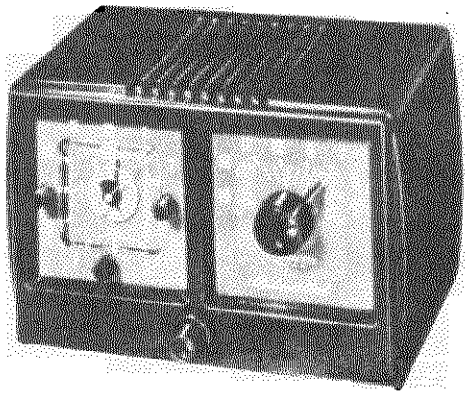


Figure 1. Automatic Clock-Controlled Radio.

DESCRIPTION

Model 621 Automatic Clock-Controlled Radio is a six tube superheterodyne receiver contained in brown or ivory plastic cabinet. A PM (Permanent Magnet) speaker is used with the radio and the tubes are standard miniature tubes. The clock is a Telechron movement and is equipped with alarm.

SPECIFICATIONS:

Overall Dimensions:
Height — 6 inches
Width — 5 inches
Length — 10 inches
Weight — 6 pounds

Electrical Rating:
Line Voltage — 110-120 AC 60 cycle only
Power Consumption — 28 watts

Tuning Frequency Range:
540 to 1620 KC

Intermediate Frequency:
455 KC

Electrical Power Output (Maximum):
1.7 watts

Loudspeaker:
Type — permanent magnet
Outside Cone Diameter — 4 inches
Voice Coil Impedance — 3.2 ohms @ 400 C.P.S.*
Magnet Rating — .68 Oz Alnico V.

**NOTE: Production runs were made using an 83009 speaker of 6 ohms impedance at 400 C.P.S. In those cases, T1 was 2500 to 6 ohm output, Part No. 89433.*

TUBE COMPLEMENT:

NO.	TUBE	FUNCTION
V-1	6BJ6	R-F Amplifier
V-2	12BE6	Frequency Converter
V-3	6BJ6	I-F Amplifier
V-4	12AV6	2nd Detector — 1st Audio
V-5	50C5	Power Amplifier
V-6	35W4	Rectifier

SPECIAL SERVICE INFORMATION:

Resistances measured are D-C. Allow a 10% toleranc between values given and readings made.

1st I-F Coil:
Primary — 17.5 ohms
Secondary — 17.5 ohms

2nd I-F Coil:
Primary — 12.2 ohms
Secondary — 11.5 ohms

Oscillator Coil:
Primary -- 1 ohm
Secondary — 5.5 ohms

I-F Trap:
Primary — 31.5 ohms

Ferro Loop:
Resistance — 1 ohm

SOCKET VOLTAGES:

The voltages shown on Schematic Diagram, figure 4 were measured under the following conditions:

1. D.C. Voltages with a vacuum tube voltmeter fro socket contacts to B minus.
2. Filament voltages measured with a 1,000 ohms pe volt A.C. meter across the filament of each tube.
3. Volume and Tone Controls maximum.
4. 117 volts A.C. line.
5. Voltages are subject to a 10% variation.

For voltages, see figure 4.

OSCILLATOR CATHODE VOLTAGES:

Measured with an A-C vacuum tube voltmeter (input in pedance above 10 megohms) at 117 volts — A-C line.

1500 KC — 1.0 VAC
1000 KC — 1.0 VAC
750 KC — 1.1 VAC
540 KC — 1.1 VAC

OPERATING INSTRUCTIONS

GENERAL:

This clock-radio operates on 110-120 volt, 60-cycle alternating current only.

The clock movement is self-starting and will begin operating when the cord is plugged into the proper outlet. The correct time is set by means of the Time Set Control at the right rear of the chassis. *Turn the Time Set Control in a Clockwise Direction Only as Viewed From the Rear.*

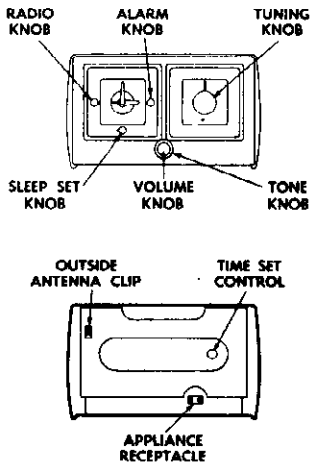


Figure 2. Controls and Connections.

AWAKE TO MUSIC AND BUZZER ALARM:

1. Adjust the radio for normal operation.
2. Pull out Alarm Knob and set the small, rotating alarm dial for the desired awakening time. Turn Alarm Knob in counterclockwise direction only.
3. Turn the Radio Knob to the "AUTO" position.*

**NOTE: Music will turn on exactly as set. Buzzer Alarm will sound ten minutes later as a reminder.*

4. Push Alarm Knob in if buzzer alarm is not desired.

TO OPERATE THE RADIO ONLY:

1. Turn the Radio Knob to the "ON" position.
2. Turn the Volume Knob to about middle position.
3. Select desired station with the Tuning Knob.
4. Adjust the Volume and Tone Knobs as desired.

TO AWAKEN TO BUZZER ALARM ONLY:

1. Pull out Alarm Knob and set the small, rotating alarm dial for desired awakening time. Turn Alarm Knob in counterclockwise direction only.
2. Turn Radio Knob to "OFF" position.
3. Allow Alarm Knob to remain in the out position.

FOR SLUMBER MUSIC UP TO 60 MINUTES DURATION:

1. Adjust the radio for normal operation.
2. Turn the Sleep Set Knob fully clockwise. Radio will operate 60 minutes, then shut off automatically. For playing time less than 60 minutes, set knob accordingly.
3. Turn Radio Knob to "AUTO" position.

CLOCK REPLACEMENT

GENERAL:

When the clock becomes defective, do not attempt to repair it; replace it.

Tools required to replace clock are: soldering iron and ¼-inch spin-tite wrench.

CLOCK REPLACEMENT PROCEDURE:

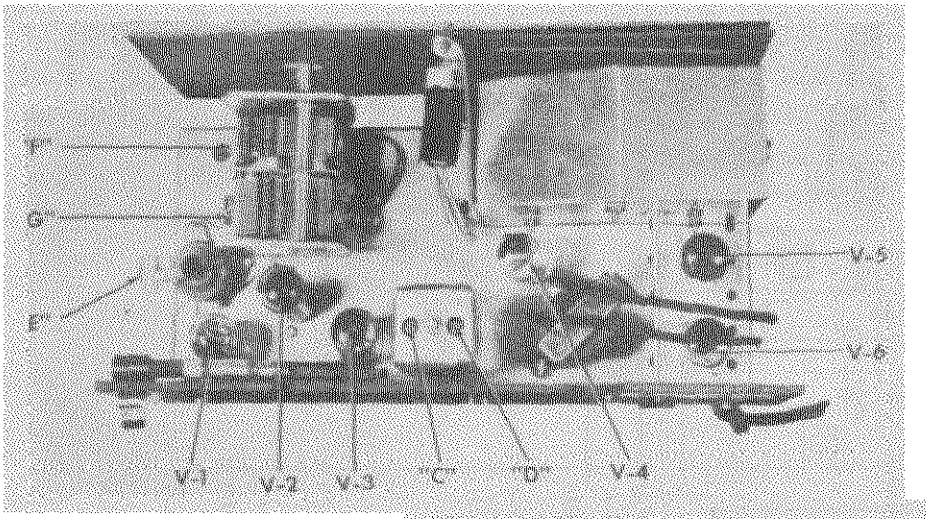
1. Remove all control knobs. (Do not lose metal clip inside Volume Knob.)
2. Remove three screws from bottom of cabinet.
3. Remove chassis.
4. Remove back and slide to one side being careful not to break loop leads.
5. Remove three screws from face and remove dial face, backing card, and dial-face gasket. (Be sure to replace spacer between backing card and chassis behind the lower right hand screw during reassembly.)
6. Remove 12AV6, 50C5, and 35W4 tubes from chassis. (See tube location diagram on back of radio.)
7. Remove two screws, located on the left side (viewing the radio from the front) of clock bracket, which hold cover in place. Remove cover.
8. Unsolder wires at clock, leading to chassis.*

**NOTE: A-C leads to clock switch must be replaced so that the leads are fastened to the same points as before disassembly.*

9. Remove three nuts located on back of clock cover and remove clock.
10. Reassemble clock-radio following above procedure in the inverse order.

ALIGNMENT PROCEDURE

Alignment procedure consists of the step outlined in the Alignment Chart. See Figure 3 for location of trimmer
Make certain each step is done with a minimum input signal. Connect output meter to speaker voice coil.



A, B, C, D — I-F Trimmers
E — I-F Trap
F — Osc. Trimmer
G — Ant. Trimmer
Note 1.

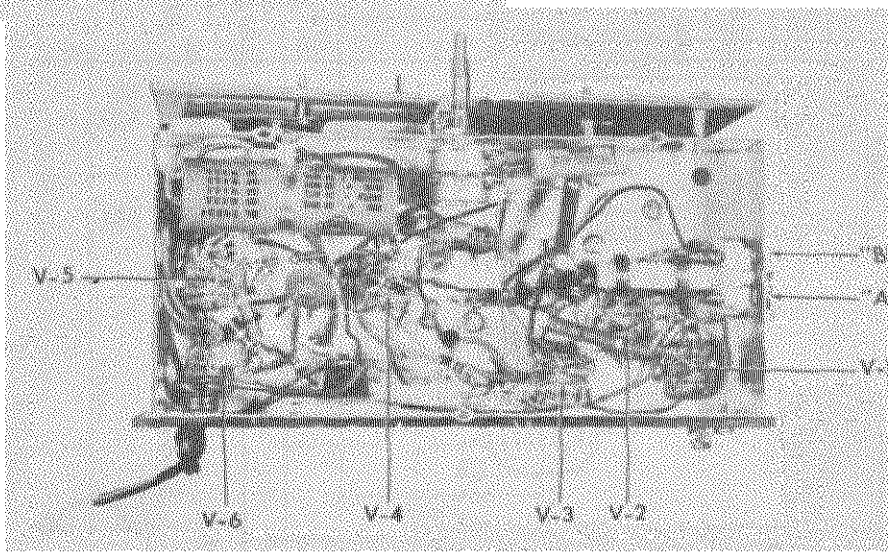
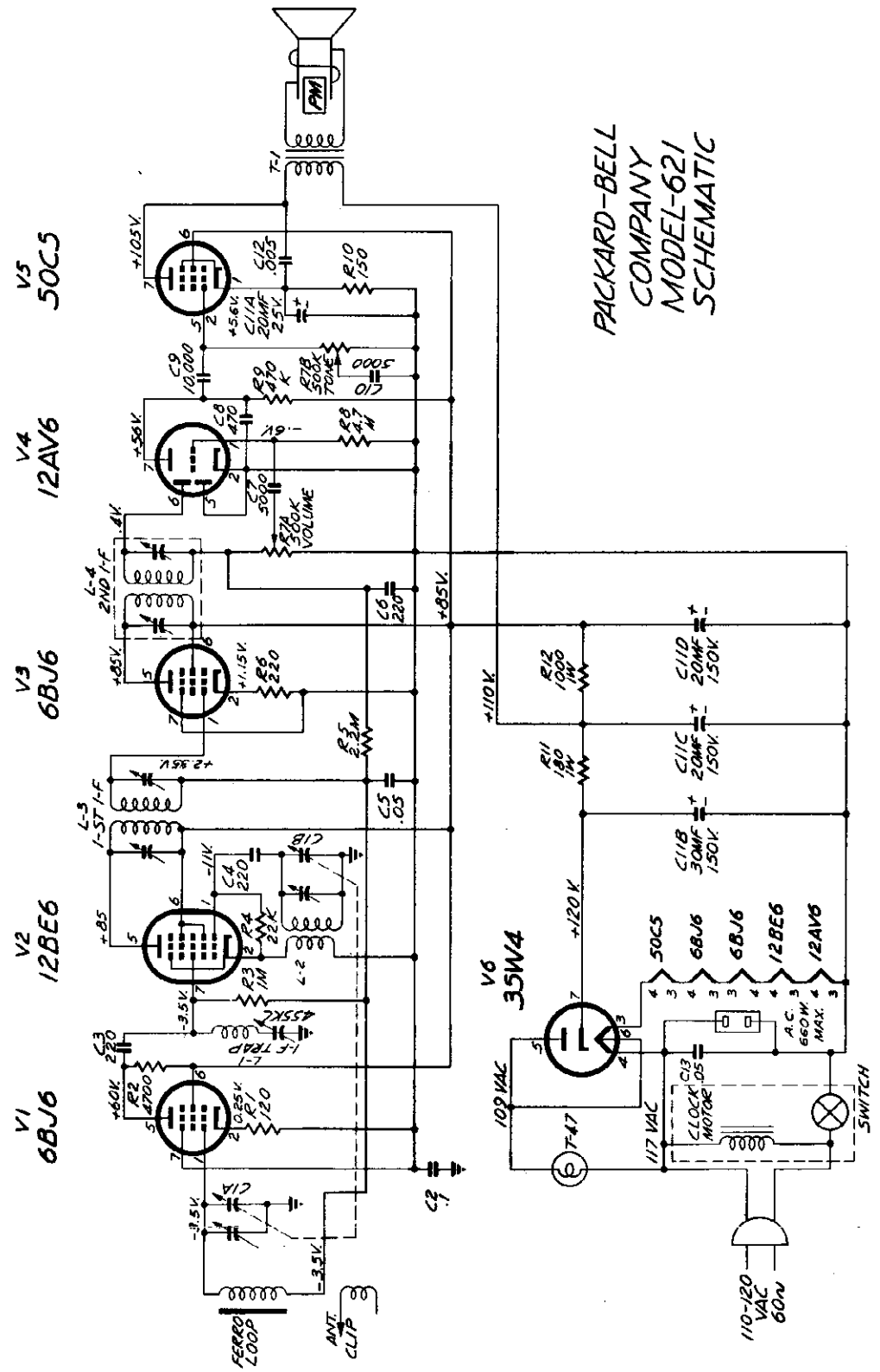


Figure 3. Chassis.

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	Mixer Grid & Ground	455 KC	540 KC	Trimmer E for minimum output
3	Mixer Grid & Ground	1620 KC	1620 KC	TrimmerF
4	Test Loop	1500 KC	1500 KC	TrimmerG
5	REPEAT STEPS 3 & 4			

MODEL 621


PACKARD-BELL
COMPANY
MODEL-621
SCHEMATIC
V1
6BJ6
V2
12BE6
V3
6BJ6
V4
12AV6
V5
50C5
V6
35W4
T-1
L-1
L-2
L-3
L-4
R1
R2
R3
R4
R5
R6
R7A
R7B
R8
R9
R10
R11
R12
C1A
C1B
C1C
C1D
C2
C3
C4
C5
C6
C7
C8
C9
C10
C11A
C11B
C11C
C11D
C12
C13
FERRO LOOP
ANT. CLIP
SWITCH
110-120 VAC 60~

REPLACEABLE PARTS

To be assured of genuine Packard-Bell replacement parts, order by the Packard-Bell part number from any of the following Packard-Bell Service Divisions.

LOS ANGELES	1101 So. Hope Street
SEATTLE	2310 Fourth Ave.
SAN DIEGO	3069 El Cajon Blvd.
SAN FRANCISCO	1157 Post Street
RIVERSIDE	247 La Cadena Drive
SALT LAKE CITY	624 So. State Street
SOUTH GATE	8640 State Street

CAPACITORS

REF. SYMBOL	DESCRIPTION	P.B. PART NO.
C1A & B	Variable, 2 gang	23528
C2	Tubular, .1 Mfd. 200 volt	23019
C3	Ceramic, 220 Mmf. G.P.	23915
C4	Ceramic, 220 Mmf. G. P.	23915
C5	Tubular, .05 Mfd. 200 volt	23017
C6	Ceramic, 220 Mmf. G.P.	23915
C7	Ceramic, 5000 Mmf. G.P.	23931
C8	Ceramic, 470 Mmf. G.P.	23916
C9	Ceramic, 10,000 Mmf. G.P.	23939
C10	Ceramic, 5000 Mmf. G.P.	23931
C11A	Electrolytic, 20 Mfd. 25 volt	24034
C11B	Electrolytic, 30 Mfd. 150 volt	24034
C11C	Electrolytic, 20 Mfd. 150 volt	24034
C11D	Electrolytic, 20 Mfd. 150 volt	24034
C12	Tubular, .005 Mfd. 600 volt	23004
C13	Tubular, .05 Mfd. 200 volt	23017

CONTROLS

REF. SYMBOL	DESCRIPTION	P.B. PART NO.
R7A & B	Volume and Tone (Dual) 500,000 ohms.	25026

COILS

REF. SYMBOL	DESCRIPTION	P.B. PART NO.
L-1	I-F Trop	29005
L-2	Oscillator	29220
L-3	1st I-F, 455 KC	29045
L-4	2nd I-F, 455 KC	29046
L-5	Loop	29343A

RESISTORS

REF. SYMBOL	DESCRIPTION	P.B. PART NO.
R1	Carbon, 120 ohms, ½ watt, 10%	73014
R2	Carbon, 4700 ohms, ½ watt, 10%	73033
R3	Carbon, 1 megohm, ½ watt, 10%	73161
R4	Carbon, 22,000 ohms, ½ watt, 10%	73041
R5	Carbon, 2.2 megohms, ½ watt, 20%	73165
R6	Carbon, 220 ohms, ½ watt, 10%	73017
R8	Carbon, 4.7 megohms, ½ watt, 20%	73169
R9	Carbon, 470,000 ohms, ½ watt, 20%	73157
R10	Carbon, 150 ohms, ½ watt, 10%	73015
R11	Carbon, 180 ohms, 1 watt, 10%	73216
R12	Carbon, 1000 ohms, 1 watt, 10%	73225

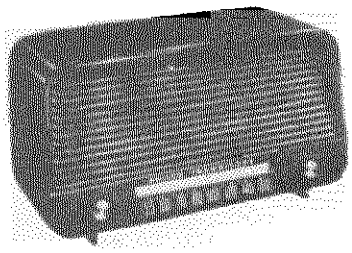
TRANSFORMER

REF. SYMBOL	DESCRIPTION	P.B. PART NO.
T1	Output, 2,500 to 3.2 ohms	89417 *See note

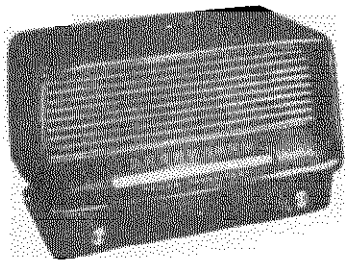
MISCELLANEOUS PARTS

Cabinet (specify color)	521-621
Ferro-Loop Antenna	29343
A.C. Cord, 6 ft.	32011
Dial, Stationized	38128
Clock Assembly	58038
Clock Knobs (specify color)	58038-
Tuning Knob (specify color)	52079
Volume Knob (specify color)	52074
Tone Knob (specify color)	52073
Dial Lamp No. T-47	54002
A-C Socket	79096
Dial Lite Socket	79082
Tube Socket, 7 pin miniature	79067
Speaker, 4-inch P.M.	83008 *See note

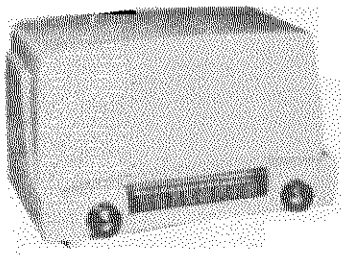
*NOTE: Production runs were made using an 83009 speak of 6 ohms impedance at 400 C.P.S. In those case T1 was 2500 to 6 ohm output, Part No. 89433.



MODEL 52-540



MODEL 52-541



MODEL 52-542-I

SPECIFICATIONS

CABINET

Model 52-540 ..... Phenolic, mottled mahogany

Model 52-540-I ..... Phenolic, ivory

Model 52-541 ..... Phenolic, mottled mahogany

Model 52-541-I ..... Phenolic, ivory

Model-52-542-I ..... Phenolic, ivory

CIRCUIT ..... 5-tube superheterodyn

FREQUENCY RANGE ..... 540—1630 k

AUDIO OUTPUT ..... 1.2 watt

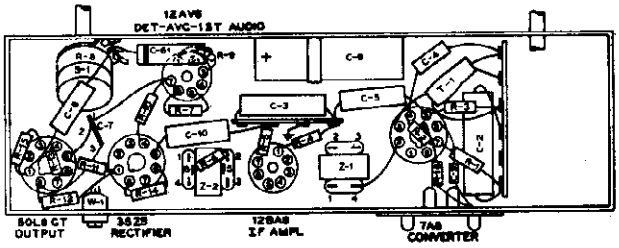
OPERATING VOLTAGE ..... 105—125 volts, a.c. or d.

POWER CONSUMPTION ..... 30 watt

AERIAL ..... High-impedance loop; connector for external aeri

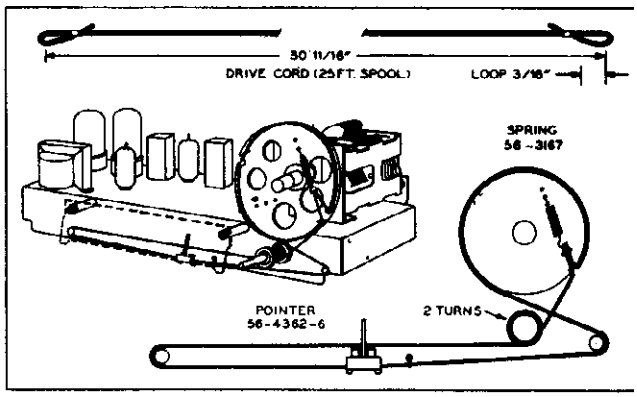
INTERMEDIATE FREQUENCY ..... 455 k

PHILCO TUBES (5) 7A8, 12BA8, 12AV6, 50L6GT, 35Z5G



TP1-1136

Figure 1. Symbolized Chassis, Showing Parts Placement



TP-7865F-

Figure 2. Drive-Cord Installation Details, Models 52-540 and 52-540-I

MODEL 52-541, CODE 123

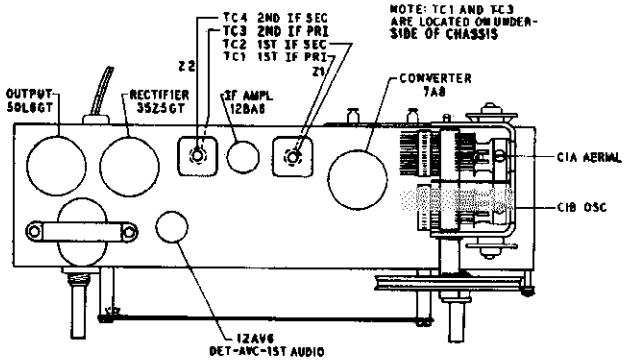
Changes to parts list:

Backplate 76-7556

Springs, diffusion panel (2) 56-3587-1

The position of the pilot-lamp socket and mounting clip was changed from under the speaker to abo center of the front side of the sub-base.

MODELS 52-540, 52-540-1, 52-541, 52-541-1, 52-542-1



TP1-1130

Figure 3. Top View, Showing Trimmer Locations

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."

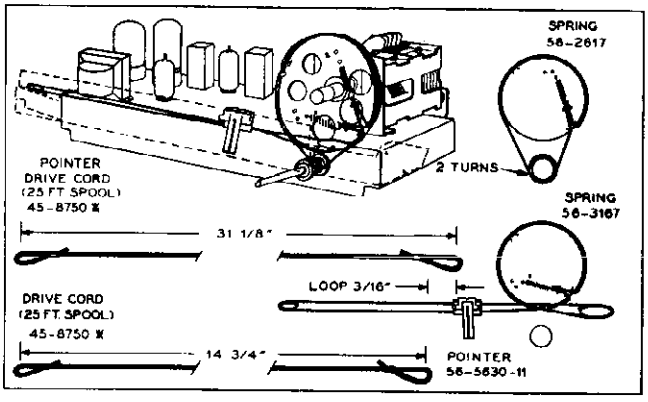
OUTPUT METER: Connect across voice-coil terminals.

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-uf. 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

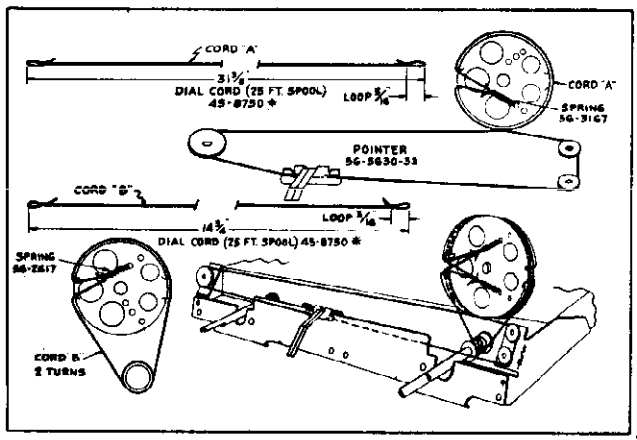
RADIATING LOOP: Make up a 6—8 turn, 6-inch-diameter loop from insulated wire; connect to signal-generator leads and place near radio loop antenna.



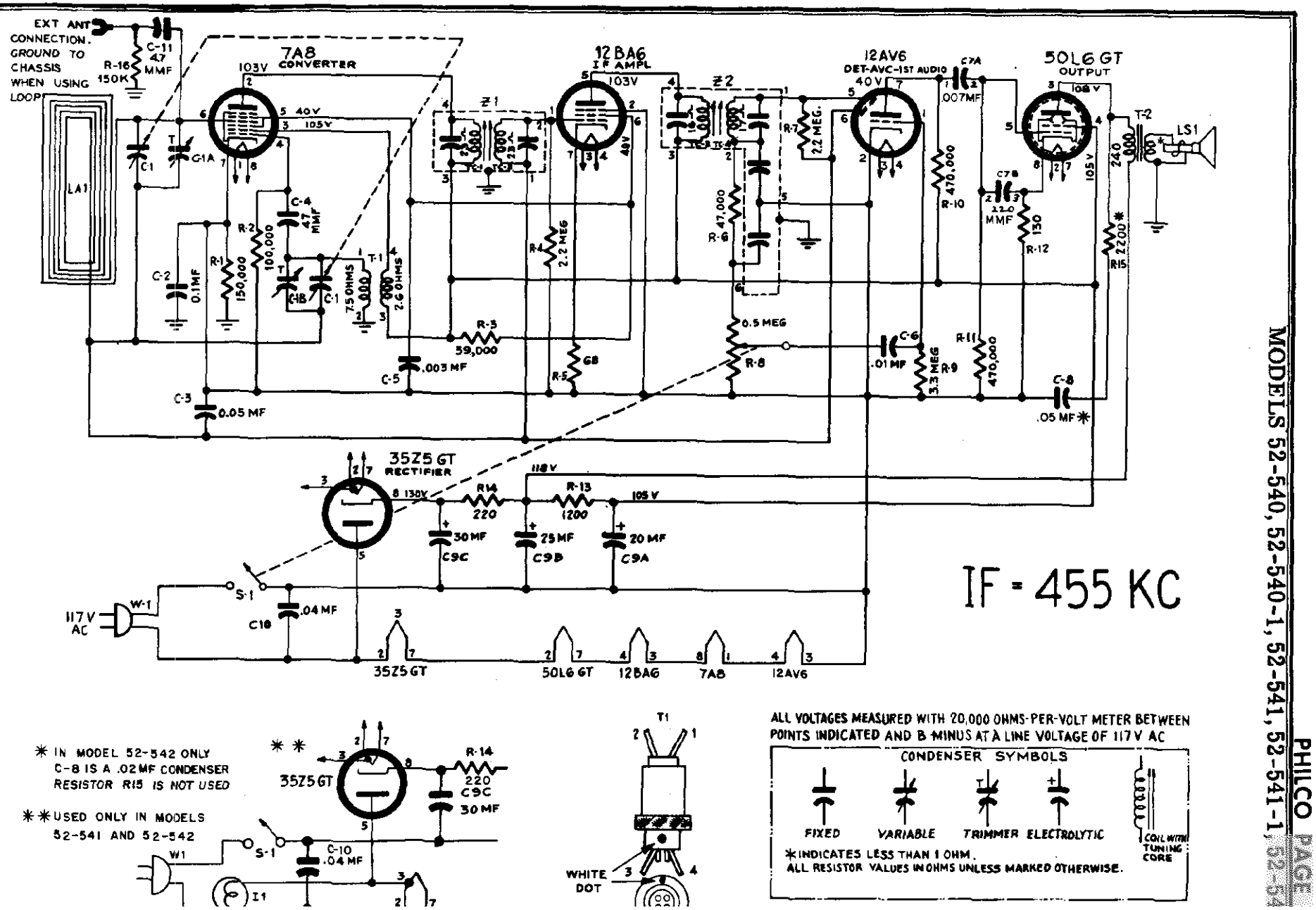
TP-7865E-1

Figure 5. Drive-Cord Installation Details, Model 52-542-1

Figure 4. Drive-Cord Installation Details, Models 52-541 and 52-541-1



TP1-1131


EXT ANT CONNECTION. GROUND TO CHASSIS WHEN USING LOOP
LA1
C-11 47 MMF
R-16 150K
7A8 CONVERTER
103V
40V
105V
C-1
C-1A
C-4 47 MMF
R-2 100,000
C-2 0.1MF
R-1 150,000
C-1B
T-1
7.5 OHMS
2.6 OHMS
C-3 0.05 MF
C-5 .003 MF
R-3 39,000
Z1
12BA6 I F AMPL
103V
R-4 2.2 MEG
G8
R-5
Z2
R-6 47,000
0.5 MEG
R-8
12AV6 DET-AVC-1ST AUDIO
40V
R-7 2.2 MEG.
C-6 .01 MF
R-9 3.3 MEG
R-11 470,000
C-7A .007MF
R-10 470,000
50L6 GT OUTPUT
108 V
C-7B 220 MMF
R-12 130
R15 2200
T-2
240 000
105V
LS1
35Z5 GT RECTIFIER
118 V
130V
R-14 220
R-13 1200
105 V
C9C 30 MF
C9B 25 MF
C9A 20 MF
S-1
W-1
117 V AC
C10 .04 MF
C-8 .05 MF *
35Z5 GT
50L6 GT
12BAG
7A8
12AV6
IF = 455 KC
* IN MODEL 52-542 ONLY C-8 IS A .02 MF CONDENSER RESISTOR R15 IS NOT USED
** USED ONLY IN MODELS 52-541 AND 52-542
35Z5 GT
R-14 220
C9C 30 MF
S-1
W1
C-10 .04 MF
I1
T1
WHITE DOT
ALL VOLTAGES MEASURED WITH 20,000 OHMS-PER-VOLT METER BETWEEN POINTS INDICATED AND B MINUS AT A LINE VOLTAGE OF 117 V AC
CONDENSER SYMBOLS
FIXED
VARIABLE
TRIMMER
ELECTROLYTIC
COIL WITH TUNING CORE
*INDICATES LESS THAN 1 OHM.
ALL RESISTOR VALUES IN OHMS UNLESS MARKED OTHERWISE.

MODELS 52-540, 52-540-1, 52-541, 52-541-1, 52-542-1

PARTS LIST

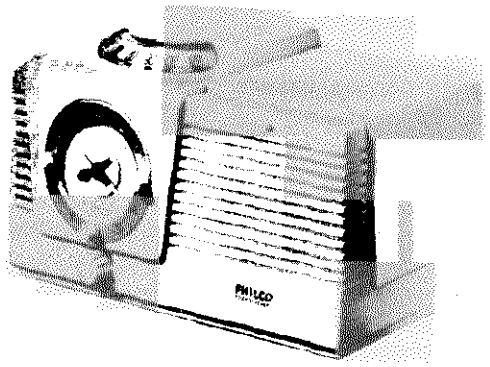
NOTE: Part numbers identified by an asterisk (*) are general replacement items. These numbers may not be identical with those on factory parts. Also, the electrical values of some replacement items may differ from the values indicated in the schematic diagram and parts list. The values substituted in 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 52-540	31-2751-6
	Models 52-541 and 52-542	31-2751
C2	Condenser, i-f bypass, .1 μf.	61-0113*
C3	Condenser, a-v-c by-pass, .05 μf.	61-0122*
C4	Condenser, d-c blocking, 47 μμf.	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 μμf.	Part of C7
C8	Condenser, tone compensation	
	Models 52-540 and 52-541: .05 μf.	61-0122*
	Model 52-542: .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*
C11	Condenser, external-aerial coupling, 4.7 μμf.	30-1230
I1	Pilot lamp (Models 52-541 and 52-542-1 only)	34-2068
LA1	Loop aerial	
	Models 52-540 and 52-540-I	32-4052-33
	Models 52-541 and 52-541-I	32-4052-31
	Model 52-542-I	32-4052-38
LS1	Speaker, p-m	
	Models 52-540, 52-540-I, 52-541 and 52-541-I	36-1627-5
	Model 52-542-I	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	
	Models 52-540 and 52-540-I	33-5538-7
	Models 52-541 and 52-541-I	33-5566-4
	Model 52-542-I	33-5566-4
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	66-1133260*
R13	Resistor, filter, 1200 ohms	66-2128340*
R14	Resistor, filter, 220 ohms, 1 watt	66-1224340*
R15	Resistor, tone compensation, 2200 ohms (Models 52-540, 52-540-I, 52-541 and 52-541-I only)	66-2228340
R16	Resistor, aerial isolating, 150,000 ohms	66-4158340
S1	Switch, off-on	Part of R8
T1	Transformer, oscillator	32-4263
T2	Transformer, output	32-8384
W1	Line cord	L-2183*
Z1	Transformer, st i-f	32-4180-6A
Z2	Transformer, 2nd i-f	32-4240-A

MISCELLANEOUS

Description	Service Part No.
MODELS 52-540 AND 52-540-I	
Cabinet, mottled mahogany	10750
Cabinet, ivory	10750-1
Back	54-7777
Fastener, back mounting (4)	W2235-2FA9
Baffle, speaker	54-7761
Dial-backplate assembly	76-4658
Knob (2)	54-4527-11
Mount, rubber (3)	27-4771-1
Pointer	56-4362-6
Pulley-and-shaft assembly	76-3671-3
MODELS 52-541 AND 52-541-I	
Cabinet, mahogany	10747
Knob (2)	54-4674
Cabinet, ivory	10747-1
Knob (2)	54-4674-1
Back	54-7767
Fastener, back mounting (4)	W2235FA9
Baffle, speaker	54-7761
Backplate, bracket and pulley assembly	76-8235
Dial-backplate assembly	76-4570
Fastener, pilot-lamp shield mounting (2)	W2235-1FA9
Speed clip, grille mounting (4)	1W56920FE7
Jewel	54-4304
Mount, rubber (3)	27-4771-1
Pointer 56-5630-11 Code 123, 56-8774-2 F.C.C.	
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	27-8233-8
MODEL 52-542-I	
Cabinet, ivory	10769-8
Back	5478-11
Fastener, back mounting (4)	W2235FA9
Clips, baffle mounting	1W56920FE7
Baffle, speaker	54-7761
Dial scale	54-5104
Screw, scale mounting (2)	1W14504FA1
Dial-backplate assembly	54-4929
Knob (2)	54-4718-33
Backplate, bracket-and-pulley assembly	76-7048
Fastener, pilot-lamp shield mounting (2)	W2235-1FA9
Grille, plastic	54-4919-1
Mount, rubber (3)	27-4771-1
Pointer	56-5630-33
Spring, pointer drive	56-3167
Pulley-and-shaft assembly	76-3671-2
Socket assembly, pilot lamp	27-8233-8
PARTS COMMON TO ALL MODELS	
Bushing, pulley and shaft	27-9437
Clamp, electrolytic mounting	56-1486
Drive cord, 25-foot spool	45-8750*
Fastener, hairpin, pulley and shaft	57-1468FA3
Socket, Loktal (1)	27-8269
Socket, miniature (2)	27-8265
Socket, octal (2)	27-8174
Spring, gang drive	56-2617

MODELS 52-544
52-544-I, 52-54



MODEL 52-544-I

SPECIFICATIONS

CABINET

Model 52-544 ..... Molded phenolic, mahogany
Model 52-544-I ..... Molded phenolic, ivory
Model 52-544-W ..... Molded phenolic, white

FREQUENCY RANGE ..... 540—1600 kc.

AUDIO OUTPUT ..... 1 watt

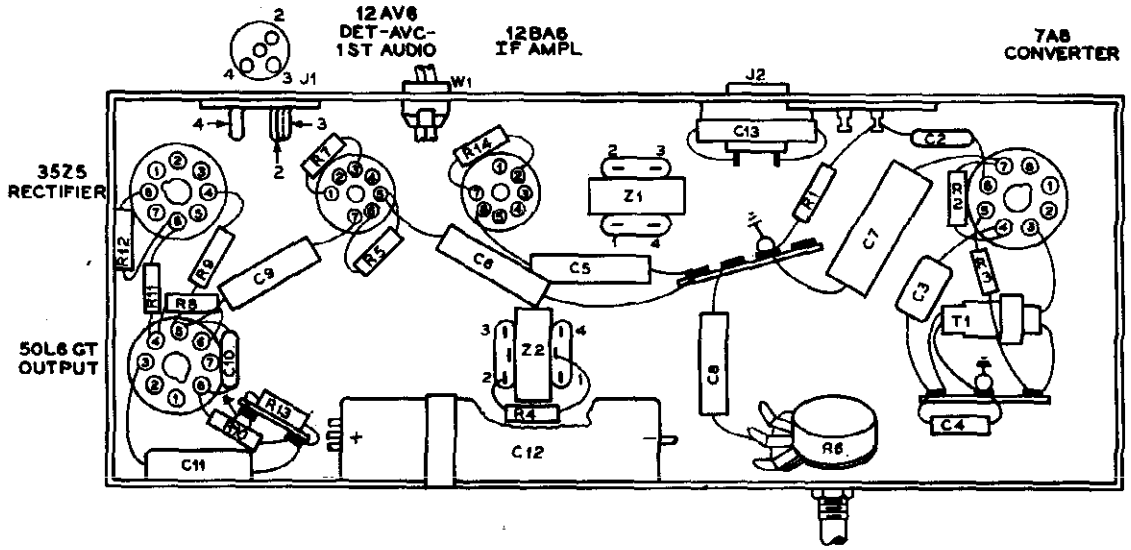
OPERATING VOLTAGE ..... 117 vol

POWER CONSUMPTION 30

AERIAL ..... High-impedance loop; connector for external

INTERMEDIATE FREQUENCY 4

PHILCO TUBES (5) 7A8, 12BA6, 12AV6, 50L6GT



TP1-1

Figure 1. Base View, Showing Symbolized Chassis

MODELS 52-544,
52-544-I, 52-544-W

ALIGNMENT PROCEDURE

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

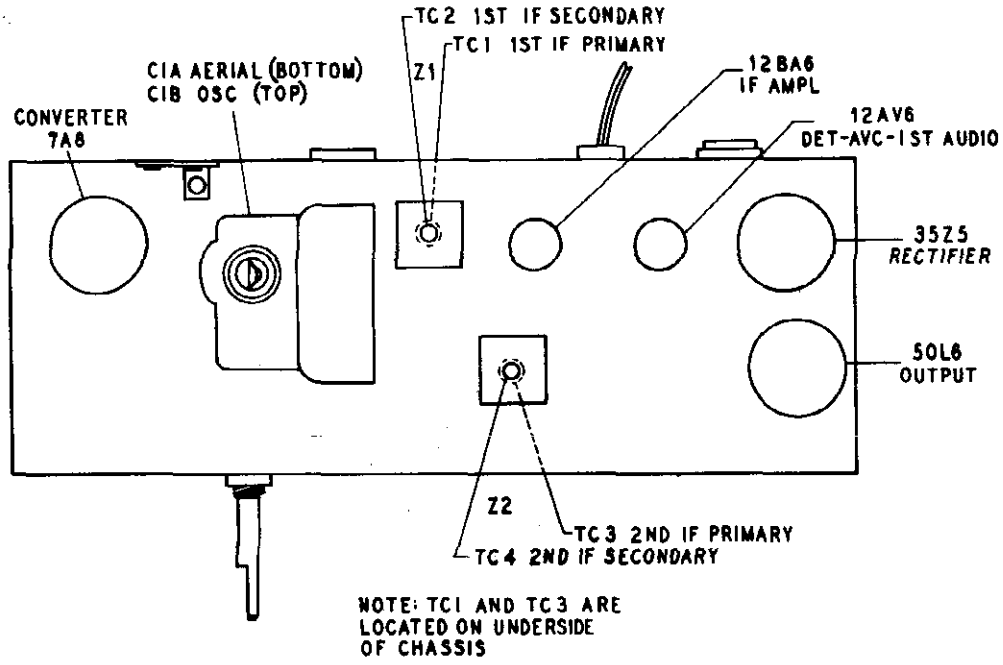
OUTPUT METER — Connect across voice-coil terminals.

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.

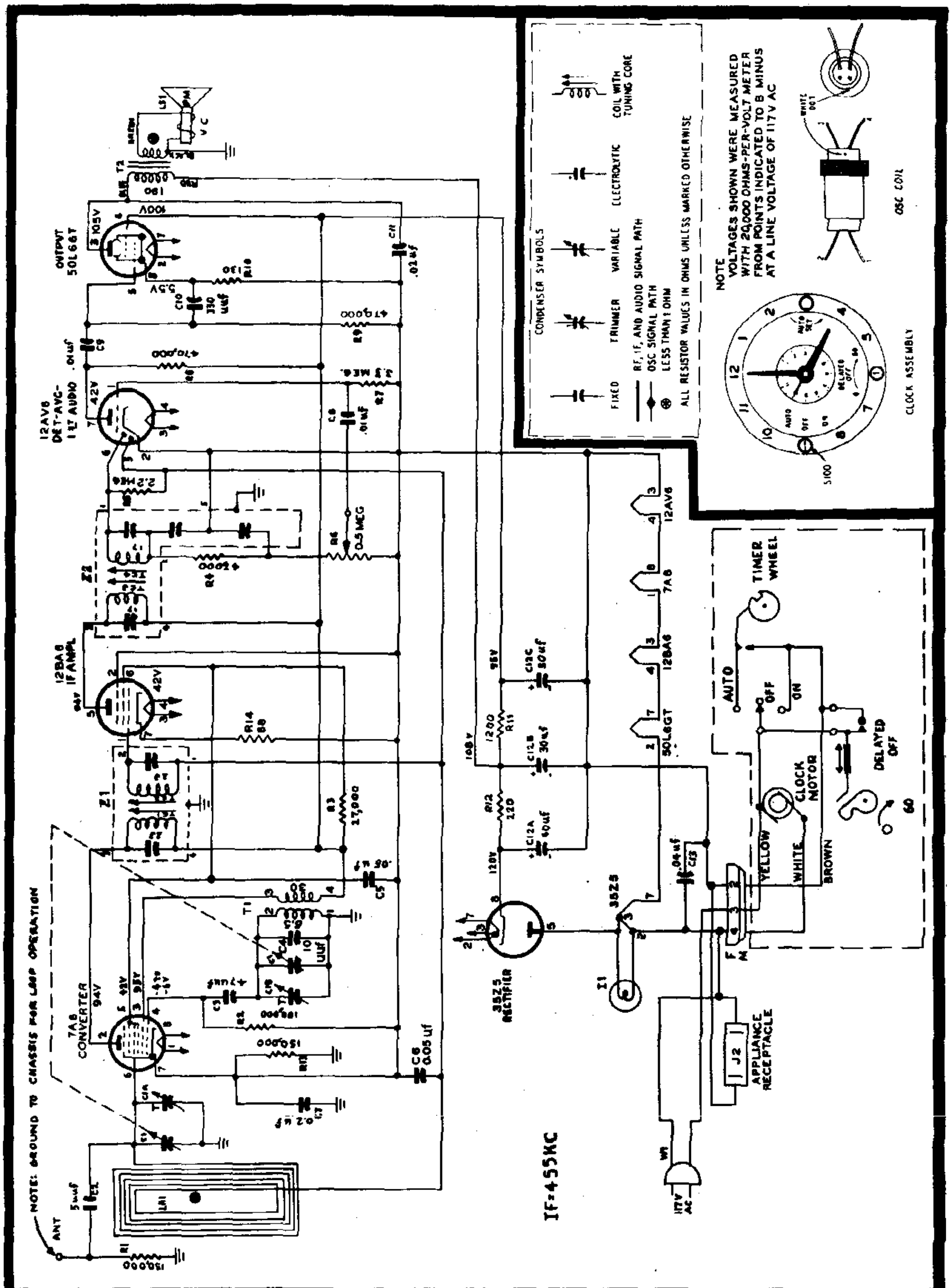
STEP	SIGNAL GENERATOR		RADIO		ADJUST
	CONNECTION *TO RADIO*	DIAL *SETTING*	DIAL *SETTING*	SPECIAL *INSTRUCTIONS*	
1	Connect ground lead to B—; output lead through .1-μf. condenser to grid (pin 8) of 7A8.	455 kc.	Tuning condenser fully meshed.	Adjust tuning cores, in order given, for maximum output.	TC4—2nd 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.



TP1-1140

Figure 2. Top View, Showing Trimmer Locations


NOTE: GROUND TO CHASSIS FOR LOOP OPERATION
ANT
7A8 CONVERTER
12BA6 IF AMPL
12AV6 DET-AVC-1ST AUDIO
OUTPUT 50L6GT
35Z5 RECTIFIER
APPLIANCE RECEPTACLE
IF-455KC
117V AC
CLOCK MOTOR
TIMER WHEEL
AUTO
OFF
ON
DELAYED OFF
YELLOW
WHITE
BROWN
CONDENSER SYMBOLS
FIXED
TRIMMER
VARIABLE
ELECTROLYTIC
COIL WITH TUNING CORE
RF, IF, AND AUDIO SIGNAL PATH
OSC SIGNAL PATH
LESS THAN 1 OHM
ALL RESISTOR VALUES IN OHMS UNLESS MARKED OTHERWISE
NOTE
VOLTAGES SHOWN WERE MEASURED WITH 20,000 OHMS-PER-VOLT METER FROM POINTS INDICATED TO B MINUS AT A LINE VOLTAGE OF 117V AC
CLOCK ASSEMBLY
OSC COIL

MODELS 52-544,
52-544-I, 52-544-W

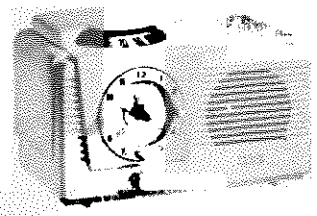
PARTS LIST

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."

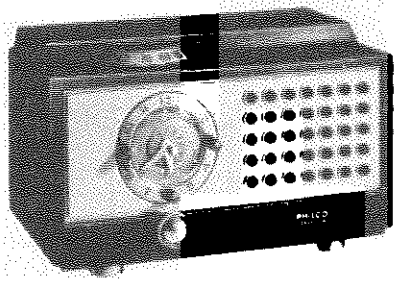
Reference Symbol	Description	Service Part No.
C1	Condenser, tuning gang, 2-section	31-2751-5
C1A	Condenser, trimmer, aerial	Part of C1
C1B	Condenser, trimmer, oscillator	Part of C1
C2	Condenser, aerial coupling, 5 μμf.	30-1230
C3	Condenser, d-c blocking, 47 μμf.	60-00475417*
C4	Condenser, temperature compensating, 7.5 μμf.	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.	45-3505-58
C9	Condenser, d-c blocking, .01 μf.	45-3505-58
C10	Condenser, parasitic suppressor, 330 μμf.	60-10335417*
C11	Condenser, tone compensation, .02 μf.	61-0108*
C12	Condenser, electrolytic, 3-section	30-2575-27
C12A	Condenser, filter, 30 μf., 150v	Part of C12
C12B	Condenser, filter, 25 μf., 150v	Part of C12
C12C	Condenser, filter, 20 μf., 150v	Part of C12
C13	Condenser, line filter, .04 μf.	45-3500-2*
I1	Pilot lamp	34-2068
J1	Socket, clock motor and switch	27-6273
J2	Receptacle, appliance, a-c	76-3931
LA1	Loop aerial	32-4052-32
LS1	Speaker, p-m	36-1627-8
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	66-1138340*
R11	Resistor, filter, 1200 ohms	66-2128340*
R12	Resistor, filter, 220 ohms, 1 watt	66-1224340*
R13	Resistor, leakage, 150,000 ohms	66-4158340*
R14	Resistor, cathode bias, 68 ohms	66-0688340
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 i-f	32-4160-6A
Z2	Transformer, 2nd i-f	32-4240A

MISCELLANEOUS

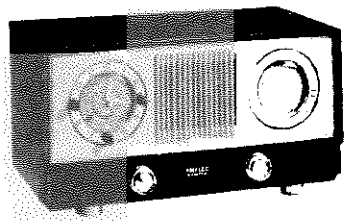
Description	Service Part No.
Cabinet	
MODEL 52-544	10745
MODEL 51-544-I	10745-1
MODEL 52-544-W	10745-4
Back	54-8391
Fastener (4), back mounting	W2235FA9
Baffle-and-cloth assembly	
Model 52-544	40-7730
Model 52-544-I	40-7730-1
Model 52-544-W	40-7730-2
Jewel (used on mahogany and ivory cabinets)	54-4304
Jewel (used on white cabinet only)	54-4304-1
Knobs	
MODEL 52-544	
VOLUME	27-4820
AUTO-OFF-ON	
DELAYED OFF	54-4736
AUTO SET	54-4736-2
TIME SET	54-4736-4
MODEL 52-544-I	
VOLUME	54-4118
AUTO-OFF-ON	
DELAYED OFF	54-4736-1
AUTO SET	54-4736-3
TIME SET	54-4736-4
MODEL 52-544-W	
VOLUME	27-4817-7
AUTO-OFF-ON	
DELAYED OFF	54-4736-5
AUTO SET	54-4736-6
TIME SET	54-4736-7
Clamp, electrolytic mounting	56-1486
Clip, pilot-lamp mounting	56-3545-6FA3
Clock-and-cable assembly	
MODEL 52-544, 60-cycle	76-6723
MODEL 52-544-I, 60-cycle	76-6724
MODEL 52-544-W, 60-cycle	76-6725
Clock cover	56-6710
Dial scale, mahogany and ivory	54-5055-2
Dial scale, white	54-5055-4
Lead assembly, aerial	76-1472
Mount, rubber, gang mounting (3)	27-4771-1
Shield, pilot lamp	56-9074-3
Socket, clock	27-6273-7
Socket, Loktal (1)	27-6289
Socket, octal (2)	27-6174
Socket, miniature (1)	27-6285
Socket assembly, pilot lamp	27-6233-6



MODELS 52-543* AND 52-545



MODEL 52-547

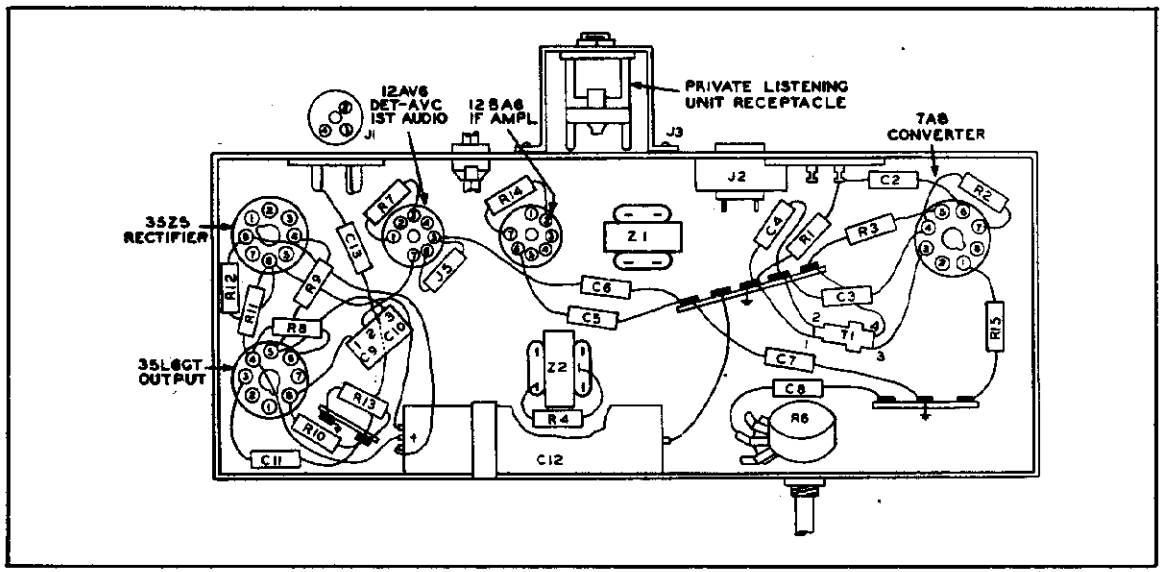


MODEL 52-550

SPECIFICATIONS

FREQUENCY RANGE	540—1600 kc.	AERIAL	High-impedance loop; connector for external aerial
AUDIO OUTPUT	1 watt	INTERMEDIATE FREQUENCY	455 kc.
OPERATING VOLTAGE	117 volts, a.c.	PHILCO TUBES (5)	7A8, 12BA6, 12AV6, 35L6GT, 35Z5
POWER CONSUMPTION	30 watts		

*The clock of Model 52-543 has TIME SET control only.



TP2-1326

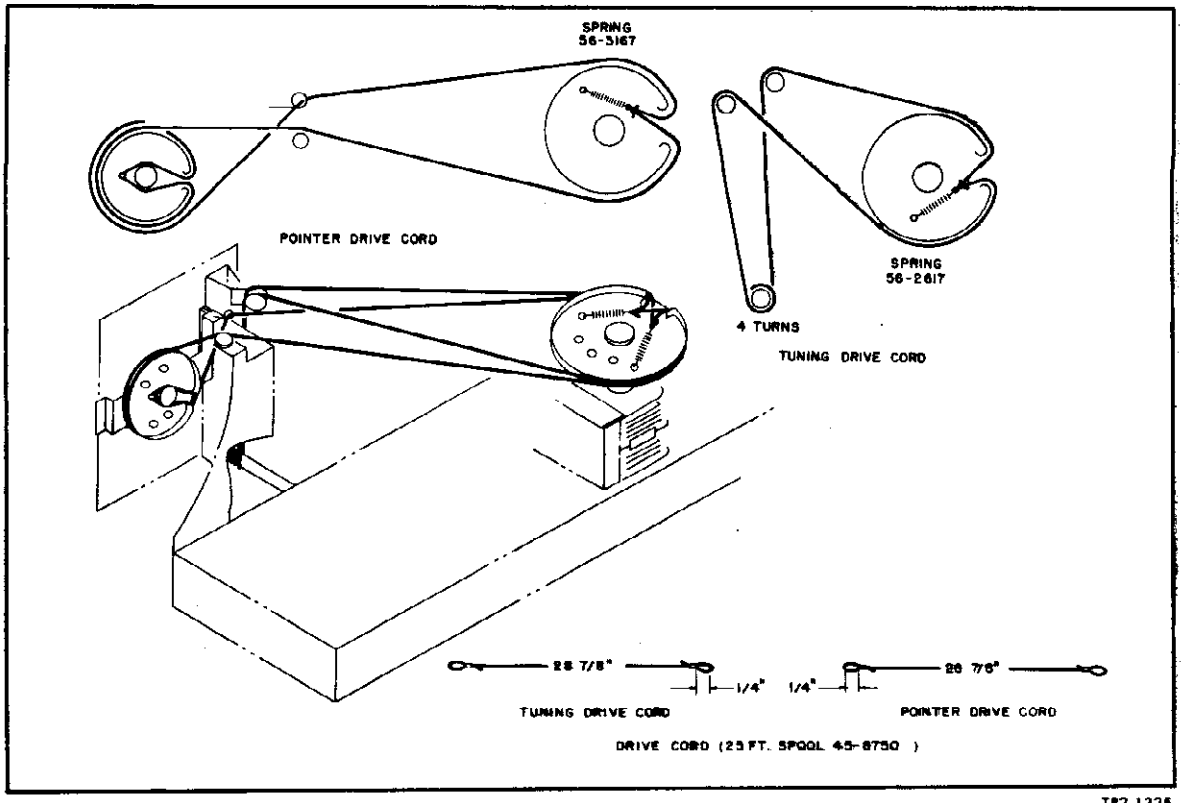
Figure 1. Model 52-550, Base View, Showing Symbolized Chassis

MODELS 52-543, -545, -547, -550

PRELIMINARY INFORMATION

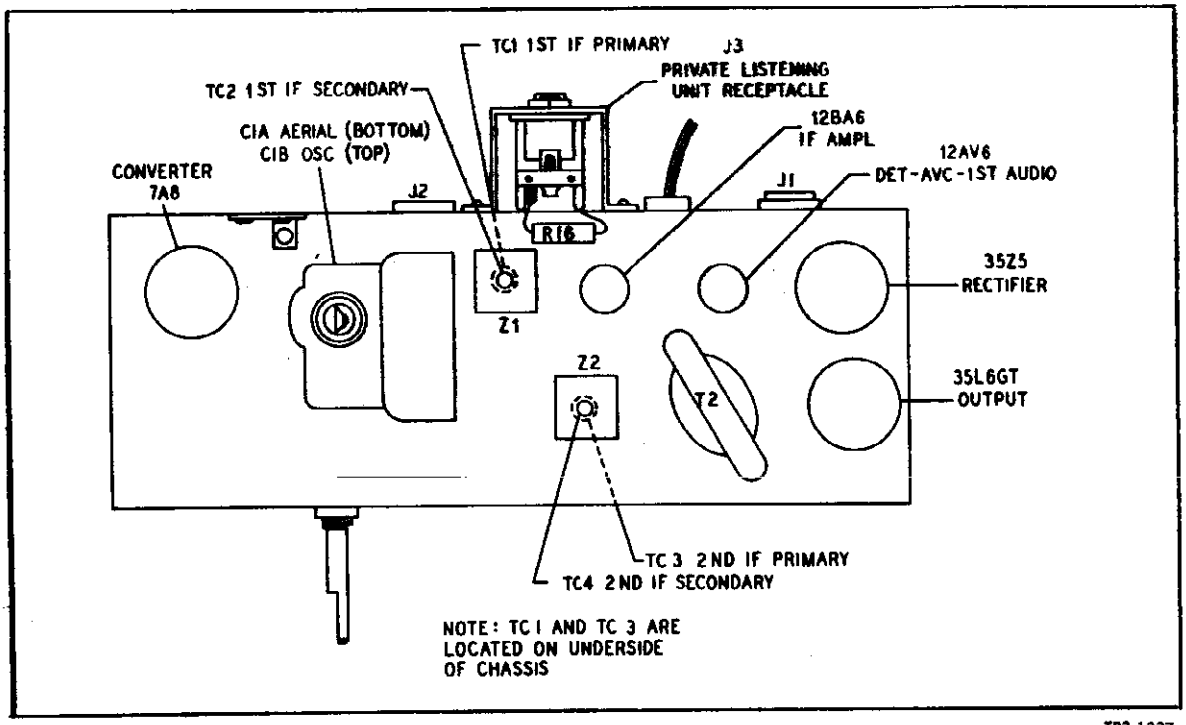
Models 52-543, 52-545, 52-547, and 52-550 are electrically similar to Model 52-544, but they are housed in different style cabinets, and incorporate certain circuit refinements over Model 52-544.

The following diagrams and the Service Information and Parts List given on page 12 of this Service Manual are for Models 52-543, 52-545, 52-547, and 52-550 only. For Alignment Procedure and the basic Schematic Diagram and Parts List for all models, refer to 52-544.



TP2-1325

Figure 2. Model 52-550, Drive-Cord Installation Details



TP2-1327

Figure 3. Model 52-550, Top View, Showing Trimmer Locations

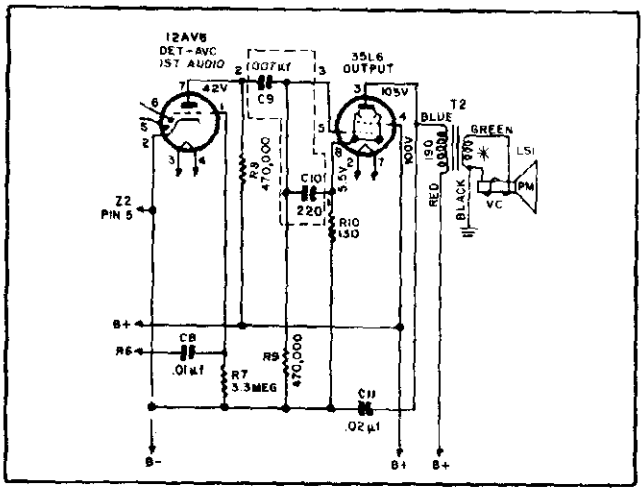


Figure 4. Models 52-543, 52-545,-and 52-547, Output Circuit TP2-1335

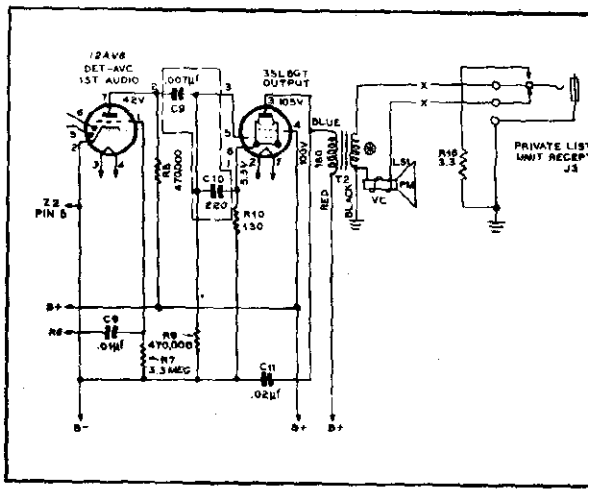
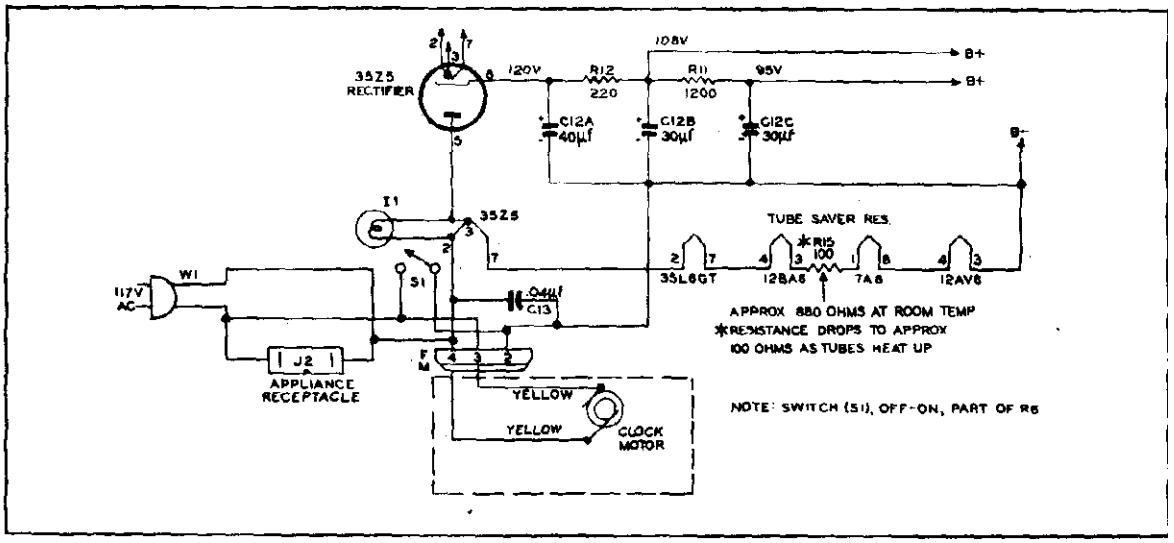
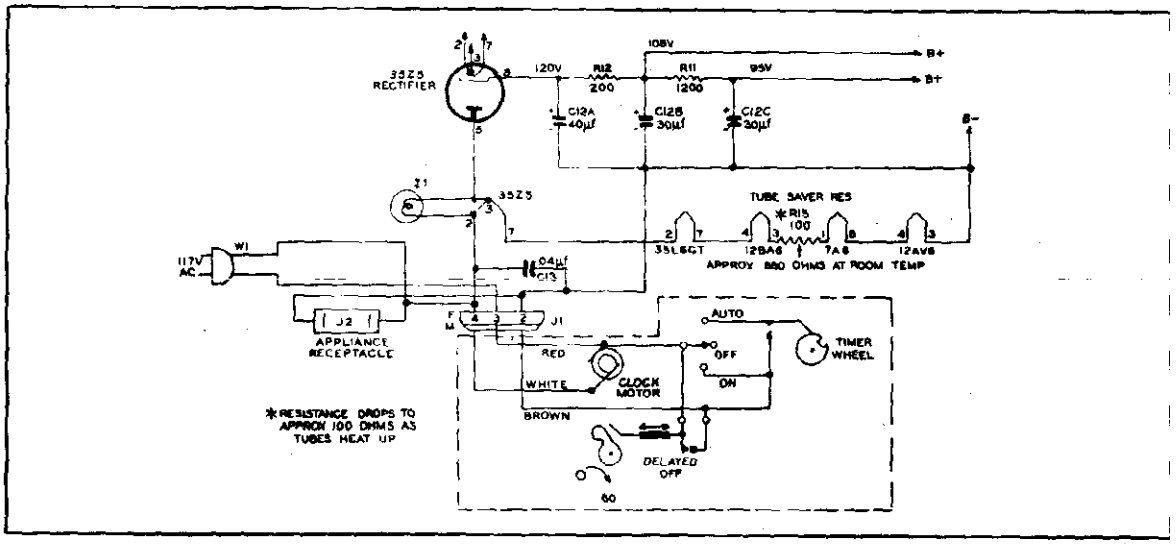


Figure 5. Model 52-550, Output Circui



TP2-1337

Figure 6. Model 52-543, Power and Clock Circuits



TP2-1338

Figure 7. Models 52-545, 52-547, and 52-550, Power and Clock Circuits

MODELS 52-543,
52-545, 52-547, 52-550

SERVICE INFORMATION

MODELS 52-543, 52-545, 52-547, AND 52-550

Dual condenser, C9 and C10, Part No. 30-1239-4, used for audio coupling (.007 μf.) and grid by-pass (220 $\mu\mu$f.) respectively. Output tube changed from 50L6GT to a 35L6GT.

Isolating condenser, C7, Part No. 61-0113, from 7A8 converter-tube cathode to ground, was changed from a .2 μf. condenser to a .1 μf. condenser.

MODELS 52-543, 52-545, AND 52-547

Pilot light and bracket are mounted on rear of clock cover.

MODEL 52-543

Clock is nonautomatic; has TIME SET control only.

Appliance receptacle on rear of chassis is connected directly to a-c line. Appliance capacity is 1100 watts. OFF-ON switch is part of VOLUME control, R6.

MODEL 52-547

Loop assembly, LA1, is Part No. 32-4052-64.

MODEL 52-550

Included with this model is Philco Private Listening unit receptacle, J3, Part No. 42-1975-2. A shunt resistor, R16, has been provided from J3 to ground. This shunt resistor reduces volume to level required for Private Listening. R16 is a 3.3-ohm resistor, Part No. 66-9334540.

Loop assembly, LA1, is Part No. 32-4052-64.
Speaker, p.m., LS1, is Part No. 36-1627-11.

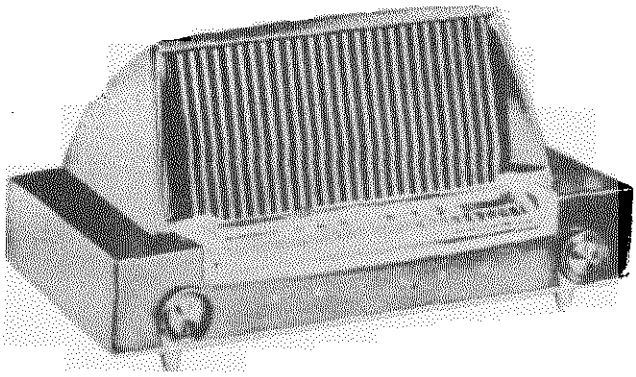
PARTS LIST

FOR MODELS 52-543, 52-545, 52-547, AND 52-550

For all parts not listed in this Service Manual, refer to Page 8.

MISCELLANEOUS

Description	Service Part No.
Cabinet	
Models 52-543M and 52-545M	10745-9
Model 52-545I	10745-10
Model 52-547L	10908-1
Model 52-547M	10908
Model 52-550L	10907-1
Model 52-550M	10907
Back, cabinet	
Models 52-543M, 52-545M, and 52-545I	54-8391
Models 52-547L and 52-547M	54-8634
Models 52-550L and 52-550M	54-8637
Baffle-and-cloth assembly	
Models 52-543M and 52-545M	40-7730
Model 52-545I	40-7730-1
Knobs	
Model 52-543M	
DIAL SCALE	54-5055-5
TIME SET	56-9656
VOLUME-OFF-ON	27-4815-9
Models 52-545M and 52-545I	
AUTO SET	54-4736-10
AUTO-OFF-ON	54-4736-9
DELAYED OFF	54-4736-9
DIAL SCALE	54-5055-5
TIME SET	54-4736-11
VOLUME	27-4815-9
Models 52-547M and 52-547L	
AUTO SET	54-4736-10
AUTO-OFF-ON	54-4736-9
DELAYED OFF	54-4736-9
DIAL SCALE	54-5055-5
TIME SET	54-4736-11
VOLUME	54-4773
Models 52-550M and 550L	
AUTO SET	54-4736-10
AUTO-OFF-ON	54-4736-9
DELAYED OFF	54-4736-9
TUNING	54-4718-6
TIME SET	54-4736-11
VOLUME	54-4718-6
Bracket-and-pulley assembly	
Models 52-550M and 52-550L	76-7580
Clock cover-and-clip assembly	
Models 52-543M, 52-545M and 52-545I	76-7547
Models 52-547M and 52-547L	76-7638
Models 52-550M and 52-550L	76-7625
Clock and plug assembly	
Model 52-543M	76-7559
Models 52-545M, 52-545I, 52-547M, and 52-547L	76-7544
Models 52-550M and 52-550L	76-7596
Dial-and-backplate assembly	
Models 52-550M and 52-550L	76-7579
Socket, clock	
Models 52-543M, 52-545M, 52-545I, 52-547M, and 52-547L	27-6273
Models 52-550M and 52-550L	27-6273
Plug, clock	54-4878-2
Tuning shaft	56-9659
Shaft assembly, pointer	76-7581



TPI-1843

MODEL 52-548

SPECIFICATIONS

CABINET	Molded plastic, maroon
CIRCUIT	Four-tube superheterodyne plus rectifier
FREQUENCY RANGE	540—1620 kc.
AUDIO OUTPUT	1 watt
OPERATING VOLTAGE	105—120 volts, a.c. or d.c.
POWER CONSUMPTION	30 watts
INTERMEDIATE FREQUENCY	455 kc.
AERIAL	Magnecor high-impe loop; provision for conn external aerial
PHILCO TUBES	7A8 converter, 7B7 i-f fier, 7C6 2nd det., avc audio, 50C5 output, 35W tifier

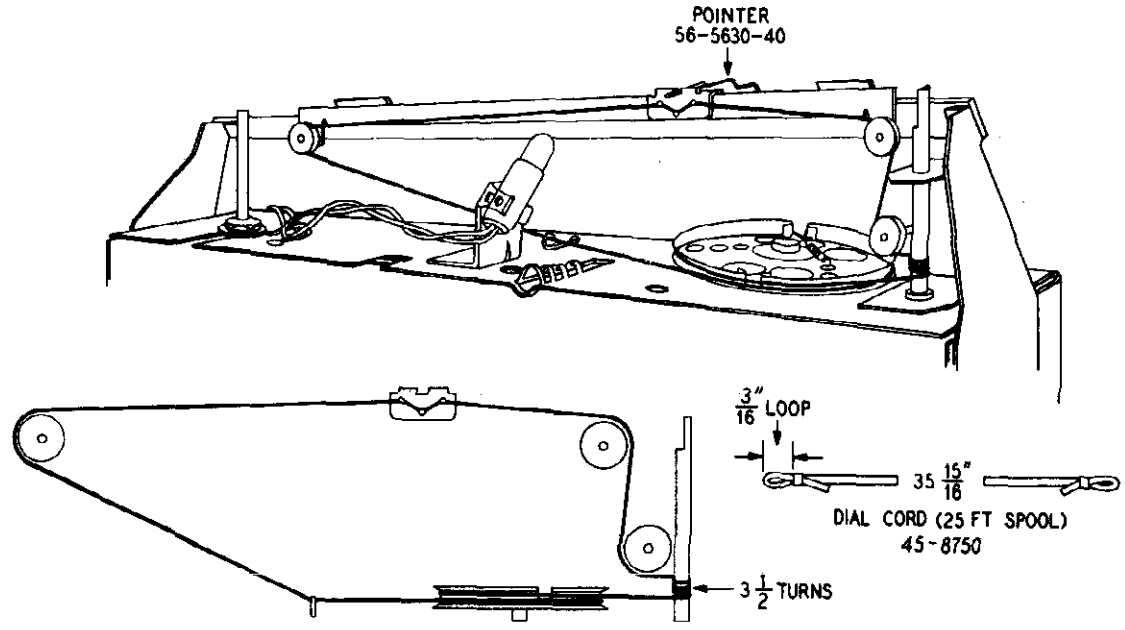


Figure 1. Drive-Cord Installation Details

TPI-1839

ALIGNMENT PROCEDURE

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

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

OUTPUT METER—Connect across voice-coil terminals.

SIGNAL GENERATOR—Ground lead to B—, output lead as indicated in chart.

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

STEP	SIGNAL GENERATOR		RADIO		ADJUST TRIMMER
	CONNECTION TO RADIO	DIAL SETTING	DIAL SETTING	SPECIAL INSTRUCTIONS	
1	Through a .01-μf. condenser to pin 6 of 7A8 converter tube.	455 kc.	Gang fully open.	Adjust, in order given, for maximum output. TC1 and TC4 are located at top of transformers.	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. trimmer
3	Same as step 2.	1500 kc.	1500 kc.	Adjust for maximum.	C1A—ant. trimmer

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

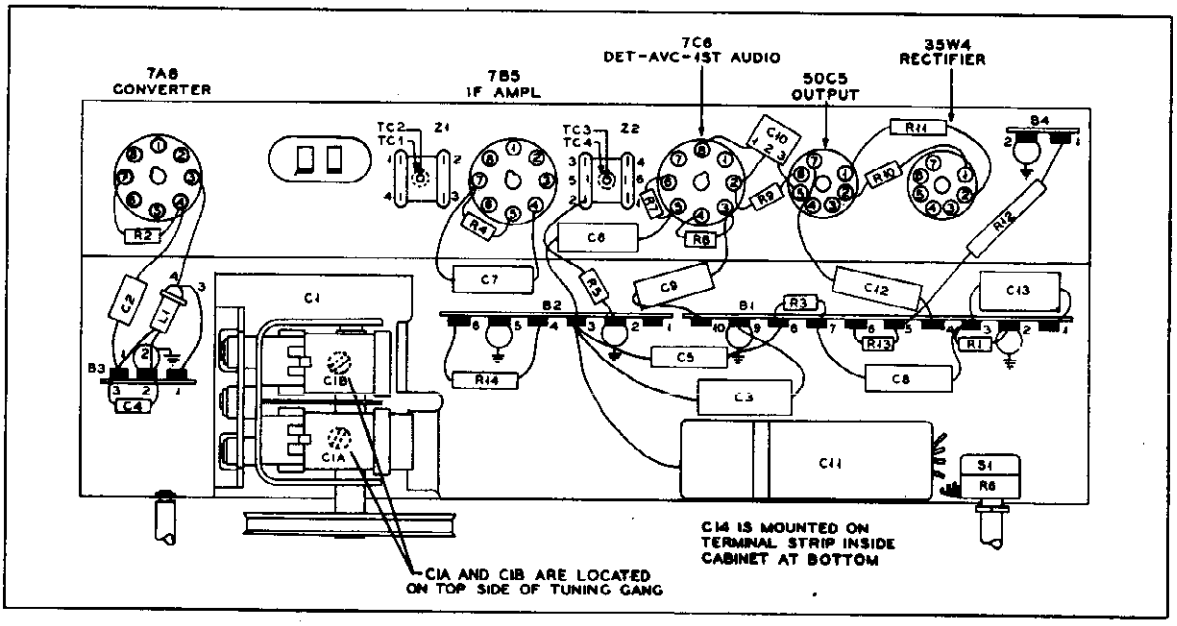
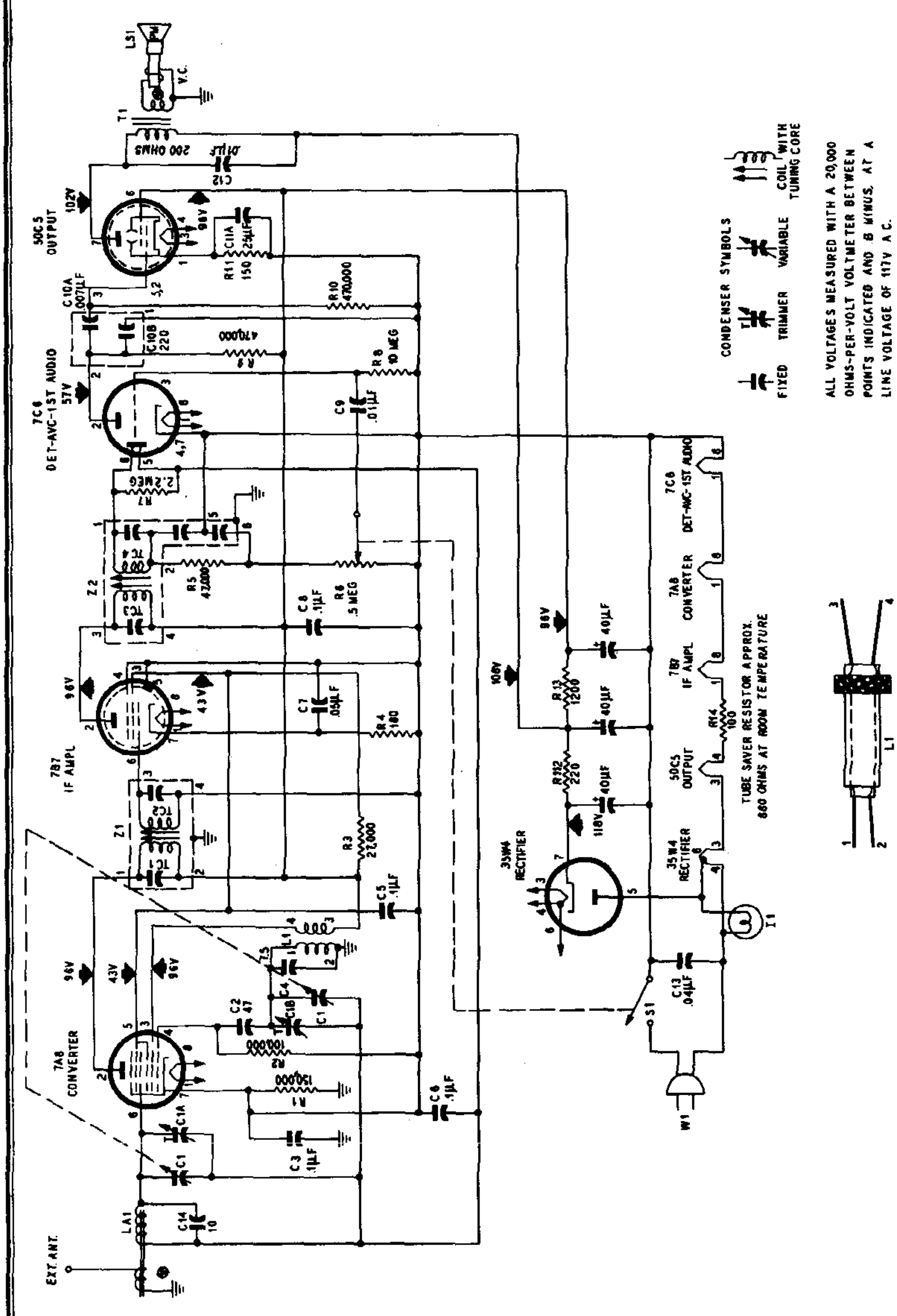


Figure 2. Base View, Showing Parts Placement and Alignment Points

TP1-1840



ALL VOLTAGES MEASURED WITH A 20,000 OHMS-PER-VOLT VOLTMETER BETWEEN POINTS INDICATED AND B MINUS, AT A LINE VOLTAGE OF 117V A.C.

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

⊛-LESS THAN ONE OHM.

MODEL 52-548

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	31-2751-10
C1A	Condenser, trimmer, aerial	Part of C1
C1B	Condenser, trimmer, oscillator	Part of C1
C2	Condenser, osc. grid, d-c blocking, 47 $\mu\mu f$.	60-00475417*
C3	Condenser, leakage, .1 μf.	45-3505-47
C4	Condenser, temperature compensating, 7.5 μf.	30-1224-65*
C5	Condenser, screen by-pass, .1 μf.	61-0113*
C6	Condenser, a-v-c by-pass, .1 μf.	61-0113*
C7	Condenser, cathode by-pass, .05 μf.	61-0122*
C8	Condenser, B+ by-pass, .1 μf.	45-3505-47*
C9	Condenser, audio coupling, .01 μf.	45-3505-58*
C10	Condenser, dual ceramic	30-1239-4
C10A	Condenser, audio coupling, .007 μf.	Part of C10
C10B	Condenser, grid by-pass, 220 $\mu\mu f$.	Part of C10
C11	Condenser, electrolytic, 4-section	30-2575-32*
C11A	Condenser, cathode by-pass, 25 μf.	Part of C11
C11B	Condenser, filter, 40 μf.	Part of C11
C11C	Condenser, filter, 40 μf.	Part of C11
C11D	Condenser, filter, 40 μf.	Part of C11
C12	Condenser, tone compensation, .01 μf.	45-3505-58*
C13	Condenser, line by-pass, .04 μf.	30-1226-17*
C14	Condenser, aerial, fixed trimmer, 10 $\mu\mu f$.	30-1224-26*
I1	Pilot lamp, type 47	34-2068
L1	Coil, oscillator	32-4263
LA1	Loop antenna (Magnecor)	32-4455-6
LS1	Speaker, 5¼" round	36-1639-9
R1	Resistor, leakage, 150,000 ohms	66-4158340*
R2	Resistor, grid return, 100,000 ohms	66-4108340*
R3	Resistor, dropping, 27,000 ohms	66-3278340*
R4	Resistor, cathode bias, 180 ohms	66-1188340*
R5	Resistor, i-f filter, 47,000 ohms	66-3478340*
R6	Resistor, volume control, .5 megohm (with switch)	33-5566-36
R7	Resistor, diode load, 2.2 megohms	66-5228340*
R8	Resistor, grid return, 10 megohms	66-6108340*
R9	Resistor, plate load, 470,000 ohms	66-4478340*
R10	Resistor, grid return, 470,000 ohms	66-4478340*
R11	Resistor, cathode bias, 150 ohms	66-1154340*
R12	Resistor, filter, 220 ohms, 2 watts	66-1225340*
R13	Resistor, filter, 1200 ohms	66-2128340*
R14	Resistor, surge limiting, 880 ohms cold, 100 ohms hot	33-1343-3
S1	Switch, off-on	Part of R6
T1	Transformer, output	32-8384*
W1	Line cord	L2183
Z1	Transformer, 1st i-f	32-4180A
Z2	Transformer, 2nd i-f	32-4240A

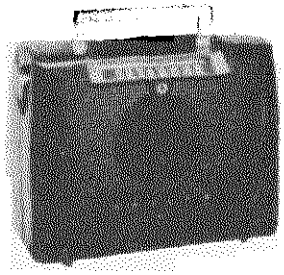
MISCELLANEOUS

Description	Service Part No.
Cabinet	10887
Fastener (5 required)	W2235-1FA9
Knob (2 required)	54-4774-9
Knob escutcheon (2 required)	54-4927
Dial backplate assembly	76-7056
Drive cord, 25-foot spool	45-8750
Dial scale	54-5128
Lamp assembly, pilot	27-6233-18
Pointer	56-5630-40
Shaft, tuning	56-9272
Spring	56-2617
Spring, hairpin	57-1468FA3
Mount, rubber (3 required)	27-4596
Socket, Locktal (3 required)	27-6207
Socket, miniature (2 required)	27-6265

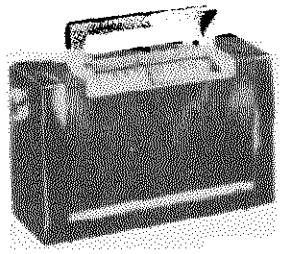
SUPPLEMENT TO MODEL 52-548

Additions to parts list:

Cabinet, ivory	10887-3
Escutcheon, knob (2)	54-4927
Knob (2)	54-4774-10
Scale	54-5128



MODEL 52-640



MODEL 52-641

SPECIFICATIONS

CABINET ..... Plastic, portable

CIRCUIT ..... Four-tube superheterodyne (plus selenium rectifier)

FREQUENCY RANGE ..... 540—1620 kc.

