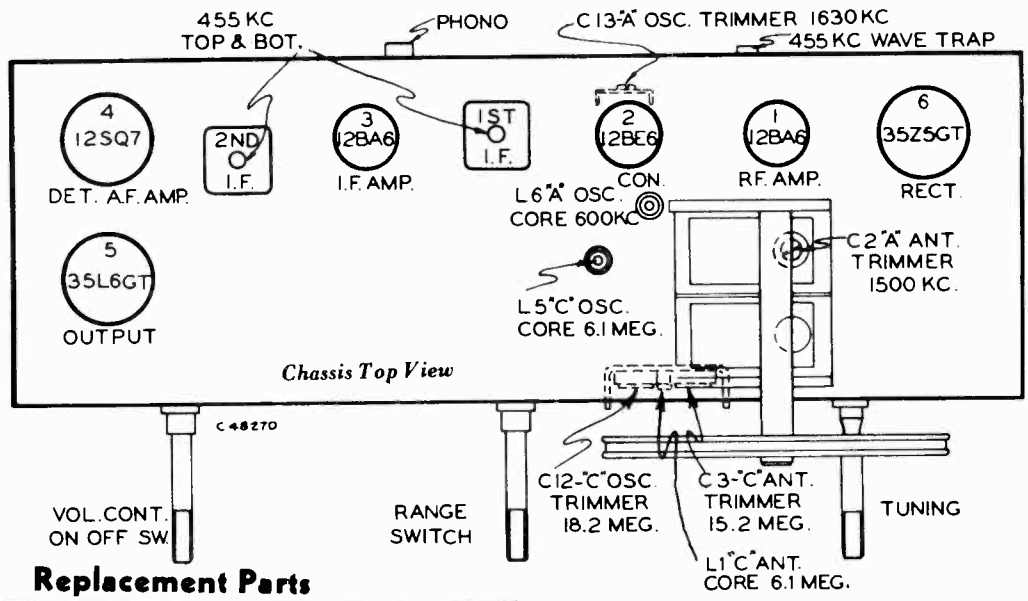
Critical Lead Dress

1. Dress all heater leads and pilot lights leads down to chassis and away from all audio grid and plate wiring.
2. Dress lead from ant. section of gang to pin 1 of V1 direct and as short as possible but position for low capacity to chassis.
3. Dress lead from ant. section of gang to S1-1 rear contact #3 direct and as short as possible but position for low capacity to chassis.
4. Leads to loop antenna are long and draped to permit tube servicing by lowering loop back. They should be evenly spaced to maintain low capacity and dressed to prevent touching gang plates.
5. All R.F. leads to coils should be short and direct. Dress other leads and components away from coils.

MODELS 9X651, Ch. RC-1085; 9X652, Ch. RC-1085A

Steps	Connect the High Side of The Test Osc. to—	Tune Test Osc. to—	Range Switch to—	Turn Radio Dial to—	Adjust for maximum output
1	Pin No. 1 of 12BA6 I.F. amp. tube in series with 0.1 mfd.	455 kc.	"A"	Quiet Point near 1600 kc.	Top and bottom T2 2nd I.F. Trans.
2	Pin No. 7 of 12BE6 Converter tube in series with 0.1 mfd.				Top and bottom T1 1st I.F. Trans.
3	Pin No. 1 of 12BA6 R.F. tube in series with 0.1 mfd.				L2 wave trap for minimum output.
4	(Radiated signal) short piece of wire placed near ant.	1630 kc.	"A"	1630 kc. (Cap. min.)	C-13 "A" Osc.
5		1500 kc.		1500 kc.	C-2 "A" ant.
6		600 kc.		600 kc.	L6 "A" Osc. Rocking gang.
7	Repeat steps 4, 5 and 6.				
8	Center terminal on loop antenna Term. board through 47 mfd. Low side to loop primary terminal	18.2 mc.	"C"	18.2 mc. (Min. cap.)	C-12* "C" Osc.
9		15.2 mc.		15.2 mc.	C-3**† "C" Ant.
10		6.1 mc.		6.1 mc.	L-5††† "C" Osc. L-1 "C" Ant.
11	Repeat steps 8, 9 and 10 as necessary.				

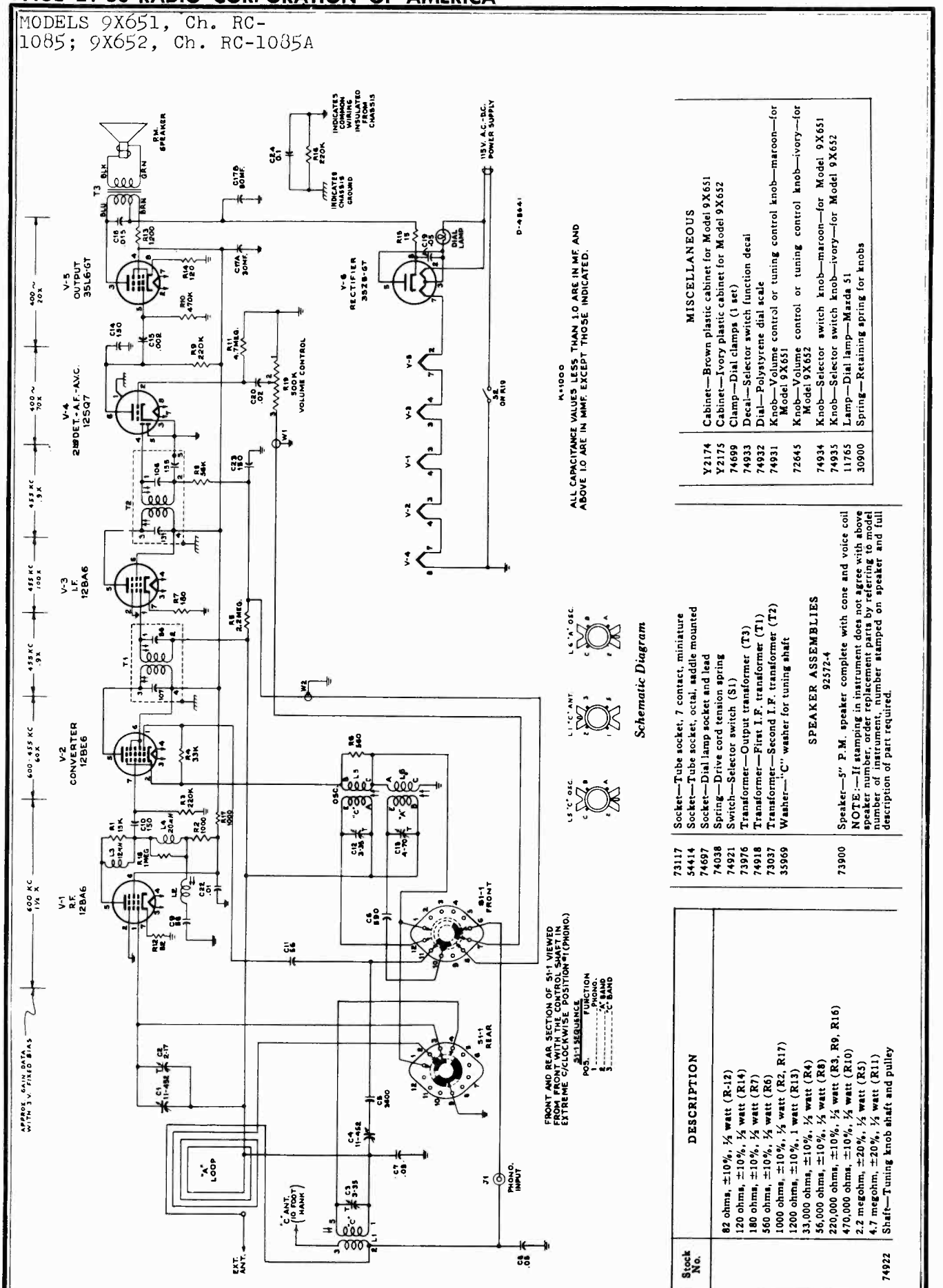
*Two peaks should be found, use one having lowest capacity.
**Two peaks should be found, use one having highest capacity.
Note: Check for image frequences.
†Radio dial tuned to 15.2 mc. as in step 9, tune test osc. to 16.11 mc. where a weaker signal should be heard.
††Radio dial tuned to 6.1 mc. as in step 10, tune test osc. to 7.01 mc. where a weaker signal should be heard.



Replacement Parts

Stock No.	DESCRIPTION
	CHASSIS ASSEMBLIES RC 1085-9X651 RC 1085A-9X652
71042	Button—Plugbutton for trimmer adjustment hole
74924	Capacitor—Mica trimmer, dual, 3-35 mmf. (C3, C12)
74923	Capacitor—Mica trimmer, 4-70 mmf. (C13)
74917	Capacitor—Variable tuning capacitor (C1, C2, C4)
71924	Capacitor—Ceramic, 56 mmf. (C9, C11)
73501	Capacitor—Ceramic, 150 mmf. (C10, C14, C23)
74929	Capacitor—Mica, 590 mmf. (C6)
39665	Capacitor—Mica, 3600 mmf. (C5)
72312	Capacitor—Electrolytic, comprising 1 section of 30 mfd, 15 volts, and 1 section of 80 mfd, 150 volts. (C17A, C17B)
72315	Capacitor—Tubular, paper, .002 mfd, 200 volts (C15)
73561	Capacitor—Tubular, paper, .01 mfd, 400 volts (C22)
70572	Capacitor—Tubular, paper, .015 mfd, 400 volts (C16)
71928	Capacitor—Tubular, paper, .02 mfd, 200 volts (C20)
73553	Capacitor—Tubular, paper, .05 mfd, 400 volts (C7, C8, C19)
70617	Capacitor—Tubular, paper, 0.1 mfd, 400 volts (C24)
73935	Clip—Mounting clip for I.F. transformer
74925	Coil—Oscillator coil—"A" band complete with adjustable core and stud (L6)
74926	Coil—Oscillator coil—"C" band complete with adjustable core and stud (L5)
74927	Coil—Antenna coil—"C" band (L1)
74928	Coil—Series wave trap coil (455KC) complete with adjustable core and stud (L2)
74930	Coil—Peaking coil (12 mh) (L3, R1)
72618	Coil—Peaking coil (20 mh) (L4, R18)
38410	Control—Volume control and power switch (R19, S2)
72953	Cord—Drive cord (approx. 48" overall)
33139	Grommet—Rubber grommet for chassis base
72283	Grommet—Rubber grommet for mounting tuning capacitor (3 req'd)
74838	Grommet—Power cord strain relief grommet (1 set)
74696	Indicator—Station selector indicator
70980	Lead—Antenna lead—part of loop and back cover
74919	Loop—Back cover and loop assembly complete with antenna lead for Model 9X651
74920	Loop—Back cover and loop assembly complete with antenna lead for Model 9X652
74690	Plate—Dial back plate complete with 4 drive cord pulleys less dial
35787	Receptacle—Phono input jack (J1)
	Resistor—Fixed, composition: 15 ohms, ±10%, ½ watt (R15)

MODELS 9X651, Ch. RC-1085; 9X652, Ch. RC-1085A



Stock No.	DESCRIPTION
	82 ohms, ±10%, ½ watt (R-12)
	120 ohms, ±10%, ½ watt (R14)
	180 ohms, ±10%, ½ watt (R7)
	560 ohms, ±10%, ½ watt (R6)
	1000 ohms, ±10%, ½ watt (R2, R17)
	1200 ohms, ±10%, 1 watt (R13)
	33,000 ohms, ±10%, ½ watt (R4)
	56,000 ohms, ±10%, ½ watt (R8)
	220,000 ohms, ±10%, ½ watt (R3, R9, R16)
	470,000 ohms, ±10%, ½ watt (R10)
	2.2 megohm, ±20%, ½ watt (R5)
	4.7 megohm, ±20%, ½ watt (R11)
74922	Shaft—Tuning knob shaft and pulley
73117	Socket—Tube socket, 7 contact, miniature
54414	Socket—Tube socket, octal, saddle mounted
74697	Socket—Dial lamp socket and lead
74038	Spring—Drive cord tension spring
74921	Switch—Selector switch (S1)
73976	Transformer—Output transformer (T3)
74918	Transformer—First I.F. transformer (T1)
73037	Transformer—Second I.F. transformer (T2)
35969	Washer—¼" "C" washer for tuning shaft

SPEAKER ASSEMBLIES

92572-4	
73900	Speaker—5" P.M. speaker complete with cone and voice coil

NOTE:—If stamping in instrument does not agree with above speaker number, order replacement parts by referring to model number of instrument, number stamped on speaker and full description of part required.

MISCELLANEOUS

Y2174	Cabinet—Brown plastic cabinet for Model 9X651
Y2175	Cabinet—Ivory plastic cabinet for Model 9X652
74699	Clamp—Dial clamps (1 set)
74933	Decal—Selector switch function decal
74932	Dial—Polystyrene dial scale
74931	Knob—Volume control or tuning control knob—maroon—for Model 9X651
72645	Knob—Volume control or tuning control knob—ivory—for Model 9X652
74934	Knob—Selector switch knob—maroon—for Model 9X651
74935	Knob—Selector switch knob—ivory—for Model 9X652
11765	Lamp—Dial lamp—Mazda 51
30900	Spring—Retaining spring for knobs

MODEL 9Y510,
Ch. RC-1077A

Specifications

Tuning Range ..... 540-1600 kc

Intermediate Frequency ..... 455 kc

Tube Complement

1. RCA-12BE6 ..... Converter
2. RCA-12BA6 ..... I-F Amplifier
3. RCA-12AV6 ..... Det., AVC., A-F Amplifier
4. RCA-50L6GT ..... Output
5. RCA-35W4 ..... Rectifier

Power Supply Rating ..... 115 volts, 60 cycles a.c., 60 watts

Dial Lamps (2) ..... Mazda type 1490, 3.2 volts, 0.16 amp.

Loudspeaker (92585-1)

Size and type ..... 5" x 7" P.M.
Voice coil impedance ..... 3.2 ohms at 400 cycles

Power Output

Undistorted ..... 1 watt
Maximum ..... 1.5 watts

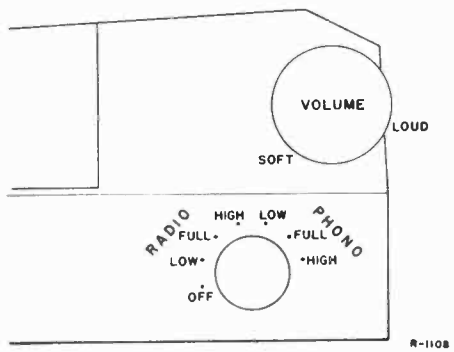
Cabinet Dimensions
Height 7¾" Width 12⅜" Depth 14¼"

Tuning Drive Ratio ..... 7½:1 (3¾ turns of knob)

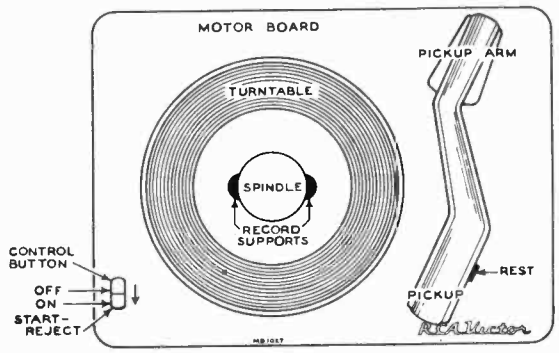
Record Changer (RP 190-1)

Turntable speed ..... 45 r.p.m.
Records used ..... RCA—7 in. fine groove
Record capacity ..... Up to 12 records
Pickup (Stock No. 75476) ..... Crystal (medium output)

FOR RECORD CHANGER SERVICE INFORMATION —REFER TO RP 190 SERIES SERVICE DATA



Controls—End View



Record Changer—Top View

Care of Stylus

The record changer stylus is protected by a permanent metal guard. LINT MAY COLLECT TO CLOG THE OPENING IN THE GUARD AT THE STYLUS POINT AND CAUSE POOR RECORD REPRODUCTION. This may require occasional cleaning of the guard opening—clean by carefully brushing with a small soft brush.

Service Hints

The tubes and the dial lamps are accessible by removing the panel in the front of the record changer compartment.

The chassis metal mounting plate should be flush against the front of the cabinet.

The position of the speaker is adjustable. When correctly positioned, it should set firmly against the front of the cabinet but with no undue strain on the speaker.

MODEL 9Y510,
Ch. RC-1077A

Alignment Procedure

Output Meter—Connect meter across speaker voice coil. Turn volume control to maximum.

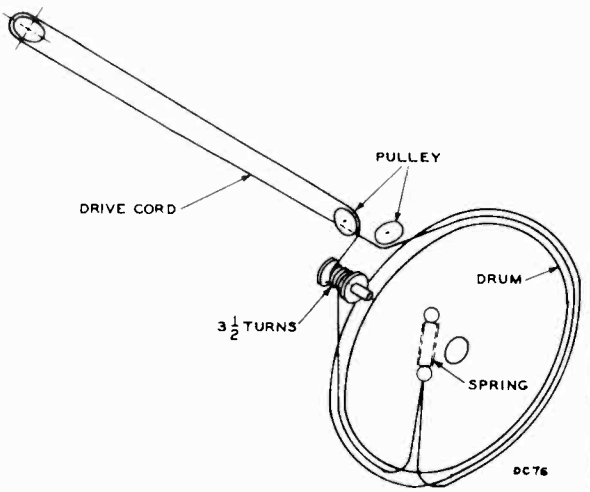
Test Oscillator—Connect low side of test oscillator to common wiring in series with a .1 mf. capacitor. If the test oscillator is a.c. operated it may be necessary to use an isolation transformer for the receiver during alignment and the low side of the test oscillator connected directly to common wiring at the electrolytic capacitor. Keep the oscillator output low to prevent a-v-c action.

Dial Pointer Adjustment—Rotate tuning condenser until the plates are fully open. Adjust indicator pointer to 1630 kc (extreme high frequency end of the scale).

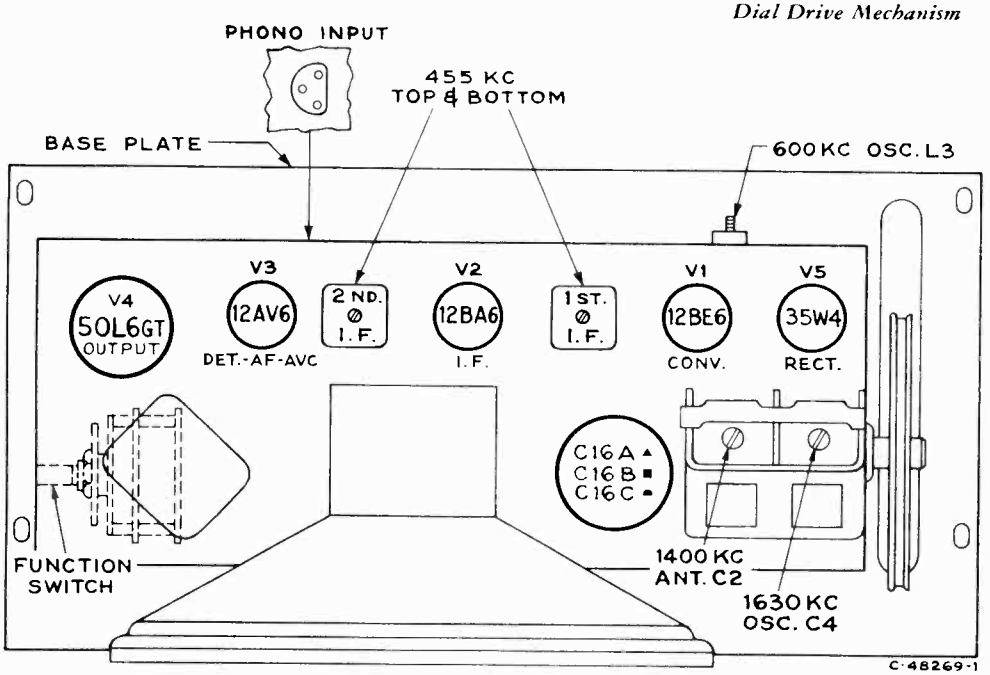
Steps	Connect the high side of test to—	Tune test-osc. to—	Turn radio dial to—	Adjust the following for max. output
1	I.F. grid, in series with .1 mfd.	455 kc	Quiet point 1,600 kc end of dial	Pri. & Sec. 2nd I.F. transformer
2	Converter grid in series with .1 mfd.			Pri. & Sec. 1st I.F. transformer
NOTE — ANTENNA LOOP AND RECORD CHANGER MUST BE IN CABINET FOR THE FOLLOWING				
3	Short wire placed near loop for radiated signal	1,630 kc	Extreme R. H. end (gang open)	1,630 KC trimmer (osc.)
4		1,400 kc	1,400 kc	1,400 KC trimmer (ant.)
5		600 kc	600 kc	Osc. Coil L3 Rock gang
6	Repeat steps 3, 4, & 5 if necessary			

LEAD DRESS

1. Dress all heater leads and pilot light leads down to chassis and as far as possible from all audio grid and plate wiring.
2. Dress all exposed leads away from each other and away from chassis to prevent short circuits.
3. Dress lead from R.F. section of gang to V1 pin 7 direct but away from chassis base to reduce capacity, also away from fuse resistor.
4. Dress lead from oscillator section of gang to oscillator coil direct but away from chassis base to reduce capacity.
5. Connect capacitor C20 with short leads between gang frame and mounting bracket.
6. Dress output transformer leads down to base.
7. Dress loop antenna leads away from gang plates and tubes.
8. Dress 33 ohm limiting resistor away from chassis.

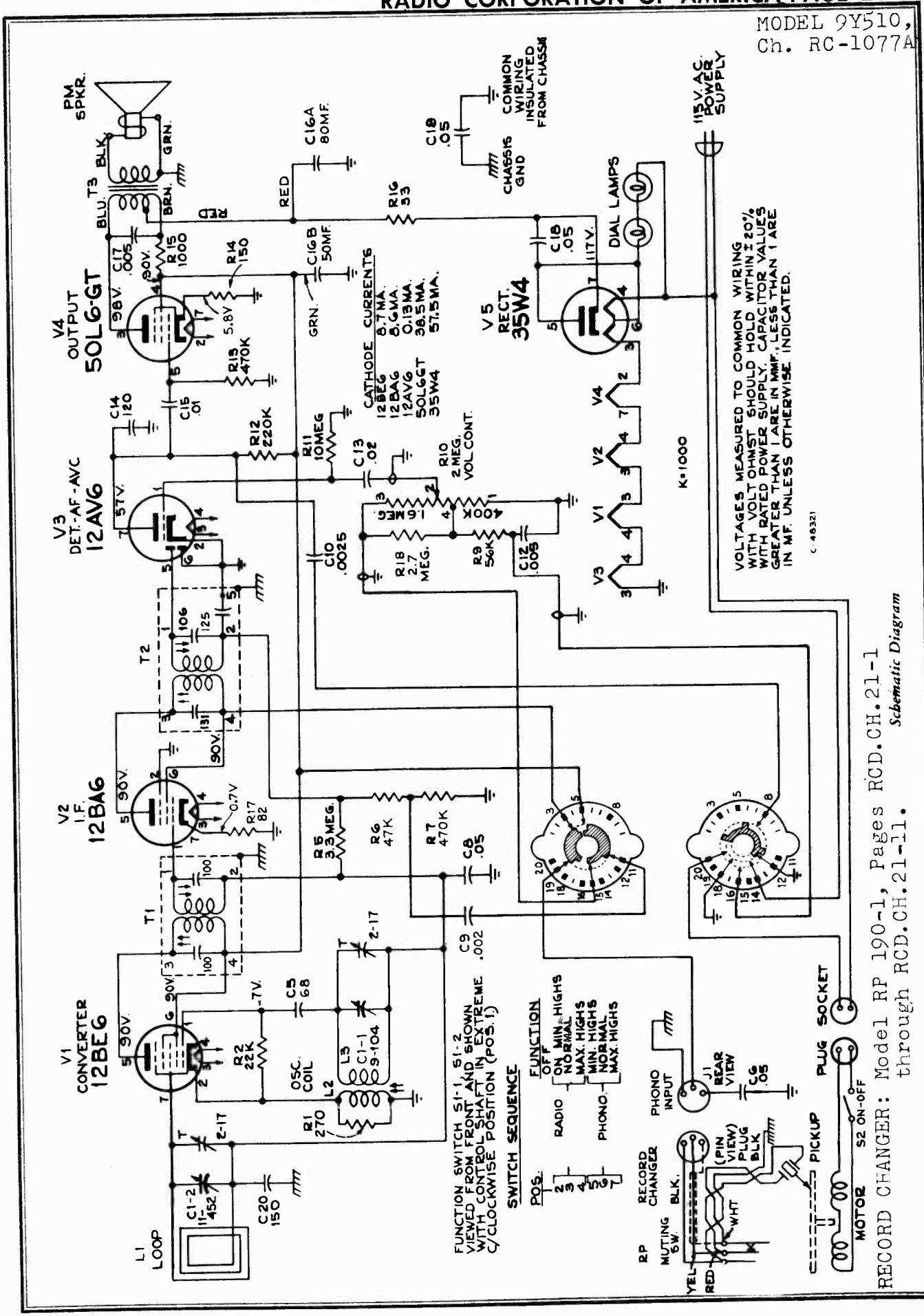


Dial Drive Mechanism



Tube and Trimmer Locations

MODEL 9Y510,
Ch. RC-1077A



RECORD CHANGER: Model RP 190-1, Pages RCD.CH.21-1 through RCD.CH.21-11.

Schematic Diagram

MODEL 9Y510,
Ch. RC-1077A

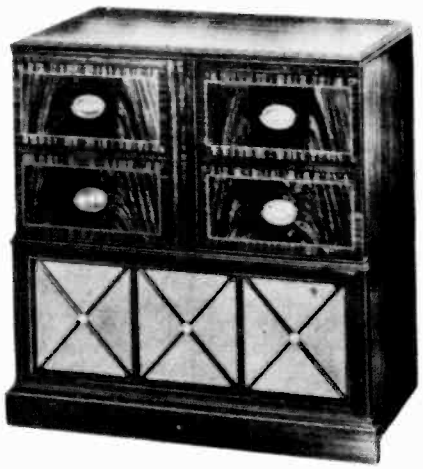
Replacement Parts

STOCK NO.	DESCRIPTION
	CHASSIS ASSEMBLIES RC 1077A
75909	Antenna—Antenna loop assembly L1
74705	Bracket—Drive cord pulley bracket (R.H.) complete with two (2) pulleys less long bracket.
74704	Capacitor—Variable tuning capacitor—less bracket C1-1, C1-2
39624	Capacitor—Mica, 68 mmf C5
39630	Capacitor—Mica, 120 mmf C14
39632	Capacitor—Mica, 150 mmf C20
73803	Capacitor—Tubular, paper, .002 mfd, 400 volts C9
73599	Capacitor—Tubular, paper, .0025 mfd, 400 volts C10
73920	Capacitor—Tubular, paper, .005 mfd, 400 volts C12, C17
73561	Capacitor—Tubular, paper, .01 mfd., 200 volts C15
73562	Capacitor—Tubular, paper, .02 mfd., 400 volts C13
73553	Capacitor—Tubular, paper, .05 mfd., 400 volts, C6, C8, C18, C19
75911	Capacitor—Electrolytic comprising 1 section of 80 mfd., 150 volts and 1 section of 50 mfd, 150 volts C16A, C16B
73935	Clip—Mounting clip for I.F. transformer
74448	Coil—Oscillator coil L2
36422	Connector—3 contact female connector for phono input cable, J1
30868	Connector—2 contact female connector for motor cable, P3
74702	Control—Volume control R10
†72953	Cord—Drive cord (approx. 49" over-all length required)
70392	Cord—Power cord and plug
74454	Gasket—Rubber gasket between speaker and cabinet
74838	Grommet—Strain relief grommet (1 set)
72283	Grommet—Rubber grommet to mount tuning capacitor
72602	Pulley—Drive cord pulley
72313	Resistor—Fuse type, 33 ohms R16
	Resistor—Fixed, composition:
	82 ohms, ±10%, ½ watt R17
	150 ohms, ±10%, ½ watt R14
	270 ohms, ±10%, ½ watt R1
	1000 ohms, ±10%, 1 watt R15
	22,000 ohms, ±20%, ½ watt R2
	47,000 ohms, ±20%, ½ watt R6
	56,000 ohms, ±10%, ½ watt R9
	220,000 ohms, ±20%, ½ watt R12
	470,000 ohms, ±20%, ½ watt R7, R13
	2.7 megohms, ±10%, ½ watt R18
	3.3 megohms, ±20%, ½ watt R5
	10 megohms, ±20%, ½ watt R11
74701	Shaft—Tuning knob shaft and pulley
73584	Shield—Tube shield for 12AV6
70827	Socket—Tube socket, octal, wafer
73117	Socket—Tube socket, 7 pin, miniature
72998	Socket—Dial lamp socket and lead
74038	Spring—Drive cord spring

STOCK NO.	DESCRIPTION
75910	Switch—Function switch S1-1
74654	Transformer—Output transformer T3
75486	Transformer—First I.F. transformer complete with adjustable cores T1
75487	Transformer—Second I.F. transformer complete with adjustable cores T2
33726	Washer—"C" washer for tuning knob shaft
	SPEAKER ASSEMBLIES 92585-1
74706	Speaker—5" x 7" P.M. speaker complete with cone and voice coil
	MISCELLANEOUS
Y2292	Cabinet—Plastic cabinet—maroon—less lid, lid support, metal grille and hinge assemblies
74713	Clamp—Dial clamp (2 req'd)
73508	Clip—Spring clip for knob #74710
75912	Clip—Spring clip for radio compartment back panel
30870	Connector—2 contact male connector for motor cable
74192	Connector—3 contact male connector for phono cable
74682	Decal—Function switch decal
74273	Decal—Trade mark decal (Victrola)
74722	Dial—Polystyrene dial scale
74782	Emblem—"RCA Victor" emblem
33317	Fastener—Push fastener for antenna loop mounting bracket
72894	Foot—Rubber foot (4 req'd)
74707	Grille—Metal grille
75697	Grommet—Rubber grommet for mounting record changer
75915	Hinge—Cabinet lid hinge (2 req'd)
74709	Indicator—Station selector indicator
74710	Knob—Volume control or tuning knob
74711	Knob—Function switch knob
71116	Lamp—Dial lamp—Type 1490
75914	Lid—Cabinet lid only
74717	Mask—End mask for dial (2 req'd)
74708	Motif—Decorative motif for front of cabinet
74788	Nut—Speed nut for radio compartment back panel clips
72765	Nut—Speed nut to fasten decorative motif
74715	Panel—Radio compartment back panel
74721	Plate—Dial back plate—less dial
73728	Screen—Ventilation screen
74716	Screw—#6-32 x ¼" cross recessed oval head machine screw for radio compartment back panel (3 req'd)
75913	Screw—#10-32 x ¾" cross recessed round head machine screw for mounting record changer
14270	Spring—Retaining spring for knob #74711
71824	Stud—Cabinet lid hinge stud and screw (2 req'd)
74714	Support—Lid support

† Stock No. 72953 is a reel containing 250 feet of card.

MODEL A-91,
Ch. RC-1095



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FOR RECORD CHANGER SERVICE INFORMATION REFER TO RP-168 SERIES SERVICE DATA OR RP-190 SERIES SERVICE DATA FOR 45 R.P.M. AND MODEL 960284 SERVICE DATA FOR 78/33⅓ R.P.M. on Pages RCD.CH.19-1, RCD.CH.21-1, and RCD.CH.21-34 respectively.

Specifications

Tuning Range

Standard Broadcast (AM) ..... 540-1,600 kc.
Frequency Modulation (FM) ..... 88-108 mc.
Intermediate Frequencies .....AM—455 kc., FM—10.7 mc.

Tube Complement

(1) RCA 6J6 .....Mixer and Oscillator
(2) RCA 6BA6 .....I-F Amplifier
(3) RCA 6AU6 .....Driver
(4) RCA 6AL5 .....Ratio Detector
(5) RCA 6AV6 .....AM Det.—AVC—A-F Amplifier
(6) RCA 6C4 .....Ph. Inv.
(7) RCA 6V6GT .....Output
(8) RCA 6V6GT .....Output
(9) RCA 5Y3GT .....Rectifier

Dial Lamps (2) .....Type No. 51, 6-8 volts, 0.2 amp.
Jewel Lamp .....Type No. 51, 6-8 volts, 0.2 amp.

Tuning Drive Ratio .....10:1 (5 turns of knob)

Power Supply Rating .....115 volts, 60 cycles, 110 watts

Loudspeaker (92569-12W)

Size and type .....12 in. PM
Voice coil impedance .....3.2 ohms at 400 cycles

Power Output

(Radio) Undistorted 8 watts .....Maximum 9 watts
(Phono.) Undistorted 10 watts .....Maximum 11 watts

Weight .....90 lbs.

Cabinet Dimensions

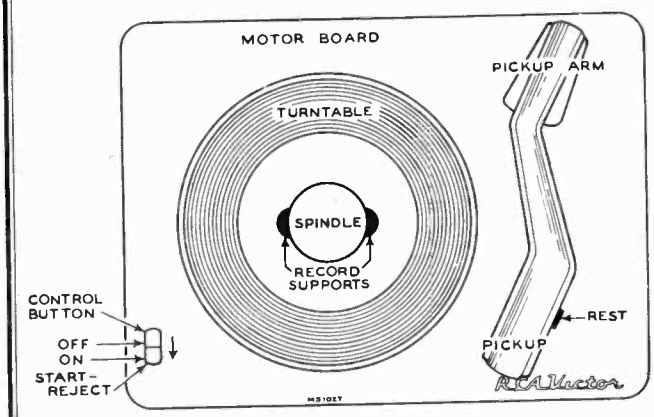
Height 32 in. Width 32 in. Depth 19¾ in.