AUDIO OUTPUT
- A-c or d-c operation ..... 150 milliwatts
- Battery operation
  - Model 52-640 ..... 150 milliwatts
  - Model 52-641 ..... 75 milliwatts

OPERATING VOLTAGES
- Model 52-640 ..... 117 volts, a.c. or d.c.; 1.5-volt "A" and 90-volt "B" battery
- Model 52-641 ..... 117 volts, a.c. or d.c.; 1.5-volt "A" and 67.5-volt "B" battery

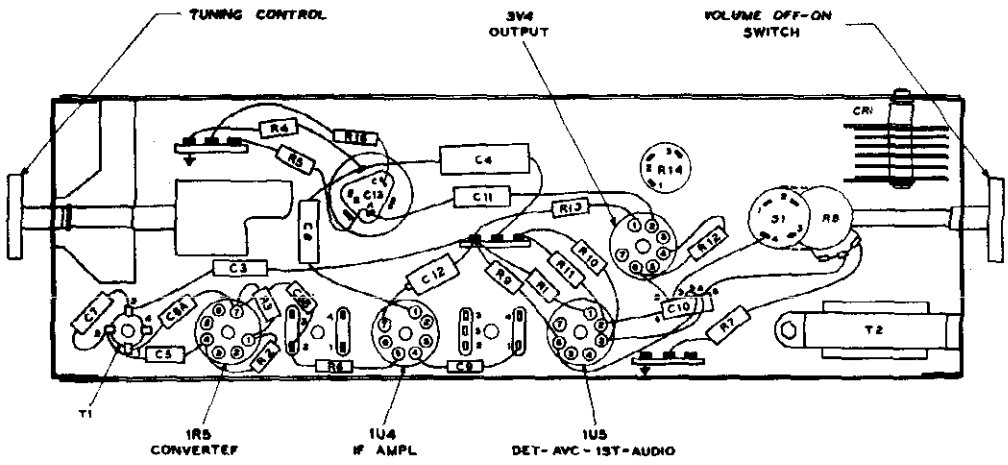
POWER CONSUMPTION
- A-c or d-c operation ..... 11 watts
- Battery operation
  - Model 52-640 ..... 13 ma. from 90-volt "B" battery; 250 ma. from 1.5-volt "A" battery
  - Model 52-641 ..... 9.5 ma. from 67.5-volt "B" battery; 250 ma. from 1.5-volt "A" battery

AERIAL
- Model 52-640 ..... High-impedance loop; provision for connecting external aerial
- Model 52-641 ..... Magnecor 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
- Model 52-640 ..... P-364
- Model 52-641 ..... P-67 "B" battery; Type D "A" battery



TP1-1167

Figure 1. Bottom View, Showing Symbolized Chassis

ALIGNMENT PROCEDURE

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

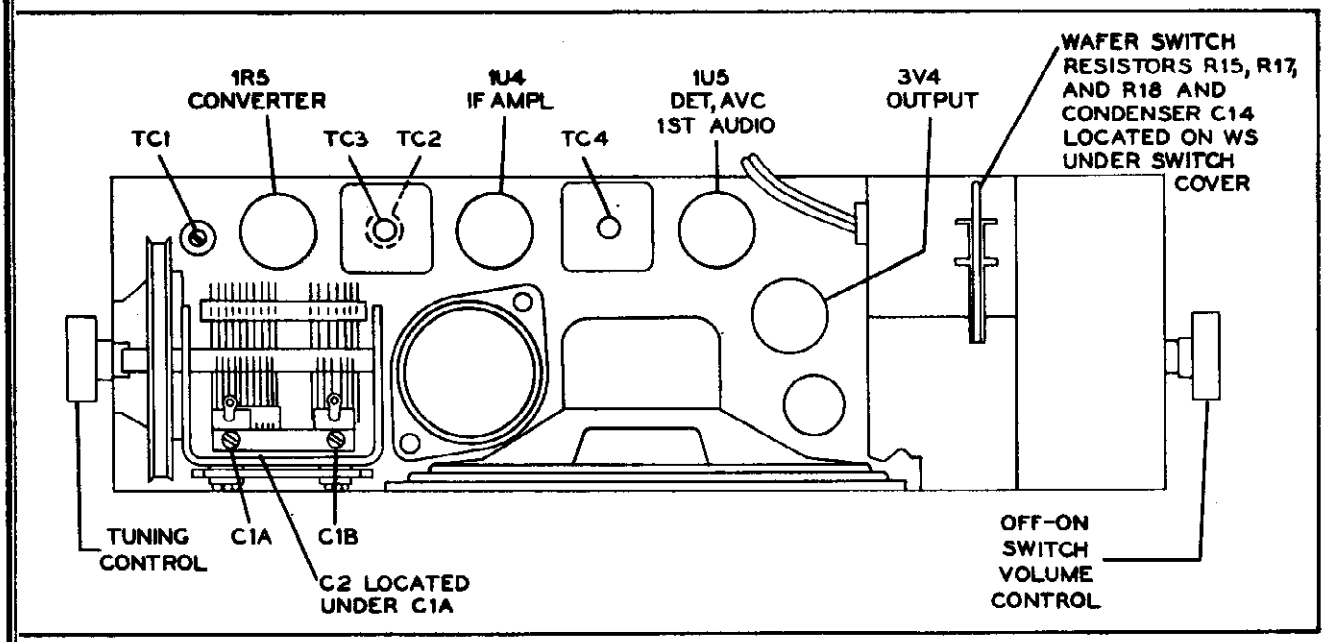
OUTPUT METER—Connect across speaker voice coil terminals.

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.

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.



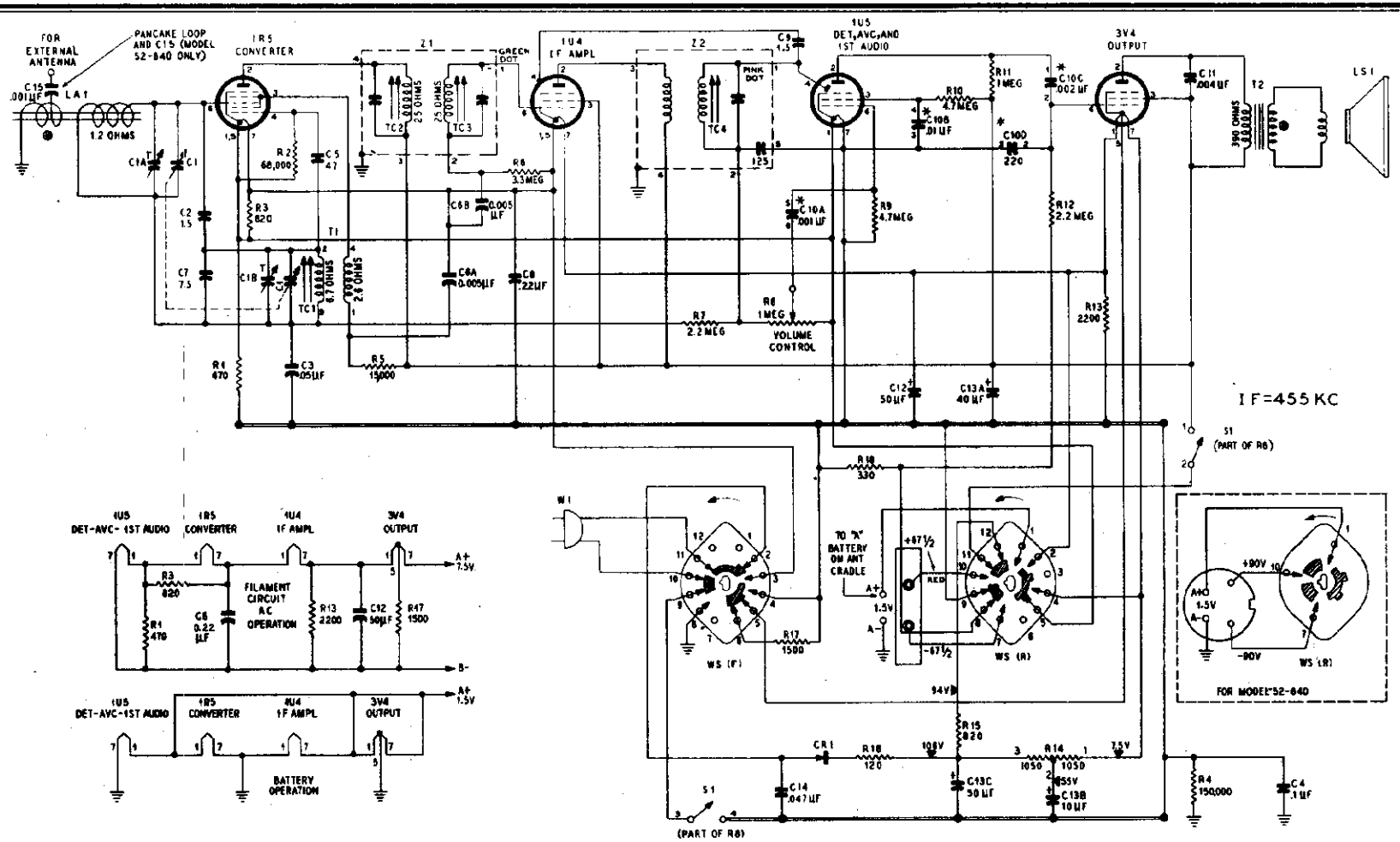
TPO-392

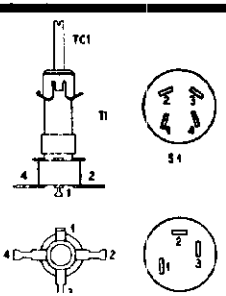
Figure 2. Top View, Showing Trimmer Locations

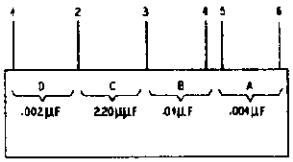
ALIGNMENT CHART

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
3	Same as step 2.	1500 kc.	1500 kc.	Adjust for maximum output.	C1A—aerial trimmer
4	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.







* C10 FOUR SECTION CONDENSER

TUBE SOCKET VOLTAGES

B SUPPLY	1R5 RF PLATE PIN 2	1R5 OSC. PLATE PIN 3	1U4 PLATE PIN 2	1U4 SCREEN PIN 3	1U5 PLATE PIN 2	1U5 SCREEN PIN 3	3V4 PLATE PIN 2	3V4 SCREEN PIN 3
PWR LINE (AC OR DC)	90	55	90	90	18	18	66	90
90V BATTERY	80	48	80	80	17	12	78	80
67½V BATTERY	65	36	65	65	17	18	62	65

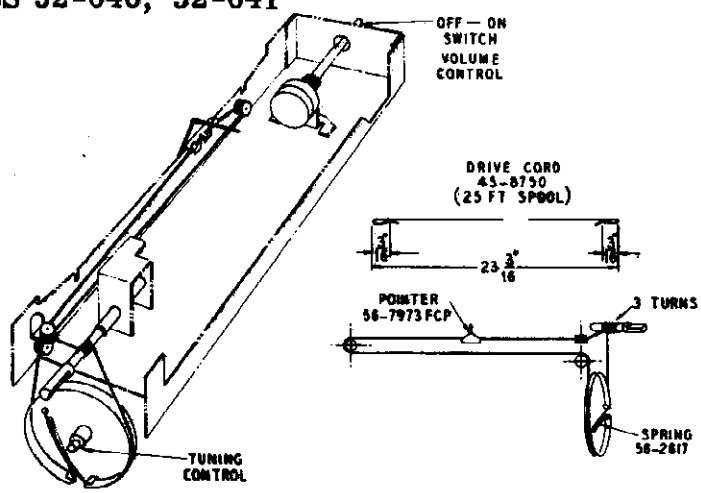
CONDENSER SYMBOLS

FIXED VARIABLE TRIMMER ELECTROLYTIC COIL WITH TUNING CORE

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-.

TP1-1164

MODELS 52-640, 52-641



TPO-390

Figure 4. Drive-Cord-Installation Details

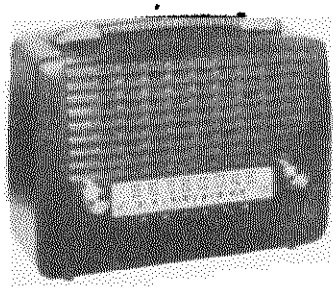
PARTS LIST

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 52-640	31-2735-3
	Model 52-641	31-2735-2
C1A	Condenser, trimmer, antenna	Part of C1
C1B	Condenser, trimmer, oscillator	Part of C1
C2	Condenser, neutralizing, 1.5 μμf.	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 μμf.	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 μμf.	30-1224-83
C8	Condenser, filament by-pass, .25 μf.	30-4656-1
C9	Condenser, neutralizing, 1.5 μμf.	30-1221-3
C10	Condenser, ceramic, 4-section	30-1327
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 μμf.	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*
C15	Condenser, antenna coupling, .001 μf.	45-3500-5
CR1	Selenium rectifier, 75 ma. at 117 volts	34-8003-1*
LA1	Loop aerial	
	Model 52-640 (flat loop)	32-4052-52
	Model 52-641 (Magnecor)	32-4455
LS1	Speaker, 4-inch p.m.	36-1627-21
R1	Resistor, current limiting, 470 ohms	66-1478340*
R2	Resistor, grid return, 68,000 ohms	66-3688340*
R3	Resistor, bias, 880 ohms	66-1888340*
R4	Resistor, leakage, 150,000 ohms	66-4158340*
R5	Resistor, oscillator dropping, 15,000 ohms	66-3158340*
R6	Resistor, grid return, 3.3 megohms	66-5338340*
R7	Resistor, a-v-c filter, 2.2 megohms	66-5228340*
R8	Resistor, 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, 2200 ohms	66-2228340*
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	32-4453-1
T2	Transformer, output	32-8434
W1	Line cord	L2183
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

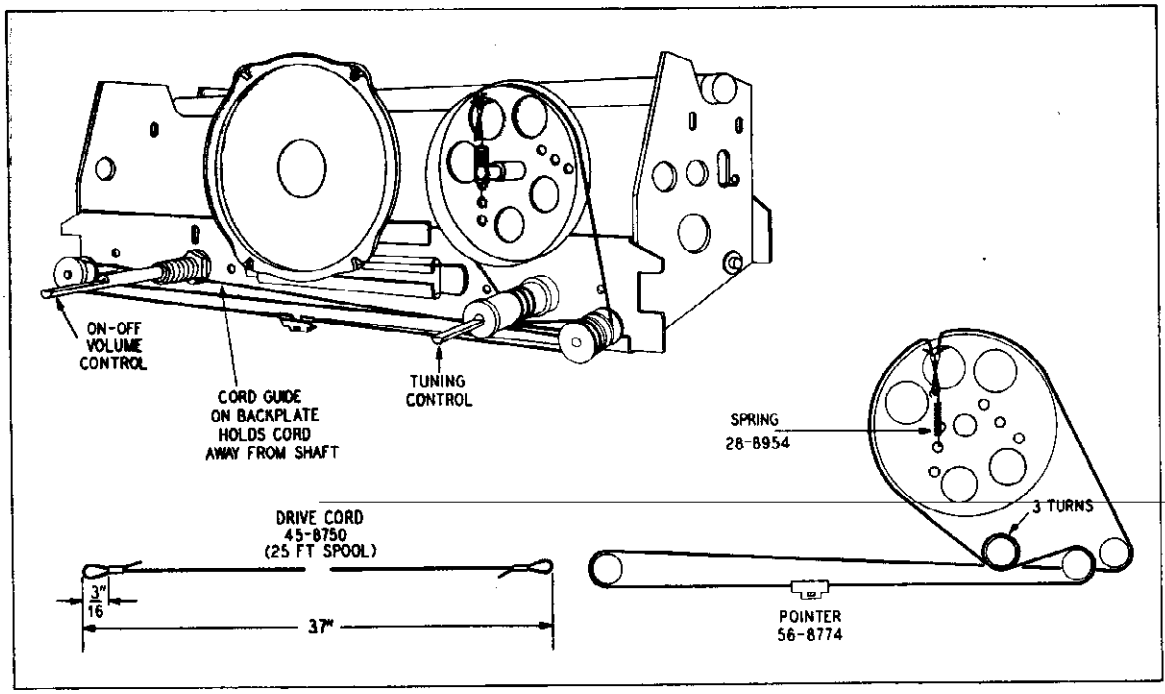
Description	Service Part No.
Cabinet, Model 52-640, maroon	10818-3
Back, maroon	54-4810
Clip (2), back	56-3807-3
Handle-and-bracket assembly	76-6987
Handle	54-4811-2
Knob assembly (2)	76-6206
Pointer	56-7973-1
Cabinet, Model 52-641, maroon	10799-1
Back, maroon	54-4767-1
Cabinet, Model 52-641, red	10799-2
Back, red	54-4767-2
Cabinet, Model 52-641, Nile	10799-4
Back, Nile	54-4767-4
Cabinet, Model 52-641, sand	10799-5
Back, sand	54-4767-5
Clip (2), back	56-9162
Fastener (2)	W2235-7FA9
Handle-and-bracket assembly	76-6081
Handle	56-7940FCP
Hinge, l.h.	56-7915
Hinge, r.h.	56-7915-1
Knob (2)	54-4773
Pointer	56-7973FCP
Scale, dial	54-5087
Baffle-and-cloth assembly	40-7884
Insulator, electrolytic-condenser mounting	27-9508
Cable-and-connector assembly, battery	41-3988
Drive cord (25-ft. spool)	45-8750*
Mount, rubber, tuning gang	27-4099-3
Retaining ring	1W60978FA3
Spring, drive cord	56-2617
Socket (2), tube, 1R5 and 1U4	27-8203
Socket (2), tube, 1U5 and 3V4	27-8203-12
Tube shield, 1U5	56-3978-1FA3
Tuning shaft	56-7906FA42



MODEL 52-643

SPECIFICATIONS

CABINET	Molded plastic, brown
CIRCUIT	Five-tube superheterodyne (plus selenium rectifier)
FREQUENCY RANGE	540—1620 kc.
AUDIO OUTPUT	160 milliwatts
OPERATING VOLTAGES	117 volts, a.c. or d.c.; or 9-volt "A" battery and 90-volt "B" battery
POWER CONSUMPTION	
A-c or d-c operation	15 watts
Battery operation	55 ma. at 9 volts, and 13 ma. at 90 volts
AERIAL	Magnecor high-impedance loop; provision for connecting external aerial
INTERMEDIATE FREQUENCY	265 kc.
PHILCO TUBES (5)	1T4 r-f ampl., 1R5 converter, 1U4 i-f ampl., 1U5 det.-a.v.c.—1st audio, 3V4 output
BATTERY TYPE	Philco P-363



TP1-1711

Figure 1. Drive-Cord-Installation Details

ALIGNMENT PROCEDURE

POINTER—Set pointer to coincide with first index mark from left side of dial backplate (looking at backplate).

RADIO CONTROLS—Set volume control to maximum.

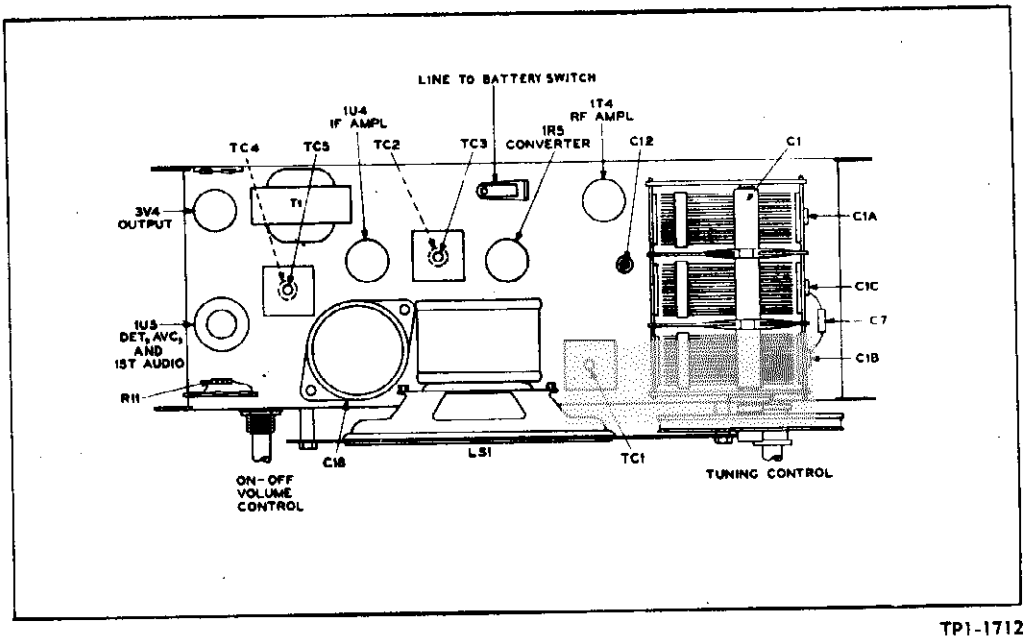
OUTPUT METER—Connect across voice-coil terminals.

SIGNAL GENERATOR—Use modulated output.

OUTPUT LEVEL—During alignment, adjust signal-generator output to maintain output-meter indication below .5 volt.

SPECIAL NOTE—The orientation of the loop with respect to the chassis and battery is critical for correct tracking. During alignment, with the cabinet back (containing the loop) lying flat on the bench, the chassis should be laid on its back in approximately its normal relation to the loop, with a ¼"-thick wooden board separating the loop and chassis. The battery should also be placed as close as possible to its normal position with respect to the chassis and loop.

CRITICAL LEAD DRESS—To secure proper padding capacity, the green lead from pin 6 of the 1R5 tube to Z1 must be dressed over wiring panel, away from chassis, and the green lead from Z1 to the tuning condenser must be dressed away from chassis.



TP1-1712

Figure 2. Top View, Showing Trimmer Locations

ALIGNMENT CHART

STEP	SIGNAL GENERATOR		RADIO		ADJUST
	CONNECTION TO RADIO	DIAL SETTING	DIAL SETTING	SPECIAL INSTRUCTIONS	
1	Through a .1-μf. condenser to pin 6 of the 1R5 converter.	265 kc.	1620 kc. (gang fully open)	Adjust, in order given, for maximum output.	TC5—2nd i-f sec. TC4—2nd i-f pri. TC2—1st i-f pri. TC3—1st i-f sec.
2	Radiating loop. See note below.	1620 kc.	1620 kc. (gang fully open)	Adjust for maximum output. If low-frequency dial tracking is far off, make adjustments in steps 3 and 4 before making this adjustment.	C1C—osc. shunt
3	Same as step 2.	580 kc.	580 kc.	Adjust for maximum output while rocking tuning control.	C13—osc. series
4	Same as step 2.	580 kc.	580 kc.	Adjust for maximum output. This adjustment should not be made unless dial tracking is off, or sensitivity is low at low-frequency end (580 kc.).	TC1—r-f sec.
5	Same as step 2.	1500 kc.	1500 kc. (index mark at right)	Adjust, in order given, for maximum output.	C1B—r-f trimmer C1A—aerial trimmer
6	Repeat steps 3 and 5 until no further improvement 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.

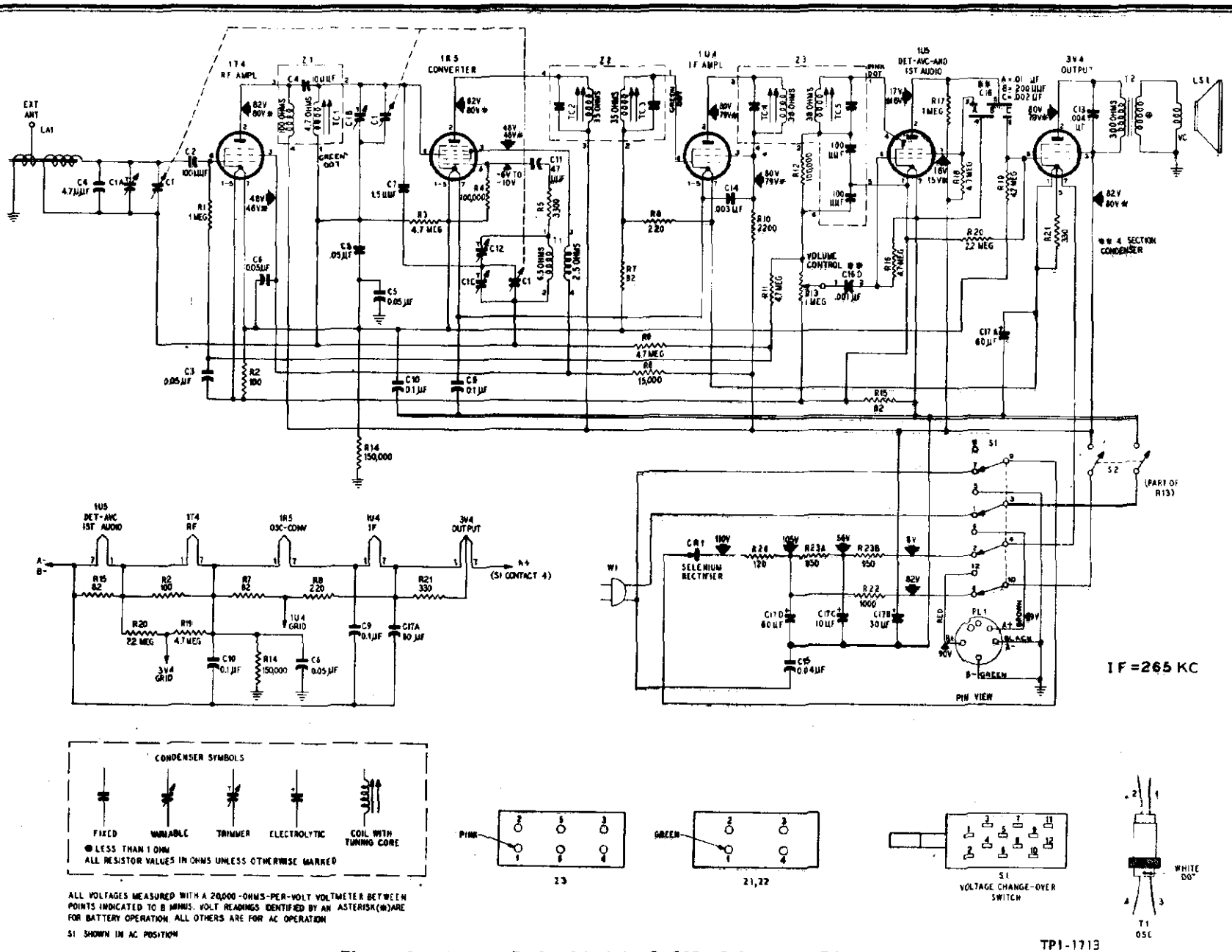


Figure 3. Philco Radio Model 52-643, Schematic Diagram

MODEL 52-643

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	Consender, tuning gang, 3-section	31-2747-2
C1A	Condenser, antenna trimmer	Part of C1
C1B	Condenser, r-f trimmer	Part of C1
C1C	Condenser, osc. trimmer	Part of C1
C2	Condenser, d-c blocking, 100 μμf.	62-110009001*
C3	Condenser, bias filter, .05 μf.	61-0122*
C4	Condenser, fixed trimmer, 4.7 μμf.	30-1230
C5	Condenser, filament by-pass, .05 μf.	61-0122*
C6	Condenser, screen by-pass, .05 μf.	61-0122*
C7	Condenser, neutralization, 1.5 μμf.	30-1221-3
C8	Condenser, a-v-c filter, .05 μf.	61-0122*
C9	Condenser, filament by-pass, .1 μf.	61-0113*
C10	Condenser, filament by-pass, .1 μf.	61-0113*
C11	Condenser, d-c blocking, 47 μμf.	60-00475417*
C12	Condenser, osc. series padder, 600 to 800 μμf.	31-6473-16
C13	Condenser, tone compensation, .004 μf.	61-0179*
C14	Condenser, screen neutralizing, .003 μf.	61-0109*
C15	Condenser, line by-pass, .04 μf.	45-3500-2*
C16	Condenser, ceramic, 4-section	30-1237
C16A	Condenser, screen by-pass, .01 μf.	Part of C16
C16B	Condenser, by-pass, 200 μμf.	Part of C16
C16C	Condenser, d-c blocking, .002 μf.	Part of C16
C16D	Condenser, d-c blocking, .001 μf.	Part of C16
C17	Condenser, electrolytic, 4-section	30-2568-26
C17A	Condenser, filament by-pass, 60 μf.	Part of C17
C17B	Condenser, filter, 30 μf.	Part of C17
C17C	Condenser, filter, 10 μf.	Part of C17
C17D	Condenser, filter, 60 μf.	Part of C17
CR1	Selentum rectifier	34-8003*
LA1	Coil, antenna	32-4455-4
LS1	Speaker, 5-inch	36-1625
PL1	Plug and cable, battery	41-3712-5
R1	Resistor, grid return, 1 megohm	66-5108340*
R2	Resistor, current limiting, 100 ohms	66-1108340*
R3	Resistor, grid return, 4.7 megohms	66-5478340*
R4	Resistor, grid return, 100,000 ohms	66-4108340*
R5	Resistor, oscillator coupling, 3300 ohms	66-2338340*
R6	Resistor, dropping, 15,000 ohms	66-3158340*
R7	Resistor, grid return, 82 ohms	66-0828340*
R8	Resistor, grid return, 220 ohms	66-1228340*
R9	Resistor, a-v-c filter, 4.7 megohms	66-5478340*
R10	Resistor, neutralization, 2200 ohms	66-2228340*
R11	Resistor, a-v-c filter, 4.7 megohms	66-5478340*
R12	Resistor, i-f filter, 100,000 ohms	66-4108340*
R13	Resistor, VOLUME control, 1 megohm	33-5566-11
R14	Resistor, leakage, 150,000 ohms	66-4158340*
R15	Resistor, current limiting, 82 ohms	66-0828340*
R16	Resistor, grid return, 4.7 megohms	66-5478340*
R17	Resistor, plate load, 1 megohm	66-5108340
R18	Resistor, screen dropping, 4.7 megohms	66-5478340*
R19	Resistor, grid return, 4.7 megohms	66-5478340*
R20	Resistor, grid return, 2.2 megohms	66-5228340*
R21	Resistor, current limiting, 330 ohms	66-1338340*
R22	Resistor, filter, 1000 ohms	66-2108340*
R23	Resistor, wire wound, 2-section	33-3431-7
R23A	Resistor, filament dropping, 950 ohms	Part of R23
R23B	Resistor, filament dropping, 950 ohms	Part of R23
R24	Resistor, wire wound, current limiting, 120 ohms	33-1334-14
S1	Switch, change-over	42-1899
S2	Switch, on-off	Part of R13
T1	Transformer, oscillator	32-4263-2
T2	Transformer, output	32-8528
W1	Line cord	L2183
Z1	Transformer, r-f	32-4399A
Z2	Transformer, 1st i-f	32-4180-2A
Z3	Transformer, 2nd i-f	32-4240-6A

MISCELLANEOUS

Description	Service Part No.
Cabinet complete	10883
Back	54-4903
Clip (2), back	56-3807-3
Handle assembly	76-6970
Scale	54-5127
Dial backplate assembly	76-7042
Backplate	56-9190FCP
Drive cord, 25-ft. spool	45-8750*
Pointer	56-8774
Spring, drive cord	28-8954
Shaft-and-pulley assembly	76-3671-4
Bushing	27-9437
Clip (1)	56-7057FA3
Knob (2)	54-4773-1
Mount (3), rubber	27-4596
Spring, retaining	57-1468FA3
Shield, 1U5 tube	56-5629FA3
Socket (4)	27-8203
Socket (1), 1U5 tube	27-8203-22
Handle end cover, plastic	54-4909
Handle mounting bracket, metal	56-9583

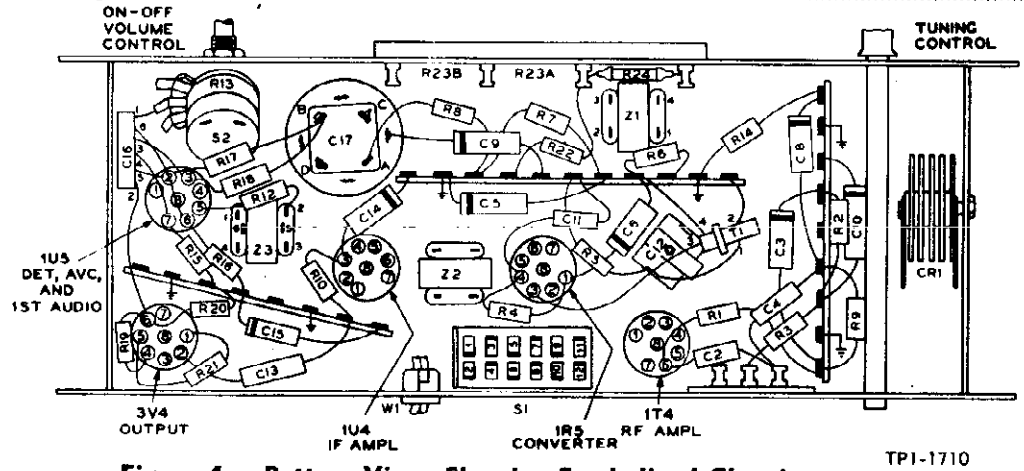
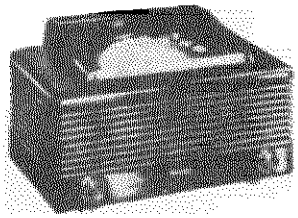
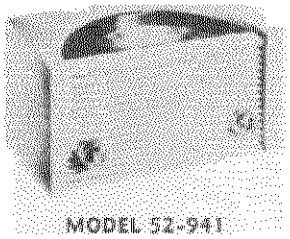


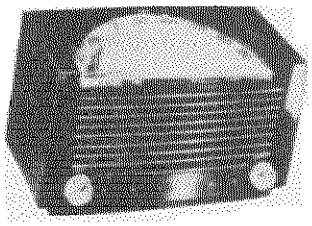
Figure 4. Bottom View, Showing Symbolized Chassis



MODEL 52-940



MODEL 52-941



MODEL 52-942

SPECIFICATIONS

CABINET	
Model 52-940	Molded plastic, mahogany or gray, wide-angle dial
Model 52-941	Molded plastic, ivory, wide-angle dial
Model 52-942	Molded plastic, maroon, wide-angle dial
CIRCUIT	Five-tube superheterodyne (plus rectifier)
FREQUENCY RANGE	540—1620 kc.
AUDIO OUTPUT	1 watt
OPERATING VOLTAGE	105—120 volts, a.c. or d.c.
POWER CONSUMPTION	30 watts
AERIAL	High-impedance loop; provision for connecting external aerial
INTERMEDIATE FREQUENCY	455 kc.
PHILCO TUBES (6)	7B7 r-f ampl., 7A8 converter, 7B7 i-f ampl., 14B6 det.-a.v.c.-1st audio, 35L6GT output, 35Z5GT rectifier

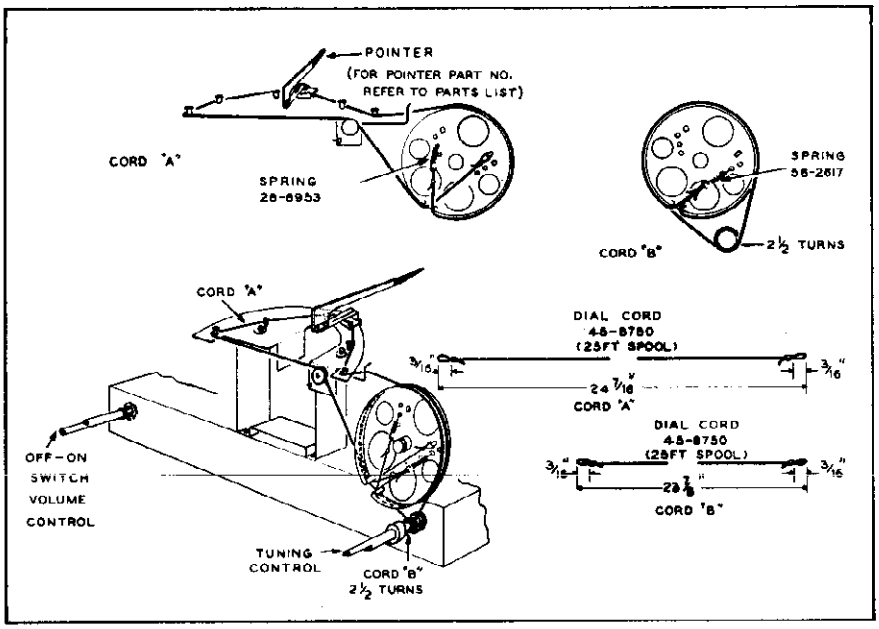


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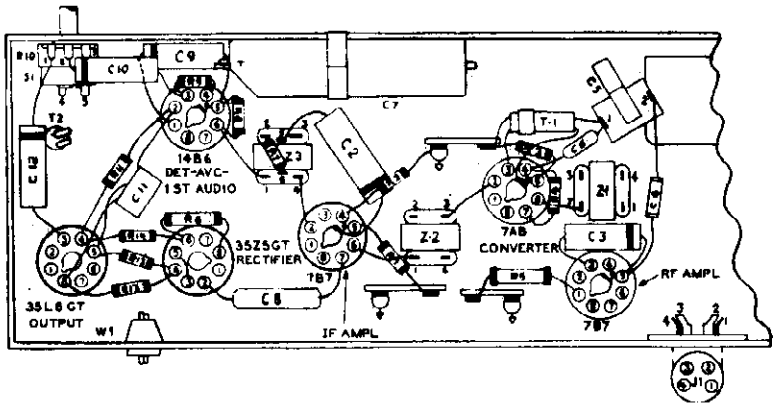
Figure 1. Dial-Cord Installation Details



TP1-1714

Figure 2. Bottom View, Showing Symbolized Chassis

ALIGNMENT PROCEDURE

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

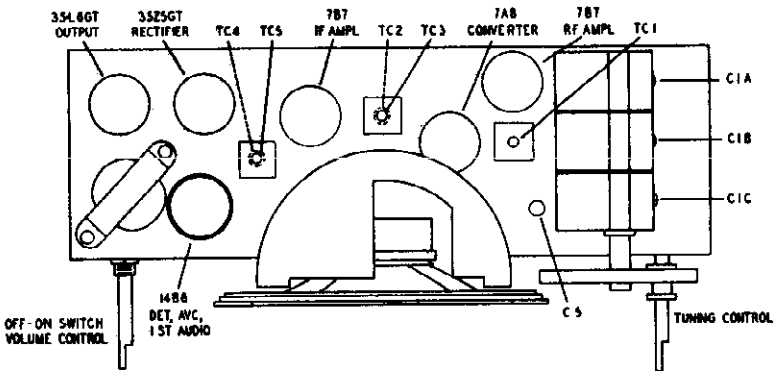
VOLUME CONTROL: Set to maximum.

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.

ALIGNMENT CHART

STEP	SIGNAL GENERATOR		RADIO		ADJUST
	CONNECTION TO RADIO	DIAL SETTING	DIAL SETTING	SPECIAL INSTRUCTIONS	
1	Through a .1-μμf. 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 ½ turn from right.	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.				

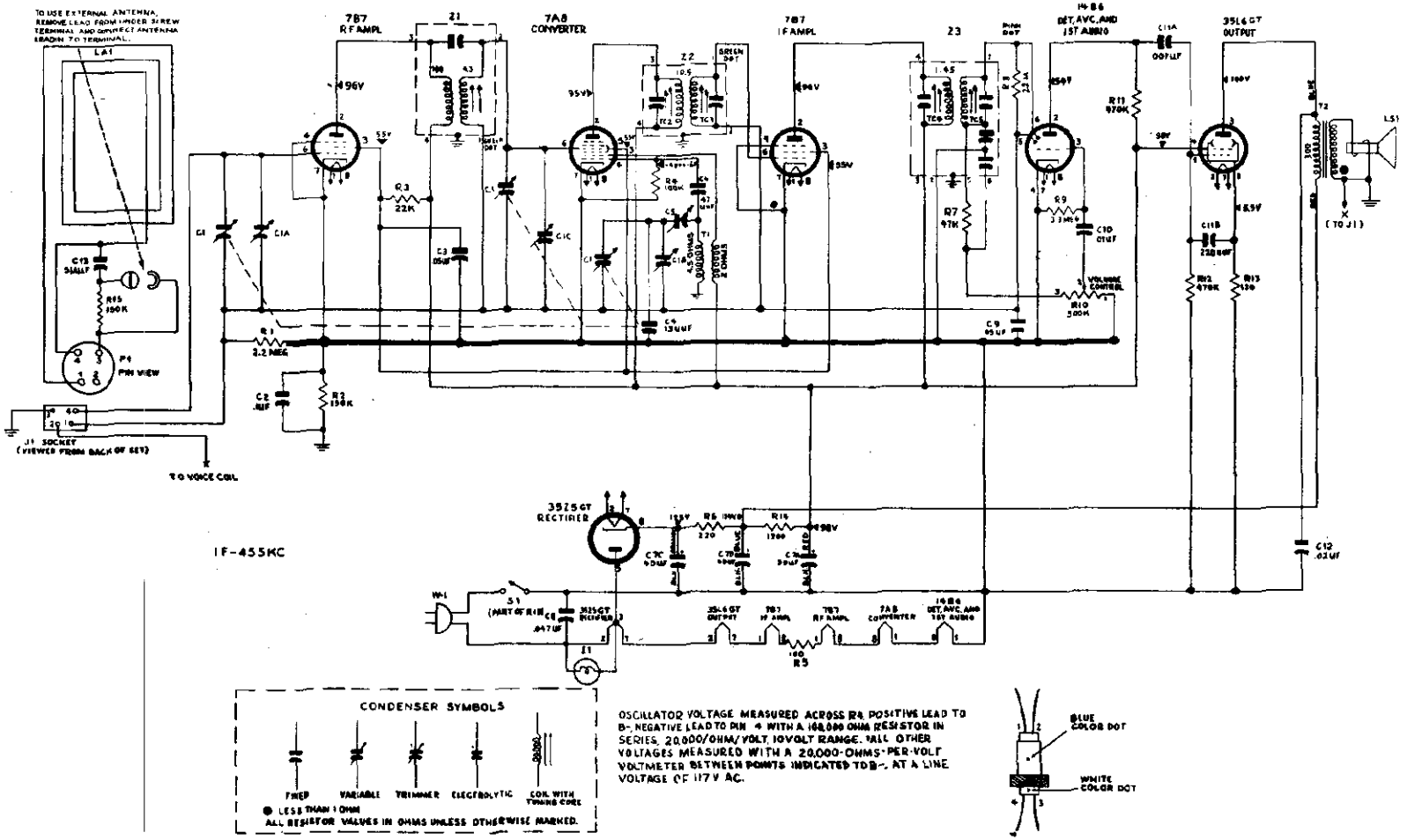
RADIATING LOOP: Make up a 6—8 turn, 6-inch-diameter loop from insulated wire; connect to signal-generator leads and place near radio loop aerial. The loop aerial must be connected to the radio.



TP9-636B

Figure 3. Top View, Showing Trimmer Locations

Figure 4. Philco Radio Models 52-940, 52-941, and 52-942, Schematic Diagram



SUPPLEMENT TO MODEL 52-940

Additions to parts list (for ivory model):

Bezel, metal	56-7427-1
Knob (2)	54-4718-7
Scale, dial	54-5070-3

MODELS 52-940, 52-941, 52-942

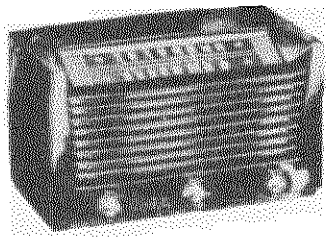
PARTS LIST

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, by-pass, .05 μf.	61-0122*
C4	Condenser, fixed trimmer, temperature comp., 13 μμf.	30-1224-68
C5	Condenser, padder, osc. series	31-6473-17
C6	Condenser, d-c blocking, 47 μμf.	60-00475417
C7	Condenser, electrolytic, 3-section	30-2575-27
C7A	Condenser, filter, 30 μf., 150v	Part of C7
C7B	Condenser, filter, 40 μf., 150v	Part of C7
C7C	Condenser, filter, 40 μf., 150v	Part of C7
C8	Condenser, line by-pass .047 μf.	45-3505-45
C9	Condenser, a-v-c filter, .05 μf.	61-0122*
C10	Condenser, d-c blocking, .01 μf.	61-0120*
C11	Condenser, dual ceramic	30-1239-4
C11A	Condenser, d-c blocking, .007 μf.	Part of C11
C11B	Condenser, by-pass, 220 μμf.	Part of C11
C12	Condenser, tone compensation, .02 μf.	61-0108*
C13	Condenser, antenna coupling, 5 μμf.	30-1230
I1	Pilot lamp, 6—8v	34-2068
J1	Jack, aerial input	27-6214-1
LA1	Loop aerial, Model 52-940	32-4052-57
LA1	Loop aerial, Model 52-941	32-4052-58
LA1	Loop aerial, Model 52-942	32-4052-59
LS1	Speaker, p-m, 4 in. x 6 in. oval	36-1633-1
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, 1 watt	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	Resistor, VOLUME control (with on-off switch), 500,000 ohms	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	66-1138340*
R14	Resistor, filter, 1200 ohms	66-2128340*
R15	Resistor, leakage, 150,000 ohms	66-4158340*
S1	Switch, off-on	Part of R10
T1	Transformer, oscillator	32-4263-2
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, Model 52-940, mahogany	10770-4
Cabinet, Model 52-940, gray	10770-3
Back	54-7917
Fastener (4), back	W-2235FA9
Backplate, ornamental, mahogany cabinet	56-7426FCP
Backplate, ornamental, gray cabinet	56-7426-1FCP
Fastener, backplate mtg.	W-2235-1FA9
Baffle	54-7938-3
Fastener (4), baffle mtg.	W-2235-2FA9
Bezel, metal	56-7427
Speed nut (2), bezel mtg.	1W60196FE7
Dial scale, mahogany cabinet	54-5070-3
Dial scale, gray cabinet	54-5070-4
Clip, scale mtg.	38-7886FE7
Knob (2), mahogany cabinet	54-4718-4
Knob (2), gray cabinet	54-4718-7
Pointer	76-5341-1
Cabinet, Model 52-941	10771
Back	54-7921
Fastener (4), back	W-2235FA9
Backplate, ornamental	56-7434-1
Fastener, backplate mtg.	W-2235-2FA9
Baffle, cardboard	54-7922
Fastener (4), baffle mtg.	W-2235-2FA9
Dial scale	54-5071
Clip, dial mtg.	56-7808FE7
Knob (2)	54-4718-5
Pointer	76-5341-4
Cabinet, Model 52-942	10772
Back	54-7920
Fastener (4), back	W-2235FA9
Backplate, ornamental	56-7435
Fastener, backplate mtg.	W-2235-1FA9
Baffle, cardboard	54-7919-2
Fastener (4), baffle mtg.	W-2235-2FA9
Bezel, metal	56-7536
Speed nut, bezel mtg.	1W60196FE7
Dial scale	54-5072-1
Clip (2), dial mtg.	56-7572FE11
Knob (2)	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	27-8437
Spring (2), hairpin, drive shaft	57-1468FA3
Panel, wiring, external aerial	38-8837
Panel, wiring, 4-lug	38-8181-1
Plug, aerial, 4-pin	6214-1
Rubber mount (4), gang mtg.	27-4771-1
Shield, tube, 14B6	56-1566
Socket (4), Loktal	27-6269
Socket (2), octal	27-6174
Socket assembly, pilot lamp	27-6233-6



MODEL 52-944

SPECIFICATIONS

CABINET ..... Plastic table model

CIRCUIT ..... Six-tube superheterodyne plus selenium rectifier

FREQUENCY RANGES

Broadcast ..... 540-1620 kc.

FM ..... 88—108 mc.

AUDIO OUTPUT ..... 1 watt

OPERATING VOLTAGE ..... 105—125 volts, a.c./d.c.

POWER CONSUMPTION ..... 45 watts

AERIAL ..... Built-in pancake loop for AM, line cord for FM; provision for connecting external aerial

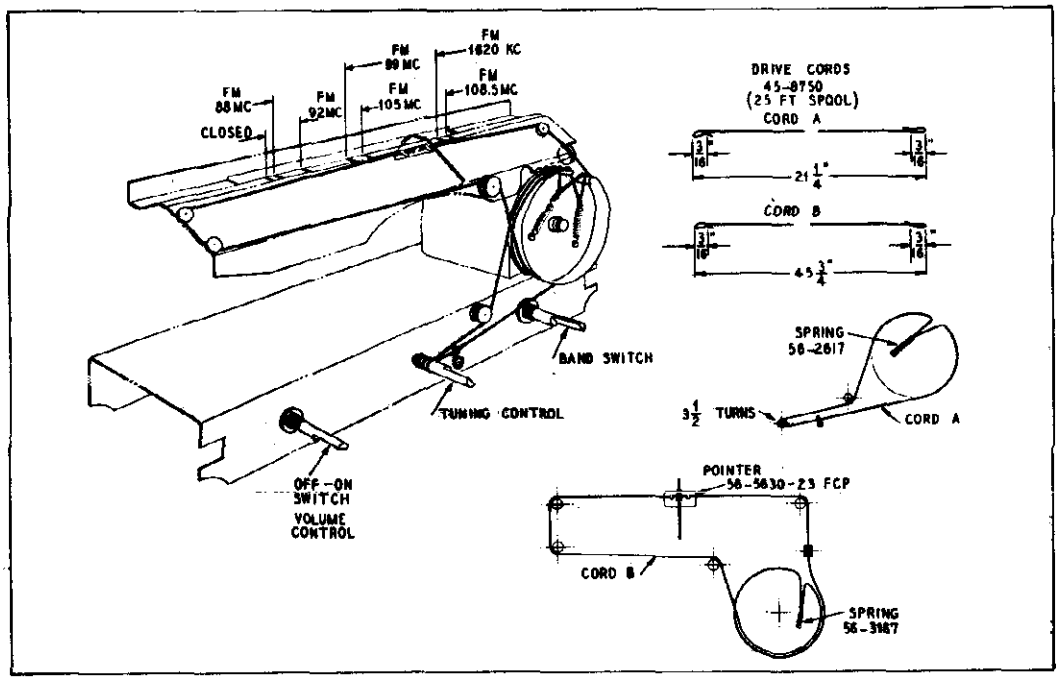
INTERMEDIATE FREQUENCY

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., 19 det.—a.v.c.—1st audio, 35C5 output

TP1-170



TPO-373

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 *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 junction of LA1 and L8.	455 kc.	Gang fully open	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.	1620 kc. (2nd index mark from right)	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*

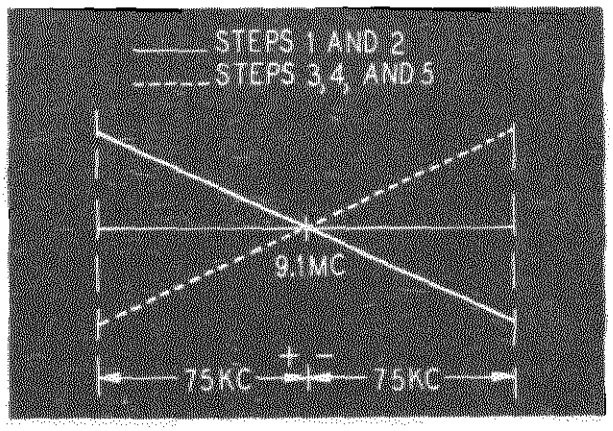
RADIO CONTROLS—Set volume control to maximum, set band switch for FM reception, and set tuning control as indicated in chart.

OSCILLOSCOPE—Connect ground lead to chassis. Connect vertical input to FM TEST jack, J2; connect horizontal input to horizontal sweep output of sweep generator. (Oscilloscope is used for steps 1 and 2.)

SWEEP GENERATOR—Use r-f sweep signal generator. Connect ground lead to chassis. Connect *output lead and set* frequency and sweep width as indicated in chart.

OUTPUT METER—*Connect across voice-coil terminals.*

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



TP1-2111

Figure 2. Characteristic Curve of FM Detector

FM ALIGNMENT CHART

STEP	SIGNAL GENERATOR		RADIO		ADJUST
	CONNECTION TO RADIO	DIAL SETTING	DIAL SETTING	SPECIAL INSTRUCTIONS	
1	Connect FM signal generator through a .01-μf. condenser to control grid (pin 1) of 12AU6 2nd i-f amplifier.	9.1 mc. (75-kc. deviation).	88 mc. (gang meshed).	Balance and adjust detector for maximum indication on scope as shown in figure 5.	TC8—detector sec. TC7—detector pri.

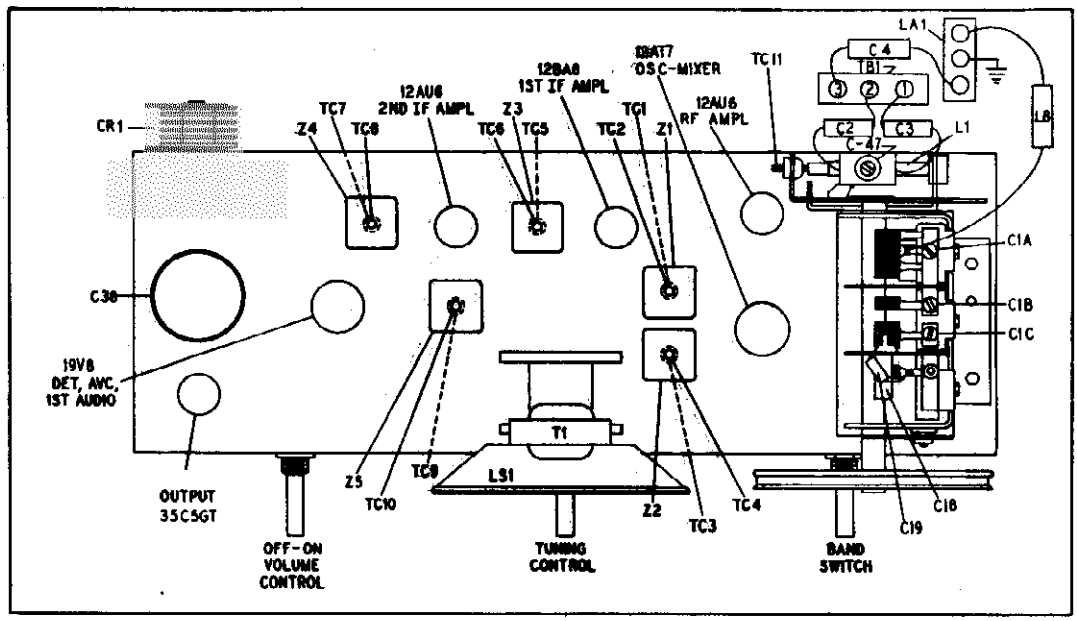


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Figure 3. Top View, Showing Trimmer Locations

FM ALIGNMENT CHART (Cont.)

STEP	SIGNAL GENERATOR		RADIO		ADJUST
	CONNECTION TO RADIO	DIAL SETTING	DIAL SETTING	SPECIAL INSTRUCTIONS	
2	Connect FM signal generator through a .01-μf. condenser to FM tuning gang stator lug, junction of C1 and pin 4 of L2.	Same as step 1.	Same as step 1.	Adjust for maximum indication on scope as shown in figure 5.	TC6—FM 2nd sec. TC5—FM 2nd pri. TC2—FM 1st sec. TC1—FM 1st pri.
3	Connect FM signal generator to lug 2 of TB1, and ground side of generator to lug 3 of TB1. See note 1 below.	108.5 mc.	108.5 mc. (1st index mark from right).	Adjust for maximum indication on output meter.	C1B—FM osc.
4	Same as step 3.	88 mc.	88 mc. (1st index mark from left).	Adjust for maximum indication on output meter. See note 2 below.	L5—FM osc.
5	Same as step 3.	105 mc.	105 mc. (3rd index mark from right).	Adjust for maximum indication on output meter while rocking tuning condenser.	C1B—FM r-f
6	Same as step 3.	105 mc.	105 mc.	Adjust for maximum indication on output meter.	C47—FM aerial
7	Same as step 3.	92 mc.	92 mc. (3rd index mark from left).	Adjust for maximum indication on output meter. See note 3 below.	L2—FM r-f coil.
If L1 is replaced, adjust antenna inductance as follows:					
8	Same as step 3.	92 mc.	92 mc.	Adjust for maximum indication on output meter.	TC11—FM aeric

NOTE 1: For proper and accurate results, the signal-generator output impedance must be 300 ohms to match the input impedance of TB
If the signal-generator output impedance is less than 300 ohms, a resistor of the proper value may be used in series with the output lea
to make the impedance correct. For example, if the output impedance is 150 ohms, place a 150-ohm resistor in series with the output lea

NOTE 2: If oscillator frequency does not tune as low as 88 mc., compress the turns on the oscillator coil. If oscillator frequency tunes t
low, spread the turns slightly. After coil is adjusted, repeat step 3.

NOTE 3: Check resonance of coil L2 by inserting end of a tuning wand, such as Philco Part No. 56-8100, in the coil. If output increas
when iron end is placed in coil, compress turns slightly. If output increases when brass end is placed in coil, spread the turns. If outp
decreases when either end is placed in coil, no adjustment is necessary. After the coil is adjusted, readjust trimmer C1B and repeat ste
3 through 8 until no further adjustment is necessary.

MODEL 52-944

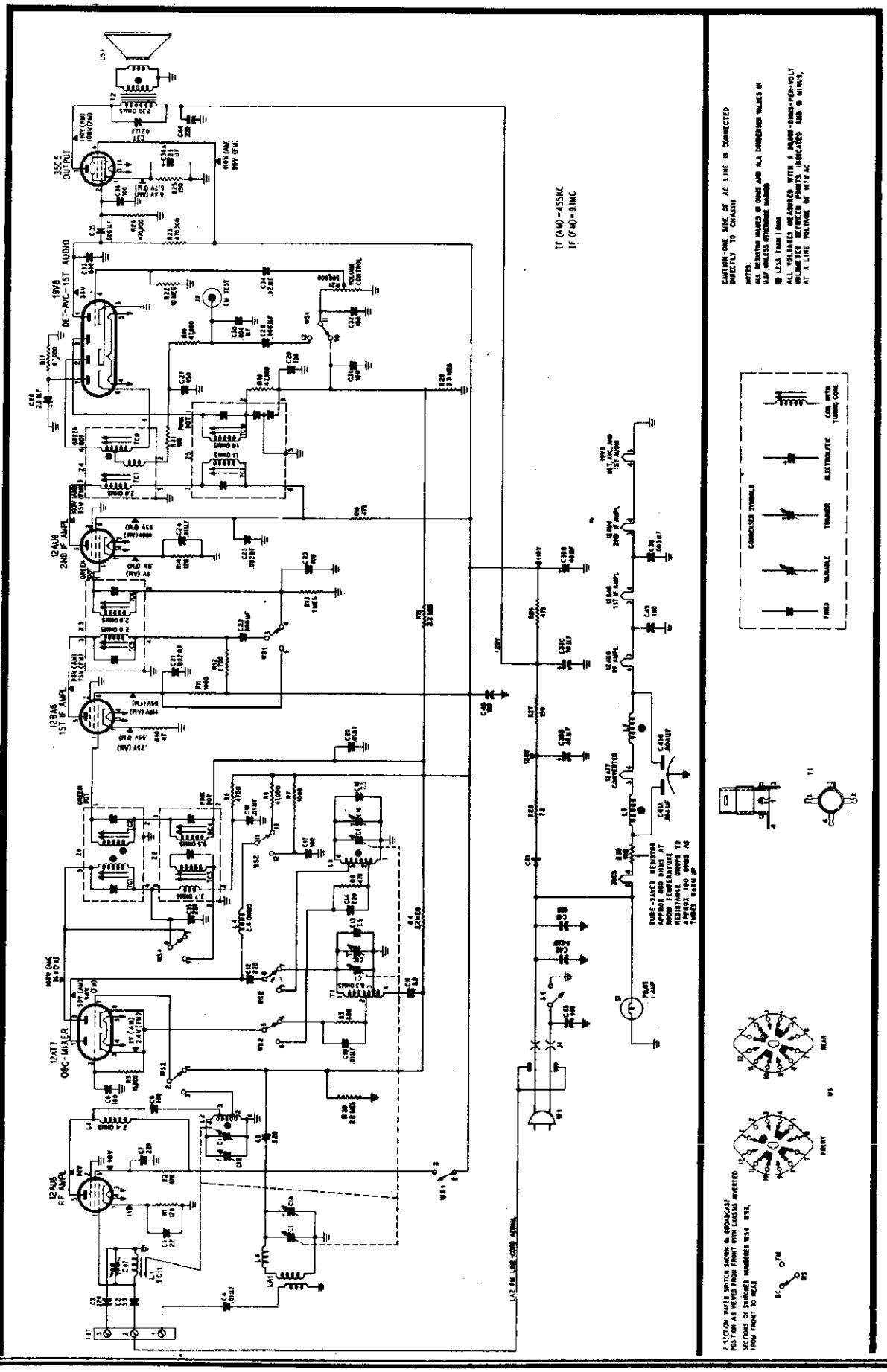


Figure 4. Philco Radio Model 52-944, Schematic Diagram

TP1-1763

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	31-2762
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
C2	Condenser, aerial isolating, 3.3 μμf.	30-1224-49
C3	Condenser, aerial isolating, 220 μμf.	62-122001001*
C4	Condenser, aerial isolating, .01 μf.	45-3505-41
C5	Condenser, cathode by-pass, 22 μμf.	62-022009001
C6	Condenser, d-c blocking, 100 μμf.	62-110001001
C7	Condenser, screen by-pass, 220 μμf.	62-122001011*
C8	Condenser, oscillator grid, 100 μμf.	62-110001021*
C9	Condenser, d-c blocking, 220 μμf.	62-122001001
C10	Condenser, d-c blocking, .01 μf.	30-1226-10
C11	Condenser, neutralizing, 3.9 μμf.	30-1221-14
C12	Condenser, d-c blocking, 220 μμf.	62-122001001
C13	Condenser, fixed trimmer, temperature compensating, 7.5 μμf.	30-1224-8
C14	Condenser, d-c blocking, 220 μμf.	62-122001001*
C15	Condenser, r-f by-pass, 220 μμf.	62-122001001*
C16	Condenser, plate decoupling, .01 μf.	30-4572
C17	Condenser, r-f by-pass, 100 μμf.	62-110001001*
C18	Condenser, trimmer, FM oscillator	31-6511
C19	Condenser, fixed trimmer, temperature compensating, 7.5 μμf.	30-1224-8
C20	Condenser, a-v-c decoupling, .01 μf.	61-0120
C21	Condenser, screen by-pass, .002 μf.	61-0062*
C22	Condenser, neutralizing, .006 μf.	45-3500-7*
C23	Condenser, i-f by-pass, 100 μμ.	62-110001021*
C24	Condenser, cathode by-pass, .01 μf.	61-0120
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, 150 μμf.	60-10155407
C28	Condenser, d-c blocking, .006 μf.	45-3500-7*
C29	Condenser, i-f by-pass, 100 μμf.	62-110001021*
C30	Condenser, de-emphasis, .004 μf.	61-0179*
C31	Condenser, i-f by-pass, 100 μμf.	62-110001001*
C32	Condenser, i-f by-pass, 100 μμf.	62-110001001*
C33	Condenser, plate by-pass, 680 μμf.	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 μμf.	62-110001001*
C37	Condenser, tone compensation, .02 μf.	61-0108*
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 μμf.	62-110001021*
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
C43	Condenser, filament by-pass, 100 μμf.	62-110001021*
C44	Condenser, plate decoupling, 220 μμf.	66-122001001
C45	Condenser, line by-pass, 100 μμf.	62-110001021*
C46	Condenser, r-f by-pass, 100 μμf.	62-110001001
C47	Condenser, FM aerial trimmer	45-30
CR1	Selenium rectifier, 100 ma., 117v	34-800
I1	Pilot lamp, frosted, 117v, 7 watts	34-26
J1	Jack, male, a-c	27-4785
J2	Socket, FM test	27-61
L1	Coil, FM aerial, complete with grommet	45-96
L2	Coil, FM r-f	32-441
L3	Choke, r-f, 3.3 μh.	32-4422
L4	Choke, r-f, 3.3 μh.	32-4422
L5	Coil, FM oscillator	32-441
L6	Choke, filament, 2.2 μh.	32-442
L7	Choke, filament, 2.2 μh.	32-442
L8	Choke, r-f, 4.1 μh.	32-406
LA1	AM loop and support assembly	76-7
LA2	Line-cord aerial, FM	Part of
LS1	Speaker, 4" p-m, including output transformer	36-161
R1	Resistor, cathode bias, 120 ohms	66-1128
R2	Resistor, screen decoupling, 470 ohms	66-1478
R3	Resistor, grid return, 15,000 ohms	66-3158
R4	Resistor, grid return, 2.2 megohms	66-5228
R5	Resistor, parasitic suppressor, 680 ohms.	66-1688
R6	Resistor, parasitic suppressor, 470 ohms.	66-1478
R7	Resistor, plate dropping, FM, 1000 ohms.	66-2108
R8	Resistor, plate dropping, AM, 47,000 ohms	66-3478
R9	Resistor, plate dropping, 4700 ohms	66-2478
R10	Resistor, cathode bias, 47 ohms	66-0478
R11	Resistor, screen decoupling, 1000 ohms	66-2108
R12	Resistor, plate decoupling, 2700 ohms	66-2278
R13	Resistor, grid return, 1 megohm	66-5108
R14	Resistor, cathode bias, 120 ohms	66-1128
R15	Resistor, a-v-c filter, 2.2 megohms	66-5228
R16	Resistor, decoupling, 470 ohms	66-1478
R17	Resistor, FM diode load, 47,000 ohms	66-3478
R18	Resistor, de-emphasis, 47,000 ohms	66-3478
R19	Resistor, i-f filter, 47,000 ohms	66-3478
R20	Resistor, a-v-c load, 3.3 megohms	66-5338
R21	Volume control (with off-on switch), 500,000 ohms	33-5566
R22	Resistor, grid return, 10 megohms	66-4478
R23	Resistor, plate load, 470,000 ohms	66-4478
R24	Resistor, grid return, 470,000 ohms	66-4478
R25	Resistor, cathode bias, 150 ohms	66-1158
R26	Resistor, filter, 470 ohms, 1 watt	66-1474
R27	Resistor, filter, 150 ohms, 2 watts	66-1155
R28	Resistor, current limiting, 22 ohms, 2 watts	66-02253
R29	Resistor, current limiting, 100 ohms	33-134
R30	Resistor, grid return, 2.2 megohms	66-5228
R31	Resistor, loading, 100 ohms	66-1108
S1	Switch, off-on	Part of R
T1	Transformer, AM oscillator	32-445
T2	Transformer, output	Part of L
W1	Line cord	L21
W2	Cable, FM aerial, 72-ohm twin lead	41-39
WS	Switch, band, 2-wafer	42-192

PARTS LIST (Cont.)

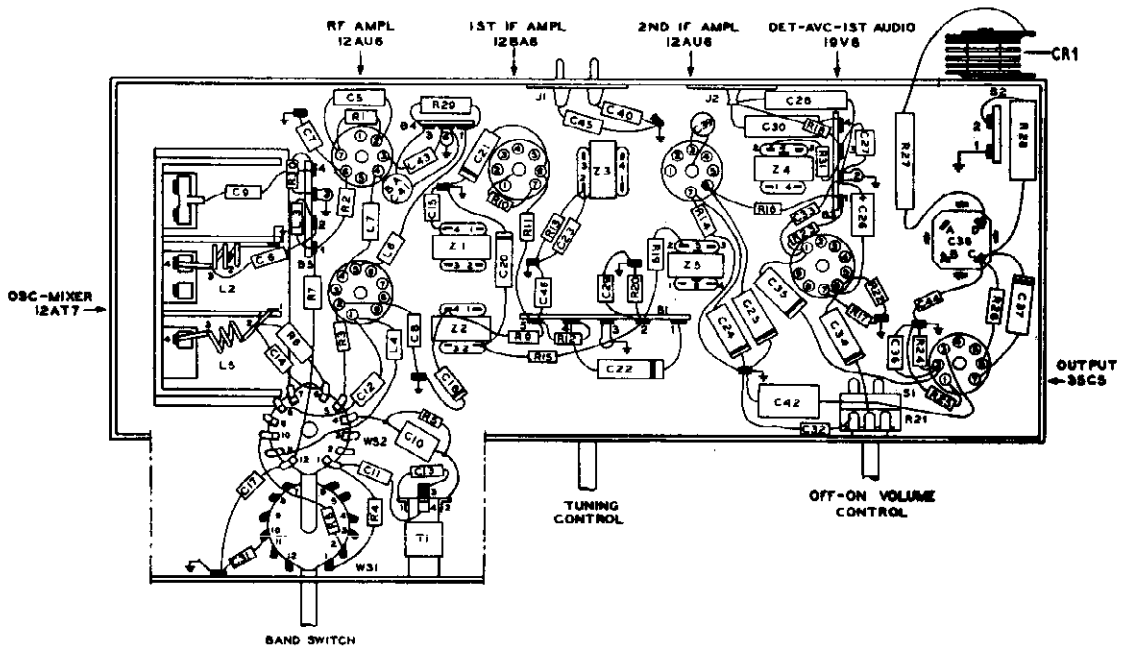
Reference Symbol	Description	Service Part No.
Z1	Transformer, FM, 1st i-f	32-4518A
Z2	Transformer, AM, 1st i-f	32-4516A
Z3	Transformer, FM, 2nd i-f	32-4518-1A
Z4	Transformer, FM, 3rd i-f	32-4310-4A
Z5	Transformer, AM, 2nd i-f	32-4517A

MISCELLANEOUS

Description	Service Part No.
Cabinet	10796
Back, flange, and socket assembly	76-5764
Fastener, back mtg. (4)	W-2235-FA9
Baffle and cloth assembly	40-7923
Fastener, baffle mtg. (2)	W-2235-2FA9
Dial scale	54-5089-2
Clip, scale mtg. (3)	56-7808FE11
Knob, FM-AM	54-4774-5
Knob, tuning	54-4774
Knob, volume-off-on	54-4774-4

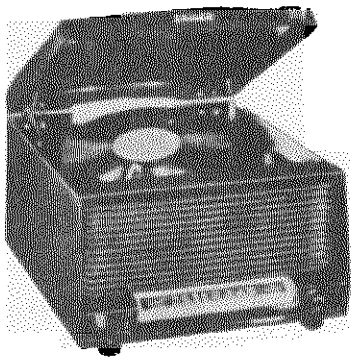
MISCELLANEOUS (Cont.)

Description	Service Part No.
Dial backplate assembly	76-7040
Drive cord, 25-foot spool	45-8750*
Pointer	56-5630-23FCP
Shaft, drive	56-7931FA11
Spring, gang drive	56-2617
Spring, pointer drive	56-3187
Rubber mounts, gang (5)	27-4771-1
Rubber mounts, speaker (2)	54-4651-1
Socket, 12BA6 (i-f ampl.)	27-6265
Socket, 12AU6 (i-f ampl.)	27-6265
Socket, 12AU6 (r-f ampl.)	27-6275-1
Socket, 12AT7	27-6203-6
Socket, 19V8	27-6203-5
Socket, 35C5	27-6203-12
Spacer, "T", speaker mtg. (2)	1W29155FA3
Washer, speaker mtg. (2)	1W52265FA9



TP1-1761

Figure 5. Symbolized Chassis, Showing Parts Placement

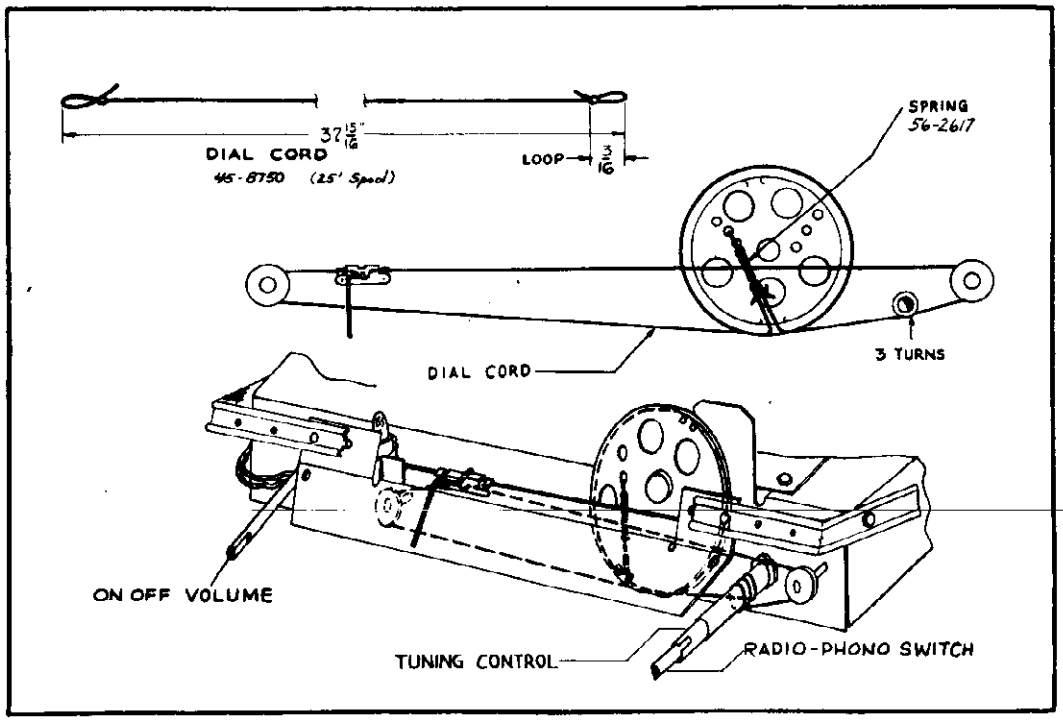


MODEL 52-1340

TP1-1836

SPECIFICATIONS

CABINET	Molded plastic, mottled mahogany
CIRCUIT	Five-tube superheterodyne
FREQUENCY RANGE	540-1620 kc.
AUDIO OUTPUT	3 watts
OPERATING VOLTAGE	105—120 volts, 60 cycles, a.c.
POWER CONSUMPTION	
Radio Position	35 watts
Phonograph Position	60 watts
INTERMEDIATE FREQUENCY	455 kc.
AERIAL	Built-in high-impedance loop; provision for external aerial
PHILCO TUBES (5)	7A8 converter, 7B7 i-f amplifier, 7C6 2nd det. —a.v.c.—1st audio, 35L6GT output, 50Y7GT rectifier
PHONOGRAPH	Philco Model M-22 All-Speed Automatic Record Changer



TP1-1835

Figure 1. Drive-Cord Installation Details

ALIGNMENT PROCEDURE

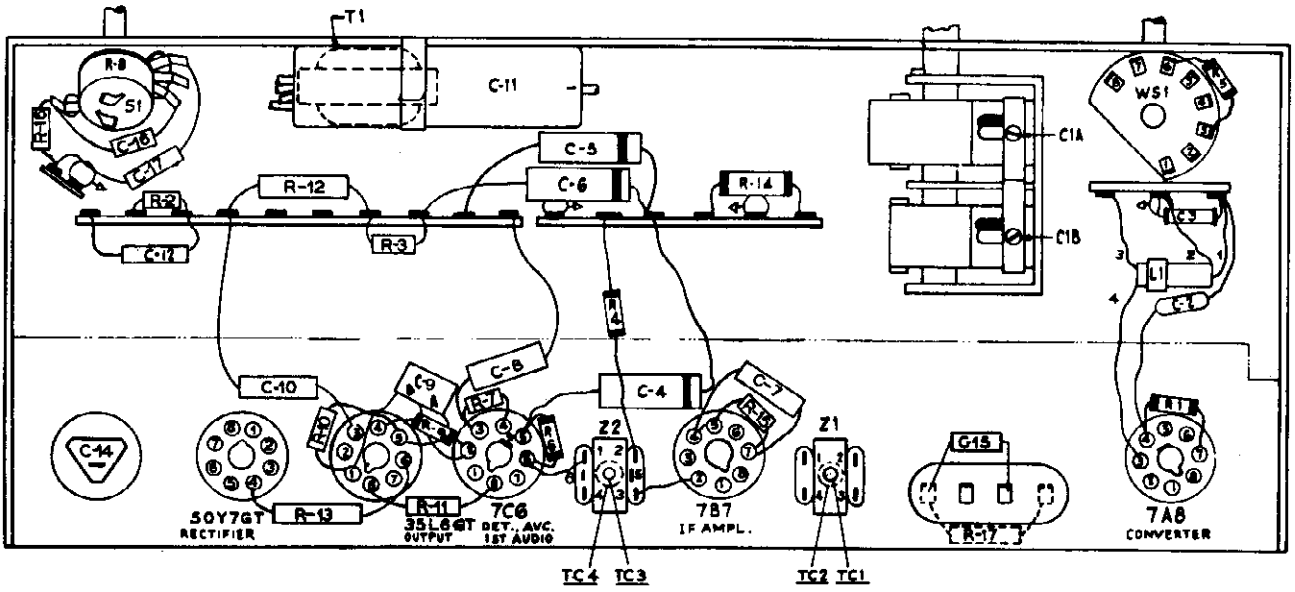
DIAL POINTER—Turn tuning condenser to full-mesh position. Set dial pointer to index mark, located to left of "55".

CONTROLS—Set volume control to maximum, radio-phono switch to RADIO position, and tuning control as indicated in chart.

OUTPUT METER—Connect across voice-coil terminals.

SIGNAL GENERATOR—Ground lead to B–, and output lead as indicated in chart.

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



TP1-1837

Figure 2. Base View, Showing Parts Placement and Alignment Points

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 6 of 7A8 converter tube.	455 kc.	Gang fully open.	Adjust, in order given, for maximum output. TC2 and TC4 are located at top of transformers.	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. trimmer
3	Same as step 2.	1500 kc.	1500 kc.	Adjust for maximum.	C1A—ant. trimmer

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

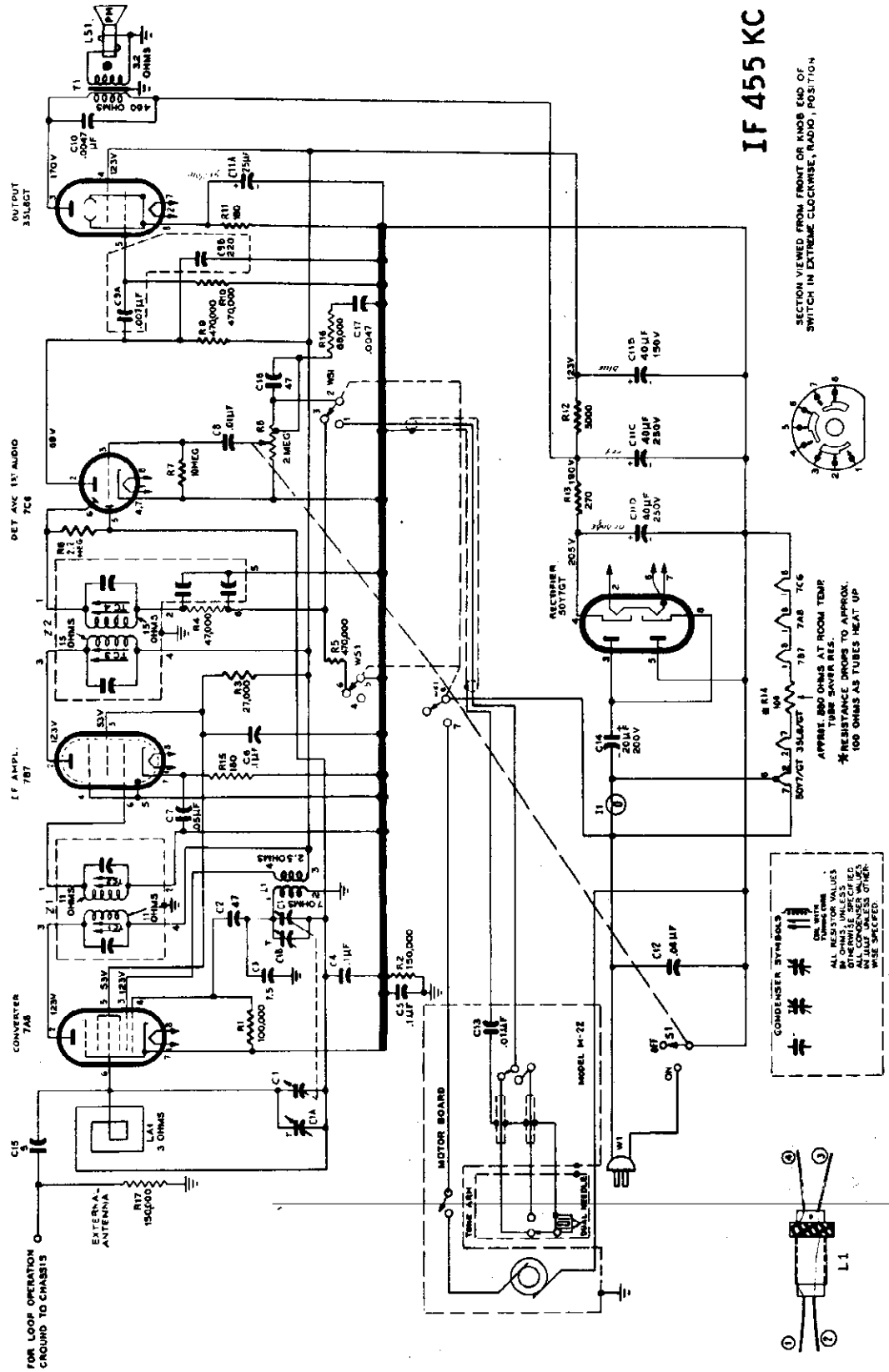


Figure 3. Philco Radio-Phonograph Model 52-1340, Schematic Diagram

MODEL 52-1340, Codes 121, 122

PARTS LIST

NOTE: Part numbers marked with 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 receiver will be either unchanged or improved. When ordering replacements, use only the "Service Part No."

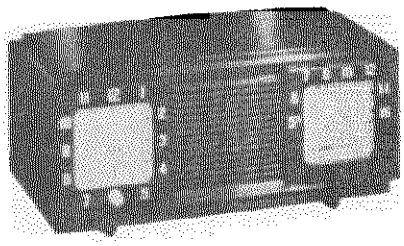
Reference Symbol	Description	Service Part No.
C1	Condenser, tuning gang	31-2751-9
C1A	Condenser, trimmer, aerial	Part of C1
C1B	Condenser, trimmer, osc.	Part of C1
C2	Condenser, osc. grid, d-c blocking, 47 μμf.	60-00515307*
C3	Condenser, temperature compensating, 7.5 μμf.	30-1224-65
C4	Condenser, a-v-c by-pass, .1 μf.	61-0113*
C5	Condenser, by-pass, .1 μf.	61-0113*
C6	Condenser, screen by-pass, .1 μf.	61-0113*
C7	Condenser, cathode by-pass, .05 μf.	61-0112
C8	Condenser, coupling, .01 μf.	61-0120*
C9	Condenser, dual ceramic	30-1239-4
C9A	Condenser, d-c blocking, .007 μf.	Part of C9
C9B	Condenser, r-f by-pass, 220 μμf.	Part of C9
C10	Condenser, tone compensation, .0047 μf.	45-3505-56
C11	Condenser, electrolytic, 4-section	30-2575-32*
C11A	Condenser, cathode by-pass, 25 μf.	Part of C11
C11B	Condenser, filter, 40 μf.	Part of C11
C11C	Condenser, filter, 40 μf.	Part of C11
C11D	Condenser, filter, 40 μf.	Part of C11
C12	Condenser, line by-pass, .04 μf.	30-1226-17
C13	Condenser, phono isolation, .01 μf.	61-0120*
C14	Condenser, voltage doubling, 20 μf. 200v.	30-2569-22
C15	Condenser, aerial blocking, 5μμf.	30-1230
C16	Condenser, high-frequency compensation, 47 μμf.	60-00515307
C17	Condenser, bass compensation, .0047 μf.	45-3505-56
I1	Pilot lamp, type 47	34-2064
L1	Coil, oscillator	32-4263
LA1	Loop antenna (Code 121)	76-2127-13
LA1	Loop antenna (Code 122)	76-2127-14
LS1	Speaker, 5¼" round	38-1639-1
R1	Resistor, grid return, 100,000 ohms	66-4108340*
R2	Resistor, leakage, 150,000 ohms	66-4158340*
R3	Resistor, dropping, 27,000 ohms	66-3278340*
R4	Resistor, i-f filter, 47,000 ohms	66-3478340*
R5	Resistor, diode return, 470,000 ohms	66-4478340*
R6	Resistor, diode load, 2.2 megohms	66-5228340*
R7	Resistor, grid return, 10 megohms	66-6108340*
R8	Volume control, 2 megohms (with switch)	33-5564-11
R9	Resistor, plate load, 470,000 ohms	66-4478340*
R10	Resistor, grid return, 470,000 ohms	66-4478340*
R11	Resistor, cathode bias, 180 ohms	66-1184340
R12	Resistor, filter, 5000 ohms	33-1335-95
R13	Resistor, filter, 270 ohms, 2 watts	33-1335-91
R14	Resistor, surge limiting, 880 ohms cold, 100 ohms hot	33-1343-3
R15	Resistor, cathode bias, 180 ohms	66-1188340
R16	Resistor, bass compensation, 68,000 ohms.	66-3688340
R17	Resistor, aerial loading, 150,000 ohms.	66-4158340
S1	Switch, off-on	Part of R8
T1	Transformer, output	32-8384*
W1	Line cord	L2183
WS1	Wafer switch, radio-phono	42-1949
Z1	Transformer, 1st i-f	32-4160A
Z2	Transformer, 2nd i-f	32-4240A

MISCELLANEOUS

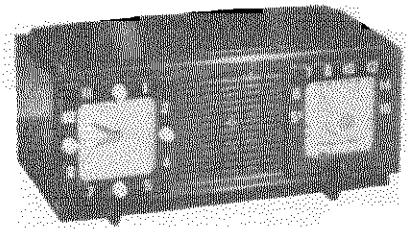
Description	Service Part No.
Backplate assembly	76-6232
Cabinet, complete, Code 121	10840-2
Cabinet, complete, Code 122	10840-6
Hinge (2)	56-6603
Lid	54-4838
Lid support	56-6604
Changer Mounting Hardware	
Sleeve, rubber (3)	54-7798
Speed nut (3)	W-2554
Spring, heavy, top (3)	56-7059FA9
Spring, light, bottom (3)	56-7059-1FJ47
Dial scale	54-5107
Knob, off-on-volume	54-4843
Knob, radio-phono	54-4842
Knob, tuning	54-4841
Pilot-lamp socket assembly	76-1179-7
Fastener, pilot-lamp shield (2)	W2235-1FA9
Pointer	56-5630-31
Spring, pointer drive	56-2617
Socket, Loktal (3)	27-6207
Socket, octal (2)	27-6174
Tuning shaft	56-6370

SPECIFICATIONS

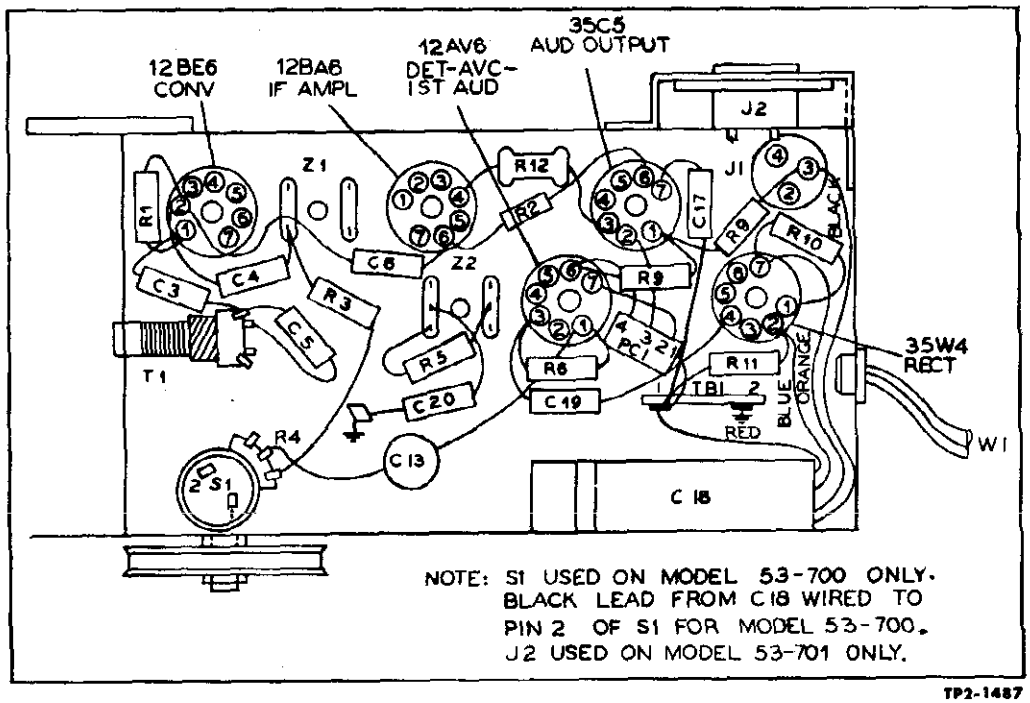
CABINET	Molded phenolic
CIRCUIT	Five-tube Superheterodyne (plus rectifier)
FREQUENCY RANGES	
Standard Broadcast	540—1620 kc.
Special Services	1700—3400 kc.
AUDIO OUTPUT	1 watt
OPERATING VOLTAGE	117 volts, a.c.
POWER CONSUMPTION	30 watts
AERIAL	High-impedance loop; connector for external aerial
INTERMEDIATE FREQUENCY	455 kc.
PHILCO TUBES	12BE6 converter, 12BA6 i-f amplifier, 12AV6 det.—a.v.c.—1st audio, 35C5 output, 35W4 rectifier



MODEL 53-700



MODEL 53-701



TP2-1487

Figure 1. Base View, Showing Symbolized Chassis

ALIGNMENT PROCEDURE

RADIO CONTROLS—Set volume control to maximum. Set tuning control and band switch 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.

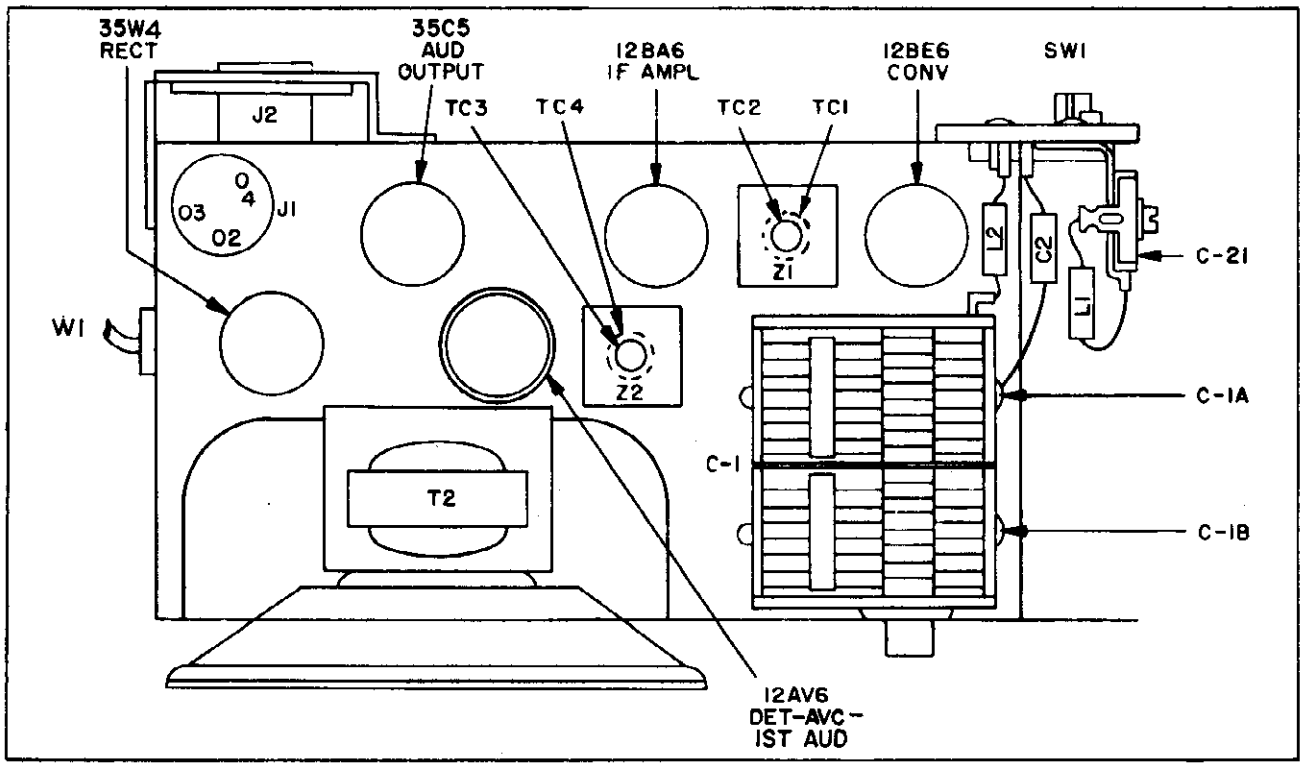


Figure 2. Top View, Showing Trimmer Locations

ALIGNMENT CHART

STEP	SIGNAL GENERATOR		RADIO			ADJUST
	CONNECTION TO RADIO	DIAL SETTING	DIAL SETTING	BAND SWITCH SETTING	SPECIAL INSTRUCTIONS	
1	Ground lead to B-; output lead through a .1-μf. condenser to grid (pin 7) of 12BE6.	455 kc.	Tuning gang fully open	Broadcast	Adjust tuning cores, in order given, for maximum output. (TC1 and TC3 are located at top of transformers.)	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).	1620 kc.	*1620 kc.	Broadcast	Adjust trimmer for maximum output.	C1-B—osc.
3	Same as step 2.	1500 kc.	1500 kc.	Broadcast	Adjust trimmer for maximum output.	C1-A—aerial (broadcast)
4	Same as step 2.	3200 kc.	3200 kc.	Special Services	Adjust trimmer for maximum output.	C21—aerial (special services)

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

*For proper adjustment of the oscillator trimmer, fully open the tuning gang and insert a .006-inch, non-metallic shim between the heel of the rotor and the top of the stator plates. Close the tuning gang sufficiently to hold the shim in place, and then remove the shim without disturbing the gang setting.

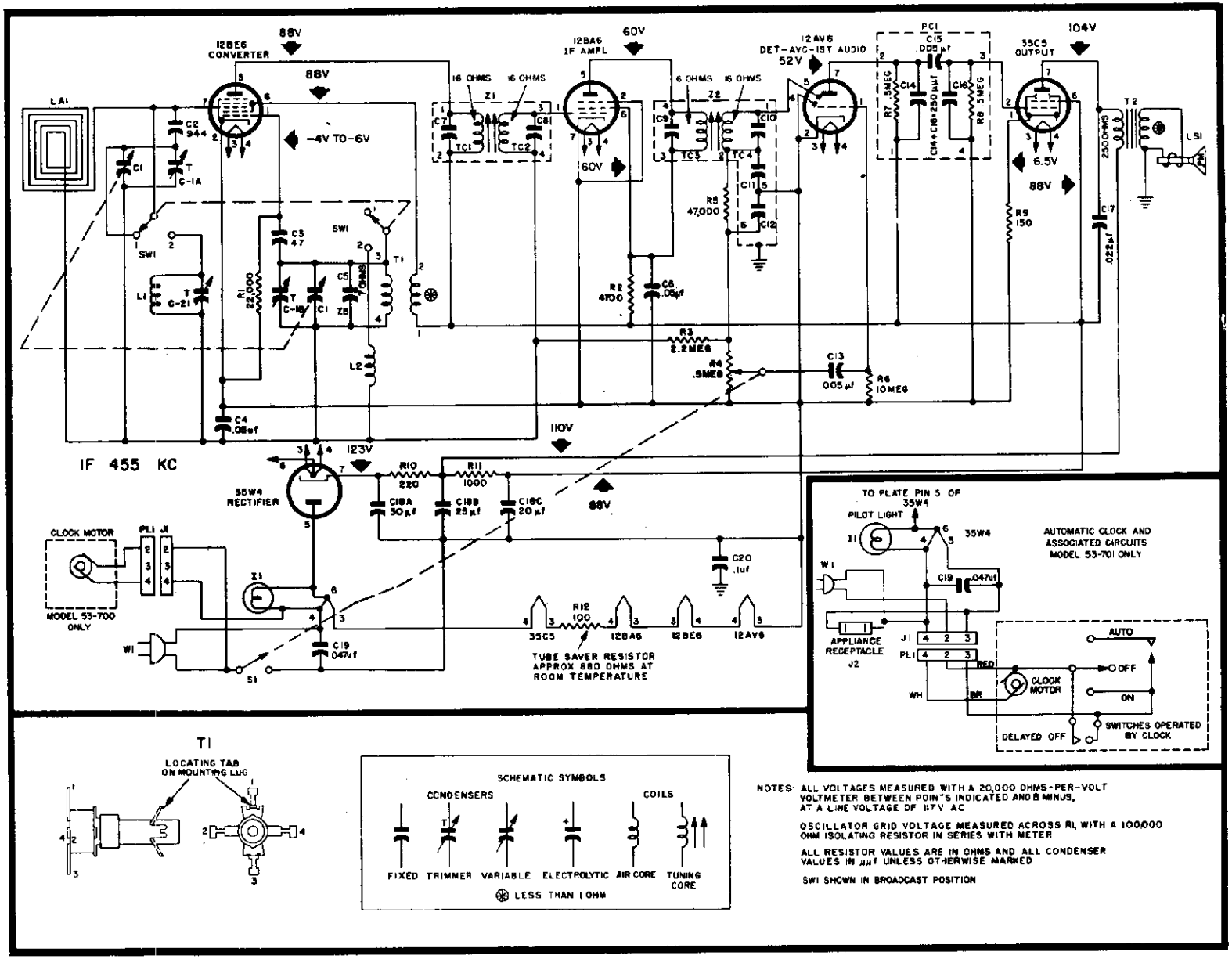


Figure 3. Philco Radio-Clock Models 53-700 and 53-701, Schematic Diagram

MODELS 53-700, 53-701

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."

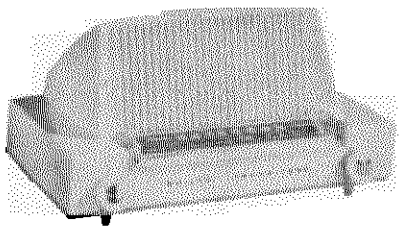
Reference Symbol	Description	Service Part No.
C1	Condenser, tuning gang	31-2751-13
C1A	Condenser, R-F trimmer	Part of C1
C1B	Condenser, oscillator trimmer	Part of C1
C2	Condenser, antenna series tracker, 944 μμf.	30-1220-65
C3	Condenser, oscillator grid, 47 μμf.	30-1230-4
C4	Condenser, a-v-c by-pass, .05 μf.	45-3505-28*
C5	Condenser, drift compensation, 7.5 μμf.	30-1224-83
C6	Condenser, screen by-pass, .05 μf.	45-3505-28*
C7	Condenser, i-f tuning	Part of Z1
C8	Condenser, i-f tuning	Part of Z1
C9	Condenser, i-f tuning	Part of Z2
C10	Condenser, i-f tuning	Part of Z2
C11	Condenser, detector filtering	Part of Z2
C12	Condenser, detector filtering	Part of Z2
C13	Condenser, audio coupling, .005 μf.	30-1238-1
C14	Condenser, plate by-pass	Part of PC1
C15	Condenser, audio coupling, .005 μf.	Part of PC1
C16	Condenser, compensating	Part of PC1
C17	Condenser, tone compensation, .022 μf.	45-3505-43*
C18	Condenser, electrolytic, 3-section	
	Model 700	30-2575-34
	Model 701	30-2575-36
C18A	Condenser, filter, 30 μf., 150v	Part of C18
C18B	Condenser, filter, 25 μf., 150v	Part of C18
C18C	Condenser, filter, 20 μf., 150v	Part of C18
C19	Condenser, line by-pass, .05 μf.	45-3505-62*
C20	Condenser, B minus to chassis, .1 μf.	45-3505-47*
C21	Condenser, trimmer, special services	31-6473-29
I1	Lamp, pilot	34-2068
J1	Jack, clock	27-6273
J2	Jack, appliance receptacle, a-c	76-3931
L1	Coil, aerial, special services	32-4561-3
L2	Coil, oscillator shunt	32-4562-2
LA1	Loop, part of cabinet back	76-7757
LS1	Speaker, p-m	36-1627-8
PL1	Plug, clock assembly	27-6273
R1	Resistor, oscillator grid, 22,000 ohms	66-3228340*
R2	Resistor, i-f screen dropping, 4700 ohms	66-2748340*
R3	Resistor, a-v-c filter, 2.2 megohms	66-5228340*
R4	Resistor, volume control, .5 megohm	
	Model 700	33-5566-41
	Model 701	33-5565
R5	Resistor, diode load, 47,000 ohms	66-3478340*
R6	Resistor, grid return, 10 megohms	66-6108340
R7	Resistor, plate load, 500,000 ohms	Part of PC1
R8	Resistor, grid return, 500,000 ohms	Part of PC1
R9	Resistor, cathode bias, 150 ohms	66-1158340*
R10	Resistor, B plus filter, 220 ohms	66-1224340*
R11	Resistor, B plus filter, 1000 ohms	66-2108340*
R12	Resistor, tube saver, 100 ohms	33-1343-3
S1	Switch, off-on	Part of R4
SW1	Switch, broadcast-special services	42-1796-2
T1	Transformer, oscillator	32-4453-6
T2	Transformer, output	32-8384*
W1	Line cord	L-2183*
Z1	Transformer, 1st i-f	32-4161A
Z2	Transformer, 2nd i-f	32-4240A

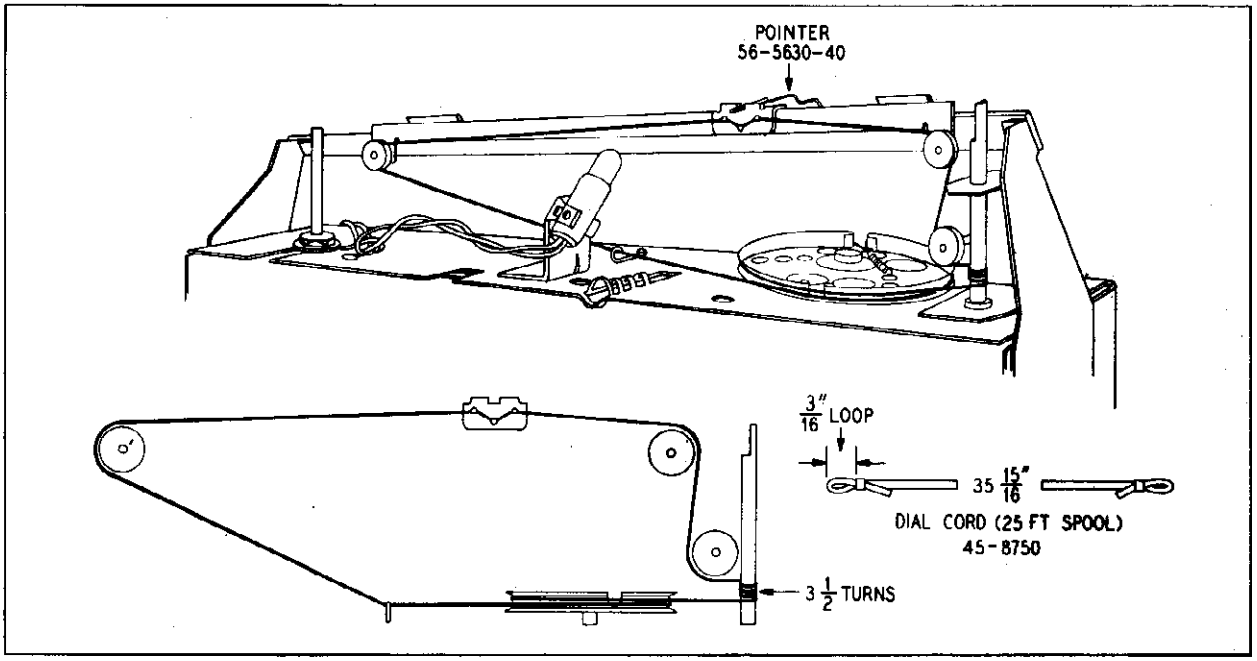
MISCELLANEOUS

Description	Service Part No.
Cabinet	
Model 53-700	10924
Model 53-700-I	10924-3
Model 53-701	10924-1
Model 53-701-I	10924-2
Knobs	
Model 53-700	
Clock	54-4983-1
Station selector	54-4978
Off-on	27-4815-10
Model 53-700-I	
Clock	54-4983
Station selector	54-4978
Off-on	27-4815-10
Model 53-701	
Clock (4)	54-4983-1
Station selector	54-4978
Off-on	27-4815-10
Model 53-701-I	
Clock (4)	54-4983
Station selector	54-4978
Off-on	27-4815-10
Clock	
Models 53-700 and 53-700-I	41-2041
Models 53-701 and 53-701-I	41-2041-1
Back-and-loop assembly	
Model 700	76-7757-1
Model 701	76-7757
Shield, tube	56-5629FA3
Clip, pilot lamp	W2563FA3
Socket, miniature (5)	27-6265
Socket assembly, pilot lamp	27-6233-6
Window, radio dial	54-4977

SPECIFICATIONS

CABINET	Molded plastic
CIRCUIT	Four-tube superheterodyne (plus rectifier)
FREQUENCY RANGES	
Standard broadcast	540-1620 kc.
Special service	1700-3400 kc.
AUDIO OUTPUT	1 watt
OPERATING VOLTAGE	105-120 volts, a.c. or d.c.
POWER CONSUMPTION	30 watts
INTERMEDIATE FREQUENCY	455 kc.
AERIAL	Magnecor high-impedance loop; provision for connecting external aerial
PHILCO TUBES	7A8 converter, 7B7 i-f amplifier, 7C6 2nd det., avc., 1st audio, 50C5 output, 35W4 rectifier





TP1-1831

Figure 1. Drive-Cord Installation Details

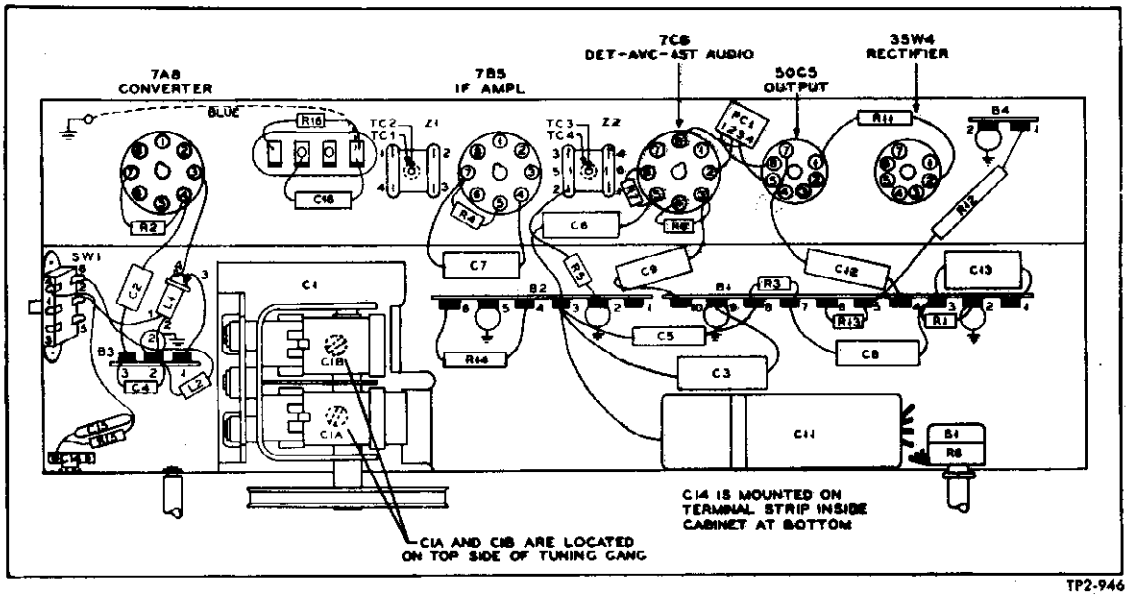


Figure 2. Base View, Showing Parts Placement and Alignment Points

ALIGNMENT PROCEDURE

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

RADIO CONTROLS—Set volume control to maximum; set broadcast-special services switch, and tuning controls as indicated in chart.

OUTPUT METER—Connect across voice-coil terminals.

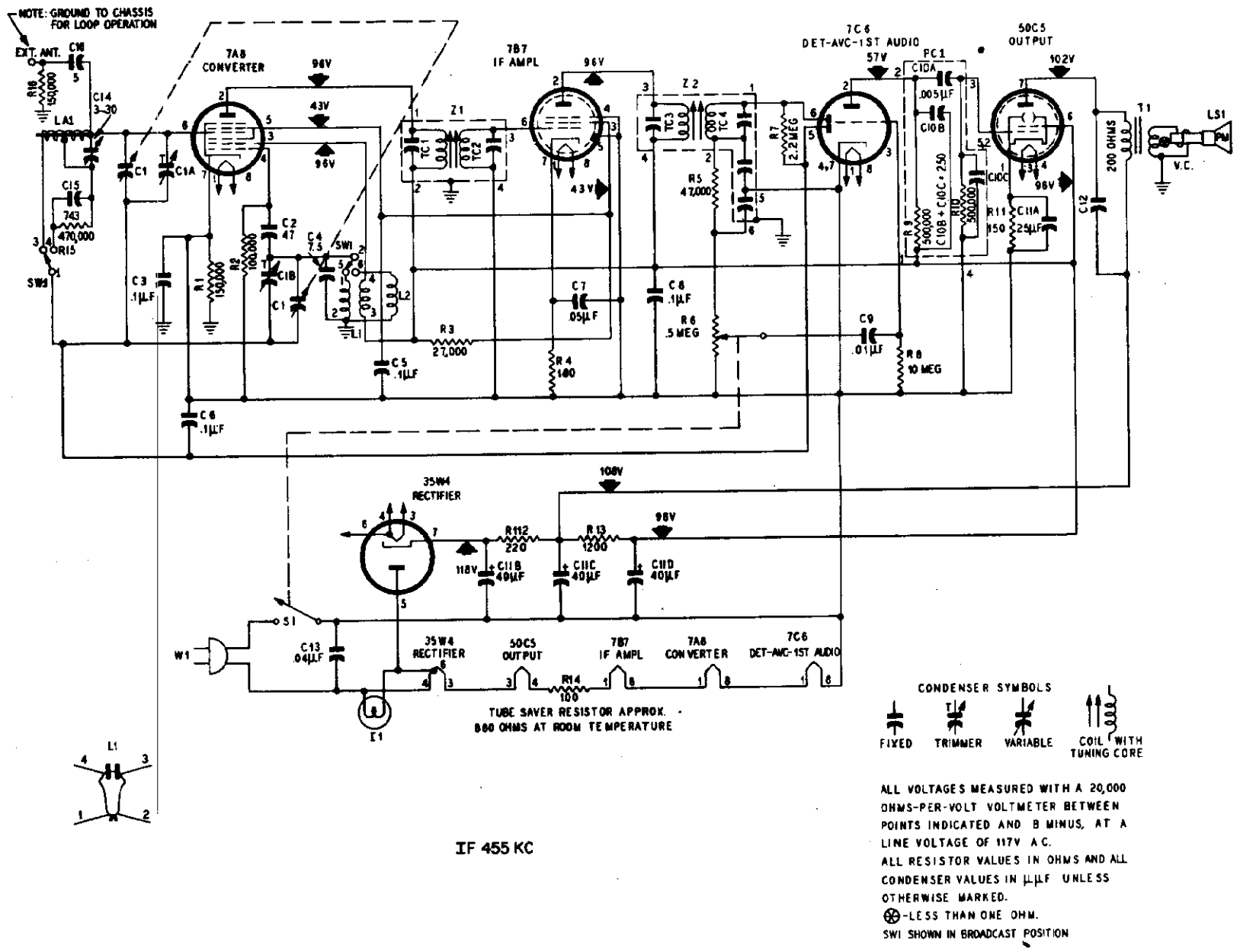
SIGNAL GENERATOR—Connect signal-generator ground lead to B—, and output lead as indicated in chart. Set frequency as indicated in chart. Use modulated output.

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

STEP	SIGNAL GENERATOR		RADIO		ADJUST TRIMMER
	CONNECTION TO RADIO	DIAL SETTING	DIAL SETTING	SPECIAL INSTRUCTIONS	
1	Through a .01-μf. condenser to grid (pin 6) of 7A8 converter tube.	455 kc.	Gang fully open.	Set broadcast-special services switch to broadcast position. Adjust, in order given, for maximum output. TC1 and TC4 are located at top of transformers.	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).	1630 kc.	*1630 kc.	Adjust for maximum.	C1B—osc.
3	Same as step 2.	1500 kc.	1500 kc.	Adjust for maximum.	C1A—aerial.
4	Same as step 2.	3200 kc.	3200 kc.	Set broadcast-special services switch to special service position. Adjust for maximum.	C14—special services
5	Repeat steps 3 and 4.				

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

***NOTE:** For proper adjustment of the oscillator trimmer, fully open the tuning gang and insert a .006-inch, non-metallic shim between the heel of the rotor and the top of the stator plates. Close the tuning gang sufficiently to hold the shim in place, and then remove the shim without disturbing the gang setting.



Fiaure 3. Philco Radio Model 53-566, Schematic Diagram

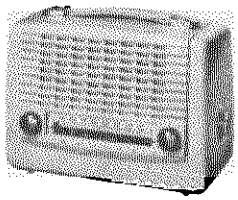
PARTS LIST

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."

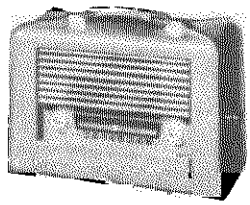
Reference Symbol	Description	Service Part No.
C1	Condenser, tuning gang	31-2751-10
C1A	Condenser, trimmer, aerial	Part of C1
C1B	Condenser, trimmer, oscillator	Part of C1
C2	Condenser, osc. grid, d-c blocking, 47 μμf.	60-00475417*
C3	Condenser, leakage, .1 μf.	45-3505-47
C4	Condenser, temperature compensating, 7.5 μf.	30-1224-65*
C5	Condenser, screen by-pass, .1 μf.	61-0113*
C6	Condenser, a-v-c by-pass, .1 μf.	61-0113*
C7	Condenser, cathode by-pass, .05 μf.	61-0122*
C8	Condenser, B + by-pass, .1 μf.	45-3505-47*
C9	Condenser, audio coupling, .01 μf.	45-3505-58*
C10A	Condenser, audio coupling, .005 μf.	Part of PC1
C10B	Condenser, plate by-pass (see schematic)	Part of PC1
C10C	Condenser, grid by-pass (see schematic)	Part of PC1
C11	Condenser, electrolytic, 4-section	30-2575-32*
C11A	Condenser, cathode by-pass, 25 μf.	Part of C11
C11B	Condenser, filter, 40 μf.	Part of C11
C11C	Condenser, filter, 40 μf.	Part of C11
C11D	Condenser, filter, 40 μf.	Part of C11
C12	Condenser, tone compensation, .022 μf.	45-3505-43*
C13	Condenser, line by-pass, .04 μf.	30-1226-17*
C14	Condenser, aerial, adjustable trimmer, 3–30 μμf.	31-6473-30
C15	Condenser, series tracking, 743 μμf.	60-10755311
C16	Condenser, aerial coupling, 5 μμf.	30-1221-5
I1	Pilot lamp, type 47	34-2068
L1	Coil, oscillator	32-4263
L2	Coil, oscillator shunt	32-4562-3
LA1	Loop antenna (Magnecor)	32-4565-1
LS1	Speaker, p-m	36-1639-9
PC1	Printed circuit	30-6001
R1	Resistor, leakage, 150,000 ohms	66-4158340*
R2	Resistor, grid return, 100,000 ohms	66-4108340*
R3	Resistor, dropping, 27,000 ohms	66-3278340*
R4	Resistor, cathode bias, 180 ohms	66-1188340*
R5	Resistor, i-f filter, 47,000 ohms	66-3478340*
R6	Resistor, volume control, .5 megohm (with off-on switch)	33-5566-36
R7	Resistor, diode load, 2.2 megohms	66-5228340*
R8	Resistor, grid return, 10 megohms	66-6108340*
R9	Resistor, plate load, 500,000 ohms	Part of PC1
R10	Resistor, grid return, 500,000 ohms	Part of PC1
R11	Resistor, cathode bias, 150 ohms	66-1154340*
R12	Resistor, B plus filter, 220 ohms, 2 w	66-1225340*
R13	Resistor, B plus filter, 1200 ohms	66-2128340*
R14	Resistor, surge limiting, 880 ohms cold, 100 ohms hot	33-1343-3
R15	Resistor, aerial loading, 470,000 ohms	66-4478340*
R16	Resistor, aerial discharge, 150,000 ohms	66-4158340*
S1	Switch, off-on	Part of R6
SW1	Switch, d.p.d.t., band selector	42-1796-2
T1	Transformer, output	32-8384*
W1	Line cord	L2183
Z1	Transformer, 1st i-f	32-4160A
Z2	Transformer, 2nd i-f	32-4517A

MISCELLANEOUS

Description	Service Part No.
Cabinet, mahogany	10887-4
Knob, mahogany (2 required)	54-4774-9
Cabinet, ivory	10887-5
Knob, ivory (2 required)	54-4774-10
Knob escutcheon (2 required)	54-4927
Fastener (5 required)	W2235-1FA9
Dial-backplate assembly	76-7056
Drive cord, 25-foot spool	45-8750
Dial scale	54-5128-2
Lamp assembly, pilot	76-1472
Pointer	56-5630-40
Shaft, tuning	56-9272
Spring	56-2617
Spring hairpin	57-1468
Mount, rubber (3 required)	27-4596
Socket, Loktal (3 required)	27-6207
Socket, miniature (2 required)	27-6265



MODEL 53-656



MODEL 53-658

SPECIFICATIONS

CABINET
- 53-656 ..... Molded plastic
- 53-658 ..... Covered, wooden

CIRCUIT ..... Five-tube superheterodyne (plus selenium rectifier)

FREQUENCY RANGES
- Standard broadcast ..... 550—1600 kc.
- Special services ..... 1700—3400 kc.

AUDIO OUTPUT ..... 160 milliwatts

OPERATING VOLTAGES ..... 117 volts, a.c. or d.c.; or 9-volt "A" battery and 90-volt "B" battery

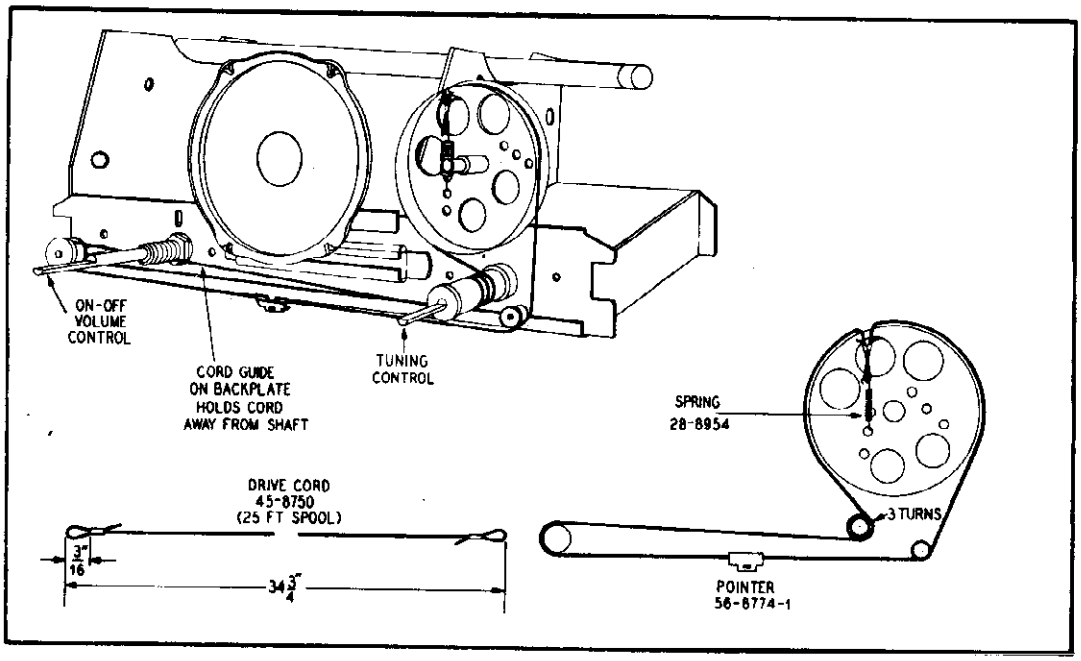
POWER CONSUMPTION
- A-c or d-c operation ..... 15 wa
- Battery operation ..... 55 ma. at 9 volts, and 15 m at 90 vo

AERIAL ..... Magnecor high-impedance loop; provision f connecting external aeri

INTERMEDIATE FREQUENCY ..... 265 k

PHILCO TUBES ..... 1T4 r-f amplifier, 1R5 converter, 1U4 amplifier, 1U5 det.—a.v.c.—1st audio 3V4 outp

BATTERY TYPE ..... Philco P-2



TP2-1392

Figure 1. Drive-Cord Installation Details

ALIGNMENT PROCEDURE

POINTER—Set pointer to coincide with first index mark from left side of dial backplate (looking at front of dial backplate).

RADIO CONTROLS—Set volume control to maximum; set broadcast-special services switch, SW1, as indicated in chart.

OUTPUT METER—Connect across voice-coil terminals.

SIGNAL GENERATOR—Use modulated output.

OUTPUT LEVEL—During alignment, adjust signal-generator output to maintain output-meter indication below .5 volt.

CRITICAL LEAD DRESS—To secure proper padding capacity, the green lead from pin 6 of the 1R5 tube to Z1 must be dressed over the wiring panel, away from the chassis. The white lead which connects the low end of the aerial (LA1) to the broadcast-special services switch (SW1), must be dressed taut between the low-end tie lug and the retaining spring.

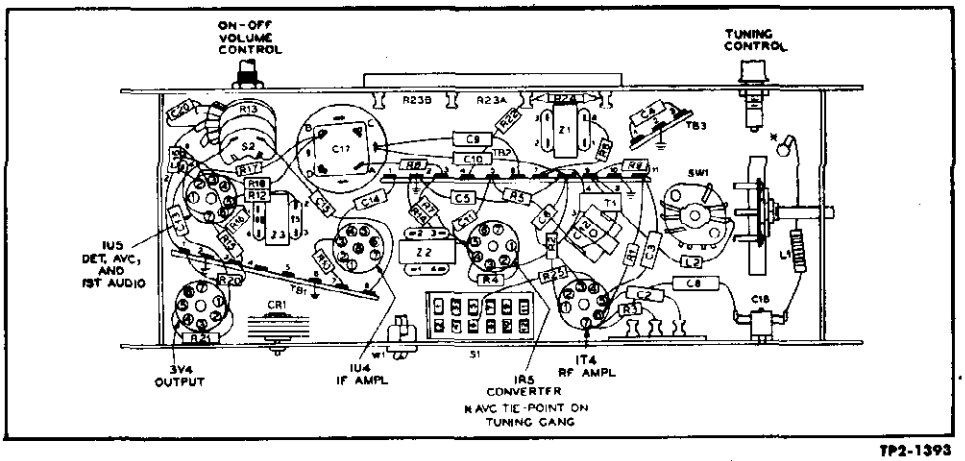


Figure 2. Top View, Showing Trimmer Locations

STEP	SIGNAL GENERATOR		RADIO		ADJUST TRIMMER
	CONNECTION TO RADIO	DIAL SETTING	DIAL SETTING	SPECIAL INSTRUCTIONS	
1	Through a .1-μf. condenser to pin 6 of 1R5 converter.	265 kc.	1630 kc. (gang fully open)	Set broadcast-special services switch to broadcast position. Adjust, in order given, for maximum output.	TC5—2nd i-f sec. TC4—2nd i-f pri. TC2—1st i-f pri. TC3—1st i-f sec.
2	Radiating loop. See note below.	1630 kc.	*1630 kc. (gang fully open)	Adjust for maximum output. If low-frequency dial tracking is far off, make adjustments in steps 3 and 4 before making this adjustment.	C1B—osc. shunt
3	Same as step 2.	580 kc.	580 kc.	Adjust for maximum output while rocking tuning control.	C12—osc. series
4	Same as step 2.	580 kc.	580 kc.	Adjust for maximum output. This adjustment should not be made unless dial tracking is off, or sensitivity is low at low-frequency end (580 kc.).	TC1—r-f sec.
5	Same as step 2.	1500 kc.	1500 kc. (Index mark at right)	Adjust, in order given, for maximum output.	C1A—r-f C19A—BC aerial
6	Repeat steps 3 and 5 until no further improvement is obtained.				
7	Same as step 2.	3000 kc.	3000 kc.	Set broadcast-special services switch to special services position. Adjust, in order given, for maximum output.	C19C—SS aerial C1B—r-f
8	Same as step 2.	1900 kc.	1900 kc.	Adjust, in order given, for maximum output.	C19B—SS aerial series tracker
9	Repeat steps 7 and 8, and then repeat step 5.				

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

*For proper adjustment of the oscillator trimmer, fully open the tuning gang and insert a .006-inch, non-metallic shim between the heel of the rotor and the top of the stator plates. Close the tuning gang sufficiently to hold the shim in place, and then remove the shim without disturbing the gang setting.

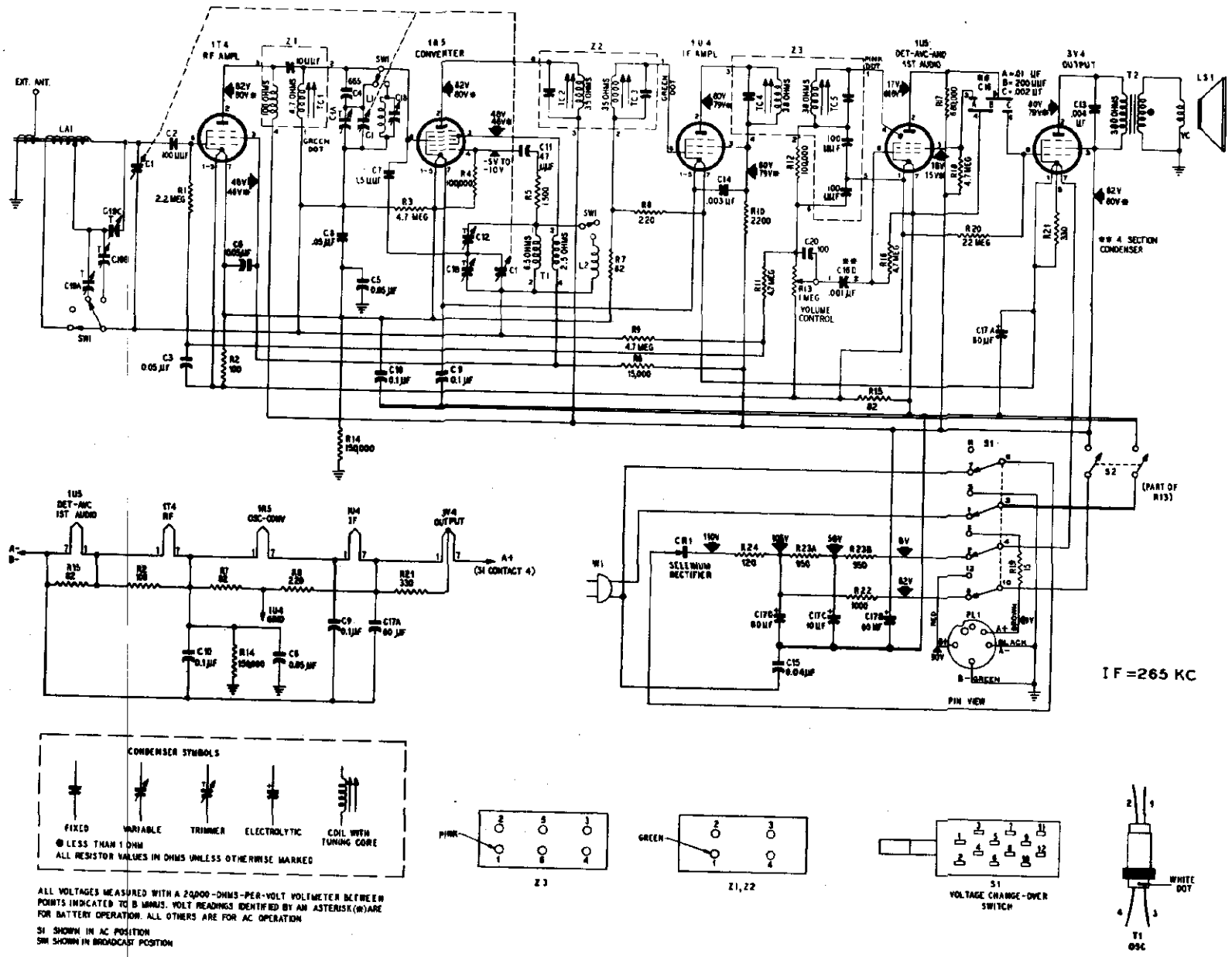
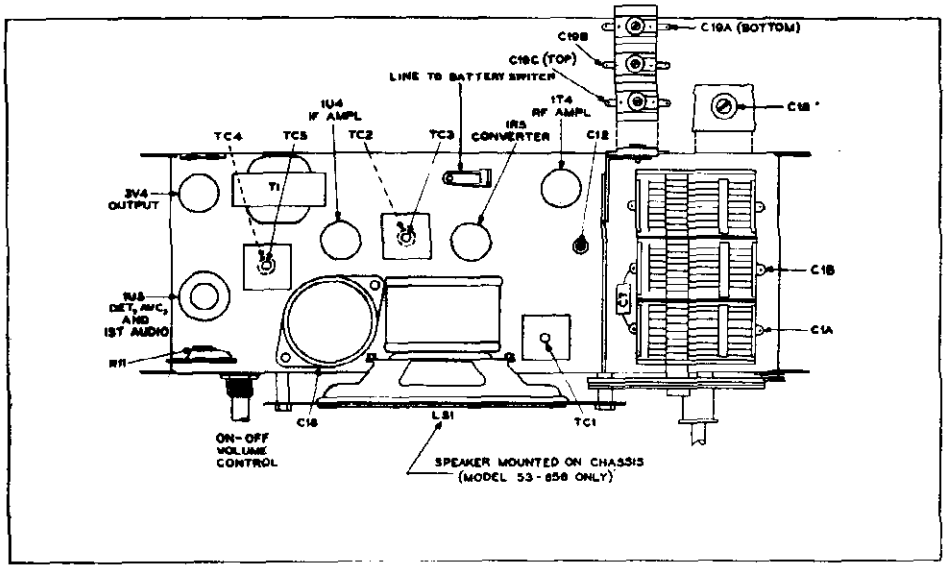


Figure 3. Philco Radio Models 53-656 and 53-658, Schematic Diagram



TP2-1394

Figure 4. Bottom View, Showing Symbolized Chassis

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, 3-section	31-2748-5
C1A	Condenser, r-f trimmer	Part of C1
C1B	Condenser, osc. trimmer	Part of C1
C2	Condenser, d-c blocking, 100 μμf.	62-110009001*
C3	Condenser, bias filter, .05 μf.	61-0122*
C4	Condenser, converter tracking, 665 μμf.	30-1220-66
C5	Condenser, filament by-pass .05 μf.	61-0122*
C6	Condenser, screen by-pass, .05 μf.	61-0122*
C7	Condenser, neutralization, 1.5 μμf.	30-1221-3
C8	Condenser, a-v-c filter, .05 μf.	61-0122*
C9	Condenser, filament by-pass, .1 μf.	61-0113*
C10	Condenser, filament by-pass, .1 μf.	61-0113*
C11	Condenser, d-c blocking, 47 μμf.	60-00475420
C12	Condenser, osc. series padder, 700 to 900 μμf.	31-6473-28
C13	Condenser, tone compensation .004 μf.	61-0179
C14	Condenser, screen neutralizing .003 μf.	45-3503-61
C15	Condenser, line by-pass, .04 μf.	45-3500-2*
C16	Condenser, ceramic, 4-section	30-1237
C16A	Condenser, screen by-pass, .01 μf.	Part of C16
C16B	Condenser, by-pass, 200 μμf.	Part of C16
C16C	Condenser, d-c blocking .002 μf.	Part of C16
C16D	Condenser, d-c blocking, .001 μf.	Part of C16
C17	Condenser, electrolytic, 4-section	30-2568-58
C17A	Condenser, filament by-pass, 60 μf.	Part of C17
C17B	Condenser, filter, 60 μf.	Part of C17
C17C	Condenser, filter, 10 μf.	Part of C17
C17D	Condenser, filter, 60 μf.	Part of C17
C18	Condenser, SS hi-frequency r-f trimmer	31-6476-27
C19	Condenser, aerial trimmer, 3-section	31-6477-16
C19A	Condenser, BC hi-frequency	Part of C19
C19B	Condenser, SS low-frequency	Part of C19
C19C	Condenser, SS hi-frequency	Part of C19
C20	Condenser, compensating, high-frequency, 100 μμf.	62-110009001*
CR1	Selenium rectifier	34-8003*
L2	Coil, oscillator shunt	32-4562
LA1	Coil, aerial	32-4565
LS1	Speaker, 5-inch	36-1628
PL1	Plug-and-cable assembly, battery	41-3712-5
R1	Resistor, grid return, 2.2 megohms	66-5228340*
R2	Resistor, current limiting, 100 ohms	66-1108340*
R3	Resistor, grid return, 4.7 megohms	66-5478340*
R4	Resistor, grid return, 100,000 ohms	66-4108340*
R5	Resistor, oscillator coupling, 1500 ohms	66-2158340*
R6	Resistor, dropping, 15,000 ohms	66-3158340*
R7	Resistor, grid return, 82 ohms	66-0828340*
R8	Resistor, grid return, 220 ohms	66-1228340*
R9	Resistor, a-v-c filter, 4.7 megohms	66-5478340*
R10	Resistor, neutralization, 2200 ohms	66-2228340*
R11	Resistor, a-v-c filter, 4.7 megohms	66-5478340*
R12	Resistor, I-f filter, 100,000 ohms	66-4108340*
R13	Resistor, volume control, 1 megohm	45-3001-21
R14	Resistor, leakage, 150,000 ohms	66-4158340*
R15	Resistor, current limiting, 82 ohms	66-0828340*
R16	Resistor, grid return, 4.7 megohms	66-5478340*
R17	Resistor, plate load, 680,000 ohms	66-6688340*
R18	Resistor, screen dropping, 4.7 megohms	66-5478340*
R19	Resistor, filament, 75 ohms	66-0133346
R20	Resistor, grid return, 2.2 megohms	66-5228340*
R21	Resistor, current limiting, 330 ohms	66-1338340*
R22	Resistor, filter, 1000 ohms	66-2108340*
R23	Resistor, wire-wound, 2-section	33-3431-7
R23A	Resistor, filament dropping, 950 ohms	Part of R23
R23B	Resistor, filament dropping, 950 ohms	Part of R23
R24	Resistor, wire-wound, current limiting, 120 ohms	33-1334-14
S1	Switch, change-over	42-1899
S2	Switch, on-off	Part of R13
SW1	Band switch	42-1986
T1	Transformer, oscillator	32-4263-6
T2	Transformer, output	32-8528
W1	Line cord	L2183
Z1	Transformer, r-f	32-4399-6A
Z2	Transformer, 1st I-f	32-4160-2A
Z3	Transformer, 2nd I-f	32-4240-6A

MISCELLANEOUS

MODEL 53-656

Description	Service Part No.
Cabinet, light beige	10883-6
Back	54-4903
Clip, back (2)	56-3807-3
Handle assembly	76-7719
Scale	54-3148
Knob (2)	54-4773-1
Knob (1)	54-4816-1

MODEL 53-658

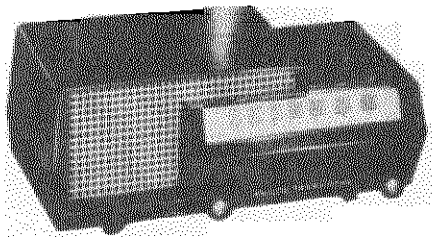
Cabinet	10919
Handle assembly	76-7681
Scale	54-3149
Knob, door	56-9812
Knob (2)	54-4527-36
Knob	54-4816-5
Back catch	76-2273
Foot (4)	56-8765
Hinge	56-9813
Strike, bolt	56-9811
Strike, catch	56-9814

MODELS 53-656 and 53-658

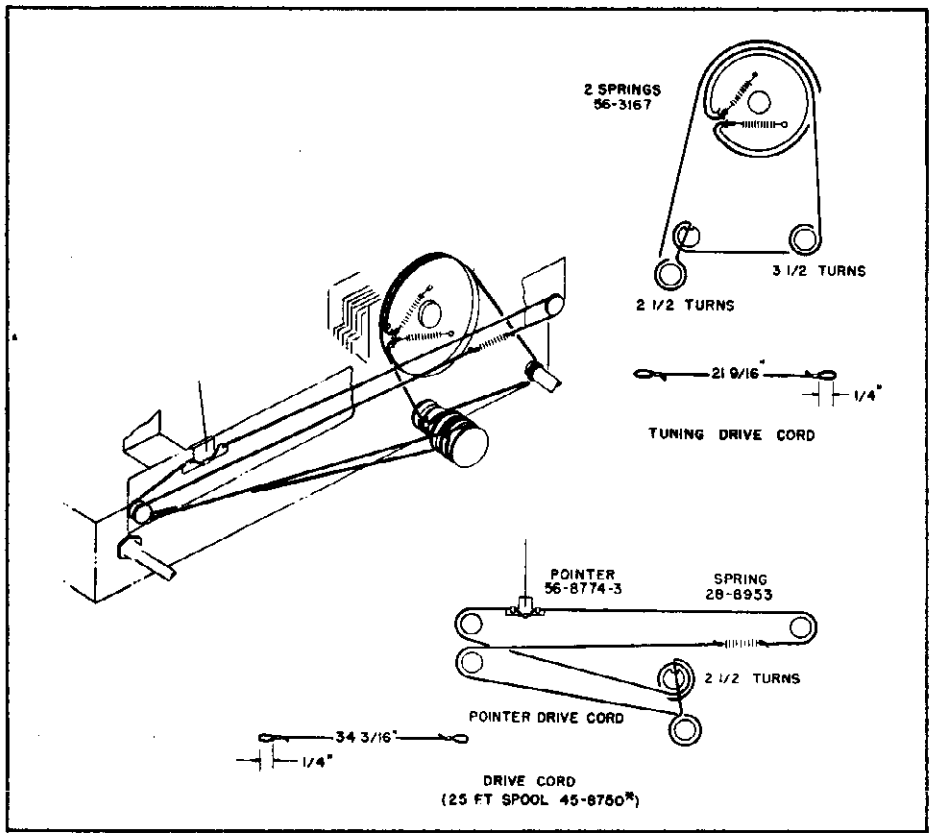
Dial-backplate assembly	76-7720
Drive cord, 25-ft. spool	45-8750*
Pointer	56-8774-1
Spring, drive cord	28-8954
Shaft-and-pulley assembly	76-7637
Mount, rubber (3)	27-4596
Spring, retaining	57-1868FA11
Shield, 1U5 tube	56-5629FA3
Socket (3)	27-6203
Socket, 1U5 tube (1)	27-6203-22
Socket, 3V4 tube (1)	27-6203-12

SPECIFICATIONS

CABINET MODEL 53-563	**Molded plastic, ebony or Swedish red**
CIRCUIT	**Four-tube superheterodyne (plus rectifier)**
FREQUENCY RANGE	
Standard Broadcast	**540 kc. to 1620 kc.**
Special Services	**1700 kc. to 3400 kc.**
AUDIO OUTPUT	**1 watt**
OPERATING VOLTAGE	**105 to 120 volts, a.c. or d.c.**
POWER CONSUMPTION	**30 watts**
AERIAL	**High-impedance loop**
INTERMEDIATE FREQUENCY	**455 kc.**
PHILCO TUBES	**12BE6 converter, 12BA6 i-f amplifier, 12AV6 det.—a.v.c.-1st audio, 35C5 output, 35W4 rectifier**



MODEL 53-563



TP2-1371

Figure 1. Dial-Cord Installation Details

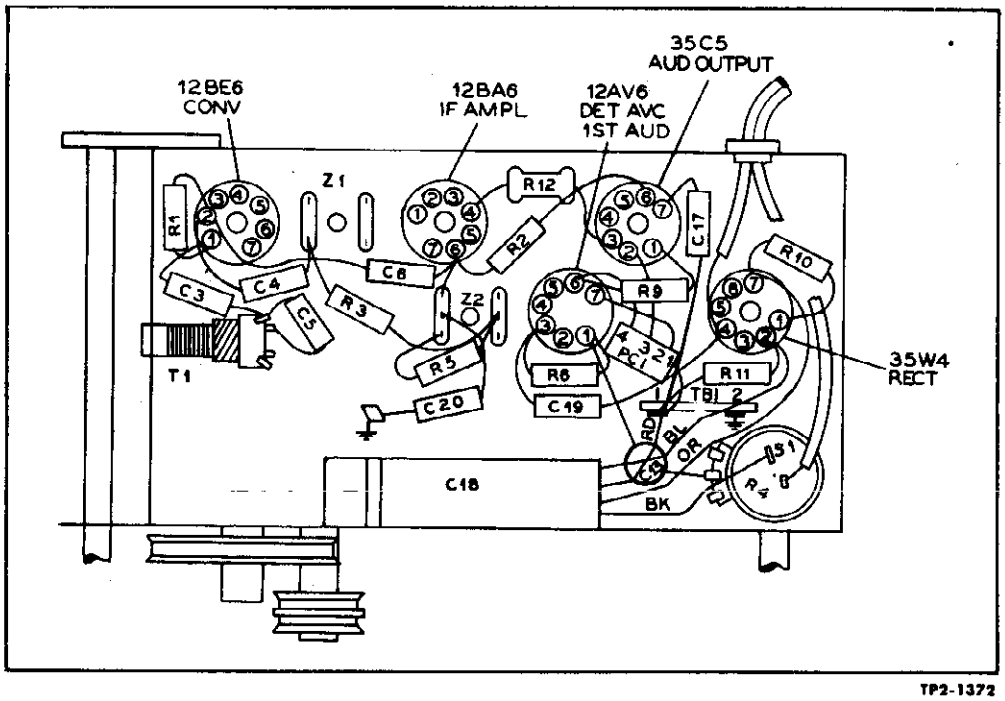
ALIGNMENT PROCEDURE

RADIO CONTROLS—Set volume control to maximum. Set tuning control and band switch, SW1, 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	BAND SWITCH SETTING	SPECIAL INSTRUCTIONS	
1	Ground lead to B-; output lead through a .1-μf. condenser to grid (pin 7) of 12BE6.	455 kc.	Tuning gang fully open	Broadcast	Adjust tuning cores, in order given, for maximum output. TC1 and TC3 are located at top of transformers.	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).	1620 kc.	*1620 kc.	Broadcast	Adjust trimmer for maximum output.	C1-B—osc.
3	Same as step 2.	1500 kc.	1500 kc.	Broadcast	Adjust trimmer for maximum output.	C1-A—aerial (broadcast)
4	Same as step 2.	3200 kc.	3200 kc.	Special Services	Adjust trimmer for maximum output.	C21—aerial (special services).

NOTE: Make up a 6—8 turn, 6-inch-diameter loop from insulated wire, connect to signal-generator leads, and place near radio loop. The 1620-kc. index mark is located on the pointer rail, to the extreme right side as viewed from the front.

*For proper adjustment of the oscillator trimmer, fully open the tuning gang and insert a .006-inch non-metallic shim between the heel of the rotor and the top of the stator plates. Close the tuning gang sufficiently to hold the shim in place, and then remove the shim without disturbing the gang setting.



TP2-1372

Figure 2. Base View, Showing Symbolized Chassis

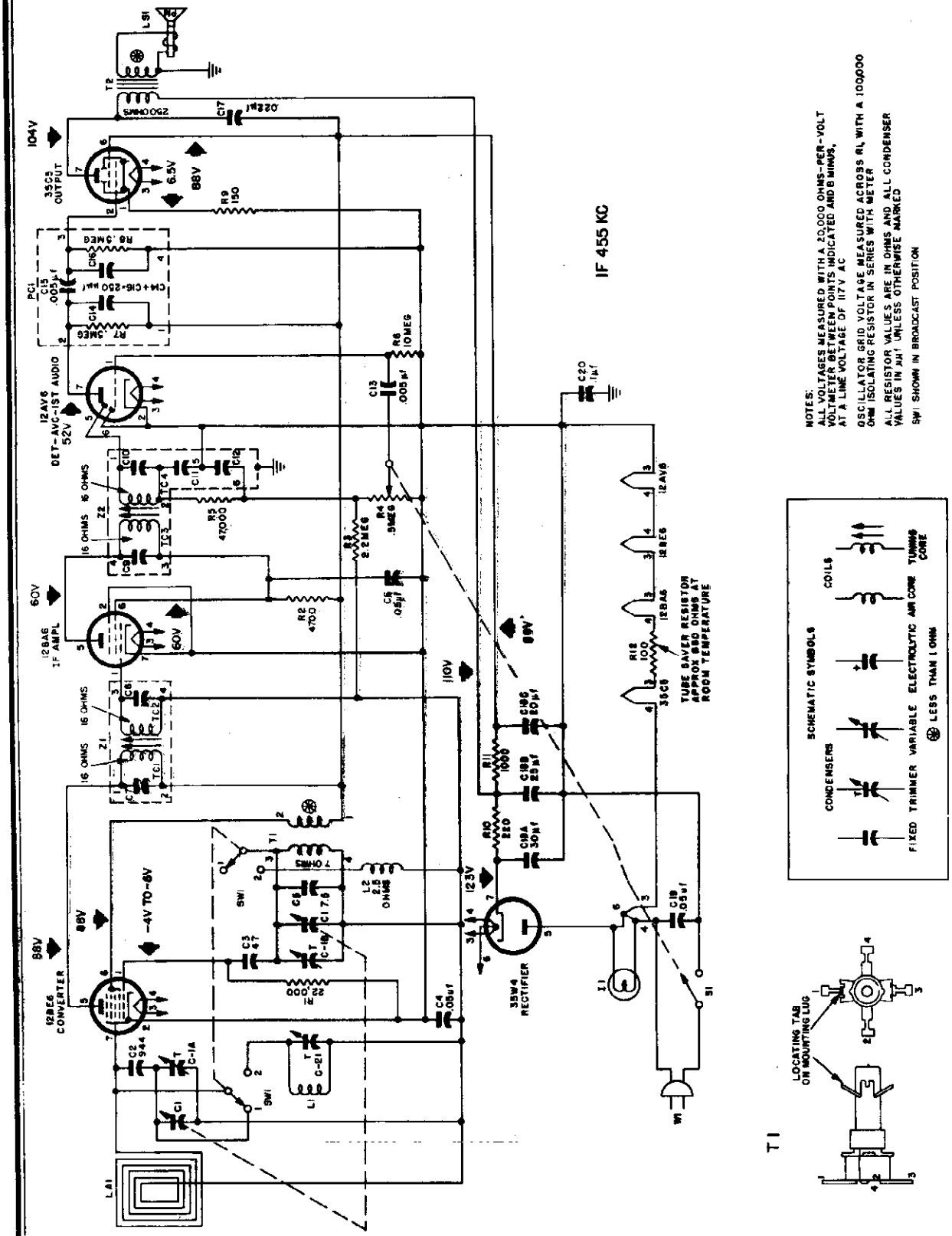


Figure 3. Philco Radio Model 53-563, Schematic Diagram

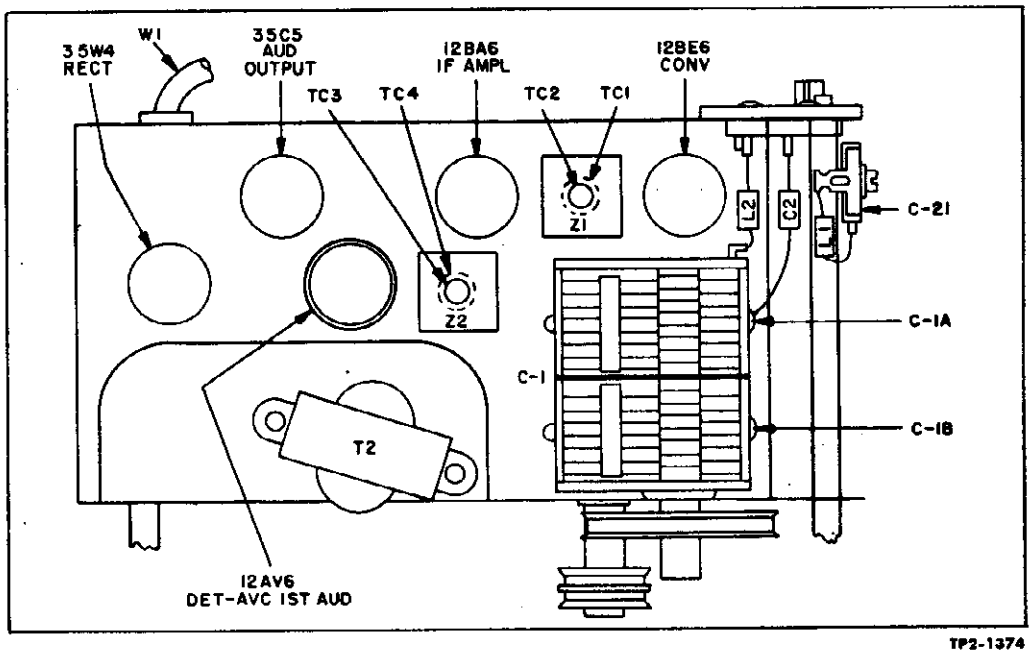


Figure 4. Top View, Showing Trimmer Locations

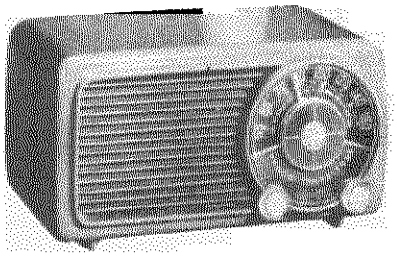
PARTS LIST

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."

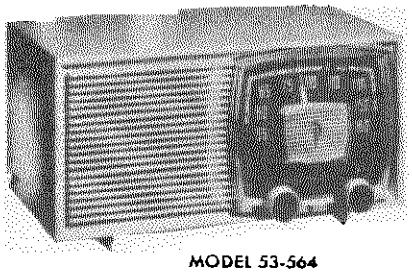
Reference Symbol	Description	Service Part No.
C1	Condenser, tuning gang	31-2751-14
C1A	Condenser, aerial trimmer	Part of C1
C1B	Condenser, oscillator trimmer	Part of C1
C2	Condenser, antenna series tracker, 944 μμf.	30-1220-65
C3	Condenser, oscillator grid, 47 μμf.	30-1230-4
C4	Condenser, a-v-c by-pass, .05 μf.	45-3505-28*
C5	Condenser, drift compensation, 7.5 μμf.	30-1224-83
C6	Condenser, screen by-pass, .05 μf.	45-3505-28*
C7	Condenser, i-f tuning	Part of Z1
C8	Condenser, i-f tuning	Part of Z1
C9	Condenser, i-f tuning	Part of Z2
C10	Condenser, i-f tuning	Part of Z2
C11	Condenser, detector filtering	Part of Z2
C12	Condenser, dectector filtering	Part of Z2
C13	Condenser, audio coupling, .005 μf.	30-1238-1
C14	Condenser, plate by-pass	Part of PC1
C15	Condenser, audio coupling, .005 μf.	Part of PC1
C16	Condenser, compensating	Part of PC1
C17	Condenser, tone compensation, .022 μf.	45-3505-43*
C18	Condenser, electrolytic, 3-section	30-2573
C18A	Condenser, filter, 30 μf., 150v	Part of C18
C18B	Condenser, filter, 25 μf., 150v	Part of C18
C18C	Condenser, filter, 20 μf., 150v	Part of C18
C19	Condenser, line by-pass, .05 μf.	45-3505-62*
C20	Condenser, B minus to chassis, .1 μf.	45-3505-47*
C21	Condenser, trimmer, special services	31-6473-29
I1	Lamp, pilot	34-2068
L1	Coil, aerial, special services	32-4561-3
L2	Coil, oscillator shunt	32-4562-2
LA1	Loop, part of cabinet back	76-7764
LS1	Speaker, p-m	36-1627-5
R1	Resistor, oscillator grid, 22,000 ohms	66-3228340*
R2	Resistor, i-f screen dropping, 4700 ohms	66-2748340*
R3	Resistor, a-v-c filter, 2.2 megohms	66-5228340*
R4	Resistor, volume control, .5 megohm	33-5566-41
R5	Resistor, diode load, 47,000 ohms	66-3478340*
R6	Resistor, grid return, 10 megohms	66-6108340*
R7	Resistor, plate load, 500,000 ohms	Part of PC1
R8	Resistor, grid return, 500,000 ohms	Part of PC1
R9	Resistor, cathode bias, 150 ohms	66-1158340*
R10	Resistor, B plus filter, 220 ohms	66-1224340*
R11	Resistor, B plus filter, 1000 ohms	66-2108340*
R12	Resistor, tube saver, 100 ohms	33-1343-3
S1	Switch, off-on	Part of R4
SW1	Switch, broadcast-special services	42-1796-2
T1	Transformer, oscillator	32-4453-6
T2	Transformer, output	32-8384*
W1	Line cord	L-2183*
Z1	Transformer, 1st i-f	32-4161A
Z2	Transformer, 2nd i-f	32-4240A

MISCELLANEOUS

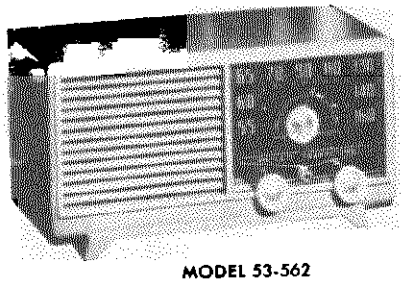
Description	Service Part No.
Cabinet, ebony	10918-1
Cabinet, Swedish red	10918-3
Back and-loop assembly	76-7764
Grille (plastic)	54-4966
Dial backplate (plastic)	54-4968
Drive cord, 25-foot spool	45-8750
Knob, red	54-4527-38
Knob, ebony	54-4527-37
Pointer, dial	56-8774-3
Pointer rail, bracket-and-pulley assembly	76-7767
Shaft, tuning	56-9807
Socket assembly, pilot lamp	27-6233-6*
Socket, 7-pin miniature	27-6265*
Spring, retaining	28-8610*
Spring	56-3167
Spring	28-8953



MODEL 53-561



MODEL 53-564



MODEL 53-562

SPECIFICATIONS

OPERATING VOLTAGE	**105 to 120 volts, a.c. or d.c**
POWER CONSUMPTION	**30 watts**
AERIAL	**High-impedance loop**
INTERMEDIATE FREQUENCY	**455 kc**
PHILCO TUBES	**12BE6 converter, 12BA6 i-f amplifier**
	12AV6 det.-a.v.c.-1st audio, 35C5 output, 35W4 rectifier
CABINET	**Molded plastic**
CIRCUIT	**Four-tube superheterodyne (plus rectifier)**
FREQUENCY RANGE	
Standard Broadcast	**540 kc. to 1620 kc.**
Special Services	**1700 kc. to 3400 kc.**
AUDIO OUTPUT	**1 watt**

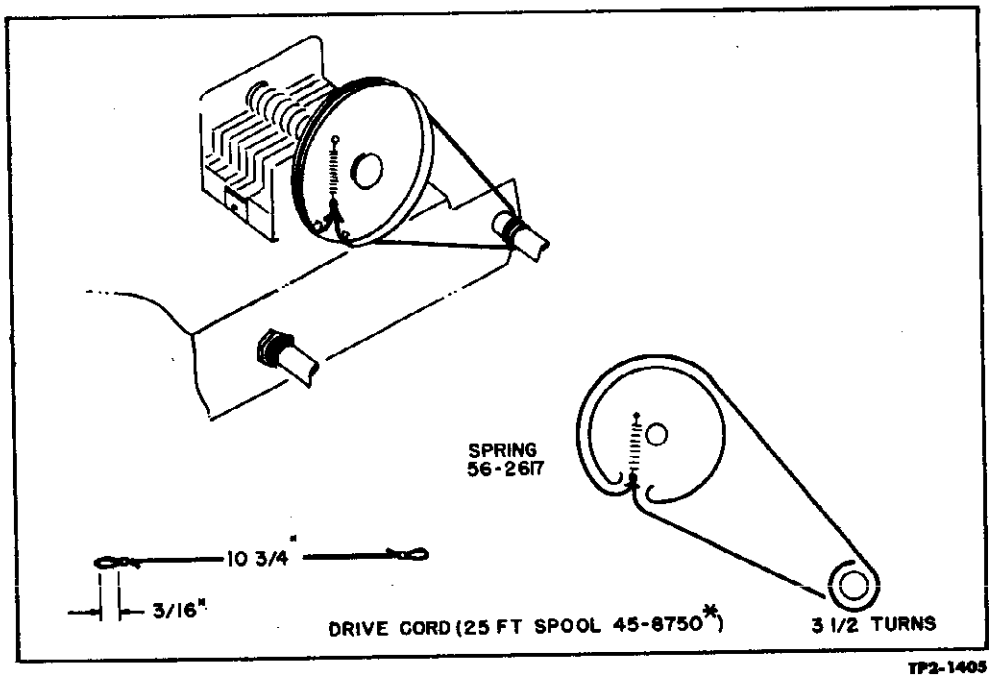


Figure 1. Dial-Cord Installation Details

ALIGNMENT PROCEDURE

RADIO CONTROLS—Set volume control to maximum. Set tuning control and band switch, SW1, 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.

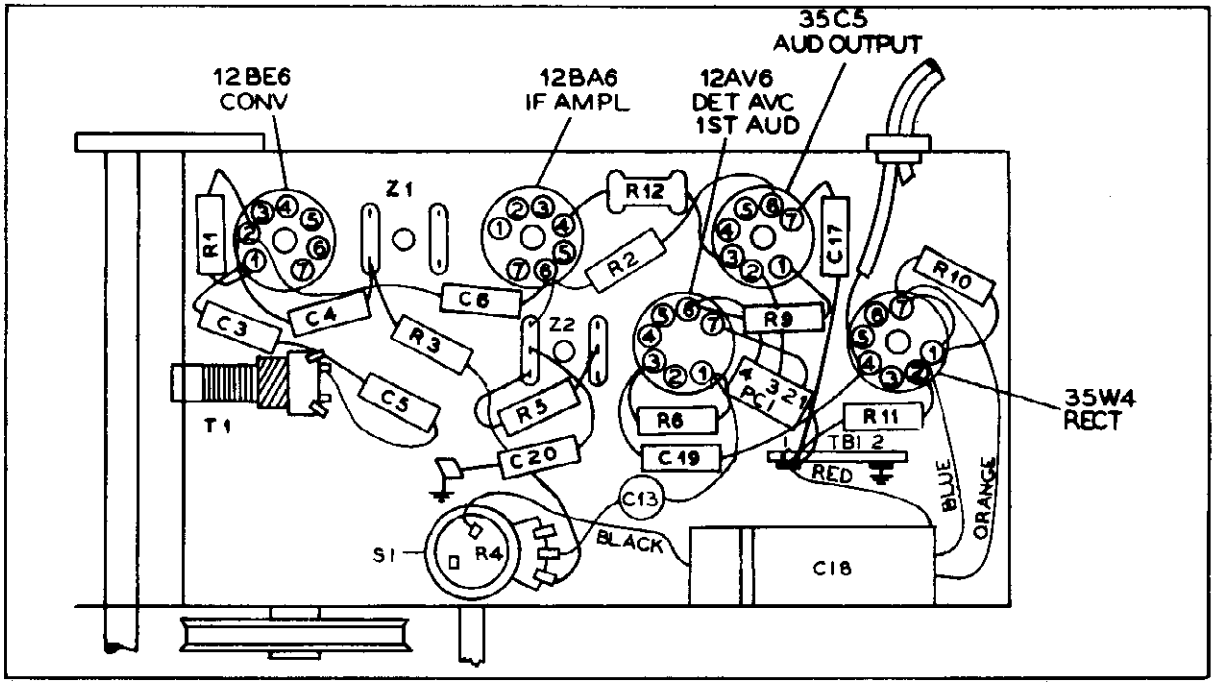
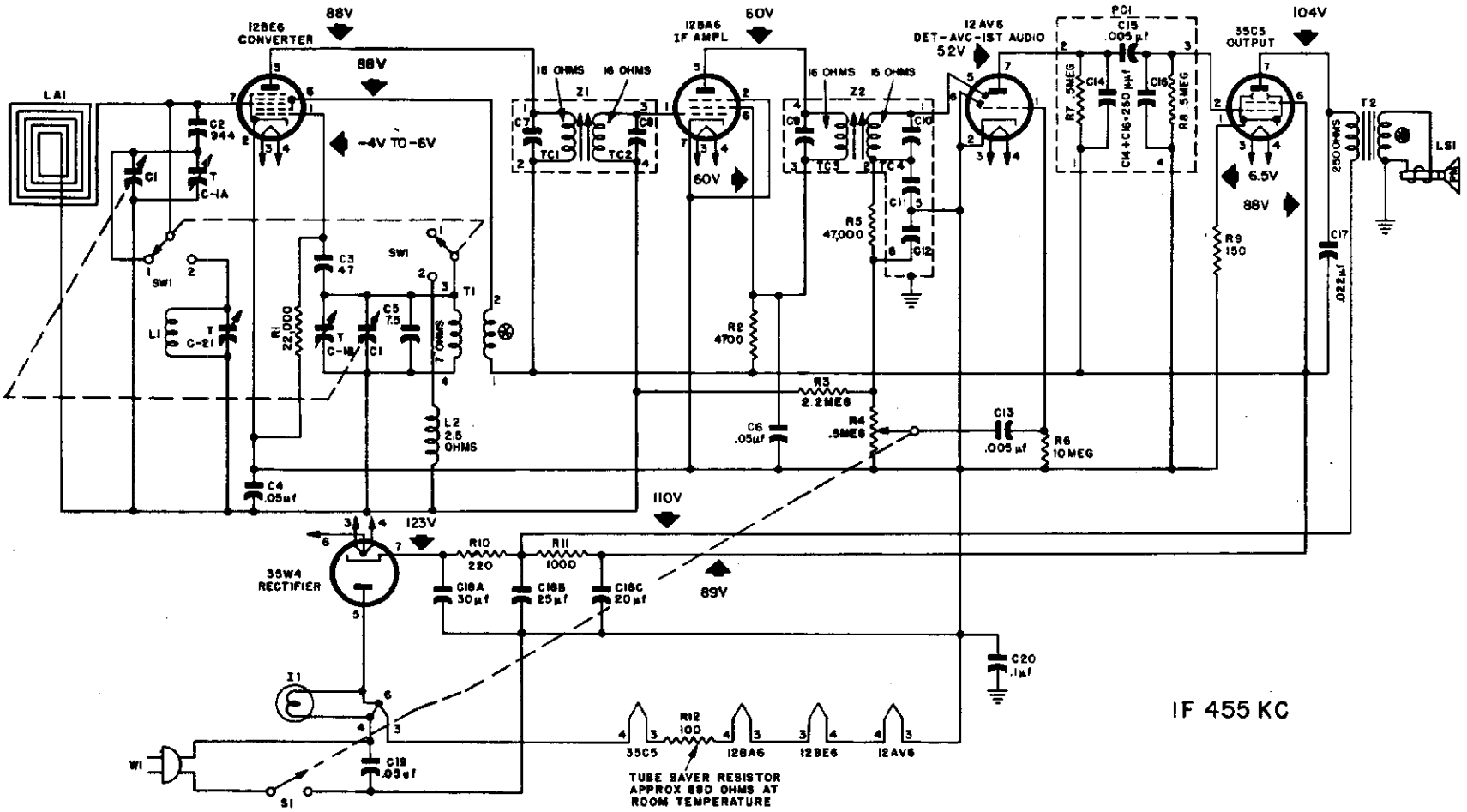


Figure 2. Base View, Showing Symbolized Chassis

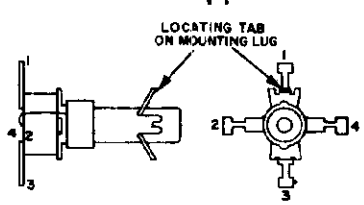
STEP	SIGNAL GENERATOR		RADIO			
	CONNECTION TO RADIO	DIAL SETTING	DIAL SETTING	BAND SWITCH SETTING	SPECIAL INSTRUCTIONS	ADJUST
1	Ground lead to B-; output lead through a .1-μf. condenser to grid (pin 7) of 12BE6.	455 kc.	Tuning gang fully open.	Broadcast	Adjust tuning cores, in order given, for maximum output. (TC1 and TC3 are located at top of transformers).	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).	1620 kc.	*1620 kc.	Broadcast	Adjust trimmer for maximum output.	C1-B osc.
3	Same as step 2.	1500 kc.	1500 kc.	Broadcast	Adjust trimmer for maximum output.	C1-A aerial (broadcast).
4	Same as step 2.	3200 kc.	3200 kc.	Special services	Adjust trimmer for maximum output.	C-21—aerial (special services).

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

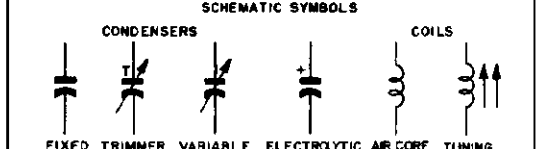
*For proper adjustment of the oscillator trimmer, fully open the tuning gang and insert a .006-inch non-metallic shim between the heel of the rotor and the top of the stator plates. Close the tuning gang sufficiently to hold the shim in place, and then remove the shim without disturbing the gang setting.