Record Changer (RP 168 or RP 190-2)

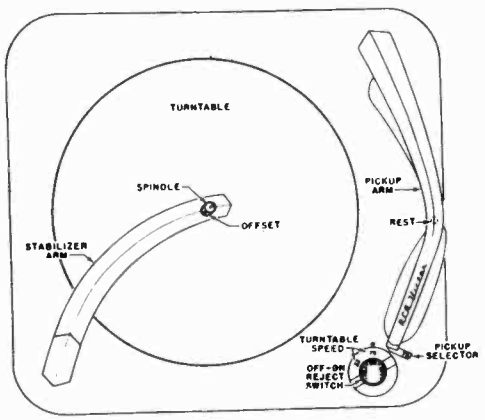
Turntable speed .....45 r.p.m.
Pickup {(RP 168—Stock No. 74625) (RP 190—Stock No. 75575)} .....Crystal

Record Changer (960284-1 or -2)

Turntable speed .....78 or 33⅓ r.p.m.
Pickup (Stock No. 75475) .....Crystal



Top View—RP190 Record Changer



Top View—960284 Record Changer

MODEL A-91,
Ch. RC-1095

ALIGNMENT PROCEDURE—CIRCUIT DESCRIPTION—LEAD DRESS

Alignment Procedure

CORRECT ALIGNMENT OF THE FM BAND REQUIRES THAT THE AM BAND BE ALIGNED FIRST

Alignment Indicators:

An RCA VoltOhmyst or equivalent meter is necessary for measuring developed d-c voltage during FM alignment. Connections are specified in the alignment tabulation. An output meter is also necessary to indicate minimum audio output during FM Ratio Detector alignment. Connect the output meter across the speaker voice coil.

The RCA VoltOhmyst can also be used as an AM alignment indicator, either to measure audio output or to measure a-v-c voltage.

When audio output is being measured the volume control should be turned to maximum.

Signal Generator:

For all alignment operations connect the low side of the signal generator to the receiver chassis. The output should be adjusted to provide accurate resonance indication at all times. If output measurement is used for AM alignment the output of the signal generator should be kept as low as possible to avoid a-v-c action.

Circuit Description

This instrument has a nine-tube (including rectifier) chassis which is very similar to those used in other RCA Victor radio-phonograph combinations designed for AM-FM reception.

The selector switch has five functions:

(1) Selection of tuning range.

(2) Selection and distribution of a.v.c. voltages.

(3) Application of B+ voltage to tubes V1, V2, and V3.

In "Phono 78/33" and "Phono 45" positions the B+ voltage is removed from tubes V1, V2 and V3.

(4) Selection of audio input applied to the volume control.

(5) Change in output tube bias.

In Radio positions R6 is in parallel with R42.

This receiver has built-in antennas for standard broadcast (AM) and frequency modulation (FM) reception.

Provision is made for the use of external antennas if desired.

Critical Lead Dress

Note: The leads listed may not be critical in all receivers. However, by dressing the leads as specified, unusual difficulties will be minimized.

1. The 2.2 meg mixer grid resistor (R10) should have a minimum practicable amount of lead extending on the grid end.
2. The first A.M. and first F.M. I.F. plate leads should be dressed away from the range switch wafer.
3. The ground strap between the R.F. shelf and the main chassis should be well soldered and kept as short as practicable.
4. Arrange wiring to prevent the filament wire between the mixer (6J6) and 1st I.F. (6BA6) tubes from passing near either the mixer grid, or the A.V.C. wiring.
5. Dress filament wires away from all audio coupling condensers.
6. Dress A.C. power switch wires away from the audio coupling condenser (C20) which is wired to the volume control.
7. Dress the mixer grid coupling condenser (C7) away from the lugs on the front range switch wafer.
8. The 1st I.F. tube A.V.C. by-pass condenser (C16) should ground at the same point as the cathode neutralizing loop.
9. The driver tube plate and screen by-pass condensers (C27, C28) should ground at the same point as the neutralizing loop.
10. The mixer plate by-pass condenser (C15) should ground as close to the R.F. shelf ground strap as practicable.
11. The shielded audio leads connecting to the front function switch wafer should have a minimum of exposed lead on the function switch end.

AM Alignment

FUNCTION SWITCH IN AM POSITION

Steps	Connect high side of sig. gen. to—	Sig. gen. output	Turn radio dial to—	Adjust for max. output
1	Stator of C1-4 in series with .01 mf.	455 kc.	Quiet point at low freq. end.	† Bottom (sec.) & top (pri.) cores of T4 † Top (sec.) & bottom (pri.) cores of T2
2	AM ant. terminal in series with 200 mmf.	1620 kc.	Extreme high freq. end.	C1-2 trimmer (osc.)
3		1400 kc.	1400 kc. signal	C1-4 trimmer (ant.)
4		600 kc.	600 kc. signal	L5 (osc.) Rock Gang
5	Repeat steps 2, 3 and 4			

† First peak T2 and T4 then starting with T4, use alternate loading. Connect a 47,000-ohm resistor across the primary to load the plate winding while the grid winding of the same transformer is being peaked. Then load the grid winding with the 47,000-ohm resistor while the plate winding is being peaked.

FM Alignment

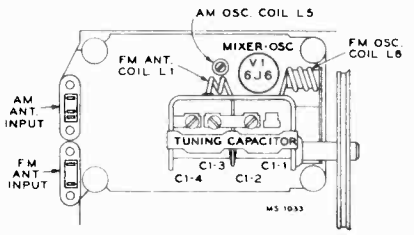
FUNCTION SWITCH IN FM POSITION—VOLUME CONTROL MAXIMUM

Steps	Connect high side of sig. gen. to—	Sig. gen. output	Turn radio dial to—	Adjust for max. output
1	Connect the d-c probe of a VoltOhmyst to the negative lead of the 2 mfd. capacitor C40 and the common lead to chassis. Adjust sig. gen. output to provide approx. —3 v. indication during alignment			
2	Pin #1 of 6 AU6 (V3) in series with .01 mf.	10.7 mc. AM modulated	—	Top of driver trans. T5 for max. d.c. voltage
3				† Bottom of driver trans. T5 for min. audio output
4	Repeat steps 2 and 3			
5	To FM antenna terminals thru 120 ohms in each side of line	10.7 mc.	low frequency end	* Top (sec.) and bottom (pri.) cores of T3 * Top (sec.) and bottom (pri.) cores of T1
6		90 mc.	90 mc.	** L8 (osc.)
7		106 mc.	106 mc.	C1-3 trimmer (ant.)
8		90 mc.	90 mc. signal	** L1 (ant.) Rock Gang
9	Repeat steps 7 and 8			

† Two or more points may be found which lower the audio output. At the correct point the minimum audio output is approached rapidly and is much lower than at any incorrect point.

* Align T3 and T1 by means of alternate loading as explained under AM alignment. Use a 680 ohm resistor instead of a 47,000 ohm resistor and load the FM windings.

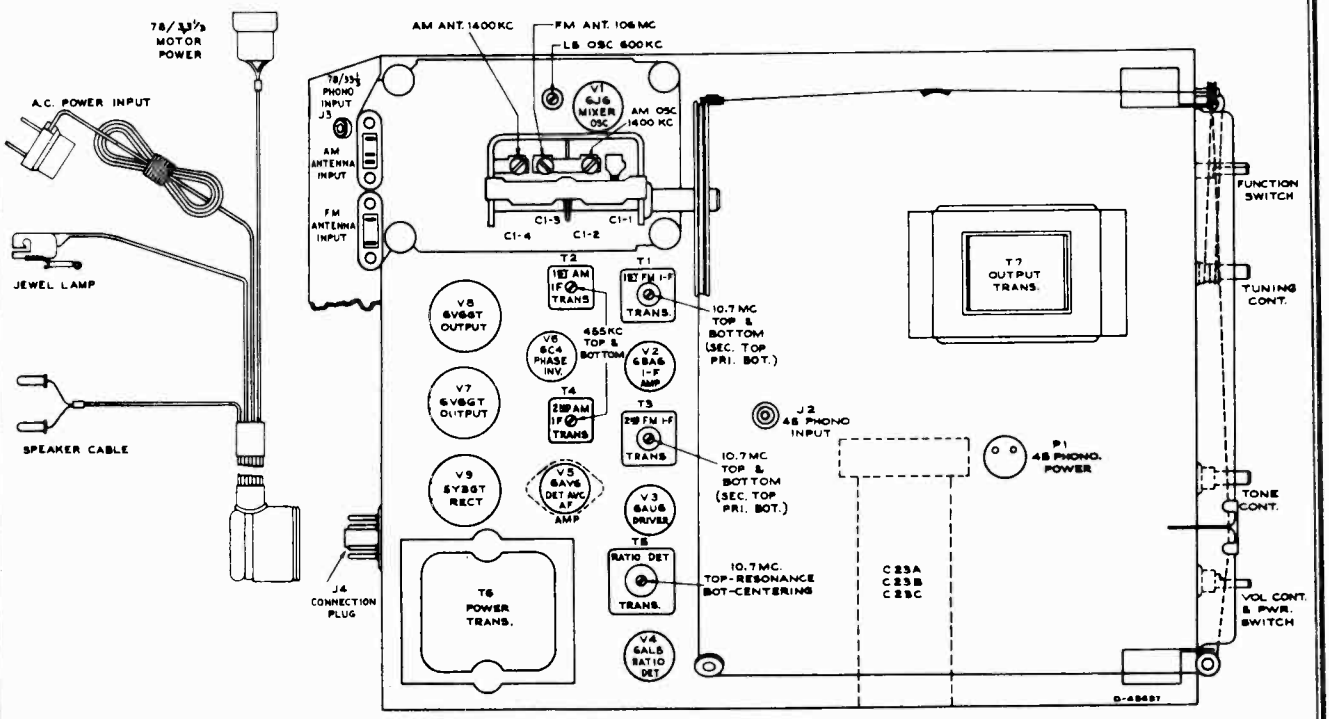
** L1 and L8 are adjustable by increasing or decreasing the spacing between turns.



F. M. Coil Locations

MODEL A-91,
Ch. RC-1095

TUBE AND TRIMMER LOCATIONS—VOLTAGE DATA

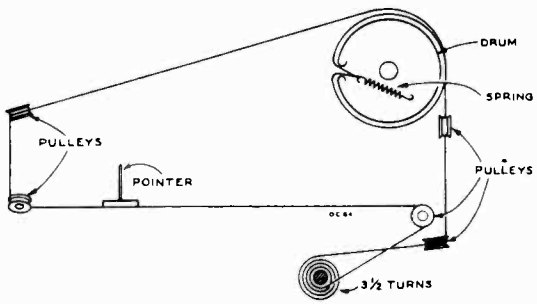


Tube and Trimmer Locations

Socket Voltages

Voltages measured to chassis with VoltOhmyst with no signal input and should hold within ±10% with 117-volt power supply.

Tube	Terminal	Voltage		
		Phono	A.M.	F.M.
V1 6J6 Mixer and Oscillator	Plate 2	—	58	53
	Grid 5	—	-1.5	-1.3
	Plate 1	—	35	29
	Grid 6	—	-2.2	-2.0
V2 6BA6 I.F. Amp.	Plate 5	—	197	193
	Screen 6	—	112	104
	Cathode 7	—	0.67	0.77
	Grid 1	—	-1.2	-0.35
V3 6AU6 Driver	Plate 5	—	193	189
	Screen 6	—	125	123
	Cathode 7	—	1.1	1.1
V4 6AL5 Ratio Det.	—— —	—	—	—
V5 6AV6 A.F. Amp.	Plate 7	112	95	95
	Grid 1	-0.7	-0.7	-0.7
V6 6C4 Ph. Inv.	Plate 1–5	125	90	90
	Cathode 7	-12.2	-11	-11
	Grid 6	-19.2	-15.6	-15.6
V7 6V6GT or V8 Output	Plate 3	305	295	295
	Screen 4	299	214	212
	Grid 5	-19.2	-15.4	-15.4
V9 5Y3GT Rectifier	Filament 2	314	301	301



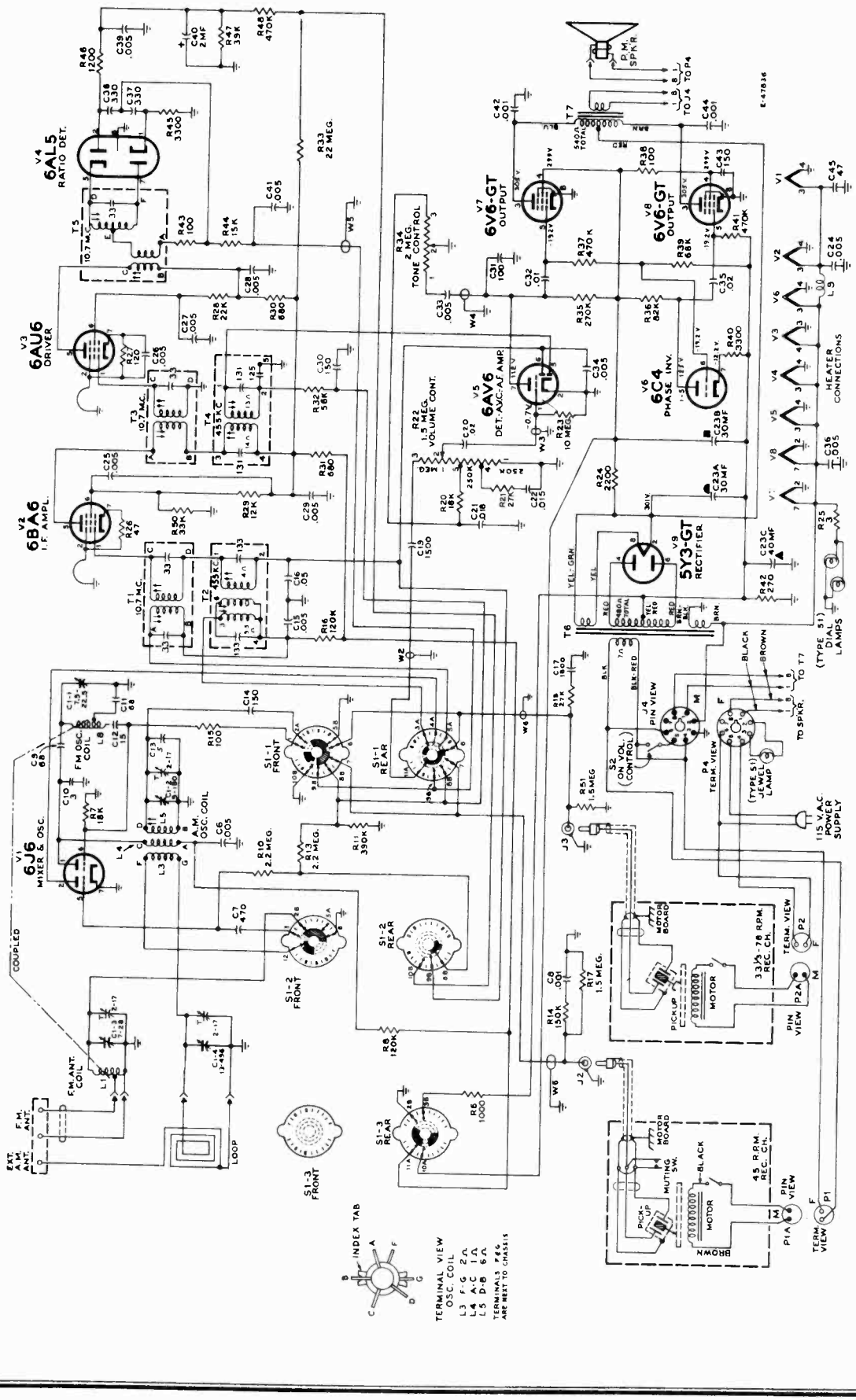
Dial Cord and Drive Assembly

Cathode Currents (Ma.)

Tube	Terminal	Phono	A.M.	F.M.
V1 6J6	7	—	2.8	2.8
V2 6BA6	7	—	16.6	16.5
V3 6AU6	7	—	9.4	9.3
V4 6AL5	1 & 5	—	—	—
V5 6AV6	2	0.8	0.5	0.5
V6 6C4	7	2.2	1.5	1.5
V7 6V6GT	8	35.6	18.6	18.5
V8 6V6GT	8	35.6	18.6	18.5
V9 5Y3GT	2	74.2	72.5	71.7

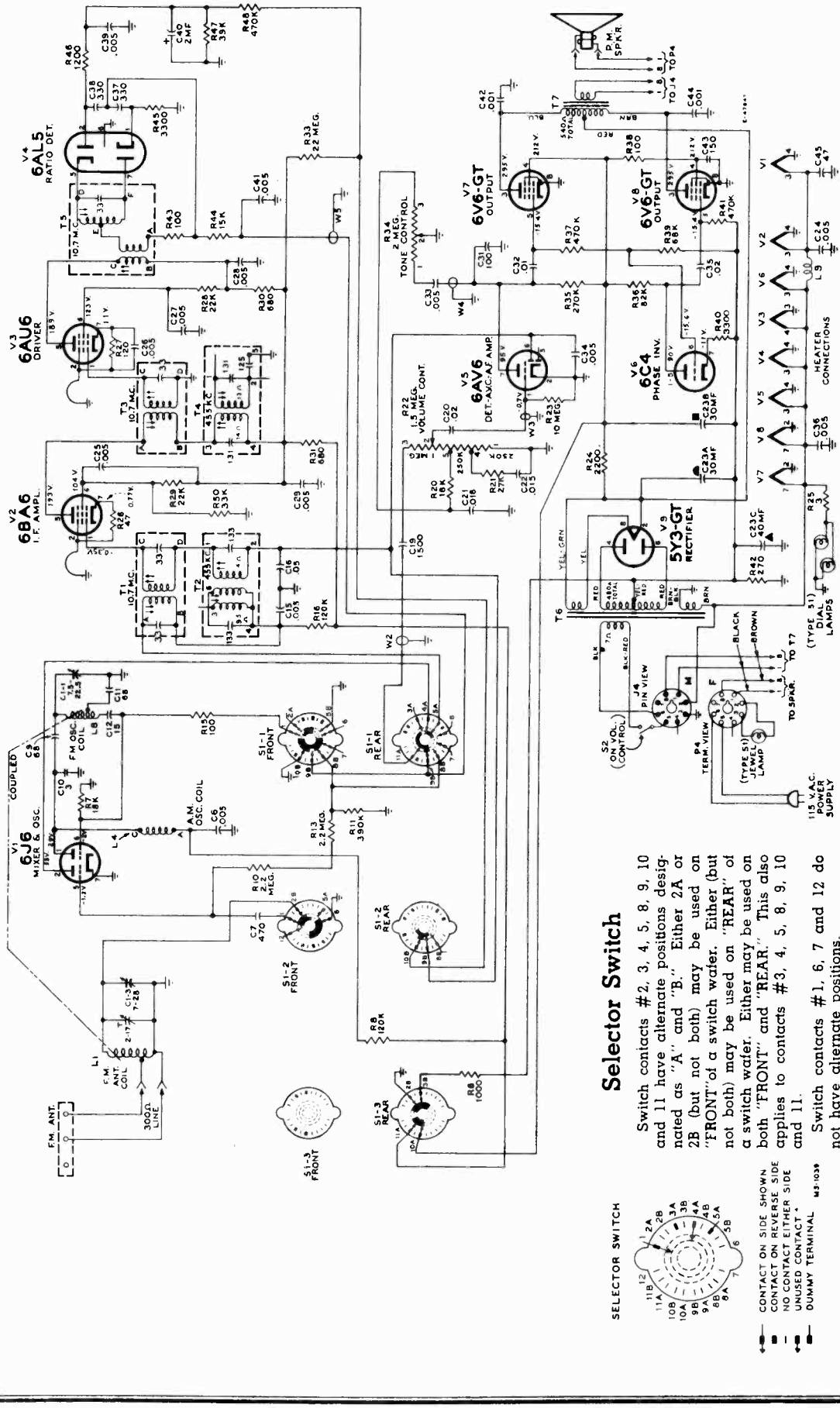
MODEL A-91,
Ch. RC-1095

COMPLETE SCHEMATIC DIAGRAM

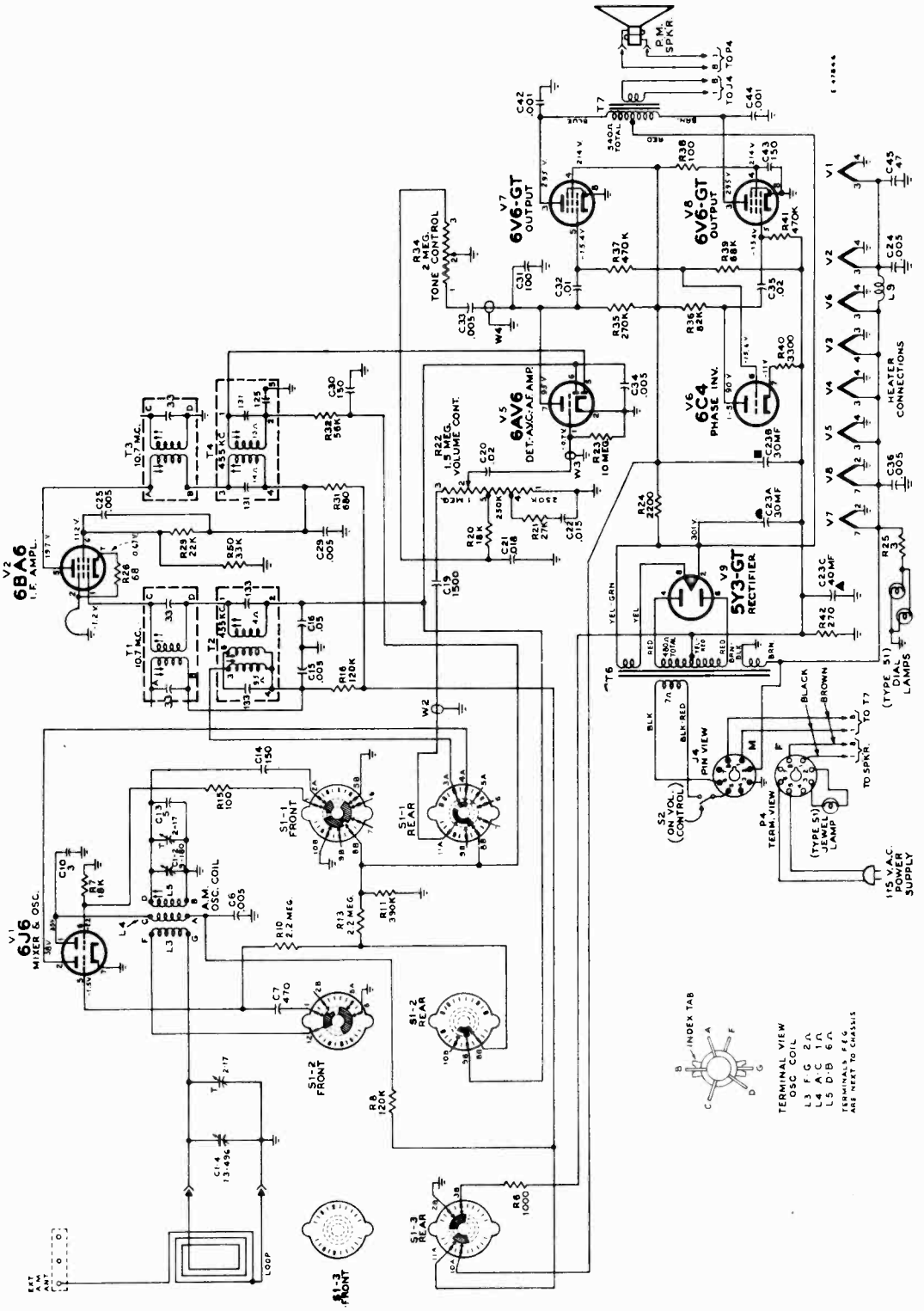


FUNCTION SWITCH VIEWED FROM FRONT AND SHOWN IN "PHONO 78/33" POSITION (MAX. C/CLOCKWISE)
VOLTAGES MEASURED TO CHASSIS WITH VOLTOHMYST AND NO SIGNAL INPUT AND SHOULD HOLD WITHIN ±20% WITH 117 VOLT POWER SUPPLY
RESISTANCE VALUES IN OHMS, K = 1000
CAPACITOR VALUES LESS THAN 1 ARE IN MF., VALUES GREATER THAN 1 ARE IN MMF. UNLESS OTHERWISE SPECIFIED

MODEL A-91,
Ch. RC-1095

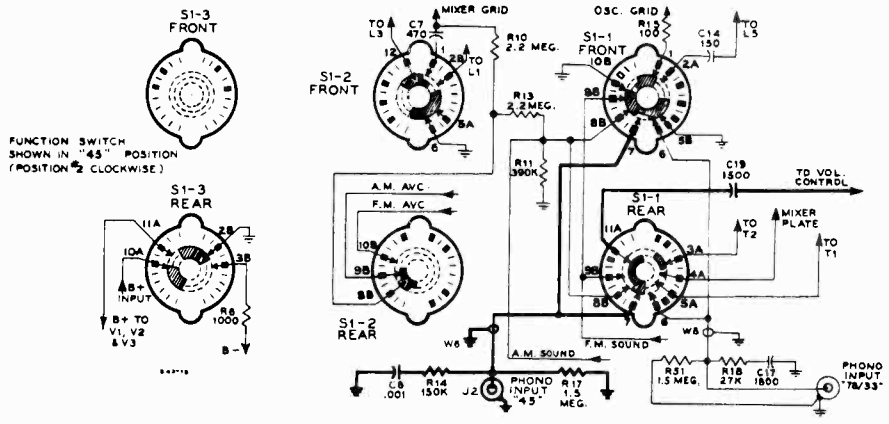


MODEL A-91,
Ch. RC-1095

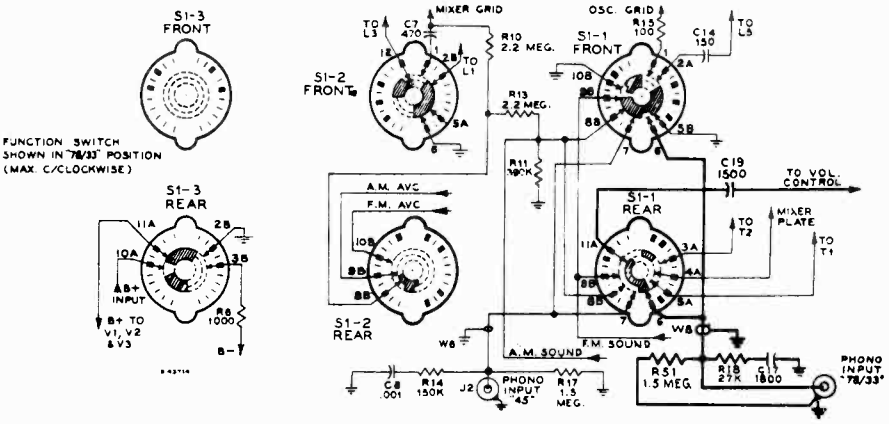


MODEL A-91,
Ch. RC-1095

PHONO SWITCH POSITIONS—MISC. SERVICE DATA



Switch Position Schematic Diagram—"Phono 45"



Switch Position Schematic Diagram—"Phono 78/33"

In "45" and "78/33" position the B+ supply voltage is disconnected in S1-3 which renders the mixer-oscillator, I. F. amplifier and driver tubes inoperative.

The bias resistor R6 (in parallel with R42 in AM and FM positions) is also disconnected in S1-3.

This results in higher grid, plate and screen voltages on the output tubes.

Record Changer Mounting

Each record changer is mounted in a roll-out carriage. The changer mechanisms are mounted on rubber grommets (45 r.p.m.) or springs (78/33 r.p.m.) and should be free floating.

Two shipping screws hold the 45 r.p.m. changer to its roll-out carriage. They are accessible from the under-side of the carriage and should be REMOVED at time of installation.

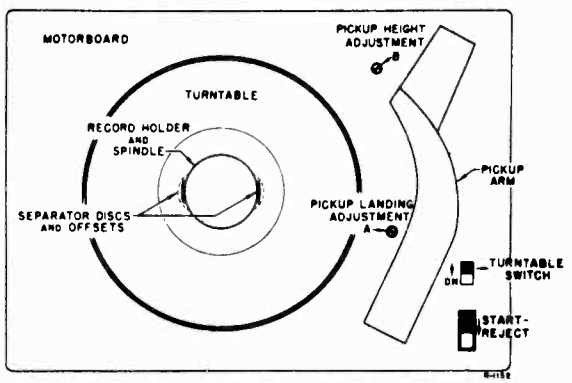
Two shipping screws hold the 78/33 r.p.m. changer to its roll-out carriage. They are accessible after the turntable is lifted off and should be LOOSENED at time of installation.

Roll-out Carriage Removal

Each roll-out carriage has two stop pins, (one at the back end of each slide) held in place by a retaining spring. To remove roll-out carriage, it is first necessary to pull the retaining springs out of the slides with a pair of long nose pliers, the stop pins are then easily removed. The roll-out carriage may then be removed from the front of the cabinet after disconnecting its connecting cables.

Roll-out Carriage Travel

The roll-out carriages have a normal movement limitation of approximately 10 inches. If a carriage does not have this amount of movement, it may be due to an obstruction or from slippage or creeping of the balls of the slide mechanism. Travel restriction due to slippage or creeping of balls in the slide mechanism can be corrected by exerting slightly greater pull until the normal travel limitation is reached. The carriage should then operate to its full travel with normal pull.



Top View—RP 168 Record Changer

Adjustments

1. PICKUP LANDING—Turn screw "A" slightly to right (clockwise) if landing is on music grooves, or to left if too near edge of record.

2. PICKUP HEIGHT—Turn screw "B" slightly to right (clockwise) if for change cycle pickup does not lift up from as many as ten records on turntable, or to left if when lifting, pickup hits records on spindle. Correct height is 3/4" from turntable to pickup point at maximum.

MODEL A-91,
Ch. RC-1095

Replacement Parts

STOCK NO.	DESCRIPTION
	CHASSIS ASSEMBLIES
	RC 1095
75599	Capacitor—Variable tuning capacitor complete with drive drum (C1-1, C1-2, C1-3, C1-4)
74733	Capacitor—Ceramic, 3 mmf. (C10)
75613	Capacitor—Ceramic, 5 mmf. (C13)
39044	Capacitor—Ceramic, 15 mmf. (C12)
75609	Capacitor—Ceramic, 47 mmf. (C45)
75612	Capacitor—Ceramic, 68 mmf. (C9, C11)
75437	Capacitor—Ceramic, 100 mmf. (C31)
75614	Capacitor—Ceramic, 150 mmf. (C14, C30, C43)
39640	Capacitor—Mica, 330 mmf. (C37, C38)
39644	Capacitor—Mica, 470 mmf. (C7)
75610	Capacitor—Ceramic, 1500 mmf. (C19)
74850	Capacitor—Ceramic, 1800 mmf. (C17)
73473	Capacitor—Ceramic, 5000 mmf. (C6, C15, C24, C25, C27, C28, C29, C34, C36)
73801	Capacitor—Tubular, paper, .001 mfd, 400 volts (C8)
70642	Capacitor—Tubular, paper, .001 mfd, 1000 volts (C42, C44)
71926	Capacitor—Tubular, paper, .005 mfd, 200 volts (C26, C39, C41)
73920	Capacitor—Tubular, paper, .005 mfd, 400 volts (C33)
71925	Capacitor—Tubular, paper, .01 mfd, 400 volts (C32)
58476	Capacitor—Tubular, paper, oil impregnated, .018 mfd, 400 volts (C21)
72120	Capacitor—Tubular, paper, .015 mfd, 200 volts (C22)
74010	Capacitor—Tubular, paper, .02 mfd, 400 volts (C20, C35)
73553	Capacitor—Tubular, paper, .05 mfd, 400 volts (C16)
73747	Capacitor—Electrolytic, 2 mfd, 500 volts (C40)
72052	Capacitor—Electrolytic, comprising 1 section of 30 mfd, 450 volts, 1 section of 30 mfd, 350 volts and 1 section of 40 mfd, 25 volts (C23A, C23B, C23C)
73935	Clip—Mounting clip for A-M, I-F transformers
75627	Clip—Clip for main cable—on rear of chassis
75569	Coil—Oscillator coil (A.M.) complete with adjustable screws
75617	Coil—Antenna coil—F-M (L1)
71942	Coil—Filament choke coil (L9)
74817	Coil—Oscillator coil—F-M (L8)
35787	Connector—Single contact female connector for pickup cables (J2, J3)
74879	Connector—2 contact female connector for antenna leads
75542	Connector—8 contact male connector for power input cable (J4)
75543	Connector—2 contact female connector for 45 RPM motor cable (P1)
70342	Control—Volume control and power switch (R22, S2)
75538	Control—Tone control (R34)
†72953	Cord—Drive cord (approx. 66" overall length required)
75564	Coupling—Spring coupling for function switch extension shaft
75556	Cover—Insulating cover for electrolytic capacitor #72052
74839	Fastener—Push fastener for mounting R-F shelf (4 required)
16058	Grommet—Rubber grommet for mounting R-F shelf (4 req'd)
75547	Grommet—Rubber grommet to mount slide mechanism to bottom—rear (2 req'd)
75548	Grommet—Rubber grommet to mount slide mechanism to bottom—front (2 req'd)
11765	Lamp—Dial lamp—Mazda #51
75544	Nut—Rivnut to fasten screw for mounting chassis (4 req'd)
18469	Plate—Bakelite mounting plate for electrolytic capacitor #72052
75535	Plate—Dial back plate complete with three (3) pulleys
75536	Pointer—Station selector pointer
72602	Pulley—Drive cord pulley
72323	Resistor—Wire wound, 3 ohms, ½ watt (R25)
73637	Resistor—Wire wound, 2200 ohms, 5 watts (R24)
	Resistor—Fixed, composition:—
	47 ohms, ±10%, ½ watt (R26)
	100 ohms, ±10%, ½ watt (R15, R38, R43)
	120 ohms, ±10%, ½ watt (R27)
	270 ohms, ±5%, 2 watts (R42)
	680 ohms, ±20%, ½ watt (R30)
	680 ohms, ±20%, 1 watt (R31)
	1000 ohms, ±10%, ½ watt (R6)
	1200 ohms, ±5%, ½ watt (R46)
	3300 ohms, ±5%, ½ watt (R40, R45)
	12,000 ohms, ±10%, 1 watt (R29)
	15,000 ohms, ±10%, ½ watt (R44)
	18,000 ohms, ±10%, ½ watt (R7, R20)
	22,000 ohms, ±10%, ½ watt (R28)
	27,000 ohms, ±10%, ½ watt (R18, R21)
	33,000 ohms, ±10%, ½ watt (R50)
	39,000 ohms, ±5%, ½ watt (R47)
	56,000 ohms, ±10%, ½ watt (R32)
	68,000 ohms, ±10%, ½ watt (R39)
	82,000 ohms, ±10%, ½ watt (R36)
	120,000 ohms, ±10%, ½ watt (R8, R16)
	150,000 ohms, ±10%, ½ watt (R14)
	270,000 ohms, ±10%, ½ watt (R35)
	390,000 ohms, ±10%, ½ watt (R11)
	470,000 ohms, ±10%, ½ watt (R37, R41, R48)
	1.5 megohm, ±10%, ½ watt (R17, R51)
	2.2 megohm, ±20%, ½ watt (R10, R13)
	10 megohm, ±20%, ½ watt (R23)
	22 megohm, ±20%, ½ watt (R33)
75540	Shaft—Tuning knob shaft
75565	Shaft—Extension shaft for function switch
73584	Shield—Tube shield for V5
75546	Slide—Slide mechanism complete for radio chassis bottom
31251	Socket—Tube socket, octal, wafer
73117	Socket—Tube socket, 7 pin, miniature
74179	Socket—Tube socket, 7 pin, miniature for 6J6 tube only
31364	Socket—Dial lamp socket
75563	Spring—Retaining spring for function switch extension shaft
74038	Spring—Drive cord spring
74847	Support—Polystyrene support for F-M oscillator coil complete with mounting bracket
75600	Switch—Function switch (S1-1, S1-2, S1-3)
75557	Transformer—Output transformer (T7)
73743	Transformer—Radio detector transformer (T5)
75558	Transformer—First I-F transformer (A-M) complete with adjustable cores (T2)
73037	Transformer—Second I-F transformer (A-M) complete with adjustable cores (T4)
75559	Transformer—First I-F transformer (F-M) complete with adjustable cores (T1)
75560	Transformer—Second I-F transformer (F-M) complete with adjustable cores (T3)
75566	Transformer—Power transformer, 117 volt, 60 cycle (T6)
33726	Washer—"C" washer for tuning knob shaft
	RADIO ROLLOUT CARRIAGE
75601	Decal—Function decal for controls
75572	Dial—Polystyrene dial scale
75549	Frame—Moulded frame (maroon) for mounting radio chassis and 45 RPM record changer—for mahogany or walnut instruments
75683	Frame—Moulded frame (light brown) for mounting radio chassis and 45 RPM record changer—for oak instruments
75551	Handle—Metal pullout handle for mounting frame
75555	Screw—#8-32 x ⅝" cross recessed pan head machine screw to mount radio chassis (4 req'd)
	SPEAKER ASSEMBLY
	Stamped 92569-12W
	RMA 274
	RL 111-A1
13867	Cap—Dust cap
75682	Cone—Cone and voice coil assembly (3.2 ohms)
75681	Speaker—12" P.M. speaker complete with cone and voice coil (3.2 ohms)
	NOTE: If stamping on speaker does not agree with above number, order replacement parts by referring to model number of instrument, number stamped on speaker and full description of part required.
	MISCELLANEOUS
71864	Antenna—F-M antenna
75705	Antenna—Antenna loop complete less cable
75898	Back—Back cover—maroon—for 33⅓/78 RPM record changer compartment—for mahogany or walnut instruments (assembled to rollout)
75899	Back—Back cover—light brown—for 33⅓/78 RPM record changer compartment—for oak instruments (assembled to rollout)
75900	Back—Back cover—Maroon—for radio—45 RPM record changer compartment—for mahogany or walnut instruments (assembled to rollout)
75901	Back—Back cover—light brown—for radio—45 RPM record changer compartment—for oak instruments (assembled to rollout)
73680	Board—"A-F-N" terminal board
75694	Bracket—Step bracket less rubber bumper for record changer rollouts
71599	Bracket—Pilot lamp bracket
75696	Bumper—Rubber bumper for record changer rollout stop bracket
74296	Cable—Shielded pickup cable complete with pin plug for 33⅓/78 RPM record changer
72437	Cable—Shielded pickup cable complete with pin plug for 45 RPM record changer
13103	Cap—Pilot lamp cap
71892	Catch—Bullet catch and strike for cabinet doors
X3093	Cloth—Grille cloth for oak instruments
X3189	Cloth—Grille cloth for mahogany or walnut instruments
74882	Connector—2 contact (polarized) male connector for antenna loop cable
74752	Connector—2 contact male connector for FM antenna cable
75709	Connector—8 contact female connector for main cable
75474	Connector—Single contact male connector for speaker (2 req'd)
30868	Connector—2 contact female connector for 33⅓/78 RPM record changer motor leads
74273	Decal—Trade mark decal (Victrola)
71984	Decal—Trade mark decal (RCA Victor)
74838	Grommet—Power cord strain relief (1 set)
37396	Grommet—Rubber grommet for mounting speaker
75697	Grommet—Rubber grommet for mounting 45 RPM record changer
75551	Handle—Metal pullout handle for 33⅓/78 RPM record changer compartment
74308	Hinge—Cabinet door hinge (1 set)
75712	Knob—Tuning control, tone control or volume control and power switch knob—maroon—for mahogany or walnut instruments
75713	Knob—Tuning control, tone control or volume control and power switch knob—for oak instruments
75714	Knob—Function switch knob—maroon—for mahogany or walnut instruments
75715	Knob—Function switch knob—tan—for oak instruments
11765	Lamp—Pilot lamp—Mazda #51
75917	Nail—Rosette head nail for grille (3 req'd)
75884	Nut—Speed nut for 33⅓/78 RPM record changer mounting screw
73634	Nut—Speed nut for speaker mounting screws
75916	Pull—Door pull
75907	Screw—#10-32 x 5¼" cross recessed round head special screw for mounting 45 RPM frame
75883	Screw—#10-24 x 2¼" round head machine screw for mounting 33⅓/78 RPM record changer
74279	Screw—#8-32 x ⅞" trimit head screw for door pull
75708	Shell—Shell for 8 contact female connector #75709
75546	Slide—Slide mechanism for 33⅓/78 RPM record mounting frame
31364	Socket—Pilot lamp socket and lead
74734	Spring—Retaining spring for knobs
75902	Spring—Suspension spring for main cable
72936	Stop—Cabinet door stop

† Stock No. 72953 is a reel containing 250 feet of cord.

MODEL A-108,
Ch. RC-1096

FOR RECORD CHANGER SERVICE INFORMATION REFER TO RP-168 SERIES SERVICE DATA OR RP-190 SERIES SERVICE DATA FOR 45 R.P.M. AND MODEL 960284 SERVICE DATA FOR 78/33⅓ R.P.M. on Pages RCD.CH.19-1, RCD.CH.21-1, and RCD.CH.21-34 respectively.

Specifications

Tuning Range

Standard Broadcast (AM) ..... 540-1,600 kc.
Frequency Modulation (FM) ..... 88-108 mc.
Intermediate Frequencies ..... AM—455 kc., FM—10.7 mc.

Tube Complement

(1) RCA 6CB6..... R-F Amplifier
(2) RCA 6J6..... Mixer and Oscillator
(3) RCA 6BA6..... I-F Amplifier
(4) RCA 6AU6..... Driver
(5) RCA 6AL5..... Ratio Detector
(6) RCA 6AV6..... AM Det.—AVC—A-F Amplifier
(7) RCA 6C4..... Ph. Inv.
(8) RCA 6V6GT..... Output
(9) RCA 6V6GT..... Output
(10) RCA 5Y3GT..... Rectifier

Dial Lamps (2).....Type No. 51, 6-8 volts, 0.2 amp.
Jewel Lamp .....Type No. 51, 6-8 volts, 0.2 amp.

Tuning Drive Ratio .....10:1 (5 turns of knob)
Power Supply Rating ..... 115 volts, 60 cycles, 115 watts

Loudspeaker (92569-12W)

Size and type ..... 12 in. PM
Voice coil impedance ..... 3.2 ohms at 400 cycles

Power Output

(Radio) Undistorted 8 watts.....Maximum 9 watts
(Phono.) Undistorted 10 watts..... Maximum 11 watts

Weight .....97 lbs.

Cabinet Dimensions

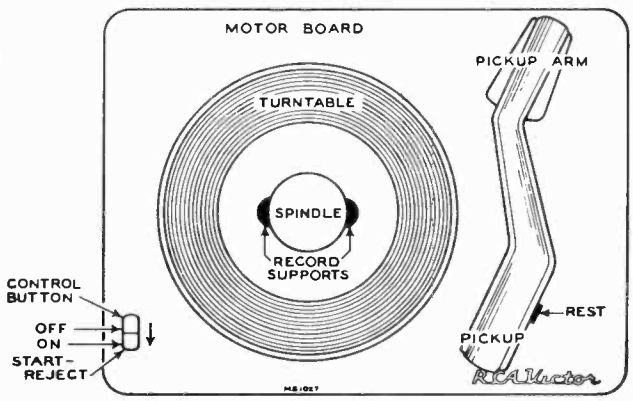
Height 32⅛ in. Width 34½ in. Depth 19¾ in.

Record Changer (RP-168 or RP-190-2)

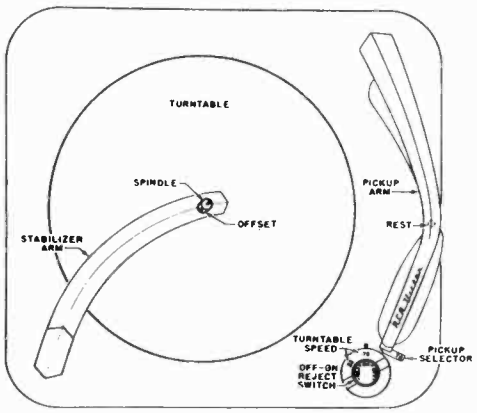
Turntable speed ..... 45 r.p.m.
Pickup (RP-168—Stock No. 74625) (RP-190—Stock No. 75575) .....Crystal

Record Changer 960284-1 or -2)

Turntable speed .....78 or 33⅓ r.p.m.
Pickup (Stock No. 75475) ..... Crystal



Top View—RP-190 Record Changer



Top View—960284 Record Changer

MODEL A-108,
Ch. RC-1096

ALIGNMENT PROCEDURE—CIRCUIT DESCRIPTION—LEAD DRESS

Alignment Procedure

CORRECT ALIGNMENT OF THE FM BAND REQUIRES THAT THE AM BAND BE ALIGNED FIRST

Alignment Indicators:

An RCA VoltOhmyst or equivalent meter is necessary for measuring developed d-c voltage during FM alignment. Connections are specified in the alignment tabulation. An output meter is also necessary to indicate minimum audio output during FM Ratio Detector alignment. Connect the output meter across the speaker voice coil.

The RCA VoltOhmyst can also be used as an AM alignment indicator, either to measure audio output or to measure a-v-c voltage.

When audio output is being measured the volume control should be turned to maximum.

Signal Generator:

For all alignment operations connect the low side of the signal generator to the receiver chassis. The output should be adjusted to provide accurate resonance indication at all times. If output measurement is used for AM alignment the output of the signal generator should be kept as low as possible to avoid a-v-c action.

Circuit Description

This instrument has a ten-tube (including rectifier) chassis which is very similar to those used in other RCA Victor radio-phonograph combinations designed for AM-FM reception.

The selector switch has five functions:

(1) Selection of tuning range.

(2) Selection and distribution of a.v.c. voltages.

(3) Application of B+ voltage to tubes.

In "Phono 78/33" and "Phono 45" positions the B+ voltage is removed from tubes V1, V2, V3 and V4.

(4) Selection of audio input applied to the volume control.

(5) Change in output tube bias.

In Radio positions R6 is in parallel with R42.

This receiver has built-in antennas for standard broadcast (AM) and frequency modulation (FM) reception.

Provision is made for the use of external antennas if desired.

Critical Lead Dress

Note: The leads listed may not be critical in all receivers. However, by dressing the leads as specified, unusual difficulties will be minimized.

1. The 2.2 meg mixer grid resistor (R10) should have a minimum practicable amount of lead extending on the grid end.
2. The first A.M. and first F.M. I.F. plate leads should be dressed away from the range switch wafer.
3. The ground strap between the R.F. shelf and the main chassis should be well soldered and kept as short as practicable.
4. Arrange wiring to prevent the filament wire between the mixer (6J6) and 1st I.F. (6BA6) tubes from passing near either the mixer grid, or the A.V.C. wiring.
5. Dress filament wires away from all audio coupling condensers.
6. Dress A.C. power switch wires away from the audio coupling condenser (C20) which is wired to the volume control.
7. Dress the mixer grid coupling condenser (C7) away from the lugs on the front range switch wafer.
8. The 1st I.F. tube A.V.C. by-pass condenser (C16) should ground at the same point as the cathode neutralizing loop.
9. The driver tube plate and screen by-pass condensers (C27, C28) should ground at the same point as the neutralizing loop.
10. The mixer plate by-pass condenser (C15) should ground as close to the R.F. shelf ground strap as practicable.
11. The shielded audio leads connecting to the front function switch wafer should have a minimum of exposed lead on the function switch end.

AM Alignment

FUNCTION SWITCH IN AM POSITION

Steps	Connect high side of sig. gen. to—	Sig. gen. output	Turn radio dial to—	Adjust for max. output
1	Stator of C1-4	455 KC	Quiet point at low freq. end.	† Bottom (sec.) & top (pri.) cores of T4 † Top (sec.) & bottom (pri.) cores of T2
2	AM ant. terminal thru 200 mmf.	1620 KC	Extreme high frequency end.	C1-2 trimmer (osc.)
3		1400 KC	1400 KC Signal	C1-4 trimmer (r. f.) C1-5 trimmer (ant.)
4		600 KC	600 KC Signal	‡ L5 (osc.) L7 (r. f.)
5	Repeat steps 2, 3 and 4			

† First peak T2 and T4 then starting with T4, use alternate loading. Connect a 47,000-ohm resistor across the primary to load the plate winding while the grid winding of the same transformer is being peaked. Then load the grid winding with the 47,000-ohm resistor while the plate winding is being peaked.

‡ With a 10,000-ohm resistor shunted across C1-4, peak the oscillator core L5, simultaneously "rocking" the gang condenser for maximum output. Then, remove the 10,000-ohm shunt resistor and peak L7 for maximum output.

FM Alignment

FUNCTION SWITCH IN FM POSITION—VOLUME CONTROL MAXIMUM

Steps	Connect high side of sig. gen. to—	Sig. gen. output	Turn radio dial to—	Adjust for max. output
1	Connect the d-c probe of a VoltOhmyst to the negative lead of the 2 mfd. capacitor C40 and the common lead to chassis. Adjust sig. gen. output to provide approx. —3 v. indication during alignment.			
2	Pin #1 of 6AU6 (V4) in series with .01 mf.	10.7 mc AM modulated	—	Top of driver trans. T5 for max. d-c voltage
3				† Bottom of driver trans. T5 for min. audio output
4	Repeat steps 2 and 3			
5	Thru 470 ohms to C1-3. Connect gnd. end of cable close to V2 cathode ground on r-f shelf	10.7 mc	88 mc	* Top (sec.) & bottom (pri.) cores of T3 * Top (sec.) & bottom (pri.) cores of T3
6	To FM antenna terminals thru 120 ohms in each side of line	90 mc	90 mc	L8 (osc.)
7		106 mc	106 mc Signal	C1-6 trimmer (ant.) and C1-3 trimmer (r. f.)
8		90 mc	90 mc Signal	L1 (ant.) and L2 (r. f.)
9	Repeat steps 6, 7 and 8			
10	Connect a sweep generator to the antenna terminals thru 120 ohms in each side of line. Connect an oscilloscope to junction of R44 and C41 to check response and linearity of FM band. Peak to peak separation should not be less than 180 kc.			

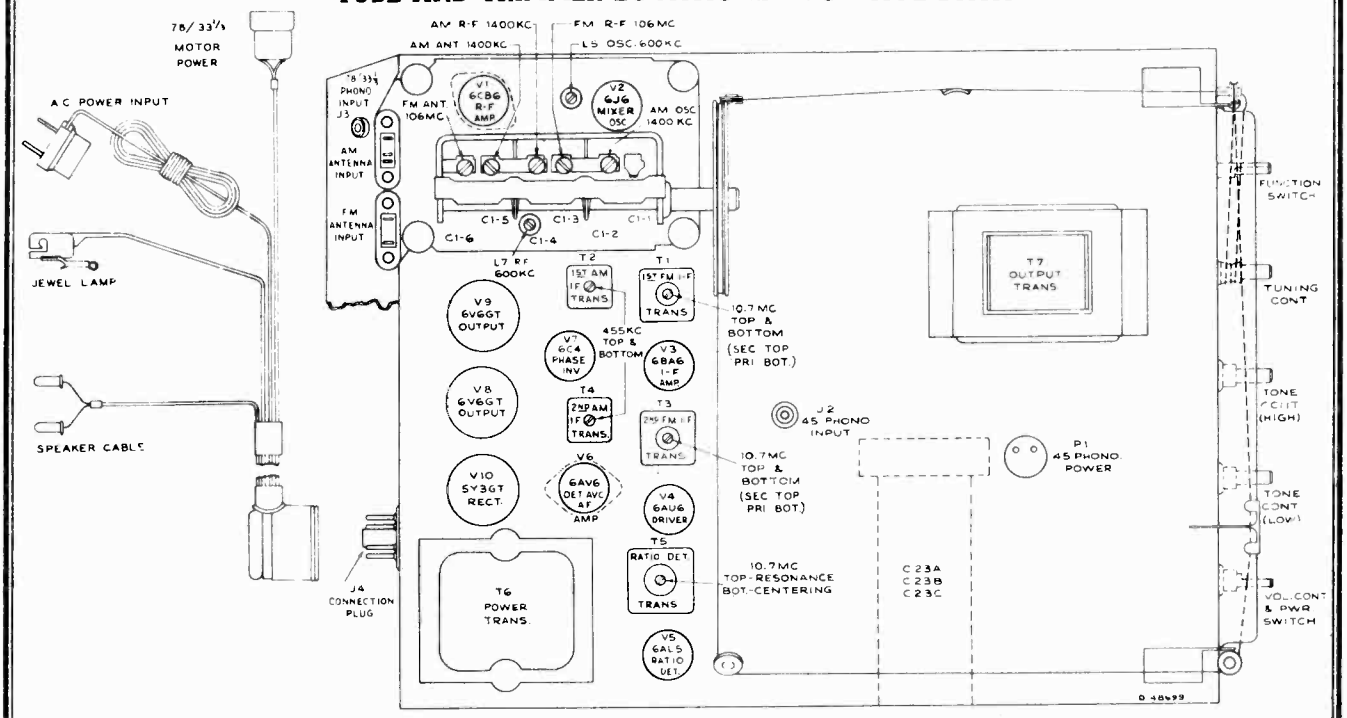
† Two or more points may be found which lower the audio output. At the correct point the minimum audio output is approached rapidly and is much lower than at any incorrect point.

* Use a 680 ohm resistor to load the plate winding while the grid winding of the same trans. is being peaked. Then the grid winding is loaded with the 680 ohm resistor while the plate winding is being peaked. When windings are loaded, it is necessary to increase the 10.7 mc input to maintain the —3 volts indication.

L8, L1 and L2 are adjustable by increasing or decreasing the spacing between turns. Oscillator signal tracks above signal frequency.

MODEL A-108,
Ch. RC-1096

TUBE AND TRIMMER LOCATIONS—VOLTAGE DATA

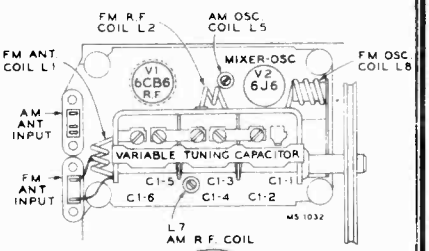


Tube and Trimmer Locations

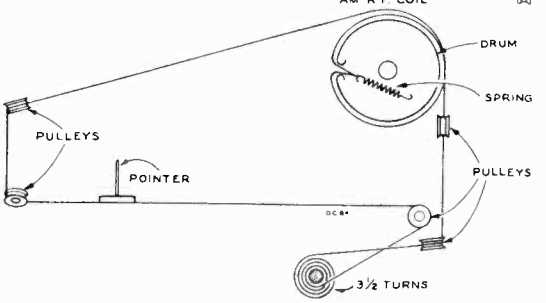
Socket Voltages

Voltages measured with Chanalyst or VoltOhmyst and should hold within ±20% with rated line voltage. Tuning condenser closed—no signal input.

Tube	Terminal	Voltage		
		Phono	A.M.	F.M.
V1 6CB6 R.F. Amp.	Plate 5	—	203	132
	Screen 6	—	48	39
	Cathode 2	—	0.2	0.2
	Grid 1	—	−1.1	−0.9
V2 6J6 Mixer and Osc.	Plate 2	—	55	51
	Grid 5	—	−1.4	−1.2
	Plate 1	—	33	27
	Grid 6	—	−2.1	−1.9
V3 6BA6 I.F. Amp.	Plate 5	—	192	188
	Screen 6	—	106	101
	Cathode 7	—	0.9	
	Grid 1	—	−1.1	−0.35
V4 6AU6 Driver	Plate 5	—	186	180
	Screen 6	—	122	120
	Cathode 7	—	1.05	1.07
V5 6AL5 Ratio Det.	—— ——	—	—	—
V6 6AV6 A.F. Amp.	Plate 7	112	94	94
	Grid 1	−0.7	−0.7	−0.7
V7 6C4 Ph. Inverter	Plate 1–5	125	87	85
	Grid 6	−19.2	−16	−16
	Cathode 7	−11.1	−11.4	−11.4
V8 6V6GT or Output V9	Plate 3	305	295	298
	Screen 4	299	208	204
	Grid 5	−19.2	−16	−16
V10 5Y36T Rectifier	Filament 2	314	313	313



F. M. Coil Locations



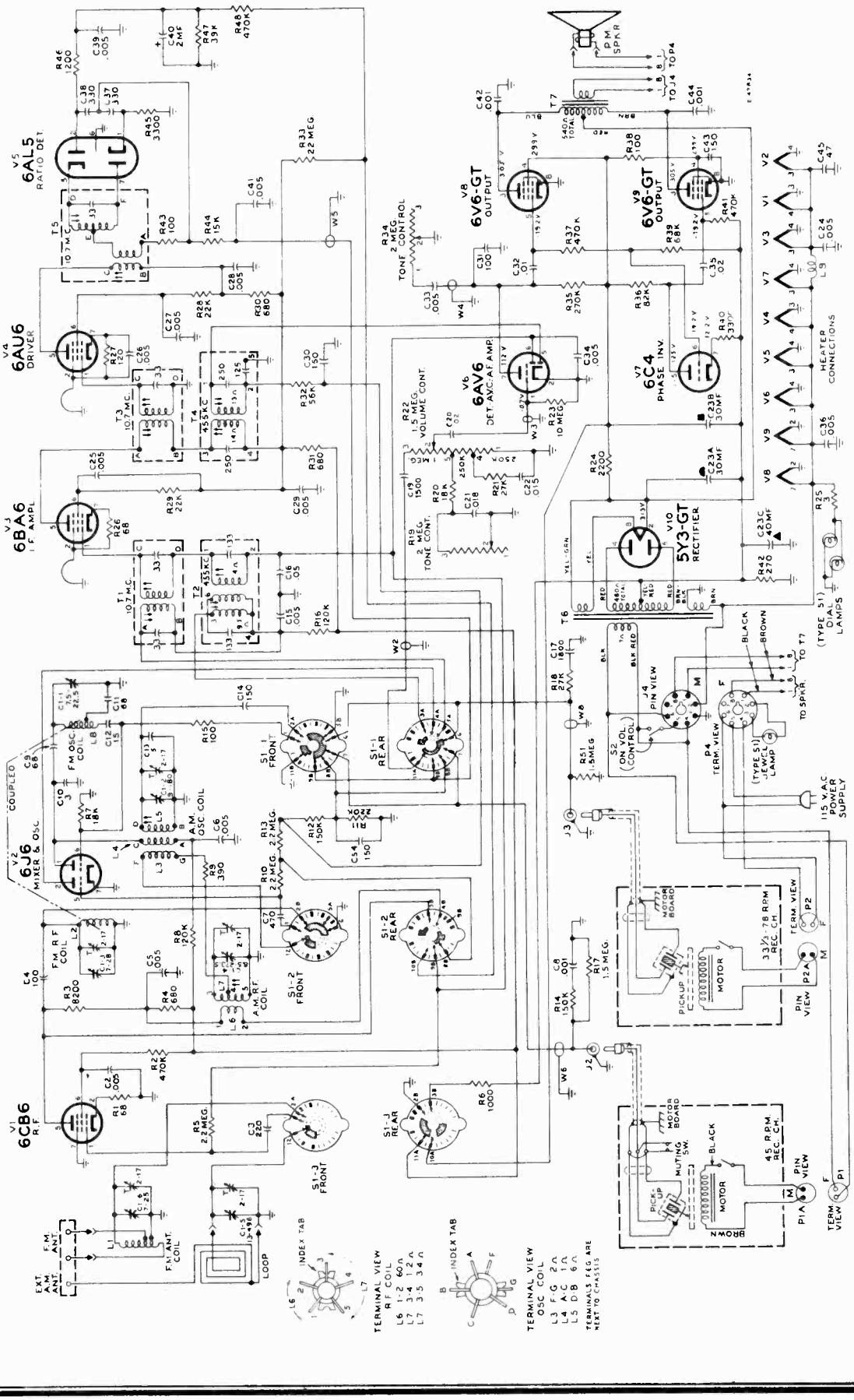
Dial Cord and Drive Assembly

Cathode Currents (Ma.)

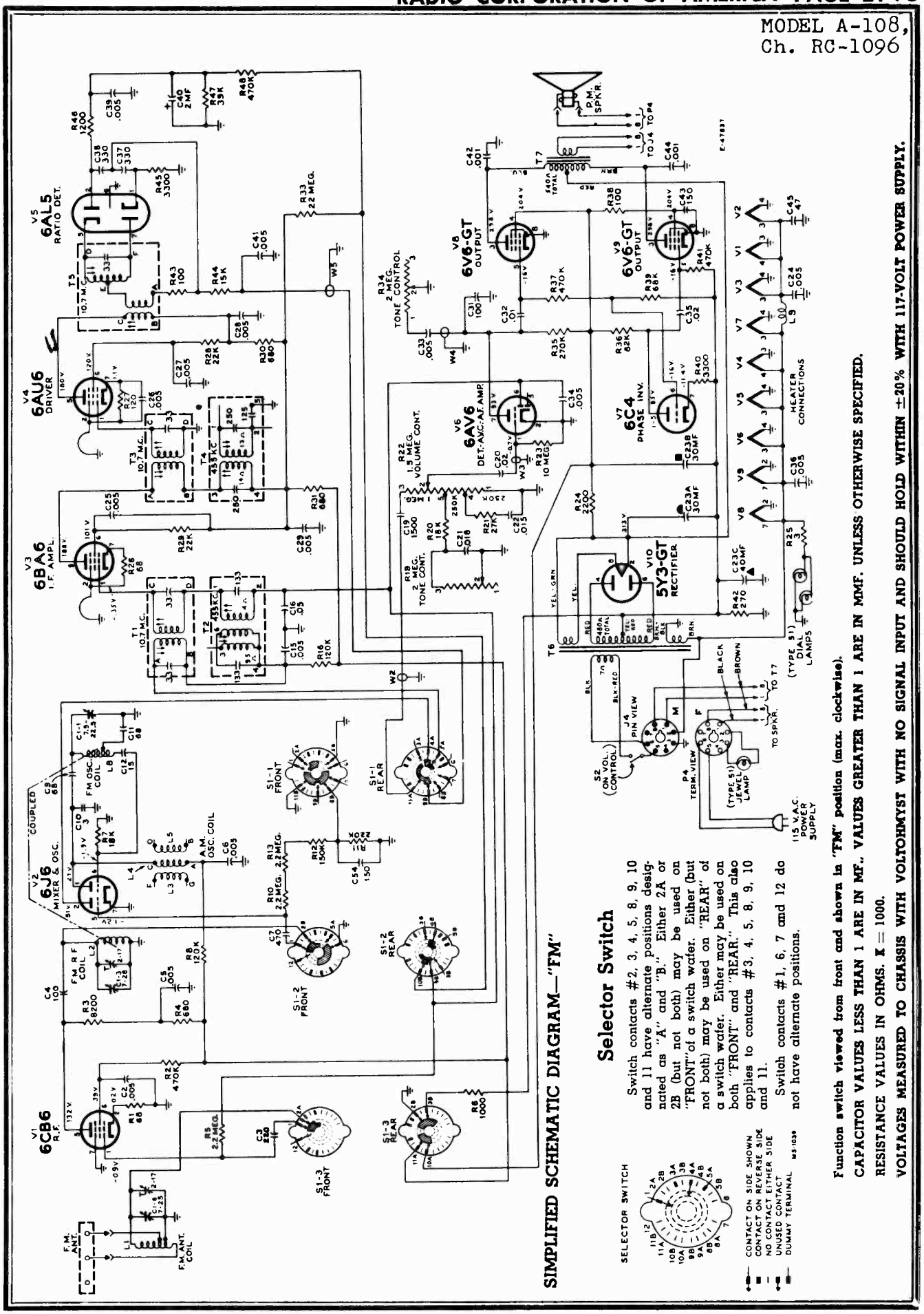
Tube	Terminal	Phono	A.M.	F.M.
V1 6CB6	2	—	3	3
V2 6J6	7	—	2.6	2.6
V3 6BA6	7	—	13.2	14.7
V4 6AU6	7	—	9.3	9
V5 6AL5	1 & 5	—	—	—
V6 6AV6	2	0.8	0.5	0.5
V7 6C4	7	2.2	1.5	1.5
V8 6V6GT	8	35.6	17.8	17.7
V9 6V6GT	8	35.6	17.8	17.7
10 5Y3GT	2	74.2	73.6	74.2

MODEL A-108,
Ch. RC-1096

COMPLETE SCHEMATIC DIAGRAM



MODEL A-108,
Ch. RC-1096



Selector Switch

Switch contacts #2, 3, 4, 5, 8, 9, 10 and 11 have alternate positions designated as "A" and "B." Either 2A or 2B (but not both) may be used on "FRONT" of a switch water. Either (but not both) may be used on "REAR" of a switch water. Either may be used on both "FRONT" and "REAR." This also applies to contacts #3, 4, 5, 8, 9, 10 and 11.

Switch contacts #1, 6, 7 and 12 do not have alternate positions.

Function switch viewed from front and shown in "FM" position (max. clockwise).

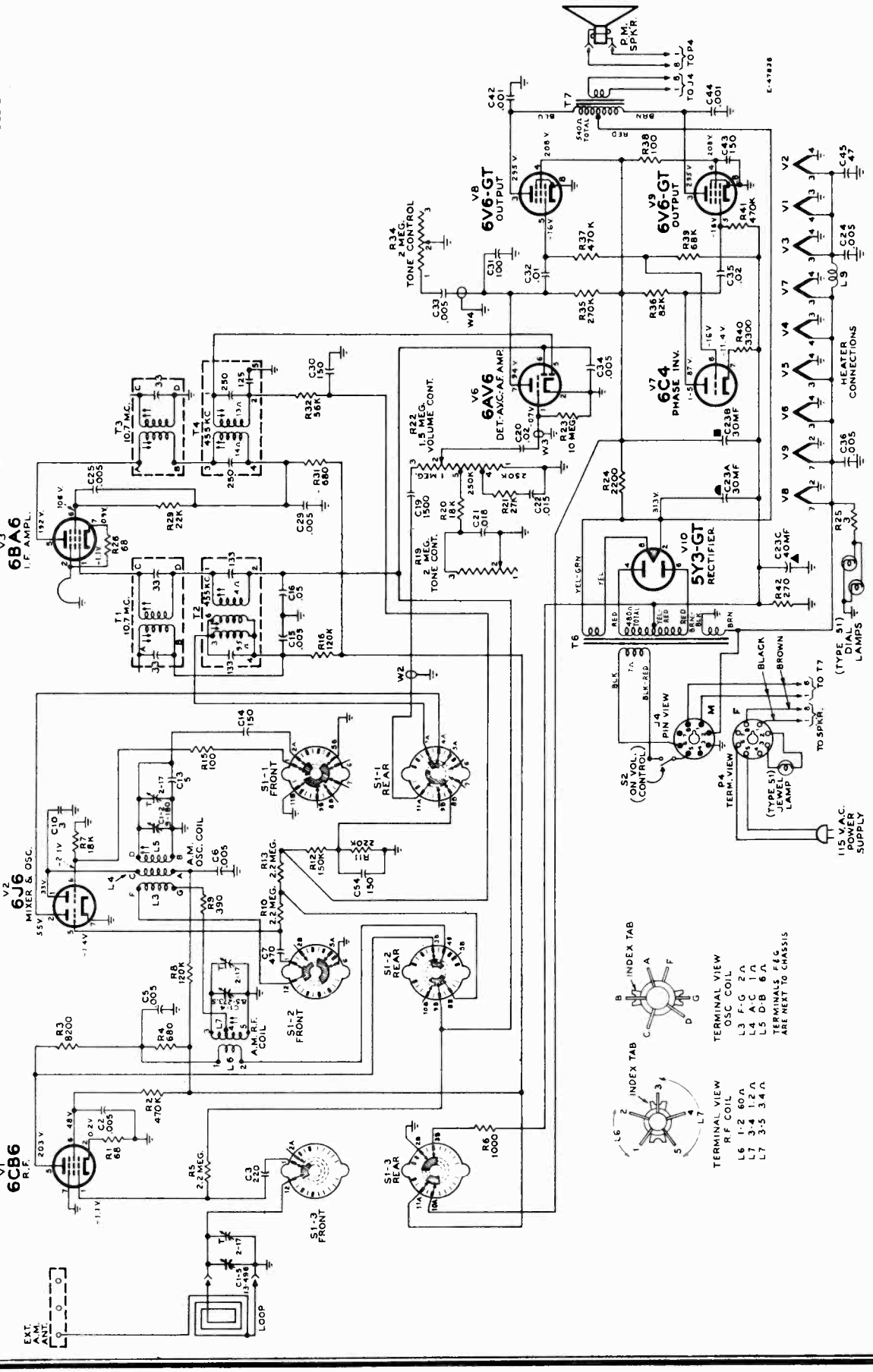
CAPACITOR VALUES LESS THAN 1 ARE IN MF., VALUES GREATER THAN 1 ARE IN MMF. UNLESS OTHERWISE SPECIFIED.