T1



SCHEMATIC SYMBOLS



NOTES:

ALL VOLTAGES MEASURED WITH A 20,000 OHMS-PER-VOLT VOLTMETER BETWEEN POINTS INDICATED AND B MINUS, AT A LINE VOLTAGE OF 117 V AC

OSCILLATOR GRID VOLTAGE MEASURED ACROSS R1, WITH A 100,000 OHM ISOLATING RESISTOR IN SERIES WITH METER

ALL RESISTOR VALUES ARE IN OHMS AND ALL CONDENSER VALUES IN µµf UNLESS OTHERWISE MARKED

SWI SHOWN IN STANDARD BROADCAST POSITION

MODELS 53-561, 53-562, 53-564

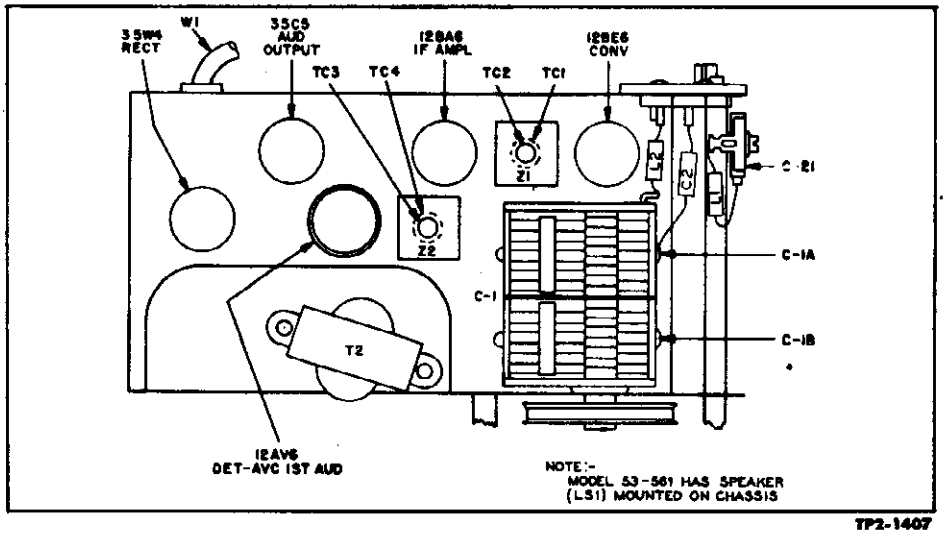


Figure 4. Top View, Showing Trimmer Locations

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	31-2751-14
C1A	Condenser, aerial trimmer	Part of C1
C1B	Condenser, osc. trimmer	Part of C1
C2	Condenser, aerial series tracker, 944 μμf.	45-3505-47
C3	Condenser, oscillator grid, 47 μμf.	30-1230-4
C4	Condenser, a-v-c by-pass, .05 μf.	45-3505-28*
C5	Condenser, drift compensation, 7.5 μμf.	30-1224-83
C6	Condenser, screen by-pass, .05 μf.	45-3505-28*
C7	Condenser, i-f tuning	Part of Z1
C8	Condenser, i-f tuning	Part of Z1
C9	Condenser, i-f tuning	Part of Z2
C10	Condenser, i-f tuning	Part of Z2
C11	Condenser, detector filtering	Part of Z2
C12	Condenser, detector filtering	Part of Z2
C13	Condenser, audio coupling, .005 μf.	30-1238-1
C14	Condenser, plate by-pass	Part of PC1
C15	Condenser, audio coupling, .005 μf.	Part of PC1
C16	Condenser, compensating	Part of PC1
C17	Condenser, tone compensation, .022 μf.	45-3505-43*
C18	Condenser, electrolytic, 3-section	30-2575-34
C18A	Condenser, filter, 30 μf., 150v	Part of C18
C18B	Condenser, filter, 25 μf., 150v	Part of C18
C18C	Condenser, filter, 20 μf., 150v	Part of C18
C19	Condenser, line by-pass, .05 μf.	45-3505-62*
C20	Condenser, B- to chassis, .1 μf.	45-3505-47*
C21	Condenser, trimmer, special service	31-6473-29
I1	Lamp, pilot	34-2068
LA1	Loop, aerial	76-7718
L1	Coil, antenna, special services	32-4561-3
L2	Coil, oscillator shunt	32-4562-2
LS1	Speaker, p-m	36-1627-8
PC1	Printed circuit	30-6001
R1	Resistor, oscillator grid, 22000 ohms	66-3228340*
R2	Resistor, i-f screen dropping, 4700 ohms	66-2748340*
R3	Resistor, a-v-c filter, 2.2 megohms	66-5228340*
R4	Resistor, volume control	33-5566-41
R5	Resistor, diode load, 47,000 ohms	66-3478340*
R6	Resistor, grid return, 10 megohms	66-6108340*
R7	Resistor, plate load, 500,000 ohms	Part of PC1
R8	Resistor, grid return, 500,000 ohms	Part of PC1
R9	Resistor, cathode bias, 150 ohms	66-1158340*
R10	Resistor, B plus filter, 220 ohms	66-1224340*
R11	Resistor, B plus filter, 1000 ohms	66-2108340*
R12	Resistor, tube saver, 100 ohms	33-1343-3
S1	Switch, off-on	Part of R4
SW1	Switch, broadcast-special services	42-1796-2
T1	Transformer, oscillator	32-4453-6
T2	Transformer, output	32-8384*

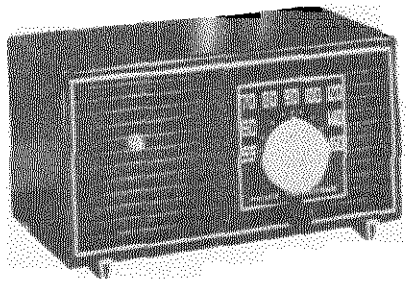
Reference Symbol	Description	Service Part No.
W1	Line cord	L-2183*
Z1	Transformer, 1st i-f	32-4161A
Z2	Transformer, 2nd i-f	32-4240A

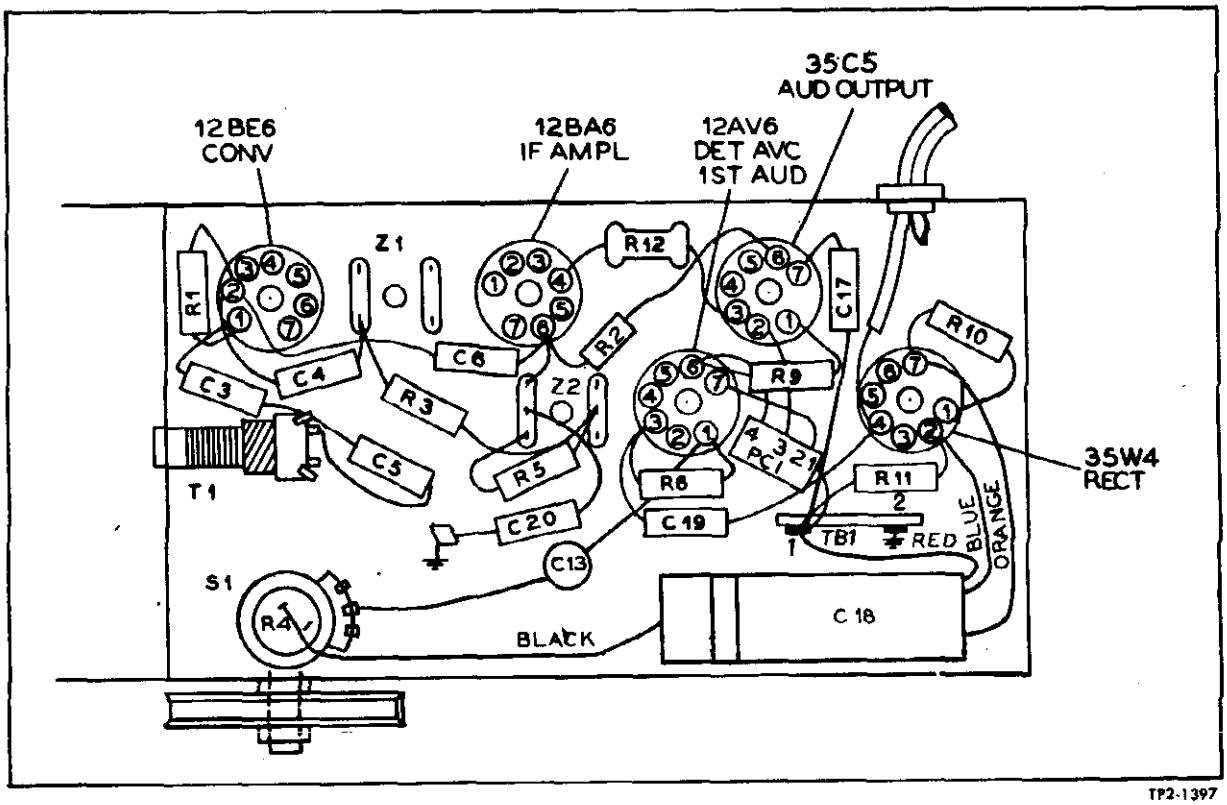
MISCELLANEOUS

Description	Service Part No.
Cabinet	
Model 53-561	
Ivory	10925-1
Colonial green	10925-5
Maroon	10925-3
Light beige	10925-7
Model 53-562	
Maroon	10926-3
Forest green	10926-5
Tangerine	10926-7
Ivory	10926
Model 53-564	
Maroon	10927-1
Back-and-Loop Assembly	
Model 53-561	76-7718
Model 53-562	76-7759
Model 53-564	76-7769
Knob (2)	
Model 53-561	
Ivory cabinet	54-4980-1
Maroon cabinet	
Light beige cabinet	
Colonial green cabinet	
Model 53-562	
Maroon cabinet	54-4773-3
Ivory cabinet	
Forest green cabinet	
Tangerine cabinet	
Model 53-564	
Maroon cabinet	54-4982
Drive Cord, 25-foot spool	45-8750
Pointer, Dial	
Model 53-561	54-4981
Model 53-562	56-9834
Model 53-564	54-4979
Shaft, tuning	56-9807FA11
Socket assembly, pilot lamp	27-6233-6
Socket, 7-pin miniature	27-6265
Socket	27-6265
Spring, retaining	28-8610
Spring	56-2617

SPECIFICATIONS

CABINET MODEL 53-560	Molded plastic
CIRCUIT	Four-tube superheterodyne (plus rectifier)
FREQUENCY RANGE	Standard broadcast, 540 kc.-1620 kc.
AUDIO OUTPUT	1 watt
OPERATING VOLTAGE	105-120 volts, a.c. or d.c.
POWER CONSUMPTION	30 watts
AERIAL	High-impedance loop
INTERMEDIATE FREQUENCY	455 kc.
PHILCO TUBES	12BE6 converter, 12BA6 i-f amplifier, 12AV6 det.-a.v.c.-1st audio, 35C5 output, 35W4 rectifier





TP2-1397

Figure 1. Base View, Showing Symbolized Chassis

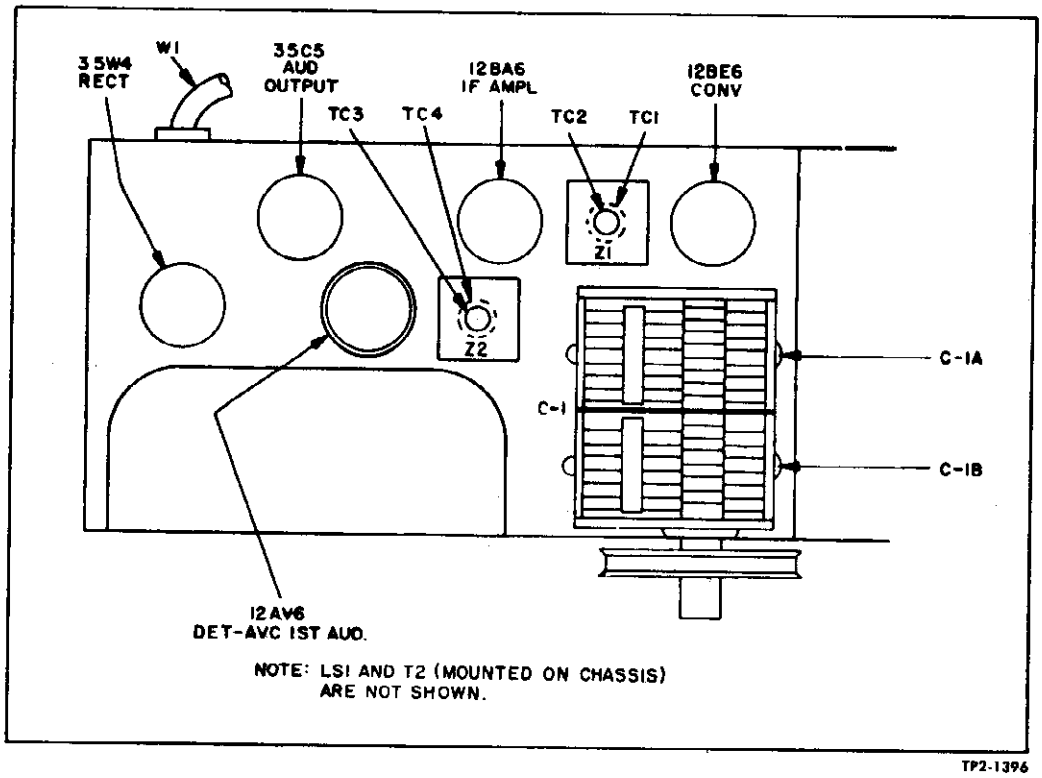


Figure 2. Top View, Showing Trimmer Locations

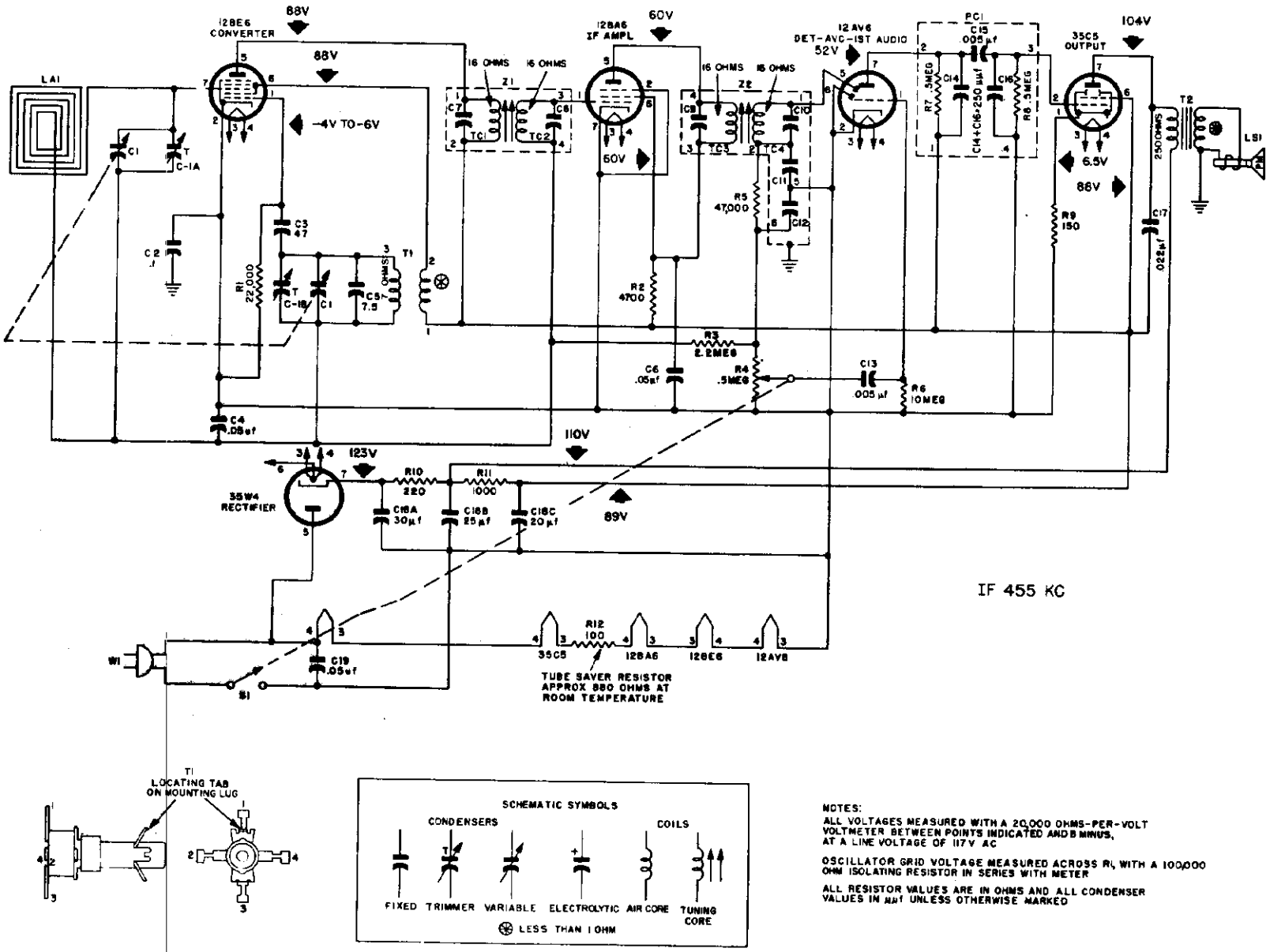
ALIGNMENT PROCEDURE

RADIO CONTROLS—Set volume control to maximum. Set tuning control as indicated in chart.
OUTPUT METER—Connect across voice-coil terminals.
SIGNAL GENERATOR—Connect signal generator and set frequency as indicated in chart. Use modulated output.
OUTPUT LEVEL—During alignment, attenuate 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	Ground lead to B-; output lead through a .1-μf. condenser to grid (pin 7) of 12BE6.	455 kc.	Tuning gang fully open.	Adjust tuning cores, in order given, for maximum output. (TC1 and TC3 are located at top of transformer.)	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).	1620 kc.	*1620 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.

***NOTE:** For proper adjustment of the oscillator trimmer, fully open the tuning gang and insert a .006-inch, non-metallic shim between the heel of the rotor and the top of the stator plates. Close the tuning gang sufficiently to hold the shim in place, and then remove the shim without disturbing the gang setting.



NOTES:

ALL VOLTAGES MEASURED WITH A 20,000 OHMS-PER-VOLT VOLTMETER BETWEEN POINTS INDICATED AND B MINUS, AT A LINE VOLTAGE OF 117 V AC

OSCILLATOR GRID VOLTAGE MEASURED ACROSS R1 WITH A 100,000 OHM ISOLATING RESISTOR IN SERIES WITH METER

ALL RESISTOR VALUES ARE IN OHMS AND ALL CONDENSER VALUES IN µµf UNLESS OTHERWISE MARKED

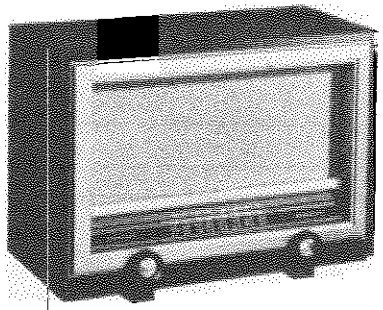
Figure 3. Philco Radio Model 53-560, Schematic Diagram

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."

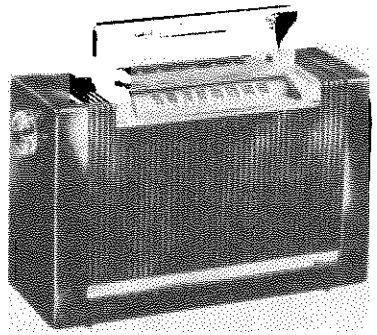
Reference Symbol	Description	Service Part No.
C1	Condenser, tuning gang	31-2751-13
C1A	Condenser, aerial trimmer	Part of C1
C1B	Condenser, osc. trimmer	Part of C1
C2	Condenser, leakage, .1 μf.	45-3505-47
C3	Condenser, oscillator grid, 47 μμf.	30-1230-4
C4	Condenser, a-v-c by-pass, .05 μf.	45-3505-28*
C5	Condenser, drift compensation, 7.5 μμf.	30-1224-83
C6	Condenser, screen by-pass, .05 μf.	45-3505-28*
C7	Condenser, i-f tuning	Part of Z1
C8	Condenser, i-f tuning	Part of Z1
C9	Condenser, i-f tuning	Part of Z2
C10	Condenser, i-f tuning	Part of Z2
C11	Condenser, detector filtering	Part of Z2
C12	Condenser, detector filtering	Part of Z2
C13	Condenser, audio coupling, .005 μf.	30-1238-1
C14	Condenser, plate by-pass	Part of PC1
C15	Condenser, audio coupling, .005 μf.	Part of PC1
C16	Condenser, plate by-pass	Part of PC1
C17	Condenser, tone compensation, .022 μf.	45-3505-43*
C18	Condenser, electrolytic, 3-section	30-2573
C18A	Condenser, filter, 30 μf., 150v	Part of C18
C18B	Condenser, filter, 25 μf., 150v	Part of C18
C18C	Condenser, filter, 20 μf., 150v	Part of C18
C19	Condenser, line by-pass, .047 μf.	45-3505-62*
LS1	Speaker, p-m	36-1627-8
PC1	Printed circuit	30-6001
R1	Resistor, oscillator grid, 22,000 ohms, ½ w	66-3228340*
R2	Resistor, i-f screen dropping, 4,700 ohms, ½ w	66-2748340*
R3	Resistor, a-v-c filter, 2.2 megohms, ½ w	66-5228340*
R4	Resistor, volume control, .5 megohms (with off-on switch)	33-5566-41
R5	Resistor, diode load, 47,000 ohms, ½ w	66-3478340*
R6	Resistor, grid return, 10 megohms, ½ w	66-6108340*
R7	Resistor, plate load, 500,000 ohms	Part of PC1
R8	Resistor, grid return, 500,00 ohms	Part of PC1
R9	Resistor, cathode bias, 150 ohms, ½ w	66-1158340*
R10	Resistor, B plus filter, 220 ohms, 1 w	66-1224340*
R11	Resistor, B plus filter, 1000 ohms, ½ w	66-2108340*
R12	Resistor, tube saver, 100 ohms	33-1343-3
S1	Switch, off-on	Part of R4
T1	Transformer, oscillator	32-4453-6
T2	Transformer, output	32-8384*
W1	Line cord	L-2183*
Z1	Transformer, 1st i-f	32-4161A
Z2	Transformer, 2nd i-f	32-4240A

MISCELLANEOUS

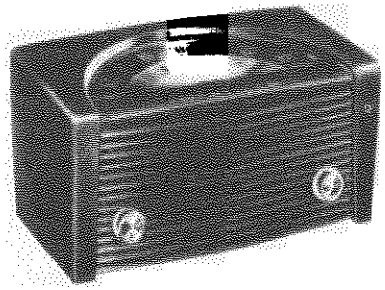
Description	Service Part No.
Cabinet, ebony	10921
Cabinet, ivory	10921-2
Cabinet, mahogany	10921-1
Cabinet back-and-loop assembly	76-7705
Drive cord, 25-foot spool	45-8750
Knob, tuning	54-4969
Ebony	27-4815-8
Ivory	54-4118
Mahogany	27-4815-10
Socket, 7-pin miniature (5 required)	27-6265*



MODEL 52-549



MODEL 52-642



MODEL 52-939

SPECIFICATIONS

MODEL 52-549

CABINET ..... Wood
CIRCUIT ..... 4-tube superheterodyne (plus rectifier)
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 (4 plus rectifier) 7A8, 12BA6, 12AV6, 35L6GT, 35Z5GT

MODEL 52-642

CABINET ..... Plastic, portable
CIRCUIT ..... 4-tube superheterodyne (plus selenium rectifier)
FREQUENCY RANGE ..... 540-1620 kc.
AUDIO OUTPUT
A-c or d-c operation ..... 150 milliwatts
Battery operation ..... 75 milliwatts
OPERATING VOLTAGES ..... 117 volts, a.c. or d.c.; 1.5-volt "A" and 67.5-volt "B" battery
POWER CONSUMPTION
A-c or d-c operation ..... 11 watts
Battery operation ..... 9.5 ma. from 67.5-volt "B" battery; 250 ma. from 1.5-volt "A" battery
AERIAL ..... Magnecor high-impedance loop; provision for connecting external aerial
INTERMEDIATE FREQUENCY ..... 455 kc.
PHILCO TUBES (4) ..... 1R5, 1U4, 1U5, and 3V4
BATTERY TYPE ..... P-67 "B" battery
TYPE D "A" battery

MODEL 52-939

CABINET ..... Molded plastic
CIRCUIT ..... 5-tube superheterodyne (plus rectifier)
FREQUENCY RANGE ..... 540-1620 kc.
AUDIO OUTPUT ..... 1 watt
OPERATING VOLTAGE .... 105-120 volts, a.c. or d.c.
POWER CONSUMPTION ..... 30 watts
AERIAL ..... High-impedance loop; provision for connecting external aerial
INTERMEDIATE FREQUENCY ..... 455 kc.
PHILCO TUBES (5 plus rectifier) ..... 7B7(2), 7AB, 14B6, 35L6GT, 35Z5GT

MODELS 52-549,
52-642, 52-939

ALIGNMENT PROCEDURE

The alignment procedures for the receivers covered by this manual are given in the service manuals listed below.

Model 52-549	same as	Model 52-541,	**Pgs. 1-4**
Model 52-642	same as	Model 52-640,	**Pgs. 17-20**
Model 52-939	same as	Model 52-940,	**Pgs. 25-28**

SCHEMATIC DIAGRAMS

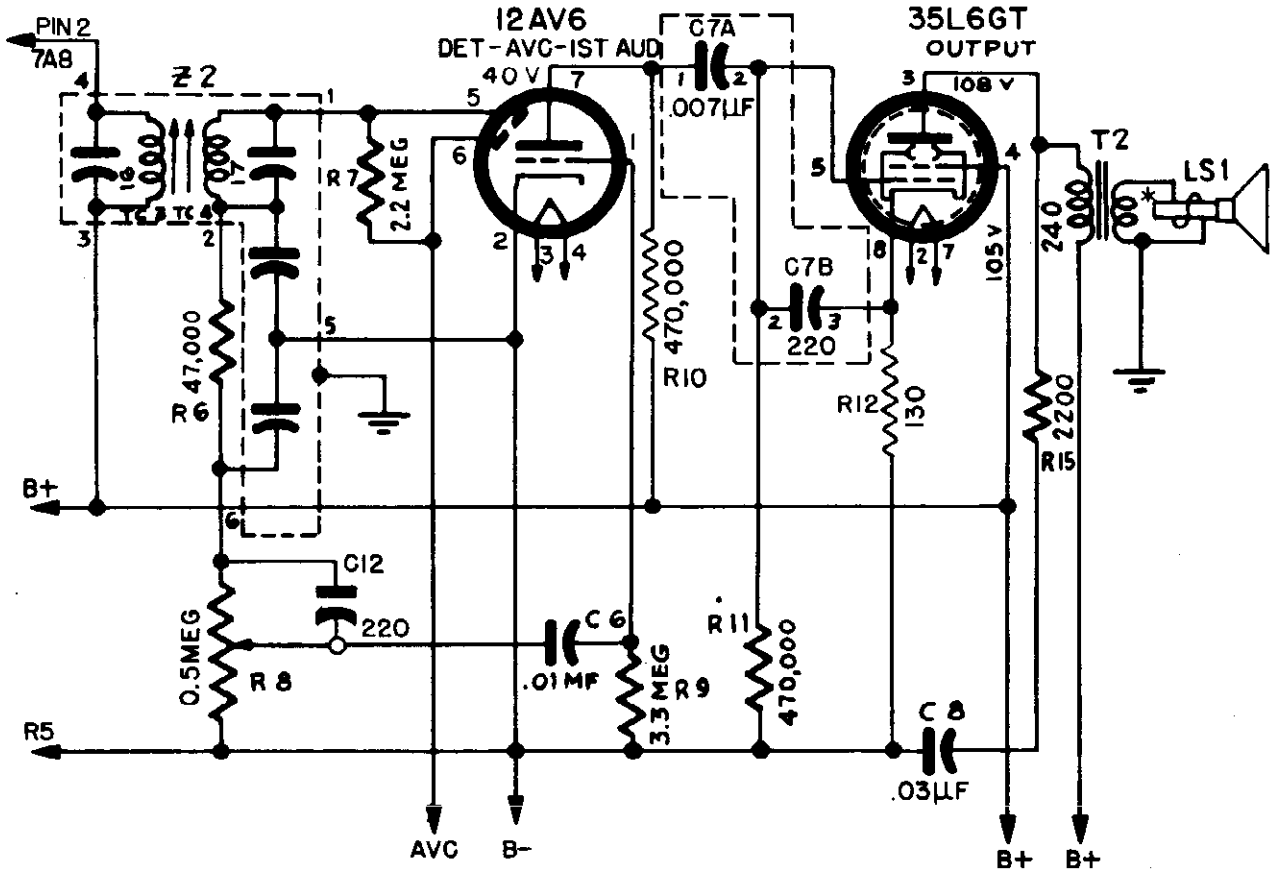
The schematic diagrams for the models in this manual are given in the service manuals listed above. Models 52-549 and 52-642 differ from the basic circuit only as described below.

MODEL 52-549 CIRCUIT

The circuit for this set differs from that of Model 52-541 only in the audio section. See figure 1 and **Pg 1-4.** These changes are as follows, and are in addition to component part number changes given in the parts list in this service manual.

A condenser, C12, 220 $\mu\mu$f., Part No. 62-122001011, is connected between the high side and the center arm of the volume control, R8. Condenser C12 is used for high-frequency compensation.

The tone-compensation condenser, C8, was changed from .05 μf. to .03 μf., Part No. 30-4517.

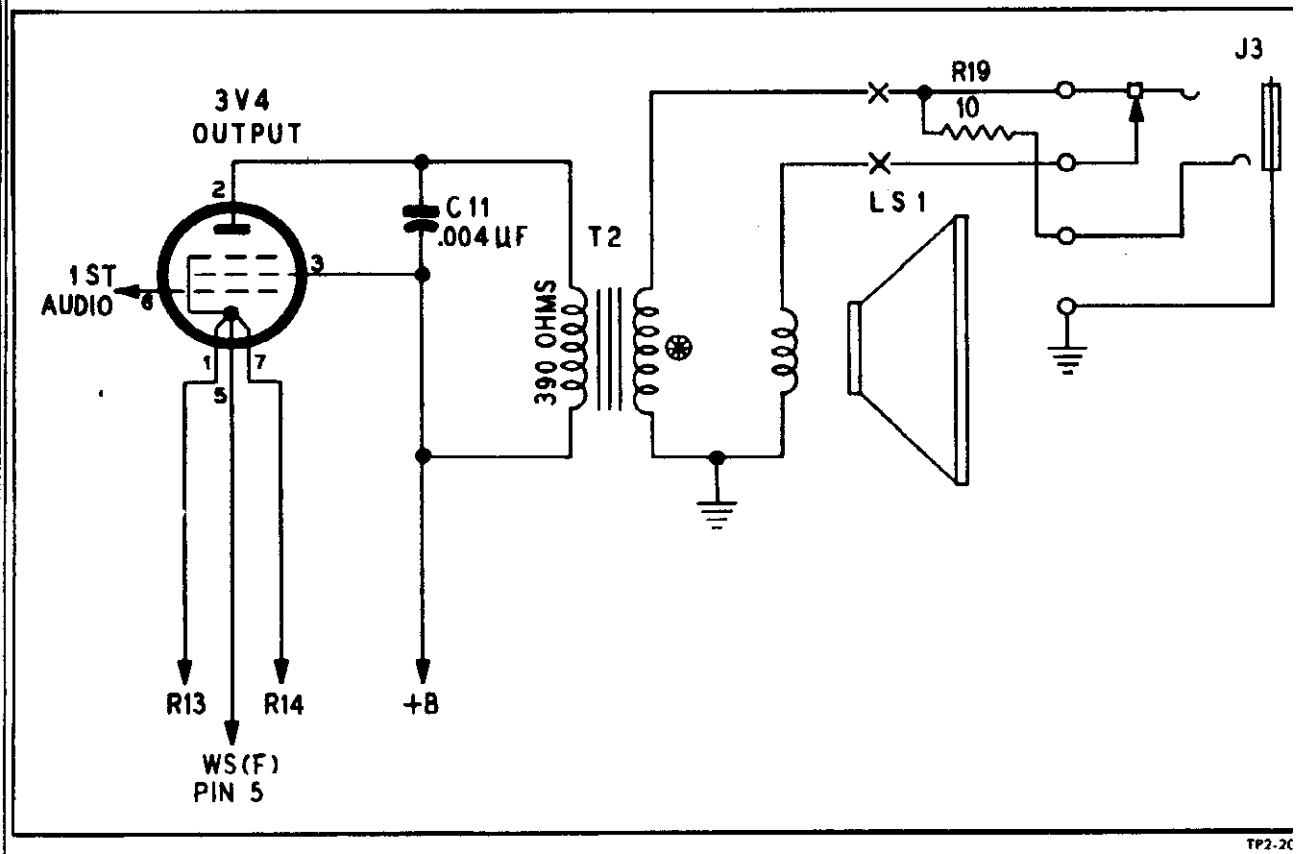


TP2-1817

Figure 1. Model 52-549, Second Detector and Audio Amplifier Circuits

MODEL 52-642 CIRCUIT

The circuit for this set differs from that of Model 52-640 in that it includes a Private Listening Unit receptacle. See figure 2 and Pg 17-20. The Private Listening Unit receptacle, J3, Part No. 42-1975-3 is wired into the circuit as shown in figure 2. A shun resistor, R19, Part No. 66-0108340, reduces volume t the correct level for Private Listening. R19, a 10-ohm resistor, is wired from J3 to chassis ground.



TP2-2C

Figure 2. Model 52-642, Output Circuit Showing the Connections for a Private Listening Unit

MODEL 52-549

Reference Symbol	Description	Service Part No.
Il	Pilot-lamp assembly	76-1179-7
LA1	Loop aerial	32-4052-65
LS1	Speaker, 6-inch, p.m.	36-1641-1
T2	Transformer, output	32-8384-2

MISCELLANEOUS

MODEL 52-549

Description	Service Part No.
Cabinet, mahogany	10910
Knob (2)	54-4774-9
Scale	54-5141
Cabinet, light (blond)	10910-1
Knob (2)	54-4774-10
Scale	54-5141-1
Cabinet, ebony	10910-2
Knob (2)	54-4774-18
Scale	54-5141
Back, cabinet (all models)	54-8640
Pointer (all models)	56-8774-2

MISCELLANEOUS (Cont.)

MODEL 52-642

Description	Servi Part N
Cabinet	
Teal green	10799-1
Maroon	10799-
Swedish red	10799-
Caribbean blue	10799-
Nile green	10799-
Arabian sand	10799-
Ebony	10799-
Knob (2) (all models)	54-47
Pointer (all models)	56-7973
Scale (all models)	54-50

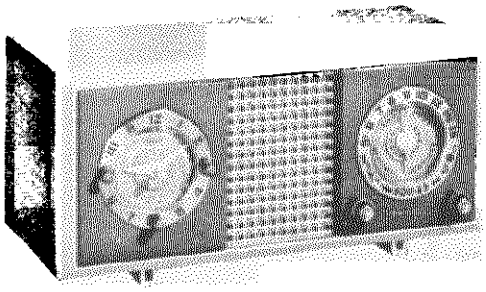
MODEL 52-939

Cabinet, ebony	76-75
Back	318-32
Knob (2)	54-4718-
Pointer assembly	76-5341
Scale	54-5071

MODEL 53-804

SPECIFICATIONS

CABINET	Molded plastic
CIRCUIT	Five-tube superheterodyne (plus rectifier)
FREQUENCY RANGE	
Broadcast	540 kc. to 1620 kc.
Special Services	1700 kc. to 3400 kc.
AUDIO OUTPUT	1 watt
OPERATING VOLTAGE	105—120 volts, a.c.
POWER CONSUMPTION	30 watts
ANTENNA	Built-in, high-impedance loop
INTERMEDIATE FREQUENCY	455 kc.
PHILCO TUBES	6BJ6 r-f ampl.; 12BE6 converter; 6BJ6 i-f ampl.; 6AQ5 detector, a.v.c., 1st audio; 35C5 output; 35W4 rectifier



MODEL 53-804

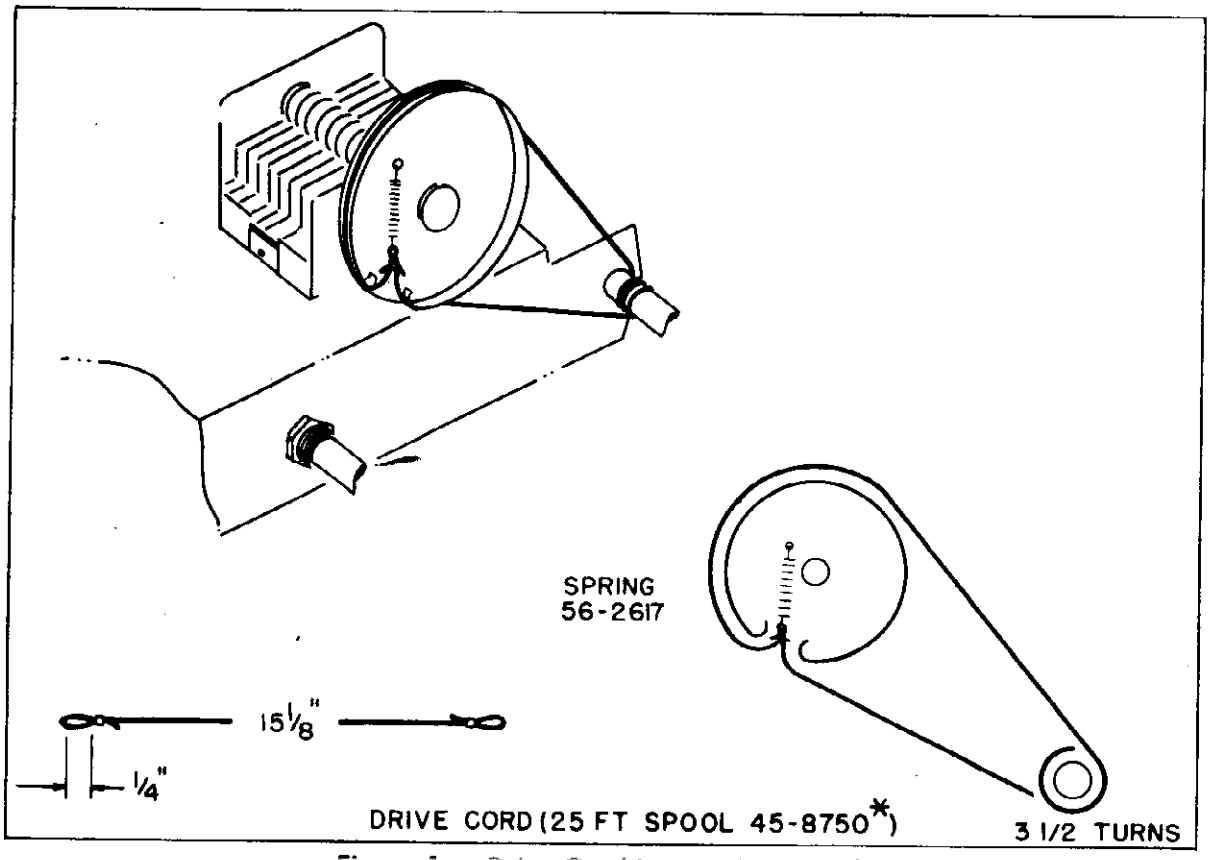


Figure 1. Drive-Cord Installation Details

ALIGNMENT PROCEDURE

GENERAL

RADIO CONTROLS—Set volume control for maximum output and tuning control as given in the alignment chart. Set band switch to broadcast position for first 5 steps, and to special services position for steps 6 and 7.

OUTPUT INDICATOR—Connect output indicator (either on oscilloscope or a 1000-ohms-per-volt, a-c voltmeter) across voice-coil terminals.

SIGNAL GENERATOR—Use an AM r-f generator, connected as indicated in the alignment chart.

OUTPUT LEVEL—During alignment, attenuate signal-generator output to maintain output indication below 1 volt.

DIAL POINTER—Before the alignment is started, the dial pointer should be set to coincide with the dial scale mark to the left of "55" when the tuning gang is fully meshed.

ALIGNMENT CHART

	SIGNAL GENERATOR		RADIO		
STEP	CONNECTION TO RADIO	DIAL SETTING	DIAL SETTING	SPECIAL INSTRUCTIONS	ADJUST
1	Ground lead to B—. Output lead through a .01-μf. condenser to pin 7 (mixer grid) of 12BE6, converter.	455 kc.	Tuning gang fully open.	Adjust, in order given in next column, 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 1 below.	1620 kc.	1620 kc. See Note 2 below.	Adjust for maximum output.	C1C—osc. trimmer
3	Same as step 2.	1520 kc.	Tune radio to generator signal.	Adjust for maximum output. (High-frequency adjustment)	C1B—mixer-grid trimmer C1A—r-f trimmer
4	Same as step 2.	580 kc.	Same as step 3.	Adjust for maximum output. (Low-frequency adjustment)	TC1—r-f transformer
5	Repeat steps 3 and 4 until no further improvement is obtained.				
6	Same as step 2.	3200 kc.	Same as step 3.	Adjust for maximum output.	C5—special-services mixer-grid trimmer C2—special-services r-f trimmer
7	Same as step 2.	1800 kc.	Same as step 3.	Adjust for maximum output.	C3—special-services r-f padder

NOTE 1: Make up a 6–8 turn, 6-inch-diameter loop from insulated wire; connect to signal-generator leads and place near radio loop antenna. The loop antenna must be connected to the radio.

NOTE 2: To set the tuning gang to 1620 kc., place a piece of 6-mil flat shim stock beneath the heel of the rotor, and turn the rotor until it holds the shim firmly in place. Then remove the shim.

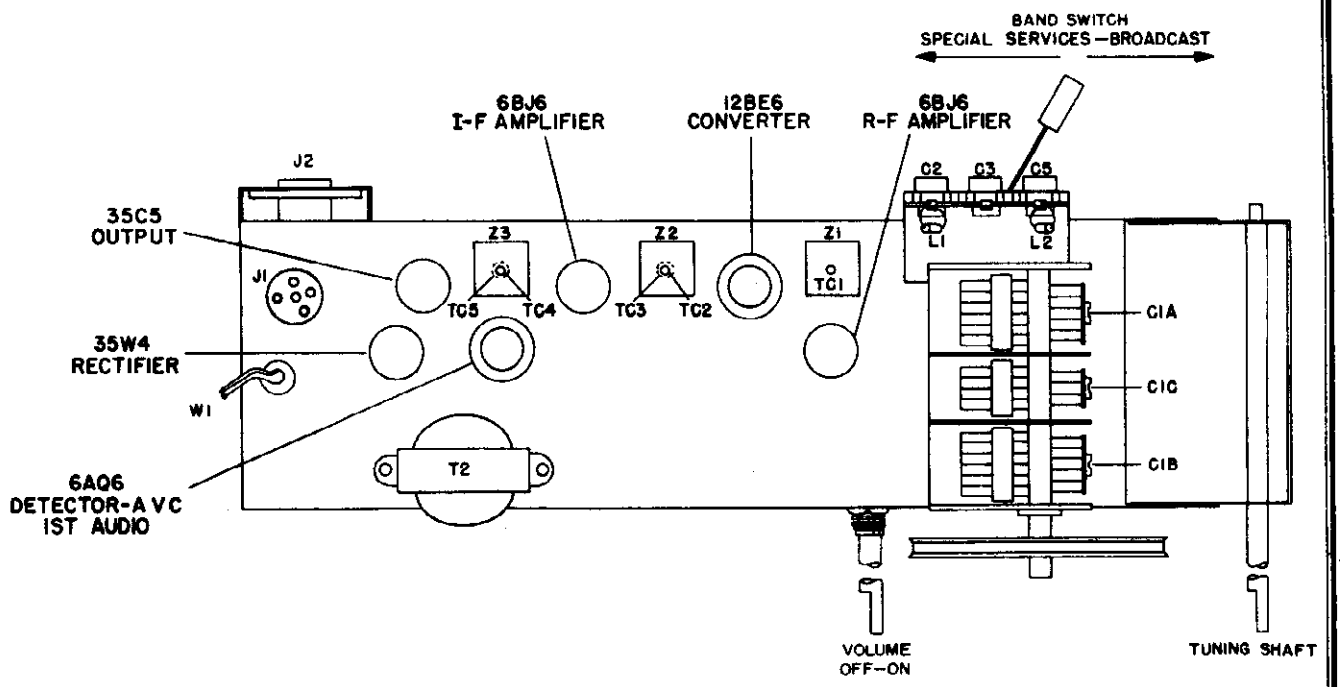


Figure 2. Top View, Showing Tuning Adjustments

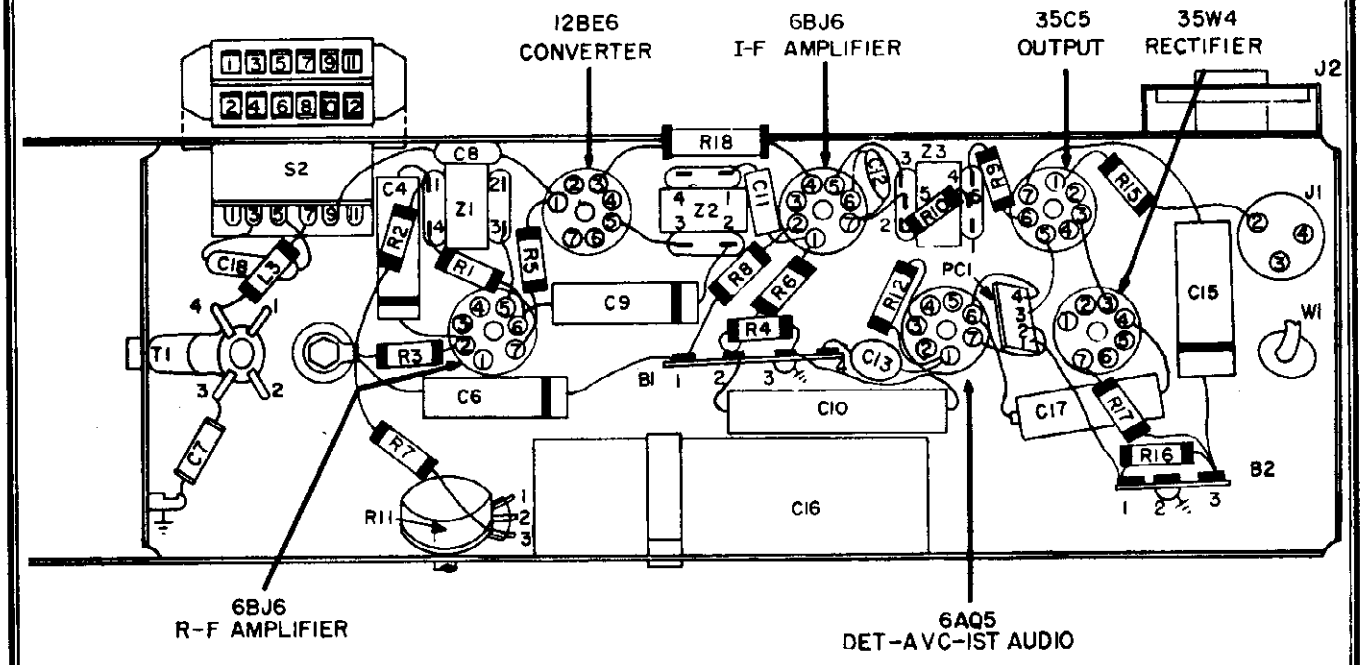
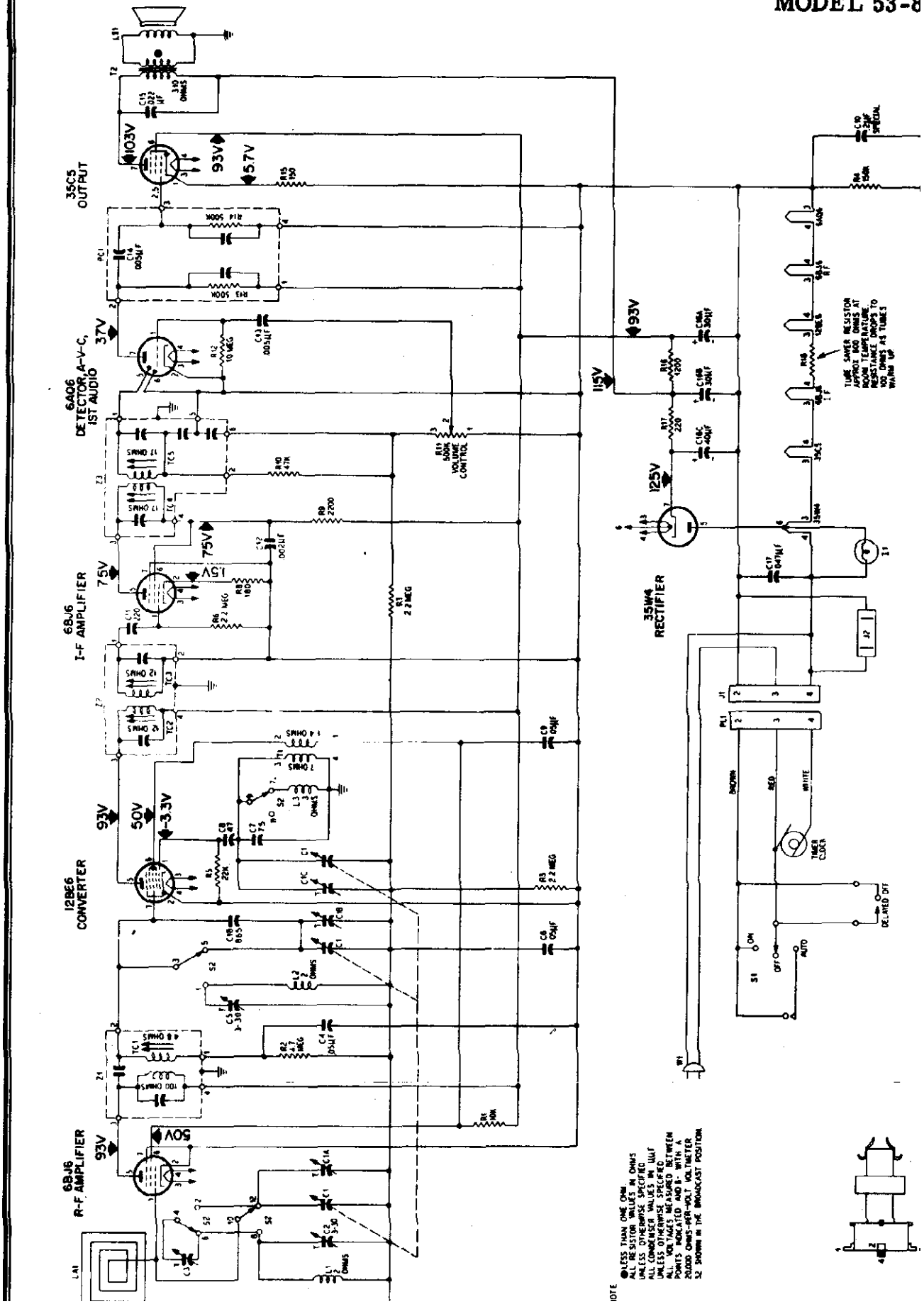


Figure 3. Base View, Showing Parts Placement



NOTE
●LESS THAN ONE OHM
ALL RESISTOR VALUES IN OHMS
UNLESS OTHERWISE SPECIFIED
ALL CONDENSER VALUES IN MFD
UNLESS OTHERWISE SPECIFIED
ALL VOLTAGES MEASURED BETWEEN
POINTS INDICATED AND B- WITH A
20,000 OHMS-PER-VOLT VOLTMETER
S2 SHOWN IN THE BROADCAST POSITION

MODEL 53-804

PARTS LIST

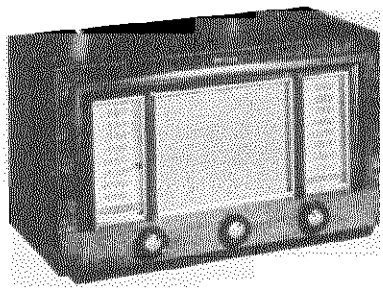
NOTE: Part numbers identified by an asterisk (*) are general replacement items. These numbers may not be identical with those on factory parts. Also, the electrical values of some replacement items may differ from the values indicated in the schematic diagram and parts list. The values substituted in 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, 3-section	31-2771-2
C1A	Condenser, trimmer, antenna	Part of C1
C1B	Condenser, trimmer, r-f	Part of C1
C1C	Condenser, trimmer, oscillator	Part of C1
C2	Condenser, trimmer, special services r-f	Part of CA1
C3	Condenser, padder, special services r-f	Part of CA1
C4	Condenser, r-f by-pass, .05 μf.	30-4650-45*
C5	Condenser, trimmer, special services mixer-grid	Part of CA1
C6	Condenser, a-v-c by-pass, .05 μf.	30-4650-45*
C7	Condenser, fixed trimmer, 7.5 μμf.	30-1224-65
C8	Condenser, d-c blocking, 47 μμf.	60-00475420
C9	Condenser, screen by-pass, .05 μf.	30-4650-45*
C10	Condenser, special, B— to chassis, .2 μf.	30-4644
C11	Condenser, i-f coupling, 220 μμf.	62-122001001*
C12	Condenser, screen by-pass, .002 μf.	30-1238-8*
C13	Condenser, audio coupling, .005 μf.	30-1238-1*
C14	Condenser, d-c blocking, .005 μf.	Part of PC1
C15	Condenser, tone compensation, .022 μf.	30-4650-60*
C16	Condenser, electrolytic filter	30-2575-27
C16A	Condenser, filter, 30 μf., 150v	Part of C16
C16B	Condenser, filter, 30 μf., 150v	Part of C16
C16C	Condenser, filter, 40 μf., 150v	Part of C16
C17	Condenser, line by-pass, .047 μf.	30-4650-45*
C18	Condenser, fixed padder, 865 μμf.	30-1220-68
CA1	Condenser assembly, trimmer	31-6477-17
I1	Lamp, pilot	34-2068
J1	Connector, clock cable, female	27-6273
J2	Connector, appliance	76-3931
L1	Coil, special services r-f	32-4561-4
L2	Coil, special services mixer-grid	32-4561-4
L3	Coil, oscillator shunt	32-4562-1
PC1	Printed circuit	30-6001
PL1	Connector, clock cable, male	Part of clock cable
R1	Resistor, screen dropping, 10,000 ohms	66-3108340*
R2	Resistor, a-v-c load, 4.7 megohms	66-5478340*
R3	Resistor, a-v-c load, 2.2 megohms	66-5228340*
R4	Resistor, B— to chassis, 150,000 ohms	66-4158340*
R5	Resistor, grid leak, 22,000 ohms	66-3228340*
R6	Resistor, grid leak, 2.2 megohms	66-5228340*
R7	Resistor, a-v-c load, 2.2 megohms	66-5228340*
R8	Resistor, cathode bias, 180 ohms	66-1188340*
R9	Resistor, screen dropping 2200 ohms	66-2228340*
R10	Resistor, i-f filter, 47,000 ohms	66-3478340*
R11	Volume control, 500,000 ohms	33-5565-51
R12	Resistor, grid leak, 10 megohms	66-6108340*
R13	Resistor, plate load, 500,000 ohms	Part of PC1
R14	Resistor, grid leak, 500,000 ohms	Part of PC1
R15	Resistor, cathode bias, 150 ohms, 1 watt	66-1154340*
R16	Resistor, B+ filter, 1200 ohms	66-2128340*
R17	Resistor, B+ filter, 220 ohms, 1 watt	66-1224340*
R18	Resistor, tube saver, 100 ohms	33-1343-3
S2	Switch, band, broadcast-special services	42-1893-3
T1	Transformer, oscillator	32-4453-2
T2	Transformer, output	32-8310-3
W1	Line cord	L-2183*
Z1	Transformer, r-f	32-4399-7A
Z2	Transformer, 1st i-f	32-4160A
Z3	Transformer, 2nd i-f	32-4240A

MISCELLANEOUS

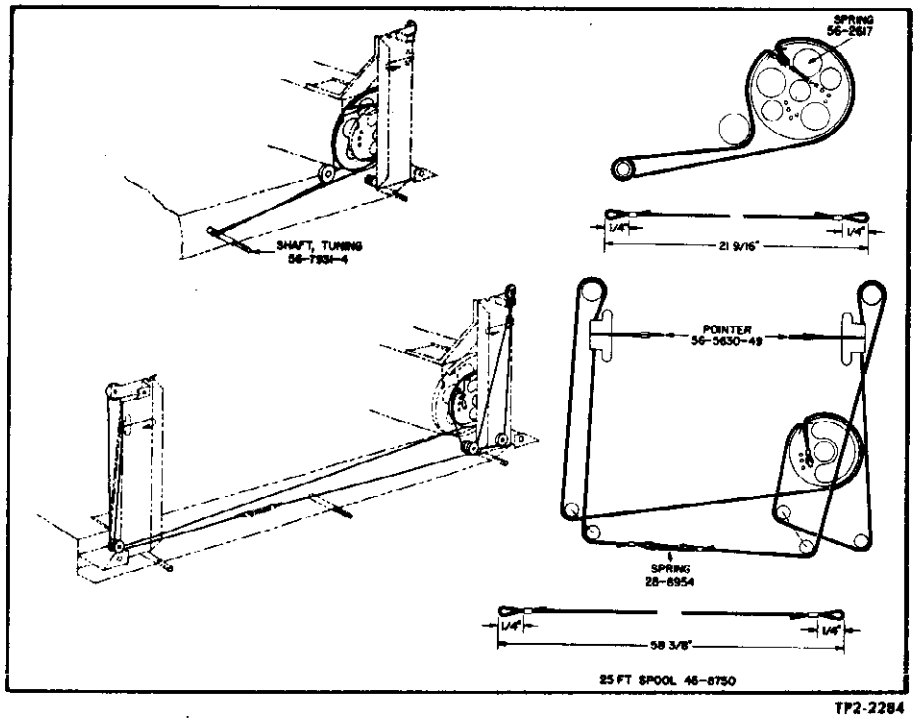
Description	Service Part No.
Bezel, radio	28-9039
Ring, bezel	28-9171
Cabinet	10965
Back and loop assembly	76-8098
Cable assembly, clock	41-3909-4
Clamp, electrolytic condenser	56-1466
Clock	41-2044-1
Cover and bracket assembly, clock	76-8095
Dial scale and backplate assembly	76-8094
Drive cord, 25-ft. spool	45-8750*
Spring, drive-cord	56-2617*
Gasket, speaker	54-8871
Grille	54-6023
Knob (2)	76-6373-2
Knob, band switch	54-4998
Pointer	27-4891-2
Rubber mount, gang mounting	27-4596
Shaft, tuning	56-9807-3
Spring, retaining	28-8610
Shield, tube (2)	56-5629FA3
Socket assembly, pilot lamp	27-6233-6
Socket, tube (2)	27-6203-14
Socket, tube (4)	27-6265
Speaker	36-1627-21

SPECIFICATIONS



MODEL 53-958

CABINET	Wood table model
CIRCUIT	Six-tube superheterodyne plus selenium rectifier
FREQUENCY RANGES	
Broadcast	540—1620 kc.
FM	88—108 mc.
AUDIO OUTPUT	1 watt
OPERATING VOLTAGE	105—125 volts, a.c./d.c.
POWER CONSUMPTION	45 watts
ANTENNA	Built-in pancake loop for AM; line cord for FM
INTERMEDIATE FREQUENCY	
AM	455 kc.
FM	9.1 mc.
PHILCO TUBES (6)	12BA6 r-f ampl., 12AT7 converter, 12BA6 1st i-f ampl., 12AU6 2nd i-f ampl., 19 det.-a.v.c.-1st audio, 35C5 output



TP2-2284

Figure 1. Drive-Cord Installation Details

AM ALIGNMENT PROCEDURE

GENERAL—Before starting the alignment, allow the radio and the signal generator to warm up for fifteen minutes. Make the alignment with the loop antenna connected to the radio. The AM alignment should be made before the FM alignment is made.

RADIO CONTROLS—Set the volume control to maximum. Set the band switch for broadcast reception. Set the tuning control as indicated in the AM alignment chart.

OUTPUT INDICATOR—Connect the output indicator (an oscilloscope or a 1,000-ohms-per-volt voltmeter) across the voice-coil terminals.

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

OUTPUT LEVEL—During the alignment, the signal generator output should be attenuated to hold the output indication below 1 volt.

DIAL POINTER—Before the alignment is started, the dial pointer should be set to coincide with the index mark on the dial pointer rail assembly when the tuning gang is completely closed. See figure 3. (The pointer rail is the metal assembly upon which the pointer rides.)

CAUTION—One side of the a-c line is connected directly to the chassis. Therefore, an isolation transformer should be used when working with this chassis, to prevent injury to personnel or damage to test equipment.

AM ALIGNMENT CHART

STEP	SIGNAL GENERATOR		RADIO		
	CONNECTION TO RADIO	DIAL SETTING	DIAL SETTING	SPECIAL INSTRUCTIONS	ADJUST
1	Ground lead to chassis. Output lead through a .1-μf. condenser to pin 7 (grid) of 12AT7.	455 kc. (modulated)	Set tuning gang so that dial pointer coincides with the 1630-kc. mark. See figure 3.	Adjust for maximum output, in order given in next column.	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.	1630 kc. (modulated)	Same as step 1.	Adjust for maximum output.	C1C—osc. trimmer
3	Same as step 2.	1520 kc. (modulated)	Set tuning gang so that dial pointer coincides with 1520-kc. mark. See figure 3.	Adjust for maximum output, in order given in next column.	C1B—r-f trimmer C1A—antenna trimmer (high-frequency adjustment)
4	Same as step 2.	580 kc. (modulated)	Set tuning gang so that dial pointer coincides with 580-kc. mark. See figure 3.	Adjust for maximum output. Rock tuning gang while making this adjustment.	TC12—r-f transformer (low-frequency adjustment)
5	Repeat steps 3 and 4 until no further improvement is obtained.				

NOTE: Make up a six-to-eight turn, 6-inch-diameter loop from insulated wire; connect to generator terminals, and place near radio loop antenna. The radio loop antenna must be connected to the radio.

FM ALIGNMENT PROCEDURE

(Using FM Test Equipment)

GENERAL—Before starting the alignment procedure, allow the radio and the test equipment to warm up for fifteen minutes. The AM alignment should be made before the FM alignment is made.

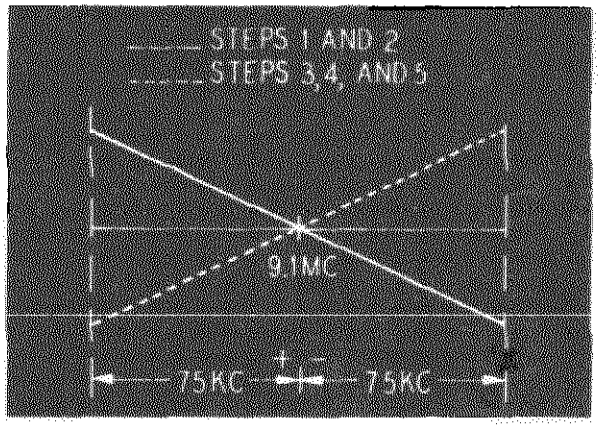
RADIO CONTROLS—Set the volume control to maximum. Set the band switch for FM reception. Set the tuning controls as indicated in the FM alignment chart.

OUTPUT INDICATOR—The first two steps must be performed with the use of an oscilloscope. Connect the ground leads to the radio chassis. Connect the vertical input to the FM test jack, J2, and the horizontal input to the horizontal sweep output of the sweep signal generator. The remaining steps should be performed with the output indicator connected across the voice-coil terminals (either an oscilloscope or a 1000-ohms-per-volt voltmeter).

SWEEP GENERATOR—Use an FM sweep signal generator. Connect the generator to the radio as indicated in the FM alignment chart. Set the frequency and sweep width as indicated in the chart.

DIAL POINTER—Before the alignment is started, the dial pointer should be set to coincide with the index mark on the dial pointer rail assembly when the tuning gang is fully closed. See figure 3.

CAUTION—One side of the a-c line is connected directly to the chassis. Therefore, an isolation transformer should be used when working with the chassis, to prevent injury to personnel or damage to test equipment.



TP1-2111

Figure 2. Characteristic Curve of FM Detector

FM ALIGNMENT CHART

STEP	SIGNAL GENERATOR		RADIO		
	CONNECTION TO RADIO	DIAL SETTING	DIAL SETTING	SPECIAL INSTRUCTIONS	ADJUST
1	Connect ground lead to chassis. Connect output lead through a .01-μf. condenser to control grid (pin 1) of 12AU6 2nd i-f amplifier (test point A). See figure 5.	9.1 mc. (75-kc. deviation)	88 mc. (gang fully meshed).	Adjust TC8 for balance and TC7 for maximum indication (maximum slope) on scope as shown in figure 2.	TC8—detector se TC7—detector pr
2	Connect ground lead to chassis. Connect output lead through a .01-μf. condenser to FM tuning gang stator lug, junction of C1 and pin 4 of L2 (test point B). See figure 5.	Same as step 1.	Same as step 1.	Adjust in order given in next column, for maximum indication (maximum slope) on scope as shown in figure 2.	TC6—FM 2nd i-f sec. TC5—FM 2nd i-f pri. TC2—FM 1st i-f sec. TC1—FM 1st i-f pri.
3	Connect output lead to lug 2 of TB1, and ground side of generator to lug 1 of TB1 (test point C). See figure 4. See note 1 below.	108.5 mc.	Set tuning gang so that dial pointer coincides with 108.5-mc. mark. See figure 3.	Adjust for maximum indication on output indicator.	C18—FM osc. trimmer
4	Same as step 3.	92 mc.	Set tuning gang so that dial pointer coincides with 92-mc. mark. See figure 3.	Adjust for maximum indication on output indicator. See note 2 below.	L5—FM osc. co
5	Same as step 3.	105 mc.	Set tuning gang so that dial pointer coincides with 105-mc. mark. See figure 3.	Adjust for maximum indication on output indicator. Rock tuning gang while making this adjustment.	C1D—FM mixer grid (high-frequency adjustment)
6	Same as step 3.	Same as step 5.	Same as step 5.	Adjust for maximum indication on output indicator.	C4—FM r-f gri (high-frequency adjustment)
7	Same as step 3.	92 mc.	Same as step 4.	Adjust for maximum indication on output indicator. See note 3 below.	L2—FM mixer g (low-frequency adjustment)
8	Same as step 3.	Same as step 7.	Same as step 4.	Adjust for maximum indication on output indicator.	TC11—FM r-f grid (low-frequency adjustment)

NOTE 1: For accurate results, the signal-generator output impedance must be 300 ohms to match the input impedance of T If the signal-generator output impedance is less than 300 ohms, a resistor of the proper value should be used in series with output lead to make the impedance correct. For example, if the output impedance is 150 ohms, place a 150-ohm resistor in se with the output lead.

NOTE 2: With the conditions given in step 4 (step 6 of alternate procedure), if the oscillator is not tuned for maximum output, it may be necessary to compress or spread the coil turns to give maximum output. (Do not disturb the setting of the tuning gang while making any necessary adjustment.) After the coil is adjusted, repeat steps 3 and 4 (steps 5 and 6 of alternate procedure) until no further improvement is obtained. Then proceed to the next step.

NOTE 3: With the conditions given in step 7 (step 8 alternate procedure), if the mixer-grid circuit is not tuned maximum output, it may be necessary to compress or spr the coil turns to give maximum output. (Do not disturb setting of the tuning gang while making any necessary justment.) After the coil is adjusted, repeat steps 5 throug (steps 7 and 8 of alternate procedure) until no further provement is obtained. Then proceed to the next step.

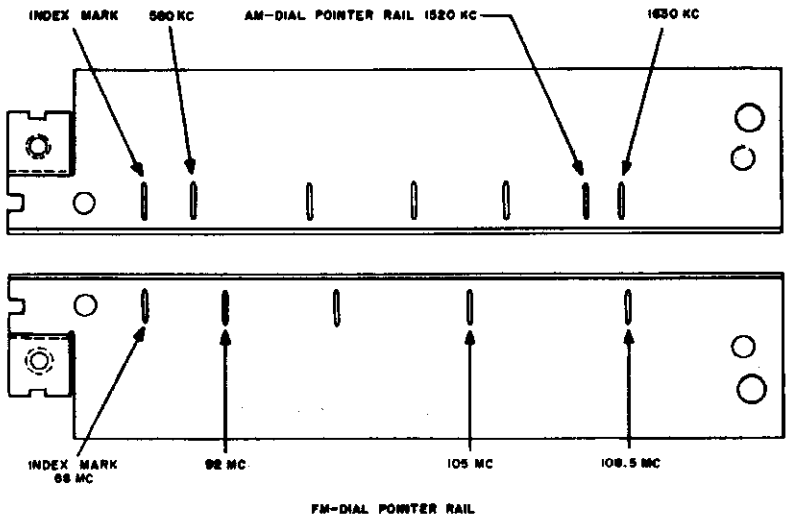


Figure 3. AM and FM Pointer Rails, Showing Alignment Marks

ALTERNATE FM ALIGNMENT PROCEDURE

This alternate procedure is designed to be used where only AM test equipment is available.

GENERAL—Before starting the alignment procedure, allow the radio and signal generator to warm up for fifteen minutes. The AM alignment should be made before the FM alignment is made.

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

OUTPUT INDICATOR—Use a 20,000-ohms-per-volt voltmeter.*

SIGNAL GENERATOR—Use an AM r-f signal generator. Connect the generator to the radio, and set the frequency as indicated in the chart.

DIAL POINTER—Before the alignment is started, the dial pointer should be set to coincide with the index mark on the dial pointer rail assembly when the tuning gang is fully closed. See figure 3.

CAUTION—Refer to the CAUTION given in the regular FM alignment procedure.

* In order to perform this alignment it is necessary to place two 100,000-ohm resistors in series between the junction of R17 and C27 (pin 7 of 19V8) and ground. The output meter must be placed between the junction of these two resistors and the FM test jack, J2, for the first step of the alignment, and between the junction of these two resistors and ground for the remaining steps of the alignment with the negative meter lead at the junction of the two resistors. For the first step of the alignment, the meter needle should be set off zero to the first major scale mark by adjusting the meter zero adjust knob. After the first step has been completed, the needle can be set back to the zero mark. The purpose of this adjustment is to enable the serviceman to see a negative indication on the meter.

The output indication for all steps except the first one should be between 5 and 10 volts.

The two series resistors should be as nearly equal in value as possible (at least within 5% of each other).

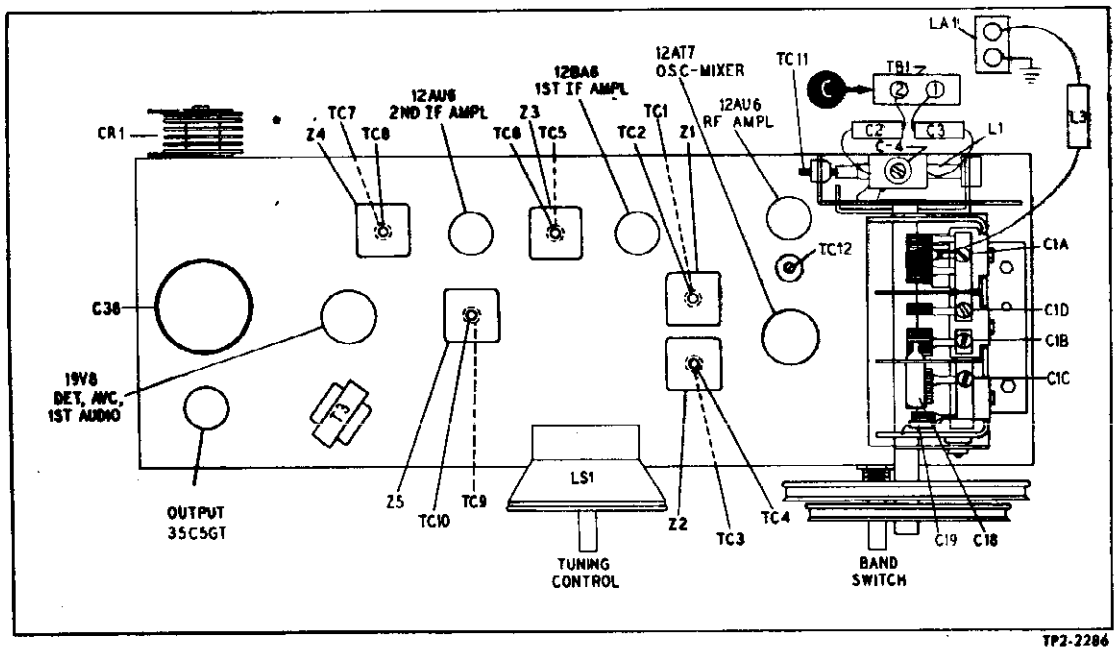


Figure 4. Top View, Showing Trimmer Locations

ALTERNATE FM ALIGNMENT CHART

STEP	SIGNAL GENERATOR		RADIO		
	CONNECTION TO RADIO	DIAL SETTING	DIAL SETTING	SPECIAL INSTRUCTIONS	ADJUST
1	Connect ground lead to chassis. Connect output lead through a .01-μf. condenser to pin 1 (grid) of 12AU6 2nd i-f amplifier (test point A). See figure 5.	9.1 mc. (modulated)	88 mc. (gang fully meshed)	Adjust for balance (zero indication on meter).	TC8—FM det. s
2	Same as step 1.	Same as step 1.	Same as step 1.	Adjust for maximum output.	TC7—FM det. p
3	Connect ground lead to chassis. Connect output lead through a .01-μf. condenser to pin 1 (grid) of 12BA6 1st i-f amplifier (test point D). See figure 5.	Same as step 1.	Same as step 1.	Adjust in order given in next column, for maximum output.	TC6—2nd FM i-f sec. TC5—2nd FM i-f pri.
4	Connect ground lead to chassis. Connect output lead through a .01-μf. condenser to junction of C1 and pin 4 of L2 (test point B). See figure 5.	Same as step 1.	Same as step 1.	Adjust in order given in next column for maximum output.	TC2—1st FM i-f sec. TC1—1st FM i-f pri.
5	Connect ground lead to pin 1 of TB1. Connect output lead to pin 2 of TB1 (test point C). See figure 4. See note 1 of regular FM alignment procedure.	108.5 mc.	Set tuning gang so that dial pointer coincides with 108.5-mc. mark. See figure 3.	Adjust for maximum output.	C18—osc. trimm
6	Same as step 5.	92 mc.	Set tuning gang so that dial pointer coincides with 92-mc. mark. See figure 3.	Adjust for maximum output. See note 2 of regular FM alignment procedure.	L5—FM osc. coi
7	Same as step 5.	105 mc.	Set tuning gang so that dial pointer coincides with 105-mc. mark. See figure 3.	Adjust in order given in next column, for maximum output.	C1D—FM mixer grid C4—FM r-f gri (high-frequency adjustments)
8	Same as step 5.	92 mc.	Same as step 6.	Adjust for maximum output. See note 3 of regular FM alignment procedure.	L2—FM mixer g (low-frequency adjustment)
9	Same as step 5.	Same as step 6.	Same as step 6.	Adjust for maximum output.	TC11—FM r-f g (low-frequency adjustment)

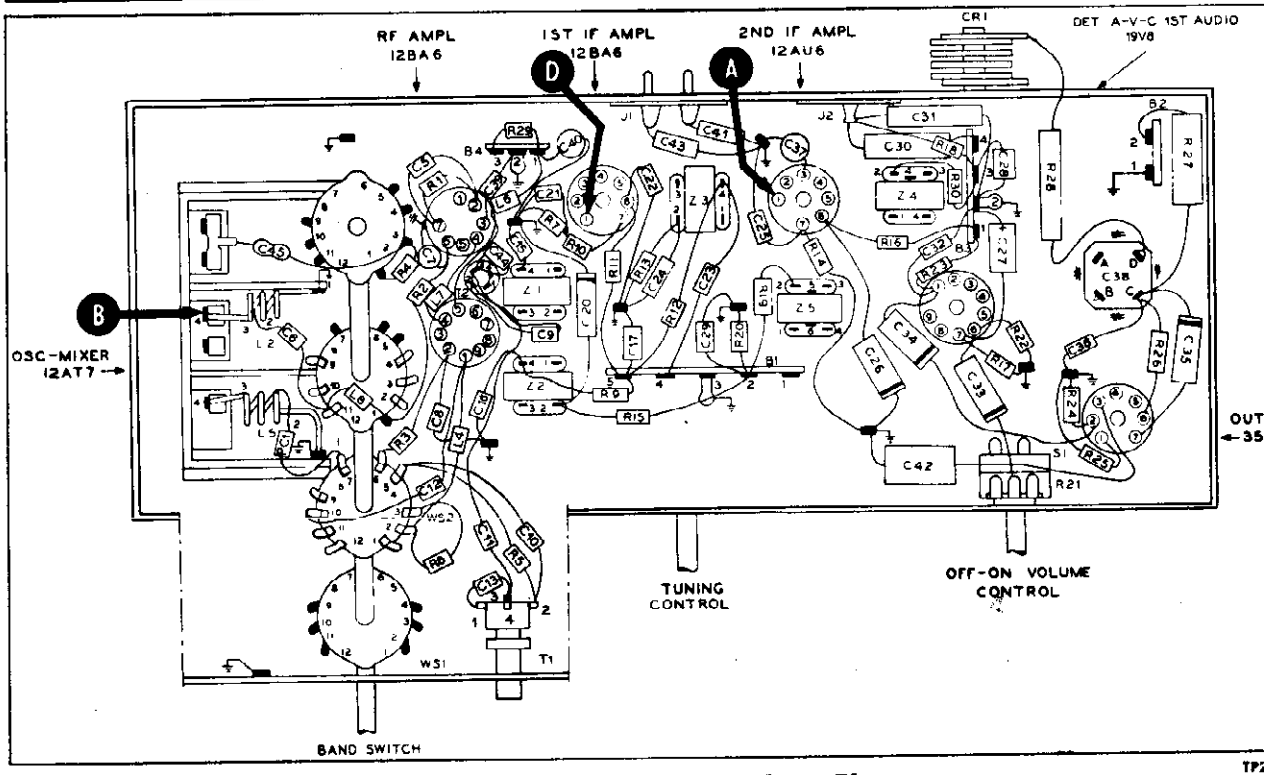


Figure 5. Base View, Showing Parts Placement

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	31-2762-2
C1A	Condenser, trimmer, BC antenna	Part of C1
C1B	Condenser, trimmer, BC r-f	Part of C1
C1C	Condenser, trimmer, BC oscillator	Part of C1
C1D	Condenser, trimmer, FM r-f	Part of C1
C2	Condenser, antenna isolating, 3.3 μμf.	30-1224-49
C3	Condenser, antenna isolating, 220 μμf.	62-122001001*
C4	Condenser, FM antenna trimmer	45-3034
C5	Condenser, cathode by-pass, 22 μμf.	62-022009001
C6	Condenser, d-c blocking, 220 μμf.	62-122001001*
C7	Condenser, screen by-pass, .005 μf.	30-1238-1*
C8	Condenser, oscillator grid, 100 μμf.	62-110001021*
C9	Condenser, neutralizing, 1.5 μμf.	30-1221-7
C10	Condenser, cathode by-pass, .01 μf.	30-4650-58*
C11	Condenser, neutralizing, 2.2 μμf.	30-1221-4
C12	Condenser, d-c blocking, 220 μμf.	30-1224-65
C13	Condenser, fixed trimmer, 7.5 μμf.	30-1224-65
C14	Condenser, cathode by-pass, 220 μμf.	Part of PC1
C15	Condenser, r-f by-pass, 220 μμf.	62-122001001*
C16	Condenser, plate decoupling, .01 μf.	30-4650-58*
C17	Condenser, r-f by-pass, 100 μμf.	62-110009001*
C18	Condenser, trimmer, FM oscillator	31-6511-10
C19	Condenser, fixed trimmer, 3.3 μμf.	30-1224-30
C20	Condenser, a-v-c decoupling, .01 μf.	30-4650-58*
C21	Condenser, cathode by-pass, 220 μμf.	62-122001001*
C22	Condenser, screen by-pass, .002 μf.	30-4650-54*
C23	Condenser, neutralizing, .006 μf.	30-4650-57*
C24	Condenser, i-f by-pass, 100 μμf.	62-1100010
C25	Condenser, cathode by-pass, .01 μf.	30-4650-
C26	Condenser, screen by-pass, .002 μf.	30-4650-
C27	Condenser, diode load filter, 2 μf., 50v	30-241
C28	Condenser, i-f by-pass, 150 μμf.	62-1150010
C29	Condenser, i-f by-pass, 100 μμf.	62-1100010
C30	Condenser, d-c blocking, .006 μf.	30-4650-
C31	Condenser, de-emphasis, .004 μf.	30-4650-
C32	Condenser, plate by-pass, 680 μμf.	62-1680010
C33	Condenser, audio coupling, .02 μf.	30-4650-
C34	Condenser, d-c blocking, .006 μf.	30-4650-
C35	Condenser, tone compensation, .006 μf.	30-4650-
C36	Condenser, plate decoupling, 220 μμf.	62-1220010
C37	Condenser, filament by-pass, .005 μf.	30-123
C38	Condenser, electrolytic, 4-section	30-2570-
C38A	Condenser, cathode by-pass, 25 μf., 25v	Part of C
C38B	Condenser, filter, 40 μf., 150v	Part of C
C38C	Condenser, filter, 70 μf., 150v	Part of C
C38D	Condenser, filter, 40 μf., 150v	Part of C
C39	Condenser, filament by-pass, 100 μμf.	62-1100010
C40	Condenser, filament by-pass, .005 μf.	30-123
C41	Condenser, line by-pass, 100 μμf.	62-1100010
C42	Condenser, line by-pass, .047 μf.	30-4650-
C43	Condenser, line by-pass, 100 μμf.	62-1100010
C44	Condenser, r-f by-pass, 47 μμf.	60-004754
C45	Condenser, d-c blocking, 220 μμf.	62-1220010
CR1	Selenium rectifier, 100 ma., 117v	34-800
I1	Pilot lamp, BC	34-26

MODEL 53-958

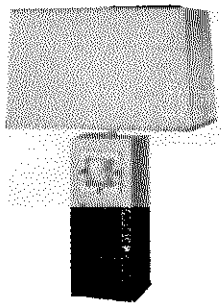
Reference Symbol	Description	Service Part No.
I2	Pilot lamp, FM	34-2605
J1	Connector, male, a-c	27-6240-5
J2	Connector, female, FM test	27-6180
L1	Coil, FM antenna tuning	32-4532A
L2	Coil, FM r-f	32-4415-2
L3	Choke, r-f	32-4061-3
L4	Choke, r-f, 3.3 μh.	32-4422-10
L5	Coil, FM oscillator	32-4414-6
L6	Choke, filament, 2.2 μh.	32-4422-8
L7	Choke, filament, 2.2 μh.	32-4422-8
L8	Choke, r-f, 3.3 μh.	32-4422-10
L9	Secondary, r-f transformer	Part of T2
L10	Primary, r-f transformer	Part of T2
LA1	AM loop and support assembly	76-7836-1
LA2	Line-cord aerial, FM	Part of Back Assembly
LS1	Speaker	36-1641-14
PC1	Printed circuit, parasitic suppressor	30-6002
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, 2.2 megohms	66-5228340*
R5	Resistor, parasitio suppressor, 2200 ohms	66-2228340*
R6	Resistor, parasitic suppressor, 470 ohms	Part of PC1
R7	Resistor, cathode bias, 33 ohms	66-0338340*
R8	Resistor, plate dropping, 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, 680 ohms	66-1688340*
R13	Resistor, grid return, 1 megohm	66-5108340*
R14	Resistor, cathode bias, 120 ohms	66-1128340*
R15	Resistor, a-v-c filter, 2.2 megohms	66-5228340*
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	33-5566-44
R22	Resistor, grid return, 10 megohms	66-4478340*
R23	Resistor, plate load, 470,000 ohms	66-6108340*
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	66-1155360*
R28	Resistor, current limiting, 22 ohms, 2 watts	66-0225360*
R29	Resistor, current limiting	33-1343-3
R30	Resistor, loading, 100 ohms	66-1108340
S1	Switch, off-on	Part of R21
T1	Transformer, AM oscillator	32-4569-1
T2	Transformer, AM r-f	32-4572
T3	Transformer, output	32-8596
W1	Line cord	Part of Back Assembly
WS	Switch, band, 4-wafer	42-1991
Z1	Transformer, FM 1st i-f	32-4518A
Z2	Transformer, AM 1st i-f	32-4516A
Z3	Transformer, FM 2nd i-f	32-4518-1A
Z4	Transformer, FM detector	32-4310-4A
Z5	Transformer, AM 2nd i-f	32-4517A

MISCELLANEOUS

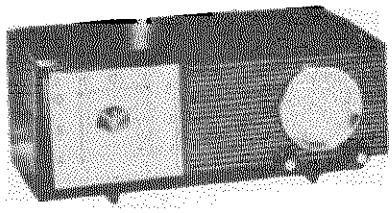
Description	Service Part No.
Cabinet	10950
Cabinet back assembly	76-7991
Clip, pilot lamp	56-3545FA3
Dial backplate, R.H.	56-9932
Dial backplate, L.H.	56-9932-1
Dial scale, R.H.	54-5159
Dial scale, L.H.	54-5159-1
Drive cord, 25-foot spool	45-8750*
Knob, FM-AM	54-4774-28
Knob, tuning	54-4774-26
Knob, volume-off-on	54-4774-27
Pointer (2)	56-5630-49
Shaft, tuning	56-7931-4
Spring, gang drive	56-2617
Spring, pointer drive	28-8954
Socket, 12BA6 i-f ampl.	27-6265
Socket, 12AU6 i-f ampl.	27-6265
Socket, 12BA6 r-f ampl.	27-6275-1
Socket, 12AT7	27-6203-6
Socket, 19V8	27-6203-6
Socket, 35C5	27-6203-12
Shield, tube (2)	56-5629-3
Shield, tube base (1)	56-3978-1FA3
Shield, tube base (2)	56-5628-1FA3
Socket assembly, pilot lamps (2)	27-6233-21
Spring, hairpin	28-8610

SPECIFICATIONS

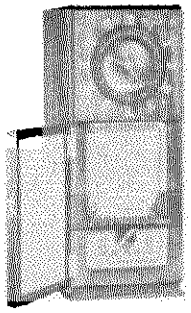
MODEL 53-702	Molded plastic
MODELS 53-706, 53-707	Wood
CIRCUIT	Five-tube Superheterodyne (plus rectifier)
FREQUENCY RANGES	
Standard Broadcast	540—1620 kc.
Special Services	1700—3400 kc.
AUDIO OUTPUT	1 watt
OPERATING VOLTAGE	117 volts, a.c.
POWER CONSUMPTION	30 watts
AERIAL	High-impedance loop
INTERMEDIATE FREQUENCY	455 kc.
PHILCO TUBES	12BE6 converter, 12BA6 i-f amplifier, 12AV6 det.—a.v.c.—1st audio, 35C5 output, 35W4 rectifier



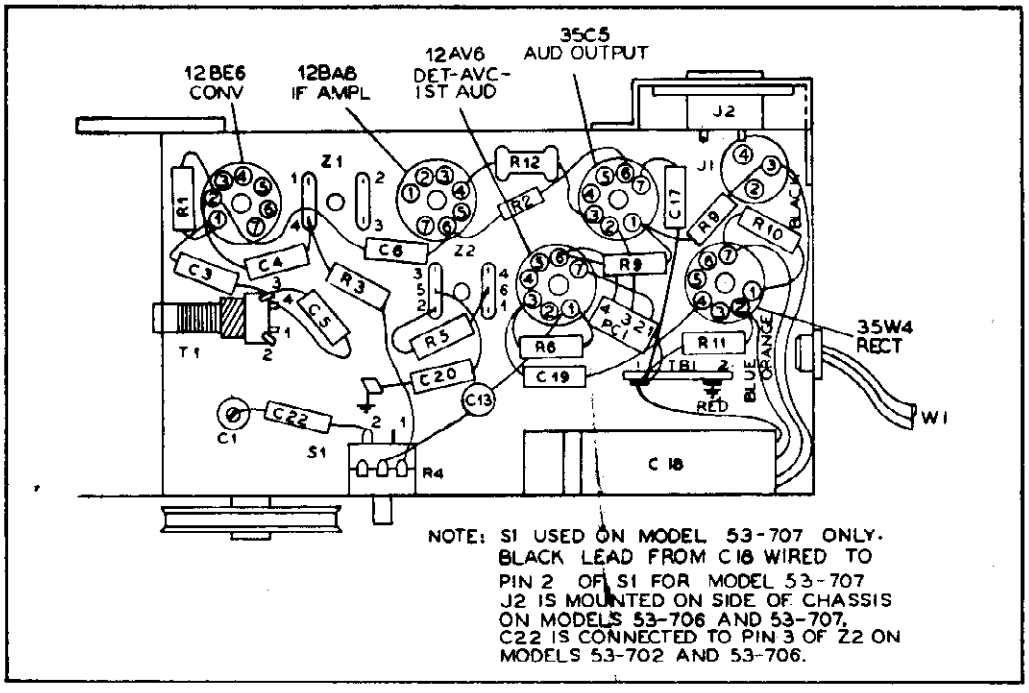
MODEL 53-706



MODEL 53-702



MODEL 53-707



TP2-2277

Figure 1. Base View, Showing Parts Placement

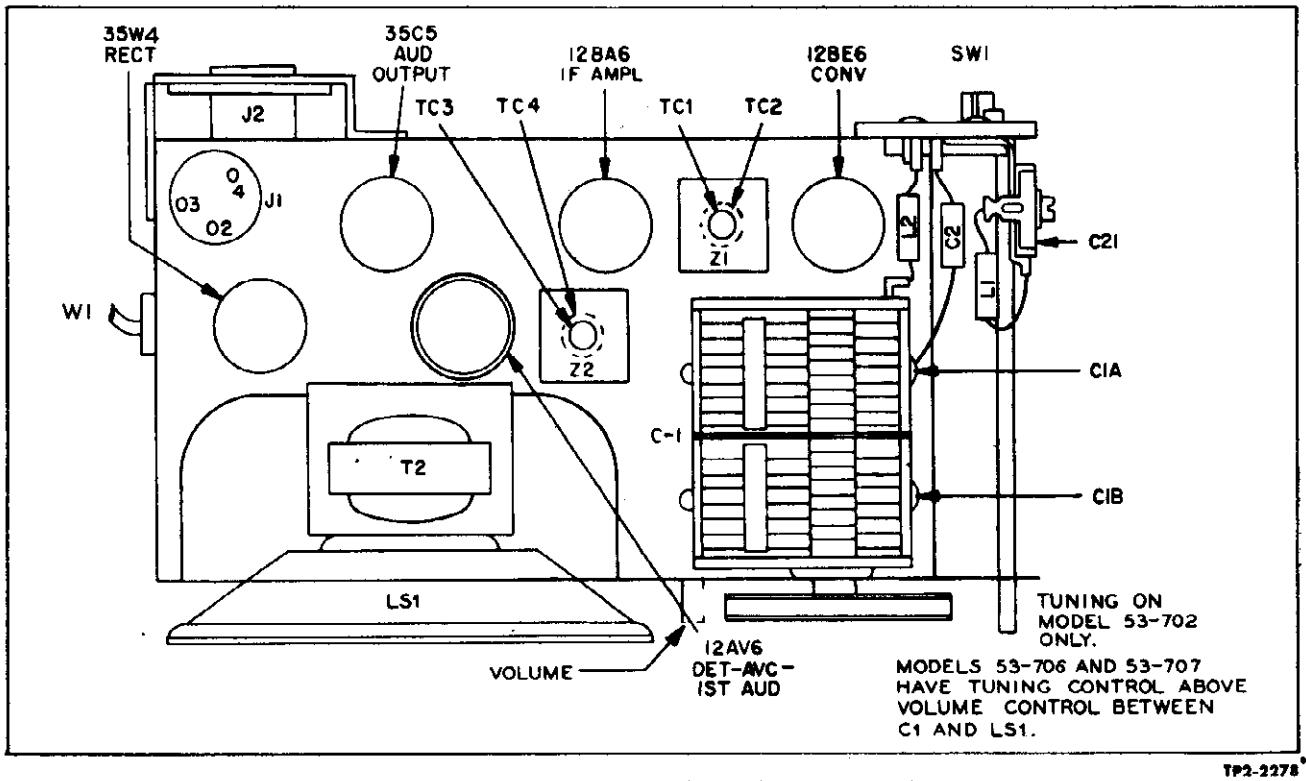
ALIGNMENT PROCEDURE

RADIO CONTROLS—Set volume control to maximum. Set tuning control and band switch 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.