RESISTANCE VALUES IN OHMS. K = 1000.

VOLTAGES MEASURED TO CHASSIS WITH VOLTOHMYST WITH NO SIGNAL INPUT AND SHOULD HOLD WITHIN ±20% WITH 117-VOLT POWER SUPPLY.

MODEL A-108,
Ch. RC-1096

SIMPLIFIED SCHEMATIC DIAGRAM—"AM"



Function switch viewed from front and shown in "AM" position (#3 clockwise).

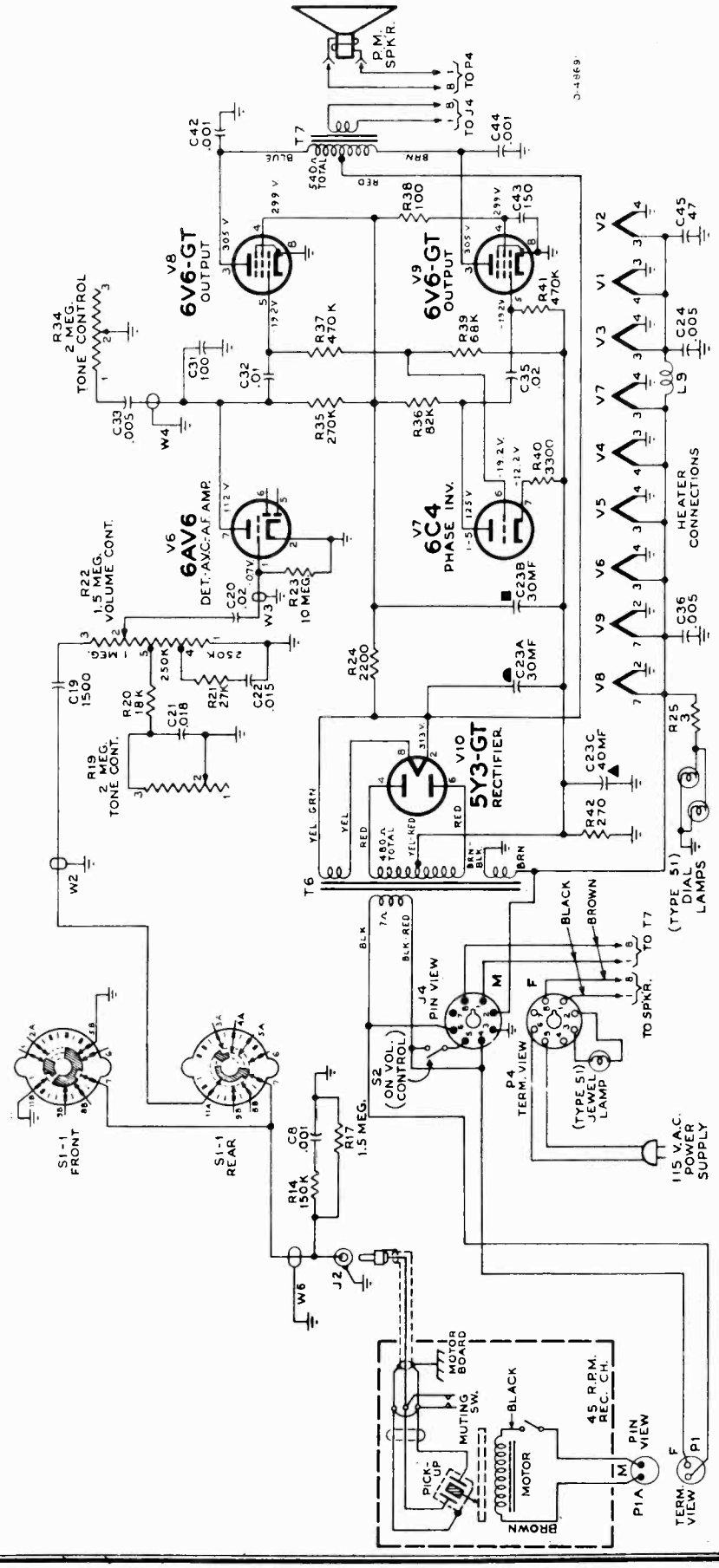
CAPACITOR VALUES LESS THAN 1 ARE IN MF.. VALUES GREATER THAN 1 ARE IN MMF. UNLESS OTHERWISE SPECIFIED.

RESISTANCE VALUES IN OHMS. K = 1000.

VOLTAGES MEASURED TO CHASSIS WITH VOLTOHMYST WITH NO SIGNAL INPUT AND SHOULD HOLD WITHIN ±20% WITH 117-VOLT POWER SUPPLY.

MODEL A-108,
Ch. RC-1096

SIMPLIFIED SCHEMATIC DIAGRAM—"45"



Note:

When the function switch is in "Phono 45" or "Phono 78/33" position the B+ supply voltage to tubes V1, V2, V3 and V4 is disconnected at switch section S1-3 rear. This results in higher plate and screen voltages on V6, V7, V8 and V9.

The bias resistor R6 (in parallel with R42 in AM and FM positions) is also disconnected at S1-3 rear. This results in higher grid bias voltage on V8 and V9.

FUNCTION SWITCH VIEWED FROM FRONT AND SHOWN IN "PHONO 45" POSITION (#2 CLOCKWISE).

CAPACITOR VALUES LESS THAN 1 ARE IN MF., VALUES GREATER THAN 1 ARE IN MMF. UNLESS OTHERWISE SPECIFIED.

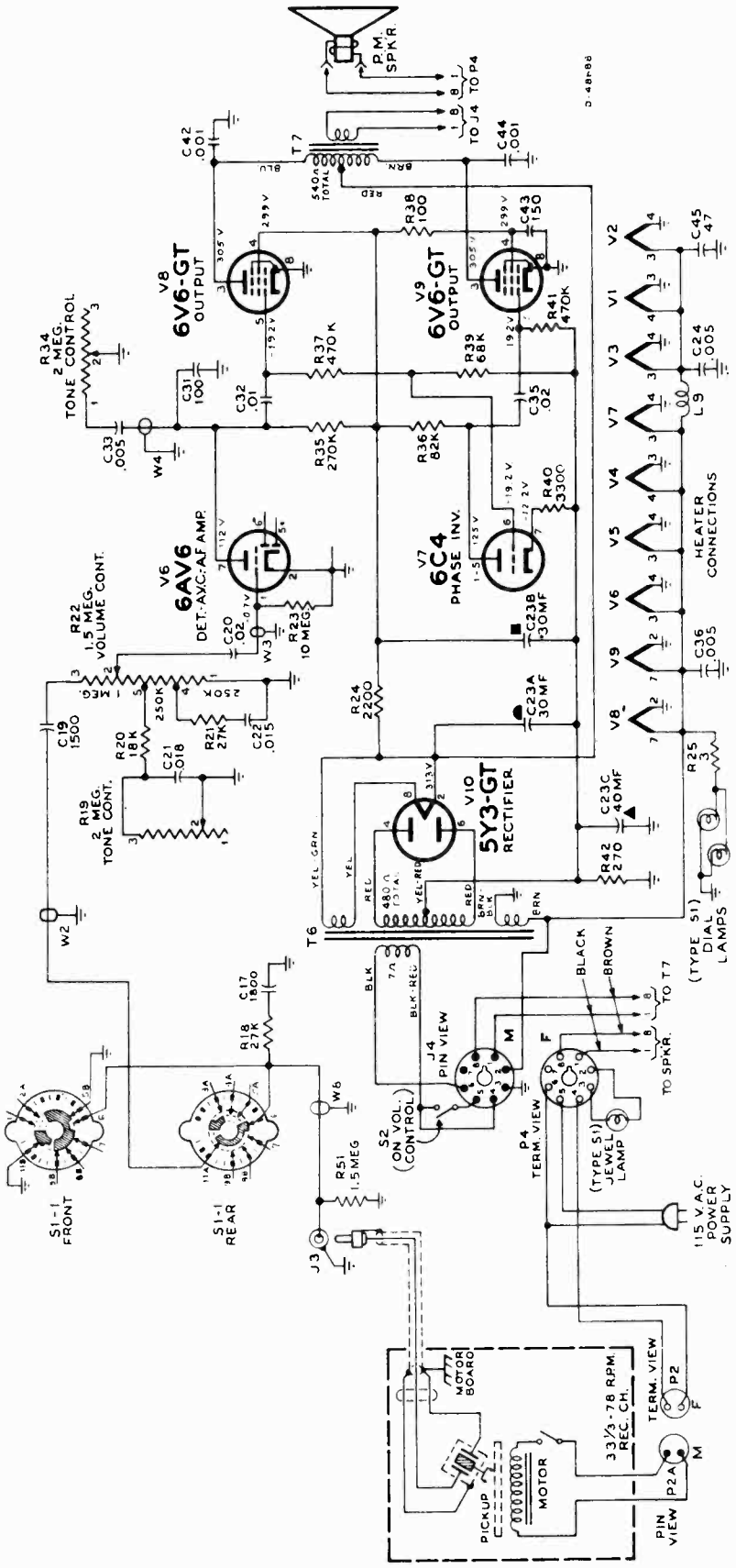
RESISTANCE VALUES IN OHMS. K = 1000.

VOLTAGES MEASURED TO CHASSIS WITH VOLTOHMYST WITH NO SIGNAL INPUT AND SHOULD HOLD WITHIN ±20% WITH 117-VOLT POWER SUPPLY.

Simplified Schematic Diagram—"Phono 45"

MODEL A-108,
Ch. RC-1096

SIMPLIFIED SCHEMATIC DIAGRAM—"78/33"



Note:

When the function switch is in "Phono 45" or "Phono 78/33" position the B+ supply voltage to tubes V1, V2, V3 and V4 is disconnected at switch section S1-3 rear. This results in higher plate and screen voltages on V6, V7, V8 and V9.

The bias resistor R6 (in parallel with R42 in AM and FM positions) is also disconnected at S1-3 rear. This results in higher grid bias voltage on V8 and V9.

FUNCTION SWITCH VIEWED FROM FRONT AND SHOWN IN "PHONO 78/33" POSITION (MAX. C/CLOCKWISE).

CAPACITOR VALUES LESS THAN 1 ARE IN MF., VALUES GREATER THAN 1 ARE IN MMF. UNLESS OTHERWISE SPECIFIED.

RESISTANCE VALUES IN OHMS. K = 1000.

VOLTAGES MEASURED TO CHASSIS WITH VOLTOHMYST WITH NO SIGNAL INPUT AND SHOULD HOLD WITHIN ±20% WITH 117-VOLT POWER SUPPLY.

Simplified Schematic Diagram—"Phono 78/33"

MODEL A-108,
Ch. RC-1096

MISC. SERVICE INFORMATION—REPLACEMENT PARTS

Record Changer Mounting

Each record changer is mounted in a roll-out carriage. The changer mechanisms are mounted on rubber grommets (45 r.p.m.) or springs (78/33 r.p.m.) and should be free floating.

Two shipping screws hold the 45 r.p.m. changer to its roll-out carriage. They are accessible from the under-side of the carriage and should be REMOVED at time of installation.

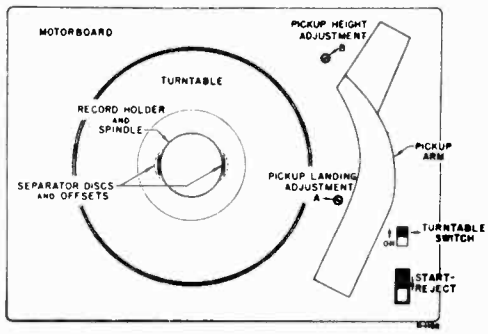
Two shipping screws hold the 78/33 r.p.m. changer to its roll-out carriage. They are accessible after the turntable is lifted off and should be LOOSENED at time of installation.

Roll-out Carriage Removal

Each roll-out carriage has two stop pins, (one at the back end of each slide) held in place by retaining spring. To remove roll-out carriage, it is first necessary to pull the retaining springs out of the slides with a pair of long nose pliers, the stop pins are then easily removed. The roll-out carriage may then be removed from the front of the cabinet after disconnecting its connecting cables.

Roll-out Carriage Travel

The roll-out carriages have a normal movement limitation of approximately 10 inches. If they do not have this amount of movement, it may be due to an obstruction or from slippage or creeping of the balls of the slide mechanism. Travel restriction due to slippage or creeping of balls in the slide mechanism can be corrected by exerting slightly greater pull until the normal travel limitation is reached. The carriage should then operate to its full travel with normal pull.



Top View—RP 168 Record Changer

Adjustments

1. PICKUP LANDING—Turn screw "A" slightly to right (clockwise) if landing is on music grooves, or to left if too near edge of record.

2. PICKUP HEIGHT—Turn screw "B" slightly to right (clockwise) if for change cycle pickup does not lift up from as many as ten records on turntable, or to left if when lifting, pickup hits records on spindle. Correct height is 3/4" from turntable to pickup point at maximum.

Replacement Parts

STOCK NO.	DESCRIPTION
	CHASSIS ASSEMBLIES RC 1096
75567	Capacitor—Variable tuning capacitor complete with drive drum (C1-1, C1-2, C1-3, C1-4, C1-5, C1-6)
74733	Capacitor—Ceramic, 3 mmf. (C10)
75613	Capacitor—Ceramic, 5 mmf. (C13)
39044	Capacitor—Ceramic, 15 mmf. (C12)
75609	Capacitor—Ceramic, 47 mmf. (C45)
75612	Capacitor—Ceramic, 68 mmf. (C9, C11)
39396	Capacitor—Ceramic, 100 mmf. (C4)
75437	Capacitor—Ceramic, 100 mmf. (C31)
75614	Capacitor—Ceramic, 150 mmf. (C14, C30, C43, C54)
75611	Capacitor—Ceramic, 220 mmf. (C3)
39640	Capacitor—Mica, 330 mmf. (C37, C38)
39644	Capacitor—Mica, 470 mmf. (C7)
75610	Capacitor—Ceramic, 1500 mmf. (C19)
74850	Capacitor—Ceramic, 1800 mmf. (C17)
73473	Capacitor—Ceramic, 5000 mmf. (C2, C5, C6, C15, C24, C25, C27, C28, C29, C34, C36)
73801	Capacitor—Tubular, paper, .001 mfd, 400 volts (C8)
70642	Capacitor—Tubular, paper, .001 mfd, 1000 volts (C42, C44)
71926	Capacitor—Tubular, paper, .005 mfd, 200 volts (C26, C39, C41)
73920	Capacitor—Tubular, paper, .005 mfd, 400 volts (C33)
71925	Capacitor—Tubular, paper, .01 mfd, 400 volts (C32)
72120	Capacitor—Tubular, paper, .015 mfd, 200 volts (C22)
58476	Capacitor—Tubular, paper, oil impregnated, .018 mfd, 400 volts (C21)
74010	Capacitor—Tubular, paper, .02 mfd, 400 volts (C20, C35)
73553	Capacitor—Tubular, paper, .05 mfd, 400 volts (C16)
73747	Capacitor—Electrolytic 2 mfd, 50 volts (C40)
72052	Capacitor—Electrolytic comprising 1 section of 30 mfd, 450 volts, 1 section of 30 mfd, 350 volts and 1 section of 40 mfd, 25 volts (C23A, C23B, C23C)
73935	Clip—Mounting clip for A-M, I-F transformers
75627	Clip—Clip for main cable—on rear of chassis
75569	Coil—Oscillator coil (A-M) complete with adjustable core (L3, L4, L5)
75570	Coil—R.F. coil complete with adjustable core (L6, L7)
71942	Coil—Filament choke coil (L9)
75615	Coil—Antenna coil—F-M (L1)
74815	Coil—R.F. coil—F-M (L2)
74817	Coil—Oscillator coil—F-M (L8)
35787	Connector—Single contact female connector for phono cables (J2, J3)
75542	Connector—8 contact male connector for power input cable (J4)
75543	Connector—2 contact female connector for 45 RPM motor cable (P1)
74879	Connector—2 contact female connector for antenna leads
75537	Control—Volume control and power switch (R22, S2)
75561	Control—Tone control—L.F. (R19)
75562	Control—Tone control—H.F. (R34)
†72953	Cord—Drive cord (approx. 66" overall length required)
75564	Coupling—Spring coupling for function switch extension shaft
75556	Cover—Insulating cover for electrolytic capacitor #72052
74839	Fastener—Push fastener for mounting R.F. shelf (4 req'd)
16058	Grommet—Rubber grommet for mounting R.F. shelf (4 req'd)
75547	Grommet—Rubber grommet to mount slide mechanism to bottom—rear (2 req'd)
75548	Grommet—Rubber grommet to mount slide mechanism to bottom—front (2 req'd)
11765	Lamp—Dial lamp—Mazda 51
75544	Nut—Rivnut to fasten screw for mounting chassis (4 req'd)
18469	Plate—Bakelite mounting plate for electrolytic capacitor #72052
75535	Plate—Dial back plate complete with three (3) pulleys
75536	Pointer—Station selector indicator
72602	Pulley—Drive cord pulley
72323	Resistor—Wire wound, 3 ohms, 1/2 watt (R25)
73637	Resistor—Wire wound, 2200 ohms, 5 watts (R24)
	Resistor—Fixed, composition:—
	68 ohms, ±10%, 1/2 watt, (R1, R26)
	100 ohms, ±10%, 1/2 watt (R15, R38, R43)
	120 ohms, ±10%, 1/2 watt (R27)
	270 ohms, ±5%, 2 watts (R42)
	390 ohms, ±10%, 1/2 watt (R9)
	680 ohms, ±10%, 1/2 watt (R4)
	680 ohms, ±20%, 1/2 watt (R30, R31)
	1000 ohms, ±10%, 1/2 watt (R6)
	1200 ohms, ±5%, 1/2 watt (R46)
	3300 ohms, ±5%, 1/2 watt (R40, R45)
	8200 ohms, ±10%, 1 watt (R3)
	15,000 ohms, ±10%, 1/2 watt (R44)
	18,000 ohms, ±10%, 1/2 watt (R7, R20)
	22,000 ohms, ±10%, 1/2 watt (R28, R29)
	27,000 ohms, ±10%, 1/2 watt (R18, R21)

† Stock No. 72953 is a reel containing 250 feet of cord.

MODEL A-108,
Ch. RC-1096

Replacement Parts—Concluded

STOCK NO.	DESCRIPTION
	39,000 ohms, ±5%, ½ watt (R47)
	56,000 ohms, ±10%, ½ watt (R32)
	68,000 ohms, ±10%, ½ watt (R39)
	82,000 ohms, ±10%, ½ watt (R36)
	120,000 ohms, ±10%, ½ watt (R8, R16)
	150,000 ohms, ±10%, ½ watt (R12, R14)
	220,000 ohms, ±20%, ½ watt (R11)
	270,000 ohms, ±10%, ½ watt (R35)
	470,000 ohms, ±10%, ½ watt (R2, R37, R41, R48)
	1.5 megohm, ±10%, ½ watt (R17, R51)
	2.2 megohm, ±20%, ½ watt (R5, R10, R13)
	10 megohm, ±20%, ½ watt (R23)
	22 megohm, ±20%, ½ watt (R33)
75540	Shaft—Tuning knob shaft
75565	Shaft—Extension shaft for function switch
73584	Shield—Tube shield for V1 and V6
75546	Slide—Slide mechanism complete for radio chassis bottom
31251	Socket—Tube socket, octal, wafer
73117	Socket—Tube socket, 7 pin, miniature
74179	Socket—Tube socket, 7 pin, miniature for 6CB6 and 6J6 tubes only.
31364	Socket—Dial lamp socket
75563	Spring—Retaining spring for function switch extension shaft
74038	Spring—Drive cord spring
74847	Support—Polystyrene support for F-M oscillator coil complete with mounting bracket
75602	Switch—Function switch (S1-1, S1-2, S1-3)
75557	Transformer—Ouput transformer (T7)
73743	Transformer—Ratio detector transformer (T5)
75558	Transformer—First I-F transformer (A-M) complete with adjustable cores (T2)
73037	Transformer—Second I-F transformer (A-M) complete with adjustable cores (T4)
75559	Transformer—First I-F transformer (F-M) complete with adjustable cores (T1)
75560	Transformer—Second I-F transformer (F-M) complete with adjustable cores (T3)
75566	Transformer—Power transformer, 117 volts, 60 cycle (T6)
33726	Washer—"C" washer for tuning knob shaft
	RADIO ROLLOUT CARRIAGE
75603	Decal—Function decal for controls
75572	Dial—Polystyrene dial scale
75571	Frame—Moulded frame (maroon) for mounting radio chassis and 45 RPM record changer—for mahogany or walnut instruments
75684	Frame—Moulded frame (light brown) for mounting radio chassis and 45 RPM record changer—for oak instruments
75551	Handle—Metal pullout handle for mounting frame.
75555	Screw—#8-32 x 5/8" cross recessed pan head machine screw to mount radio chassis (4 req'd)
	SPEAKER ASSEMBLY
	Stamped 92589--12W RMA 274
	RL 111-A1
13867	Cap—Dust cap
75682	Cone—Cone and voice coil assembly (3.2 ohms)
75681	Speaker—12" P.M. speaker complete with cone and voice coil (3.2 ohms)
	NOTE:—If stamping on speaker does not agree with above number, order replacement parts by referring to model number of instrument, number stamped on speaker and full description of part required.

STOCK NO.	DESCRIPTION
	MISCELLANEOUS
71864	Antenna—F-M antenna
75705	Antenna—Antenna loop complete less cable
75898	Back—Back cover—maroon—for 33⅓/78 RPM record changer compartment—for mahogany or walnut instruments (assembled to rollout)
75899	Back—Back cover—light brown—for 33⅓/78 RPM record changer compartment—for oak instruments (assembled to rollout)
75903	Back—Back cover—maroon—for radio—45 RPM record changer compartment—for mahogany or walnut instruments (assembled to rollout)
75904	Back—Back cover—light brown—for radio—45 RPM record changer compartment—for oak instruments (assembled to rollout)
73680	Board—"A—F-M" terminal board
75694	Bracket—Stop bracket (less rubber bumper) for rollouts
71599	Bracket—Pilot lamp bracket
75696	Bumper—Rubber bumper for record changer rollout stop bracket
75919	Button—Rosette button for speaker grille
74296	Cable—Shielded pickup cable complete with pin plug for 33⅓/78 RPM record changer
72437	Cable—Shielded pickup cable complete with pin plug for 45 RPM record changer
13103	Cap—Pilot lamp cap
71892	Catch—Bullet catch and strike for cabinet door
X3144	Cloth—Grille cloth for mahogany or walnut instruments
X3089	Cloth—Grille cloth for oak instruments
74882	Connector—2 contact (polarized) male connector for antenna loop cable
74752	Connector—2 contact male connector for FM antenna terminal board cable
75709	Connector—8 contact female connector for main cable (less shell) (P4)
30868	Connector—2 contact female connector for 33⅓/78 RPM record changer motor cable (P2)
75474	Connector—Single contact male connector for speaker cable (2 req'd)
71894	Decal—Trade mark decal (RCA Victor)
74273	Decal—Trade mark decal (Victrola)
74838	Grommet—Power cord strain relief (1 set)
37396	Grommet—Rubber grommet for mounting speaker
75697	Grommet—Rubber grommet for mounting 45 RPM changer
75551	Handle—Metal pullout handle for 33⅓/78 RPM record changer mounting frame
74308	Hinge—Cabinet door hinge (1 set)
75712	Knob—Tuning control, tone control or volume control and power switch knob—maroon—for mahogany or walnut instruments
75713	Knob—Tuning control, tone control or volume control and power switch knob—tan—for oak instruments
75714	Knob—Function switch knob—maroon—for mahogany or walnut instruments
75715	Knob—Function switch knob—tan—for oak instruments
11765	Lamp—Pilot lamp—Mazda #51
75884	Nut—Speed nut for 33⅓/78 RPM record changer mounting screw
73634	Nut—Speed nut for speaker mounting screw.
75438	Pull—Door pull for upper part of door
75918	Pull—Door pull for center of door
75907	Screw—#10-32 x 5¼" cross recessed round head special screw to mount 45 RPM record changer
75883	Screw—#10-24 x ½" round head machine screw for mounting 33⅓/78 RPM record changer
75626	Screw—#8-32 x 1¼" trimit head screw for door pull.
75708	Shell—Shell for 8 contact female connector #75709
75546	Slide—Slide mechanism for 33⅓/78 RPM record changer mounting frame
31364	Socket—Pilot lamp socket and lead
74734	Spring—Retaining spring for knobs
75902	Spring—Suspension spring for main cable
72936	Stop—Cabinet door stop

MODEL 45-W-9,
Ch. RC-1095-A

PH571

FOR RECORD CHANGER SERVICE INFORMATION REFER TO RP 190 SERIES SERVICE DATA. on Pages RCD.CH.21-1 through RCD.CH.21-11.

Specifications

Tuning Range

Standard Broadcast (AM) ..... 540-1,600 kc.
Frequency Modulation (FM) ..... 88-108 mc.
Intermediate Frequencies..... AM—455 kc., FM—10.7 mc.

Tube Complement

(1) RCA 6J6..... Mixer and Oscillator
(2) RCA 6BA6..... I-F Amplifier
(3) RCA 6AU6 ..... Driver
(4) RCA 6AL5 ..... Ratio Detector
(5) RCA 6AV6..... AM Det.—AVC—A-F Amplifier
(6) RCA 6C4 ..... Ph. Inv.
(7) RCA 6V6GT..... Output
(8) RCA 6V6GT..... Output
(9) RCA 5Y3GT..... Rectifier

Dial Lamps (2)..... Type No. 51, 6-8 volts, 0.2 amp.
Jewel Lamp..... Type No. 51, 6-8 volts, 0.2 amp.

Tuning Drive Ratio..... 10:1 (5 turns of knob)

Power Supply Rating..... 115 volts, 60 cycles, 95 watts

Loudspeaker (92569-12W)

Size and type..... 12 in. PM
Voice coil impedance..... 3.2 ohms at 400 cycles

Power Output

(Radio) Undistorted 8 watts..... Maximum 9 watts
(Phono) Undistorted 10 watts.....Maximum 11 watts

Cabinet Dimensions

Height 32 in. Width 29¼ in. Depth 19¾ in.

Weight..... 90 lbs.

Record Changer (RP 190-2)

Turntable speed..... 45 r.p.m.
Record capacity..... 12 RCA 7-in. fine groove records
Pickup (Stock No. 75575)..... Crystal (medium output)

Circuit Description

This instrument has a nine-tube (including rectifier) chassis which is very similar to those used in other RCA Victor radio-phonograph combinations designed for AM-FM reception.

The selector switch has five functions:

(1) Selection of tuning range.

(2) Selection and distribution of a.v.c. voltages.

(3) Application of B+ voltage to tubes V1, V2 and V3.

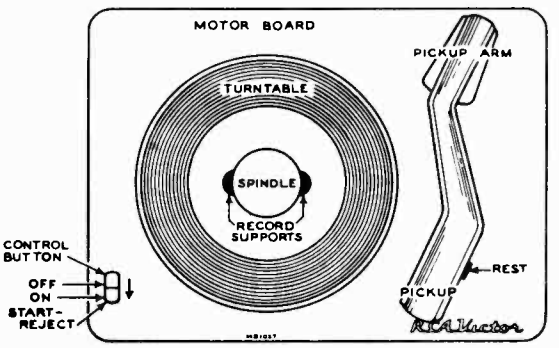
In "Phono" and "Aux." positions, the B+ voltage is removed from tubes V1, V2 and V3.

(4) Selection of audio input applied to the volume control.

(5) Change in output tube bias.

In "Radio" positions, R6 is in parallel with R42.

This receiver has built-in antennas for standard broadcast (AM) and frequency modulation (FM) reception. Provision is made for the use of external antennas if desired.



Top View—RP 190 Record Changer

MODEL 45-W-9,
Ch. RC-1095-A

ALIGNMENT PROCEDURE — LEAD DRESS

Alignment Procedure

CORRECT ALIGNMENT OF THE FM BAND REQUIRES THAT THE AM BAND BE ALIGNED FIRST

Alignment Indicators:

An RCA VoltOhmyst or equivalent meter is necessary for measuring developed d-c voltage during FM alignment. Connections are specified in the alignment tabulation. An output meter is also necessary to indicate minimum audio output during FM Ratio Detector alignment. Connect the output meter across the speaker voice coil.

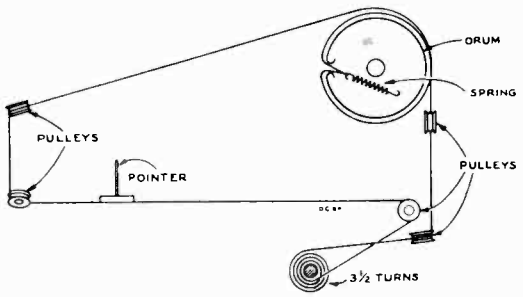
The RCA VoltOhmyst can also be used as an AM alignment indicator, either to measure audio output or to measure a-v-c voltage.

When audio output is being measured the volume control should be turned to maximum.

Critical Lead Dress

The items listed below may not appear to be critical in all receivers. However, by dressing the leads as specified it is believed that difficulties will be minimized.

1. The 2.2 meg mixer grid (R10) resistor should have a minimum practicable amount of lead extending on the grid end.
2. The first A.M. and first F.M. I.F. plate leads should be dressed away from the range switch wafer.
3. The ground strap between the R.F. shelf and the main chassis should be well soldered and kept as short as practicable.
4. Arrange wiring to prevent the filament wire between the mixer (6J6) and 1st I.F. (6BA6) tubes from passing near either the mixer grid, or the A.V.C. wiring.
5. Dress filament wires away from the 1st audio (6AV6) and inverter (6C4) tube audio coupling condensers.
6. Dress A.C. power switch wires away from the audio coupling condenser (C20) which is wired to the volume control.
7. Dress the mixer grid coupling condenser (C7) away from the lugs on the front range switch wafer.
8. The 1st I.F. tube A.V.C. by-pass condenser (C16) should ground at the same point as the cathode neutralizing loop.
9. The driver tube plate and screen by-pass condensers (C26, C27) should ground at the same point as the neutralizing loop.
10. The mixer plate by-pass condenser (C15) should ground as close to the R.F. shelf ground strap as practicable.
11. The shielded audio leads connecting to the front function switch wafer should have a minimum of exposed lead on the function switch end.



Dial Indicator and Drive Mechanism

Signal Generator:

For all alignment operations connect the low side of the signal generator to the receiver chassis. The output should be adjusted to provide accurate resonance indication at all times. If output measurement is used for AM alignment the output of the signal generator should be kept as low as possible to avoid a-v-c action.

AM Alignment

FUNCTION SWITCH IN AM POSITION

Steps	Connect high side of sig. gen. to—	Sig. gen. output	Turn radio dial to	Adjust for max. output
1	Stator of C1-4 in series with .01 mf.	455 kc	Quiet point at low freq. end.	†Bottom (sec.) and top (pri.) cores of T4. †Top (sec.) and bottom (pri.) cores of T2.
2	AM ant. terminal through 200 mmf.	1620 kc	Extreme high frequency end.	C1-2 trimmer (osc.).
3		1400 kc.	1400 kc signal.	C1-4 trimmer (ant.).
4		600 kc.	600 kc. signal.	L5 (osc.). Rock gang.
5	Repeat steps 2, 3 and 4.			

†First peak T2 and T4 then starting with T4, use alternate loading. Connect a 47,000-ohm resistor across the primary to load the plate winding while the grid winding of the same transformer is being peaked. Then load the grid winding with the 47,000-ohm resistor while the plate winding is being peaked.

FM Alignment

RANGE SWITCH IN FM POSITION — VOLUME CONTROL MAXIMUM

Steps	Connect high side of sig. gen. to—	Sig. gen. output	Turn radio dial to—	Adjust for peak output
1	Connect the d-c probe of a VoltOhmyst to the negative lead of the 2 mfd. capacitor C40 and the common lead to chassis. Adjust sig. gen. output to provide approx. —3 v. indication during alignment.			
2	Pin No. 1 of 6AU6 (V3) in series with .01 mf.	10.7 mc. AM modulated.	——	Top of driver trans. T5 for max. d.c. voltage.
3				†Bottom of driver trans. T5 for min. audio output.
4	Repeat steps 2 and 3.			
5	To FM antenna terminals thru 120 ohms in each side of line.	10.7 mc.	Low frequency end.	*Top (sec.) and bottom (pri.) cores of T3. *Top (sec.) and bottom (pri.) cores of T1.
6		90 mc.	90 mc.	**L8 (osc.).
7		106 mc.	106 mc.	C1-3 trimmer (ant.).
8		90 mc.	90 mc. signal.	**L1 (ant.). Rock gang.
9	Repeat steps 7 and 8.			

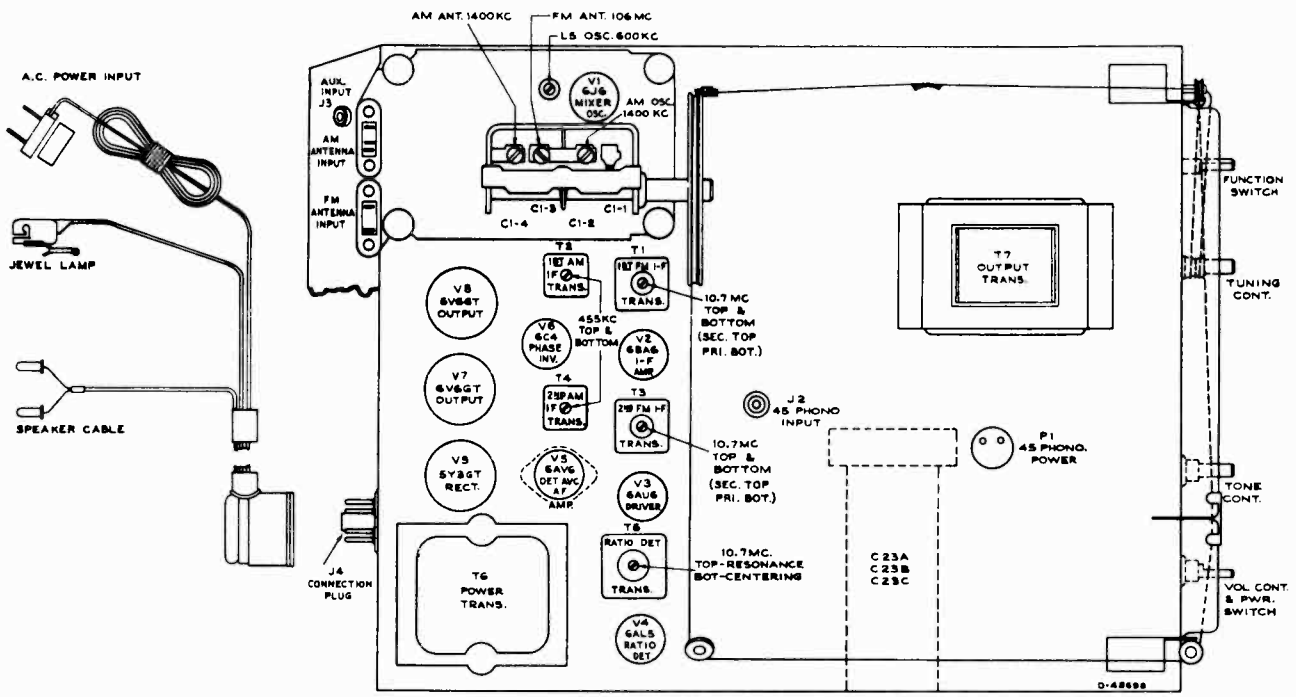
†Two or more points may be found which lower the audio output. At the correct point the minimum audio output is approached rapidly and is much lower than at any incorrect point.

*Align T3 and T1 by means of alternate loading as explained under AM alignment. Use a 680-ohm resistor instead of a 47,000-ohm resistor and load the FM windings.

**L1 and L8 are adjustable by increasing or decreasing the spacing between turns.

MODEL 45-W-9,
Ch. RC-1095-A

TUBE AND TRIMMER LOCATIONS—VOLTAGE DATA

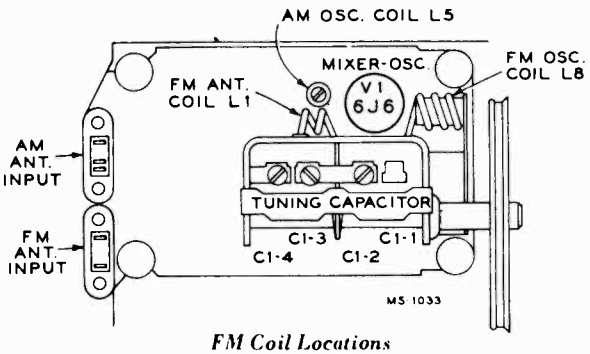


Tube and Trimmer Locations

Socket Voltages

Voltages measured to chassis with VoltOhmyst with no signal input and should hold within ±10% with 117 volt power supply.

Tube	Terminal	Voltage		
		Phono	AM	FM
V1 6J6 Mixer and Oscillator	Plate 2	—	58	53
	Grid 5	—	-1.5	-1.3
	Plate 1	—	35	29
	Grid 6	—	-2.2	-2.0
V2 6BA6 I.F. Amp.	Plate 5	—	197	193
	Screen 6	—	112	104
	Cathode 7	—	0.67	0.77
	Grid 1	—	-1.2	-0.35
V3 6AU6 Driver	Plate 5	—	193	189
	Screen 6	—	125	123
	Cathode 7	—	1.1	1.1
V4 6AL5 Ratio Det.	—— —	—	—	—
V5 6AV6 A. F. Amp.	Plate 7	112	95	95
	Grid 1	-0.7	-0.7	
V6 6C4 Ph. Inv.	Plate 1–5	125	90	90
	Cathode 7	-12.2	-11	-11
	Grid 6	-19.2	-15.6	-15.6
V7 6V6GT or Output V8	Plate 3	305	295	295
	Screen 4	299	214	212
	Grid 5	-19.2	-15.4	-15.4
V9 5Y3GT Rectifier	Filament 2	314	301	301



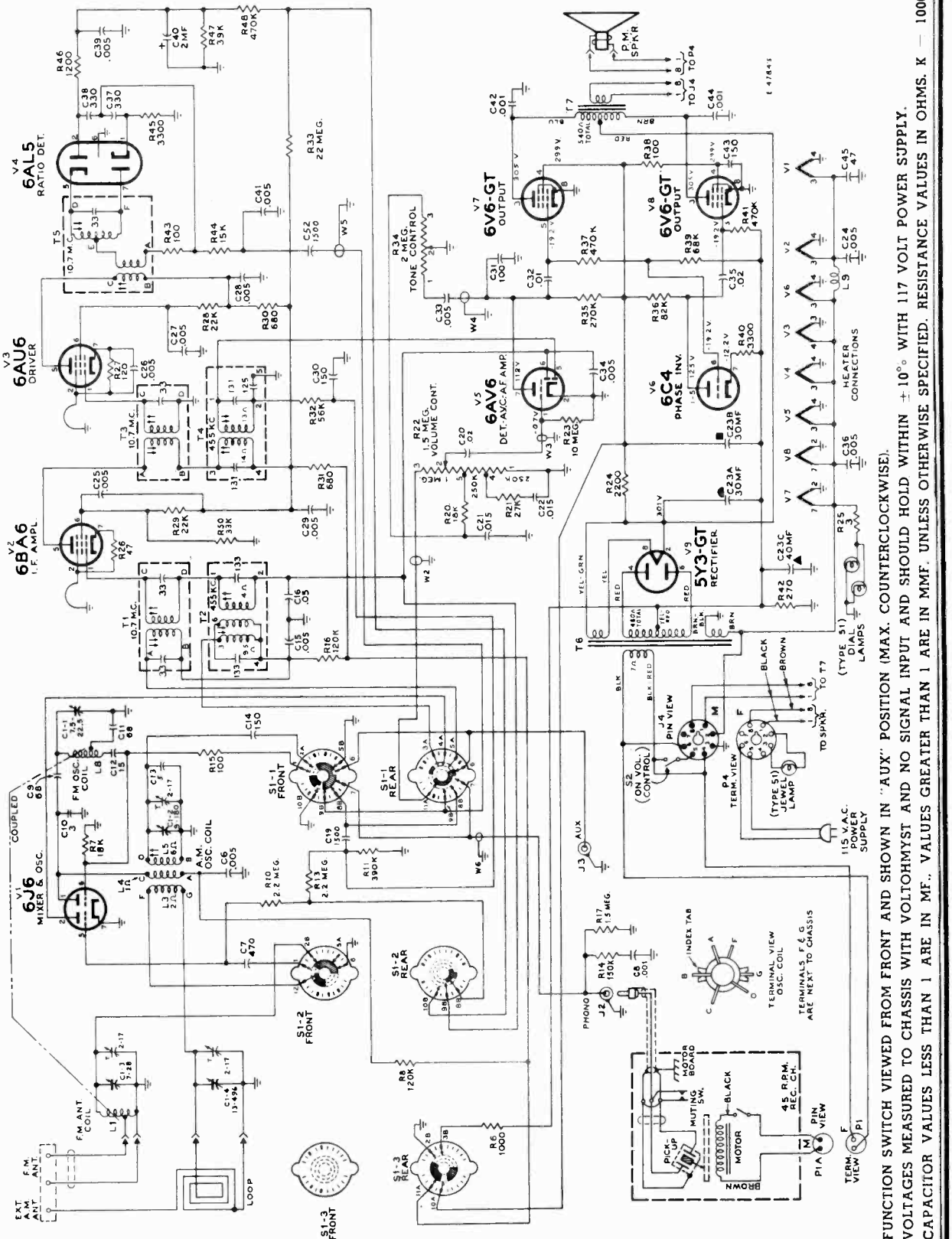
FM Coil Locations

Cathode Currents (Ma.)

Tube	Terminal	Phono	AM	FM
V1 6J6	7	—	2.8	2.8
V2 6BA6	7	—	16.6	16.5
V3 6AU6	7	—	9.4	9.3
V4 6AL5	1 & 5	—	—	—
V5 6AV6	2	0.8	0.5	0.5
V6 6C4	7	2.2	1.5	1.5
V7 6V6GT	8	35.6	18.6	18.5
V8 6V6GT	8	35.6	18.6	18.5
V9 5Y3GT	2	74.2	72.5	71.7

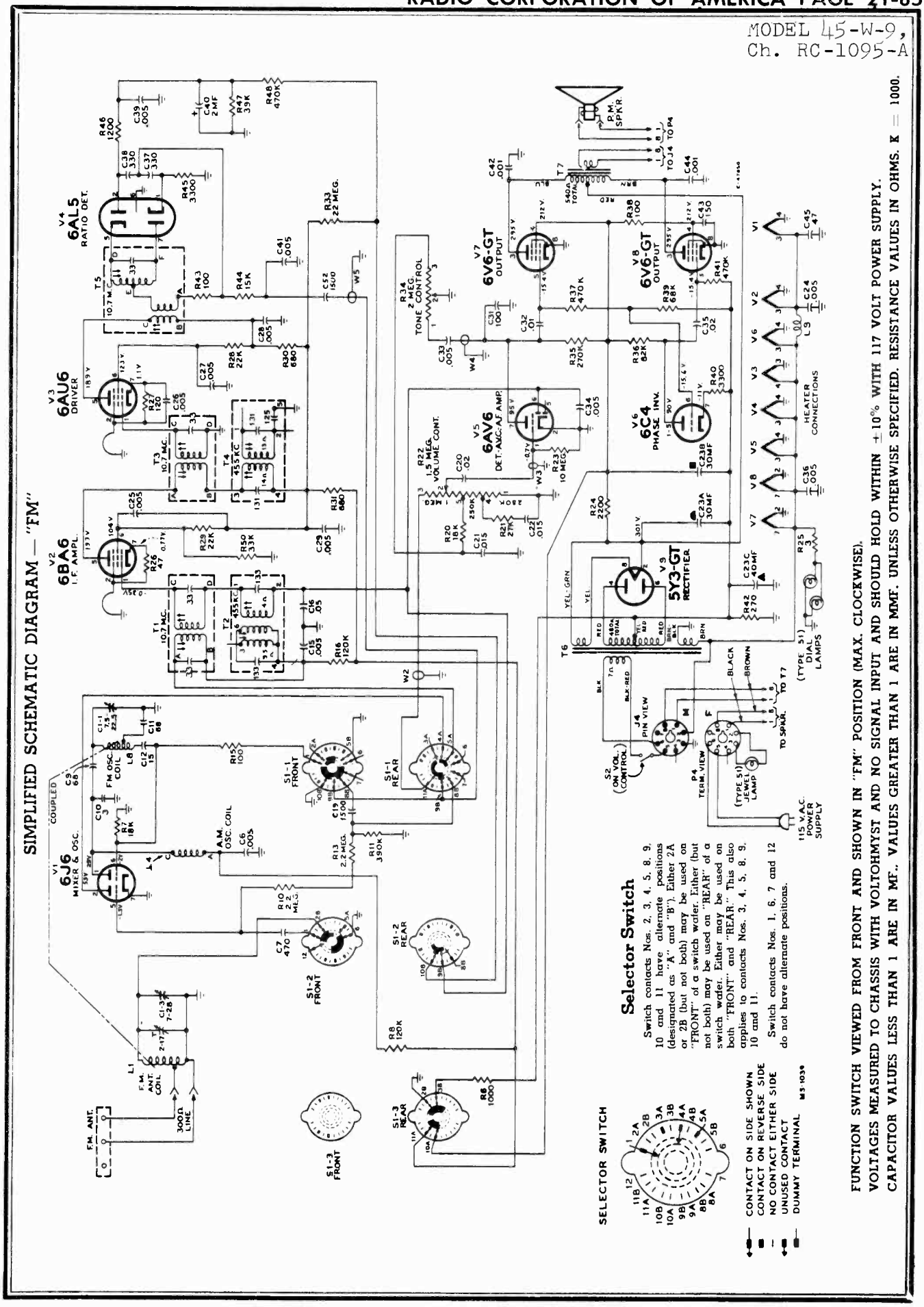
MODEL 45-W-9,
Ch. RC-1095-A

COMPLETE SCHEMATIC DIAGRAM



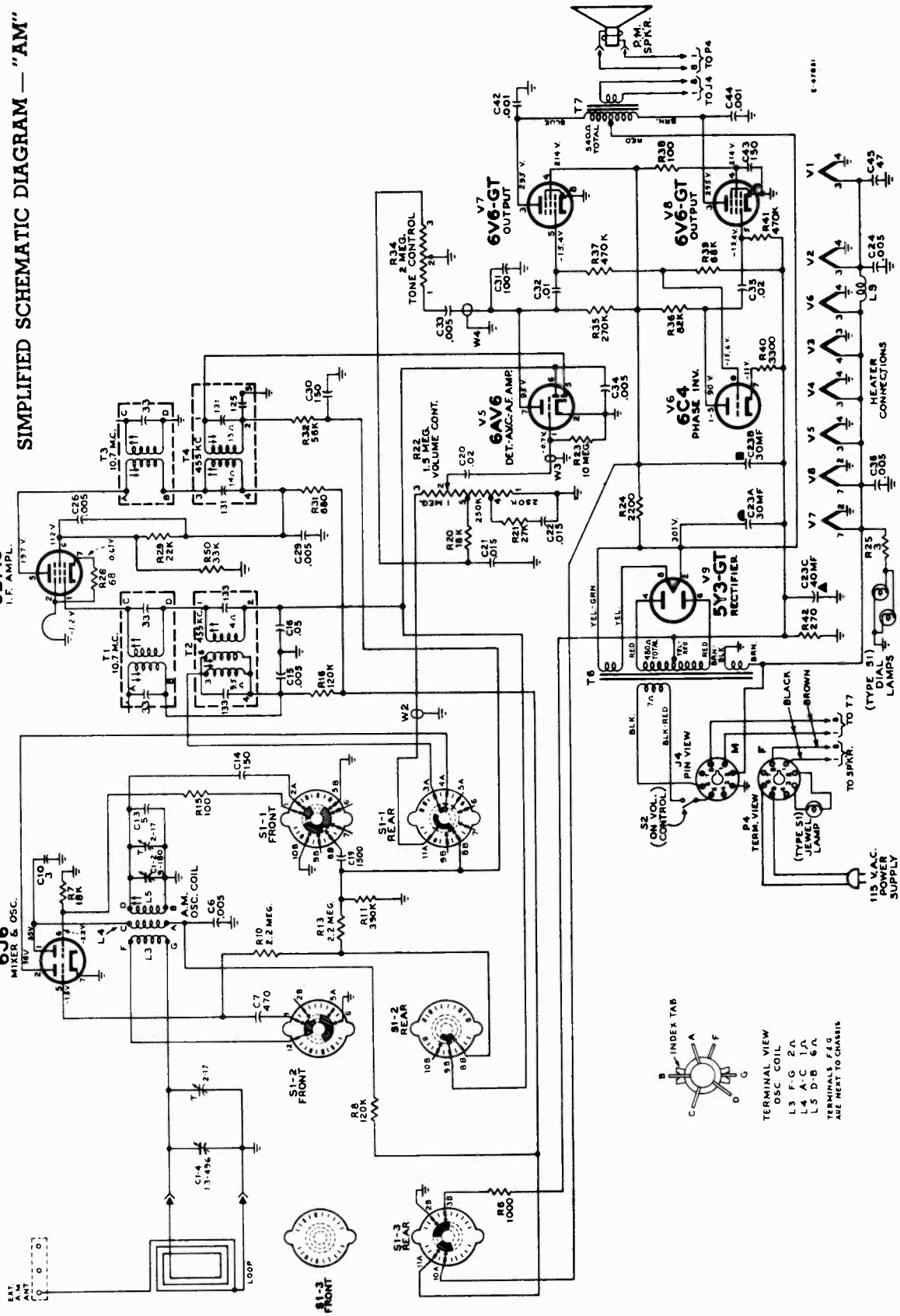
FUNCTION SWITCH VIEWED FROM FRONT AND SHOWN IN "AUX" POSITION (MAX. COUNTERCLOCKWISE).
VOLTAGES MEASURED TO CHASSIS WITH VOLTOHMYST AND NO SIGNAL INPUT AND SHOULD HOLD WITHIN ±10% WITH 117 VOLT POWER SUPPLY.
CAPACITOR VALUES LESS THAN 1 ARE IN MF., VALUES GREATER THAN 1 ARE IN MMF. UNLESS OTHERWISE SPECIFIED. RESISTANCE VALUES IN OHMS. K = 1000.

MODEL 45-W-9,
Ch. RC-1095-A



MODEL 45-W-9,
Ch. RC-1095-A

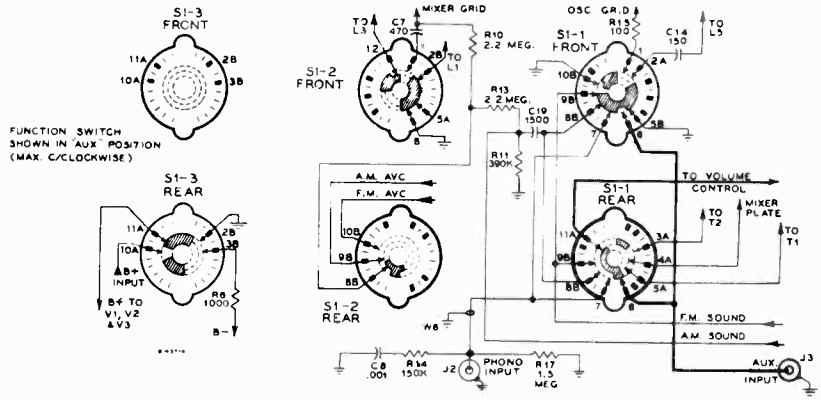
SIMPLIFIED SCHEMATIC DIAGRAM — "AM"



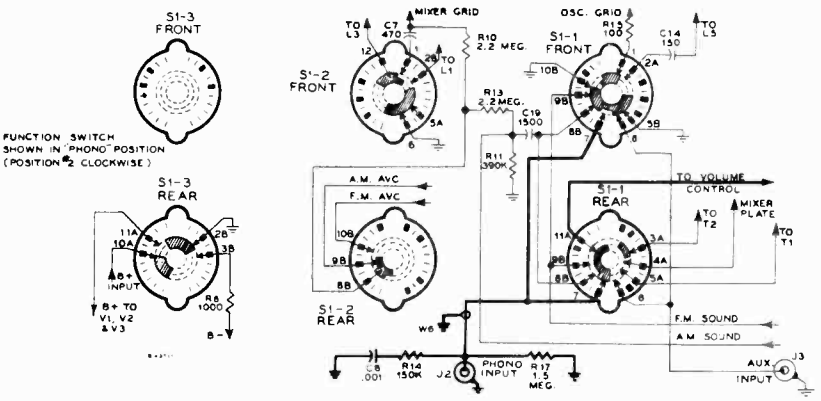
FUNCTION SWITCH VIEWED FROM FRONT AND SHOWN IN "AM" POSITION (No. 3 CLOCKWISE).
VOLTAGES MEASURED TO CHASSIS WITH VOLTOHMYST AND NO SIGNAL INPUT AND SHOULD HOLD WITHIN ±10% WITH 117 VOLT POWER SUPPLY.
CAPACITOR VALUES LESS THAN 1 ARE IN MF.. VALUES GREATER THAN 1 ARE IN MMF. UNLESS OTHERWISE SPECIFIED. RESISTANCE VALUES IN OHMS. K = 1000.

MODEL 45-W-9,
Ch. RC-1095-A

"AUX" AND "PHONO" SWITCH POSITIONS — REPLACEMENT PARTS



Switch Position Schematic Diagram—"Aux"



Switch Position Schematic Diagram—"Phono"

In "Aux" and "Phono" positions the B - supply voltage is disconnected in S1-3 which renders the mixer-oscillator, I.F. amplifier and driver tubes inoperative.

Record Changer Mounting

Two shipping screws hold the 45 r.p.m. changer to its roll-out carriage. They are accessible from the underside of the carriage and should be REMOVED at time of installation.

The record changer is mounted with rubber grommets in the carriage and should be free floating.

Roll-out Carriage Removal

The roll-out carriage has two stop pins (one at the back end of each slide), held in place by a retaining spring. To remove roll-out carriage, it is first necessary to pull the retaining springs out of the slides with a pair of long nose pliers, the stop pins are then easily removed. The roll-out carriage may then be removed from the front of the cabinet after disconnecting its connecting cables.

Roll-out Carriage Travel

The radio-45 r.p.m. carriage has a normal movement limitation of approximately 10 in. If the carriage does not have this amount of movement, it may be due to an obstruction or from slippage or creeping of the balls of the slide mechanism. Travel restriction due to slippage or creeping of balls in the slide mechanism can be corrected by exerting slightly greater pull until the normal travel limitation is reached. The carriage should then operate to its full travel with normal pull.

REPLACEMENT PARTS

STOCK No.	DESCRIPTION
	CHASSIS ASSEMBLIES RC 1095A
75599	Capacitor—Variable tuning capacitor (C1-1, C1-2, C1-3, C1-4)
74733	Capacitor—Ceramic, 3 mmf. (C10)
75613	Capacitor—Ceramic, 5 mmf. (C13)
39044	Capacitor—Ceramic, 15 mmf. (C12)
75609	Capacitor—Ceramic, 47 mmf. (C45)
75612	Capacitor—Ceramic, 68 mmf. (C9, C11)
75437	Capacitor—Ceramic, 100 mmf. (C31)
75614	Capacitor—Ceramic, 150 mmf. (C14, C30, C43)
39640	Capacitor—Mica, 330 mmf. (C37, C38)
39644	Capacitor—Mica, 470 mmf. (C7)
75610	Capacitor—Ceramic, 1,500 mmf. (C19, C52)
73473	Capacitor—Ceramic, 5,000 mmf. (C6, C15, C24, C25, C27, C28, C29, C34, C36)
73801	Capacitor—Tubular, paper, .001 mfd. 400 volts (C8)
70642	Capacitor—Tubular, paper, .001 mfd, 1,000 volts (C42, C44)
72490	Capacitor—Tubular, paper, .005 mfd, 200 volts (C26, C39, C41)
73920	Capacitor—Tubular, paper, .005 mfd, 400 volts (C33
71925	Capacitor—Tubular, paper, .01 mfd, 400 volts (C32)
72120	Capacitor—Tubular, paper, .015 mfd, 200 volts (C21, C22)
71928	Capacitor—Tubular, paper, .02 mfd, 100 volts (C20
73638	Capacitor—Tubular, paper, .02 mfd, 400 volts (C35
73553	Capacitor—Tubular, paper, .05 mfd, 200 volts (C16)
73747	Capacitor—Electrolytic, 2 mfd, 50 volts (C40
72052	Capacitor—Electrolytic, comprising 1 section of 30 mfd, 450 volts, 1 section of 30 mfd, 350 volts, and 1 section of 40 mfd, 25 volts (C23A, C23B, C23C)
75627	Clip—Clip for main cable—on rear of chassis
73935	Clip—Mounting clip for A-M I-F transformers
75569	Coil—Oscillator coil (A-M) complete with adjustable core (L3, L4, L5)
71942	Coil—Filament choke coil (L9)
74817	Coil—Oscillator coil—F-M (L8)
75617	Coil—Antenna coil—F-M (L1)
35787	Connector—Single contact female connector for pick-up cables (J2, J3)
75542	Connector—8 contact male connector for power input cable (J4)
75543	Connector—2 contact female connector for record changer motor cable (P1)
74879	Connector—2 contact female connector for antenna leads
75537	Control—Volume control and power switch (R22, S2)
75538	Control—Tone control (R34)
†72953	Cord—Drive cord (approximately 66" overall length required)
75564	Coupling—Spring coupling for function switch extension shaft
75556	Cover—Insulating cover for electrolytic capacitor No. 72052
74839	Fastener—Push fastener for mounting R.F. shelf (4 required)
16058	Grommet—Rubber grommet for mounting R.F. shelf (4 required)
75547	Grommet—Rubber grommet to mount slide mechanism to bottom—rear (2 required)
75548	Grommet—Rubber grommet to mount slide mechanism to bottom—front (2 required)
11765	Lamp—Dial lamp—Mazda No. 51

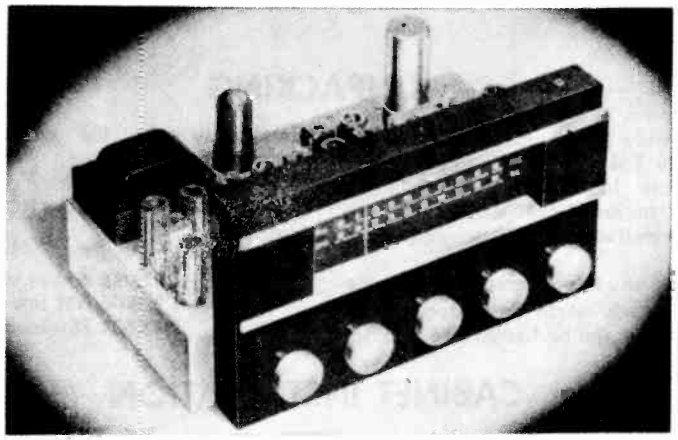
†Stock No. 72953 is a reel containing 250 feet of cord.

MODEL 45-W-9,
Ch. RC-1095-A

REPLACEMENT PARTS — Continued

STOCK No.	DESCRIPTION
75544	Nut—Rivnut to fasten screw for mounting chassis (4 required)
18469	Plate—Bakelite mounting plate for electrolytic capacitor No. 72052
75535	Plate—Dial back plate complete with three (3) pulleys
75536	Pointer—Station selector pointer
72602	Pulley—Drive cord pulley
72323	Resistor—Wire wound, 3 ohms, ½ watt (R25)
73637	Resistor—Wire wound, 2,200 ohms, 5 watts (R24)
	Resistor—Fixed, composition:
	47 ohms, ±10%, ½ watt (R26)
	100 ohms, ±10%, ½ watt (R15, R38, R43)
	120 ohms, ±10%, ½ watt (R27)
	270 ohms, ±5%, 2 watts (R42)
	680 ohms, ±20%, ½ watt (R30)
	680 ohms, ±20%, 1 watt (R31)
	1,000 ohms, ±10%, ½ watt (R6)
	1,200 ohms, ±5%, ½ watt (R46)
	3,300 ohms, ±5%, ½ watt (R40, R45)
	12,000 ohms, ±10%, 1 watt (R29)
	15,000 ohms, ±10%, ½ watt (R44)
	18,000 ohms, ±10%, ½ watt (R7, R20)
	22,000 ohms, ±10%, ½ watt (R28)
	27,000 ohms, ±10%, ½ watt (R21)
	33,000 ohms, ±10%, ½ watt (R50)
	39,000 ohms, ±5%, ½ watt (R47)
	56,000 ohms, ±10%, ½ watt (R32)
	68,000 ohms, ±10%, ½ watt (R39)
	82,000 ohms, ±10%, ½ watt (R36)
	120,000 ohms, ±10%, ½ watt (R8, R16)
	150,000 ohms, ±10%, ½ watt (R14)
	270,000 ohms, ±10%, ½ watt (R35)
	390,000 ohms, ±10%, ½ watt (R11)
	470,000 ohms, ±10%, ½ watt (R37, R41, R48)
	1.5 megohm, ±10%, ½ watt (R17)
	2.2 megohm, ±20%, ½ watt (R10, R13)
	10 megohm, ±20%, ½ watt (R23)
	22 megohm, ±20%, ½ watt (R33)
75540	Shaft—Tuning knob shaft
75565	Shaft—Extension shaft for function switch
73584	Shield—Tube shield for V5
75546	Slide—Slide mechanism complete for radio chassis bottom
31251	Socket—Tube socket, octal, wafer
73117	Socket—Tube socket, 7 pin, miniature
74179	Socket—Tube socket, 7 pin, miniature for 6J6 tube only
31364	Socket—Dial lamp socket
75563	Spring—Retaining spring for function switch extension shaft
74038	Spring—Drive cord spring
74847	Support—Polystyrene support for F-M oscillator coil complete with mounting bracket
75600	Switch—Function switch (S1-1, S1-2, S1-3)
75557	Transformer—Output transformer (T7)
73743	Transformer—Ratio detector transformer (T5)
75558	Transformer—First I-F transformer (A-M) complete with adjustable cores (T2)
73037	Transformer—Second I-F transformer (A-M) complete with adjustable cores (T4)
75559	Transformer—First I-F transformer (F-M) complete with adjustable cores (T1)
75560	Transformer—Second I-F transformer (F-M) complete with adjustable cores (T3)
75566	Transformer—Power transformer, 117 volts, 60 cycle (T6)
33726	Washer—"C" washer for tuning knob shaft
	RADIO ROLLOUT CARRIAGE
75895	Decal—Function decal for controls
75572	Dial—Polystyrene dial scale
75549	Frame—Moulded frame (maroon) for mounting radio chassis and 45 RPM record changer—for mahogany or walnut instruments
75683	Frame—Moulded frame (light brown) for mounting radio chassis and 45 RPM record changer—for oak instruments
75551	Handle—Metal pullout handle for mounting frame
75555	Screw—No. 8-32 x ⅝" cross recessed pan head machine screw to mount radio chassis
	SPEAKER ASSEMBLY Stamped 92569-12W RMA 274 RL 111-A1
13867	Cap—Dust cap
75682	Cone—Cone and voice coil assembly (3.2 ohms)
75681	Speaker—12" P.M. speaker complete with cone and voice coil (3.2 ohms) NOTE: If stamping on speaker does not agree with above number, order replacement parts by referring to model number of instrument, number stamped on speaker and full description of part required.
	MISCELLANEOUS
71864	Antenna—F-M antenna
75705	Antenna—Antenna loop complete, less cable
75900	Back—Back cover—maroon—for radio-phono compartment—for mahogany or walnut instruments (assembled to rollout)
75901	Back—Back cover—light brown—for radio-phono compartment—for oak instruments (assembled to rollout)
73680	Board—"A-F-M" terminal board
75694	Bracket—Stop bracket less rubber bumper for radio-phono compartment rollout
71599	Bracket—Pilot lamp bracket
75696	Bumper—Rubber bumper for rollout stop bracket
72437	Cable—Shielded pickup cable complete with pin plug
13103	Cap—Pilot lamp cap
71892	Catch—Bullet catch and strike for cabinet doors
X3144	Cloth—Grille cloth for mahogany or walnut instruments
X3089	Cloth—Grille cloth for oak instruments
74882	Connector—2 contact (polarized) male connector for AM loop cable
74752	Connector—2 contact male connector for FM antenna terminal board cable
75709	Connector—8 contact female connector for main cable (less shell) (P4)
75474	Connector—Single contact male connector for speaker (2 required)
30870	Connector—2 contact male connector for motor cable (P1A)
71984	Decal—Trade mark decal (RCA Victor)
74273	Decal—Trade mark decal (Victrola)
37396	Grommet—Rubber grommet for mounting speaker
74838	Grommet—Power cord strain relief (1 set)
75697	Grommet—Rubber grommet to mount record changer
74308	Hinge—Cabinet door hinge (1 set)
75712	Knob—Tuning control, tone control or volume control and power switch knob—maroon—for mahogany or walnut instruments
75713	Knob—Tuning control, tone control or volume control and power switch knob—tan—for oak instruments
75714	Knob—Function switch knob—maroon—for mahogany or walnut instruments
75715	Knob—Function switch knob—tan—for oak instruments
11765	Lamp—Pilot lamp—Mazda No. 51
73634	Nut—Speed nut for speaker mounting screws
75908	Pull—Door pull
75907	Screw—No. 10-32 x 5¼" cross recessed round head screw (special) to mount rollout frame
75920	Screw—No. 10-24 x 1" trimit head screw for door pull
75708	Shell—Shell for 8 contact connector No. 75709
31364	Socket—Pilot lamp socket and lead
74734	Spring—Retaining spring for knobs
75902	Spring—Suspension spring for main cable
72936	Stop—Cabinet door stop

MODEL RC10, Tuner



ELECTRICAL SPECIFICATIONS

TUBE COMPLEMENT: 11 tubes plus rectifier — 6AB4 FM RF preamp., 6CB6 RF amp., 12AT7 mixer, 12AT7 osc. and AFC., (2) 6CB6 IF amp., (2) 9001 limiters, 6AL5 FM det., 6AV6 AM det. and phono, pre-amp., 12AU7 audio amp., 6X5GT rectifier.

CONTROLS: Bass, Off-On-Volume, FM-AM-PH-TV selector, Tuning, Treble.

ANTENNA: FM-300 ohm or 72 ohm input. Built-in antenna also provided. AM-high or low impedance transformer input. Low-noise loop also provided.

SENSITIVITY: FM-5 microvolts for 30 db. quieting. AM-5 microvolts for 0.25 volts output at either detector or audio amplifier.

FM DRIFT: Negligible with Automatic Frequency Control. Without AFC, ± 20 kc. after 10 sec. warmup.

OUTPUT: Capability up to 3 volts at less than 1% distortion at 5000 ohms impedance. For use with either high or low gain amplifiers with input impedance of 25,000 ohms or higher. Connection direct from detector also provided.