TP2-2278

Figure 2. Top View, Showing Trimmer Locations

ALIGNMENT CHART

STEP	SIGNAL GENERATOR		RADIO			ADJUST
	CONNECTION TO RADIO	DIAL SETTING	DIAL SETTING	BAND SWITCH SETTING	SPECIAL INSTRUCTIONS	
1	Ground lead to B-; output lead through a .1-μf. condenser to grid (pin 7) of 12BE6.	455 kc.	Tuning gang fully open	Broadcast	Adjust tuning cores, in order given, for maximum output. (TC1 and TC3 are located at top of transformers.)	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).	1620 kc.	*1620 kc.	Broadcast	Adjust trimmer for maximum output.	C1-B—osc.
3	Same as step 2.	1500 kc.	1500 kc.	Broadcast	Adjust trimmer for maximum output.	C1-A—aerial (broadcast)
4	Same as step 2.	3200 kc.	3200 kc.	Special Services	Adjust trimmer for maximum output.	C21—aerial (special services)

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

*For proper adjustment of the oscillator trimmer, fully open the tuning gang and insert a .006-inch, non-metallic shim between the heel of the rotor and the top of the stator plates. Close the tuning gang sufficiently to hold the shim in place, and then remove the shim without disturbing the gang setting.

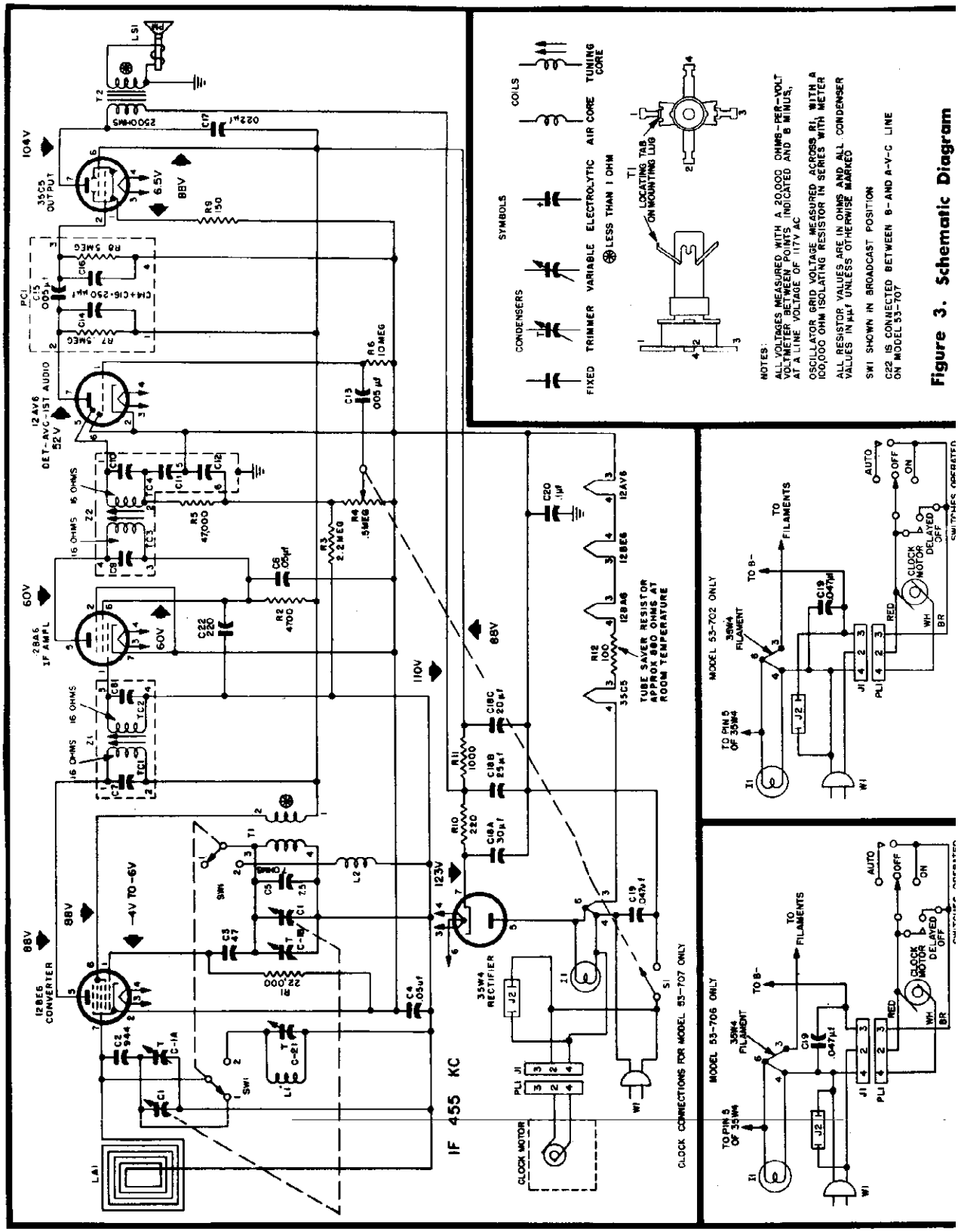


Figure 3. Schematic Diagram

MODELS 53-702,
53-706, 53-707

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	31-2751-14
C1A	Condenser, r-f trimmer	Part of C1
C1B	Condenser, oscillator trimmer	Part of C1
C2	Condenser, aerial series tracker, 944 μμf..	30-1220-65
C3	Condenser, oscillator grid, 47 μμf.	30-1230-4
C4	Condenser, a-v-c by-pass, .05 μf.	30-4650-45*
C5	Condenser, drift compensation, 7.5 μμf.	30-1224-83
C6	Condenser, screen by-pass, .05 μf.	30-4650-45*
C7	Condenser, i-f tuning	Part of Z1
C8	Condenser, i-f tuning	Part of Z1
C9	Condenser, i-f tuning	Part of Z2
C10	Condenser, i-f tuning	Part of Z2
C11	Condenser, detector filtering	Part of Z2
C12	Condenser, detector filtering	Part of Z2
C13	Condenser, audio coupling, .005 μf.	30-1238-1*
C14	Condenser, plate by-pass	Part of PC1
C15	Condenser, audio coupling, .005 μf.	Part of PC1
C16	Condenser, compensating	Part of PC1
C17	Condenser, tone compensation, .022 μf.	30-4650-43*
C18	Condenser, electrolytic, 3-section	30-2573
C18A	Condenser, filter, 30 μf., 150v.	Part of C18
C18B	Condenser, filter, 25 μf., 150v.	Part of C18
C18C	Condenser, filter, 20 μf., 150v.	Part of C18
C19	Condenser, line by-pass, .047 μf.	30-4650-45*
C20	Condenser, B minus to chassis, .1 μf.	30-4650-47*
C21	Condenser, trimmer, special services	31-6473-29
C22	Condenser, a-v-c decoupling, 220 μμf.	62-122001001*
I1	Lamp, pilot	34-2068
J1	Jack, clock	27-6273
J2	Jack, appliance receptacle, a-c	76-3931
L1	Coil, aerial, special services	32-4561-3
L2	Coil, oscillator shunt	32-4562-2
LA1	Loop, antenna	Part of back-and-loop ass'y
LS1	Speaker, p-m	36-1627-8
PC1	Coupling network	30-6001
PL1	Plug, clock assembly	54-4878-2
R1	Resistor, oscillator grid, 22,00 ohms	66-3228340*
R2	Resistor, i-f screen dropping, 4700 ohms	66-2478340*
R3	Resistor, a-v-c filter, 2.2 megohms	66-5228340*
R4	Resistor, volume control, .5 megohm	
	Model 702	33-5565
	Model 706	33-5565-50
	Model 707	33-5566-49
R5	Resistor, diode load, 47,000 ohms	66-3478340*
R6	Resistor, grid return, 10 megohms	66-6108340*
R7	Resistor, plate load, 500,000 ohms	Part of PC1
R8	Resistor, grid return, 500,000 ohms	Part of PC1
R9	Resistor, cathode bias, 150 ohms	66-1158340*
R10	Resistor, B plus filter, 220 ohms, 1 watt	66-1224340*
R11	Resistor, B plus filter, 1000 ohms.	66-2108340*
R12	Resistor, tube saver, 100 ohms	33-1343-3
S1	Switch, off-on	Part of R4
SW1	Switch, broadcast-special services	42-1796-2
T1	Transformer, oscillator	32-4453-6
T2	Transformer, output	32-8384*
W1	Line cord	L-2183*
Z1	Transformer, 1st i-f	32-4161A
Z2	Transformer, 2nd i-f	32-4240A

Reference Symbol	Description	Service Part No.

MISCELLANEOUS

PARTS COMMON TO ALL MODELS

Description	Service Part No.
Shield, tube	56-5629FA3
Shield, tube base	56-3978FA3
Socket, tube (5)	27-6265
Socket assembly, pilot lamp	27-6233-6
Spring, drive cord	56-2617
Spring, retaining	28-8610
Drive cord, 25-ft. spool	45-8750*

MODEL 53-702

Cabinet	
Maroon	10940
Biege	10940-2
Knobs	
Maroon	
Clock (3)	54-4983
Tuning and volume	54-4986
Biege	
Clock (3)	54-4983
Tuning and volume	54-4986-1
Clock	41-1042-1
Back-and-loop assembly	
Maroon	76-7807
Biege	76-7807-1
Backplate and clip assembly, pilot lamp	76-7808
Scale	
Radio	54-4985
Clock	54-4984
Pointer	56-9846
Clock cover	54-4989
Shaft, tuning	56-9807

MODEL 53-706

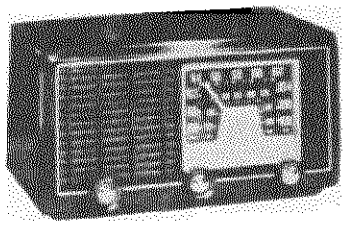
Cabinet	
Mahogany	10952
Blond	10952-1
Knobs	
Mahogany	
Clock (3)	54-4983-3
Tuning and volume	54-4557-6
Blond	
Clock (3)	54-4983-3
Tuning and volume	54-4557-7
Clock	41-2043
Back-and-loop assembly	76-8004
Lamp attachment	40-8916
Scale, radio	54-5160
Pointer	
Mahogany	56-10043
Blond	56-10043-1
Clock cover	54-4989
Shaft, tuning	56-10012

MODEL 53-707

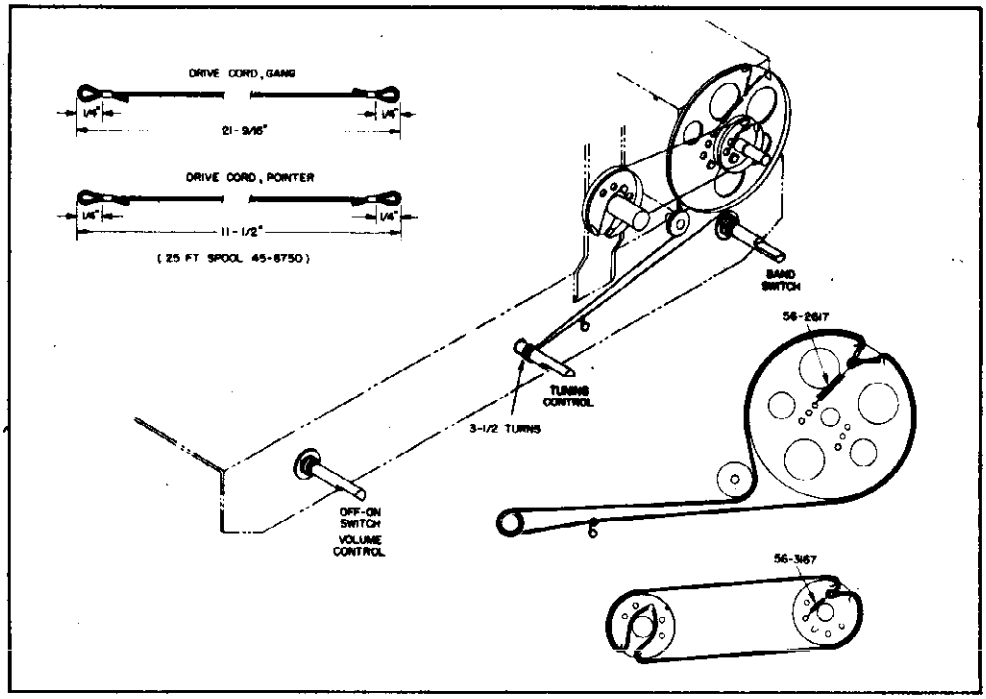
Cabinet	1095:
Knobs	
Clock (3)	54-4983-3
Tuning and volume	54-4557-6
Clock	41-2042-2
Back-and-loop assembly	76-8004
Scale, radio	54-5160
Pointer	56-10043
Shaft, tuning	56-10012
Door, cabinet	45-6735
Hook, door	56-10049
Hinge, door (2)	56-10048

SPECIFICATIONS

CABINET	Plastic table model
CIRCUIT	Six-tube superheterodyne plus selenium rectifier
FREQUENCY RANGES	
Broadcast	540—1620 kc.
FM	88—108 mc.
AUDIO OUTPUT	1 watt
OPERATING VOLTAGE	105—125 volts, a.c./d.c.
POWER CONSUMPTION	45 watts
AERIAL	Built-in pancake 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., 19V8 det.-a.v.c.-1st audio, 35C5GT output



MODEL 53-956



TP2-226Q

Figure 1. Drive-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 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 junction of LA1 and L8.	455 kc.	Gang fully open.	Adjust for maximum output, in order given.	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.	1620 kc. (2nd index mark from right).	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.

OSCILLOSCOPE—Connect ground lead to chassis. Connect vertical input to FM TEST jack, J2; connect horizontal input to horizontal sweep output of sweep generator. (Oscilloscope is used for steps 1 and 2.)

SWEEP GENERATOR—Use FM r-f sweep signal generator. Connect output lead as given in chart. Set frequency and sweep width as indicated in chart.

OUTPUT METER—Connect across voice-coil terminals.

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

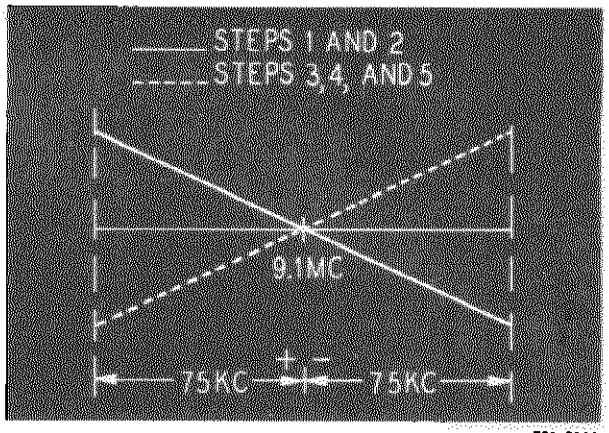
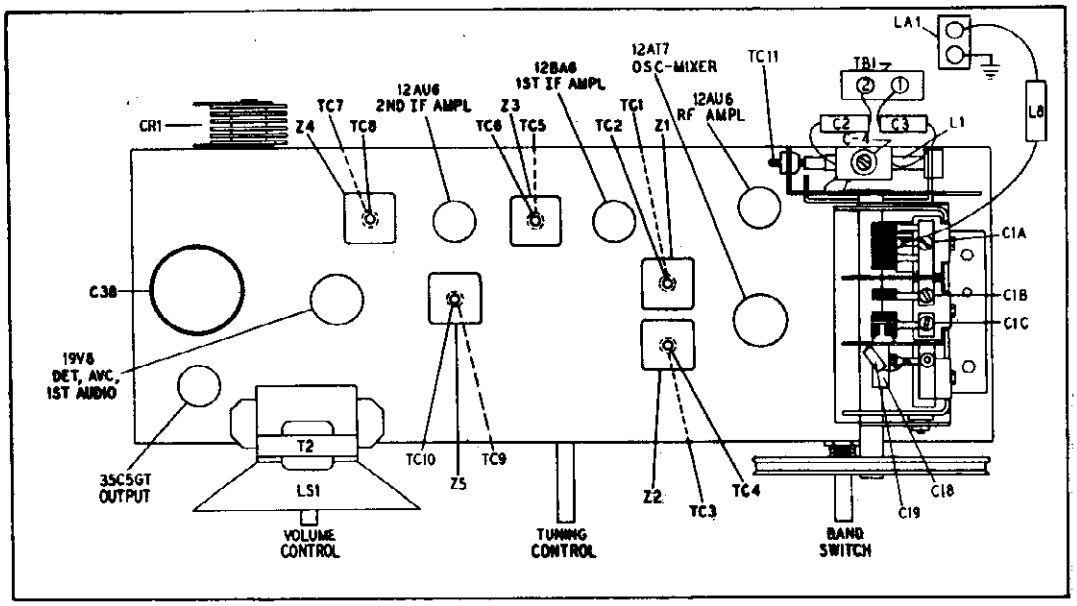


Figure 2. Characteristic Curve of FM Detector

FM 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 .01-μf. condenser to control grid (pin 1) of 12AU6 2nd i-f amplifier.	9.1 mc. (75-kc. deviation).	88mc. (gang meshed).	Balance and adjust detector for maximum indication on scope, as shown in figure 2.	TC8—detector sec. TC7—detector pri.



TP2-2261

Figure 3. Top View, Showing Trimmer Locations

FM ALIGNMENT CHART (Cont.)

STEP	SIGNAL GENERATOR		RADIO		ADJUST
	CONNECTION TO RADIO	DIAL SETTING	DIAL SETTING	SPECIAL INSTRUCTIONS	
2	Ground lead to chassis. Output lead through a .01-μf. condenser to FM tuning gang stator lug, junction of C1 and pin 4 of L2.	Same as step 1.	Same as step 1.	Adjust for maximum indication on scope, as shown in figure 2.	TC6—FM 2nd i-f sec. TC5—FM 2nd i-f pri. TC2—FM 1st i-f sec. TC1—FM 1st i-f pri.
3	Ground lead to lug 3 of TB1. Output lead to lug 2 of TB1. See note 1 below.	108.5 mc.	108.5 mc. (1st index mark from right).	Adjust for maximum indication on output meter.	C18—FM osc.
4	Same as step 3.	88 mc.	88 mc. (1st index mark from left).	Adjust for maximum indication on output meter. See note 2 below.	L5—FM osc.
5	Same as step 3.	105 mc.	105 mc. (3rd index mark from right).	Adjust for maximum indication on output meter while rocking tuning condenser.	C1B—FM r-f.
6	Same as step 3.	105 mc.	105 mc.	Adjust for maximum indication on output meter.	C4—FM aerial.
7	Same as step 3.	92 mc.	92 mc. (3rd index mark from left).	Adjust for maximum indication on output meter. See note 3 below.	L2—FM r-f coil.
If FM aerial coil, L1, is replaced, it should be adjusted as directed in step 8, below.					
8	Same as step 3.	92 mc.	92 mc.	Adjust for maximum indication on output meter.	TC11—FM aerial.

NOTE 1: For accurate results, the signal-generator output impedance must be 300 ohms, to match the input impedance of TB1 If the generator impedance is less than 300 ohms, a resistor of the proper value may be used in series with the output lead to mak the impedance correct. For example, if the output impedance is 150 ohms, place a 150-ohm resistor in series with the output lead

NOTE 2: If oscillator does not tune as low as 88 mc., compress the turns on the oscillator coil. If oscillator tunes too low, sprea the turns slightly. After coil is adjusted, repeat step 3.

NOTE 3: Check resonance of coil L2 by inserting end of a tuning wand, such as Philco Part No. 56-6100, in the coil. If outpu increases when iron end is placed in coil, compress turns slightly. If output increases when brass end is placed in coil, spread th turns. If output decreases when either end is placed in coil, no adjustment is necessary. After the coil is adjusted, readjust trimme C1B and repeat steps 3 through 8 until no further improvement is obtained.

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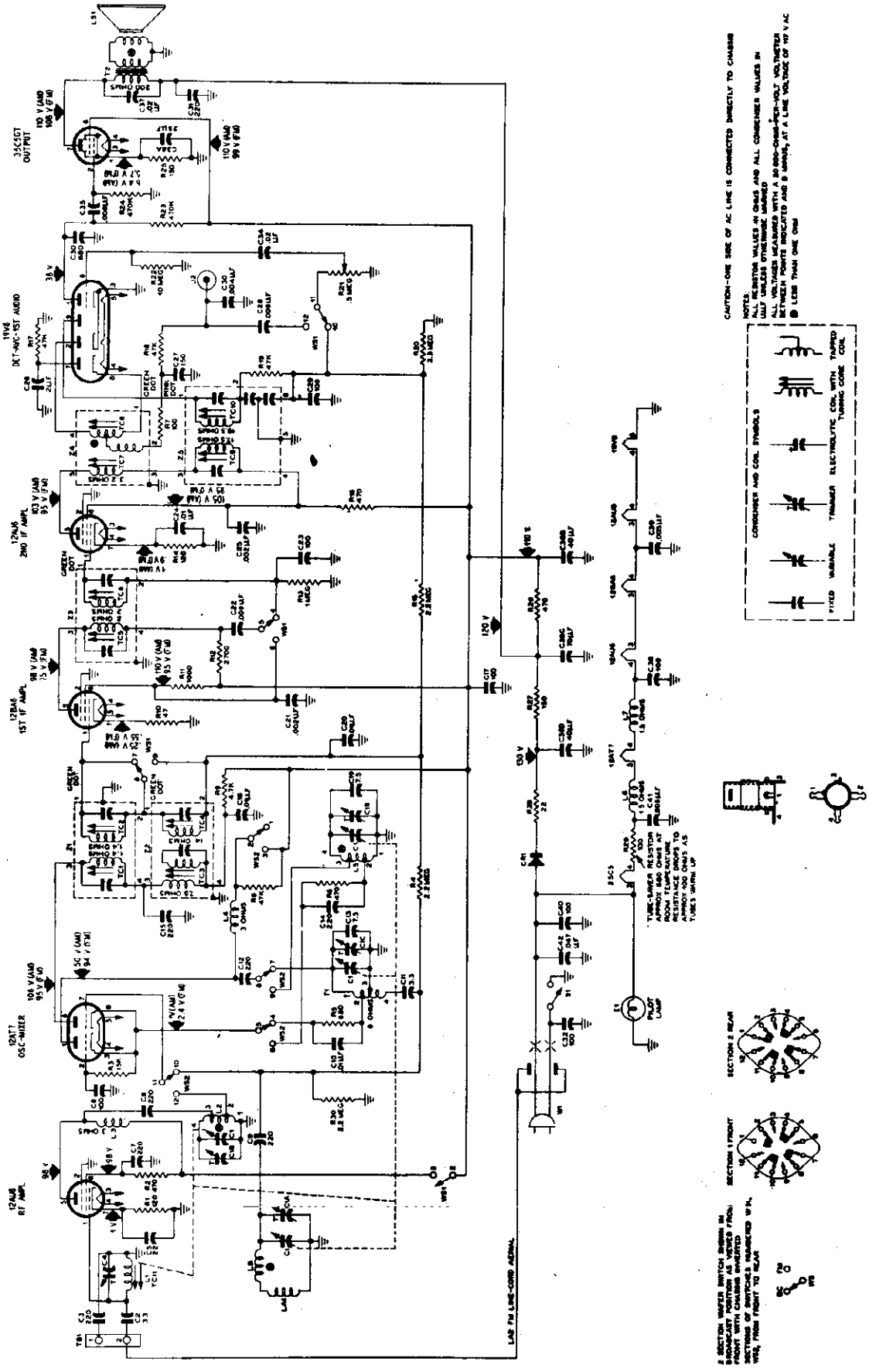


PARTS LIST

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	31-2762-1
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
C2	Condenser, aerial isolating, 3.3 μμf.	30-1221
C3	Condenser, aerial isolating, 220 μμf.	62-122001001*
C4	Condenser, FM aerial trimmer	45-3034
C5	Condenser, cathode by-pass, 22 μμf.	62-022009001
C6	Condenser, d-c blocking, 220 μμf	30-6002
C7	Condenser, screen by-pass, 220 μμf.	62-122001001*
C8	Condenser, oscillator grid, 100 μμf.	62-110001021*
C9	Condenser, d-c blocking, 220 μμf	62-122001001*
C10	Condenser, cathode by-pass, .01 μf.	30-4650-58*
C11	Condenser, neutralizing, 3.3 μμf.	30-1224-49
C12	Condenser, d-c blocking 220 μμf	62-122001001*
C13	Condenser, fixed trimmer, 7.5 μμf.	30-1224-65
C14	Condenser, cathode by-pass, 220 μμf.	62-122001001*
C15	Condenser, r-f by-pass, 220 μμf	62-122001001*
C16	Condenser, plate decoupling, .01 μf	30-4650-58*
C17	Condenser, r-f by-pass, 100 μμf.	62-110009001*
C18	Condenser, trimmer, FM oscillator	31-6511-10
C19	Condenser, fixed trimmer, 7.5 μμf.	30-1224-8
C20	Condenser, a-v-c decoupling, .01 μf	30-4650-58*
C21	Condenser, screen by-pass, .002 μf.	30-4650-54*
C22	Condenser, neutralizing, .006 μf.	30-4650-57*
C23	Condenser, i-f by-pass, 100 μμf.	62-110001021*
C24	Condenser, cathode by-pass, .01 μf	30-4650-58*
C25	Condenser, screen by-pass, .002 μf	30-4650-54*
C26	Condenser, electrolytic, diode-load filter, 2 μf., 50v	30-2417-7
C27	Condenser, i-f by-pass, 150 μμf.	62-115001011*
C28	Condenser, d-c blocking, .006 μf.	30-4650-57*
C29	Condenser, i-f by-pass, 100 μμf.	62-110001021*
C30	Condenser, de-emphasis, .004 μf.	30-4650-56*
C31	Condenser, plate decoupling, 220 μμf.	62-122001001*
C32	Condenser, line by-pass, 100 μμf	62-110001021*
C33	Condenser, plate by-pass, 680 μμf	62-168001001*
C34	Condenser, d-c blocking, .02 μf.	30-4650-60*
C35	Condenser, d-c blocking, .006 μf.	30-4650-57*
C36	Condenser, filament by-pass, 100 μμf.	62-110001021*
C37	Condenser, tone compensation, .02 μf.	30-4650-60*
C38	Condenser, electrolytic, 4-section	30-4650-46
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 μμf	62-110001021*
C41	Condenser, filament by-pass, .005 μf	30-1238-1*
C42	Condenser, line by-pass, .047 μf	30-4650-45*
CR1	Selenium rectifier, 100 ma., 117v	34-8003-1
I1	Pilot lamp, frosted, 117v, 7 watts	34-2605
J1	Jack, male, a-c	27-6240-5
J2	Socket, FM test	27-6180
L1	Coil, FM aerial, complete with grommet	32-4532A
L2	Coil, FM r-f	32-4415-2
L3	Choke, r-f, 3.3 μh.	32-4422-10
L4	Choke, r-f, 3.3 μh.	32-4422-10
L5	Coil, FM oscillator	32-4414-5
L6	Choke, filament, 2.2 μh.	32-4422-8
L7	Choke, filament, 2.2 μh.	32-4422-8
L8	Choke, r-f, 4.1 μh.	32-4061-3
LA1	AM loop and support assembly	76-7836
LA2	Line-cord aerial, FM	Part of W1
LS1	Speaker, 4" p-m, including output transformer	36-1625-14
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, 2.2 megohms	66-5228340*
R5	Resistor, parasitic suppressor, 680 ohms	66-1688340*
R6	Resistor, parasitic suppressor, 470 ohms	66-1478340*
R7	Resistor, loading, 100 ohms	66-1108340*
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, 2700 ohms	66-2278340*
R13	Resistor, grid return, 1 megohm	66-5108340*
R14	Resistor, cathode bias, 120 ohms	66-1128340*
R15	Resistor, a-v-c filter, 2.2 megohms	66-5228340*
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*

Reference Symbol	Description	Service Part No.
R25	Resistor, cathode bias, 150 ohms	66-1158340*
R26	Resistor, filter, 470 ohms, 1 watt	66-1474340*
R27	Resistor, filter, 150 ohms, 2 watts	66-1155360*
R28	Resistor, current limiting, 22 ohms, 2 watts	66-0225360*
R29	Resistor, current limiting, 100 ohms	33-1343-3
R30	Resistor, grid return, 2.2 megohms	66-5228340*
S1	Switch, off-on	Part of R21
T1	Transformer, AM oscillator	32-4569-1
T2	Transformer, output	Part of LS1
W1	Line cord	41-3865-3
W2	Cable, FM aerial, 72-ohm twin lead	41-3987
WS	Switch, band, 2-wafer	42-1924-1
Z1	Transformer, FM, 1st i-f	32-4518A
Z2	Transformer, AM, 1st i-f	32-4516A
Z3	Transformer, FM, 2nd i-f	32-4518-1A
Z4	Transformer, FM, detector	32-4310-4A
Z5	Transformer, AM, 2nd i-f	32-4517A

MISCELLANEOUS

Description	Service Part No.
Cabinet	10941
Back, flange, and socket assembly	76-7829

MISCELLANEOUS (Cont.)

Description	Service Part No.
Fastener, back mtg. (4)	W-2235-FA9
Dial scale	54-4987
Knob, FM-AM	54-4774-28
Knob, tuning	54-4774-26
Knob, volume-off-on	54-4774-27
Clip, pilot lamp	56-3545-FA3
Drive cord, 25-foot spool	45-8750*
Pointer	56-9906
Shaft, drive	56-7931FA11
Spring, gang drive	56-2617
Spring, pointer drive	56-3167
Rubber mount, speaker (2)	54-4651-1
Socket, 12BA6 (i-f ampl.)	27-6265
Socket, 12AU6 (i-f ampl.)	27-6265
Socket, 12AU6 (r-f ampl.)	27-6275-1
Socket, 12AT7	27-6203-6
Socket, 19V8	27-6203-6
Socket, 35C5	27-6203-12
Shield, tube (2)	56-5629-3
Shield, tube base (1)	56-3978-1FA3
Shield, tube base (2)	56-5628-1FA3
Socket, assembly, pilot lamp	27-6233-21
Spring, hairpin	28-8610

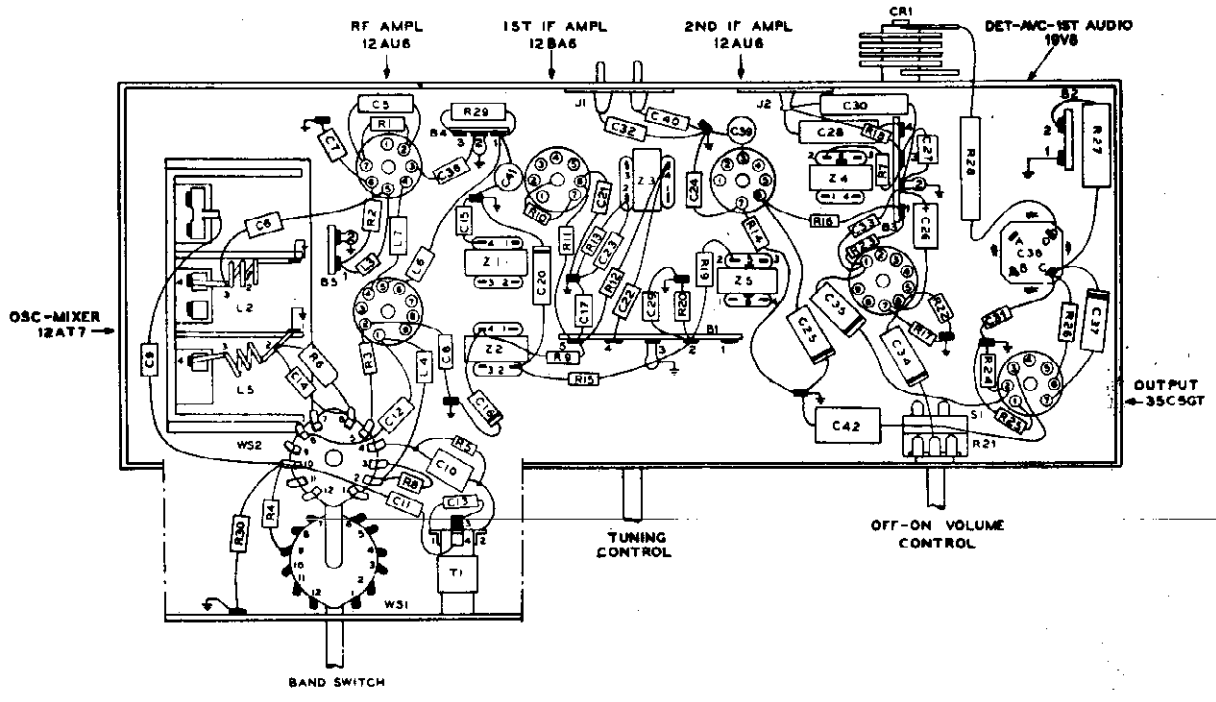
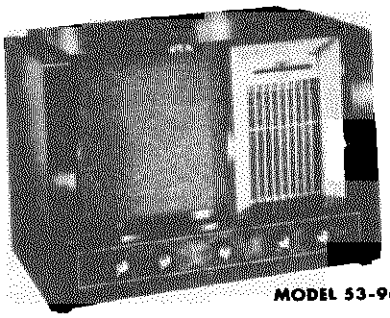


Figure 5. Base View, Showing Parts Placement

Circuit ..... Superheterodyne
Frequency ranges
- Standard Broadcasts: .540 to 1.70 megacycles (555 to 176.5 meters)
- Short Wave 1: 1.7 to 5.3 megacycles (176.5 to 56.5 meters)
- Short Wave 2: 7.5 to 22.0 megacycles (40.0 to 13.62 meters)
- Band Spread:
  - 49-Meter Band: 5.2 to 7.6 megacycles (57.7 to 39.4 meters)
  - 31-Meter Band: 9.4 to 9.9 megacycles (31.9 to 30.3 meters)
  - 25-Meter Band: 11.4 to 12.0 megacycles (26.3 to 25 meters)
  - 19-Meter Band: 14.8 to 15.6 megacycles (20.3 to 19.2 meters)
  - 16-Meter Band: 17.3 to 18.2 megacycles (17.3 to 16.5 meters)
  - 13-Meter Band: 20.8 to 21.9 megacycles (14.4 to 13.7 meters)



MODEL 53-960

Number of tubes (excluding rectifier) 7
Number of rectifier tubes 1
Tone control ..... Continuously variable
Aerial ..... Loop aerial for Standard Broadcast; whip aerial for Short Wave; provision for external aerial
Operating voltage ..... 115 volts, 60 cycles, a.c.
Speaker ..... 10-inch PM
Undistorted power output ..... 7 watts
Total power consumption ..... 110 watts

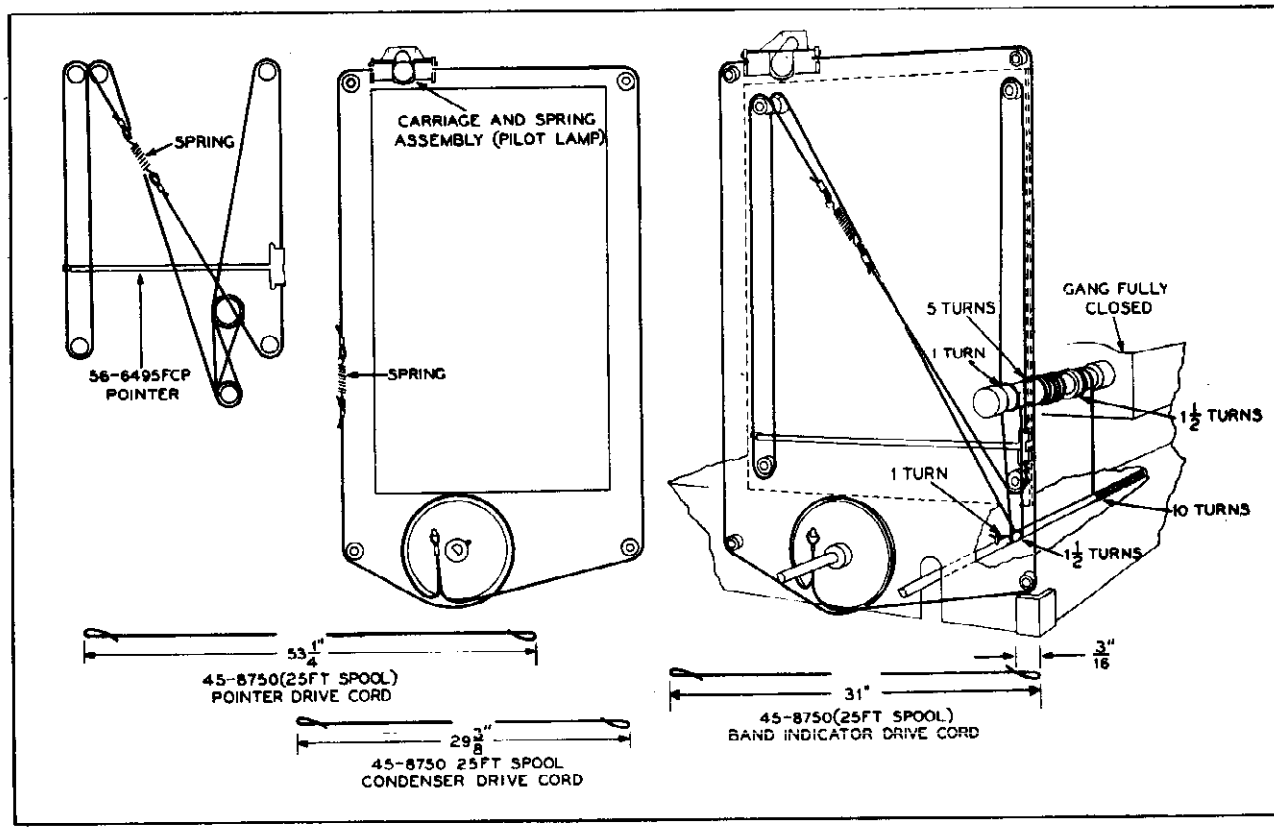


Figure 1. Drive-Cord Installation Details

ALIGNMENT PROCEDURE

DIAL POINTER: With the tuning-condenser plates fully meshed, adjust the dial pointer to coincide with the index mark (the second mark below "55") at the low-frequency end of the dial.

BAND-SPREAD TUNING CORES: With the tuning control at the extreme low-frequency setting, set oscillator core TC1C flush with the rear end of the oscillator coil form. Aerial core TC1A and r-f core TC1B should now extend approximately 1/16 inch beyond their coil forms.

SIGNAL GENERATOR: Connect the ground lead to the chassis, and the output lead as indicated in the chart. Set the signal-generator frequency as indicated in the chart, and use modulated output.

RADIO CONTROLS: Set the volume control to maximum, and the tone control fully clockwise. Set the band switch and tuning control as indicated in the chart.

OUTPUT METER: Connect between the voice-coil lug on the speaker and the chassis.

OUTPUT LEVEL: During alignment, the signal-generator output must be attenuated to maintain an output-meter reading below 1.5 volts.

STEP	SIGNAL GENERATOR		RADIO			ADJUST
	CONNECTION TO RADIO	DIAL SETTING	BAND SWITCH	DIAL SETTING	SPECIAL INSTRUCTIONS	
1	Through a .1-μf. condenser to stator of r-f (center) section of C1.	455 kc.	BC	Tuning gang fully open.	Adjust, in order given, for maximum output; then repeat.	C28—2nd i-f sec. C27—2nd i-f pri. C30—1st i-f sec. C29—1st i-f pri.
2	Through a 25-$\mu\mu$f. condenser to aerial terminal of TB1.	580 kc.	BC	580 kc.	Adjust for maximum output while rocking tuning control.	C14A—BC osc. (series)
3	Same as step 2.	1500 kc.	BC	1500 kc.	Adjust, in order given, for maximum output.	C13—BC osc. (shunt) C41—BC r-f C52—BC aerial
4	Through a 25-$\mu\mu$f. condenser to aerial terminal of TB1.	5.0 mc.	SW1	5.0 mc.	Adjust for maximum output.	C14B—SW1 osc.
5	Same as step 4.	7.5 mc.	BS1	7.5 mc.	Adjust, in order given, for maximum output.	C14C—BS1 osc. C7D—BS1 r-f C2D—BS1 aerial
6					Preset approximately ¾ turn from tight position.	C7I—SW2 osc. C7E—SW2 r-f C2E—SW2 aerial
7	Same as step 4.	9.0 mc.	SW2	9.0 mc.	Adjust, in order given, for maximum output.	TC13—SW2 osc. TC9—SW2 r-f TC5—SW2 aerial
8	Same as step 4.	21.0 mc.	SW2	21.0 mc.	Adjust, in order given, for maximum output. Repeat steps 7 and 8 until maximum output is obtained.	C7I—SW2 osc. C7E—SW2 r-f C2E—SW2 aerial
9	Same as step 4.	15.2 mc.	BS4	15.2 mc.	Adjust, in order given, for maximum output.	C7F—BS4 osc. C7C—BS4 r-f C2C—BS4 aerial
10	Same as step 4.	9.7 mc.	BS2	9.7 mc.	Adjust for maximum output.	C7H—BS2 osc.
11	Same as step 4.	11.7 mc.	BS3	11.7 mc.	Adjust for maximum output.	C7G—BS3 osc.
12	Same as step 4.	17.8 mc.	BS5	17.8 mc.	Adjust, in order given, for maximum output.	C24B—BS5 osc. C7B—BS5 r-f C2B—BS5 aerial
13	Same as step 4.	21.5 mc.	BS6	21.5 mc.	Adjust, in order given, for maximum output.	C24A—BS6 osc. C7A—BS6 r-f C2A—BS6 aerial

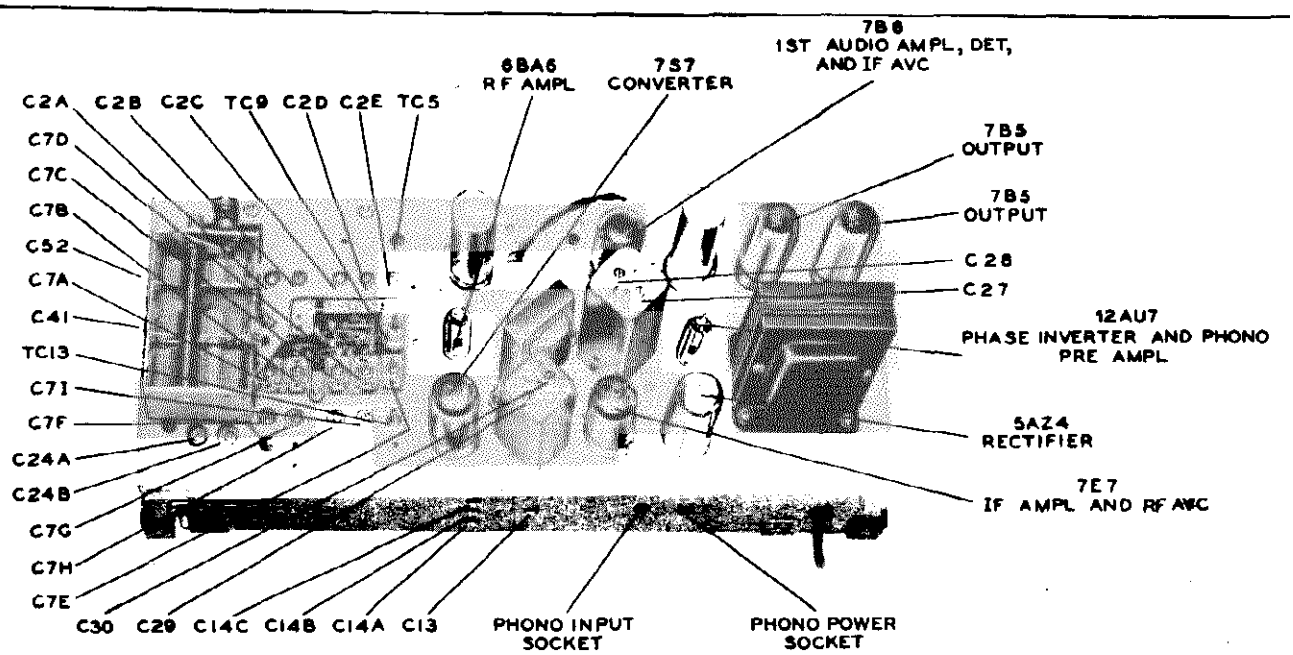


Figure 2. Top View, Showing Trimmer Locations

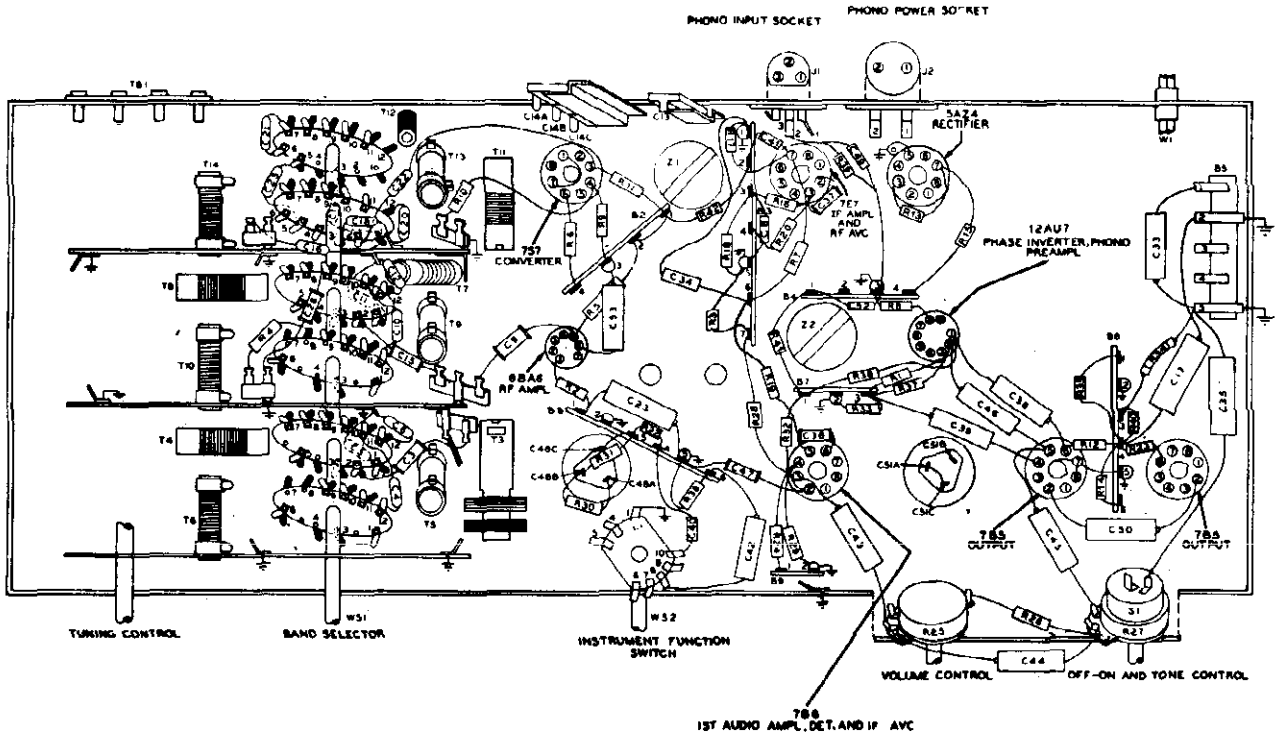
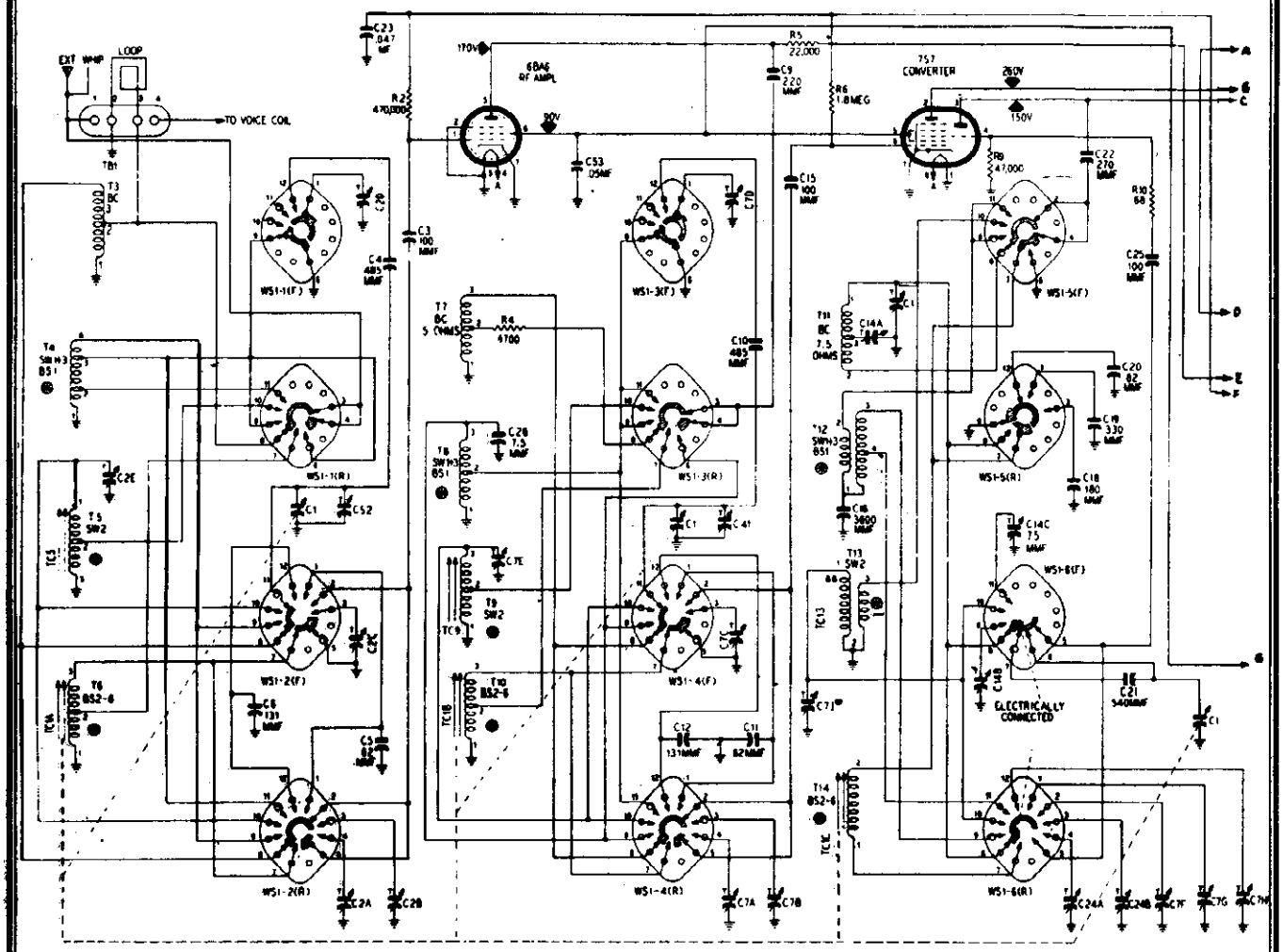
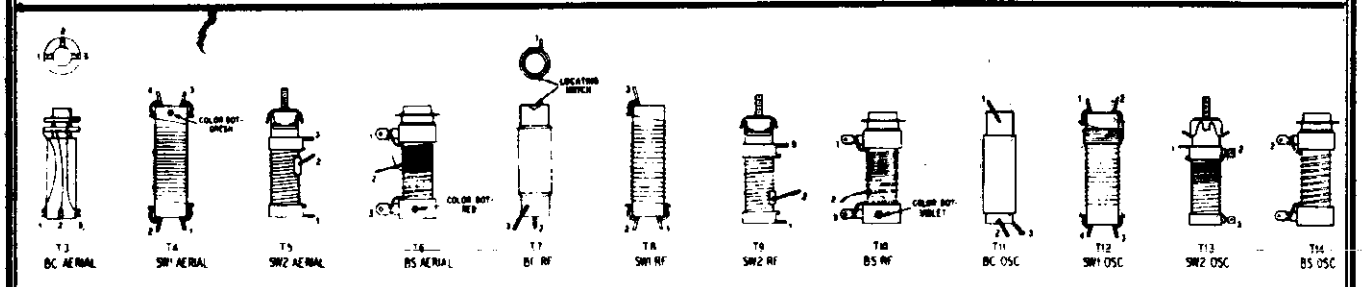
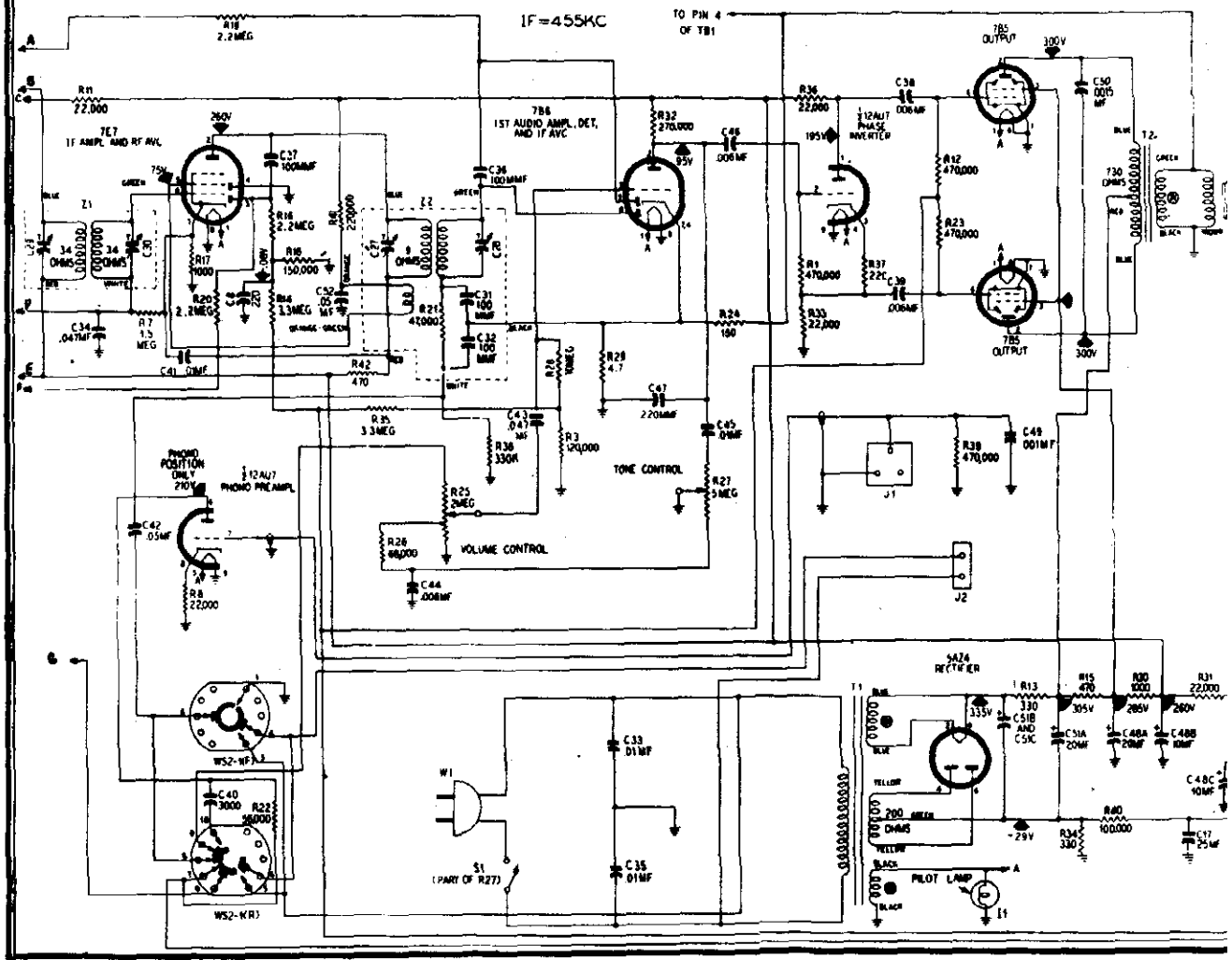


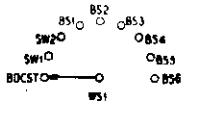
Figure 3. Bottom View, Showing Symbolized Chassis

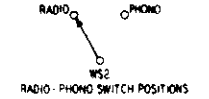
MODEL 53-960


EXT WHIP
LOOP
TO VOICE COIL
6BA6 RF AMPL
7S7 CONVERTER
170V
260V
150V
90V
ELECTRICALLY CONNECTED


T3 BC AERIAL
T4 SW1 AERIAL
T5 SW2 AERIAL
T6 BS AERIAL
T7 BC RF
T8 SW1 RF
T9 SW2 RF
T10 BS RF
T11 BC OSC
T12 SW1 OSC
T13 SW2 OSC
T14 BS OSC







WS1 SHOWN IN BC POSITION.

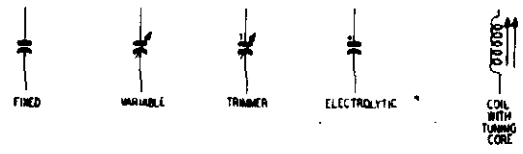
WS2 SHOWN IN RADIO POSITION.

WAFER SWITCH SECTIONS SYMBOLIZED WS1-1, WS1-2, ETC. FROM FRONT OF CHASSIS TOWARD REAR.

(F) INDICATES FRONT CONTACTS LOOKING FROM KNOB END.
(R) INDICATES REAR CONTACTS LOOKING THROUGH FROM KNOB END.

ALL VOLTAGES SHOWN WERE MEASURED WITH 20,000 OHMS-PER-VOLT METER FROM POINTS INDICATED TO CHASSIS, AT A LINE VOLTAGE OF 117 V AC.

CONDENSER SYMBOLS



ALL RESISTOR VALUES IN OHMS UNLESS OTHERWISE MARKED.

● INDICATES LESS THAN 1 OHM.

MODEL 53-960

PARTS LIST

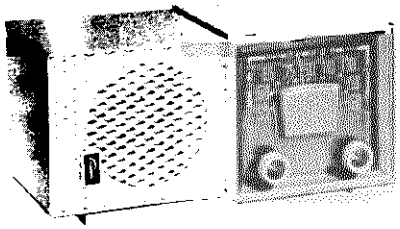
NOTE: Part numbers identified by an asterisk (*) are general replacement items. These numbers may not be identical with those on factory parts; also, the electrical values of some replacement items may differ from the values indicated in the schematic diagram and parts list. The values substituted in 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."

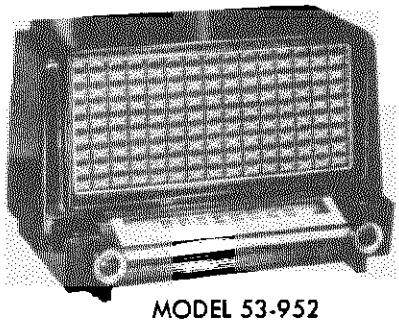
Reference Symbol	Description	Service Part No.
C1	Condenser, tuning gang, 3-section	31-2741-2
C2	Condenser, trimmer, 5-section	31-6507-5
C2A	Condenser, aerial trimmer, 21.5 mc.	Part of C2
C2B	Condenser, aerial trimmer, 17.8 mc.	Part of C2
C2C	Condenser, aerial trimmer, 15.2 mc.	Part of C2
C2D	Condenser, aerial trimmer, 7.5 mc.	Part of C2
C2E	Condenser, aerial trimmer, SW2	Part of C2
C3	Condenser, d-c blocking, 100 μμf.	62-110009001*
C4	Condenser, tracking, BS1, 485 μμf.	30-1220-23
C5	Condenser, shunt, BS3, 62 μμf.	30-1220-62
C6	Condenser, shunt, BS2, 131 μμf.	30-1220-38
C7	Condenser, trimmer, 9-section	31-6507-4
C7A	Condenser, r-f trimmer, 21.5 mc.	Part of C7
C7B	Condenser, r-f trimmer, 17.8 mc.	Part of C7
C7C	Condenser, r-f trimmer, 15.2 mc.	Part of C7
C7D	Condenser, r-f trimmer, 7.5 mc.	Part of C7
C7E	Condenser, r-f trimmer, SW2	Part of C7
C7F	Condenser, oscillator trimmer, 15.2 mc.	Part of C7
C7G	Condenser, oscillator trimmer, 11.7 mc.	Part of C7
C7H	Condenser, oscillator trimmer, 9.7 mc.	Part of C7
C7I	Condenser, oscillator trimmer, SW2	Part of C7
C8	Condenser, bias filter, 220 μμf.	62-122001001
C9	Condenser, d-c blocking, 220 μμf.	62-122001001*
C10	Condenser, tracking, BS1, 485 μμf.	30-1220-23
C11	Condenser, shunt, BS3, 62 μμf.	30-1220-62
C12	Condenser, shunt, BS2, 131 μμf.	30-1220-38
C13	Condenser, oscillator trimmer, BC	31-6308
C14	Condenser, trimmer, 3-section	31-6477-4
C14A	Condenser, oscillator padder, BC	Part of C14
C14B	Condenser, oscillator trimmer, SW1	Part of C14
C14C	Condenser, oscillator trimmer, 7.5 mc.	Part of C14
C15	Condenser, d-c blocking, 100 μμf.	62-110009001*
C16	Condenser, fixed tracker, SW1, 3600 μμf.	60-20365314
C17	Condenser, bias filter, .25 μf.	30-4588
C18	Condenser, oscillator divider, BS1, 180 μμf.	30-1220-30*
C19	Condenser, oscillator divider, BS2, 330 μμf.	60-10335317
C20	Condenser, oscillator divider, BS3, 82 μμf.	60-00825237
C21	Condenser, tracking, BS1, 540 μμf.	30-1220-61
C22	Condenser, d-c blocking, 270 μμf.	60-10275417
C23	Condenser, a-v-c filter, .047 μf.	45-3505-28
C24	Condenser, trimmer, 2-section	31-6476-19
C24A	Condenser, oscillator trimmer, 21.5 mc.	Part of C24
C24B	Condenser, oscillator trimmer, 17.8 mc.	Part of C24
C25	Condenser, d-c blocking, 100 μμf.	60-10105417
C26	Condenser, shunt, SW1, 3.3 μμf.	30-1221
C27	Condenser, primary trimmer, 2nd i-f	Part of Z2
C28	Condenser, secondary trimmer, 2nd i-f	Part of Z2
C29	Condenser, primary trimmer, 1st i-f	Part of Z1
C30	Condenser, secondary trimmer, 1st i-f	Part of Z1
C31	Condenser, i-f filter, 100 μμf. (part of Z2)	Part of Z2
C32	Condenser, i-f filter, 100 μμf. (part of Z2)	Part of Z2
C33	Condenser, line filter, .01 μf.	45-3305-92*
C34	Condenser, a-v-c filter, .047 μf.	45-3505-28*
C35	Condenser, line filter, .01 μf.	45-3305-92*
C36	Condenser, diode coupling, 100 μμf.	62-110009001*
C37	Condenser, diode coupling, 100 μμf.	62-110009001*
C38	Condenser, d-c blocking, .006 μf.	30-4591
C39	Condenser, d-c blocking, .006 μf.	30-4591
C40	Condenser, coupling, .003 μf.	30-4639
C41	Condenser, d-c blocking, .01 μf.	30-1238-6
C42	Condenser, d-c blocking, .05 μf.	30-4519
C43	Condenser, d-c blocking, .047 μf.	45-3505-28*
C44	Condenser, bass compensation, .006 μf.	30-4591
C45	Condenser, tone compensation, high-cut, .01 μf.	30-4572
C46	Condenser, d-c blocking, .006 μf.	30-4591
C47	Condenser, plate by-pass, 220 μμf.	62-122001001
C48	Condenser, electrolytic, 3-section	30-2570-15
C48A	Condenser, filter, 20 μf., 450v	Part of C48
C48B	Condenser, filter, 10 μf., 450v	Part of C48
C48C	Condenser, filter, 10 μf., 450v	Part of C48
C49	Condenser, grid return, .001 μf.	30-4620
C50	Condenser, plate by-pass, .0015 μf.	30-4616
C51	Condenser, electrolytic, 3-section	30-2570-15
C51A	Condenser, filter, 10 μf., 450v	Part of C51
C51B	Condenser, filter, 20 μf., 450v	Part of C51
C51C	Condenser, filter, 10 μf., 450v	Part of C51
C52	Condenser, screen by-pass, .05 μf.	30-4638
C53	Condenser, screen by-pass, .05 μf.	30-4638
I1	Pilot lamp, 6.3v	34-2064
J1	Socket, phono input	27-6126
J2	Socket, phono power	27-6200
LS1	Speaker, p-m, 10-inch	36-1610-17
R1	Resistor, grid return, 470,000 ohms	66-4478340*
R2	Resistor, grid return, 470,000 ohms	66-4478340*
R3	Resistor, voltage divider, 120,000 ohms	66-4128340
R4	Resistor, loading, 4700 ohms	66-2478340*
R5	Resistor, plate load, 22,000 ohms, 2 watts	66-3225340*
R6	Resistor, a-v-c divider, 1.8 megohms	66-5188340*
R7	Resistor, a-v-c filter, 1.5 megohms	66-5158340*
R8	Resistor, cathode bias, 22,000 ohms	66-3228340*
R9	Resistor, grid return, 47,000 ohms	66-3478340*
R10	Resistor, parasitic suppressor, 68 ohms	66-0688350*
R11	Resistor, plate load, 22,000 ohms, 1 watt	66-3224340*
R12	Resistor, grid return, 470,000 ohms	66-4478340*
R13	Resistor, filter, 330 ohms, 3 watts	33-1334-8
R14	Resistor, a-v-c delay, 3.3 megohms	66-5338340*
R15	Resistor, filter, 470 ohms, 1 watt	66-1474540*
R16	Resistor, a-v-c load, 2.2 megohms	66-5228340*
R17	Resistor, cathode bias, 1000 ohms	66-2108340*
R18	Resistor, bias divider, 150,000 ohms	66-4158340*
R19	Resistor, a-v-c filter, 2.2 megohms	66-5228340*
R20	Resistor, a-v-c filter, 2.2 megohms	66-5228340*
R21	Resistor, i-f filter, 47,000 ohms (part of Z2)	66-3478340*
R22	Resistor, phono preamplifier plate, 56,000 ohms	66-3565340*
R23	Resistor, grid return, 470,000 ohms	66-4478340*
R24	Resistor, inverse feedback, 150 ohms	66-1158350*
R25	Resistor, volume control, 2 megohms	33-5335-34
R26	Resistor, bass compensation, 68,000 ohms	66-3688540*
R27	Resistor, tone control, 5 megohms	33-5566-38
R28	Resistor, grid return, 10 megohms	66-6108340*
R29	Resistor, cathode degeneration, 4.7 ohms	66-9478340*
R30	Resistor, filter, 1000 ohms, 1 watt	66-2104540*
R31	Resistor, filter, 22,000 ohms, 2 watts	66-3224540*
R32	Resistor, plate load, 270,000 ohms	66-4278340*
R33	Resistor, cathode load, 22,000 ohms	66-3228340*
R34	Resistor, bias voltage divider, 330 ohms, 3 watts	33-1334-8
R35	Resistor, load, 3.3 megohms	66-5338340
R36	Resistor, plate load, 22,000 ohms	66-3228340*
R37	Resistor, cathode bias, 2200 ohms	66-2228340*
R38	Resistor, diode load, 330,000 ohms	66-4338340*
R39	Resistor, grid return, 470,000 ohms	66-4478340*
R40	Resistor, bias, 100,000 ohms	66-4108340*
R41	Resistor, screen dropping, 220,000 ohms	66-4228340
R42	Resistor, plate filter, 470 ohms	66-1478340
S1	Switch, off-on	Part of R27
T1	Transformer, power	32-8584
T2	Transformer, output	32-8585
T3	Transformer, BC aerial	32-4033-15
T4	Transformer, SW1 and BS1 aerial	32-4364
T5	Transformer, SW2 aerial	32-4208
T6	Transformer, BS2, BS3, BS4, BS5, and BS6 aerial	32-3670
T7	Transformer, BC r-f	32-4369
T8	Transformer, SW1 and BS1 r-f	32-4364-1
T9	Transformer, SW2 r-f	32-4208-7
T10	Transformer, BS2, BS3, BS4, BS5, and BS6 r-f	32-3671
T11	Transformer, BC oscillator	32-4370-2
T12	Transformer, SW1 and BS1 oscillator	32-4207-2
T13	Transformer, SW2 oscillator	32-4208-2
T14	Transformer, BS2, BS3, BS4, BS5, and BS6 oscillator	32-4212-2
TB1	Terminal board, aerial connection	38-9870
TC1	Tuning-core assembly, 3-section	76-5958
TC1A	Tuning core, band spread, aerial	Part of TC1
TC1B	Tuning core, band spread, r-f	Part of TC1
TC1C	Tuning core, band spread, osc.	Part of TC1
TC2	Tuning core, SW2 aerial	Part of T8
TC3	Tuning core, SW2 r-f	Part of T9
TC4	Tuning core, SW2 osc.	Part of T13
W1	Line cord	41-3821
WS1	Wafer switch, band-change	42-1883-2
WS2	Wafer switch, radio-phono	42-1971
Z1	Transformer, 1st i-f	32-3976
Z2	Transformer, 2nd i-f	32-4346-1

MISCELLANEOUS

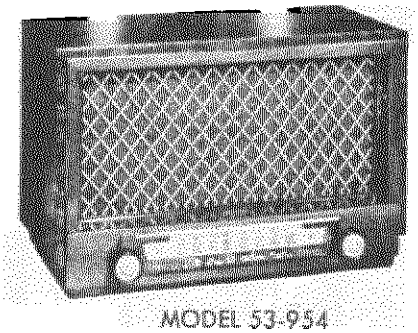
Description	Service Part No.
Cabinet	10898
Back assembly	76-7902-1
Baffle assembly (part of cabinet)	40-8774
Cable, speaker	41-3714-2
Cord, drive (25-ft. spool)	45-8750
Dial-plate assembly	76-7333
Dial-scale assembly	76-6437
Pointer	56-6405PCP
Spring, indicator (2)	56-3066PA38
Spring, indicator (part of 76-5616)	56-2135
Drive-shaft-and-bearing assembly	Part of WS1
Drum assembly (band indicator)	76-1246-2PA33
Knob, phono-radio	54-4774-11
Knob, band-selector	54-4774-12
Knob, tone, on-off	54-4774-13
Knob, tuning	54-4774
Knob, volume	54-4774-14
Loop, BC aerial	76-7493
Pilot-lamp assembly	76-1236-1
Pilot-lamp-carriage-and-spring assembly	76-5616
Shield, tube	56-2731
Socket, Loktal (6)	27-6207
Socket, 9-pin miniature	27-6203-18
Socket, 7-pin miniature	27-6275
Whip aerial	76-7503
Lead assembly, aerial	76-7504



MODEL 53-950



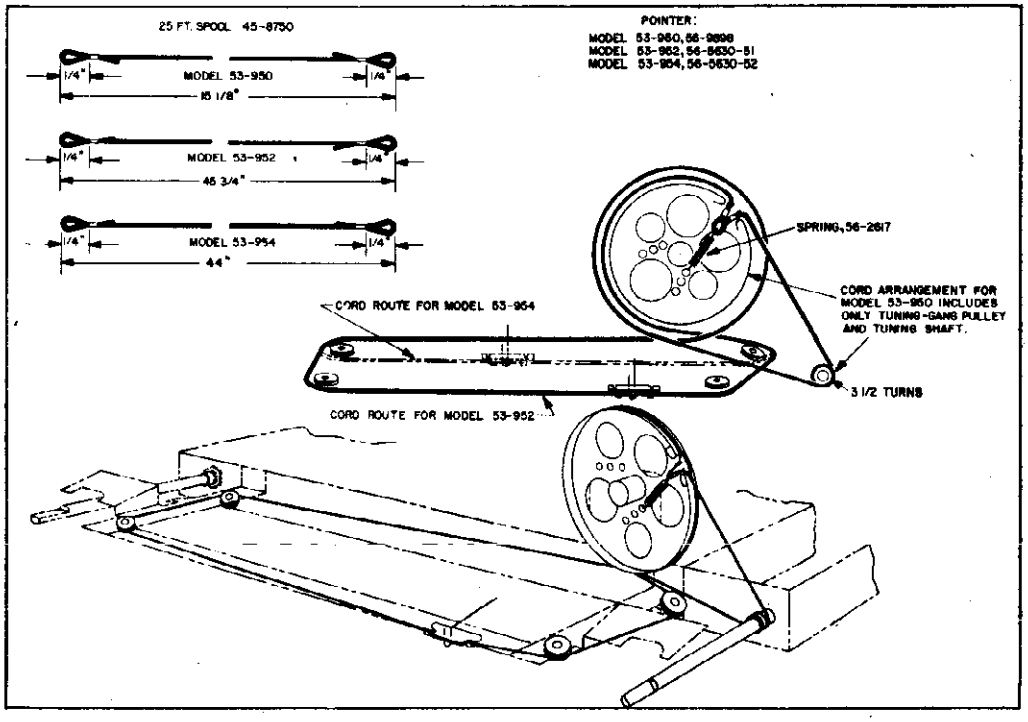
MODEL 53-952



MODEL 53-954

SPECIFICATIONS

Cabinet	
Model 53-950	Phenolic, brown or ivory
Model 53-952	Phenolic, brown
Model 53-954	Wood, mahogany or blonde
Circuit	Five-tube superheterodyne (plus rectifier
Frequency Range	
Broadcast	540—1620 kc
Special Services	1700—3400 kc
Audio Output	1 wa
Operating Voltage	105—120 volts, a.c. or d.
Power Consumption	30 wat
Antenna	Built-in, high-impedance loo
Intermediate Frequency	455 k
Philco Tubes	6BJ6 r-f ampl.; 12BE6 converter; 6BJ6 i- ampl.; 6AQ6 det., a.v.c., 1st audio 35C5 output; 35W4 rectifie



TP2-2656

Figure 1. Drive-Cord Installation Details

ALIGNMENT PROCEDURE

GENERAL

RADIO CONTROLS—Set volume control for maximum output and tuning control as given in the alignment chart. Set band switch to broadcast position for first 5 steps, and to special services position for steps 6 and 7.

OUTPUT INDICATOR—Connect output indicator (either on oscilloscope or a 1000-ohms-per-volt, a-c voltmeter) across voice-coil terminals.

SIGNAL GENERATOR—Use an AM r-f generator, connected as indicated in the alignment chart.

OUTPUT LEVEL—During alignment, attenuate signal-generator output to maintain output indication below 1 volt.