TONE COMPENSATION: Bass variable up to 12 db. boost or 10 db. cut at 70 cps. Treble variable up to 9 db. boost or 15 db. cut at 10,000 cps.

PHONO PRE-AMPLIFIER: 24 db. gain plus 10 db. bass compensation.

INTERMEDIATE FREQUENCIES: FM—10.7 mc.; AM—455 kc.

BANDWIDTH: FM—190 kc.; AM—8.5 kc.

AM INTERSTATION WHISTLE FILTER: 25 db. rejection at 10 kc., 1 db. at 7 kc.

POWER CONSUMPTION: 105-125 volts, 60 cps., 55 watts.

SHIPPING WEIGHT: 16 lbs.

DIMENSIONS: 13½" x 9½" x 7" high.

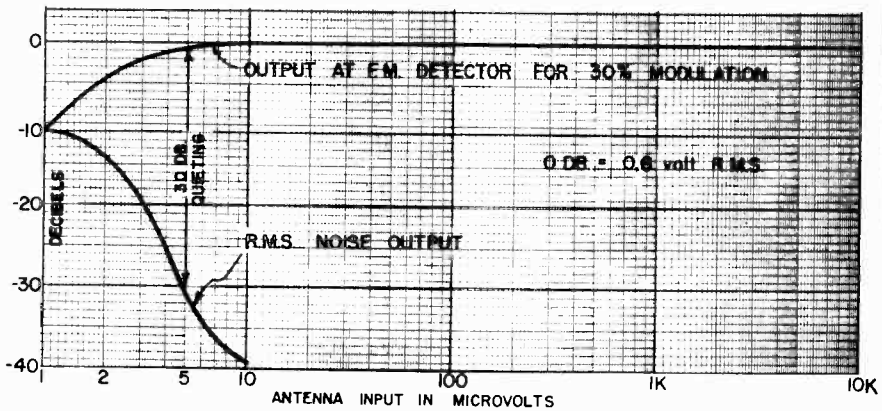


Fig. 1. FM Limiting Characteristic

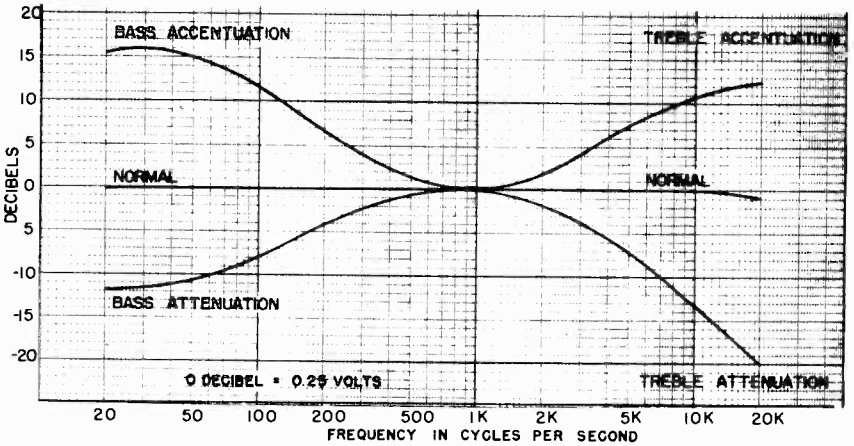


Fig. 2. Audio Characteristic

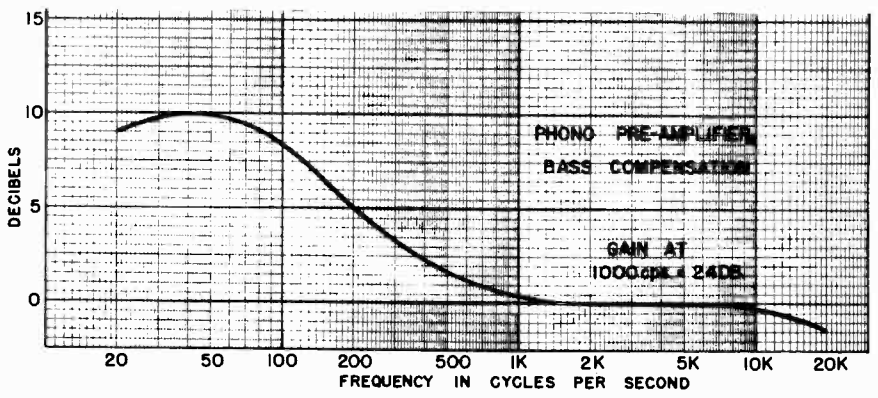


Fig. 3. Phono Pre-amplifier Characteristic

MODEL RC10,
Tuner

UNPACKING

These instructions cover the operation and installation of the Craftsmen RC10 FM-AM Tuner. The entire manual should be read before installing the unit, since much general information is included that will be of value in making any custom-built installation.

As soon as the tuner has been unpacked, examine it for any apparent damage which might have occured in shipment. Should any sign of damage be found, file a claim immediately with the carrier stating the extent of the damage.

Included with the RC10 tuner chassis should be the following:

1 3B023 Brass escutcheon
1 7X403 AM low-impedance antenna
1 7X604 Shielded audio cable

CABINET INSTALLATION

GENERAL - Considerable thought should be given in respect to the installation of the chassis in order to obtain maximum benefit from the operating ease the chassis offers. The dial and controls should be positioned for easy access and reading which, in many cases, can be improved with a sloping front panel. If the mounting board cannot be readily tilted, wooden spacers can be inserted under the front mounting holes to provide the necessary inclination. Position the knobs sufficiently above any front projection to provide ample finger clearance for adjusting the knobs. "chimney effect" can be utilized advantageously in wall or bookcase installations by providing ports near the bottom and top of the enclosure to effect a flow of air past the chassis.

ASSEMBLY - The front panel cutouts should be made first by using the full-scale template provided. Note that this template is laid out symmetrically about the center knob and above the bottom mounting surface of the rubber shock mounts. Locate and drill the mounting holes

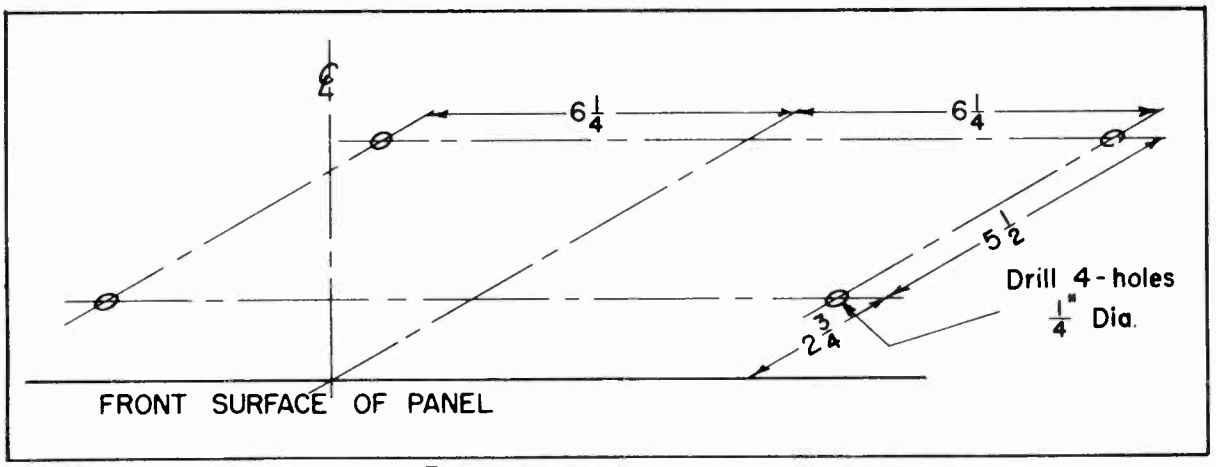


Fig. 4. Mounting Hole Layout

The types and orientation of the tubes used in the tuner permit satisfactory operation regardless of mounting position.

Other considerations in layout are accessibility to the rear for interconnections, sufficient clearance from any metal for the AM loop to insure good pickup, and ample air space above the tubes to prevent any deterioration to a finished wooden cabinet top from tube heat. Where the spacing is necessarily close, this effect may be alleviated with a thin sheet of bright metal tacked beneath the vulnerable surface.

VENTILATION - Considerable ventilation must be provided to carry off the heat dissipated by the receiver. A

as shown in Figure 4. Insert the studs on the rear of the dial escutcheon into the two 3/16-in. diameter holes in the panel and secure the escutcheon with the two #6-32 nuts provided.

Remove the five press-fit knobs (use a steady outward pull on the knob) and the four mounting screws and washers found in the chassis mounts. Locate the chassis so that a 1/16-in. clearance exists between the inward flange of the escutcheon and the dial glass. Replace the four washers and screws and finally press the five knobs on their shafts, noting that the lettering uppermost on the channel knob indicates the channel selected for use.

ELECTRICAL CONNECTIONS

AUDIO SYSTEM - A 5000-ohm audio output socket, furnishing up to 3 volts at less than 1% distortion from 20 to 20,000 cps., (refer to Figure 2) and the associated shielded audio cable have been provided to connect the RC10 into new or existing audio systems. Any audio amplifier, such as the Craftsmen RC2 Hi-Fi Amplifier, with an input impedance of 25,000 ohms or greater can be operated from this output. At the 5000 ohm level as much as 30 feet of cable can be used for inter-connection without undue loss of high-frequency response. The audio amplifier power line cord should be plugged into the AC outlet on the rear of the chassis so that the amplifier can be turned on simultaneously with the FM-AM tuner.

A connection directly to the FM and AM detectors is available at the receptacle labeled Detector Output. This output bypasses the entire RC10 audio system including the tone and volume controls and is useful for feeding recording amplifiers which have preset tone compensation while using the Amplifier Output for monitoring purposes. An audio amplifier with self-contained controls can also be fed from the Detector Output and the Phono or Television inputs will operate thru the band switch even with the tuner power OFF.

Extreme care should be taken with connections to the Detector Output receptacle. Only low capacity cable should be used to prevent loss in high-frequency response.

input, and an input marked "S" connected internally through a switch to either the FM or AM input.

For reception in local or urban localities, loop the flexible ribbon lead (furnished) around the cabinet interior and connect to terminals marked "S" and "G". Finally connect the shorting link between the blank terminal and "G". This ribbon lead forms a low-noise, low-impedance AM loop antenna and should be formed into the largest one or two turn loop practical in the available cabinet space. This loop also provides FM reception since terminal "S" is internally switched to the FM input.

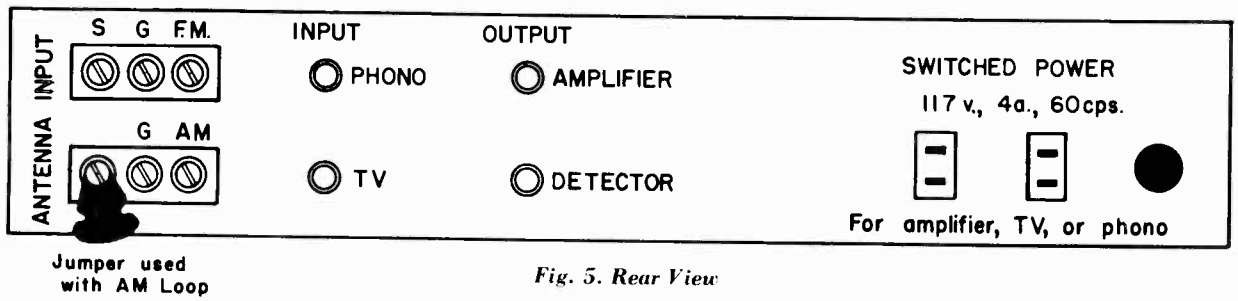


Fig. 5. Rear View

PHONO - Either a reluctance or crystal type phono cartridge may be connected into the Phono input receptacle. For use with a crystal cartridge the pre-amplifier selector switch lever located on top of chassis should be thrown toward the gang - in which position the phono pre-amplifier is bypassed and not in the circuit. When using a reluctance type cartridge (GE, Pickering), throw the switch knob away from the gang to add 24db. gain and bass compensation as shown in Figure 3.

Installations remote from stations might require outside antennas of a more elaborate nature. Connect exterior FM antennas to terminals "FM" and "G", or if to be used as an AM aerial as well, then connect to "S" and "G". Long-line AM aerials can be connected directly to the high-impedance input "AM" (link disconnected) or if brought down through a low-impedance line, to "AM" with the link in place.

Finally for installations including television, it is usually convenient to use the TV antenna to feed the FM

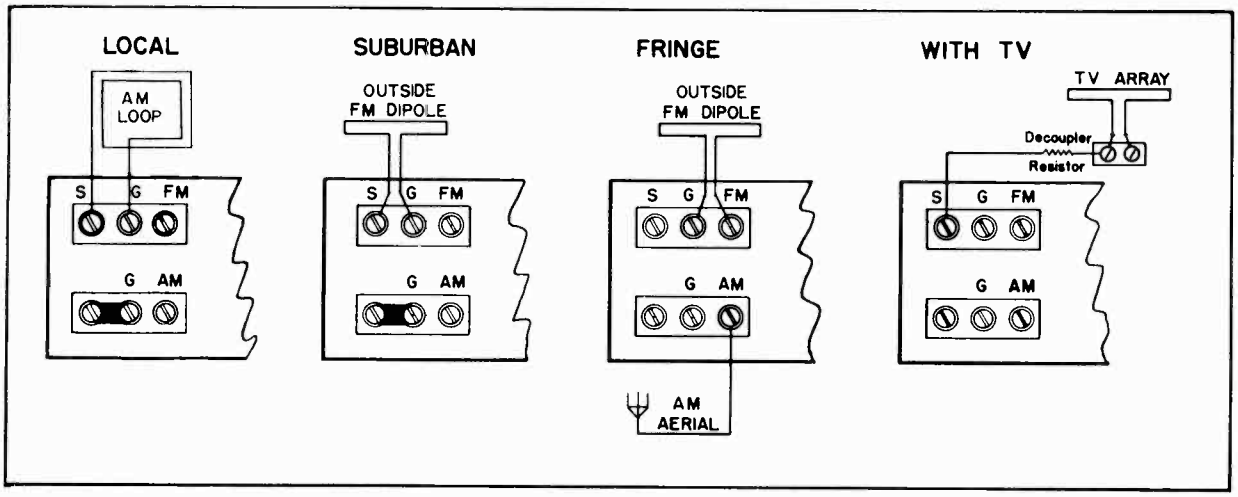


Fig. 6. Antenna Arrangements

ANTENNA - Several antenna arrangements are possible for use with the RC10 as shown in Figure 6 and the best arrangement will depend on the particular installation. The various antenna arrangements make use of AM inputs at either high-impedance (shorting link removed) or low-impedance (shorting link in place), a single-ended FM and AM signals as well. This can be done by coupling lightly (through a 1000-ohm resistor) from terminal "S" to one side of the TV antenna terminals.

TELEVISION - Complete suggested interconnections for installations including television are shown in Figure 7. In general, it is desirable not to operate a television unit while attempting either FM or AM reception because of the various types of interference that may be encountered.

MODEL RC10,
Tuner

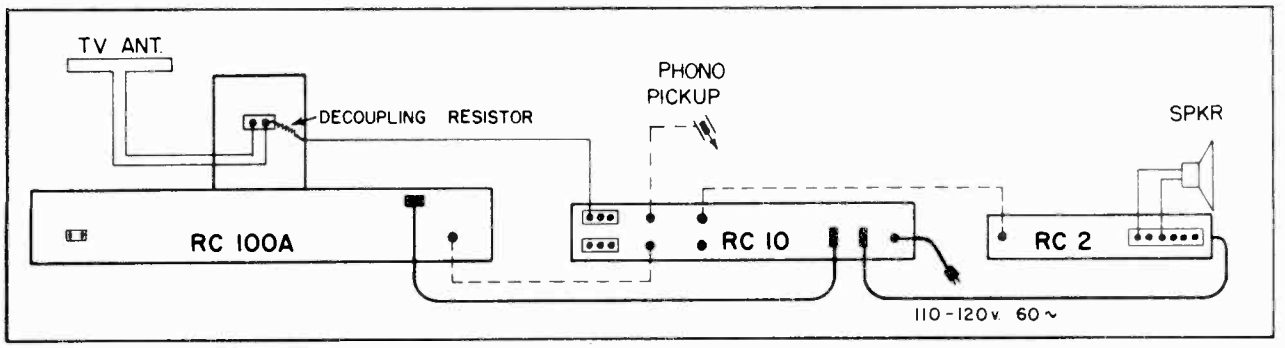
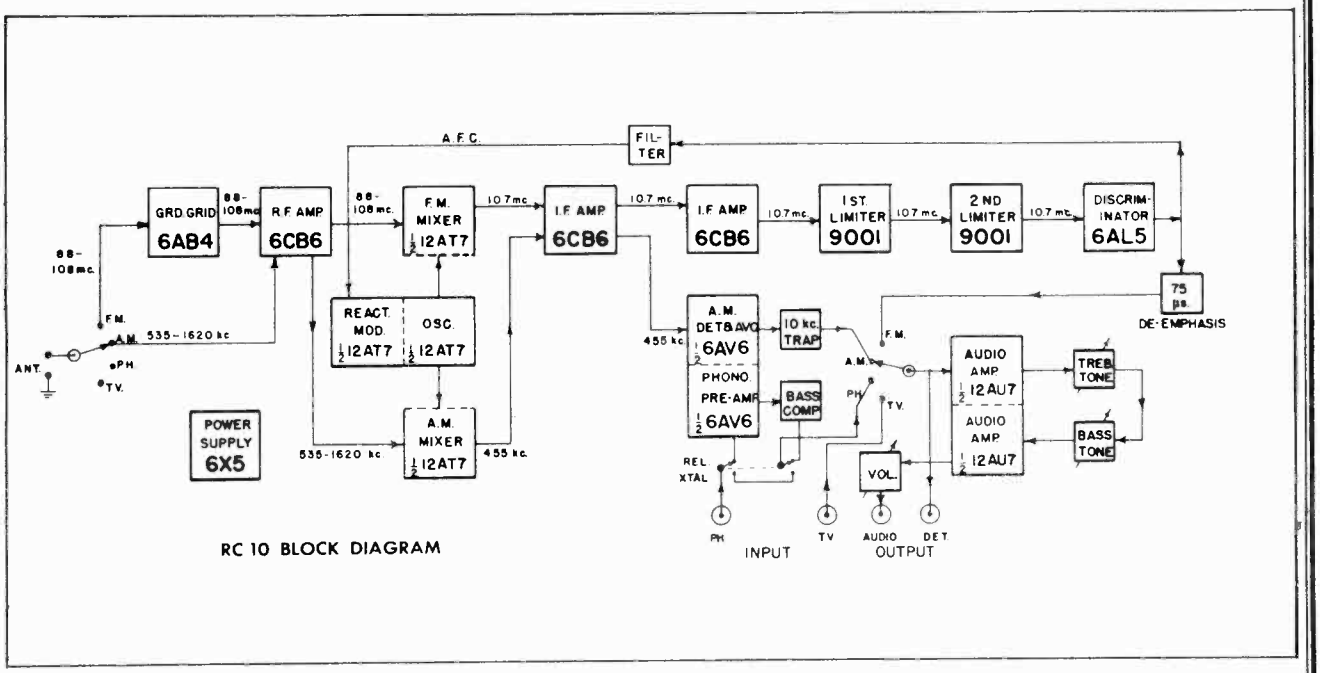
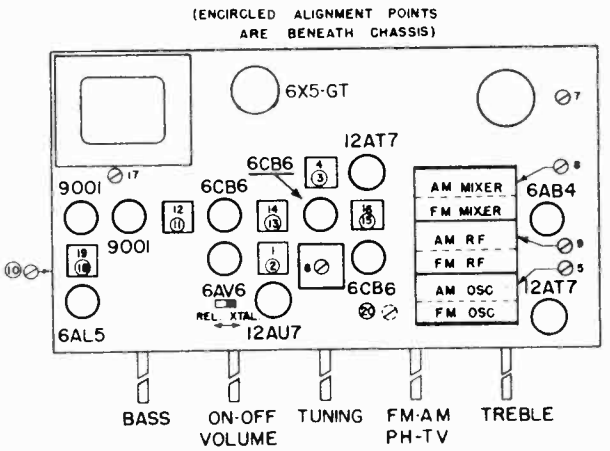
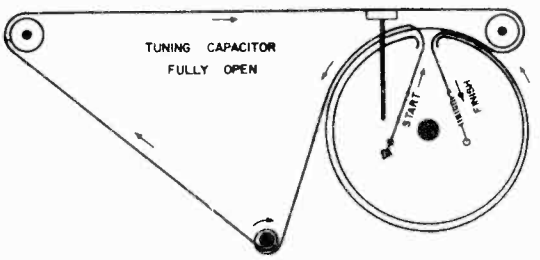


Fig. 7. Typical Installation Interconnections







DIAL CORD DRIVE

MODEL RC10,
Tuner

SERVICE INSTRUCTIONS

ALIGNMENT PROCEDURE To set pointer, completely mesh tuning capacitor and align pointer with last reference mark at low frequency end of dial. Volume control should be in maximum clockwise position. Output of signal generator should be no higher than necessary to obtain an output reading. Low side of signal generator and indicating meter should be connected directly to chassis at all times. Use an insulated screw driver witn 1/16" thick blade for adjusting IF transformers.

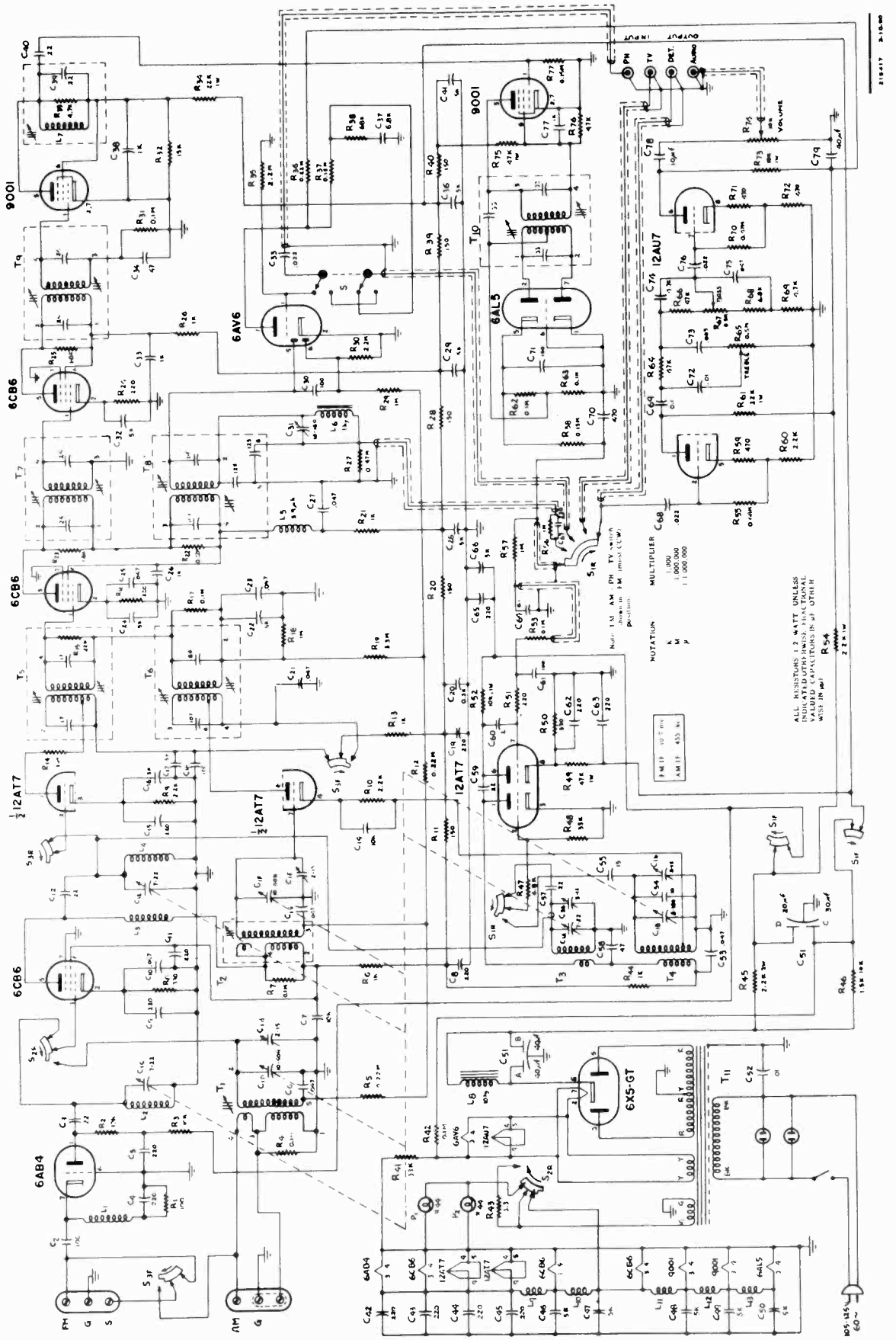
		SIGNAL GENERATOR			Dial Setting	Indicating Meter	Adjust	Indication
		Coupling	Freq.	Modulation				
AM Alignment	1	.01 µf to pin 7 of 12AT7	455 kc	400 cps AM	Point of no interference	AC voltmeter at Audio output	1, 2, 3, & 4	Maximum deflection
	2	220 µµf to AM ant. input	1500 kc	400 cps AM	1500 kc	Same as above	5	Maximum deflection
	3	Same as above	600 kc	400 cps AM	Tune for maximum response	Same as above	6 & 7	Maximum deflection
	4	Same as above	1400 kc	400 cps AM	Tune for maximum response	Same as above	8 & 9	Maximum deflection
	5	Repeat Steps 3 & 4						
	6	Same as above	1400 kc	10 kc AM	Tune for maximum response	Same as above	10	Null
FM Alignment	7	.01 µf to pin 2 of 12AT7	10.7 mc	None	Point of no interference	Neg. DC VTVM across R31	11, 12, 13, 14, 15, & 16	Maximum deflection
	8	Same as above	10.7 mc	None	Same as above	Neg. DC VTVM at junction R62 & R63	17 & 18	Maximum deflection
	9	Same as above	10.7 mc	None	Same as above	Zero center scale DC VTVM at Det. Output	19	Zero volts between positive & negative reading
	10	270Ω Carbon to FM ant. input	106 mc	400 cps FM ± 25 kc	106 mc	AC voltmeter at Audio output	20	Maximum deflection
	11	Same as above	98 mc	Same as above	Tune for maximum response	Same as above	Contract or extend coil spring 21, 22, & 23	Maximum deflection
	12	Same as above	98 mc	400 cps FM ± 250 kc	98 mc	Vertical input oscilloscope at Det. Output		Check symmetry of 'S' shape

TUBE	FUNCTION	PIN 1	PIN 2	PIN 3	PIN 4	PIN 5	PIN 6	PIN 7	PIN 8	PIN 9
6AB4	FM RF Preamp.	95	0	6.3*	0	0	0	0.5	--	--
6CB6	RF Amp.	0	2.5	0	6.3*	137	137	0	--	--
12AT7	Mixer	145	0	2.8	0	0	0	-1.0	0	6.3*
12AT7	Osc. & AFC	137	-2.0	0	0	0	156	0	2.1	6.3*
6CB6	1st IF Amp.	-0.2	1.9	6.3*	0	140	140	0	--	--
6CB6	2nd IF Amp.	0	2.0	6.3*	0	142	142	0	--	--
9001	1st Limiter	-0.4	0	6.3*	0	40	40	0	--	--
9001	2nd Limiter	-0.6	0	6.3*	0	36	36	0	--	--
6AL5	FM Det.	0	-2.0	6.3*	0	0	0	-1.8	--	--
6AU6	AM Det. & Phono Amp.	-0.83	0	55	55	-0.5	-0.7	77	--	--
12AU7	Audio Amp.	85	7.2	10	55	5	115	2.3	5.2	55
6X5GT	Rectifier	--	55	207*	--	207*	--	55	235	--

VOLTAGE READINGS

*AC Voltages measured at 1,000 ohms per volt.
DC Voltages measured with vacuum-tube voltmeter.
Socket connections are shown as bottom views.
Measured values are from socket pin to common negative.
Line voltage maintained at 117 volts for voltage readings.
Measurements are with no signal applied and bandswitch in FM position.

MODEL RC10,
Tuner



MODEL RC10,
Tuner

REPLACEMENT PARTS LIST

Part No.	Ref. No.	Description
		CAPACITOR, Ganged Tuning
17S007	C1A	7-22 μμf, FM Osc. Tuning
	C1B	8-180 μμf, AM Osc. Tuning
	C1C	7-22 μμf, FM RF Tuning
	C1D	10-408 μμf, AM RF Tuning
	C1E	7-22 μμf, FM Conv. Tuning
	C1b	2-15 μμf, AM Osc. Mica Trimmer
	C1d	2-15 μμf, AM RF Mica Trimmer
	C1f	2-15 μμf, AM Conv. Mica Trimmer
		CAPACITORS, Ceramic
17X401	C56	3-13 μμf. 500v. Trimmer
18X612	C60	2 μμf, 500v, Tubular
18X601	C54	10 μμf, 500v, Tubular
18X602	C55	15 μμf, 500v, Tubular
18X603	C3, C12, C39, C40, C57, C59	22 μμf, 500v, Tubular
18X604	C34, C58	47 μμf, 500v, Tubular
18X605	C2, C18, C30, C61, C71	100 μμf, 500v, Tubular
18X306	C70	470 μμf, 500v Tubular
18X614	C26, C33, C38, C77	1000 μμf, 500v, Tubular
18X620	C4, C5, C8, C9, C11, C15, C19, C42, C43, C44, C45, C62, C63 C65, C67	220 μμf, 500v, Tubular
18X701	C16, C17, C20, C22, C24, C28, C29, C32, C36, C41, C46, C47, C48, C49, C50, C66	5000 μμf, 500v, Disc
18X704	C7, C14	10,000 μμf, 500v, Disc
		CAPACITORS, Mica
17X205	C31	10-160 μμf, 300v Trimmer
18X407	C74	.0047 μf. 300v Molded
18X412	C37	.0068 μf, 300v Molded
18X414	C73	.0033 μf, 300v Molded
		CAPACITORS, Paper
18Z214	C35, C68, C76	.022 μf, 400v Tubular
18Z234	C72	.01 μf, 400v Tubular
18Z236	C52	.01 μf, 600v Molded
18Z254	C6, C10, C13, C21, C23, C25, C27, C53	.047 μf, 400v Tubular
18Z264	C64, C69	0.1 μf, 400v Tubular
18X308	C75	.047 μf ± 10% 400v Tubular
		CAPACITORS, Electrolytic
18S022	C51A	40 μf, 300v, Twist Mount
	C51B	40 μf, 300v
	C51C	30 μf, 300v
	C51D	20 μf, 300v
18X023	C78	10 μf, 250v, Tubular
18X027	C79	40 μf, 250v, Tubular
		PILOT LIGHTS
15X003	P1, P2	#44 Pilot Light

Part No.	Ref. No.	Description
		COILS & CHOKES
5X017	L7	FM Limiter Coil
5A209	L4	FM Conv. Coil
5A210	L2	FM RF Coil
5S402	L3, L5	3.5 μh Choke
5X406	L9, L10, L11, L12, L13	1.0 μh Choke
5X409	L1	0.2 μh Choke
19S405	L8	10 h, Filter Choke
19S406	L6	1 h, 10 kc Filter
		RESISTORS
23Z030	R47	6.8 ohm, 1/2w, Carbon
23Z031	R14	68 ohm, 1/2w, Carbon
23Z002	R1	100 ohm, 1/2w, Carbon
23Z012	R11, R20, R28, R39, R40	150 ohm, 1/2w, Carbon
23Z022	R16, R24, R51	220 ohm, 1/2w, Carbon
23Z032	R8, R50	330 ohm, 1/2w, Carbon
23Z042	R59, R71, R72	470 ohm, 1/2w, Carbon
23Z003	R6, R13, R21, R26, R44	1 K ohm, 1/2w, Carbon
23Z023	R9, R10, R60	2.2 K ohm, 1/2w, Carbon
23Z043	R33, R69	4.7 K ohm, 1/2w, Carbon
23Z033	R68	6.8 K ohm, 1/2w, Carbon
23Z004	R2, R3	10 K ohm, 1/2w, Carbon
23Z014	R32	15 K ohm, 1/2w, Carbon
23Z024	R15	22 K ohm, 1/2w, Carbon
23Z034	R41, R48	33 K ohm, 1/2w, Carbon
23Z044	R64, R65, R76	47 K ohm, 1/2w, Carbon
23Z064	R23, R25, R38	68 K ohm, 1/2w, Carbon
23Z005	R4, R7, R17, R31, R42, R53, R62, R63	0.1 M ohm, 1/2w, Carbon
23Z015	R37, R58, R77	0.15 M ohm, 1/2w, Carbon
23Z025	R5, R12, R22, R36	0.22 M ohm, 1/2w, Carbon
23Z045	R27, R70	0.47 M ohm, 1/2w, Carbon
23Z065	R55	0.68 M ohm, 1/2w, Carbon
23Z006	R18, R29, R56, R57	1 M ohm, 1/2w, Carbon
23Z026	R30, R35	2.2 M ohm, 1/2w, Carbon
23Z036	R19	3.3 M ohm, 1/2w, Carbon
23Z123	R54	2.2 K ohm, 1w, Carbon
23Z104	R52, R73	10 K ohm, 1w, Carbon
23Z124	R34, R61	22 K ohm, 1w, Carbon
23Z144	R49, R75	47 K ohm, 1w, Carbon
23Z223	R45	2.2 K ohm, 2w, Carbon
23X504	R15	3.3 ohm, 1/2w, Wire Wound
23X511	R46	1.5 K ohm, 10w, Wire Wound
23S715	R67	0.5 M ohm, 1/4w, Carbon Pot.
23S716	R74	10 K ohm, 1/4w, Carbon Pot. & Sw
23S717	R65	0.5 M ohm, 1/4w, Carbon Pot.
		SWITCHES
4S003	S1, 2, 3	4 Pos., 3 section Band Switch
4S007	S	DPDT Slide Switch
		TRANSFORMERS
5X005	T10	10.7 mc FM Discriminator
5X013	T5	10.7 mc FM Converter
5X014	T7, T9	10.7 mc FM IF
5X015	T6	455 kc AM Converter
5X016	T8	455 kc AM IF
5A208	T3	FM Osc.
5A218	T4	AM Osc.
5A219	T2	AM RF
5A220	T1	Power Transformer

MODEL FM5

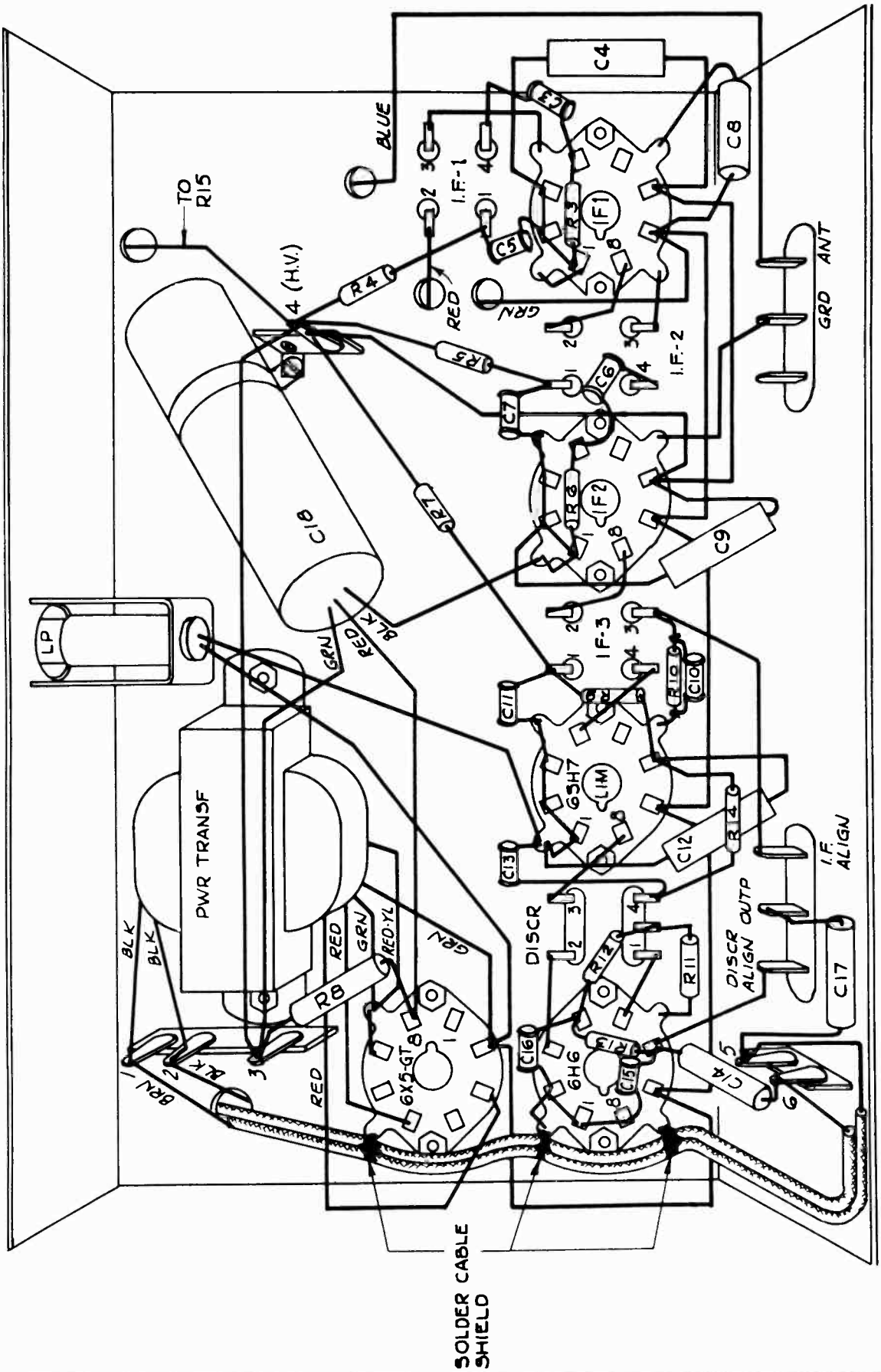
METER METHOD OF ALIGNMENT

EQUIPMENT: A STANDARD SIGNAL GENERATOR CAPABLE OF FREQUENCIES ILLUSTRATED BELOW AND A VACUUM TUBE VOLTMETER (VTVM) AS AN OUTPUT INDICATOR. IF NO VTVM IS AVAILABLE USE AS HIGH A RESISTANCE PER VOLT DC VOLTMETER (PREFERABLY 20,000 OHMS PER VOLT METER). THE LOW SIDE OF THE SIGNAL GENERATORS AND METER SHOULD BE CONNECTED FOR ALL ALIGNMENTS TO CHASSIS GROUND OR PIN 2 OF THE TERMINAL STRIP.