DIAL POINTER—Before the alignment is started, the dial pointer should be set to coincide with the dial scale mark to the left of "55" when the tuning gang is fully meshed.

ALIGNMENT CHART

	SIGNAL GENERATOR		RADIO		
STEP	CONNECTION TO RADIO	DIAL SETTING	DIAL SETTING	SPECIAL INSTRUCTIONS	ADJUST
1	Ground lead to B—. Output lead through a .01-μf. condenser to pin 7 (mixer grid) of 12BE6, converter.	455 kc.	Tuning gang fully open.	Adjust, in order given in next column, 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 1 below.	1620 kc.	1620 kc. See Note 2 below.	Adjust for maximum output.	C1C—osc. trimmer
3	Same as step 2.	1520 kc.	Tune radio to generator signal.	Adjust for maximum output. (High-frequency adjustment)	C1B—mixer-grid trimmer C1A—r-f trimmer
4	Same as step 2.	580 kc.	Same as step 3.	Adjust for maximum output. (Low-frequency adjustment)	TC1—r-f transformer
5	Repeat steps 3 and 4 until no further improvement is obtained.				
6	Same as step 2.	3200 kc.	Same as step 3.	Adjust for maximum output.	C5—special-services mixer-grid trimmer C2—special-services r-f trimmer
7	Same as step 2.	1800 kc.	Same as step 3.	Adjust for maximum output.	C3—special-services r-f padder

NOTE 1: Make up a 6—8 turn, 6-inch-diameter loop from insulated wire; connect to signal-generator leads and place near radio loop antenna. The loop antenna must be connected to the radio.

NOTE 2: To set the tuning gang to 1620 kc., place a piece of 6-mil flat shim stock beneath the heel of the rotor, and turn the rotor until it holds the shim firmly in place. Then remove the shim.

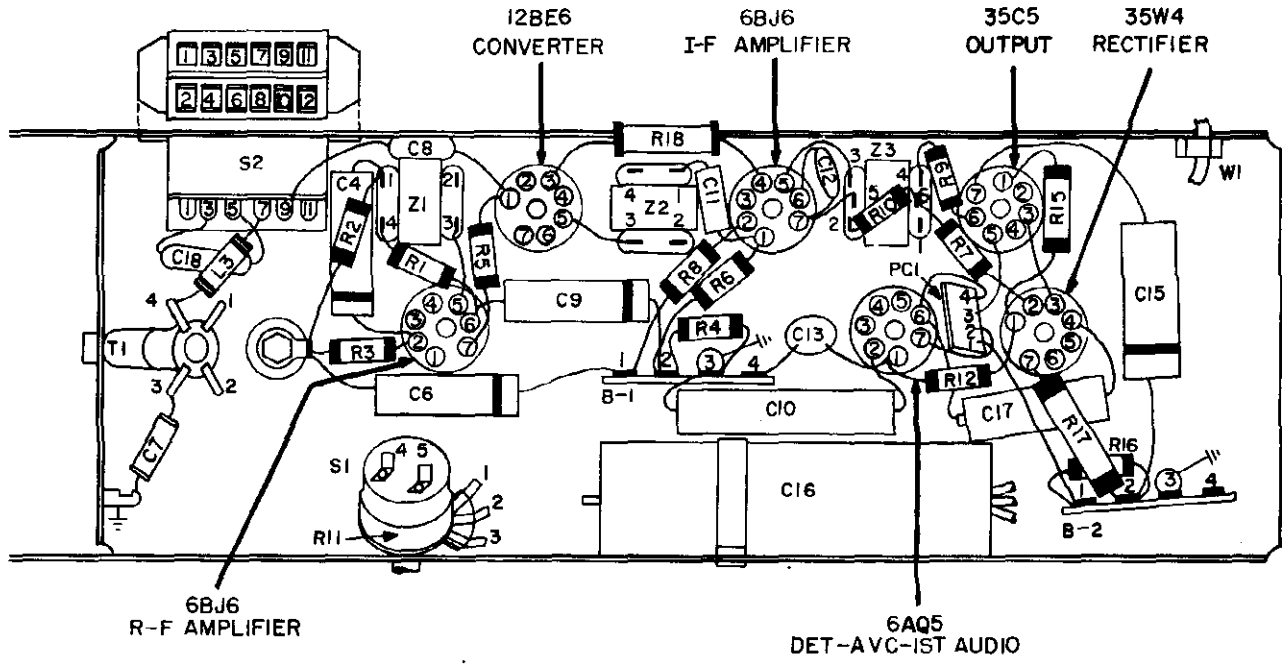


Figure 2. Top View, Showing Tuning Adjustments

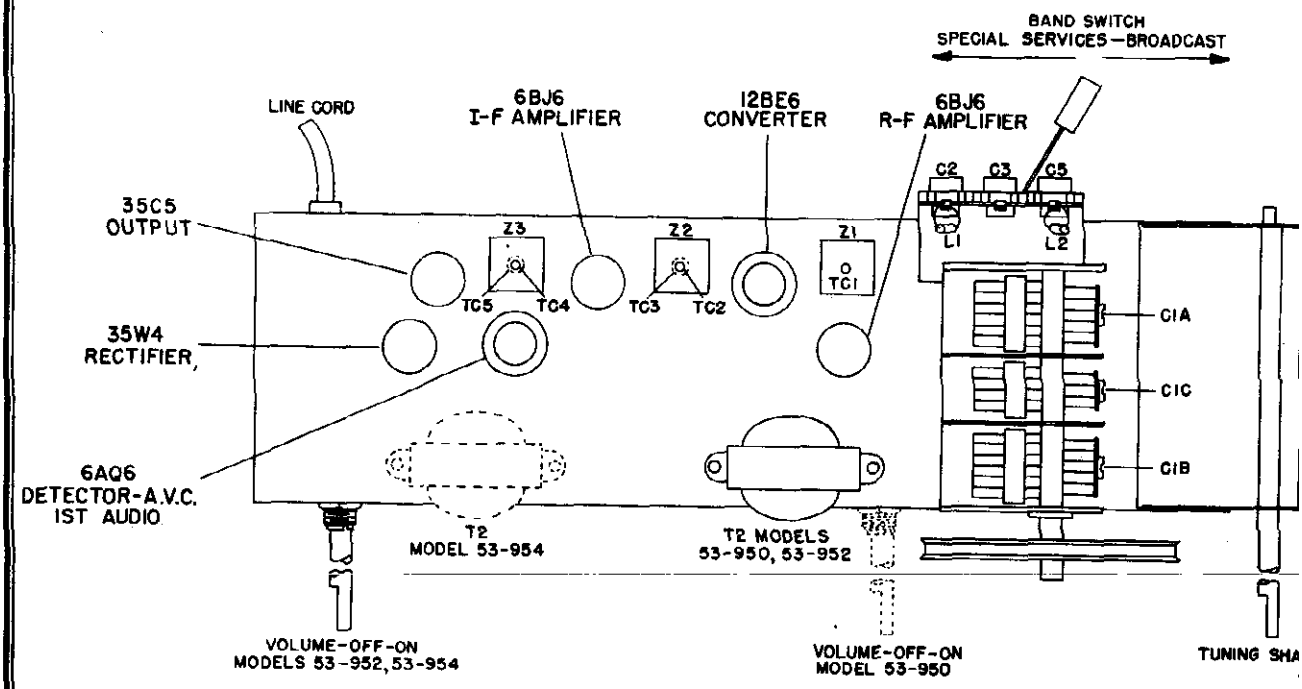
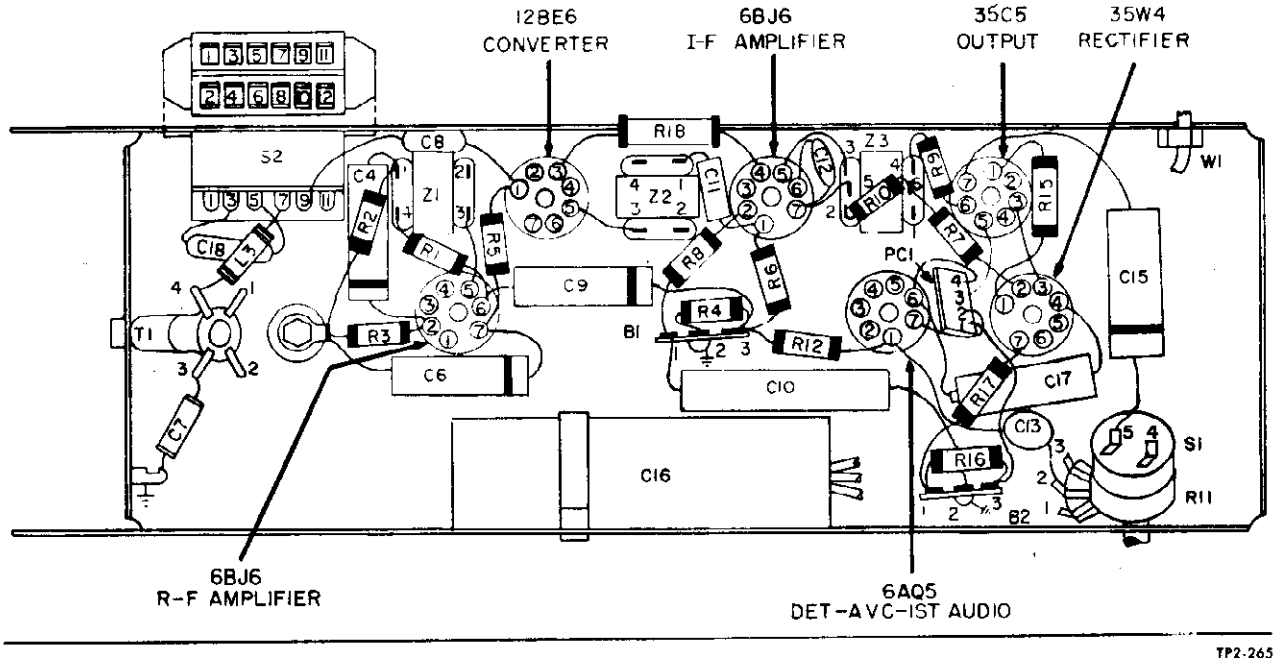


Figure 3. Base View, Model 53-950, Showing Parts Placement

MODELS 53-950, 53-952, 53-954



TP2-265

Figure 4. Base View, Models 53-952 and 53-954, Showing Parts Placement

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, 3 section	
	Model 53-950	31-2771
	Models 53-952, 53-954	31-2771-1
C1A	Condenser, trimmer, antenna	Part of C1
C1B	Condenser, trimmer, r-f	Part of C1
C1C	Condenser, trimmer, oscillator	Part of C1
C2	Condenser, trimmer, special services r-f	Part of CA1
C3	Condenser, padder, special services r-f	Part of CA1
C4	Condenser, r-f by-pass, .05 μf.	30-4650-45*
C5	Condenser, trimmer, special services mixer-grid	Part of CA1
C6	Condenser, a-v-c by-pass, .05 μf.	30-4650-45*
C7	Condenser, fixed trimmer, 7.5 μμf.	30-1224-65
C8	Condenser, d-c blocking, 47 μμf.	60-00475420
C9	Condenser, screen by-pass, .05 μf.	30-4650-45*
C10	Condenser, special, B− to chassis, .2 μf.	30-4644
C11	Condenser, i-f coupling, 220 μμf.	62-122001001*
C12	Condenser, screen by-pass, .002 μf.	30-1238-8*
C13	Condenser, audio coupling, .005 μf.	30-1238-1*
C14	Condenser, d-c blocking, .005 μf.	Part of PC1
C15	Condenser, tone compensation, .022 μf.	30-4650-43*
C16	Condenser, electrolytic filter	30-2575-27
C16A	Condenser, filter, 30 μf., 150v	Part of C16
C16B	Condenser, filter, 30 μf., 150v	Part of C16
C16C	Condenser, filter, 40 μf., 150v	Part of C16
C17	Condenser, line by-pass, .047 μf.	30-4650-45*
C18	Condenser, fixed padder, 865 μf.	30-1220-68
CA1	Condenser assembly, trimmer	31-6477-17
I1	Lamp, pilot	34-2068
L1	Coil, special services r-f	32-4561-4
L2	Coil, special services mixer-grid	32-4561-4
L3	Coil, oscillator shunt	32-4562-1
PC1	Printed circuit	30-6001
R1	Resistor, screen dropping, 10,000 ohms	66-3108340*
R2	Resistor, a-v-c load, 4.7 megohms	66-5478340*
R3	Resistor, a-v-c load, 2.2 megohms	66-5228340*
R4	Resistor, B− to chassis, 150,000 ohms	66-4158340*

PARTS LIST (Continued)

Reference Symbol	Description	Service Part No.
R5	Resistor, grid leak, 22,000 ohms	66-3228340*
R6	Resistor, grid leak, 2.2 megohms	66-5228340*
R7	Resistor, a-v-c load, 2.2 megohms	66-5228340*
R8	Resistor, cathode bias, 180 ohms	66-1188340*
R9	Resistor, screen dropping, 2200 ohms	66-2228340*
R10	Resistor, i-f filter, 47,000 ohms	66-3478340*
R11	Volume control, 500,000 ohms	
	Models 53-950, 53-954	33-5566-43
	Model 53-952	33-5566-46
R12	Resistor, grid leak, 10 megohms	66-6108340*
R13	Resistor, plate load, 500,000 ohms	Part of PC1
R14	Resistor, grid leak, 500,000 ohms	Part of PC1
R15	Resistor, cathode bias, 150 ohms, 1 watt	66-1154340*
R16	Resistor, B+ filter, 1200 ohms	66-2128340*
R17	Resistor, B+ filter, 220 ohms, 1 watt	66-1224340*
R18	Resistor, tube saver, 100 ohms	33-1343-3
S1	Switch, off-on	Part of R11
S2	Switch, broadcast-special services	
	Model 53-950	42-1893-3
	Model 53-952	42-1893-5
	Model 53-954	42-1893-4
T1	Transformer, oscillator	32-4453-2
T2	Transformer, output	32-8310-3
W1	Line cord	L-2183*
Z1	Transformer, r-f	32-4399-7A
Z2	Transformer, 1st i-f	32-4160A
Z3	Transformer, 2nd i-f	32-4240A

MISCELLANEOUS

PARTS COMMON TO ALL MODELS

Description	Service Part No.
Drive cord, 25-ft. spool	45-8750*
Spring, drive cord	56-2617
Rubber mount, gang mtg. (3)	27-4596
Shield, tube (2)	56-5629FA3
Socket assembly, pilot lamp	27-6233-6
Socket, tube (2)	27-6203-
Socket, tube (4)	27-62(
Speed nut (4)	1W56920FI

MODEL 53-950

Cabinet, mahogany	109
Cabinet, ivory	10938
Cabinet back and loop assembly	76-78
Scale, mahogany	54-51
Scale, ivory	54-5152
Knob (2)	54-4718-
Knob, band switch	54-49
Pointer	56-98
Shaft, tuning	56-9807
Spring, retaining	28-86
Speaker	45-97

MODEL 53-952

Cabinet	109(
Cabinet back and loop assembly	76-80(
Knob (2)	54-60
Knob, band switch	54-49
Panel, diffusing	54-881
Clip, panel diffusing	56-3587-
Pointer	56-5630-5
Pointer rail assembly	76-80(
Scale, dial	54-516
Shaft, tuning	56-9807-
Spring, retaining	28-861
Speaker	45-97

MODEL 53-954

Cabinet, mahogany	1095
Cabinet, blond	10959-
Back assembly, mahogany cabinet	76-806
Back assembly, blond cabinet	76-8063-1
Loop assembly, antenna	76-2127-1
Metal grille	56-1003
Knob (2), mahogany	54-601
Knob (2), blond	54-6019-
Knob, band switch	54-499
Panel, diffusing	54-881
Clip, diffusing panel	56-3587-
Pointer	56-5630-5
Pointer rail assembly	76-798
Shaft, tuning	56-9807-
Spring, retaining	28-861
Speaker	36-1626-

MODELS 53-950,
53-952, 53-954

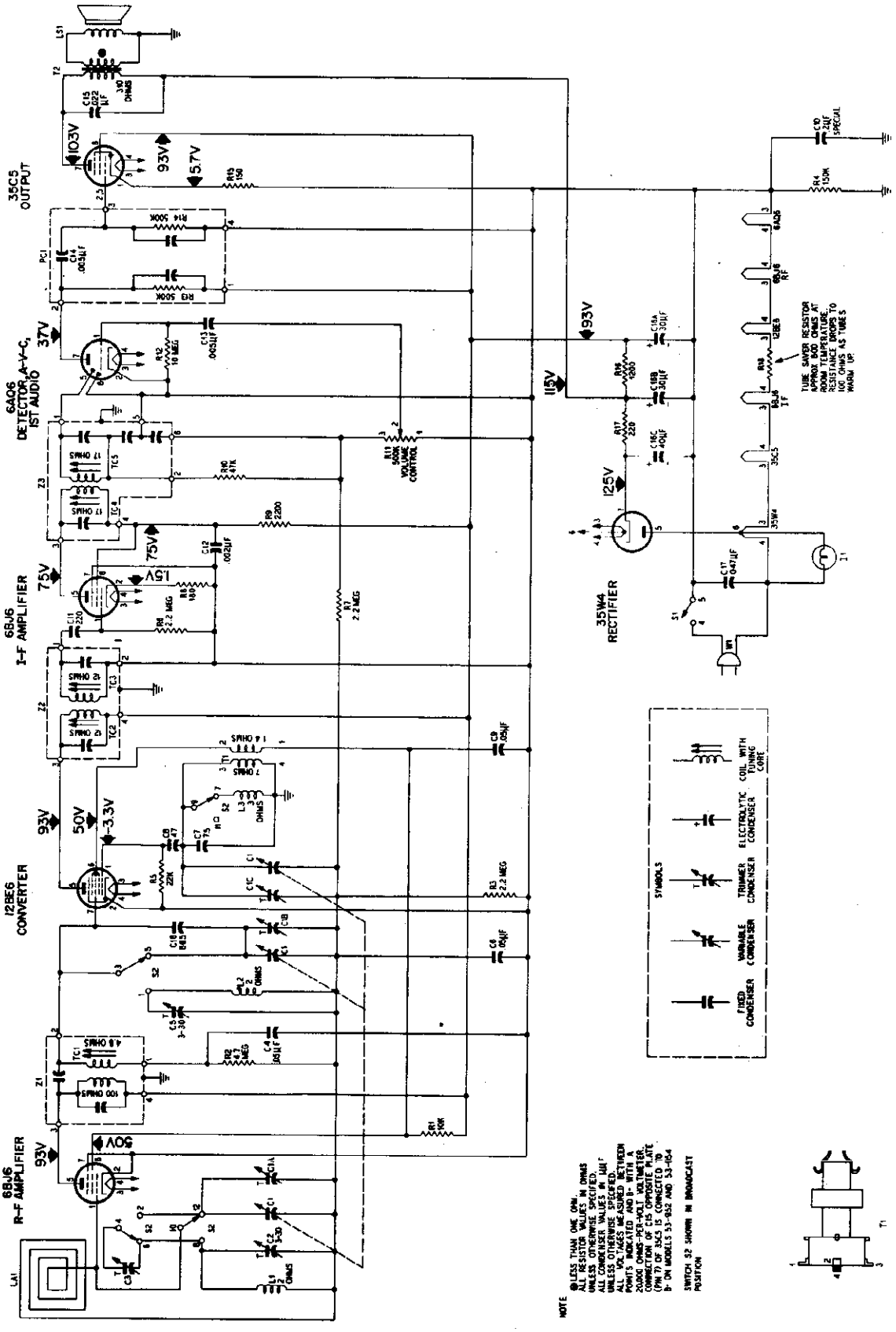
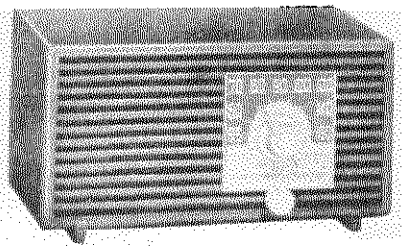


Figure 5. Philco Radio Models 53-950, 53-952, and 53-954, Schematic Diagram



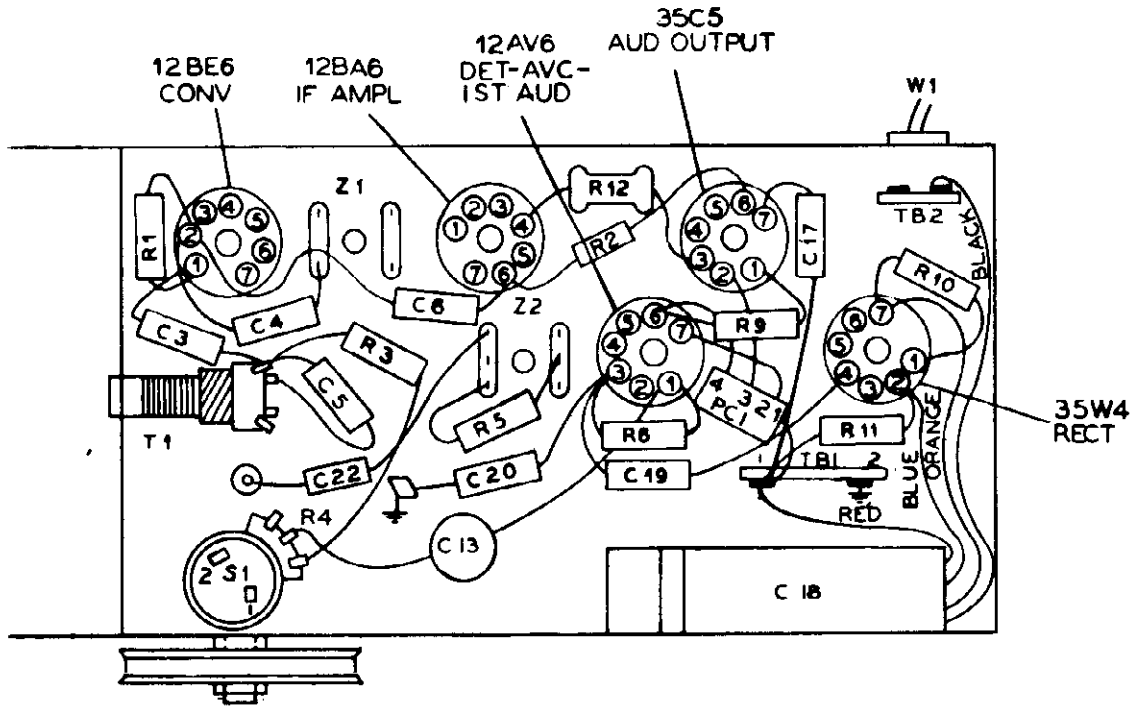
TP2-3229

MODEL 53-559

SPECIFICATIONS

CABINET	Molded plastic
CIRCUIT	Four-tube superheterodyne (plus rectifier)
FREQUENCY RANGE	
Standard Broadcast	540—1620 kc.
Special Services	1700—3400 kc.
AUDIO OUTPUT	1 watt
OPERATING VOLTAGE	105—120 volts, a.c. or d.c.
POWER CONSUMPTION	30 watts
ANTENNA	High-impedance loop
INTERMEDIATE FREQUENCY	455 kc.
PHILCO TUBES	12BE6, converter; 12BA6, i-f amplifier; 12AV6, detector-a.v.c.-1st. audio; 35C5, output; 35W4, rectifier

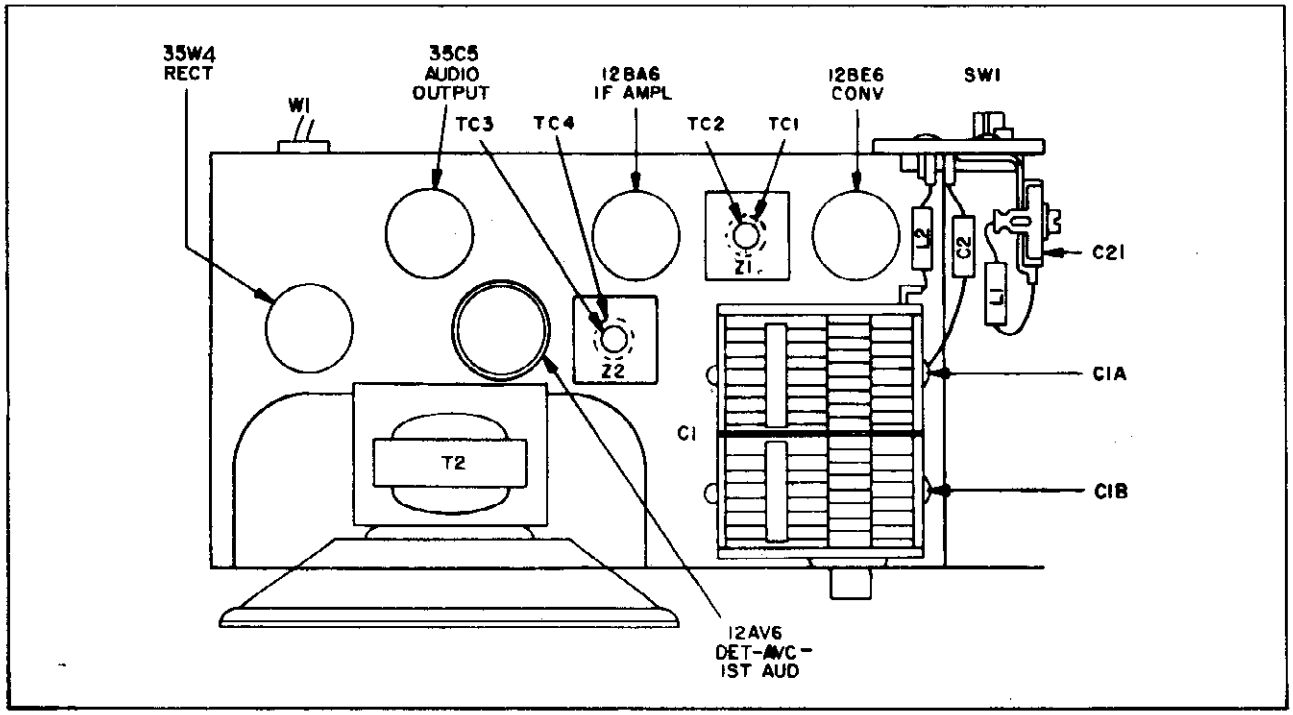
NOTE: The antenna is mounted on the cabinet back. When removing the cabinet back, use care to avoid breaking the antenna leads.



TP2-32

Figure 1. Base View, Showing Parts Placement

MODEL 53-559



TP2-3227

Figure 2. Top View, Showing Tuning Adjustments

ALIGNMENT PROCEDURE

RADIO CONTROLS—Set volume control to maximum. Set tuning control and band switch 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.

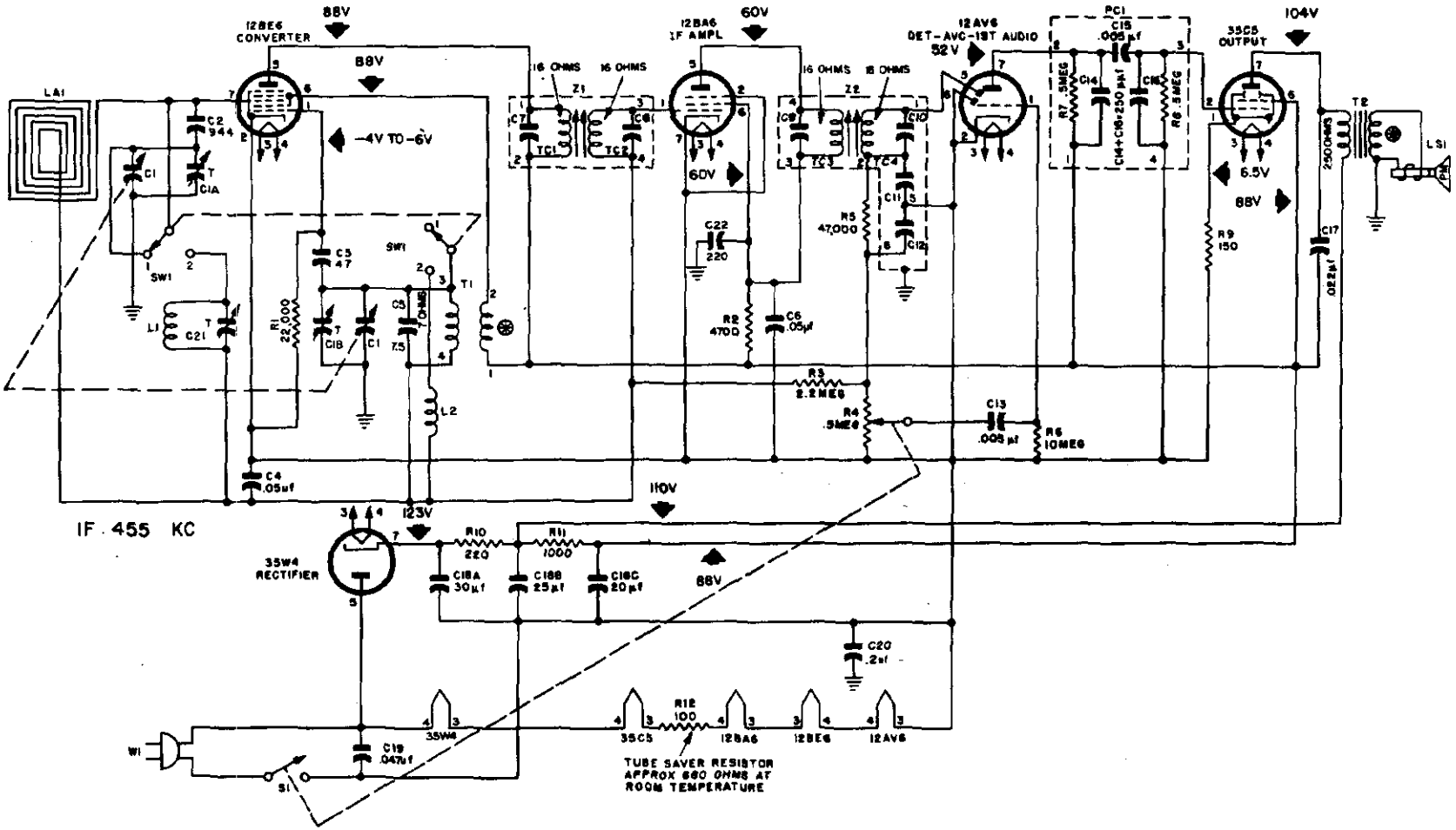
ALIGNMENT CHART

STEP	SIGNAL GENERATOR		RADIO			ADJUST
	CONNECTION TO RADIO	DIAL SETTING	DIAL SETTING	BAND-SWITCH SETTING	SPECIAL INSTRUCTIONS	
1	Ground-lead to B–; output lead through a .1-μf. condenser to grid (pin 7) of 12BE6.	455 kc.	Tuning gang fully open	Broadcast	Adjust tuning cores, in order given, for maximum output. (TC1 and TC3 are located at top of transformers.)	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).	1620 kc.	1620 kc.*	Broadcast	Adjust trimmer for maximum output.	C1B—osc.
3	Same as step 2.	1500 kc.	1500 kc.†	Broadcast	Adjust trimmer for maximum output.	C1A—antenna (broadcast)
4	Same as step 2.	3200 kc.	3200 kc.†	Special services	Adjust trimmer for maximum output.	C2I—antenna (special services)

NOTE: Make up a 6–8 turn, 6-inch-diameter loop from insulated wire; connect to signal-generator leads, and place about 1 foot from radio loop. The position of the radio loop, with respect to the chassis, should be approximately the same as when both are mounted in the cabinet.

* To set the tuning gang to 1620 kc., fully open the tuning gang and insert a .006-inch nonmetallic shim between the heel of the rotor and the top of the stator plates. Close the tuning gang sufficiently to hold the shim in place, and then remove the shim without disturbing the gang setting.

† To set the radio to this frequency, place chassis in cabinet, attach knob, and tune until pointer indicates the correct frequency. Then remove knob and take chassis from cabinet without disturbing the setting of the gang.



NOTES:

ALL VOLTAGES MEASURED WITH A 20,000-OHMS-PER-VOLT VOLTMETER BETWEEN POINTS INDICATED AND B- AT A LINE VOLTAGE OF 117V AC

OSCILLATOR GRID VOLTAGE MEASURED ACROSS R1 WITH A 100,000 OHM RESISTOR IN SERIES WITH METER

ALL RESISTOR VALUES IN OHMS AND ALL CONDENSER VALUES IN μμf UNLESS OTHERWISE INDICATED

SW1 SHOWN IN BROADCAST POSITION

TP2-3226

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."

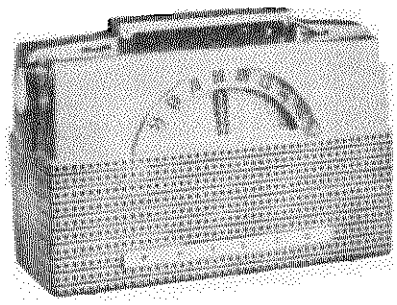
Reference Symbol	Description	Service Part No.
C1	Condenser, tuning gang	31-2751-13
C1A	Condenser, r-f trimmer	Part of C1
C1B	Condenser, oscillator trimmer	Part of C1
C2	Condenser, antenna series tracker, 944 μμf.	30-1220-65
C3	Condenser, oscillator grid, 47 μμf.	30-1230-4
C4	Condenser, a-v-c by-pass, .05 μf.	30-4650-45*
C5	Condenser, drift compensation, 7.5 μμf.	30-1224-83
C6	Condenser, screen by-pass, .05 μf.	30-4650-45*
C7	Condenser, i-f tuning	Part of Z1
C8	Condenser, i-f tuning	Part of Z1
C9	Condenser, i-f tuning	Part of Z2
C10	Condenser, i-f tuning	Part of Z2
C11	Condenser, detector filtering	Part of Z2
C12	Condenser, detector filtering	Part of Z2
C13	Condenser, audio coupling, .005 μf.	30-1238-1
C14	Condenser, plate by-pass	Part of PC1
C15	Condenser, audio coupling, .005 μf.	Part of PC1
C16	Condenser, compensating	Part of PC1
C17	Condenser, tone compensation, .022 μf.	30-4650-43
C18	Condenser, electrolytic, 3-section	30-2573
C18A	Condenser, filter, 30 μf., 150v	Part of C18
C18B	Condenser, filter, 25 μf., 150v	Part of C18
C18C	Condenser, filter, 20 μf., 150v	Part of C18
C19	Condenser, line by-pass, .047 μf.	30-4650-45*
C20	Condenser, B– to chassis, .2 μf.	30-4650-49*
C21	Condenser, trimmer, special services	31-6473-29
C22	Condenser, r-f by-pass, 220 μμf.	60-10225417
L1	Coil, antenna, special services	32-4561-3
L2	Coil, oscillator shunt	32-4562-2
LA1	Loop	Part of cabinet back
LS1	Speaker, p-m	36-1627-8
PC1	Printed circuit	30-6001
R1	Resistor, oscillator grid, 22,000 ohms	66-3228340*
R2	Resistor, i-f screen dropping, 4700 ohms	66-2478340*
R3	Resistor, a-v-c filter, 2.2 megohms	66-5228340*
R4	Resistor, volume control, .5 megohm	33-5566-41
R5	Resistor, diode load, 47,000 ohms	66-3478340*
R6	Resistor, grid return, 10 megohms	66-6108340*
R7	Resistor, plate load, 500,000 ohms	Part of PC1
R8	Resistor, grid return, 500,000 ohms	Part of PC1
R9	Resistor, cathode bias, 150 ohms	66-1158340*
R10	Resistor, B plus filter, 220 ohms	66-1224340*
R11	Resistor, B plus filter, 1000 ohms	66-2108340*
R12	Resistor, tube saver, 100 ohms	33-1343-3
S1	Switch, off-on	Part of R4
SW1	Switch, broadcast-special services	42-1796-2
T1	Transformer, oscillator	32-4453-6
T2	Transformer, output	32-8384-2*
W1	Line cord	L-2183*
Z1	Transformer, 1st i-f	32-4161A
Z2	Transformer, 2nd i-f	32-4240A

MISCELLANEOUS

Description	Service Part No.
Back-and-loop ass'y.	76-7705-1
Cabinet	
Driftwood	10921-5
Mahogany	10921-6
Dial scale	28-9292
Drive cord (25-ft. spool)	45-8750*
Fastener, back	W2235FA9
Knob, tuning	54-4978-2
Knob, volume	54-4118
Shield, tube	56-5629FA3
Socket, tube (4)	27-6265*
Socket, tube (12AV6)	27-6203-14*

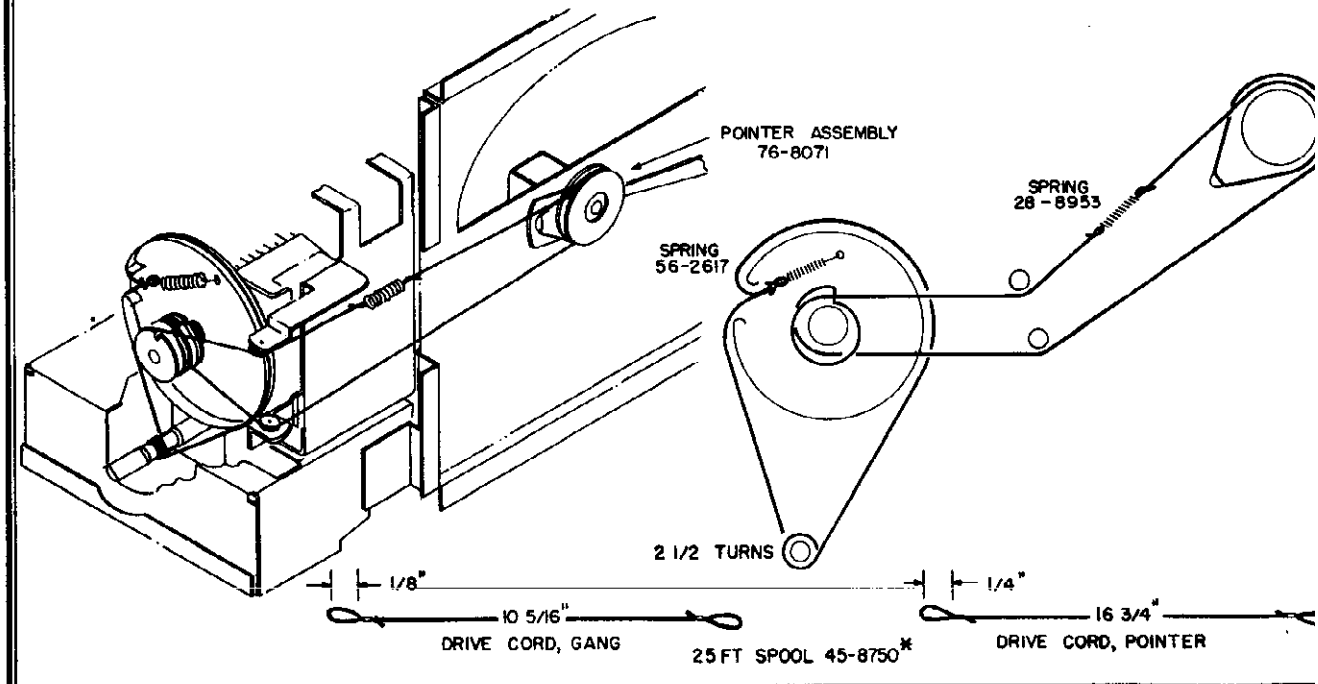
SPECIFICATIONS

CABINET	Plastic portable
CIRCUIT	Four-tube superheterodyne (plus selenium rectifier)
AUDIO OUTPUT	
A-C or d-c operation	150 milliwatts
Battery operation	90 milliwatts (75 milliwatts: battery-saver operation)
OPERATING VOLTAGE	117 volts, a.c. or d.c. 1.5-volt "A" battery and 75-volt "B" battery
POWER CONSUMPTION	
A-C or d-c operation	11 watts.
Battery operation	10 ma. from 75-volt "B" Battery (9 ma.: battery-saver operation) 260 ma. from 1.5-volt "A" battery
ANTENNA	Magnecor high-impedance loop with provision for external antenna
INTERMEDIATE FREQUENCY	455 kc.
PHILCO TUBES	1R5 converter, 1U4 i-f amplifier, 1U5 detector-a.v.c. 1st audio, 3V4 output
BATTERY TYPE	P144 "B" battery P77 "A" battery



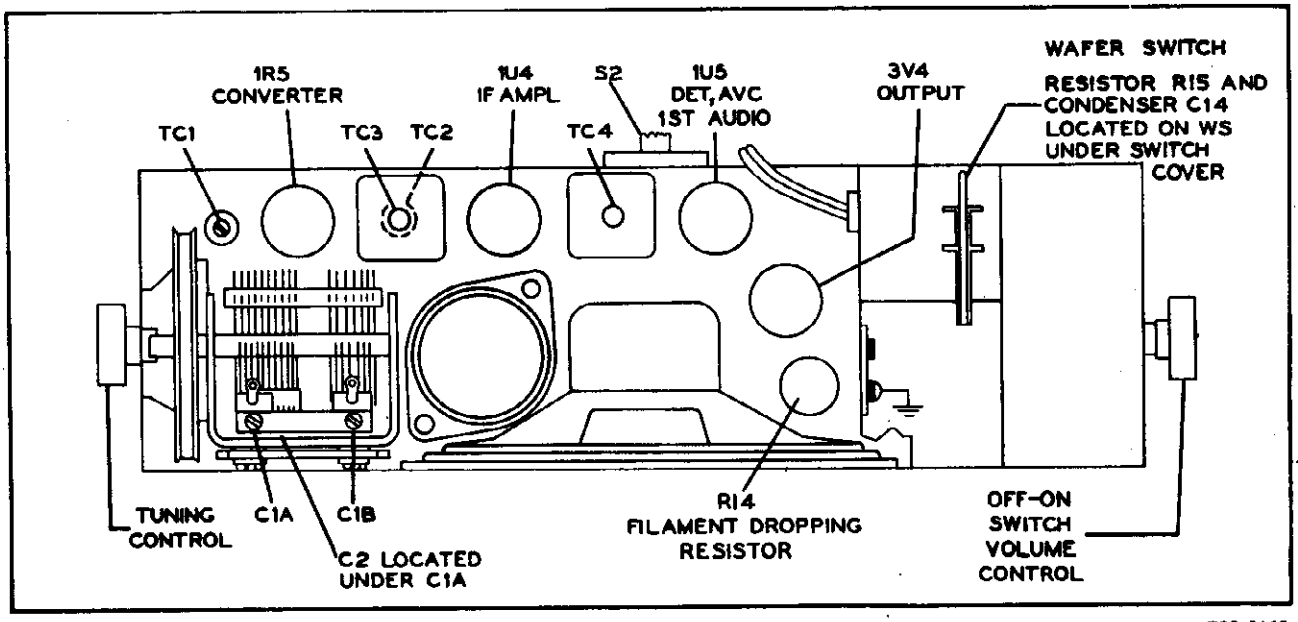
TP2-3223

MODEL 53-652



TP2-32

Figure 1. Dial-Cord Stringing Arrangement



TP2-3168

Figure 2. Top View, Showing Tuning Adjustments

ALIGNMENT PROCEDURE

GENERAL—Allow the set and the test equipment to warm up for fifteen minutes before starting the alignment procedure.

DIAL POINTER—Before proceeding with the alignment, the dial pointer should be set to coincide with the index mark to the extreme left of the dial backplate when the tuning-condenser plates are fully meshed. See figure 4.

OUTPUT INDICATOR—Connect the output indicator (a 1000-ohm-per-volt, a-c voltmeter, or an oscilloscope) across the voice-coil terminals.

SIGNAL GENERATOR—Use an AM r-f signal generator. Connect the ground lead to B–, and connect the output lead as indicated in the alignment chart.

OUTPUT LEVEL—Attenuate the signal-generator output throughout the alignment so as to maintain the output level below .5 volt.

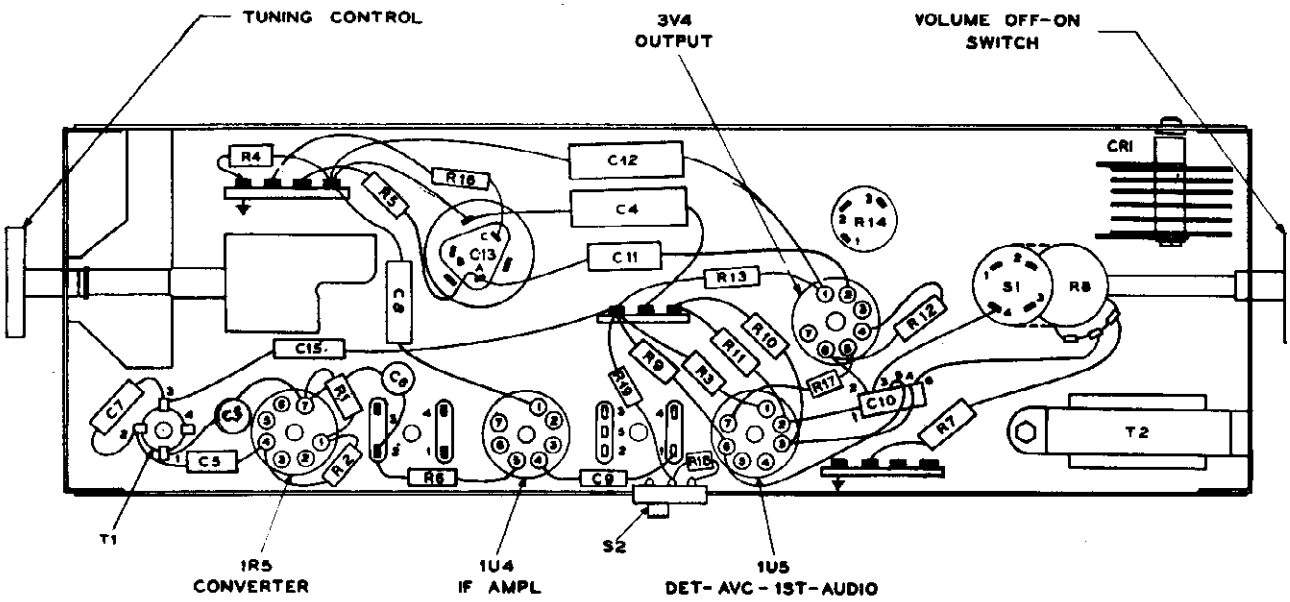
RADIO CONTROLS—Set the volume control to maximum. Set the tuning control as indicated in the alignment chart. During alignment of the radio, the batteries should be in the same position with respect to the chassis and the loop antenna as they normally are in the cabinet. It is recommended that a-c power be used when aligning the radio.

ALIGNMENT CHART

STEP	SIGNAL GENERATOR		RADIO		ADJUST
	CONNECTION TO RADIO	DIAL SETTING	DIAL SETTING	SPECIAL INSTRUCTIONS	
1	Connect signal generator through a .1-μf. condenser to pin 6 (converter grid) of 1R5.	455 kc.	Tuning gang fully open.	Adjust for maximum output in order given.	TC4—2nd i-f sec. TC3—1st i-f sec. TC2—1st i-f pri.
2	Use radiating loop. (See NOTE 1 below.)	1620 kc.	1620 kc. (See NOTE 2 below.)	Adjust for maximum output.	C1B—osc. trimmer
3	Same as step 2.	1400 kc.	1400 kc. (See NOTE 2 below.)	Adjust for maximum output.	C1A—antenna trimmer
4	Same as step 2.	600 kc.	600 kc. (See NOTE 2 below.)	Adjust for maximum output. Rock tuning gang while making this adjustment.	TC1—osc. core
5	Repeat steps 2, 3, and 4 until no further improvement is obtained.				

NOTE 1. Use a 6-to-8-turn, 6-inch-diameter loop made up of insulated wire. Connect to generator terminals, and place about one foot from radio loop.

NOTE 2. The tuning condenser can be set to the proper frequency by turning it until the dial pointer coincides with the respective marks on the dial backplate. See figure 2.



TP2-3167

Figure 3. Base View, Showing Parts Placement

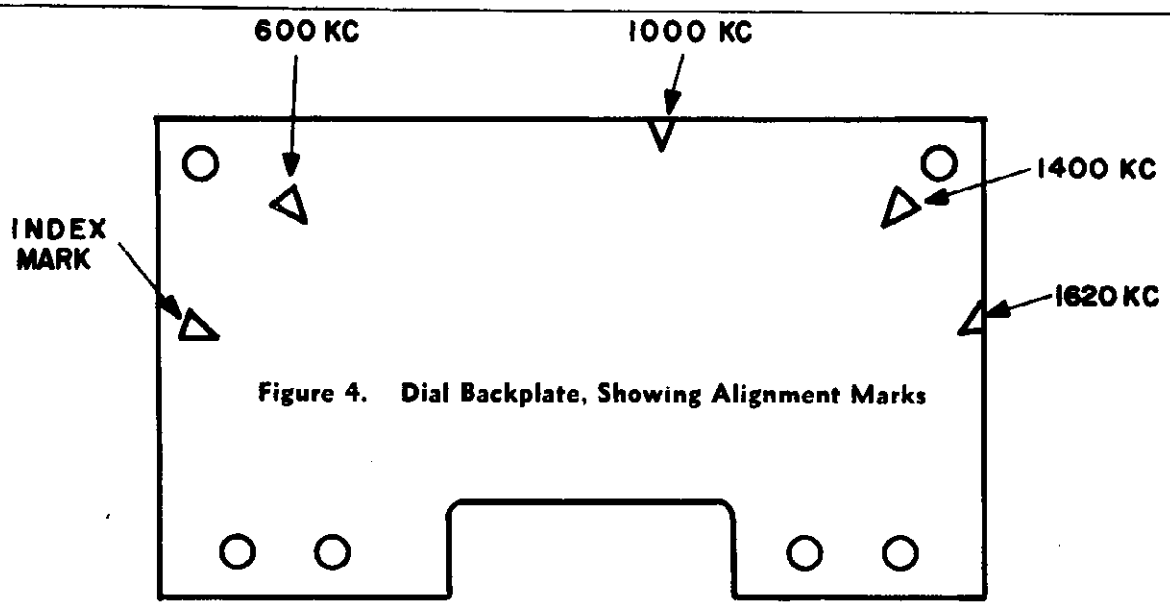
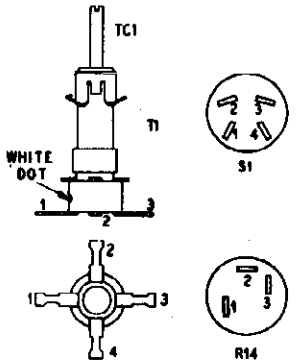
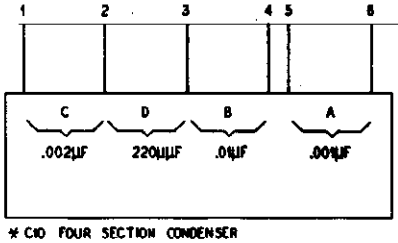


Figure 4. Dial Backplate, Showing Alignment Marks





* C10 FOUR SECTION CONDENSER

TUBE SOCKET VOLTAGES

B SUPPLY	1R5		1U4		1U5		3V4	
	RF PLATE PIN 2	OSC. PLATE PIN 3	PLATE PIN 2	SCREEN PIN 3	PLATE PIN 2	SCREEN PIN 3	PLATE PIN 2	SCREEN PIN 3
PWR LINE (AC OR DC)	90	55	90	90	18	16	86	90
BATTERY	70	41	70	70	17	16	67	70

MODEL 53-652

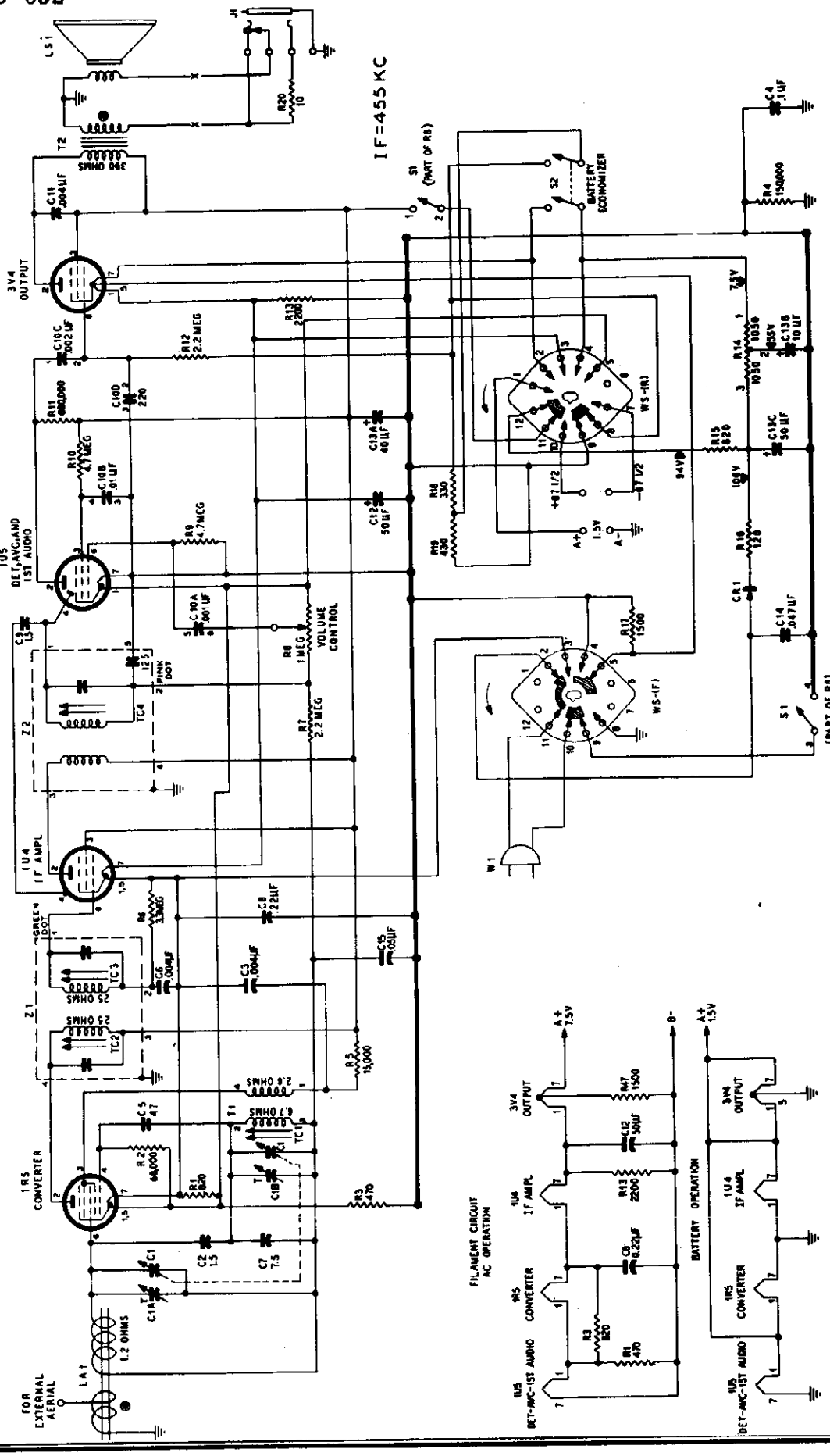
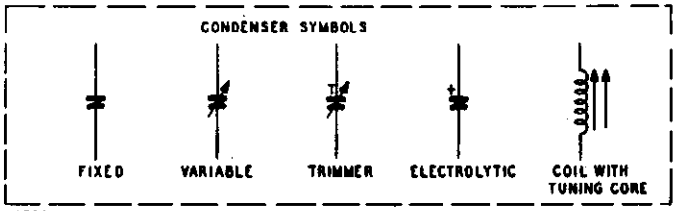


Figure 5. Philco Portable Radio Model 53-652, Schematic Diagram



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–.

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 either be unchanged or improved. When ordering replacements, use only the "Service Part No."

Reference Symbol	Description	Service Part No.
C1	Condenser, tuning gang	31-2735-4
C1A	Condenser, trimmer, antenna	Part of C1
C1B	Condenser, trimmer, oscillator	Part of C1
C2	Condenser, i-f neutralizing, 1.5 μμf.	30-1221-7
C3	Condenser, screen by-pass, .004 μf.	30-1239*
C4	Condenser, B– to chassis, .1 μf.	30-4650-47*
C5	Condenser, d-c blocking, 47 μμf.	60-00475420*
C6	Condenser, grid by-pass, .004 μf.	30-1239*
C7	Condenser, temperature compensating, 7.5 μμf.	30-1224-83
C8	Condenser, filament by-pass, .25 μf.	30-4656-1
C9	Condenser, neutralizing, 1.5 μμf.	30-1221-7
C10	Condenser, audio circuit	30-1237
C10A	Condenser, audio coupling, .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 μμf.	Part of C10
C11	Condenser, tone compensation, .004 μf.	30-4650-56*
C12	Condenser, electrolytic, filament by-pass, 50 μf.	30-2417-12
C13	Condenser, electrolytic, filter	30-2568-39
C13A	Condenser, filter, 40 μf.	Part of C13
C13B	Condenser, filter, 10 μf.	Part of C13
C13C	Condenser, filter, 50 μf.	Part of C13
C14	Condenser, line by-pass, .047 μf.	30-4650-45*
C15	Condenser, a-v-c by-pass, .05 μf.	30-4650-45*
CR1	Rectifier, selenium	34-8003
J1	Private listening unit	42-1975-2
LA1	Coil, antenna	32-4455-9
LS1	Loudspeaker	36-1637
R1	Resistor, filament dropping, 820 ohms	66-1828340*
R2	Resistor, grid leak, 68,000 ohms	66-3688340*
R3	Resistor, cathode bias, 470 ohms	66-1478340*
R4	Resistor, B– to chassis, 150,000 ohms	66-4158340*
R5	Resistor, screen dropping, 15,000 ohms	66-3158340*
R6	Resistor, grid leak, 3.3 megohms	66-5338340*
R7	Resistor, a-v-c load, 2.2 megohms	66-5228340*
R8	Volume control, 1 megohm	33-5566-21
R9	Resistor, grid leak, 4.7 megohms	66-5478340*
R10	Resistor, screen dropping, 4.7 megohms	66-5478340*
R11	Resistor, plate load, 680,000 ohms	66-4688340*
R12	Resistor, grid leak, 2.2 megohms	66-5228340*
R13	Resistor, filament dropping, 2200 ohms	66-2228340*
R14	Resistor, limiting, 2100 ohms	33-3445
R15	Resistor, B+ filter, 820 ohms	66-1828340*
R16	Resistor, limiting, 120 ohms	33-1334-14
R17	Resistor, filament dropping, 1500 ohms	66-215834(
R18	Resistor, battery economizer, 330 ohms	66-133834(
R19	Resistor, battery economizer, 560 ohms	66-156834(
R20	Resistor, private listening unit, 10 ohms	66-010834(
S1	Switch, on-off	Part of R
S2	Switch, battery economizer	42-1796-
T1	Transformer, oscillator	32-4453-
T2	Transformer, output	32-843
W1	Line cord	L 218
WS1	Switch, wafer, battery to line	42-1925-
Z1	Transformer, 1st i-f	32-4160-4
Z2	Transformer, 2nd i-f	32-4454-1

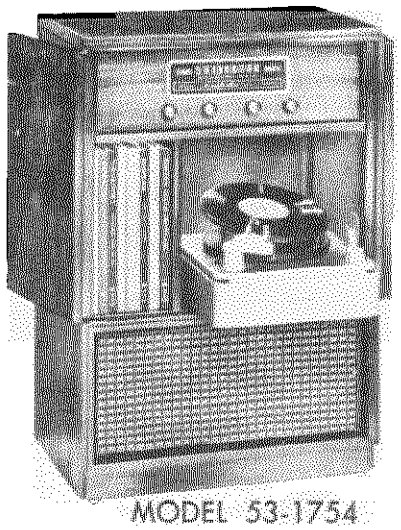
MISCELLANEOUS

Description	Service Part N
Cabinet, light beige	1095-
Back, cabinet, light beige	54-601(
Handle, cabinet, light beige	54-601
Cabinet, spruce green	10954-
Back, cabinet, spruce green	54-6010-
Handle, cabinet, spruce green	54-6012-
Cable, battery	41-3988-
Clip, cabinet back (2)	56-916
Dial scale	56-998
Backplate assembly, dial	76-817
Window, dial	54-601
Drive cord, 25-ft. spool	45-875
Spring, gang drive	56-261
Spring, pointer drive	28-895
Fastener, speaker baffle (2)	W2235-7FA
Hinge, cabinet (2)	56-545
Insulator, tuning-condenser mtg.	27-950
Knobs, (2) light beige or spruce green	54-601
Pointer assembly	76-807
Ring, handle mtg. (2)	56-966
Rubber mount, tuning-condenser mtg. (3)	27-4099-
Shaft, tuning	56-7906FA4
Shield, tube base	56-3978-1FA
Socket, tube (2)	27-620
Socket, tube (2)	27-6203-1
Spring, hairpin, shaft mtg.	28-861
Spring, retaining	57-1868FA1

MODEL 53-1754,

SPECIFICATIONS

CABINET	Wood console, mahogany
CIRCUIT	Five-tube superheterodyne (plus rectifier)
FREQUENCY RANGE	
Broadcast	540 kc. to 1620 kc.
Special Services	1700 kc. to 3400 kc.
AUDIO OUTPUT	4.5 watts
OPERATING VOLTAGE	105—120 volts, a.c.
POWER CONSUMPTION	80 watts
ANTENNA	Built-in, low-impedance loop
INTERMEDIATE FREQUENCY	455 kc.
PHILCO TUBES	6BJ6 r-f ampl; 6BE6 converter, osc., phono preampl; 6BJ6 i-f ampl; 6AV6 detector, a.v.c., 1st audio; 6AQ5 output; 6X4 rectifier



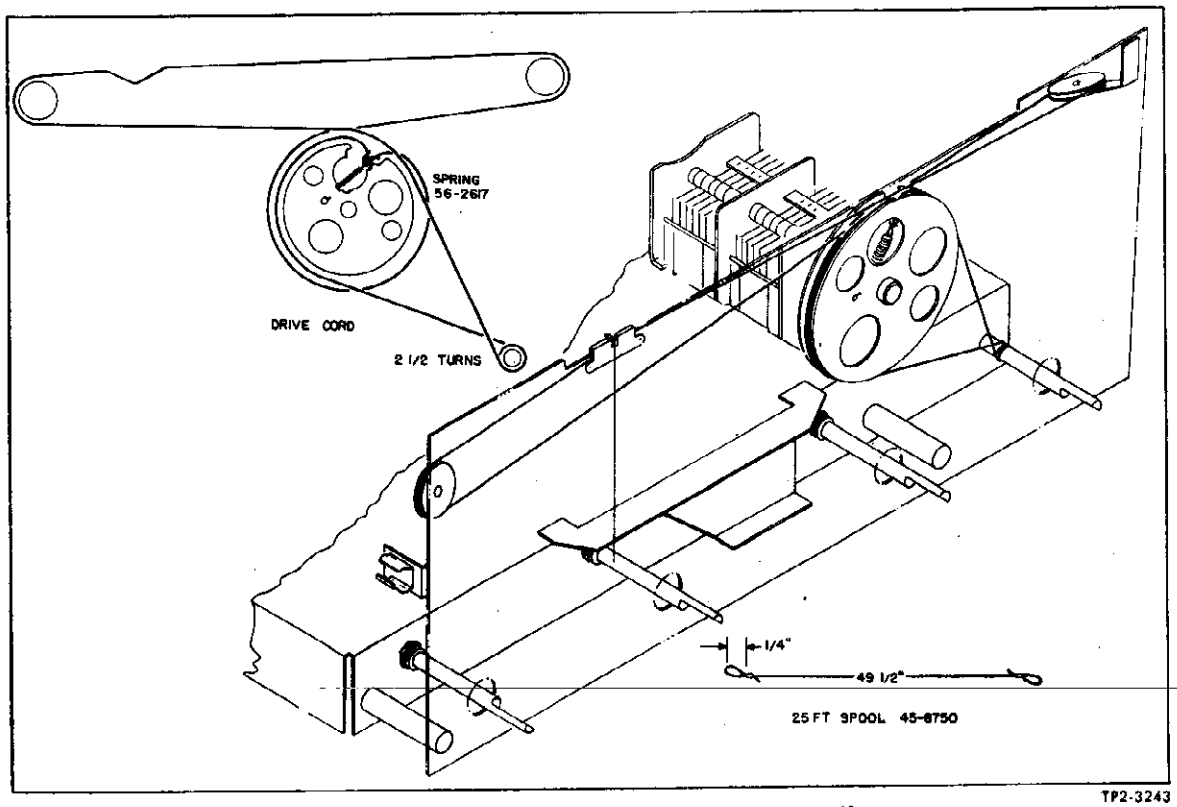


Figure 1. Drive-Cord Installation Details

ALIGNMENT PROCEDURE

GENERAL

RADIO CONTROLS—Set volume control for maximum output, and set tuning control as indicated in the alignment chart. Set band switch to broadcast position for first 5 steps, then to special services position for steps 6 and 7.

OUTPUT INDICATOR—Connect output indicator (either an oscilloscope or a 1000-ohms-per-volt, a-c voltmeter) across voice-coil terminals.

SIGNAL GENERATOR—Use an AM r-f generator, connected as indicated in the alignment chart.

OUTPUT LEVEL—During alignment, attenuate signal-generator output to maintain output indication below 1 volt.

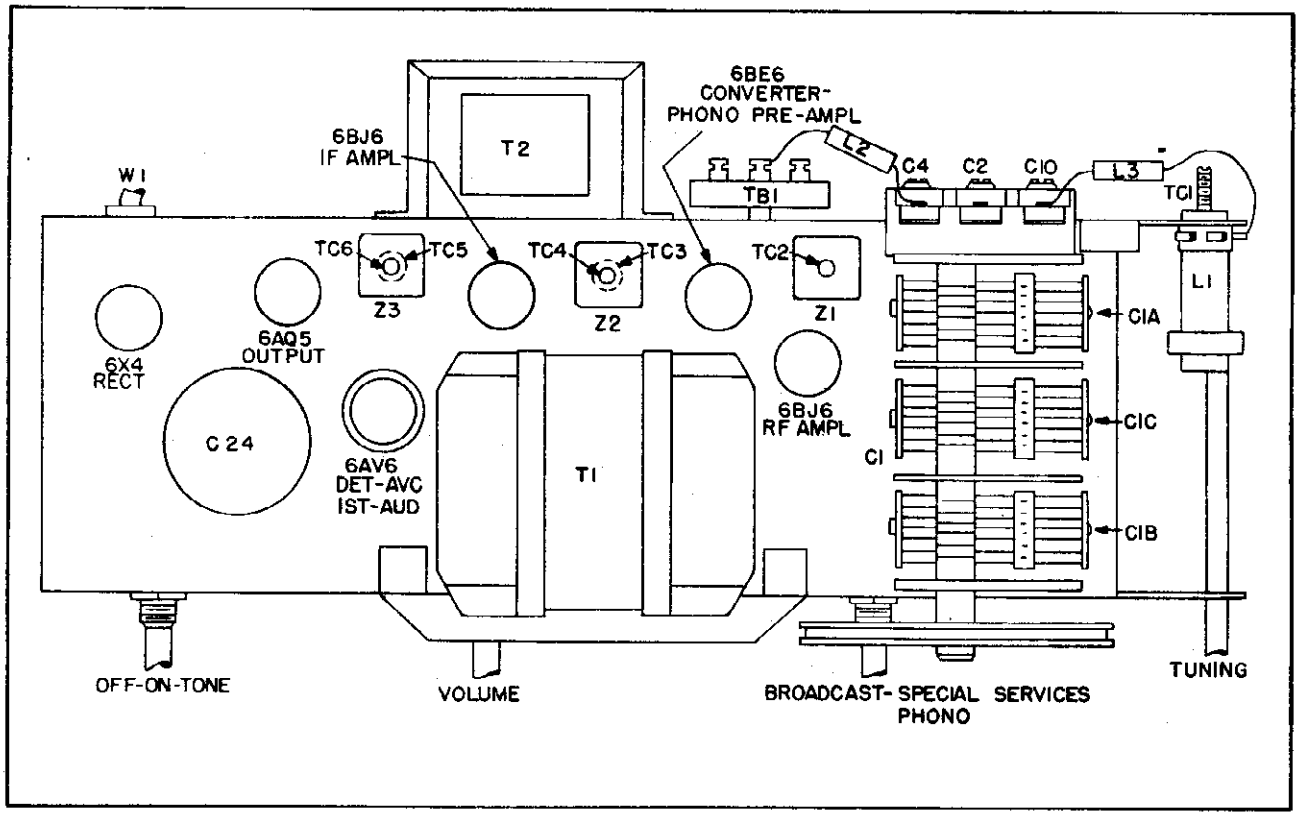
DIAL POINTER—Before the alignment is started, the dial pointer should be set to coincide with the dial scale mark to the left of "55" when the tuning gang is fully meshed.

ALIGNMENT CHART

	SIGNAL GENERATOR		RADIO		
STEP	CONNECTION TO RADIO	DIAL SETTING	DIAL SETTING	SPECIAL INSTRUCTIONS	ADJUST
1	Ground lead to chassis. Output lead through a .01-μf. condenser to pin 7 (mixer grid) of 6BE6, converter.	455 kc.	Tuning gang fully open.	Adjust, in order given in next column, for maximum output.	TC6—2nd i-f sec. TC3—1st i-f pri. TC5—2nd i-f pri. TC4—1st i-f sec.
2	Radiating loop. See Note 1 below.	1620 kc.	1620 kc. See Note 2 below.	Adjust for maximum output.	C1C—osc. trimmer
3	Same as step 2.	1520 kc.	Tune radio to generator signal.	Adjust for maximum output. (High-frequency adjustment)	C1B—mixer-grid trimmer C1A—r-f trimmer
4	Same as step 2.	580 kc.	Same as step 3.	Adjust for maximum output. (Low-frequency adjustment)	TC2—r-f transformer
5	Repeat steps 3 and 4 until no further improvement is obtained.				
6	Same as step 2.	3200 kc.	Same as step 3.	Adjust for maximum output.	C10—special services mixer-grid trimmer C4—special services r-f trimmer
7	Same as step 2.	1800 kc.	Same as step 3.	Adjust for maximum output.	C2—special services r-f padder

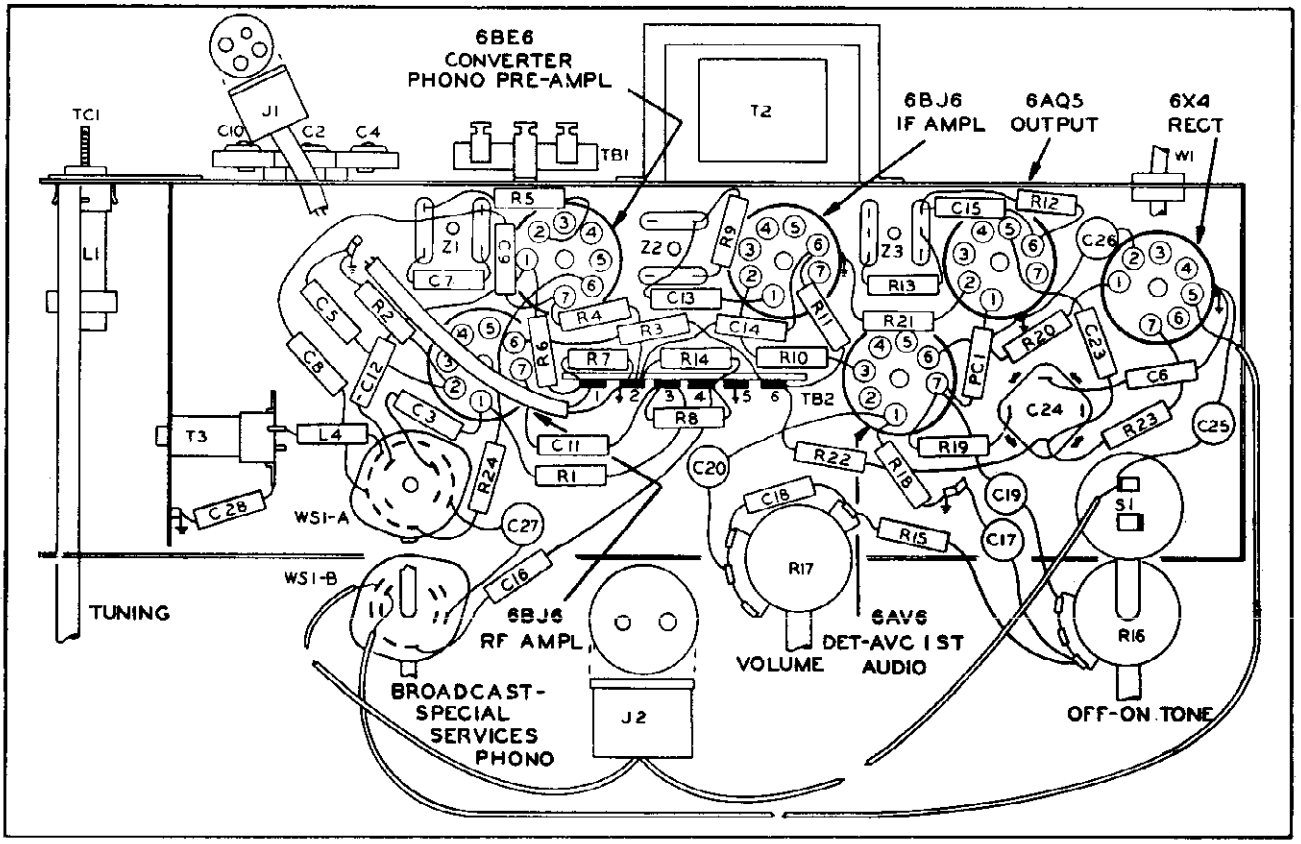
NOTE 1: Make up a 6–8 turn, 6-inch-diameter loop from insulated wire; connect to signal-generator leads and place about 1 foot from radio loop antenna. The position of the radio loop with respect to the chassis should be approximately the same as when both are mounted in the cabinet.

NOTE 2: To set the tuning gang to 1620 kc., place a piece of 6-mil flat shim stock beneath the heel of the rotor, and turn the rotor until it holds the shim firmly in place. Then remove the shim.



TP2-3245

Figure 2. Top View, Showing Tuning Adjustments



TP2-3244

Figure 3. Base View, Showing Parts Placement

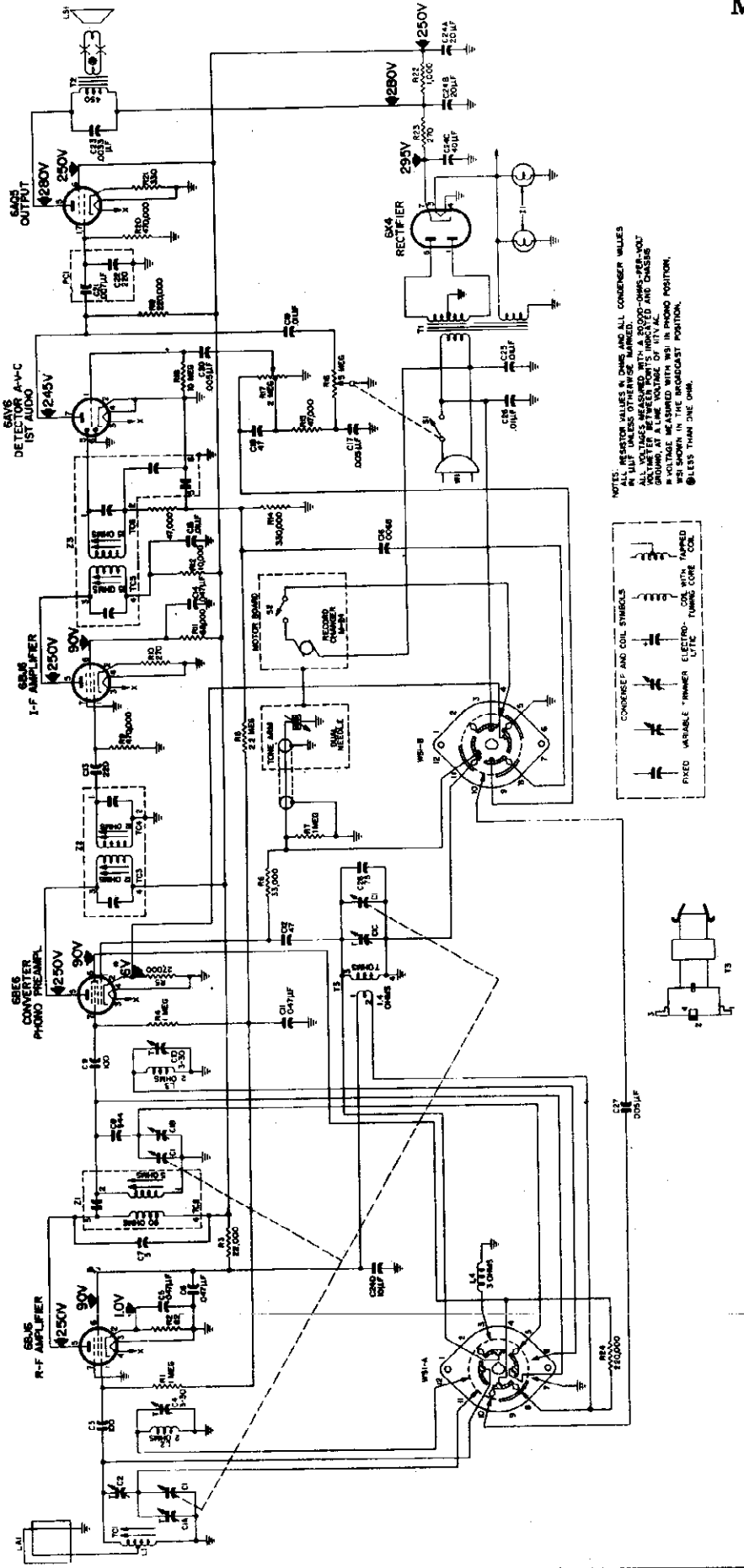


Figure 4. Philco Radio-Phonograph Model 53-1754, Schematic Diagram

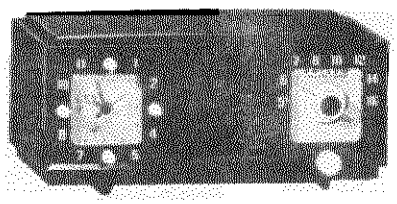
PARTS LIST

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 unchanged. When ordering replacements, use only the "Service Part No."

Reference Symbol	Description	Service Part No.
C1	Condenser, tuning gang, 3-section	31-2771-3
C1A	Condenser, trimmer, antenna	Part of C1
C1B	Condenser, trimmer, r-f	Part of C1
C1C	Condenser, trimmer, oscillator	Part of C1
C2	Condenser, padder, special services r-f	Part of CA1
C3	Condenser, d-c blocking, 100 μμf.	62-110001001*
C4	Condenser, trimmer, special services r-f	Part of CA1
C5	Condenser, cathode by-pass, .047 μf.	30-4650-45
C6	Condenser, screen by-pass, .047 μf.	30-4650-45
C7	Condenser, r-f by-pass, 5 μμf.	60-90505020
C8	Condenser, fixed padder, 944 μμf.	30-1220-65
C9	Condenser, d-c blocking, 100 μμf.	62-110001001*
C10	Condenser, trimmer, special services mixer-grid	Part of CA1
C11	Condenser, a-v-c by-pass, .047 μf.	30-4650-45*
C12	Condenser, oscillator coupling, 47 μμf.	60-00475417
C13	Condenser, i-f coupling, 220 μμf.	62-122001001*
C14	Condenser, screen by-pass, .047 μf.	30-4650-45*
C15	Condenser, plate by-pass, .01 μf.	30-1238-2*
C16	Condenser, audio coupling, .0068 μf.	30-4650-57
C17	Condenser, tone compensation (bass boost), .005 μf.	30-1238-1*
C18	Condenser, tone compensation, 47 μμf.	60-00475417
C19	Condenser, tone compensation (high cut) .01 μf.	30-1238-2*
C20	Condenser, audio coupling, .005 μf.	30-1238-1*
C21	Condenser, d-c blocking, .007 μf.	Part of PC1
C22	Condenser, r-f by-pass, 220 μμf.	Part of PC1
C23	Condenser, tone compensation, .0033 μf.	30-4650-89*
C24	Condenser, electrolytic filter	30-2584-32
C24A	Condenser, filter, 20 μf.	Part of C24
C24B	Condenser, filter, 20 μf.	Part of C24
C24C	Condenser, filter, 40 μf.	Part of C24
C24D	Condenser, filter, 10 μf.	Part of C24
C25	Condenser, line by-pass, .01 μf.	30-1238-2
C26	Condenser, line by-pass, .01 μf.	30-1238-2
C27	Condenser, audio coupling (phono), .005 μf.	30-1238-1
C28	Condenser, fixed trimmer, 7.5 μμf.	30-1224-65
CA1	Condenser assembly, trimmer	31-6477-17
I1	Lamp assembly, pilot (2)	27-6233-4
J1	Connector, phono input	76-8262-1
J2	Connector, phono a-c	76-8366
L1	Coil, antenna	32-4413-2
L2	Coil, special services r-f	32-4561-5
L3	Coil, special services mixer grid	32-4561-5
L4	Coil, oscillator shunt	32-4562-1
LA1	Loop antenna	32-4394-13
LS1	Speaker (10")	36-1610-6
PC1	Printed circuit	30-1239-4
R1	Resistor, r-f a-v-c, 1 megohm	66-5108340*
R2	Resistor, cathode bias, 82 ohms	66-0828340*
R3	Resistor, screen dropping, 22,000 ohms	66-3225340*
R4	Resistor, grid leak, 1 megohm	66-5108340
R5	Resistor, cathode bias, 27,000 ohms	66-3278340*
R6	Resistor, oscillator grid leak, 33,000 ohms	66-3338340*
R7	Resistor, load (phono), 1 megohm	66-5108340*
R8	Resistor, a-v-c load, 2.2 megohms	66-5228340*
R9	Resistor, grid leak, 470,000 ohms	66-4478340*
R10	Resistor, cathode bias, 270 ohms	66-1275340*
R11	Resistor, screen dropping, 68,000 ohms	66-3688340*
R12	Resistor, plate dropping, 10,000 ohms	66-3108340*
R13	Resistor, i-f filter, 47,000 ohms	66-3478340*
R14	Resistor, diode load, 330,000 ohms	66-4338340*
R15	Resistor, tone compensation (bass boost)	66-3478340*
R16	Resistor, tone control, 5 megohms	33-5566-48
R17	Resistor, volume control, 2 megohms	33-5535-36
R18	Resistor, grid leak, 10 megohms	66-6108340*
R19	Resistor, plate load, 220,000 ohms	66-4228340*
R20	Resistor, grid leak, 470,000 ohms	66-4478340*
R21	Resistor, cathode bias, 330 ohms, 1 watt	66-1334340*
R22	Resistor, B+ filter, 1000 ohms	66-2105340*
R23	Resistor, B+ filter, 270 ohms	66-1275340*
R24	Resistor, plate load, preampl., 220,000 ohms	66-4228340*
S1	Switch, off-on	Part of R16
S2	Switch, off-on, phono motor	Part of M-24 Record Changer
T1	Transformer, power	32-8610
T2	Transformer, output	32-8242-13
T3	Transformer, oscillator	32-4453-2
W1	Line cord	12183*
WS1	Switch, band	42-1997
Z1	Transformer, r-f	32-4399-7A
Z2	Transformer, 1st i-f	32-4160A
Z3	Transformer, 2nd i-f	32-4240A

MISCELLANEOUS

Description	Service Part No.
Cabinet	10985
Back	54-8932
Dome (4)	45-6190
Door pull (2)	56-7062-1
Hinge, right hand (2)	56-9922
Hinge, left hand (2)	56-9922-1
Bullet catch (2)	45-6002
Strike plate (2)	45-6003
Changer frame ass'y.	76-6600-2
Rail ass'y., r.h. (changer drawer)	76-6597
Rail ass'y., l.h. (changer drawer)	76-6258
Spring, changer mtg. (3)	56-7059FA9
Spring, changer mtg. (3)	56-7059-1FCP
Sleeve, changer mtg. (3)	54-7798
Pull knob, changer drawer	56-8496
Frame ass'y.	45-9790
Dial backplate ass'y.	76-8321
Dial scale	54-5184
Clip, scale	56-4756FE11
Knob (3)	54-4718-20
Knob	54-4718-21
Spring, shaft retaining	28-8610
Pointer	56-5630-57
Socket (5)	27-6275
Socket (6AV6)	27-6203-14
Rubber mount, gang mounting	27-4596
Tube shield	56-5629FA3



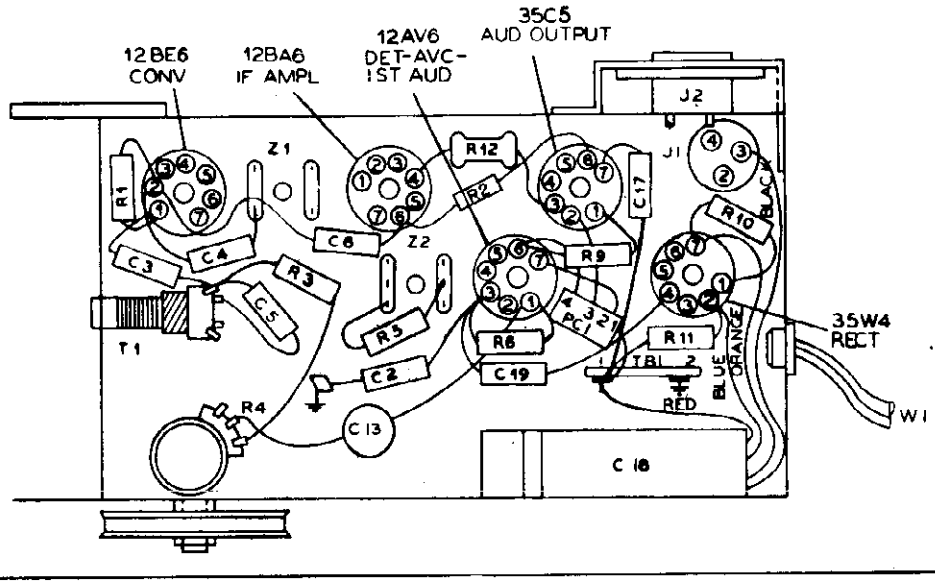
TP2-3233

MODEL 53-701X

SPECIFICATIONS

CABINET .....Molded phenolic
CIRCUIT .....Four-tube superheterodyne (plus rectifier)
FREQUENCY RANGE .....540—1620 kc.
AUDIO OUTPUT .....1 watt
OPERATING VOLTAGE .....117 volts, a.c.
POWER CONSUMPTION .....30 watts
ANTENNA .....High-impedance loop
INTERMEDIATE FREQUENCY .....455 kc.
PHILCO TUBES .....12BE6, converter; 12BA6, i-f amplifier; 12AV6, det.—a.v.c.—1st audio; 35C5, output; 35W4, rectifier

NOTE: The antenna is mounted on the cabinet back. When removing the cabinet back, use care to avoid breaking the antenna leads.