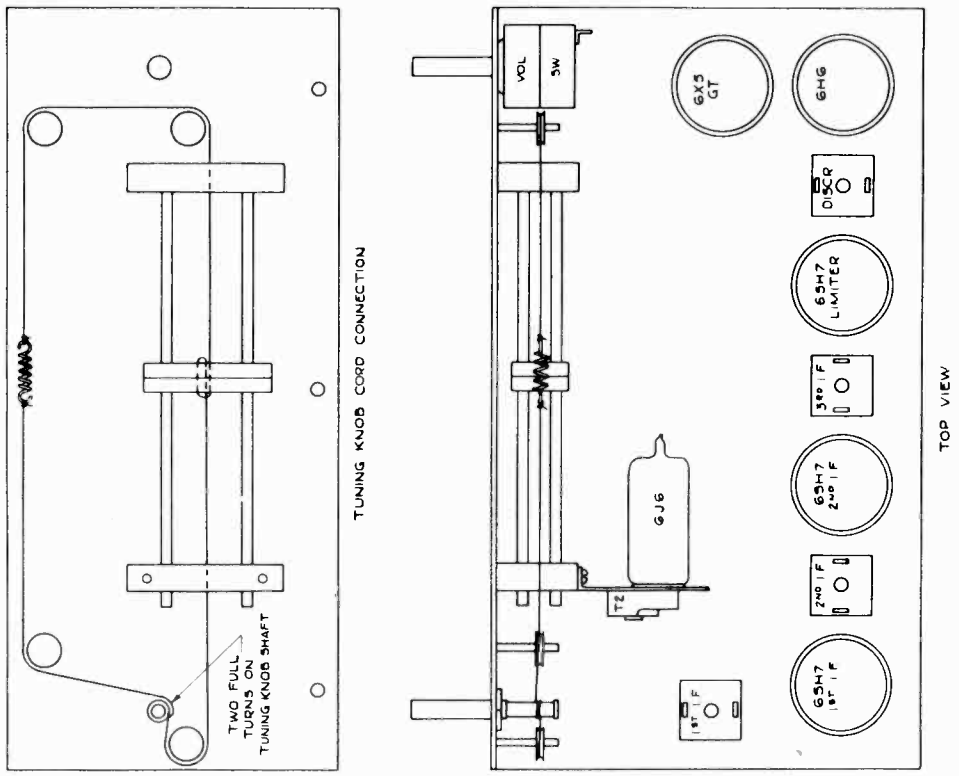
STEPS	TUNER DIAL SETTING	SIGNAL GENERATOR FREQUENCY	CONNECT SIGNAL GENERATOR TO	DUMMY ANTENNA	METER CONNECTION	ADJUST TRIMMERS OR COILS IN ORDER SHOWN	REMARKS
A	HIGH FREQ. END OF BAND	10.7 MC UNMODULATED	PIN 4 GRID OF 6SH7 2ND IF AMPLIFIER	0.02MF	TO PIN 3 OF TERMINAL STRIP	S5, S6	MAXIMUM DEFLECTION OF METERS
B	"	"	PIN 4 GRID OF 6SH7 1ST IF	"	"	S3, S4	" " "
C	"	"	PIN 6 RF GRID OF 6J6 CONVERTER TUBE	"	"	S1, S2	" " "
D	98 MC	98 MC UNMODULATED	PIN 1 OF TERMINAL STRIP	500 OHM CARBON RESISTOR	"	T1, T2	MAXIMUM DEFLECTION ON METER HOOK DIAL WHILE TUNING T2 FOR MAXIMUM
E	105 MC	105 MC UNMODULATED	"	"	"	T1	MAXIMUM DEFLECTION ON METER
F	TUNE DIAL FOR MAXIMUM METER DEFLECTION	90 MC UNMODULATED	"	"	"	OSC.COIL	IF DIAL READING IS TOO LOW ACCORDING TO THE FREQ. OF THE GENERATOR EXPAND OSC.COIL SLIGHTLY; IF DIAL READING IS HIGH, COMPRESS COIL. IN EITHER CASE IT IS FOR MAX. DEFLECTION. REPEAT STEPS E & F FOR BEST POSSIBLE INDICATION.
G	REPEAT STEP D FOR FINAL ADJUSTMENTS OF R-F AND OSCILLATOR SECTIONS						
H	HIGH FREQ. END OF BAND	10.7 MC UNMODULATED	PIN 4 GRID OF 6SH7 LIMITER	0.02MF	TO JUNCTION OF T11 & R12 DISCRIMINATOR LEAD RESISTORS	S8	MAXIMUM DEFLECTION ON METER.
I	"	"	"	"	TO PIN 6 OF TERMINAL STRIP	S7	ZERO DEFLECTION (ZERO READING)* ON METER

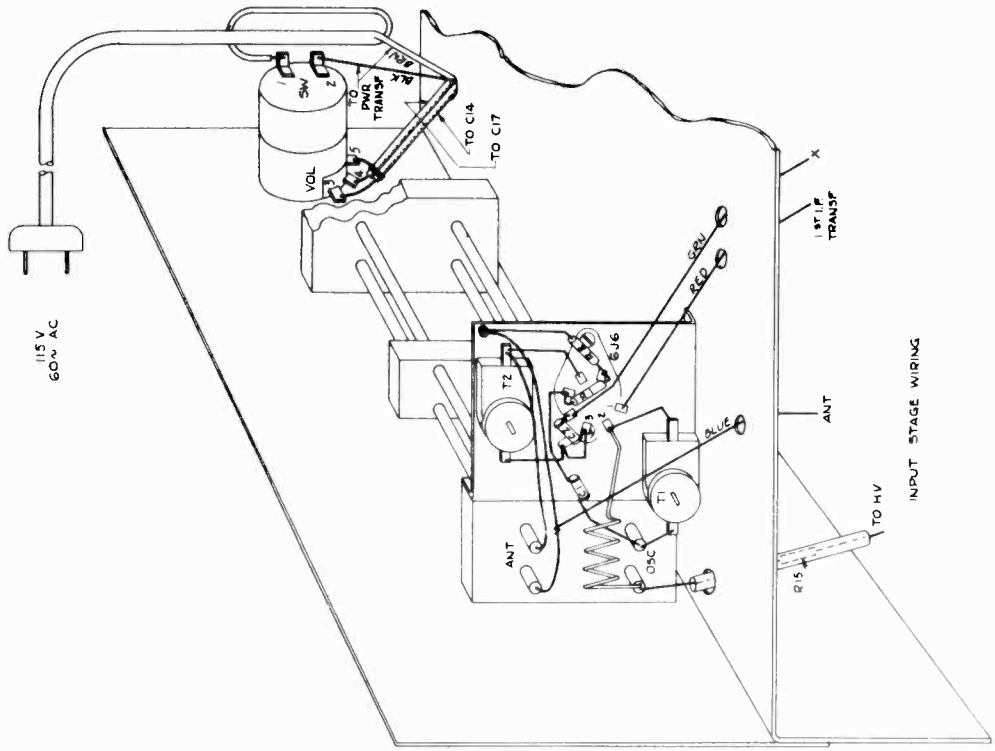
* VARY SIGNAL GENERATOR BY A SIMILAR AMOUNT ON EITHER SIDE OF THE 10.7 MC SIGNAL AND OBSERVE METER. THE READINGS SHOULD BE THE SAME BUT OF OPPOSITE POLARITY. IF THEY ARE NOT, REPEAT STEPS H AND I IN THE ORDER INDICATED.

MODEL FM5

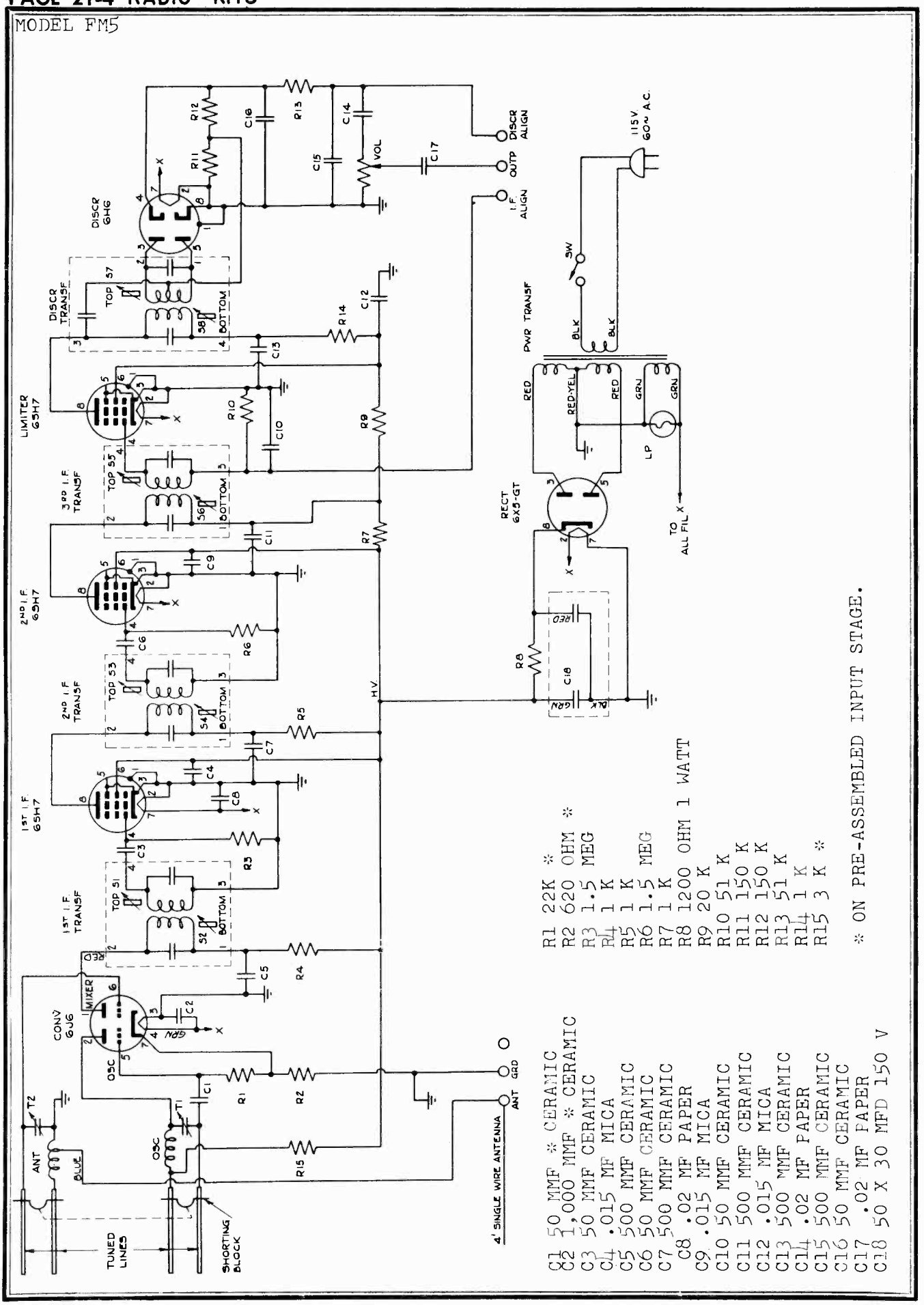


MODEL FM5





MODEL FM5

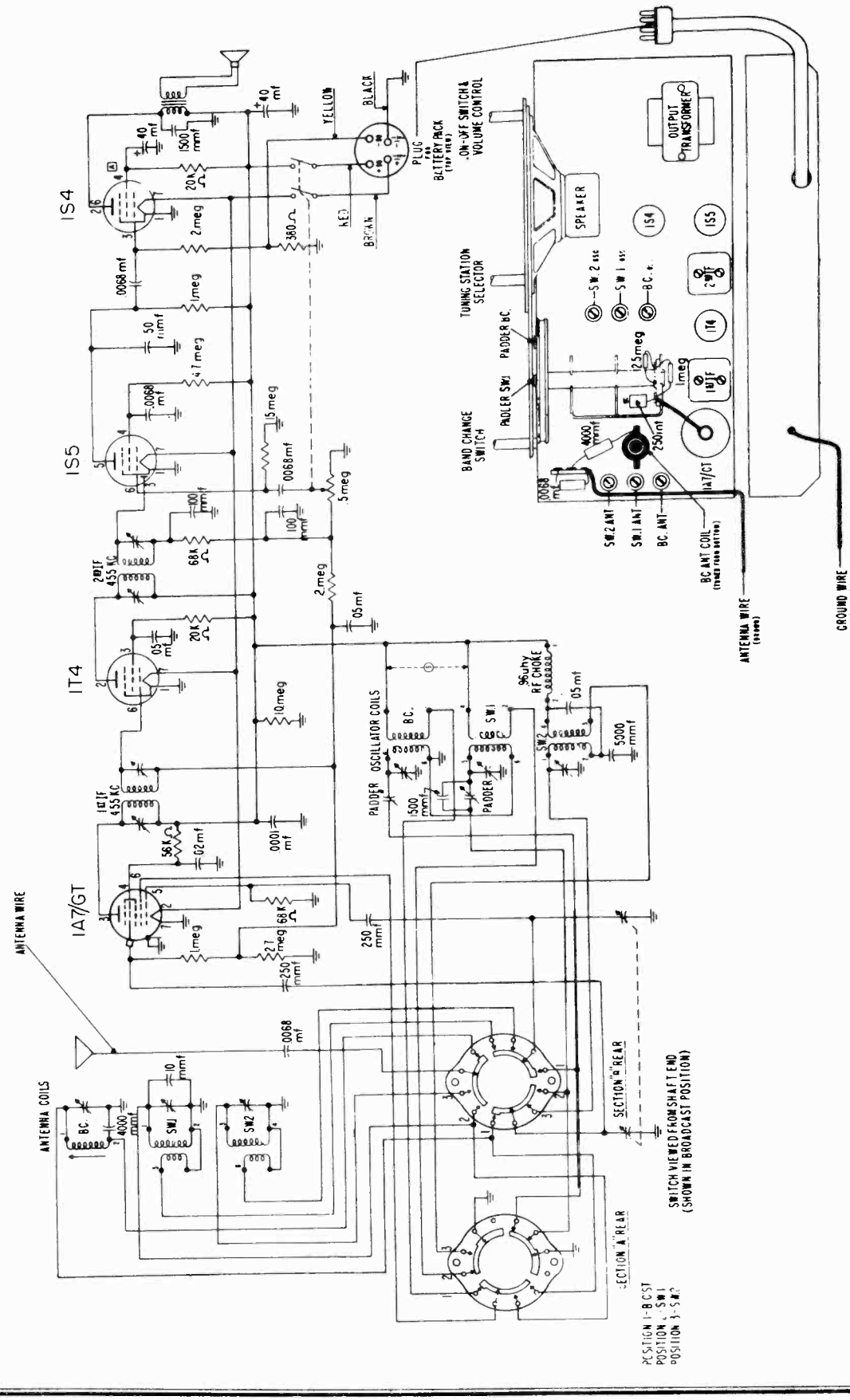


C1 50 MMF * CERAMIC
C2 1,000 MMF * CERAMIC
C3 50 MMF CERAMIC
C4 .015 MF MICA
C5 500 MMF CERAMIC
C6 50 MMF CERAMIC
C7 500 MMF CERAMIC
C8 .02 MF PAPER
C9 .015 MF MICA
C10 50 MMF CERAMIC
C11 500 MMF CERAMIC
C12 .015 MF MICA
C13 500 MMF CERAMIC
C14 .02 MF PAPER
C15 500 MMF CERAMIC
C16 50 MMF CERAMIC
C17 .02 MF PAPER
C18 50 X 30 MFD 150 V

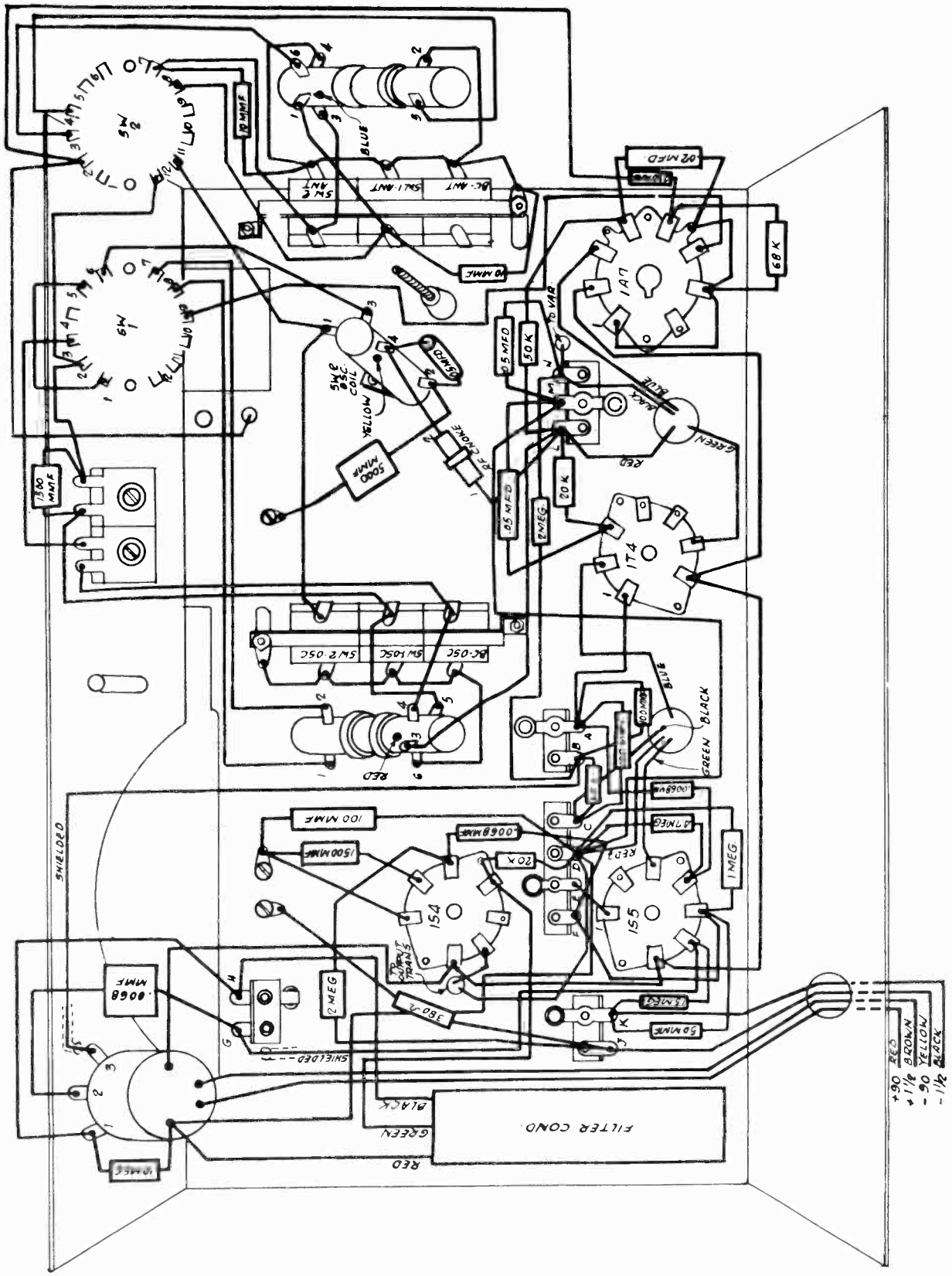
R1 22K *
R2 620 OHM *
R3 1.5 MEG
R4 1 K
R5 1 K
R6 1.5 MEG
R7 1 K
R8 1200 OHM 1 WATT
R9 20 K
R10 51 K
R11 150 K
R12 150 K
R13 51 K
R14 1 K
R15 3 K *

* ON PRE-ASSEMBLED INPUT STAGE.

MODEL 4T3X



MODEL 4T3X



SPECIFICATIONS

MODEL 120 IS A 5-TUBE SUPERHETRODYNE RECEIVER DESIGNED FOR USE ON AC OR DC POWER-LINES. IT HAS THREE TUNING RANGES.

MODEL 120L: FOR USE ON POWER LINES OF 100-125 VOLTS DC OR AC, 50-100 CYCLES.

MODEL 120R: FOR USE ON POWER LINES OF 135-275 VOLTS DC OR AC, 50-100 CYCLES.

VOLTAGES: THE MODEL 120R MUST BE ADAPTED TO THE LINE VOLTAGE BY INSERTING THE CORRECT BALLAST RESISTOR INTO THE BALLAST SOCKET AS FOLLOWS:

ON POWER LINES OF 135 - 165 VOLTS, USE 150 V. BALLAST RESISTOR (G8.323.00)

ON POWER LINES OF 185 - 230 VOLTS, USE 200 V. BALLAST RESISTOR (G8.323.01)

ON POWER LINES OF 225 - 275 VOLTS, USE 250 V. BALLAST RESISTOR (G8.323.02)

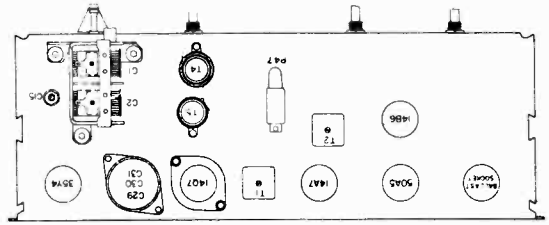
BEFORE INSERTING BALLAST RESISTOR INTO SOCKET, THE LEADS BETWEEN PINS 4 AND 1 AND 5 AND 8 OF BALLAST SOCKET MUST BE REMOVED.

(FOR THE POSITION OF THE BALLAST SOCKET, SEE LABEL UNDERNEATH THE CABINET)

TUBES: CONVERTER - 14Q7, I.F. AMPLIFIER - 14A7, SECOND DETECTOR AND FIRST AUDIO - 14B6, AUDIO OUTPUT - 50A5, RECTIFIER - 35Y4.

TUNING RANGES:

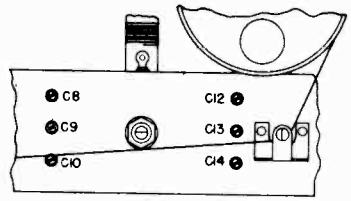
MW, 166.7 - 560 M (1800-535 kc/s) LOCAL
MW, 166.7 - 560 M (1800-535 kc/s) DISTANT
2nd SW 166.7 - 50 M (6.0-1.8 Mc/s)
1st SW 50 - 16.6 M (18.0-6.0 Mc/s)



INTERMEDIATE FREQUENCY: 455 kc/s.

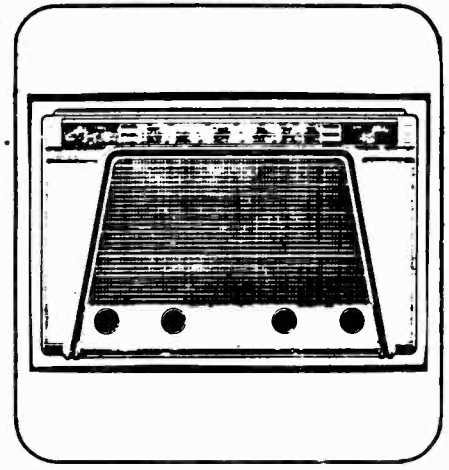
AUDIO OUTPUT: 1 WATT (D. 10%).

LOUDSPEAKER: PERMANENT MAGNET DYNAMIC: DIAMETER 15 CENTIMETERS (6 INCHES).



ANTENNA AND GROUND: FOR BEST RESULTS, AN OUTSIDE ANTENNA IS NECESSARY. A SECURE GROUND CONNECTION SHOULD BE MADE TO A GROUNDING PLATE BURIED IN DAMP GROUND, OR TO A COLD WATER PIPE.

PHONOGRAPH CONNECTION: A PHONOGRAPH JACK IS PROVIDED ON THE REAR OF THE CHASSIS.



POWER CONSUMPTION: APPROX. 35 WATTS AT 117 VOLTS.

CABINET DIMENSIONS:

WIDTH - 38.7 cm (15-1/4")
HEIGHT - 25.2 cm (9-15/16")
DEPTH - 19.0 cm (7-1/2")

WEIGHT: APPROXIMATELY 5 KGS. (11 POUNDS)

CAUTION: *THE POSSIBILITY OF ACCIDENTAL ELECTRICAL SHOCK HAS BEEN REDUCED BY ELIMINATING A DIRECT CONNECTION BETWEEN THE LINE AND THE CHASSIS. USE A LINE SEPARATING TRANSFORMER WHILE WORKING ON THE RECEIVER ESPECIALLY IF THE LINE VOLTAGE IS 150 VOLTS OR HIGHER.*

MODEL 120
120L, 120R

ALIGNMENT OF RECEIVER

Equipment Required

SIGNAL GENERATOR: CAPABLE OF SUPPLYING MODULATED FREQUENCIES BETWEEN 455 kc/s AND 20 Mc/s.

OUTPUT INDICATOR: A HIGH RESISTANCE A.C. VOLTMETER OR A POWER OUTPUT METER OR ANY OUTPUT INDICATING DEVICE.

Preliminary

REMOVE THE CHASSIS FROM THE CABINET BY UNSCREWING THE FOUR SCREWS, TWO OF WHICH ARE ON THE REAR CHASSIS APRON AND TWO ON THE DIAL POINTER SUPPORT BRACKET. THE TWO LEADS THAT CONNECT THE LOUDSPEAKER TO THE CHASSIS ARE LONG ENOUGH TO PERMIT REMOVAL OF THE CHASSIS WITHOUT DISTURBING THE SPEAKER.

Equipment Connections

OUTPUT INDICATOR: IF A POWER OUTPUT METER IS USED, ADJUST IT FOR FOUR OHMS IMPEDANCE AND CONNECT IT ACROSS SPEAKER VOICE COIL. IF AN A.C. VOLTMETER IS USED IT MAY BE CONNECTED ACROSS THE VOICE COIL, BUT A MORE SATISFACTORY INDICATION WILL BE OBTAINED IF IT IS CONNECTED BETWEEN THE PLATE PRONG OF THE OUTPUT TUBE AND THE CHASSIS, BEING SURE TO USE A .05 mfd. CAPACITOR IN SERIES WITH THE LEAD WHICH IS CONNECTED TO THE PLATE PRONG. REGULATE THE OUTPUT ATTENUATOR OF THE SIGNAL GENERATOR UNTIL A MID-SCALE READING IS OBTAINED ON A LOW SCALE OF THE OUTPUT METER. KEEP THE RECEIVER VOLUME CONTROL IN MAXIMUM OUTPUT POSITION. WHEN OUTPUT INDICATION INCREASES REGULATE SIGNAL GENERATOR ATTENUATOR TO RESTORE THE ORIGINAL INDICATION. THIS REDUCES A.V.C. ACTION AND PERMITS MORE ACCURATE ADJUSTMENTS.

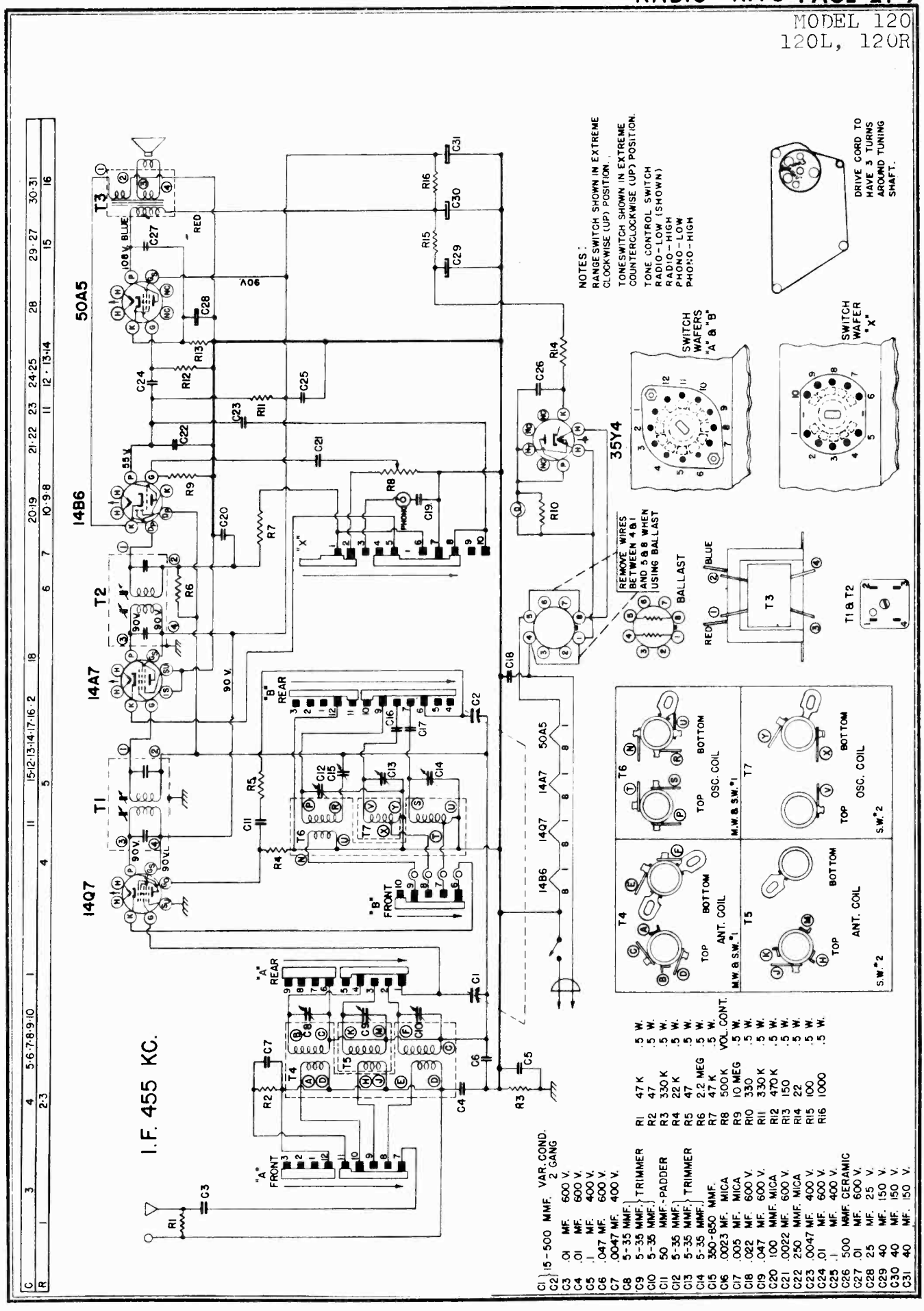
SIGNAL GENERATOR: WHEN ADJUSTING THE I.F. SLUGS, CONNECT THE SIGNAL GENERATOR GROUND LEAD TO "B-". FOR ALL OTHER ADJUSTMENTS CONNECT THIS LEAD TO THE GROUND WIRE (BLACK) IN REAR OF CHASSIS.
USE A NON-METALLIC TOOL FOR THE ADJUSTMENT OF THE I.F. SLUGS. ALWAYS BE SURE TO USE THE SPECIFIED CAPACITOR OR RESISTOR IN SERIES WITH THE SIGNAL GENERATOR OUTPUT LEAD.

Alignment Procedure

	SIGNAL GENERATOR		RECEIVER			
OPERATION STEP	OUTPUT CONNECTION TO RECEIVER	FREQUENCY	RANGE SWITCH	TUNING CAPACITOR	SEE NOTES	ADJUST IN STATED ORDER
1	TO 14Q7 CONTROL GRID THROUGH .1 MFD CAPACITOR	455 kc/s	M.W.	MAX. CAP.	"A"	ADJUST I.F. TRANSFORMER SLUGS TO MAXIMUM OUTPUT
2	TO ANTENNA CONTACT THROUGH 200 MFD CAPACITOR - MICA	1810 kc/s	M.W.	MIN. CAP.		C12 FOR MAXIMUM OUTPUT
3	TO ANTENNA CONTACT THROUGH 200 MFD CAPACITOR - MICA	1500 kc/s	M.W.	1500 kc/s	"B"	C8 FOR MAXIMUM OUTPUT
4	TO ANTENNA CONTACT THROUGH 200 MFD CAPACITOR - MICA	600 kc/s	M.W.	600 kc/s	"B"	PADDER C13 FOR MAXIMUM OUTPUT WHILE ROCKING GANG, REPEAT C12,C8,C13
5	THROUGH 400 OHM CARBON RESISTOR TO ANTENNA LEAD	6.1 Mc/s	2nd S.W.	MIN. CAP.	"C"	C19 FOR MAXIMUM OUTPUT
6	THROUGH 400 OHM CARBON RESISTOR TO ANTENNA LEAD	5.0 Mc/s	2nd S.W.	5.0 Mc/s	"B" & "D"	C9 FOR MAXIMUM OUTPUT
7	THROUGH 400 OHM CARBON RESISTOR TO ANTENNA LEAD	18.1 Mc/s	1st S.W.	MIN. CAP.	"C"	C15 FOR MAXIMUM OUTPUT
8	THROUGH 400 OHM CARBON RESISTOR TO ANTENNA LEAD	17.0 Mc/s	1st S.W.	17.0 Mc/s	"B"	C10 FOR MAXIMUM OUTPUT
9	CHECK TRACKING AT 6.5 Mc/s					

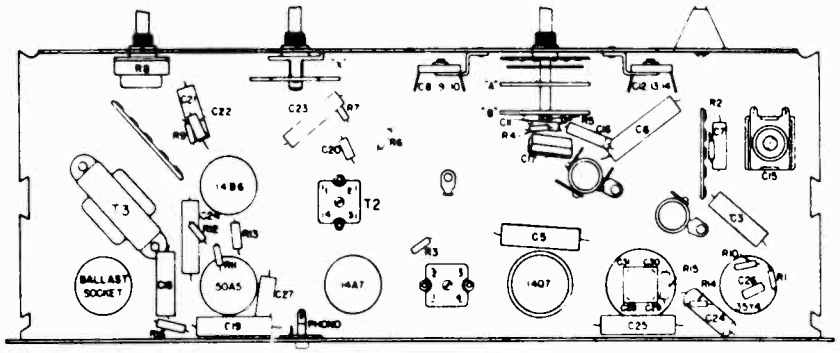
NOTE A: SIGNAL GENERATOR GROUND LEAD TO "B-" AS EXPLAINED ABOVE.
NOTE B: TUNE GANG TO SIGNAL GENERATOR.
NOTE C: ADJUST OSCILLATOR TRIMMER TO MAXIMUM CAPACITY POSITION (CLOCKWISE). TURN SCREW COUNTER-CLOCKWISE UNTIL SECOND PEAK IS OBTAINED. THIS WILL BE THE SMALLER CAPACITANCE POSITION.
NOTE D: CHECK TRACKING AT 2 Mc/s.

MODEL 120
120L, 120R



MODEL 120
120L, 120R

LOCATION OF PARTS



REPLACEMENT PARTS

WHEN ORDERING ALWAYS GIVE DESCRIPTION OF PART, CODE NUMBER AND MODEL NUMBER OF RECEIVER.

CAPACITORS

C1-C2	2 GANG VARIABLE CONDENSER			G9.117.27
C3-C4 C24-C27	.01	Mfd.	600 V	G8.396.39
C5-C25	.1	Mfd.	600 V	G8.396.30
C6-C19	.047	Mfd.	600 V	G8.396.43
C7-C23	.0047	Mfd.	600 V	G8.396.22
C8	5-35	Mmfd.	ANT. TRIMMER	G8.393.26
C9	5-35	Mmfd.	ANT. TRIMMER	
C10	5-35	Mmfd.	ANT. TRIMMER	
C11	50	Mmfd.	MICA	G8.451.06
C12	5-35	Mmfd.	OSC. TRIMMER	G8.393.25
C13	5-35	Mmfd.	OSC. TRIMMER	
C14	5-35	Mmfd.	OSC. TRIMMER	
C15	350-850	Mmfd.	PADDER	G8.394.35
C16	.0023	Mfd.	MICA	G8.450.30
C17	.005	Mfd.	MICA	G8.450.27
C18	.022	Mfd.	600 V	G8.396.41
C20	100	Mmfd.	CERAMIC	G8.395.13
C21	.0022	Mfd.	600 V	G8.396.35
C22	250	Mmfd.	CERAMIC	G8.395.09
C26	500	Mmfd.	CERAMIC	G8.395.12
C28	25	Mfd.	25 V	G8.386.35
C29	40	Mfd.	150 V	
C30	40	Mfd.	150 V	
C31	40	Mfd.	150 V	

RESISTORS

R1-R7	47KK	1/2 W	G8.314.21
R2-R5	47	1/2 W	G8.314.04
R3-R11	330 K	1/2 W	G8.314.26
R4	22 K	1/2 W	G8.314.41
R6	2.2 MEG	1/2 W	G8.314.31
R8	500 K	VOLUME CONTROL	G8.600.43
R9	10 MEG	1/2 W	G8.314.35
R10	330	.5 W	G8.314.09
R12	470 K	1/2 W	G8.314.27
R13	150	1 W	G8.317.15
R14	22	1 W	G8.314.02
R15	100	1 W	G8.319.06
R16	1000	1 W	G8.319.12
150 V	BALLAST RESISTOR		G8.323.00
200 V	BALLAST RESISTOR		G8.323.01
250 V	BALLAST RESISTOR		G8.323.02

COILS AND TRANSFORMERS

L1 L2	ANTENNA COIL ASSEMBLY (SW BAND #2)	G9.136.24
L3 L4 L5 L6	ANTENNA COIL ASSEMBLY (MW / SW Band #1)	G9.136.17
L7 L8	OSC. COIL ASSEMBLY (SW BAND #2)	G9.139.19
L9 L10	OSC. COIL ASSEMBLY (MW / SW BAND #1)	G9.139.27
T1	1st I.F. ASSEMBLY	G9.142.67
T2	2nd I.F. ASSEMBLY	G9.142.68
T3	OUTPUT TRANSFORMER	G9.142.58

MISCELLANEOUS PARTS

BACK COVER	G8.516.41
CABINET	G9.000.28
DIAL GLASS	G5.926.13
DIAL LAMP #47	G8.002.08
DIAL LIGHT SOCKET	G8.001.31
DIAL POINTER	G5.926.06
DIAL DIFFUSION SCREEN	G5.925.26
DIAL DIFFUSION SPRING	G5.600.02
DIAL POINTER DRIVE CORD	G8.104.10
DIAL DRIVE CORD SPRING	G5.600.03
KNOB, WITH DOT	G5.483.41
KNOB, PLAIN	G5.483.42
LINE CORD	W7.052.60
LOCTAL SOCKET	G8.550.95
OCTAL SOCKET	G8.532.07
PHONOGRAPH CONNECTOR	G8.532.13
SPEAKER	G9.107.36
SPEAKER BAFFLE ASSEMBLY	G9.117.71
SPEAKER GRILLE CLOTH	G9.109.28
TONE CONTROL AND PHONO SWITCH	G8.703.22
WAVERANGE SWITCH	G8.703.21

Battery Operation

For operation on batteries it is necessary that the line cord plug be inserted into the changeover plate (see Fig. 2). The receiver may now be turned on by rotating the on-off switch to right and advancing volume control knob. (See Fig. 1).

Electric Operation

To operate this set on AC, open the rear of the case by pulling it back at the top. Then remove the plug from the plate where it has been inserted, (See Fig. 2) and pull the cord all the way out of the case. Close the rear of the case, making sure that the cord runs out through the slot at the side. Pulling out the plug from the changeover plate disconnects the batteries automatically and connects the receiver for power line operation.

Electric Operation 110-125 Volts AC-DC

For operation on the above voltage and current, the line switch MUST BE IN THE CORRECT POSITION 110-125V. AC-DC. Pin plug must always be in the BLACK socket. (See Fig. 2).

Electric Operation 210-230 Volts AC

For operation on the above voltage and current, the line switch MUST BE IN THE 210-230V. AC POSITION, and the pin plug must always be in the BLACK socket. (See Fig. 2).

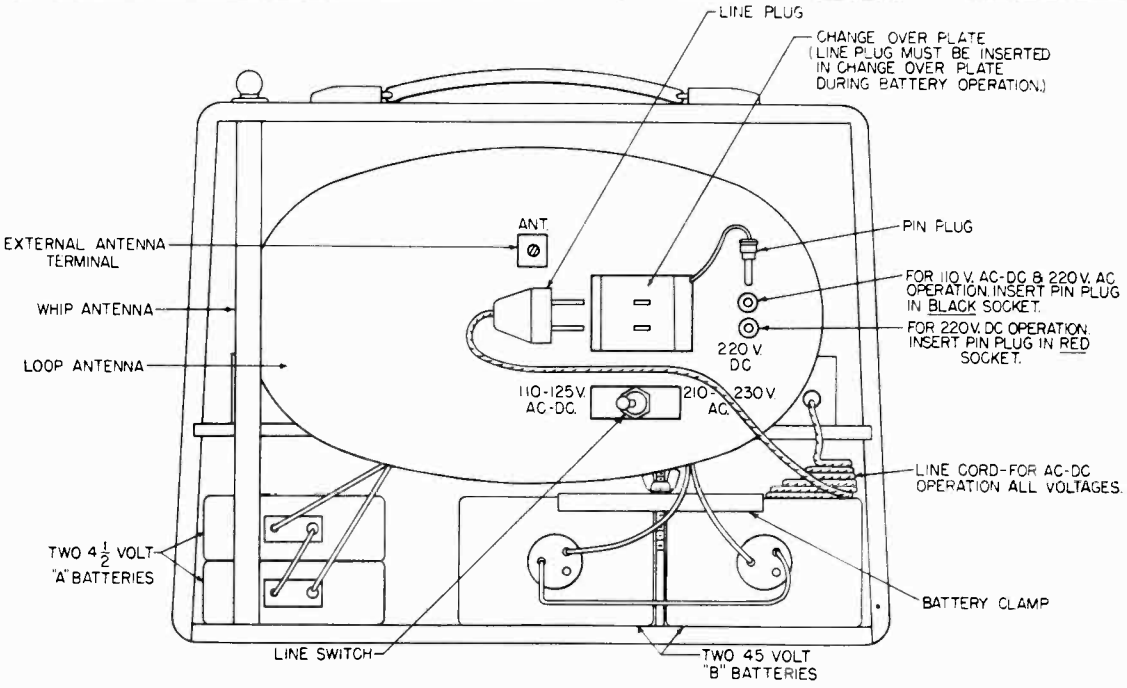


FIG. 2

MODEL P-175

ALIGNMENT INSTRUCTIONS

USE BATTERY POWER WHENEVER POSSIBLE.

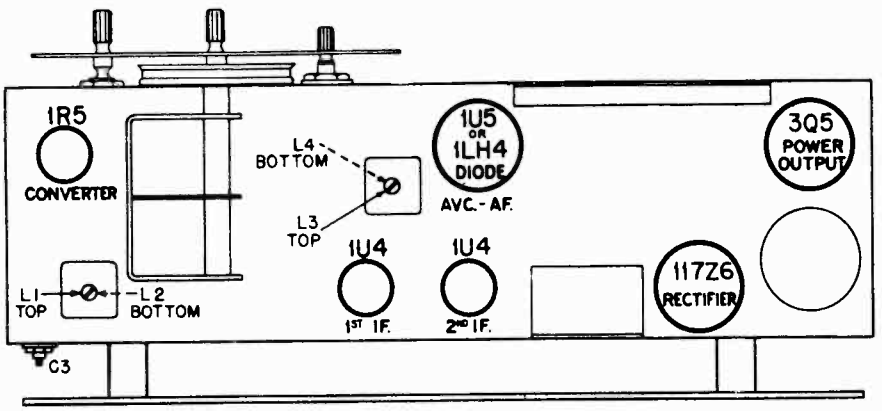
SET VOLUME CONTROL AT MAXIMUM VOLUME AND OUTPUT FROM SIGNAL GENERATOR NO HIGHER THAN NECESSARY TO OBTAIN OUTPUT READING.

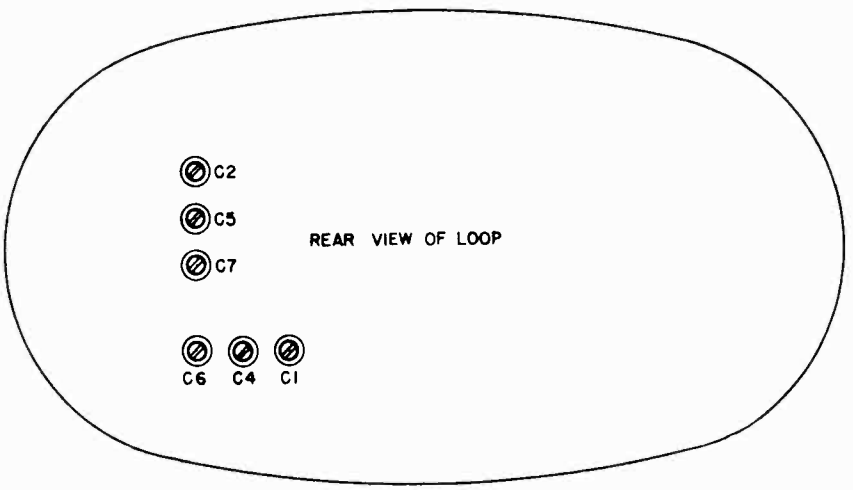
TUNING RANGE:- BROADCAST 535 - 1650 KC TROPIC 2.1 - 6.5 MC INTERNATIONAL 6.4 - 18.3 MC

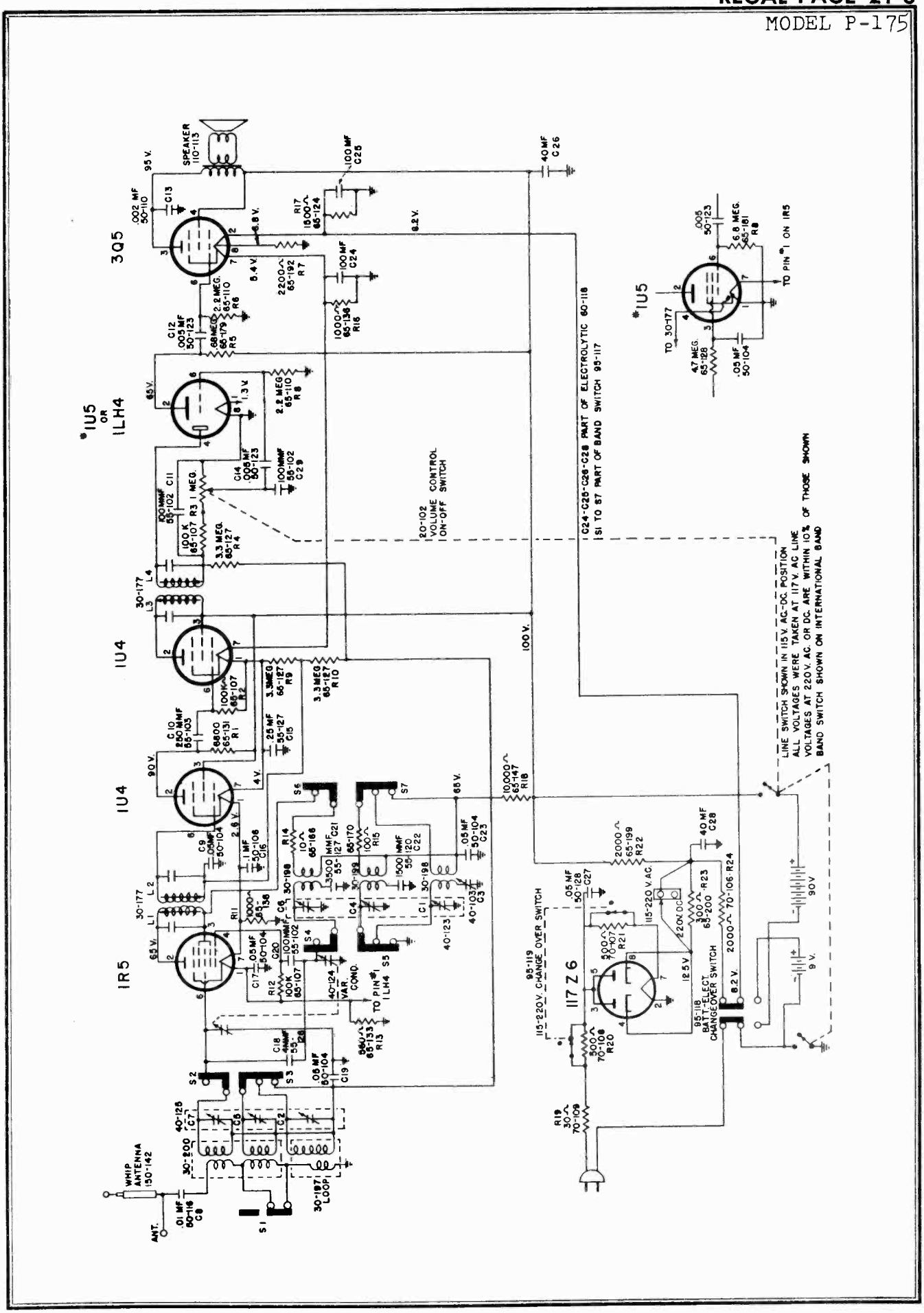
USE INSULATED ALIGNMENT SCREWDRIVER FOR ADJUSTING.

DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	BAND SWITCH POSITION	SIGNAL GEN. FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1 MFD	RF SECTION OF VARIABLE CONDENSER	BC	455 KC	1650 KC	ACROSS VOICE COIL	L1, L2, L3, L4	ADJUST FOR MAXIMUM
200 MMFD	ANTENNA TERMINAL	BC	1650 KC	FULLY OPEN	" "	C1	" " "
200 MMFD	" "	BC	1500 KC	1500 KC	" "	C2	" " "
200 MMFD	" "	BC	600 KC	600 KC	" "	C3	ROCK GANG & ADJUST FOR MAXIMUM OUTPUT RECHECK C1 & C2 ADJUSTMENTS AS GIVEN
400 ∧	" "	TROPIC	6.5 MC	FULLY OPEN	" "	C4	*ADJUST FOR MAXIMUM
400 ∧	" "	TROPIC	6.0 MC	6.0 MC	" "	C5	+ROCK GANG & ADJUST FOR MAXIMUM OUTPUT
400 ∧	" "	INTERNATIONAL	18.3 MC	FULLY OPEN	" "	C6	*ADJUST FOR MAXIMUM
400 ∧	" "	INTERNATIONAL	17 MC	17 MC	" "	C7	+ROCK GANG & ADJUST FOR MAXIMUM OUTPUT

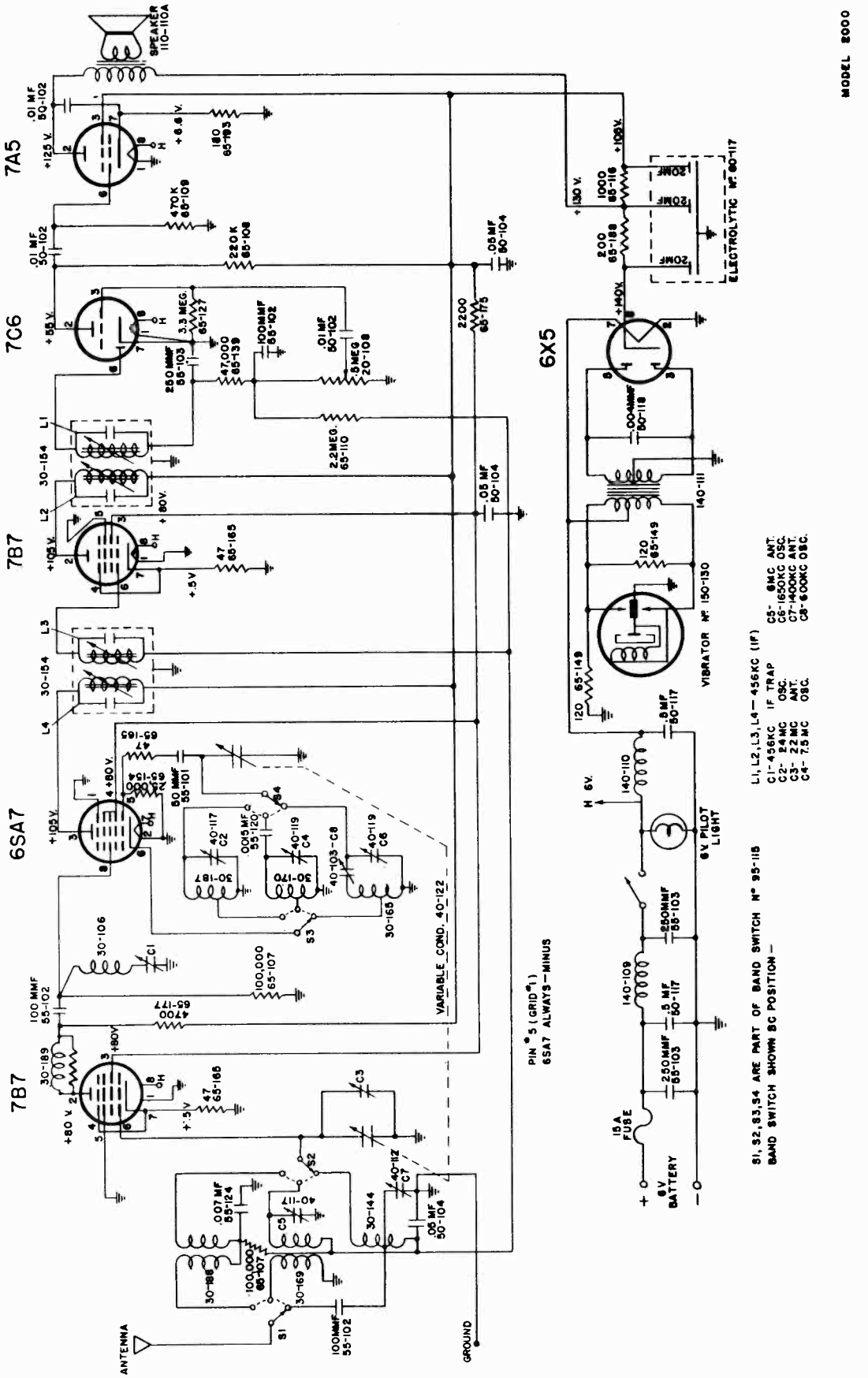
* IF TWO PEAKS CAN BE OBTAINED, USE ONE WITH TRIMMER SCREW FURTHER OUT.
+ " " " " " " " " " " " " " " IN







MODEL 2000



MODELS 2000, 4963

ALIGNMENT INSTRUCTIONS

SET VOLUME CONTROL AT MAXIMUM VOLUME AND OUTPUT FROM SIGNAL GENERATOR NO HIGHER THAN IS NECESSARY TO OBTAIN OUTPUT READING

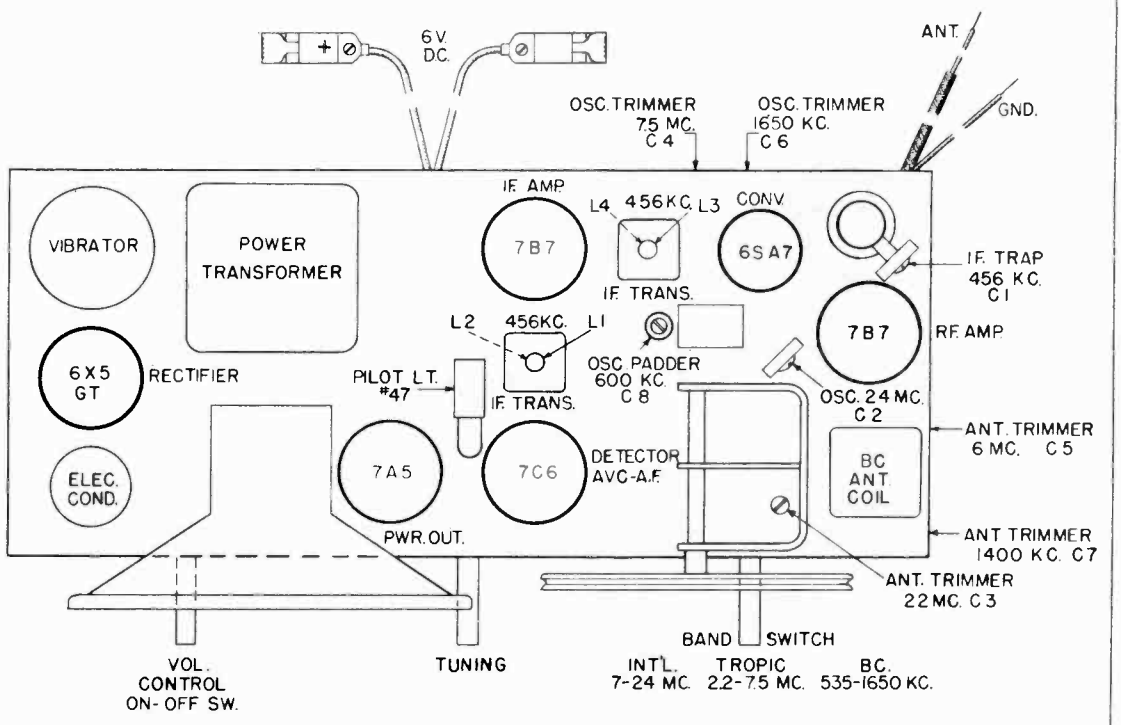
TUNING RANGE

BROADCAST 540-1650 KC , INTERNATIONAL - 7-24 MC , TROPIC 2.3-7.4 MC

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING ON	BAND SWITCH POSITION	SIGNAL GEN'R FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1	.1 MFD	PIN #6 ON 7B7 (RF) SOCKET	B C	456 KC	FULL OPEN	ACROSS VOICE COIL	L1, L2, L3, L4,	ADJUST FOR MAXIMUM OUTPUT
2	.1 MFD	PIN #6 ON 7B7 (RF) SOCKET	B C	456 KC	FULL OPEN	ACROSS VOICE COIL	C1	ADJUST FOR MINIMUM OUTPUT
3	200 OHMS	ANTENNA LEAD	INTERNATIONAL	24MC	FULL OPEN	ACROSS VOICE COIL	* C2	AJUST FOR MAXIMUM OUTPUT
4	200 OHMS	ANTENNA LEAD	INTERNATIONAL	20 MC	APPROX. 20 MC	ACROSS VOICE COIL	C3	ROCK GANG & ADJUST FOR MAXIMUM OUTPUT C3 ADJUSTMENT
5	200 OHMS	ANTENNA LEAD	TROPIC	7.4 MC	FULL OPEN	ACROSS VOICE COIL	+ C4	ADJUST FOR MAXIMUM OUTPUT
6	200 OHMS	ANTENNA LEAD	TROPIC	6 MC	APPROX. 6 MC	ACROSS VOICE COIL	C5	ADJUST FOR MAXIMUM OUTPUT
7	50 MMFD	ANTENNA LEAD	B C	1650 KC	FULL OPEN	ACROSS VOICE COIL	C6	ADJUST FOR MAXIMUM OUTPUT
8	50 MMFD	ANTENNA LEAD	B C	1400 KC	APPROX. 1400 KC	ACROSS VOICE COIL	C7	ADJUST FOR MAXIMUM OUTPUT
9	50 MMFD	ANTENNA LEAD	B C	600 KC	600 KC	ACROSS VOICE COIL	C8	ROCK GANG & ADJUST FOR MAXIMUM OUTPUT

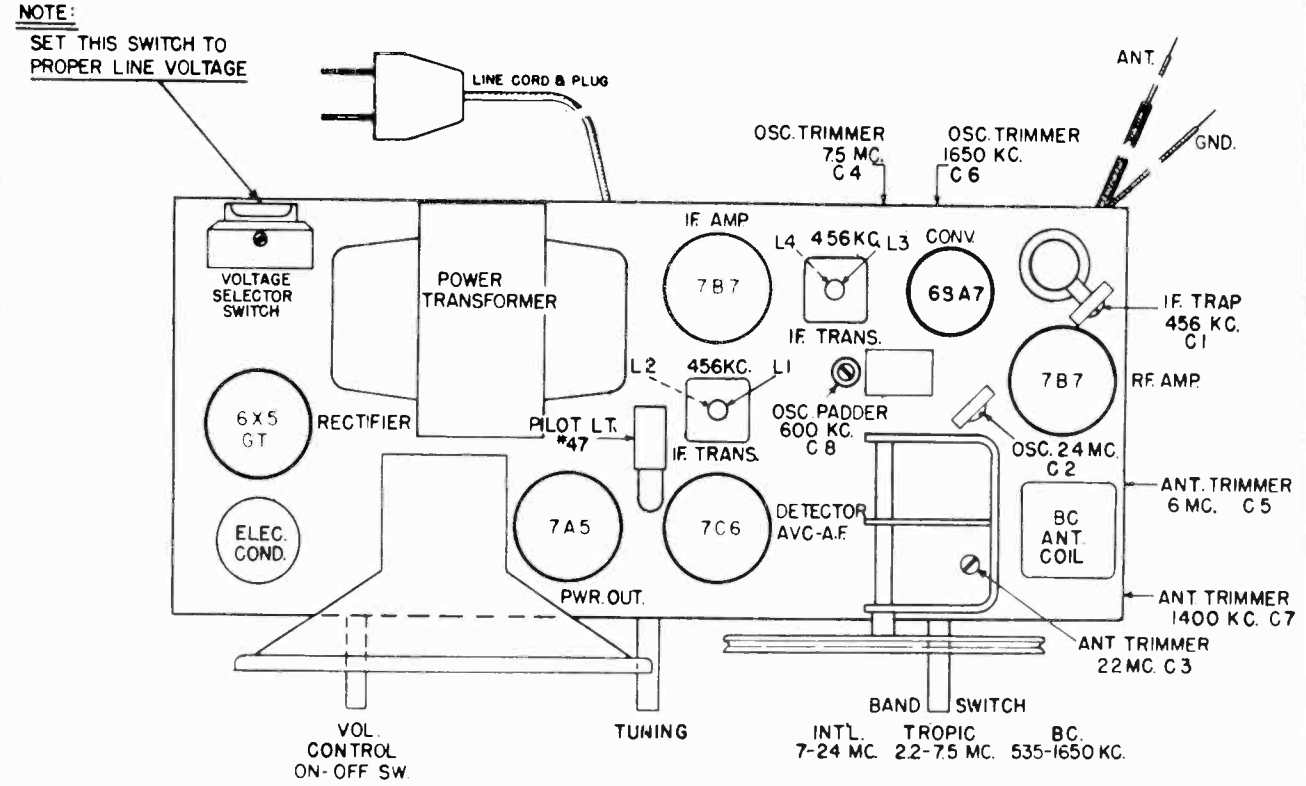
* IF TWO PEAKS CAN BE OBTAINED, USE ONE WITH TRIMMER SCREW FURTHER IN.
+ IF TWO PEAKS CAN BE OBTAINED, USE ONE WITH TRIMMER SCREW FURTHER OUT.

2000
4963



TUBE LAYOUT — MODEL 2000

MODELS 2000,
4963



TUBE LAYOUT — MODEL 4963

MODEL 4963