P2-3231

Figure 1. Base View, Showing Parts Placement

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.

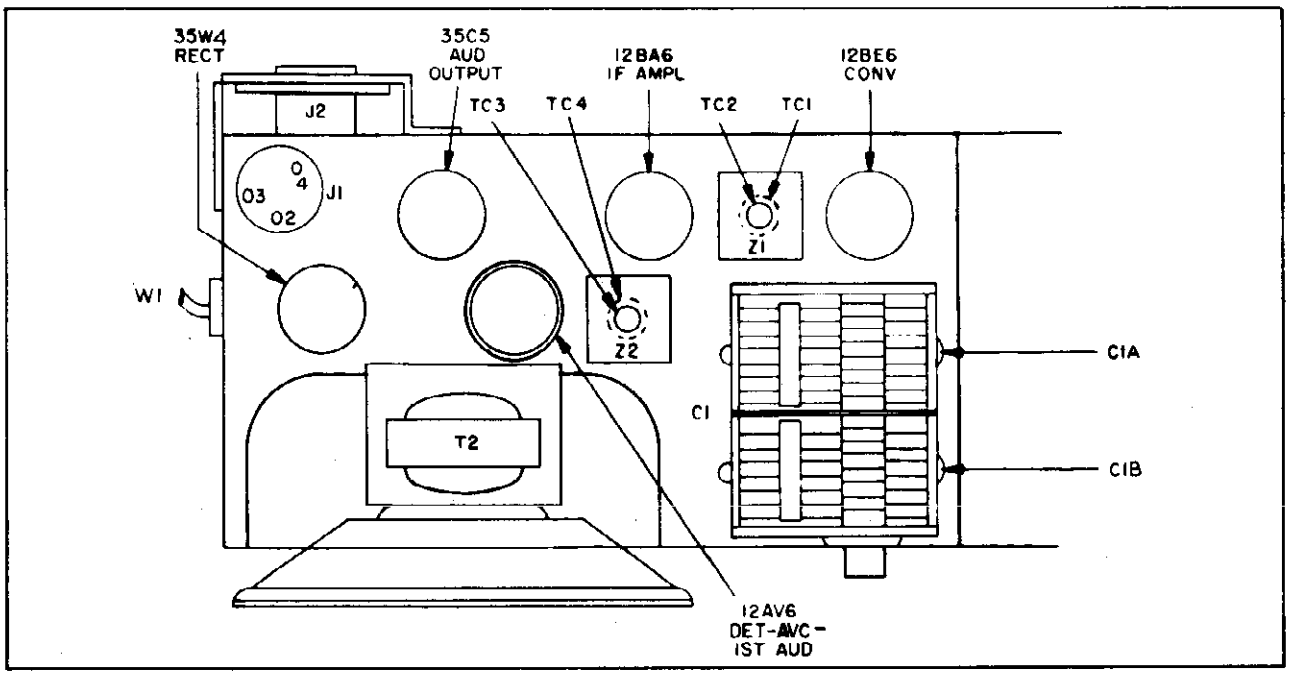
ALIGNMENT CHART

STEP	SIGNAL GENERATOR		RADIO		ADJUST
	CONNECTION TO RADIO	DIAL SETTING	DIAL SETTING	SPECIAL INSTRUCTIONS	
1	Ground lead to B−; output lead through a .1-μf. condenser to grid (pin 7) of 12BE6.	455 kc.	Tuning gang fully open.	Adjust tuning cores, in order given, for maximum output. (TC1 and TC3 are located at top of transformers.)	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).	1620 kc.	1620 kc.*	Adjust trimmer for maximum output.	C1B—osc.
3	Same as step 2.	1500 kc.	1500 kc.†	Adjust trimmer for maximum output.	C1A—antenna

NOTE: Make a 6—8 turn, 6-inch-diameter loop from insulated wire; connect to signal-generator leads, and place about 1 foot from radio loop. The position of the radio loop with respect to the chassis should be approximately the same as when both are mounted in the cabinet.

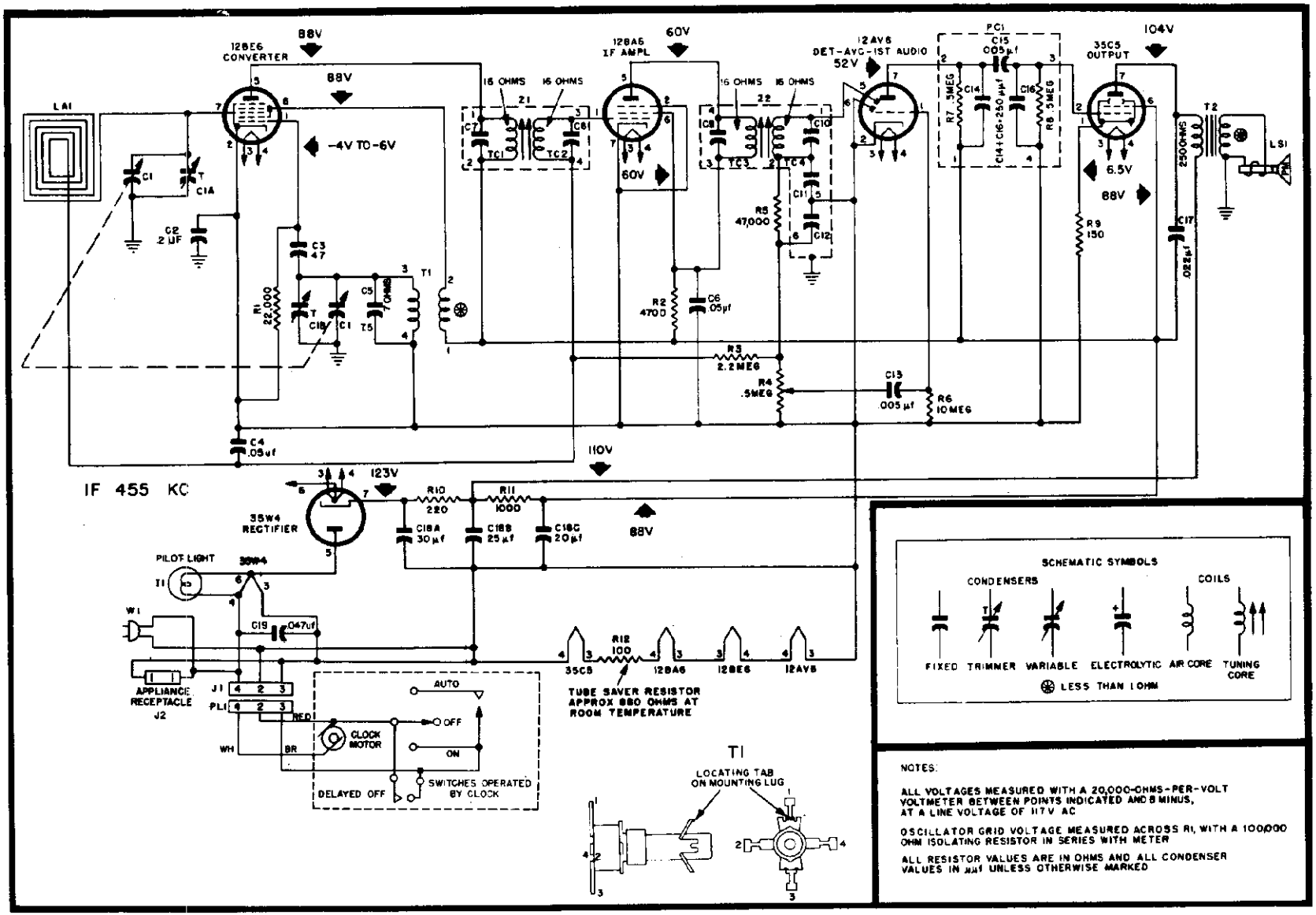
* To set the tuning gang to 1620 kc., fully open the gang and insert a .006-inch, nonmetallic shim between the heel of the rotor and the top of the stator plates. Close the gang sufficiently to hold the shim in place, and then remove the shim without disturbing the gang setting.

† To set the radio to 1500 kc., place chassis in cabinet, attach knob to indicate previous setting of 1620 kc., and tune until pointer indicates 1500 kc. Then remove knob and take chassis from cabinet without disturbing gang setting.



TP2-3232

Figure 2. Top View, Showing Tuning Adjustments



TP2-3230

Figure 3. Philco Radio-Clock Model 53-701X, Schematic Diagram

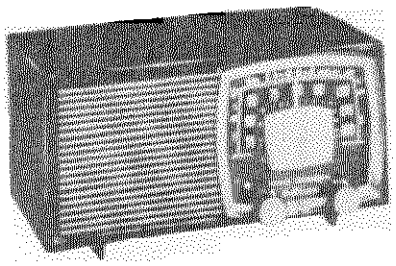
PARTS LIST

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	31-2751-13
C1A	Condenser, r-f trimmer	Part of C1
C1B	Condenser, oscillator trimmer	Part of C1
C2	Condenser, B– to chassis, .2 μf.	30-4650-49
C3	Condenser, oscillator grid, 47 μμf.	30-1230-4
C4	Condenser, a-v-c by-pass, .05 μf.	30-4650-45*
C5	Condenser, drift compensation, 7.5 μμf.	30-1224-83
C6	Condenser, screen by-pass, .05 μf.	30-4650-45*
C7	Condenser, i-f tuning	Part of Z1
C8	Condenser, i-f tuning	Part of Z1
C9	Condenser, i-f tuning	Part of Z2
C10	Condenser, i-f tuning	Part of Z2
C11	Condenser, detector filtering	Part of Z2
C12	Condenser, detector filtering	Part of Z2
C13	Condenser, audio coupling, .005 μf.	30-1238-1
C14	Condenser, plate by-pass	Part of PC1
C15	Condenser, audio coupling, .005 μf.	Part of PC1
C16	Condenser, compensating	Part of PC1
C17	Condenser, tone compensation, .022μf.	30-4650-43*
C18	Condenser, electrolytic, 3-section	30-2573
C18A	Condenser, filter, 30 μf., 150v	Part of C18
C18B	Condenser, filter, 25 μf., 150v	Part of C18
C18C	Condenser, filter, 20 μf., 150v	Part of C18
C19	Condenser, line by-pass, .047 μf.	30-4650-45*
I1	Lamp, pilot	34-2068
J1	Jack, clock	27-6273
J2	Jack, appliance receptacle, a-c	76-3931
LA1	Loop	Part of cabinet back
LS1	Speaker, p-m	36-1627-8
PC1	Printed circuit	30-6001
PL1	Plug, clock assembly	27-6273
R1	Resistor, oscillator grid, 22,000 ohms	66-3228340*
R2	Resistor, i-f screen dropping, 4700 ohms	66-2478340*
R3	Resistor, a-v-c filter, 2.2 megohms	66-5228340*
R4	Resistor, volume control, .5 megohm	33-5566-41
R5	Resistor, diode load, 47,000 ohms	66-3478340*
R6	Resistor, grid return, 10 megohms	66-6108340
R7	Resistor, plate load, 500,000 ohms	Part of PC1
R8	Resistor, grid return, 500,000 ohms	Part of PC1
R9	Resistor, cathode bias, 150 ohms	66-1158340*
R10	Resistor, B plus filter, 220 ohms, 1 watt	66-1224340*
R11	Resistor, B plus filter, 1000 ohms	66-2108340*
R12	Resistor, tube saver, 100 ohms	33-1343-3
T1	Transformer, oscillator	33-4453-6
T2	Transformer, output	32-8384*
W1	Line cord	L2183*
Z1	Transformer, 1st i-f	32-4161A
Z2	Transformer, 2nd i-f	32-4240A

MISCELLANEOUS

Description	Service Part No.
Cabinet	10924-6
Knobs	
Clock (4 required)	54-4983
Station selector	54-4978
Off-on	54-4118
Clock	41-2041-1
Back-and-loop assembly	76-7757-3
Shield, tube	56-5629FA3
Clip, pilot lamp	W2563FA3
Socket, miniature (5 required)	27-6265*
Socket assembly, pilot lamp	27-6233-6
Window, radio dial	54-4977-2



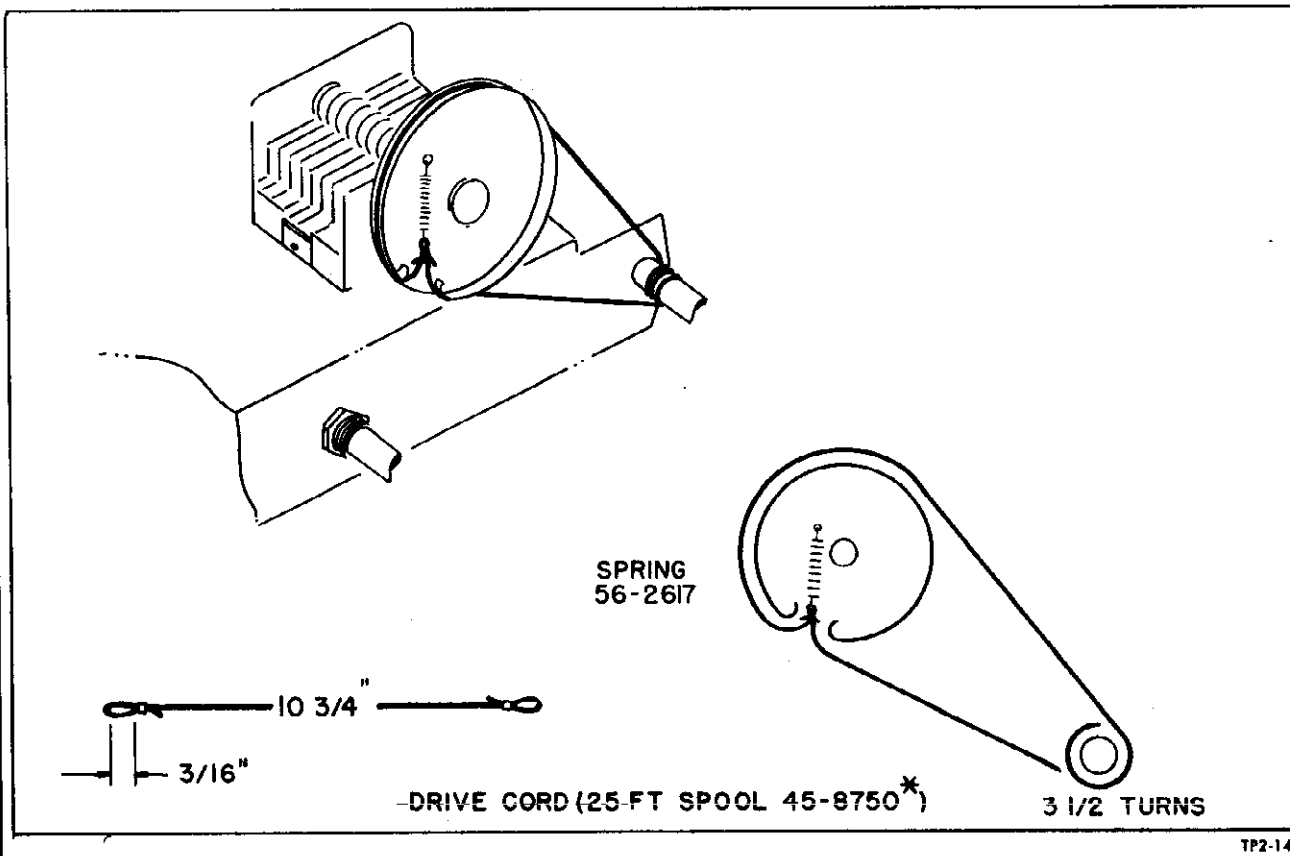
TP2-3248

MODEL 53-565

SPECIFICATIONS

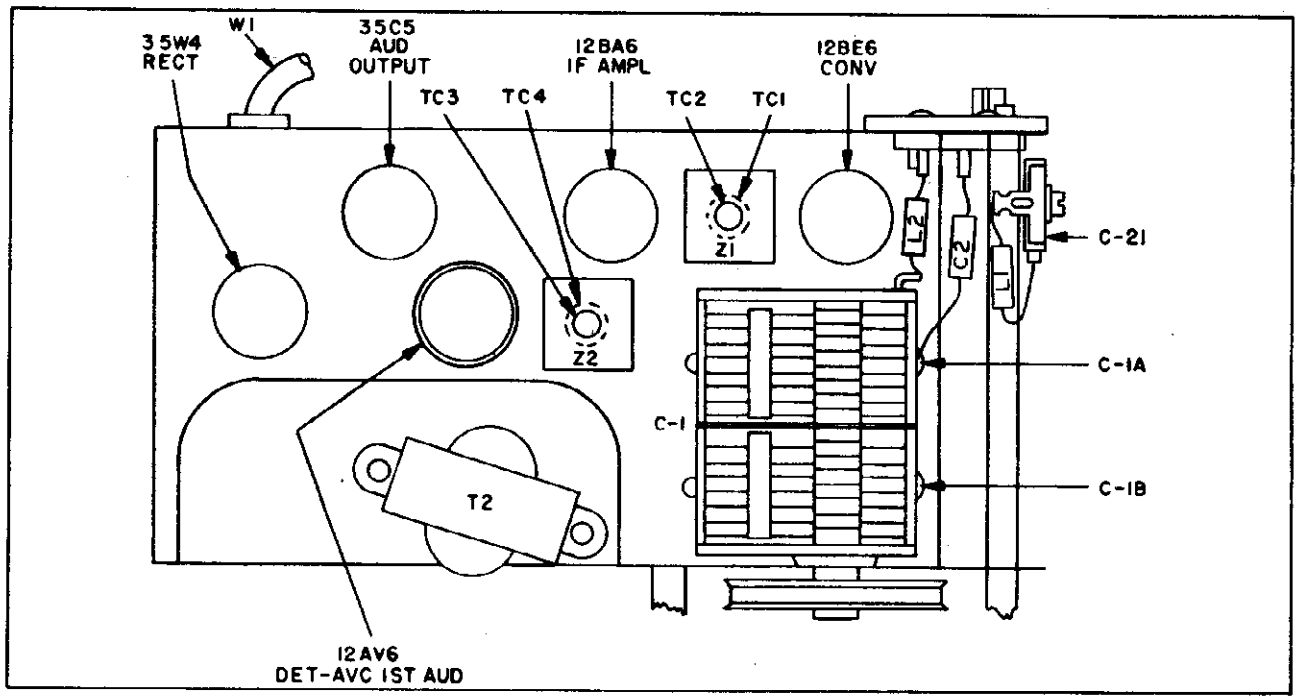
CABINET	Molded plastic
CIRCUIT	Four-tube superheterodyne (plus rectifier)
FREQUENCY RANGE	
Standard Broadcast	540 kc. to 1620 kc.
Special Services	1700 kc. to 3400 kc.
AUDIO OUTPUT	1 watt
OPERATING VOLTAGE	105 to 120 volts, a.c. or d.c.
POWER CONSUMPTION	30 watts
ANTENNA	High-impedance loop
INTERMEDIATE FREQUENCY	455 kc.
PHILCO TUBES	12BE6, converter; 12BA6, i-f amplifier; 12AV6, det.—a.v.c.—1st audio; 35C5, output; 35W4, rectifier

Note: The antenna is mounted on the cabinet back. When removing the cabinet back, use care to avoid breaking the antenna leads.



TP2-14

Figure 1. Dial-Cord Installation Details



TP2-1407

Figure 2. Top View, Showing Tuning Adjustments

ALIGNMENT PROCEDURE

RADIO CONTROLS—Set volume control to maximum. Set tuning control and band switch, SW1, 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.

ALIGNMENT CHART

STEP	SIGNAL GENERATOR		RADIO			ADJUST
	CONNECTION TO RADIO	DIAL SETTING	DIAL SETTING	BAND-SWITCH SETTING	SPECIAL INSTRUCTIONS	
1	Ground lead to B—; output lead through a .1-μf. condenser to grid (pin 7) of 12BE6.	455 kc.	Tuning gang fully open.	Broadcast	Adjust tuning cores, in order given, for maximum output. (TC1 and TC3 are located at top of transformers.)	TC4—2nd i-f sec. TC3—2nd i-f pri. TC2—1st i-f sec. TC1—1st i-f pri.
2	Use radiating loop (see NOTE below).	1620 kc.	*1620 kc.	Broadcast	Adjust trimmer for maximum output.	C1B—osc.
3	Same as step 2.	1500 kc.	†1500 kc.	Broadcast	Adjust trimmer for maximum output.	C1A—antenna (broadcast)
4	Same as step 2.	3200 kc.	†3200 kc.	Special services	Adjust trimmer for maximum output.	C21—antenna (special services)

NOTE: Make up a 6—8 turn, 6-inch-diameter loop from insulated wire; connect to signal-generator leads and place about 1 foot from radio loop. The position of the radio loop with respect to the chassis should be approximately the same as when both are mounted in the cabinet.

* To set the tuning gang to 1620 kc., fully open the gang and insert a .006-inch nonmetallic shim between the heel of the rotor and the top of the stator plates. Close the gang sufficiently to hold the shim in place, and then remove the shim without disturbing the gang setting.

† To set the tuning gang to this frequency, put the chassis into the cabinet, tune the dial until it indicates the proper frequency on the dial scale, and then remove the chassis from the cabinet without disturbing the gang setting.

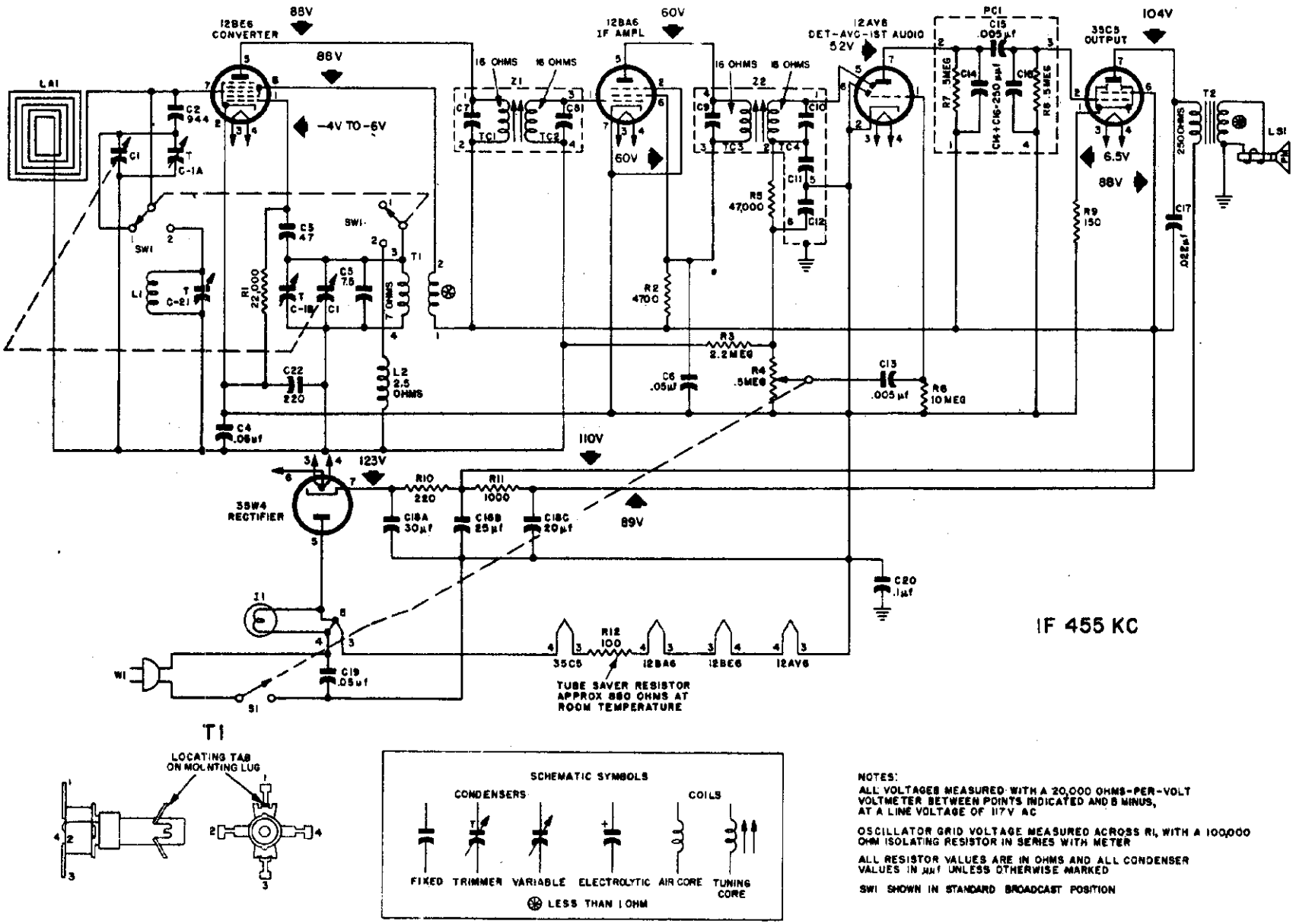
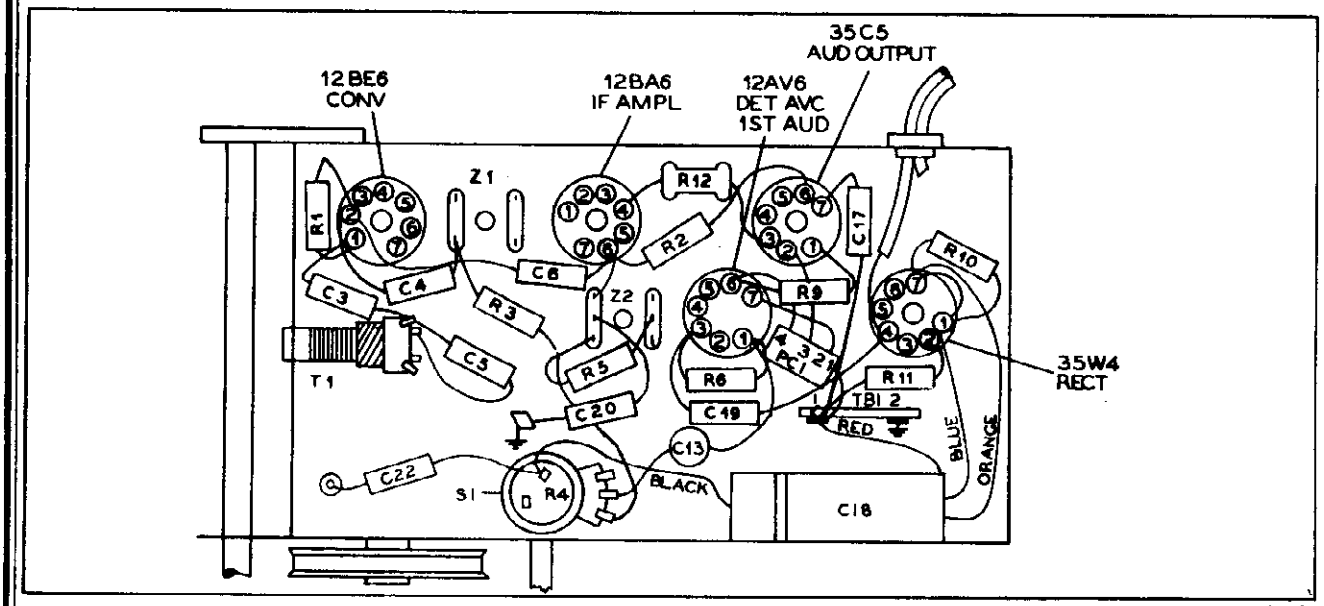


Figure 3. Philco Radio Model 53-565, Schematic Diagram



TP2-1406

Figure 4. Base View, Showing Parts Placement

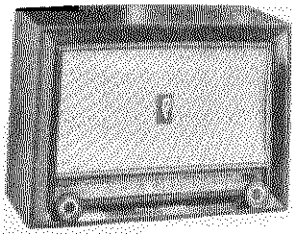
PARTS LIST

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 unchanged. When ordering replacements, use only the "Service Part No."

Reference Symbol	Description	Service Part No.
C1	Condenser, tuning gang	31-2751-14
C1A	Condenser, antenna trimmer	Part of C1
C1B	Condenser, osc. trimmer	Part of C1
C2	Condenser, antenna series tracker, 944 μμf.	30-1220-65
C3	Condenser, oscillator grid, 47 μf.	30-1230-4
C4	Condenser, a-v-c by-pass, .05 μf.	30-4650-45*
C5	Condenser, drift compensation, 7.5 μμf.	30-1224-83
C6	Condenser, screen by-pass, .05 μf.	30-4650-45*
C7	Condenser, i-f tuning	Part of Z1
C8	Condenser, i-f tuning	Part of Z1
C9	Condenser, i-f tuning	Part of Z2
C10	Condenser, i-f tuning	Part of Z2
C11	Condenser, detector filtering	Part of Z2
C12	Condenser, detector filtering	Part of Z2
C13	Condenser, audio coupling, .005 μf.	30-1238-1
C14	Condenser, plate by-pass	Part of PC1
C15	Condenser, audio coupling, .005 μf.	Part of PC1
C16	Condenser, compensating	Part of PC1
C17	Condenser, tone compensation, .022 μf.	30-4650-43*
C18	Condenser, electrolytic, 3-section	30-2575-34
C18A	Condenser, filter, 30 μf., 150v	Part of C18
C18B	Condenser, filter, 25 μf., 150v	Part of C18
C18C	Condenser, filter, 20 μf., 150v	Part of C18
C19	Condenser, line by-pass, .05 μf.	30-4650-45*
C20	Condenser, B- to chassis, .1 μf.	30-4650-47*
C21	Condenser, trimmer, special services	31-6473-29
I1	Lamp, pilot	34-2068
LA1	Loop, antenna	Part of cabinet back
L1	Coil, antenna, special services	32-4561-3
L2	Coil, oscillator shunt	32-4562-2
LS1	Speaker, p-m	36-1625-3
PC1	Printed circuit	30-6001
R1	Resistor, oscillator grid, 22,000 ohms	66-3228340*
R2	Resistor, i-f screen dropping, 4700 ohms	66-2478340*
R3	Resistor, a-v-c filter, 2.2 megohms	66-5228340*
R4	Resistor, volume control	33-5566-41
R5	Resistor, diode load, 47,000 ohms	66-3478340*
R6	Resistor, grid return, 10 megohms	66-6108340*
R7	Resistor, plate load, 500,000 ohms	Part of PC1
R8	Resistor, grid return, 500,000 ohms	Part of PC1
R9	Resistor, cathode bias, 150 ohms	66-1158340*
R10	Resistor, B plus filter, 220 ohms	66-1224340*
R11	Resistor, B plus filter, 1000 ohms	66-2108340*
R12	Resistor, tube saver, 100 ohms	33-1343-3
S1	Switch, off-on	Part of R4
SW1	Switch, broadcast-special services	42-1796-2
T1	Transformer, oscillator	32-4453-6
T2	Transformer, output	32-8384-4
W1	Line cord	L-2183*
Z1	Transformer, 1st i-f	32-4161A
Z2	Transformer, 2nd i-f	32-4240A

MISCELLANEOUS

Description	Service Part No.
Cabinet	
Spruce	10927-4
Ebony	10927
Back-and-loop assembly	76-7769
Knob (2)	54-4982-1
Drive cord, 25-foot spool	45-8750*
Pointer, dial	54-4979
Shaft, tuning	56-9807FA11
Socket assembly, pilot lamp	27-6233-6
Socket, 7-pin miniature	27-6265*
Socket (12AV6)	27-6203-14*
Spring, retaining	28-8610
Spring, dial cord	56-2617

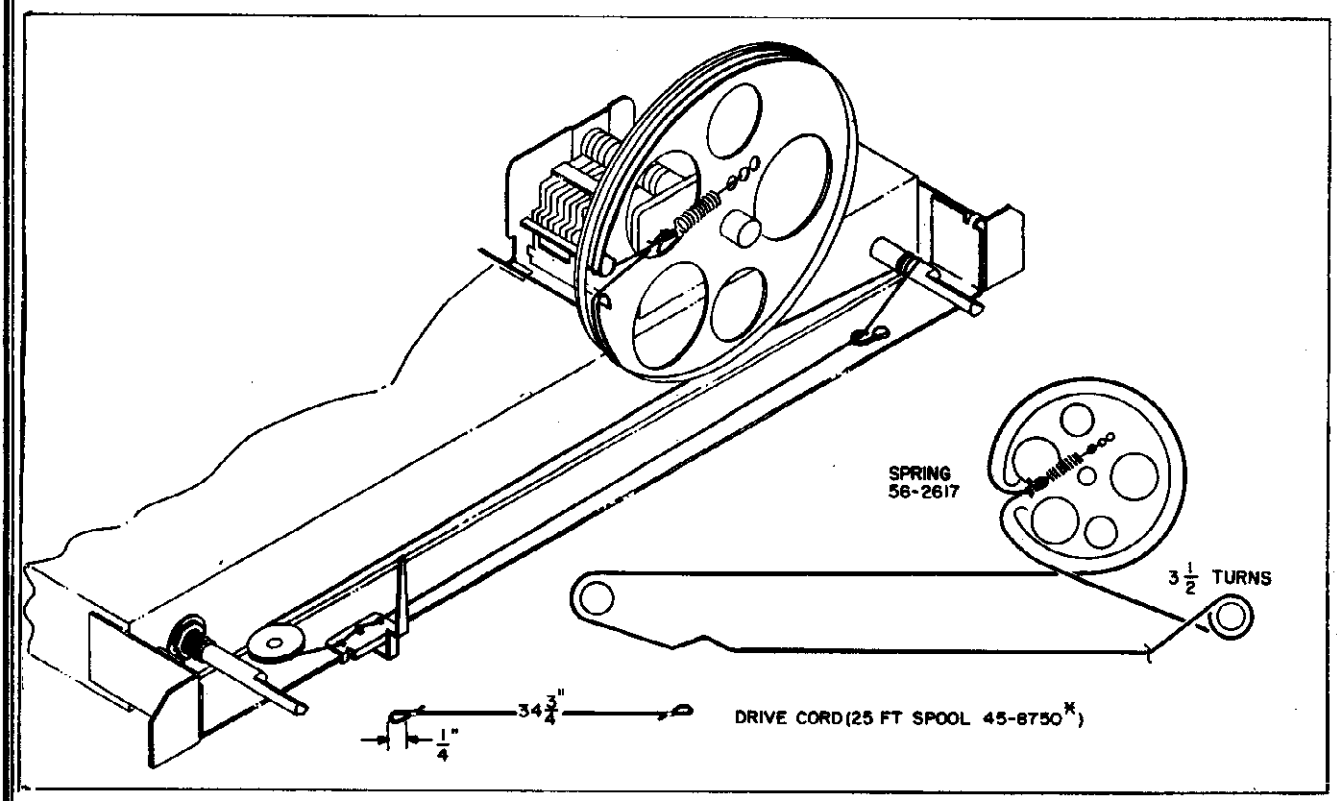


MODEL 53-568

SPECIFICATIONS

CABINET	Molded plastic
CIRCUIT	Four-tube superheterodyne (plus rectifier)
FREQUENCY RANGE	
Standard Broadcast	540 kc. to 1620 kc.
Special Services	1700 kc. to 3400 kc.
AUDIO OUTPUT	1 watt
OPERATING VOLTAGE	105 to 120 volts, a.c. or d.c.
POWER CONSUMPTION	30 watts
ANTENNA	High-impedance loop
INTERMEDIATE FREQUENCY	455 kc.
PHILCO TUBES	12BE6, converter; 12BA6, i-f amplifier; 12AV6, det.-a.v.c.-1st audio; 35C5, output; 35W4, rectifier

NOTE: The antenna is mounted on the cabinet back. When removing the cabinet back, use care to avoid breaking the antenna leads.



TP2-3193

Figure 1. Dial-Cord Installation Details

ALIGNMENT PROCEDURE

RADIO CONTROLS—Set volume control to maximum. Set tuning control and band switch, SW1, 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, attenuate signal-generator output to hold output-meter reading below 1.25 volts.

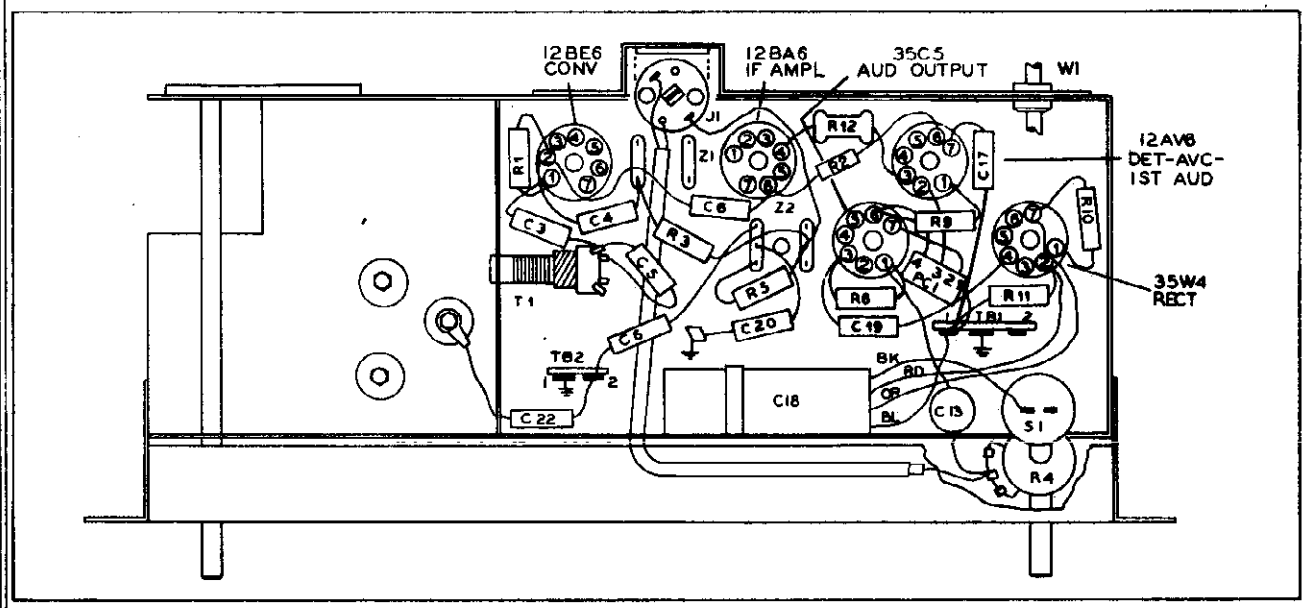
ALIGNMENT CHART

STEP	SIGNAL GENERATOR		RADIO			ADJUST
	CONNECTION TO RADIO	DIAL SETTING	DIAL SETTING	BAND-SWITCH SETTING	SPECIAL INSTRUCTIONS	
1	Ground-lead to B–; output lead through a .1-μf. condenser to grid (pin 7) of 12BE6.	455 kc.	Tuning gang fully open.	Broadcast	Adjust tuning cores, in order given, for maximum output. (TC1 and TC3 are located at top of transformers.)	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).	1620 kc.	1620 kc.*	Broadcast	Adjust trimmer for maximum output.	C1B—osc.
3	Same as step 2.	1500 kc.	1500 kc.†	Broadcast	Adjust trimmer for maximum output.	C1A—antenna (broadcast)
4	Same as step 2.	3200 kc.	3200 kc.†	Special services	Adjust trimmer for maximum output.	C21—antenna (special services)

NOTE: Make up a 6—8 turn, 6-inch diameter loop from insulated wire; connect to signal-generator leads, and place 1 foot from radio loop. The position of the radio loop (LA1) with respect to the chassis, should be approximately the same as when both are mounted in the cabinet.

* To set the tuning gang to 1620 kc., fully open the tuning gang and insert a .006-inch nonmetallic shim between the heel of the rotor and the top of the stator plates. Close the tuning gang sufficiently to hold the shim in place, and then remove the shim without disturbing the gang setting. Then proceed with the remainder of step 2.

† Place radio chassis in cabinet and set pointer to proper frequency; then remove chassis and proceed with adjustment of designated trimmer.



TP2-3195

Figure 2. Base View, Showing Placement of Parts

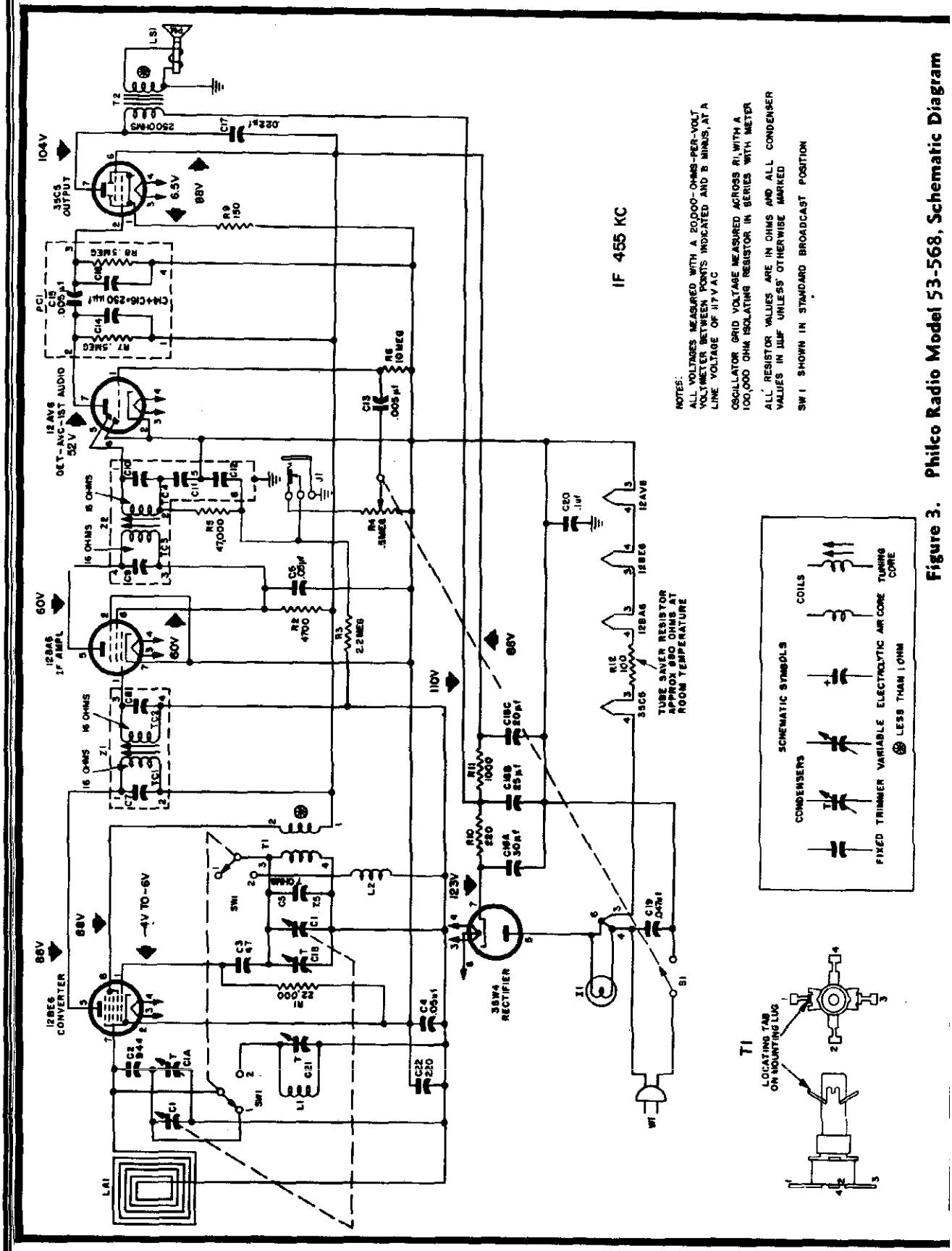
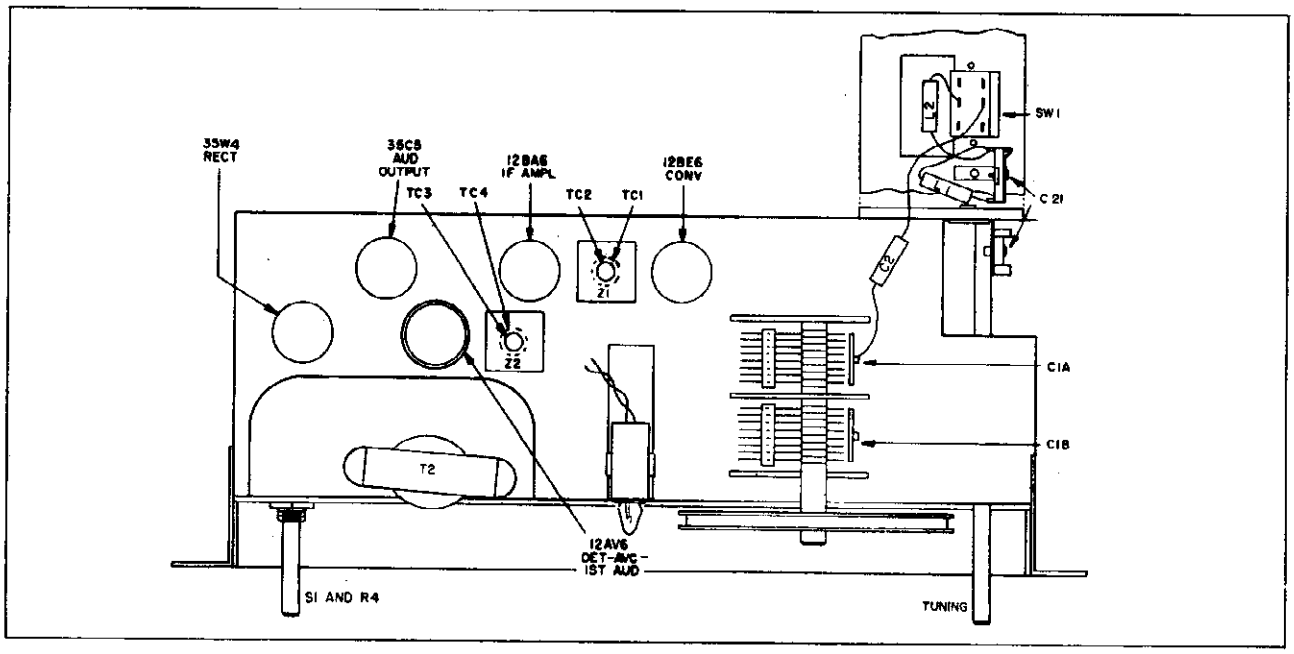


Figure 3. Philco Radio Model 53-568, Schematic Diagram



TP2-3196

Figure 4. Top View, Showing Trimmer Locations.

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."

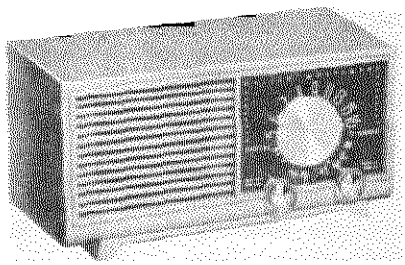
Reference Symbol	Description	Service Part No.
C1	Condenser, tuning gang	31-2751-15
C1A	Condenser, antenna trimmer	Part of C1
C1B	Condenser, osc. trimmer	Part of C1
C2	Condenser, aerial series tracker, 944 $\mu\mu$f.	30-1220-65
C3	Condenser, oscillator grid, 47 $\mu\mu$f.	30-1230-4
C4	Condenser, a-v-c by-pass, .05 μf.	30-4650-45
C5	Condenser, drift compensation, 7.5 $\mu\mu$f.	30-1224-83
C6	Condenser, screen by-pass, .05 μf.	30-4650-45
C7	Condenser, i-f tuning	Part of Z1
C8	Condenser, i-f tuning	Part of Z1
C9	Condenser, i-f tuning	Part of Z2
C10	Condenser, i-f tuning	Part of Z2
C11	Condenser, detector filtering	Part of Z2
C12	Condenser, detector filtering	Part of Z2
C13	Condenser, audio coupling, .005 μf.	30-1238-1
C14	Condenser, plate by-pass	Part of PC1
C15	Condenser, audio coupling, .005 μf.	Part of PC1
C16	Condenser, compensating	Part of PC1
C17	Condenser, tone compensation, .022 μf.	30-4650
C18	Condenser, electrolytic, 3-section	30-2753
C18A	Condenser, filter, 30 μf., 150v	Part of C18
C18B	Condenser, filter, 25 μf., 150v	Part of C18
C18C	Condenser, filter, 20 μf., 150v	Part of C18
C19	Condenser, line by-pass, .05 μf.	30-4650-45
C20	Condenser, B- to chassis, .1 μf.	30-4650-47*
C21	Condenser, trimmer, special services	31-6473-29
C22	Condenser, r-f by-pass	60-10225417
I1	Lamp, pilot	34-2068
J1	Bracket and socket assembly, phono	76-8330
L1	Coil, antenna, special services	32-4561-3
L2	Coil, oscillator shunt	32-4562-2
LA1	Loop, antenna	76-7718
LS1	Speaker, p-m	36-1641-1
PC1	Printed circuit	30-6001
R1	Resistor, oscillator grid, 22,000 ohms	66-3228340*
R2	Resistor, i-f screen dropping, 4700 ohms	66-2478340*
R3	Resistor, a-v-c filter, 2.2 megohms	66-5228340*
R4	Resistor, volume control, .5 megohm	33-5566-41
R5	Resistor, diode load, 47,000 ohms	66-3478340*
R6	Resistor, grid return, 10 megohms	66-6108340*
R7	Resistor, plate load, 500,000 ohms	Part of PC1
R8	Resistor, grid return, 500,000 ohms	Part of PC1
R9	Resistor, cathode bias, 150 ohms	66-1158340*
R10	Resistor, B plus filter, 220 ohms	66-1224340*
R11	Resistor, B plus filter, 1000 ohms	66-2108340*
R12	Resistor, tube saver, 100 ohms	33-1343-3
S1	Switch, off-on	Part of R4
SW1	Switch, broadcast-special services	42-1796-2
T1	Transformer, oscillator	32-4453-6
T2	Transformer, output	32-8384-2*
W1	Line cord	L-2183*
Z1	Transformer, 1st i-f	32-4161A
Z2	Transformer, 2nd i-f	32-4240A

MISCELLANEOUS

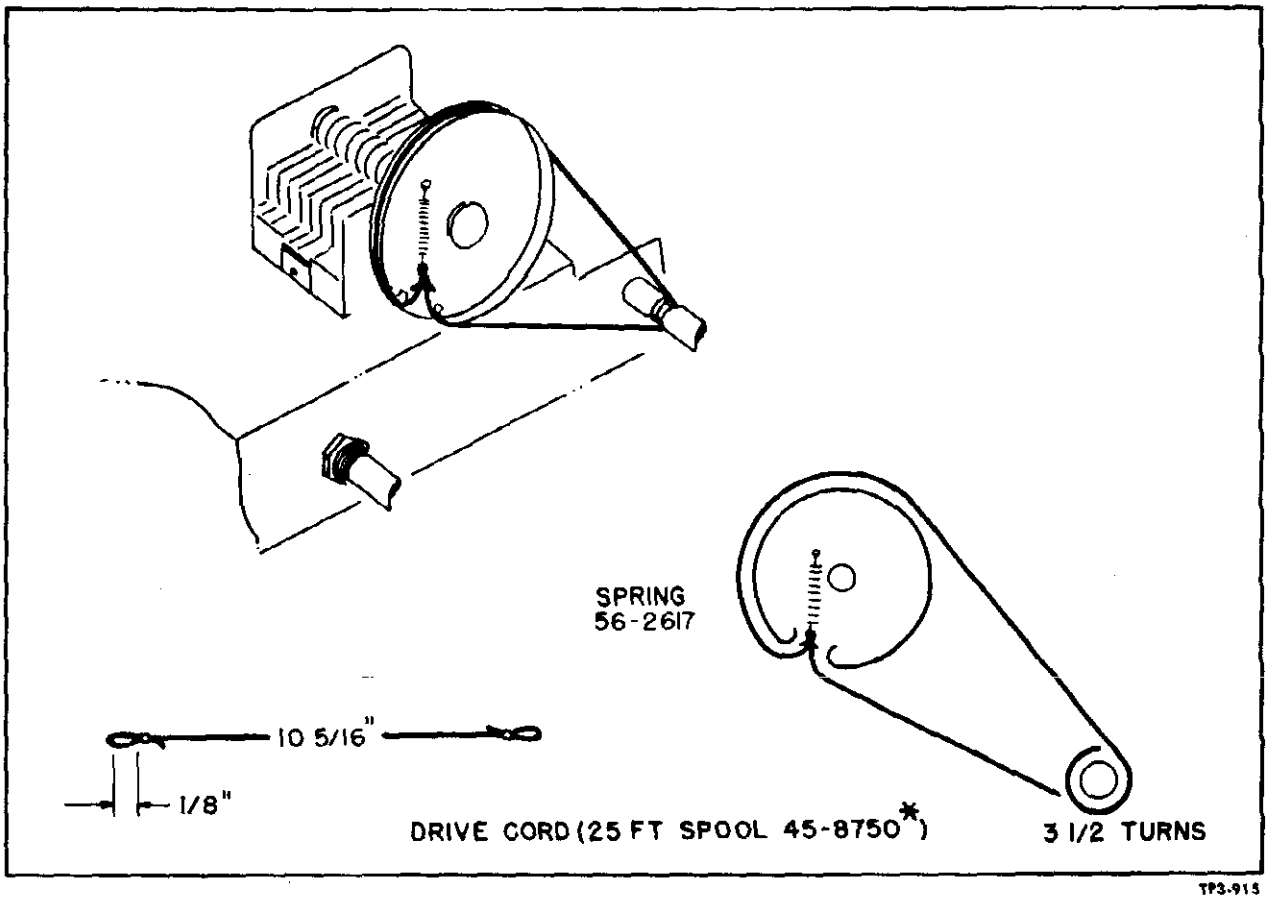
Description	Service Part No.
Cabinet, gray	10969
Cabinet back-and-loop assembly	76-7705
Cabinet back	54-6038
Dial scale	54-5173
Backplate, dial	28-9110
Clip, scale mounting (4 required)	1W60211FE7
Knob (2 required)	54-6034
Drive cord (25-foot spool)	45-8750
Pointer, dial	56-5630-55FCP
Rail assembly, pointer	76-8202
Shaft, tuning	56-9807
Socket assembly, pilot lamp	27-6233-6
Bracket and clip, pilot lamp	76-8272
Socket, 7-pin miniature (4 required)	27-6265
Socket (12AV6)	27-6203-14
Shield, tube	56-5629FA3
Spring	56-2617
Spring, retaining	28-8610

SPECIFICATIONS

CABINET	Molded plastic, ebony or Swedish red
CIRCUIT	Four-tube superheterodyne (plus rectifier)
FREQUENCY RANGE	
Standard Broadcast	540 kc. to 1620 kc.
Special Services	1700 kc. to 3400 kc.
AUDIO OUTPUT	1 watt
OPERATING VOLTAGE	105 to 120 volts, a.c. or d.c.
POWER CONSUMPTION	30 watts
AERIAL	High-impedance loop
INTERMEDIATE FREQUENCY	455 kc.
PHILCO TUBES	12BE6 converter, 12BA6 i-f amplifier, 12AV6 det.—a.v.c.-1st audio, 35C5 output, 35W4 rectifier



MODEL B574, CODE 122



TP3-915

Figure 1. Dial-Cord Installation Details

MODEL B574, Code 122

SERVICE HINTS

REMOVING THE CHASSIS FROM THE CABINET

To remove the chassis from the cabinet, first remove the station selector knob, volume control knob, and, at the bottom-center of the dial scale, remove the dial scale retaining screw. A flat object (knife blade) placed under the bottom edge will assist in prying the scale out of the cabinet. Pull to remove the pointer from the tuning gang shaft. Remove the screws from the cabinet back, and pull the back away from the back of the cabinet (use care to prevent breaking the leads from the loop aerial) far enough to reach in and remove the pilot lamp and socket from the retaining clip. Unsolder the output transformer leads from the speaker. Then remove the chassis mounting screws from beneath the cabinet, and remove the chassis.

REMOVING THE SUBBASE

After removing the chassis from the cabinet, remove the subbase, using the following procedure.

1. Remove the output transformer and dial light connections by pulling the jacks from the pins on the subbase.
2. Unsolder the volume control and a-c switch leads, and unsolder and remove the loop aerial.
3. Spring the Special Services switch bracket off the tuning shaft.
4. At the rear of the panel, bend the hold down tabs out flush with the subbase, and remove.

PARTS REPLACEMENT

Whenever possible, replace all components and leads from the top side of the chassis. In cases where this is not possible, the components must be unsoldered when removed from the bottom. Use only a lightweight low-wattage iron of approximately 22.5 to 25 watts, and always use a low-melting-point solder. Extreme caution must be used to prevent solder from dropping or splashing, and to avoid lifting of the printed wiring foil. Use only the tip of the soldering iron at the solder point whenever heat is being applied. Hold the subbase in one hand while applying heat to the solder point and throw the solder off, with a downward thrust, as soon as it starts to melt. When the solder is removed, the part to be repaired or replaced can be lifted from its location. Insert the new part and secure it with just a drop of solder at each point.

REPLACING TUBE SOCKETS AND I-F TRANSFORMERS

To replace tube sockets and i-f transformers, follow the procedure given above for removing solder. Then use a sharp knife to sever the remaining thin bond of solder at the connections. With the solder removed, the part can be backed out of the slots. Before inserting the repaired or new part, clean all connections at the unsoldered lugs. Use caution when reinserting parts through the subbase slots, so that the foil is not lifted. When soldering is complete apply an electrical varnish to all repaired areas.

ALIGNMENT PROCEDURE

RADIO CONTROLS—Set volume control to maximum. Set tuning control and band switch, SW1, 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	BAND SWITCH SETTING	SPECIAL INSTRUCTIONS	
1	Ground lead to B–; output lead through a .1-μf. condenser to grid (pin 7) of 12BE6.	455 kc.	Tuning gang fully open	Broadcast	Adjust tuning cores, in order given, for maximum output. TC1 and TC3 are located at top of transformers.	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).	1620 kc.	*1620 kc.	Broadcast	Adjust trimmer for maximum output.	C1-B—osc.
3	Same as step 2.	1500 kc.	1500 kc.	Broadcast	Adjust trimmer for maximum output.	C1-A—aerial (broadcast)
4	Same as step 2.	3200 kc.	3200 kc.	Special Services	Adjust trimmer for maximum output.	C21—aerial (special services).

NOTE: Make up a 6—8 turn, 6-inch-diameter loop from insulated wire, connect to signal-generator leads, and place near radio loop. The 1620-kc. index mark is located on the pointer rail, to the extreme right side as viewed from the front.

* For proper adjustment of the oscillator trimmer, fully open the tuning gang and insert a .006-inch non-metallic shim between the heel of the rotor and the top of the stator plates. Close the tuning gang sufficiently to hold the shim in place, and then remove the shim without disturbing the gang setting.

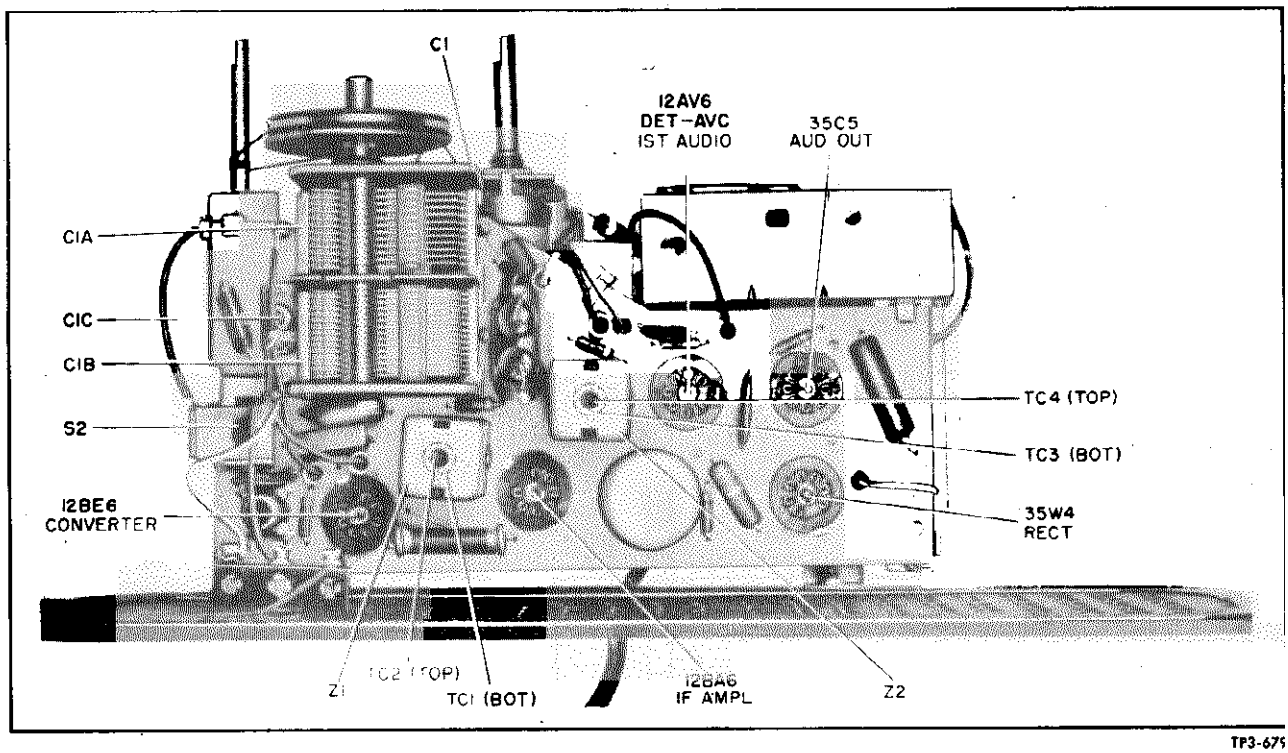


Figure 2. Top View, Showing Trimmer Locations

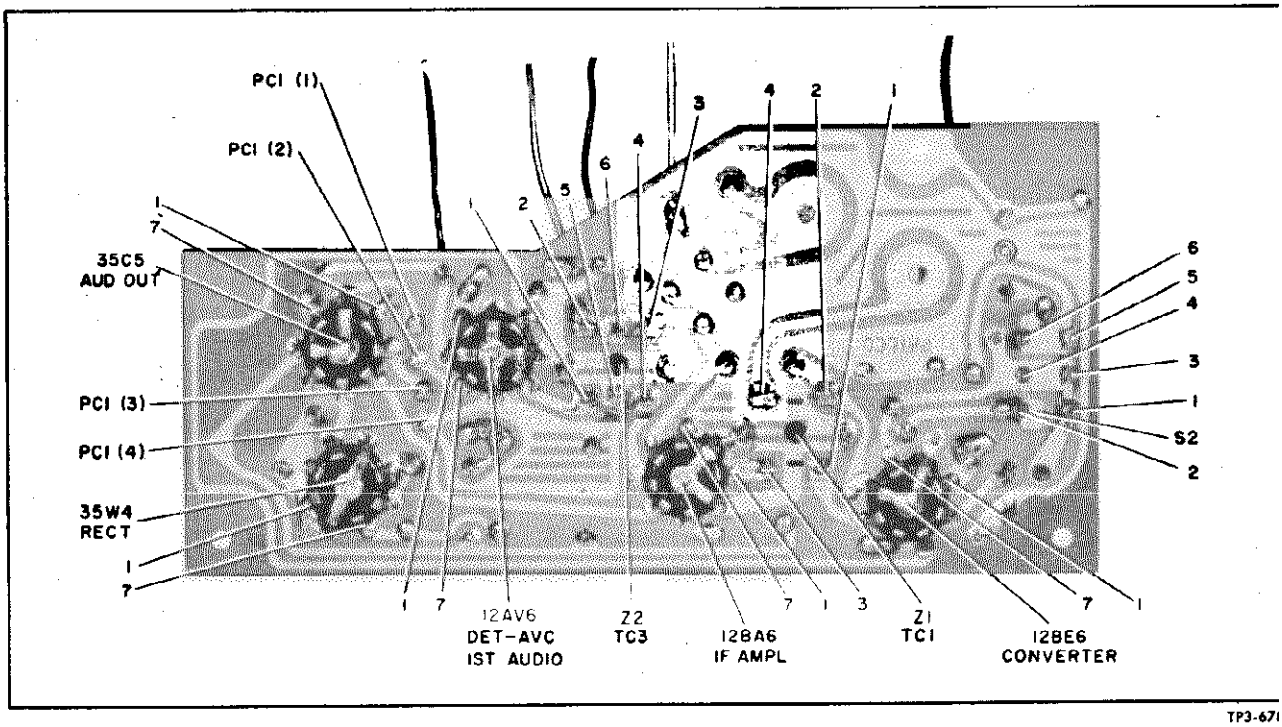


Figure 3. Base View, Showing Printed Wiring Circuit

MODEL B574, Code 122

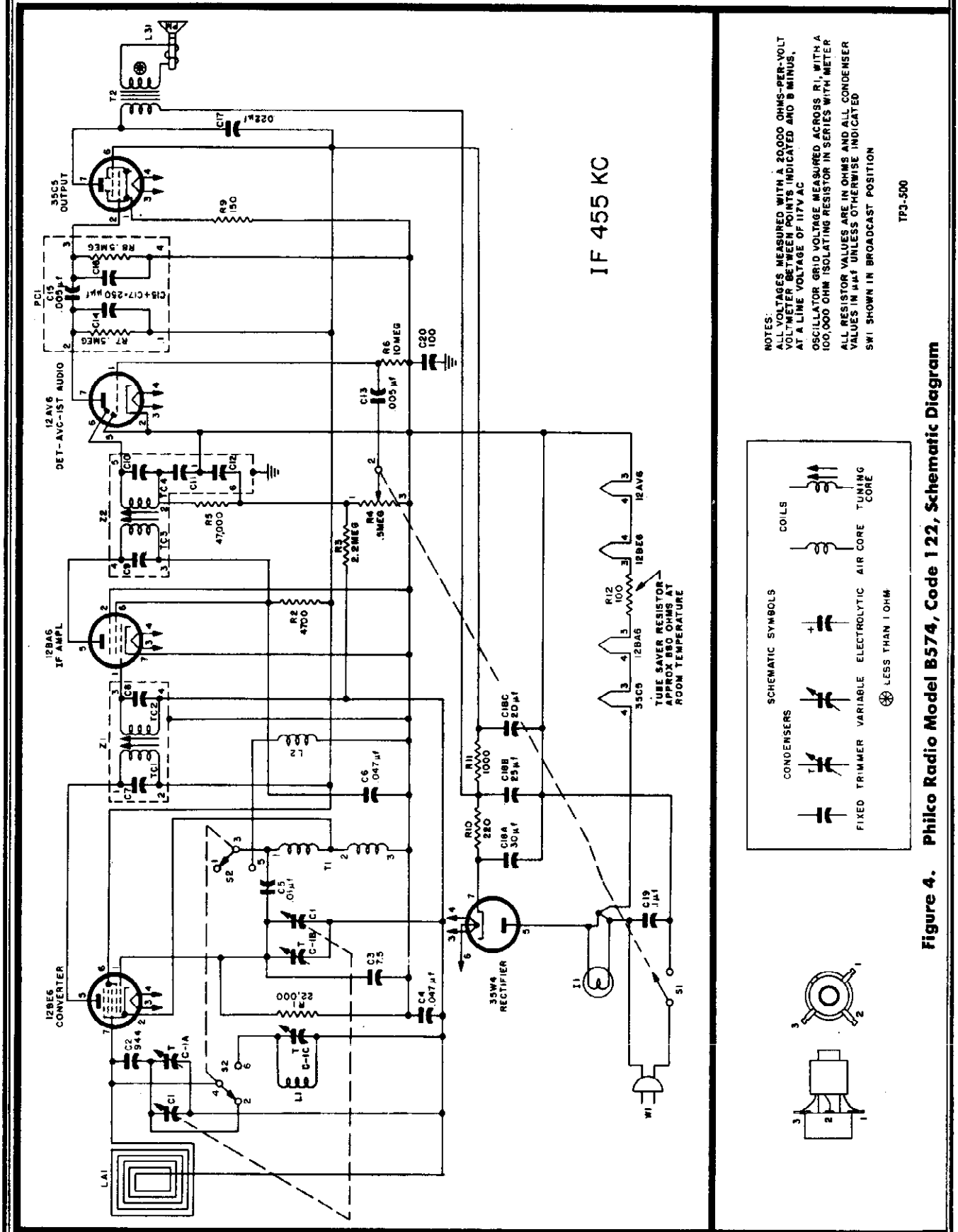
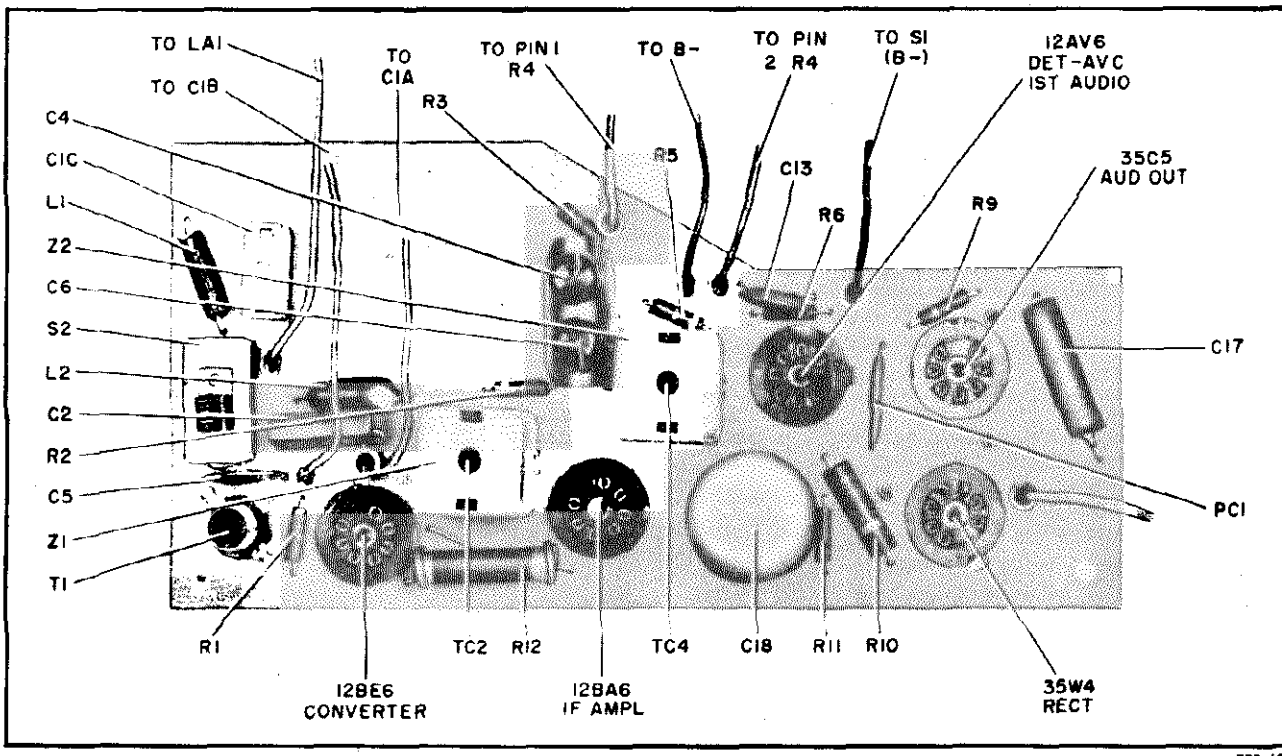


Figure 4. Philco Radio Model B574, Code 122, Schematic Diagram



TP3-68

Figure 5. Top View, Showing Parts Placement

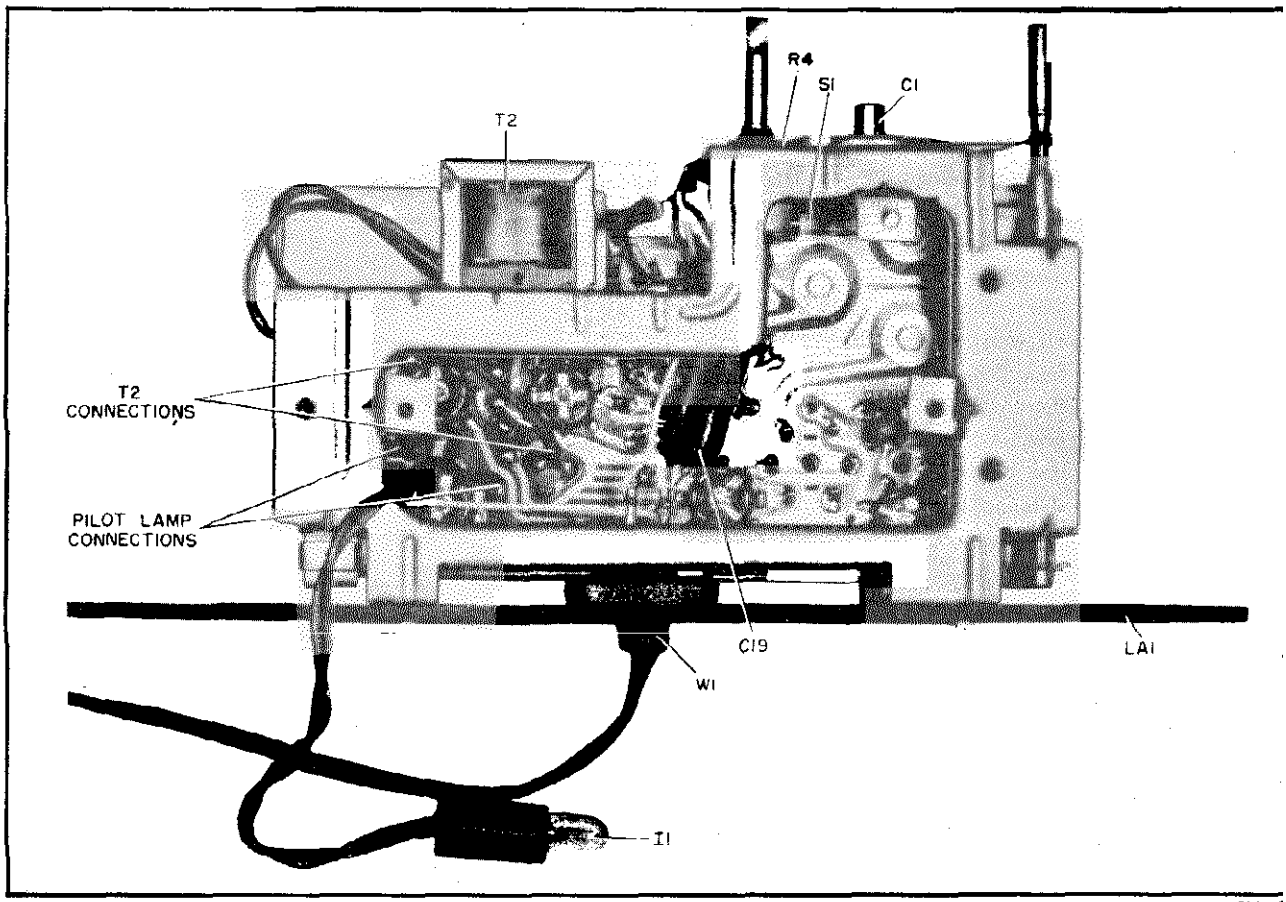


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Figure 6. Bottom View, Showing Parts Placement

MODEL B574, Code 122

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 unchanged. When ordering replacements, use only the "Service Part No."

Reference Symbol	Description	Service Part No.
C1	Condenser, tuning gang	31-2751-16
C1A	Condenser, aerial trimmer	Part of C1
C1B	Condenser, oscillator trimmer	Part of C1
C1C	Condenser, trimmer, Special Services	31-6502-4
C2	Condenser, antenna series tracker, 944 μμf.	30-1220-65
C3	Condenser, drift compensation, 7.5 μμf.	30-1224-83
C4	Condenser, a-v-c by-pass, .047 μf.	30-4650-45
C5	Condenser, oscillator grid, .01 μf.	30-1238-2
C6	Condenser, screen by-pass, .05 μf.	30-4650-45
C7	Condenser, i-f tuning	Part of Z1
C8	Condenser, i-f tuning	Part of Z1
C9	Condenser, i-f tuning	Part of Z2
C10	Condenser, i-f tuning	Part of Z2
C11	Condenser, detector filtering	Part of Z2
C12	Condenser, detector filtering	Part of Z2
C13	Condenser, audio coupling, .005 μf.	30-1238-1
C14	Condenser, plate by-pass	Part of PC1
C15	Condenser, audio coupling, .005 μf.	Part of PC1
C16	Condenser, compensating	Part of PC1
C17	Condenser, tone compensation, .022 μf.	30-4650-43
C18	Condenser, electrolytic, 3-section	30-2583-1
C18A	Condenser, filter, 30 μf., 150v	Part of C18
C18B	Condenser, filter, 25 μf., 150v	Part of C18
C18C	Condenser, filter, 20 μf., 150v	Part of C18
C19	Condenser, line by-pass, .05 μf.	30-4650-47
C20	Condenser, B minus to chassis, 100 μμf.	62-110009001
I1	Lamp, pilot	34-2068
L1	Coil, aerial, Special Services	32-4561-3
L2	Coil, oscillator shunt	32-4562-2
LA1	Loop, part of cabinet back	76-8362
LS1	Speaker, p-m	36-1627-21
R1	Resistor, oscillator grid, 22,000 ohms	66-3228340*
R2	Resistor, i-f screen dropping, 4700 ohms	66-2748340*
R3	Resistor, a-v-c filter, 2.2 megohms	66-5228340*
R4	Resistor, volume control, .5 megohm	33-5566-41
R5	Resistor, diode load, 47,00 ohms	66-3478340*
R6	Resistor, grid return, 10 megohms	66-6108340*
R7	Resistor, plate load, 500,000 ohms	Part of PC1
R8	Resistor, grid return, 500,000 ohms	Part of PC1
R9	Resistor, cathode bias, 150 ohms	66-1158340*
R10	Resistor, B plus filter, 220 ohms	66-1224340*
R11	Resistor, B plus filter, 1000 ohms	66-2108340*
R12	Resistor, tube saver, 100 ohms	33-1343-3
S1	Switch, off-on	Part of R4
S2	Switch, Broadcast-Special Services	42-1796-4
T1	Transformer, oscillator	32-4582
T2	Transformer, output	32-8384-5
W1	Line cord	L-2183*
Z1	Transformer, 1st i-f	32-4583
Z2	Transformer, 2nd i-f	32-4584

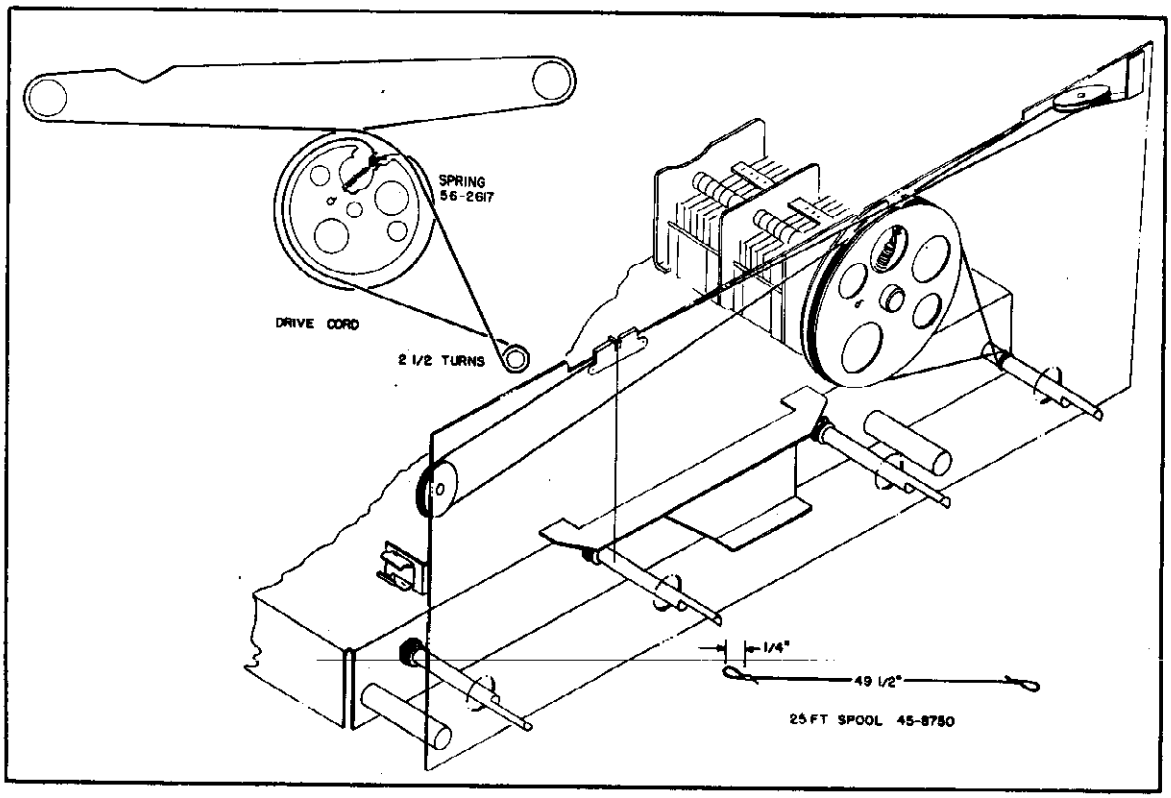
MISCELLANEOUS

Description	Service Part No.
Cabinet, spruce	10926-19
Cabinet, tangerine	10926-23
Back-and-loop assembly	76-8362
Connector, interlock, male	27-6240-6
Dial backplate, spruce	54-4972-2
Dial backplate, tangerine	54-4972
Dial scale	54-5147-3
Drive cord, 25-foot spool	45-8750
Knob	54-4773-3
Pointer	28-9502
Shaft, tuning	28-9312
Bracket, switch operating	28-9313
Socket assembly, pilot lamp	41-4176-2
Shield, pilot lamp	54-8806
Socket, 7-pin miniature	27-6296-5
Socket, 7-pin miniature, 12AV6	27-6296-4
Shield, tube	56-5629-12
Printed wiring panel (less components)	54-6058

SPECIFICATIONS

CABINET	Wood console, mahogany
CIRCUIT	Five-tube superheterodyne (plus rectifier)
FREQUENCY RANGE	
Broadcast	540 kc. to 1620 kc.
Special Services	1700 kc. to 3400 kc.
AUDIO OUTPUT	4.5 watts
OPERATING VOLTAGE	105—120 volts, a.c.
POWER CONSUMPTION	80 watts
ANTENNA	Built-in, low-impedance loop
INTERMEDIATE FREQUENCY	455 kc.
PHILCO TUBES	6BJ6 r-f ampl; 6BE6 converter, osc., phono preampl; 6BJ6 i-f ampl; 6AV6 detector, a.v.c., 1st audio; 6AQ5 output; 6X4 rectifier

MODEL B1754



TP2-3243

Figure 1. Drive-Cord Installation Details

ALIGNMENT PROCEDURE

GENERAL

RADIO CONTROLS—Set volume control for maximum output, and set tuning control as indicated in the alignment chart. Set band switch to broadcast position for first 5 steps, then to special services position for steps 6 and 7.

OUTPUT INDICATOR—Connect output indicator (either an oscilloscope or a 1000-ohms-per-volt, a-c voltmeter) across voice-coil terminals.

SIGNAL GENERATOR—Use an AM r-f generator, connected as indicated in the alignment chart.

OUTPUT LEVEL—During alignment, attenuate signal-generator output to maintain output indication below 1 volt.

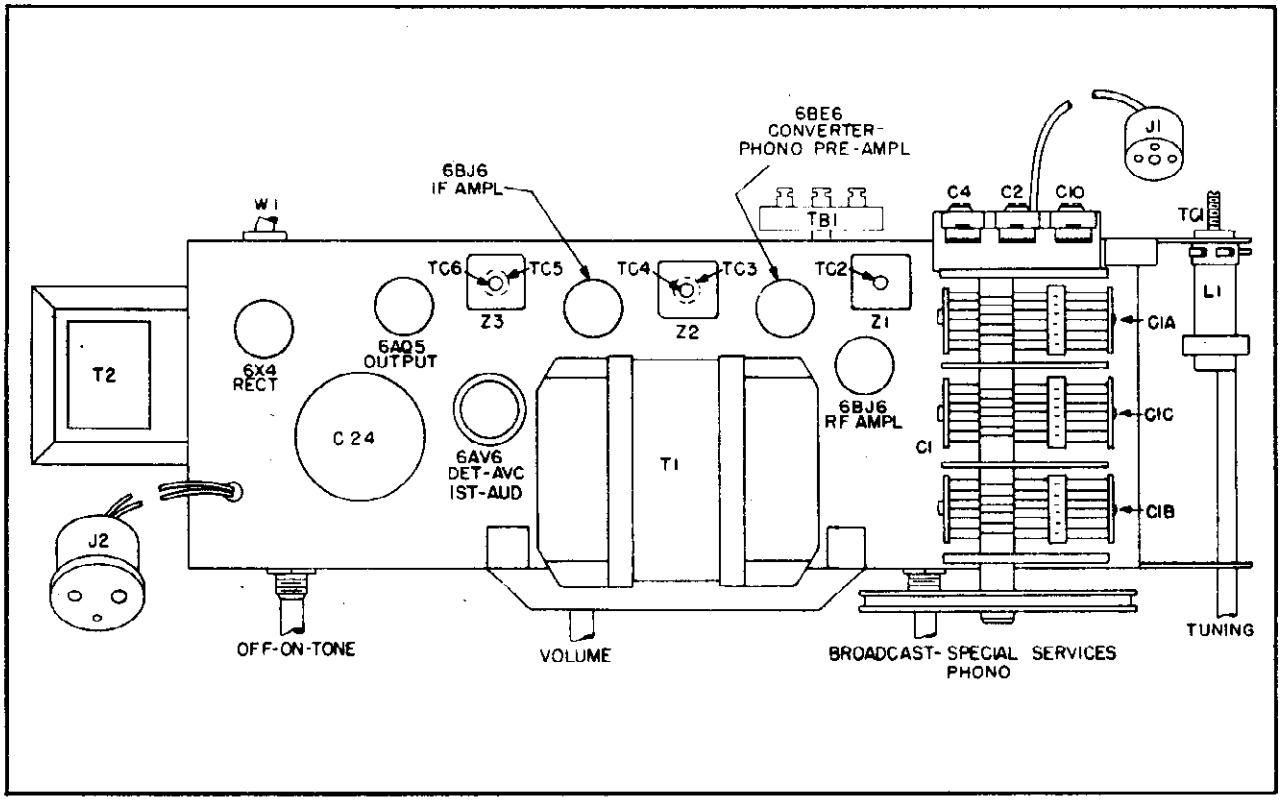
DIAL POINTER—Before the alignment is started, the dial pointer should be set to coincide with the dial scale mark to the left of "55" when the tuning gang is fully meshed.

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 .01-μf. condenser to pin 7 (mixer grid) of 6BE6, converter.	455 kc.	Tuning gang fully open.	Adjust, in order given in next column, for maximum output.	TC6—2nd i-f sec. TC3—1st i-f pri. TC5—2nd i-f pri. TC4—1st i-f sec.
2	Radiating loop. See Note 1 below.	1620 kc.	1620 kc. See Note 2 below.	Adjust for maximum output.	C1C—osc. trimmer
3	Same as step 2.	1520 kc.	Tune radio to generator signal.	Adjust for maximum output. (High-frequency adjustment).	C1B—mixer-grid trimmer C1A—r-f trimmer
4	Same as step 2.	580 kc.	Same as step 3.	Adjust for maximum output. (Low-frequency adjustment).	TC-2—r-f transformer TC1—ant. transformer
5	Repeat steps 3 and 4 until no further improvement is obtained.				
6	Same as step 2.	3200 kc.	Same as step 3.	Adjust for maximum output.	C10—special services mixer-grid trimmer C4—special services r-f trimmer
7	Same as step 2.	1800 kc.	Same as step 3.	Adjust for maximum output.	C2—special services r-f padder

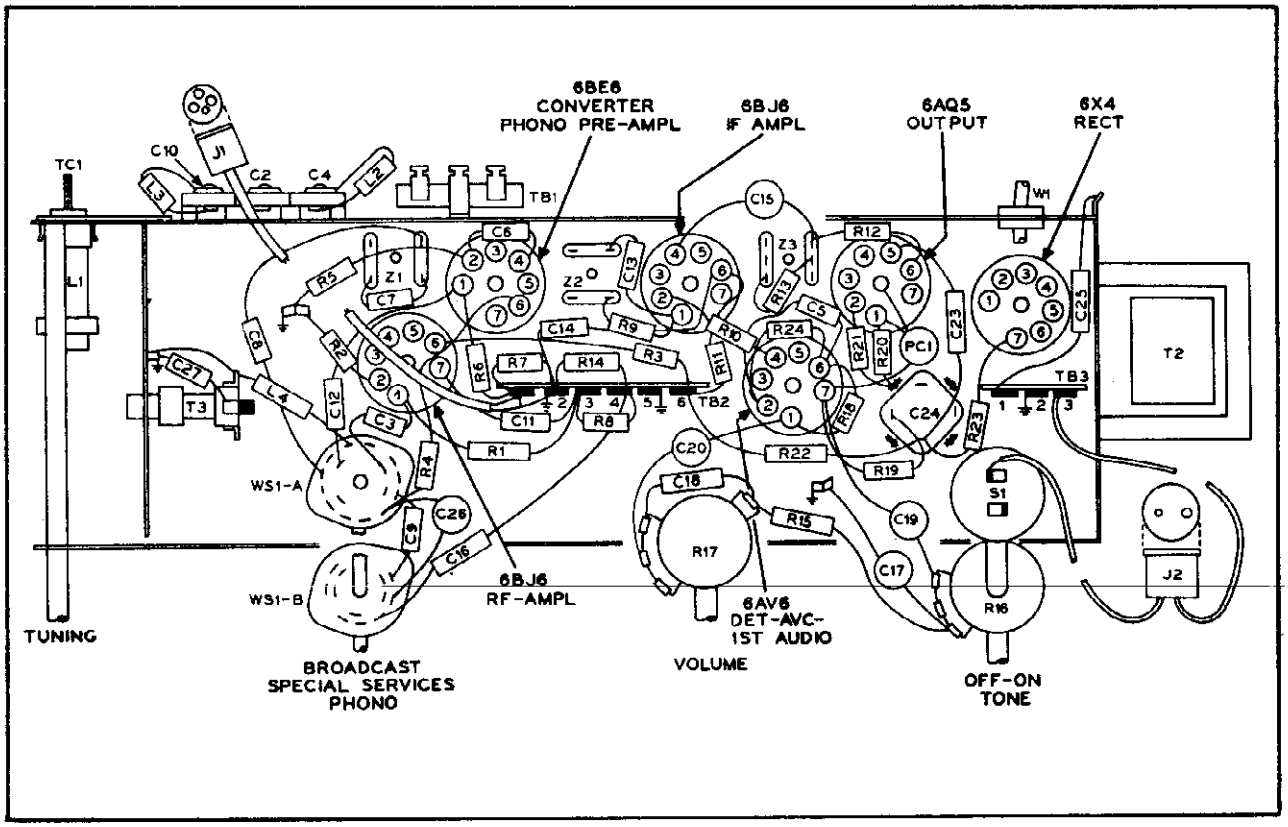
NOTE 1: Make up a 6-8 turn, 6-inch-diameter loop from insulated wire; connect to signal-generator leads and place about 1 foot from radio loop antenna. The position of the radio loop with respect to the chassis should be approximately the same as when both are mounted in the cabinet.

NOTE 2: To set the tuning gang to 1620 kc., place a piece of 6-mil flat shim stock beneath the heel of the rotor, and turn the rotor until it holds the shim firmly in place. Then remove the shim.



TP3-837

Figure 2. Top View, Showing Tuning Adjustments



TP3-838

Figure 3. Base View, Showing Parts Placement

MODEL B1754

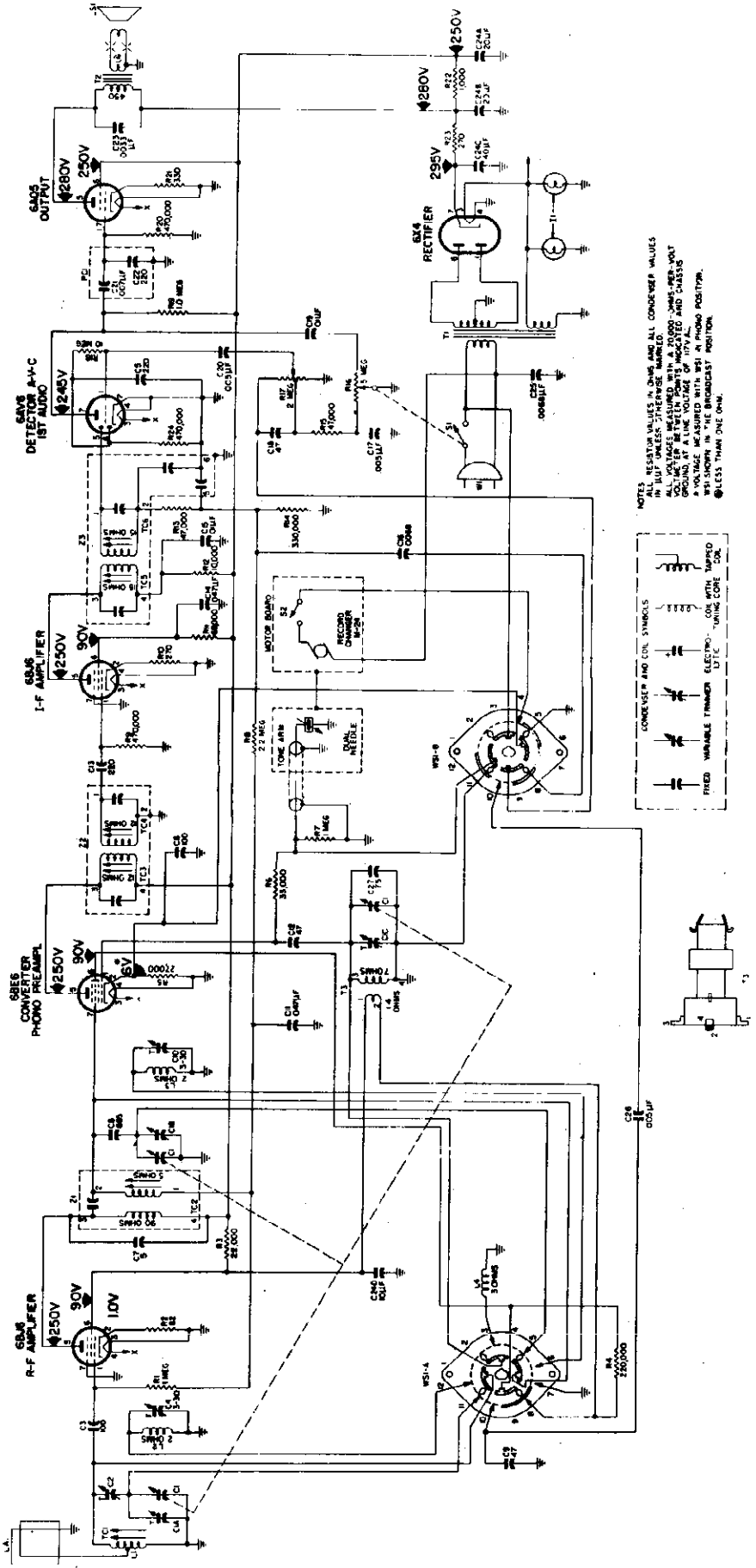


Figure 4. Philco Radio-Phonograph Model B1754, Schematic Diagram

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 unchanged. When ordering replacements, use only the "Service Part No."

Reference Symbol	Description	Service Part No.
C1	Condenser, tuning gang, 3-section	31-2771-3
C1A	Condenser, trimmer, antenna	Part of C1
C1B	Condenser, trimmer, r-f	Part of C1
C1C	Condenser, trimmer, oscillator	Part of C1
C2	Condenser, padder, special services r-f	Part of CA1
C3	Condenser, d-c blocking, 100 μμf.	62-110001001*
C4	Condenser, trimmer, special services r-f	Part of CA1
C5	Condenser, r-f by-pass, 220 μμf.	62-122001001*
C6	Condenser, r-f by-pass, 100 μμf.	62-110001001*
C7	Condenser, r-f by-pass, 5 μμf.	60-90505020
C8	Condenser, fixed padder, 865 μμf.	30-1220-72
C9	Condenser, harmonic suppression, 47 μμf.	60-00475417
C10	Condenser, trimmer, special services mixer-grid	Part of CA1
C11	Condenser, a-v-c by-pass, .047 μf.	30-4650-45*
C12	Condenser, oscillator coupling, 47 μμf.	60-00475417
C13	Condenser, i-f coupling, 220 μμf.	62-122001001*
C14	Condenser, screen by-pass, .047 μf.	30-4650-45*
C15	Condenser, plate by-pass, .01 μf.	30-1238-2*
C16	Condenser, audio coupling, .0068 μf.	30-4650-57
C17	Condenser, tone compensation (bass boost), .005 μf.	30-1238-1*
C18	Condenser, tone compensation, 47 μμf.	60-00475417
C19	Condenser, tone compensation (high cut) .01 μf.	30-1238-2*
C20	Condenser, audio coupling, .005 μf.	30-1238-1*
C21	Condenser, d-c blocking, .007 μf.	Part of PC1
C22	Condenser, r-f by-pass, 220 μμf.	Part of PC1
C23	Condenser, tone compensation, .0033 μf.	30-4650-89*
C24	Condenser, electrolytic filter	30-2584-32
C24A	Condenser, filter, 20 μf.	Part of C24
C24B	Condenser, filter, 20 μf.	Part of C24
C24C	Condenser, filter, 40 μf.	Part of C24
C24D	Condenser, filter, 10 μf.	Part of C24
C25	Condenser, line by-pass, .0068 μf.	30-4650-57
C26	Condenser, audio coupling (phono), .005 μf.	30-1238-1
C27	Condenser, fixed trimmer, 7.5 μμf.	30-1224-65
CA1	Condenser assembly, trimmer	31-6477-17
I1	Lamp assembly, pilot (2)	27-6233-4
J1	Connector, phono input	76-8262-1
J2	Connector, phono a-c	76-8366
L1	Coil, antenna	32-4413-2
L2	Coil, special services r-f	32-4561-5
L3	Coil, special services mixer grid	32-4561-5
L4	Coil, oscillator shunt	32-4562-1
LA1	Loop antenna	32-4394-13
LS1	Speaker (10")	36-1610-6
PC1	Printed circuit	30-1239-4
R1	Resistor, r-f a-v-c, 1 megohm	66-5108340*
R2	Resistor, cathode bias, 82 ohms	66-0828340*
R3	Resistor, screen dropping, 22,000 ohms	66-3225340*
R4	Resistor, plate load, preampl., 220,000 ohms	66-4228340
R5	Resistor, cathode bias, 27,000 ohms	66-3278340*
R6	Resistor, oscillator grid leak, 33,000 ohms	66-3338340*
R7	Resistor, load (phono), 1 megohm	66-5108340*
R8	Resistor, a-v-c load, 2.2 megohms	66-5228340*
R9	Resistor, grid leak, 470,000 ohms	66-4478340*
R10	Resistor, cathode bias, 270 ohms	66-127534
R11	Resistor, screen dropping, 68,000 ohms	66-368834
R12	Resistor, plate dropping, 10,000 ohms	66-310834
R13	Resistor, i-f filter, 47,000 ohms	66-347834
R14	Resistor, diode load, 330,000 ohms	66-433834
R15	Resistor, tone compensation (bass boost)	66-347834
R16	Resistor, tone control, 5 megohms	33-5566-
R17	Resistor, volume control, 2 megohms	33-5535-
R18	Resistor, grid leak, 10 megohms	66-610834
R19	Resistor, plate load, 1 megohm	66-510834
R20	Resistor, grid leak, 470,000 ohms	66-447834
R21	Resistor, cathode bias, 330 ohms, 1 watt	66-133434
R22	Resistor, B+ filter, 1000 ohms	66-210534
R23	Resistor, B+ filter, 270 ohms	66-127534
R24	Resistor, diode load, 470,000 ohms	66-447834
S1	Switch, off-on	Part of R
S2	Switch, off-on, phono motor	Part of M-24 Record Chan
T1	Transformer, power	32-86
T2	Transformer, output	32-8242-
T3	Transformer, oscillator	32-445
W1	Line cord	L-218
WS1	Switch, band	42-19
Z1	Transformer, r-f	32-4399-
Z2	Transformer, 1st i-f	32-416
Z3	Transformer, 2nd i-f	32-424

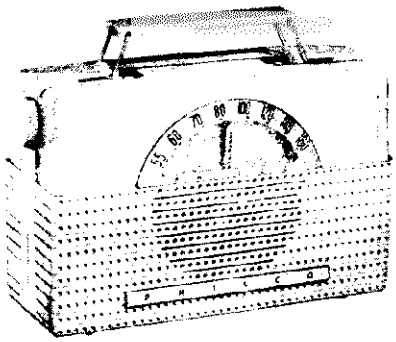
MISCELLANEOUS

Description	Service Part
Cabinet, mahogany	109
Back	54-89
Hinge, right hand (2)	56-99
Hinge, left hand (2)	56-992
Cabinet, blonde oak	1098
Back	54-893
Hinge, right hand (2)	56-992
Hinge, left hand (2)	56-992
Dome (4)	45-61
Door pull (2)	56-706
Bullet catch (2)	45-6
Strike plate (2)	45-6
Changer frame ass'y.	76-660
Rail ass'y., r.h. (changer drawer)	76-6
Rail ass'y., l.h. (changer drawer)	76-6
Spring, changer mtg. (3)	56-7059F
Spring, changer mtg. (3)	56-7059-1F
Sleeve, changer mtg. (3)	54-77
Pull knob, changer drawer	56-8
Frame ass'y.	45-9
Dial backplate ass'y.	76-8
Dial scale	54-5
Clip, scale	56-4756FE
Knob (3)	54-4718
Knob	54-4718
Spring, shaft retaining	28-8
Pointer	56-5630
Socket (5)	27-6
Socket (6AV6)	27-6203
Rubber mount, gang mounting	27-4
Tube shield	56-5629F

MODEL B652

SPECIFICATIONS

CABINET	Plastic portable
CIRCUIT	Four-tube superheterodyne (plus selenium rectifier)
AUDIO OUTPUT	
A-C or d-c operation	160 milliwatts
Battery operation	85 milliwatts
OPERATING VOLTAGE	117 volts, a.c. or d.c. 1.5-volt "A" battery and 75-volt "B" battery
POWER CONSUMPTION	
A-C or d-c operation	11 watts
Battery operation	10 ma. from 75-volt "B" battery (7 ma.: battery-saver operation) 260 ma. from 1.5-volt "A" battery
ANTENNA	Magnecor high-impedance loop with provision for external antenna
INTERMEDIATE FREQUENCY	455 kc.
PHILCO TUBES	1R5 converter, 1U4 i-f amplifier, 1U5 detector-a.v.c. 1st audio, 3V4 output
BATTERY TYPE	P144 "B" battery P77 "A" battery



MODEL B652

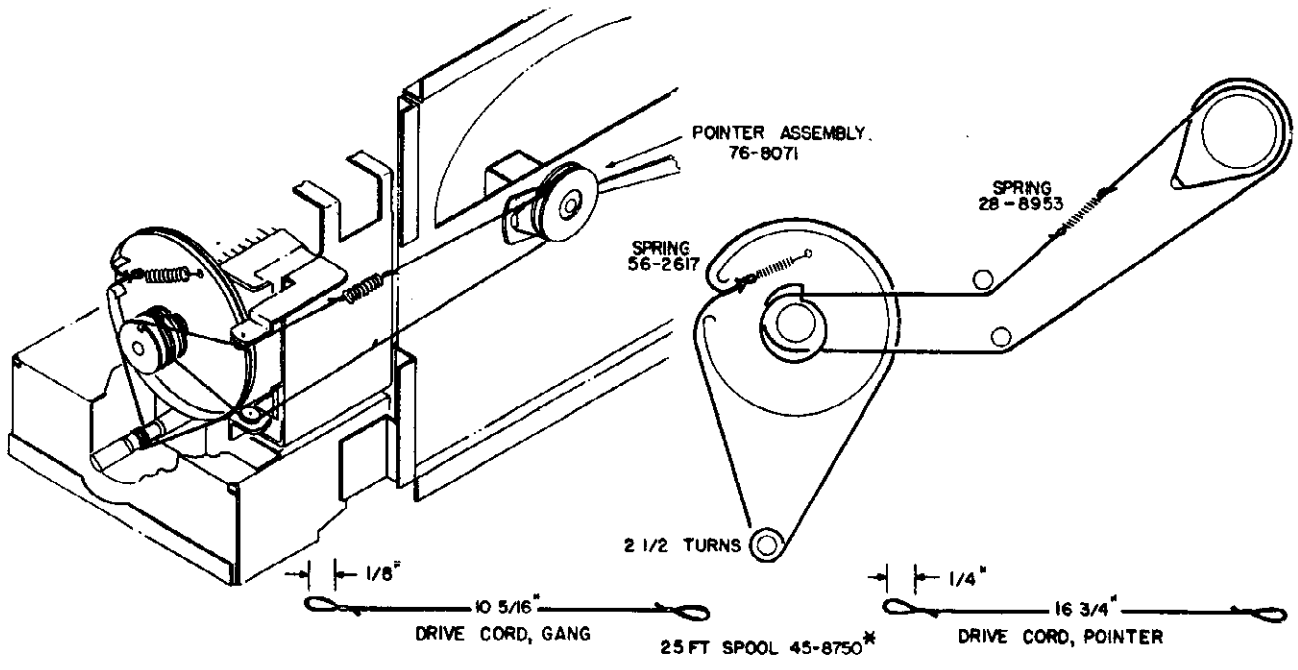


Figure 1. Dial-Cord Stringing Arrangement

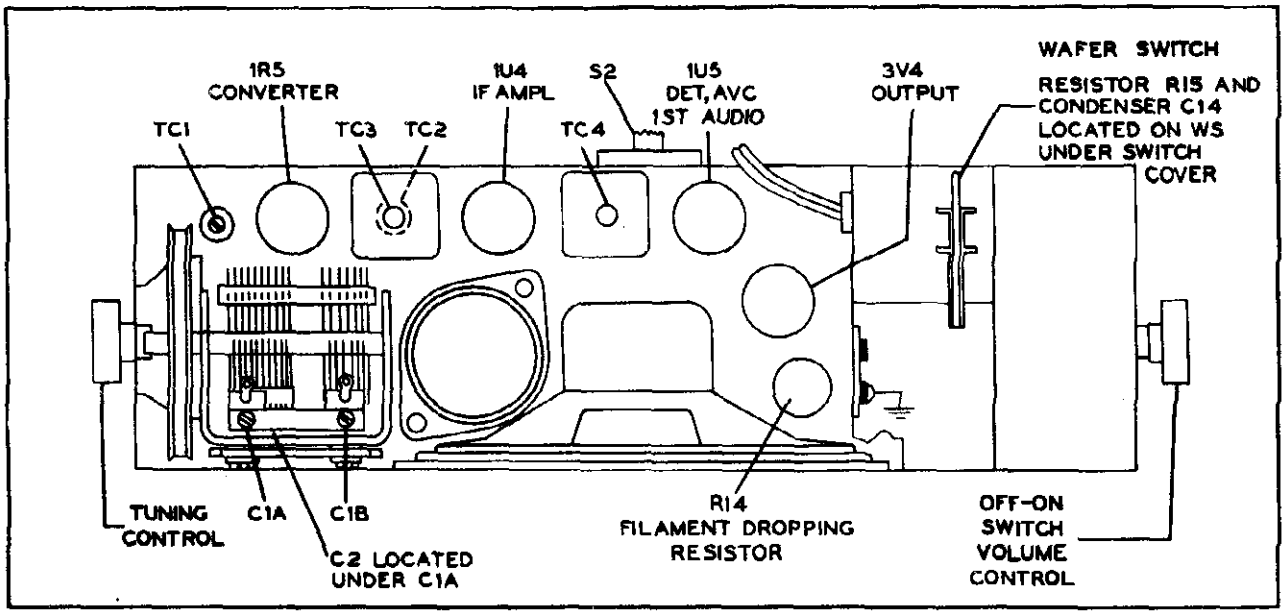


Figure 2. Top View, Showing Tuning Adjustments

ALIGNMENT PROCEDURE

GENERAL—Allow the set and the test equipment to warm up for fifteen minutes before starting the alignment procedure.

DIAL POINTER—Before proceeding with the alignment, the dial pointer should be set to coincide with the index mark to the extreme left of the dial backplate when the tuning-condenser plates are fully meshed. See figure 4.

OUTPUT INDICATOR — *Connect the output indicator* (a 1000-ohm-per-volt, a-c voltmeter, or an oscilloscope) across the voice-coil terminals.

SIGNAL GENERATOR—Use an AM r-f signal generator. Connect the ground lead to B−, and connect the output lead as indicated in the alignment chart.

OUTPUT LEVEL — Attenuate the signal-generator output throughout the alignment so as to maintain the output level below .5 volt.

RADIO CONTROLS—Set the volume control to maximum. Set the tuning control as indicated in the alignment chart. During alignment of the radio, the batteries should be in the same position with respect to the chassis and the loop antenna as they normally are in the cabinet. It is recommended that a-c power be used when aligning the radio.

ALIGNMENT CHART

STEP	SIGNAL GENERATOR		RADIO		ADJUST
	CONNECTION TO RADIO	DIAL SETTING	DIAL SETTING	SPECIAL INSTRUCTIONS	
1	Connect signal generator through a .1-μf. condenser to pin 6 (converter grid) of 1R5.	455 kc.	Tuning gang fully open.	Adjust for maximum output in order given.	TC4—2nd i-f sec. TC2—1st i-f pri. TC3—1st i-f sec.
2	Use radiating loop. (See NOTE 1 below.)	1620 kc.	1620 kc. (See NOTE 2 below.)	Adjust for maximum output.	C1B—osc. trimmer
3	Same as step 2.	1400 kc.	1400 kc. (See NOTE 2 below.)	Adjust for maximum output.	C1A—antenna trimmer
4	Same as step 2.	600 kc.	600 kc. (See NOTE 2 below.)	Adjust for maximum output. Rock tuning gang while making this adjustment.	TC1—osc. core
5	Repeat steps 2, 3, and 4 until no further improvement is obtained.				

NOTE 1. Use a 6-to-8-turn, 6-inch-diameter loop made up of insulated wire. Connect to generator terminals, and place about one foot from radio loop.

NOTE 2. *The tuning condenser can be set to the proper frequency* by turning it until the dial pointer coincides with the respective marks on the dial backplate. See figure 2.

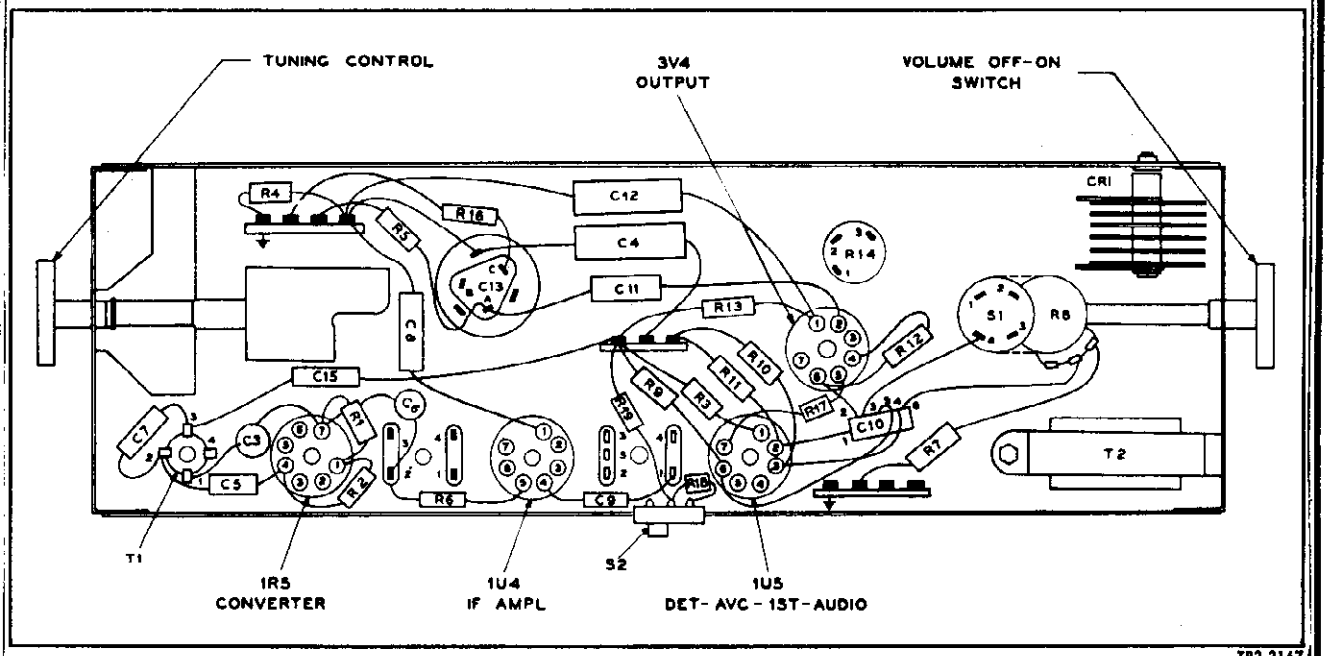


Figure 3. Base View, Showing Parts Placement

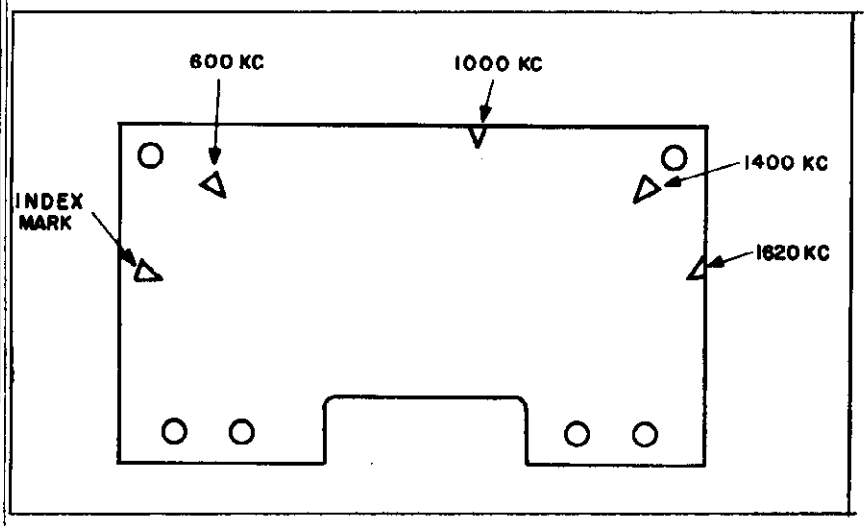
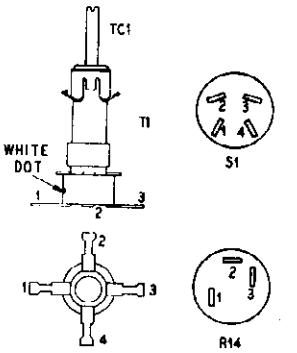
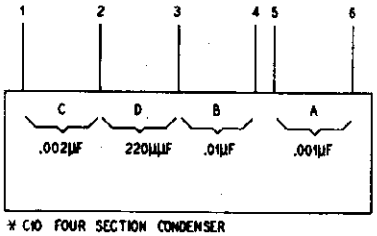


Figure 4. Dial Backplate, Showing Alignment Marks

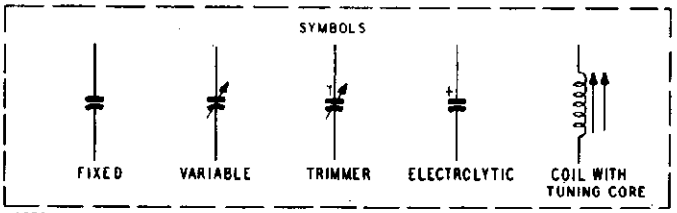




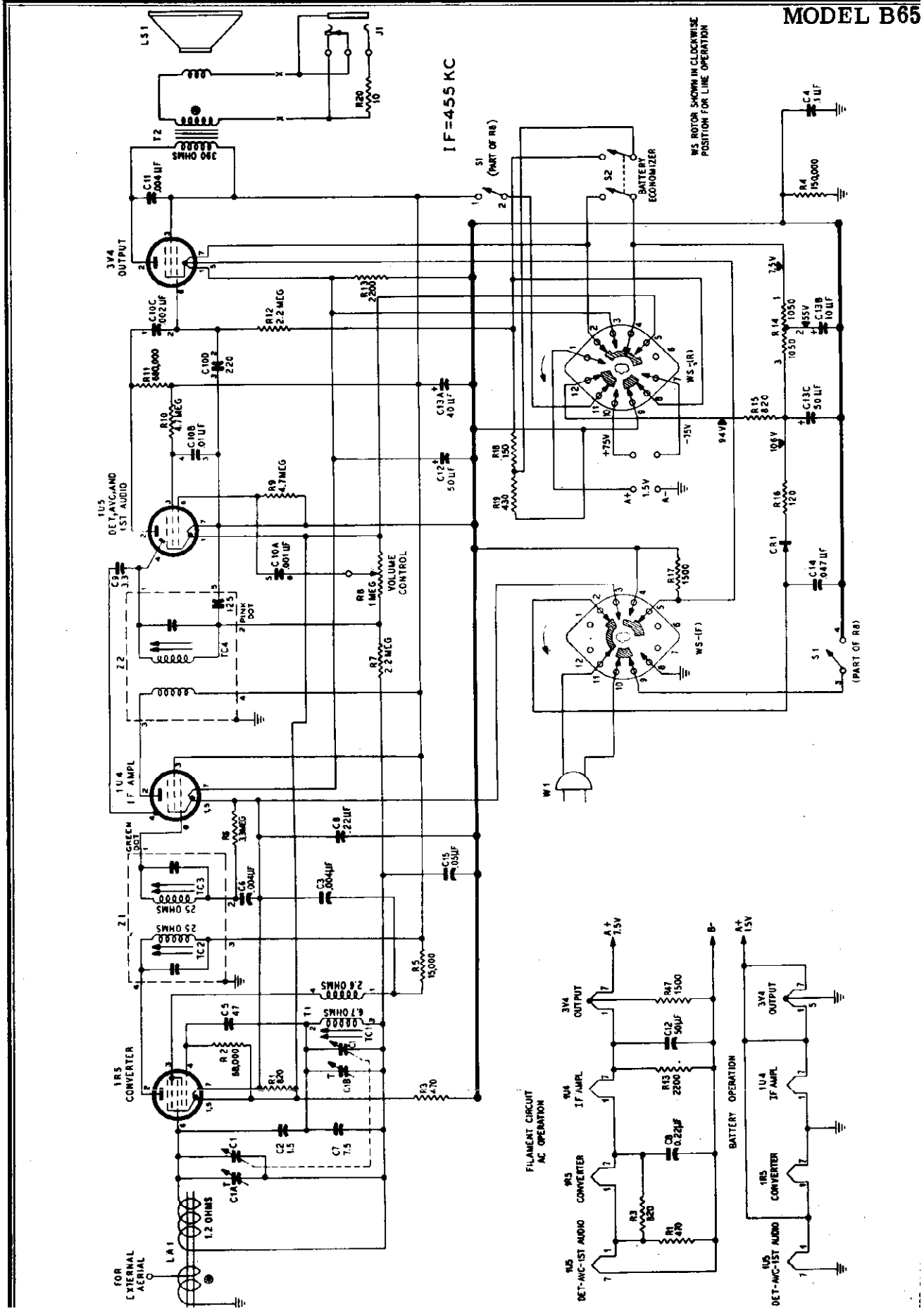
* C10 FOUR SECTION CONDENSER

TUBE SOCKET VOLTAGES

B SUPPLY	1R5		1U4		1U5		3V4	
	RF PLATE PIN 2	OSC PLATE PIN 3	PLATE PIN 2	SCREEN PIN 3	PLATE PIN 2	SCREEN PIN 3	PLATE PIN 2	SCREEN PIN 3
PWR LINE (AC OR DC)	90	55	90	90	16	16	86	90
BATTERY	70	41	70	70	17	16	67	70



NOTES:
ALL RESISTOR VALUES IN OHMS AND ALL CONDENSER VALUES IN μμF 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-


IF=455 KC
WS ROTOR SHOWN IN CLOCKWISE POSITION FOR LINE OPERATION
BATTERY ECONOMIZER
VOLUME CONTROL
FOR EXTERNAL AERIAL
FILAMENT CIRCUIT AC OPERATION
BATTERY OPERATION
1R5 CONVERTER
1U4 IF AMPL
3V4 OUTPUT
1U5 DET-AVC-1ST AUDIO

MODEL B652

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 unchanged. When ordering replacements, use only the "Service Part No."

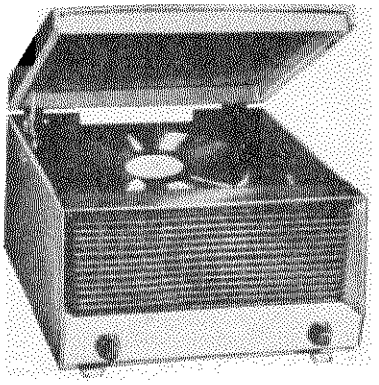
Reference Symbol	Description	Service Part No.
C1	Condenser, tuning gang	31-2735-4
C1A	Condenser, trimmer, antenna	Part of C1
C1B	Condenser, trimmer, oscillator	Part of C1
C2	Condenser, i-f neutralizing, 1.5 μμf.	30-1221-7
C3	Condenser, screen by-pass, .004 μf.	30-1239*
C4	Condenser, B– to chassis, .1 μf.	30-4650-47*
C5	Condenser, d-c blocking, 47 μμf.	60-00475420*
C6	Condenser, grid by-pass .004 μf.	30-1239*
C7	Condenser, temperature compensating, 7.5 μμf.	30-1224-83
C8	Condenser, filament by-pass, .25 μf.	30-4656-1
C9	Condenser, neutralizing 3.3 μμf.	30-1221
C10	Condenser, audio circuit	30-1237
C10A	Condenser, audio coupling .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 μμf.	Part of C10
C11	Condenser, tone compensation, .004 μf.	30-4650-56*
C12	Condenser, electrolytic, filament by-pass, 50 μf.	30-2417-12
C13	Condenser, electrolytic, filter	30-2568-39
C13A	Condenser, filter, 40 μf.	Part of C13
C13B	Condenser, filter, 10 μf.	Part of C13
C13C	Condenser, filter, 50 μf.	Part of C13
C14	Condenser, line by-pass, .047 μf.	30-4650-45*
C15	Condenser, a-v-c by-pass, .05 μf.	30-4650-45*
CR1	Rectifier, selenium	34-8003
J1	Private listening unit	42-1975-2
LA1	Coil, antenna	32-4455-9
LS1	Loudspeaker	36-1637
R1	Resistor, filament dropping, 820 ohms	66-1828340*
R2	Resistor, grid leak, 68,000 ohms	66-3688340*
R3	Resistor, cathode bias, 470 ohms	66-1478340*
R4	Resistor, B– to chassis, 150,000 ohms	66-4158340*
R5	Resistor, screen dropping, 15,000 ohms	66-3158340*
R6	Resistor, grid leak, 3.3 megohms	66-5338340*
R7	Resistor, a-v-c load, 2.2 megohms	66-5228340*
R8	Volume control, 1 megohm	33-5566-21
R9	Resistor, grid leak, 4.7 megohms	66-5478340*
R10	Resistor, screen dropping, 4.7 megohms	66-5478340*
R11	Resistor, plate load, 680,000 ohms	66-4688340*
R12	Resistor, grid leak, 2.2 megohms	66-5228340*
R13	Resistor, filament dropping, 2200 ohms	66-2228340*
R14	Resistor, limiting, 2100 ohms	33-3445
R15	Resistor, B+ filter, 820 ohms	66-1828340*
R16	Resistor, limiting, 120 ohms	33-1334-14
R17	Resistor, filament dropping, 1500 ohms	66-2158340*
R18	Resistor, battery economizer, 150 ohms	66-1158340*
R19	Resistor, battery economizer, 430 ohms	66-1438340*
R20	Resistor, private listening unit, 10 ohms	66-0108340*
S1	Switch, on-off	Part of R8
S2	Switch, battery economizer	42-1796-3
T1	Transformer, oscillator	32-4453-1
T2	Transformer, output	32-8434
W1	Line cord	L2183*
WS1	Switch, wafer, battery to line	42-1925-1
Z1	Transformer, 1st i-f	32-4160-4A
Z2	Transformer, 2nd i-f	32-4454-1A

MISCELLANEOUS

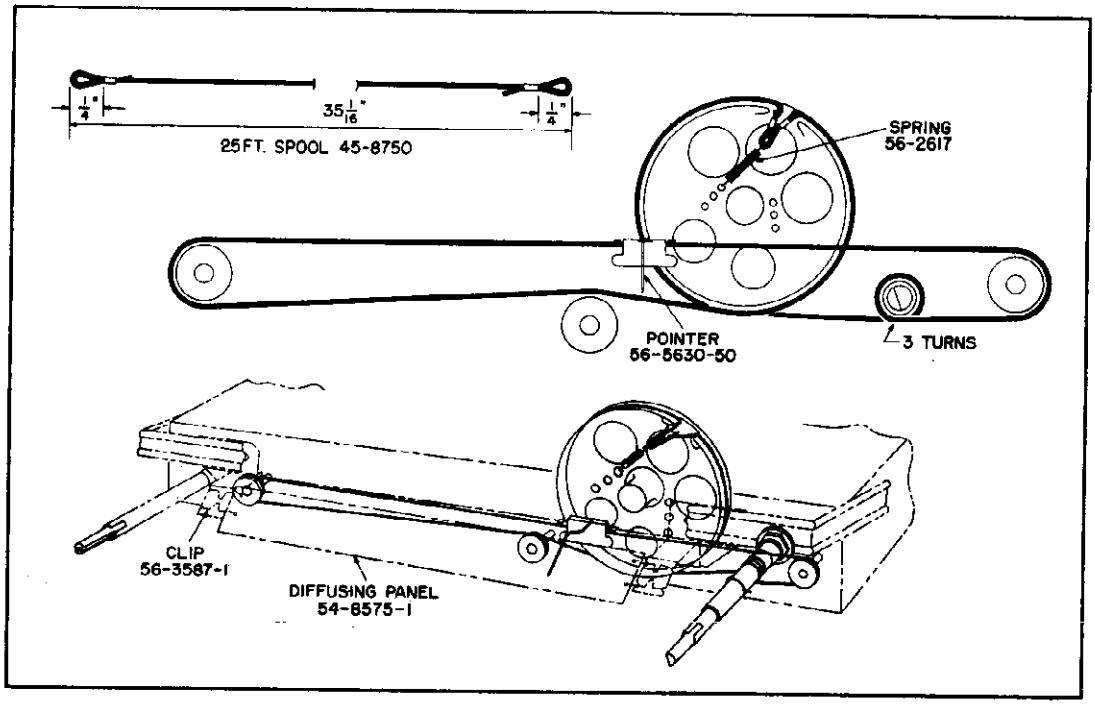
Description	Service Part No.
Cabinet, pine green	10954-10
Back, pine green	54-6010-5
Handle, pine green	54-6012-5
Jack, cover	54-4967-11
Knob (2)	54-6016-2
Cabinet, cherry	10954-12
Back, cherry	54-6010-6
Handle, cherry	54-6012-6
Jack, cover	54-4967-10
Knob (2)	54-6016-1
Cabinet, spruce green	10954-16
Back, spruce green	54-6010-8
Handle, spruce green	54-6012-8
Jack, cover	54-4967-8
Knob (2)	54-6016-3
Cabinet, pearl grey	10954-18
Back, pearl grey	54-6010-9
Handle, pearl grey	54-6012-9
Jack, cover	54-4967-12
Knob (2)	54-6016-9
Cable, battery	41-3988-1
Clip, cabinet back (2)	56-9162
Dial scale	56-9986
Backplate assembly, dial	76-8177
Window, dial	54-6011
Drive cord, 25-ft. spool	45-8750*
Spring, gang drive	56-2617*
Spring, pointer drive	28-8953
Fastener, speaker baffle (2)	W2235-7FA9
Hinge, cabinet (2)	56-5457
Insulator, tuning-condenser mtg.	27-9508
Pointer assembly	76-8071
Ring, handle mtg. (2)	56-9987
Rubber mount, tuning-condenser mtg. (3)	27-4099-3
Shaft, tuning	56-7906FA42
Shield, tube base	56-3978-1FA3
Socket, tube (2)	27-6203
Socket, tube (2)	27-6203-12
Spring, hairpin, shaft mtg.	28-8610
Spring, retaining	57-1868FA11

SPECIFICATIONS

CABINET	Molded plastic
CIRCUIT	Four-tube superheterodyne plus rectifier
FREQUENCY RANGES	
Broadcast	540—1620 kc.
Special Services	1700—3400 kc.
AUDIO OUTPUT	3 watts
OPERATING VOLTAGE	105—120 volts, 60 cycles, a.c.
POWER CONSUMPTION	
Radio	35 watts
Phonograph	60 watts
INTERMEDIATE FREQUENCY	455 kc.
ANTENNA	Built-in high-impedance loop; provision for external antenna
PHILCO TUBES	7A8 converter; 7B7 i-f amplifier; 7C6 detector-a.v.c.-1st audio; 35L6GT output; 50Y7GT rectifier
PHONOGRAPH	Philco Model M-24 All-Speed Automatic Record Changer



MODEL B1350



TP2-2587

Figure 1. Drive-Cord Installation Details

MODEL B1350

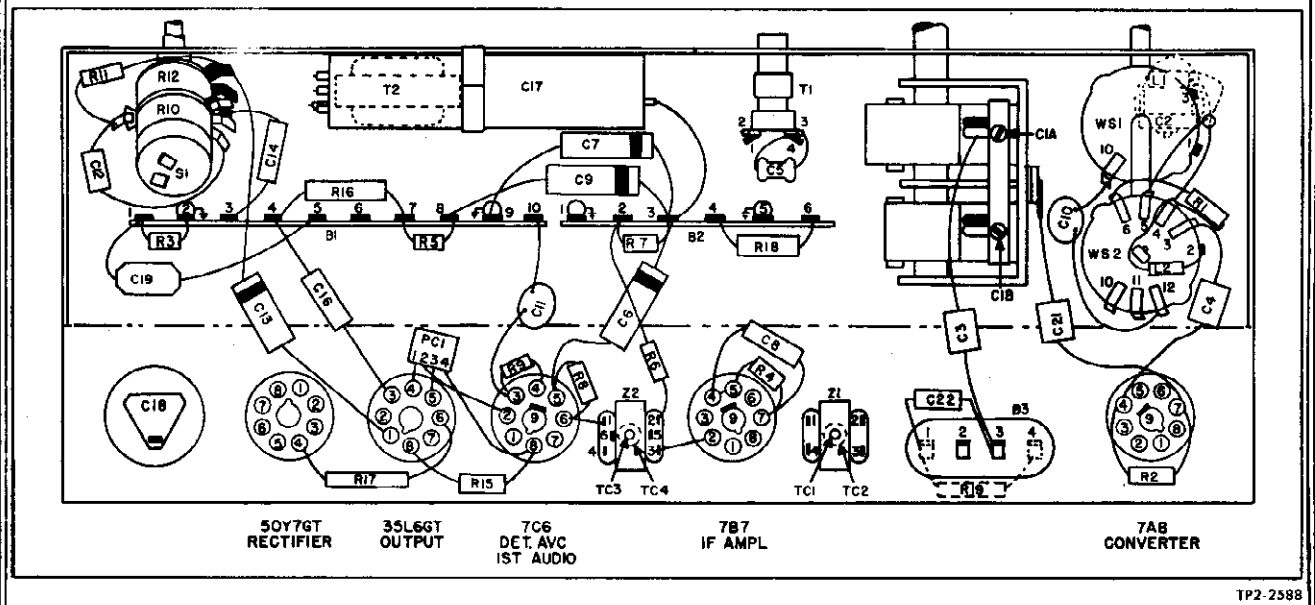


Figure 2. Base View, Showing Parts Placement and Alignment Points

ALIGNMENT PROCEDURE

GENERAL—In order to perform the alignment procedure it is necessary to remove the front of the cabinet from the back portion of the cabinet holding the record changer. This front part of the cabinet can be removed by loosening the front screws located on the bottom of the cabinet, and the screws located directly under the front of the changer lid.

DIAL POINTER—With the tuning-condenser plates fully meshed, set the dial pointer to coincide with the index mark located to the left of "55" on the dial scale.

CONTROLS—Set the volume control to maximum and the tone control to the treble position. Set the radio-phono switch to the broadcast position for the first three steps of the procedure, and to the special services position for the last step. Set the tuning control as indicated in the chart.

OUTPUT INDICATOR—Connect the output indicator (a 1000-ohms-per-volt voltmeter or an oscilloscope) across the voice-coil terminals.

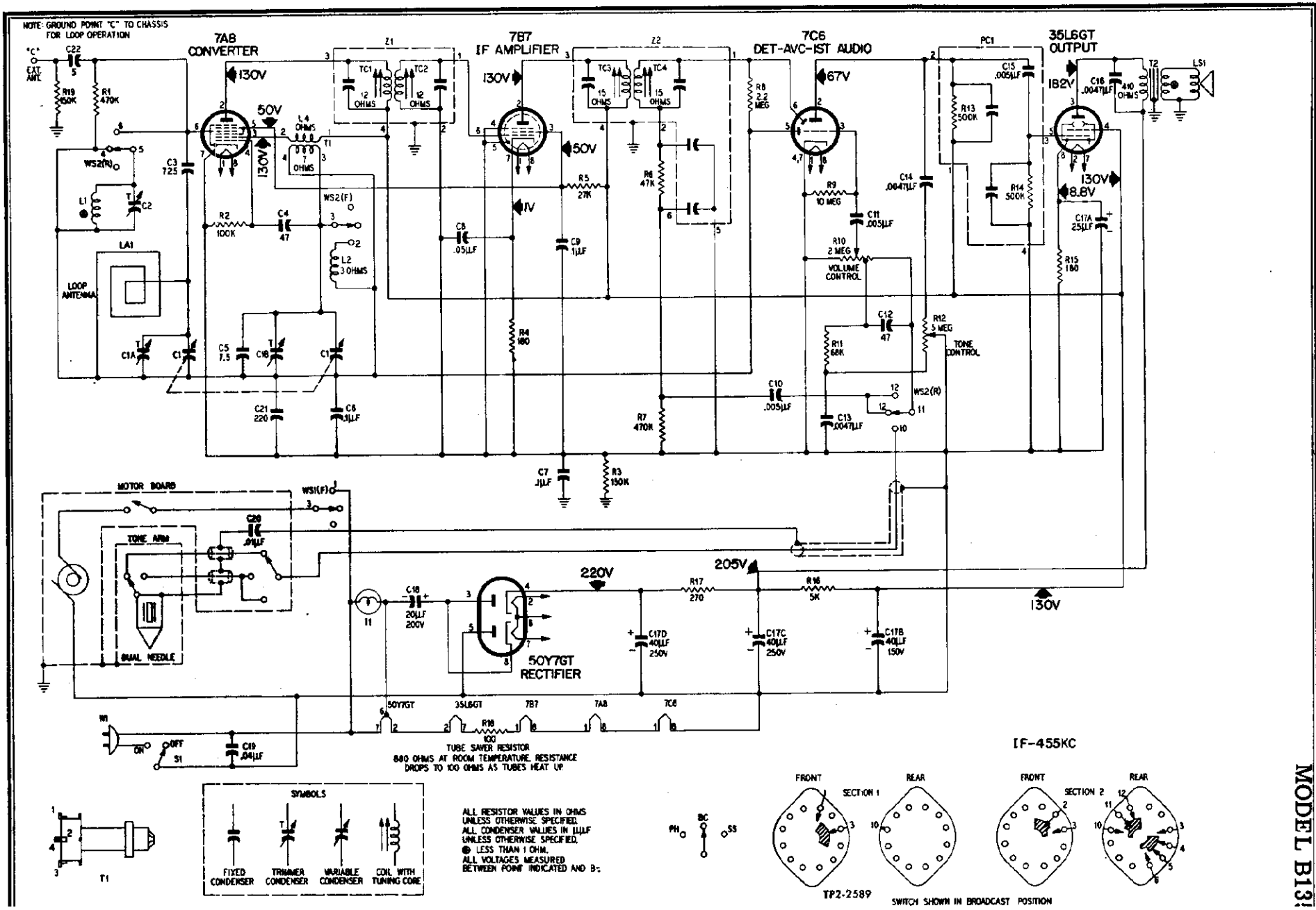
SIGNAL GENERATOR—Use an amplitude-modulated r-f generator. Connect the ground lead to B−, and the output lead as indicated in the chart.

OUTPUT LEVEL—During the alignment, attenuate the signal-generator output to maintain the output indication below 1 volt.

ALIGNMENT CHART

STEP	SIGNAL GENERATOR		RADIO		
	CONNECTION TO RADIO	DIAL SETTING	DIAL SETTING	SPECIAL INSTRUCTIONS	ADJUST TRIMMER
1	Output lead through a .01-μf. condenser to grid (pin 6) of 7A8 converter tube.	455 kc. (modulated)	Gang fully open.	Adjust, in order given in next column, for maximum output. TC2 and TC4 are located at top of transformers.	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 1 below).	1620 kc.	1620 kc. (see note 2 below).	Adjust for maximum output.	C1B—oscillator trimmer
3	Same as step 2.	1500 kc.	1500 kc.	Adjust for maximum output.	C1A—antenna trimmer (broadcast)
4	Same as step 2.	3200 kc.	3200 kc.	Adjust for maximum output.	C2 — antenna trimmer (special services)

NOTE 1: Make up a 6—8 turn, 6-inch-diameter loop from insulated wire; connect to signal-generator leads, and place near radio loop.
NOTE 2: The tuning gang can be set to 1620 kc. by placing a piece of 6-mil flat shim stock between the heel of the rotor and the top of the stator plates, and moving the rotor until is holds the shim in place. Remove the shim before proceeding with the alignment.



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MODEL B13

MODEL B1350

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 unchanged. When ordering replacements, use only the "Service Part No."

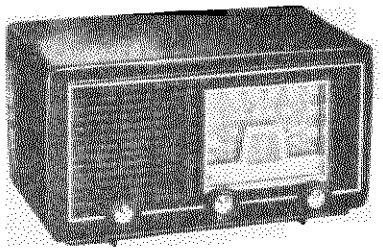
Reference Symbol	Description	Service Part No.
C1	Condenser, tuning gang	31-2751-9
C1A	Condenser, trimmer, antenna	Part of C1
C1B	Condenser, trimmer, oscillator	Part of C1
C2	Condenser, trimmer, special services antenna	31-6473-31
C3	Condenser, series tracker, 725 μμf.	30-1220-69
C4	Condenser, d-c blocking, 47 μμf.	60-00475420
C5	Condenser, fixed trimmer, 7.5 μμf.	30-1224-65
C6	Condenser, a-v-c by-pass, .1 μf.	30-4650-47*
C7	Condenser, by-pass, .1 μf.	30-4650-47*
C8	Condenser, cathode by-pass, .05 μf.	30-4650-45*
C9	Condenser, screen by-pass, .1 μf.	30-4650-47*
C10	Condenser, d-c blocking, .005 μf.	30-1238-1*
C11	Condenser, d-c blocking, .005 μf.	30-1238-1*
C12	Condenser, high-frequency compensation, 47 μμf.	60-00475420
C13	Condenser, bass compensation, .0047 μf.	30-4650-56*
C14	Condenser, tone, .0047 μf.	304650-56*
C15	Condenser, d-c blocking, .005 μf.	Part of PC1
C16	Condenser, tone compensation, .0047 μf.	30-4650-56
C17	Condenser, electrolytic, 4-section	30-2575-32
C17A	Condenser, cathode by-pass, 25 μf., 50v.	Part of C17
C17B	Condenser, filter, 40 μf., 150v	Part of C17
C17C	Condenser, filter, 40 μf., 250v	Part of C17
C17D	Condenser, filter, 40 μf., 250v	Part of C17
C18	Condenser, voltage doubling, 20 μf., 200v	30-2568-22
C19	Condenser, line by-pass, .04 μf.	30-1226-17*
C20	Condenser, phono isolation, .01 μf.	30-4650-58*
C21	Condenser, a-v-c decoupling, 220 μμf.	62-122001001*
C22	Condenser, aerial blocking, 5 μμf.	30-1221-5
I1	Lamp, pilot	34-2064*
L1	Coil, antenna, special services	32-4561-5
L2	Coil, oscillator shunt	32-4562-1
LA1	Loop assembly, antenna	76-2127-16
LS1	Speaker	36-1639-1
PC1	Printed circuit, d-c blocking	30-6001
R1	Resistor, grid return, 470,000 ohms	66-4478340*
R2	Resistor, grid leak, 100,000 ohms	66-4108340*
R3	Resistor, B– to chassis, 150,000 ohms	66-4158340*
R4	Resistor, cathode bias, 180 ohms	66-1188340*
R5	Resistor, screen dropping, 27,000 ohms	66-3278340*
R6	Resistor, i-f filter, 47,000 ohms	66-3478340*
R7	Resistor, diode return, 470,000 ohms	66-4478340*
R8	Resistor, diode load, 2.2 megohms	66-5228340*
R9	Resistor, grid leak, 10 megohms	66-6108340*
R10	Volume control, 2 megohms (with off-on switch and tone control)	33-5563-55
R11	Resistor, bass compensation, 68,000 ohms	66-3688340*
R12	Tone control, 5 megohms	Part of R10
R13	Resistor, plate load, 500,000 ohms	Part of PC1
R14	Resistor, grid leak, 500,000 ohms	Part of PC1
R15	Resistor, cathode bias, 180 ohms, 1 watt	66-1184340*
R16	Resistor, filter, 5000 ohms, 7 watts	33-1335-95
R17	Resistor, filter, 270 ohms, 7 watts	33-1335-91
R18	Resistor, tube saver, 100 ohms	33-1343-3
R19	Resistor, aerial loading, 150,000 ohms	66-4158340*
S1	Switch, off-on	Part of R10
T1	Transformer, oscillator	32-4453-2
T2	Transformer, output	32-8242-9
W1	Line cord	L-2183*
WS	Wafer switch, 2-section	42-1989
Z1	Transformer, 1st i-f	32-4160A
Z2	Transformer, 2nd i-f	32-4240A

MISCELLANEOUS

Description	Service Part No.
Cabinet	10949
Bottom cover	54-8255-1
Hinge (2)	56-6603
Lid	54-4990
Lid support	56-6604
Binder post	56-6296
Changer Mounting Hardware	
Sleeve, rubber (3)	54-7798
Speed nut (3)	W-2554
Spring, mounting, top (3)	56-7059FA9
Spring, mounting, bottom (3)	56-7059-1FCP
Dial scale	54-5156
Drive cord, 25 ft. spool	45-8750*
Foot, rubber (4)	54-4579
Gasket, speaker	54-8089
Knob, off-on-volume	54-4842-8
Knob, radio-phono—Special Services	54-4842-9
Knob, tuning	54-4841
Knob, tone	54-4841-10
Lead assembly, antenna	76-1472
Mounting foot (4)	56-7778-1
Mount, rubber (3)	27-4596
Panel, diffusing	54-8575-1
Clip, diffusing panel (2)	56-3587-1
Pilot-lamp socket assembly	76-1179-7
Fastener, pilot-lamp shield (2)	W2235-1FA9
Pointer	56-5630-50
Rail assembly, pointer	76-7906
Spring, pointer drive	56-2617*
Socket, Loktal (3)	27-6207*
Socket, octal (2)	27-6174*
Spring, hairpin	56-6552
Tuning shaft	56-8370-1

SPECIFICATIONS

CABINET	Plastic table model
CIRCUIT	Six-tube superheterodyne plus selenium rectifier
FREQUENCY RANGES	
Broadcast	540—1620 kc.
FM	88—108 mc.
AUDIO OUTPUT	1 watt
OPERATING VOLTAGE	105—125 volts, a.c./d.c.
POWER CONSUMPTION	45 watts
AERIAL	Built-in pancake 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., 19V8 det.-a.v.c.-1st audio, 35C5GT output



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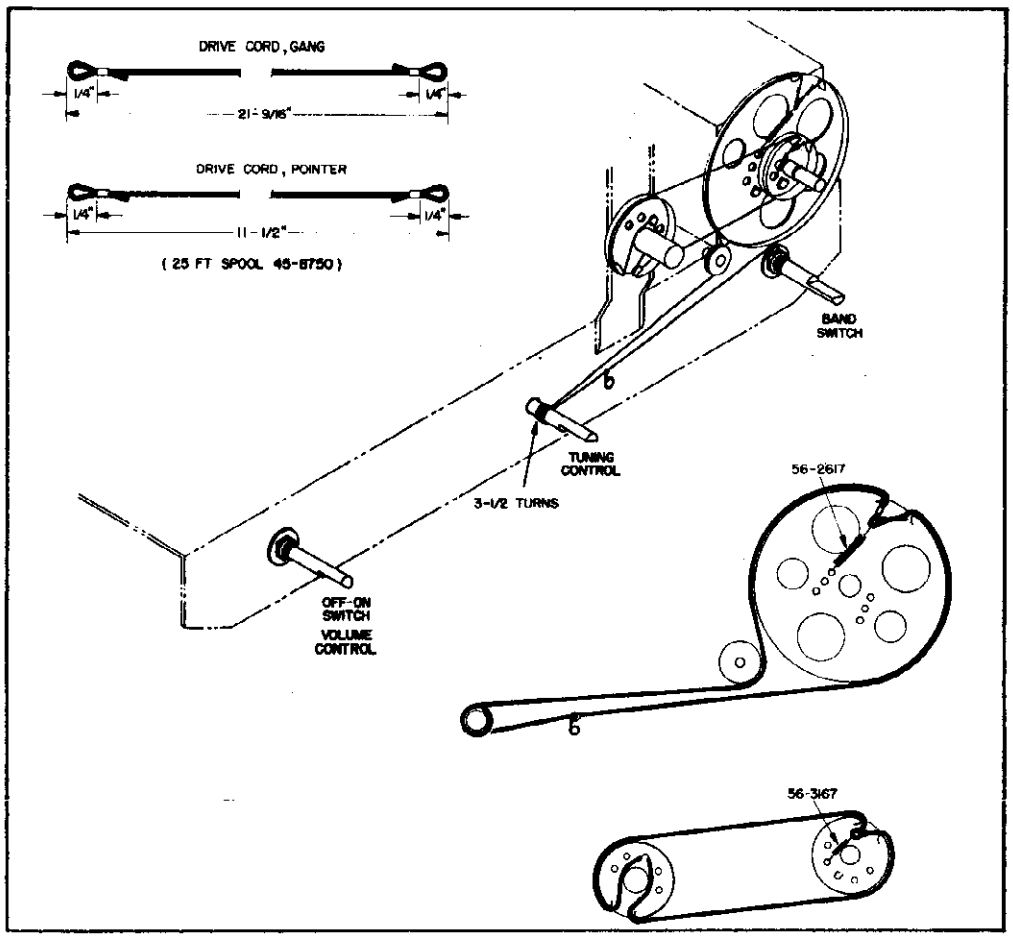

TP2-2260

Figure 1. Drive-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 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 junction of LA1 and L8.	455 kc.	Gang fully open.	Adjust for maximum output, in order given.	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.	1620 kc. (2nd index mark from right).	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.

OSCILLOSCOPE—Connect ground lead to chassis. Connect vertical input to FM TEST jack, J2; connect horizontal input to horizontal sweep output of sweep generator. (Oscilloscope is used for steps 1 and 2.)

SWEEP GENERATOR—Use FM r-f sweep signal generator. Connect output lead as given in chart. Set frequency and sweep width as indicated in chart.

OUTPUT METER—Connect across voice-coil terminals.

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

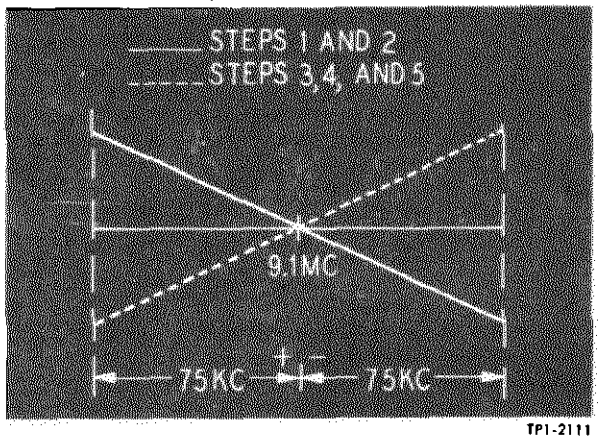

Figure 2. Characteristic Curve of FM Detector

FM 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 .01-μf. condenser to control grid (pin 1) of 12AU6 2nd i-f amplifier.	9.1 mc. (75-kc. deviation).	88 mc. (gang meshed).	Balance and adjust detector for maximum indication on scope, as shown in figure 2.	TC8—detector sec. TC7—detector pri.

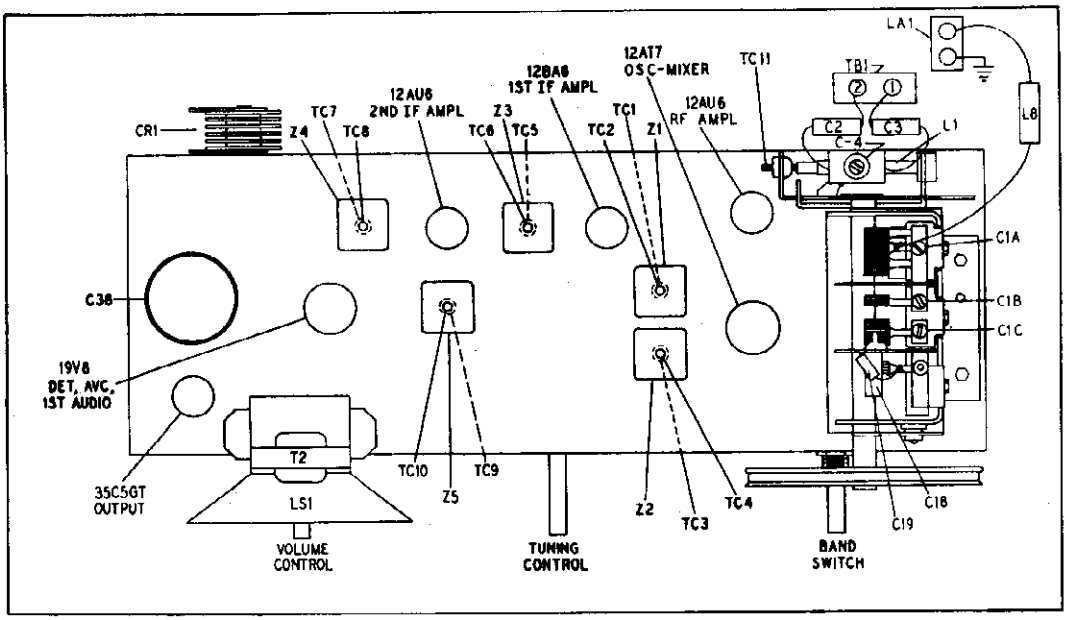

Figure 3. Top View, Showing Trimmer Locations

FM ALIGNMENT CHART *(Continued)*

STEP	SIGNAL GENERATOR CONNECTION TO RADIO	SIGNAL GENERATOR DIAL SETTING	RADIO DIAL SETTING	RADIO SPECIAL INSTRUCTIONS	ADJUST
2	Ground lead to chassis. Output lead through a .01-μf. condenser to FM tuning gang stator lug, junction of C1 and pin 4 of L2.	Same as step 1.	Same as step 1.	Adjust for maximum indication on scope, as shown in figure 2.	TC6—FM 2nd i-f sec. TC5—FM 2nd i-f pri. TC2—FM 1st i-f sec. TC1—FM 1st i-f pri.
3	Ground lead to lug 3 of TB1. Output lead to lug 2 of TB1. See note 1 below.	108.5 mc.	108.5 mc. (1st index mark from right).	Adjust for maximum indication on output meter.	C18—FM osc.
4	Same as step 3.	88 mc.	88 mc. (1st index mark from left).	Adjust for maximum indication on output meter. See note 2 below.	L5—FM osc.
5	Same as step 3.	105 mc.	105 mc. (3rd index mark from right).	Adjust for maximum indication on output meter while rocking tuning condenser.	C1B—FM r-f.
6	Same as step 3.	105 mc.	105 mc.	Adjust for maximum indication on output meter.	C4—FM aerial.
7	Same as step 3.	92 mc.	92 mc. (3rd index mark from left).	Adjust for maximum indication on output meter. See note 3 below.	L2—FM r-f coil.
If FM aerial coil, L1, is replaced, it should be adjusted as directed in step 8, below.					
8	Same as step 3.	92 mc.	92 mc.	Adjust for maximum indication on output meter.	TC11—FM aerial

NOTE 1: For accurate results, the signal-generator output impedance must be 300 ohms, to match the input impedance of TB1. If the generator impedance is less than 300 ohms, a resistor of the proper value may be used in series with the output lead to make the impedance correct. For example, if the output impedance is 150 ohms, place a 150-ohm resistor in series with the output lead.

NOTE 2: If oscillator does not tune as low as 88 mc., compress the turns on the oscillator coil. If oscillator tunes too low, spread the turns slightly. After coil is adjusted, repeat step 3.

NOTE 3: Check resonance of coil L2 by inserting end of a tuning wand, such as Philco Part No. 56-6100, in the coil. If output increases when iron end is placed in coil, compress turns slightly. If output increases when brass end is placed in coil, spread the turns. If output decreases when either end is placed in coil, no adjustment is necessary. After the coil is adjusted, readjust trimmer C1B and repeat steps 3 through 8 until no further improvement is obtained.

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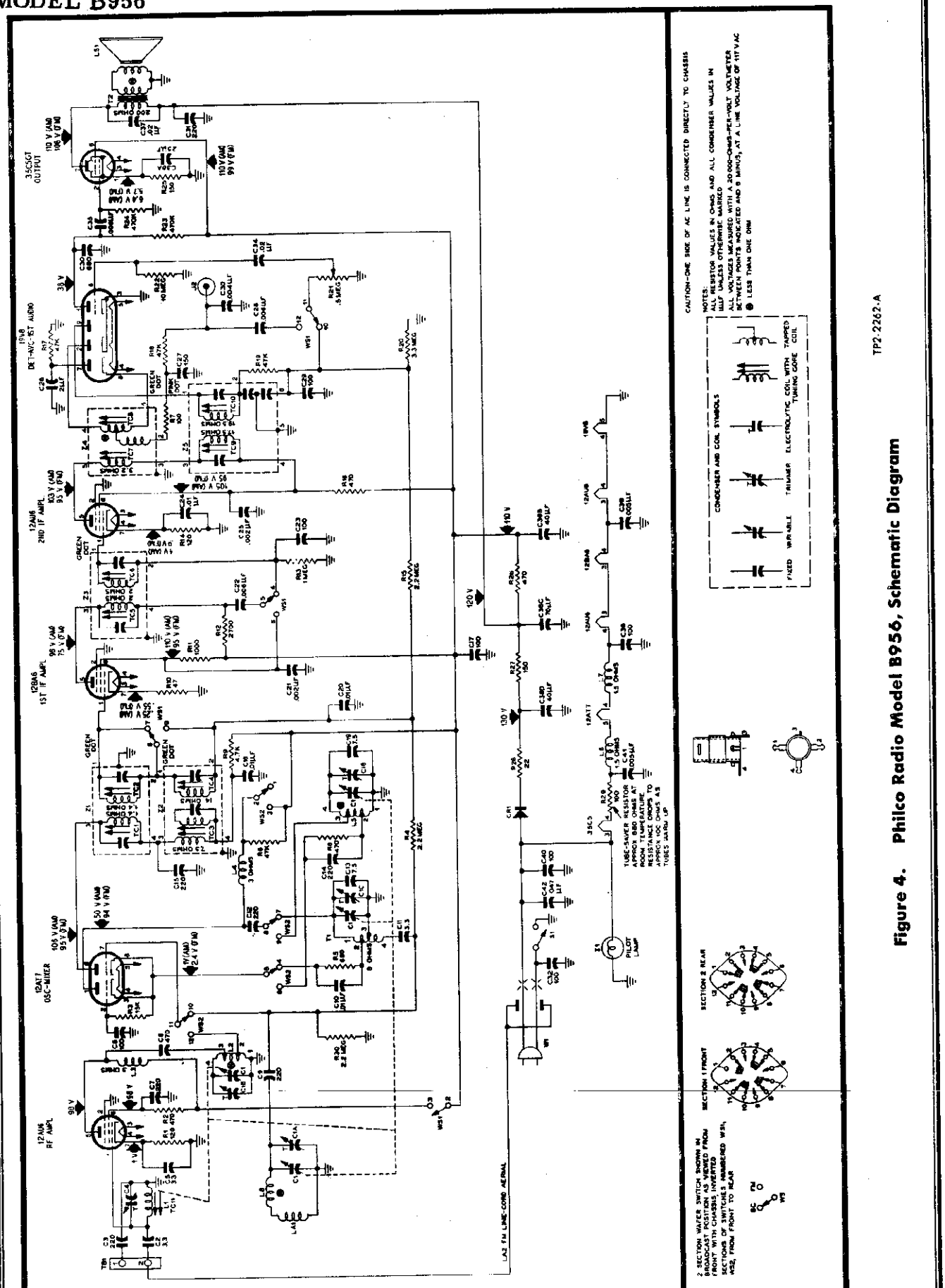


Figure 4. Philco Radio Model B956, Schematic Diagram

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 unchanged. When ordering replacements, use only the "Service Part No."

Reference Symbol	Description	Service Part No.
C1	Condenser, tuning gang, 5-section	31-2762-1
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
C2	Condenser, aerial isolating, 3.3 μμf.	30-1221
C3	Condenser, aerial isolating, 220 μμf.	62-122001001*
C4	Condenser, FM aerial trimmer	45-3034
C5	Condenser, cathode by-pass, 33 μμf.	62-033009001
C6	Condenser, d-c blocking, 470 μμf.	62-147001021*
C7	Condenser, screen by-pass, 220 μμf.	62-122001001*
C8	Condenser, oscillator grid, 100 μμf.	62-110001021*
C9	Condenser, d-c blocking, 220 μμf.	62-122001001*
C10	Condenser, cathode by-pass, .01 μf.	30-4650-58*
C11	Condenser, neutralizing, 3.3 μμf.	30-1224-49
C12	Condenser, d-c blocking 220 μμf.	62-122001001*
C13	Condenser, fixed trimmer, 7.5 μμf.	30-1224-65
C14	Condenser, cathode by-pass, 220 μμf.	62-122001001*
C15	Condenser, r-f by-pass, 220 μμf.	62-122001001*
C16	Condenser, plate decoupling, .01 μf.	30-4650-58*
C17	Condenser, r-f by-pass, 100 μμf.	62-110009001*
C18	Condenser, trimmer, FM oscillator	31-6511-10
C19	Condenser, fixed trimmer, 7.5 μμf.	30-1224-8
C20	Condenser, a-v-c decoupling, .01 μf.	30-4650-58*
C21	Condenser, screen by-pass, .002 μf.	30-4650-54*
C22	Condenser, neutralizing, .006 μf.	30-4650-57*
C23	Condenser, i-f by-pass, 100 μμf.	62-110001021*
C24	Condenser, cathode by-pass, .01 μf.	30-4650-58*
C25	Condenser, screen by-pass, .002 μf.	30-4650-54*
C26	Condenser, electrolytic, diode-load filter, 2 μf., 50v	30-2417-7
C27	Condenser, i-f by-pass, 150 μμf.	62-115001011*
C28	Condenser, d-c blocking, .006 μf.	30-4650-57*
C29	Condenser, i-f by-pass, 100 μμf.	62-110001021*
C30	Condenser, de-emphasis, .004 μf.	30-4650-56*
C31	Condenser, plate decoupling, 220 μμf.	62-122001001*
C32	Condenser, line by-pass, 100 μμf.	62-110001021*
C33	Condenser, plate by-pass, 680 μμf.	62-168001001*
C34	Condenser, d-c blocking, .02 μf.	30-4650-60*
C35	Condenser, d-c blocking, .006 μf.	30-4650-57*
C36	Condenser, filament by-pass, 100 μμf.	62-110001021*
C37	Condenser, tone compensation, .02 μf.	30-4650-60*
C38	Condenser, electrolytic, 4-section	30-4650-46
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 μμf.	62-110001021
C41	Condenser, filament by-pass, .005 μf.	30-1238-1
C42	Condenser, line by-pass, .047 μf.	30-4650-45
CR1	Selenium rectifier, 100 ma., 117v.	34-8003-1
I1	Pilot lamp, frosted, 117v, 7 watts	34-2605
J1	Jack, male, a-c	27-6240-5
J2	Socket, FM test	27-6180
L1	Coil, FM aerial, complete with grommet	32-4532A
L2	Coil, FM r-f	32-4415-2
L3	Choke, r-f, 3.3 μh.	32-4422-10
L4	Choke, r-f, 3.3 μh.	32-4422-10
L5	Coil, FM oscillator	32-4414-5
L6	Choke, filament, 2.2 μh.	32-4422-8
L7	Choke, filament, 2.2 μh.	32-4422-8
L8	Choke, r-f, 4.1 μh.	32-4061-3
LA1	AM loop and support assembly	76-7836
LA2	Line-cord aerial, FM	Part of W1
LS1	Speaker, 4" p-m, including output transformer	36-1625-14
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, 2.2 megohms	66-5228340
R5	Resistor, parasitic suppressor, 680 ohms	66-1688340
R6	Resistor, parasitic suppressor, 470 ohms	66-1478340
R7	Resistor, loading, 100 ohms	66-1108340
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, 2700 ohms	66-2278340
R13	Resistor, grid return, 1 megohm	66-5108340
R14	Resistor, cathode bias, 120 ohms	66-1128340
R15	Resistor, a-v-c filter, 2.2 megohms	66-5228340
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

PARTS LIST *(Cont.)*

Reference Symbol	Description	Service Part No.
R25	Resistor, cathode bias, 150 ohms	66-1158340*
R26	Resistor, filter, 470 ohms, 1 watt	66-1474340*
R27	Resistor, filter, 150 ohms, 2 watts	66-1155360*
R28	Resistor, current limiting, 22 ohms, 2 watts	66-0225360*
R29	Resistor, current limiting, 100 ohms	33-1343-3
R30	Resistor, grid return, 2.2 megohms	66-5228340*
S1	Switch, off-on	Part of R21
T1	Transformer, AM oscillator	32-4569-1
T2	Transformer, output	Part of LS1
W1	Line cord	41-3865-3
W2	Cable, FM aerial, 72-ohm twin lead	41-3987
WS	Switch, band, 2-wafer	42-1924-1
Z1	Transformer, FM, 1st i-f	32-4518A
Z2	Transformer, AM, 1st i-f	32-4516A
Z3	Transformer, FM, 2nd i-f	32-4518-1A
Z4	Transformer, FM, detector	32-4310-4A
Z5	Transformer, AM, 2nd i-f	32-4517A

MISCELLANEOUS

Description	Service Part No.
Cabinet	10941
Back, flange, and socket assembly	76-7829

MISCELLANEOUS (Cont.)

Description	Service Part No.
Fastener, back mtg. (4)	W-2235-FA9
Dial scale	54-4987
Knob, FM-AM	54-4774-28
Knob, tuning	54-4774-26
Knob, volume-off-on	54-4774-27
Clip, pilot lamp	56-3545-FA3
Drive cord, 25-foot spool	45-8750*
Pointer	56-9906
Shaft, drive	56-7931FA11
Spring, gang drive	56-2617
Spring, pointer drive	56-3167
Rubber mount, speaker (2)	54-4651-1
Socket, 12BA6 (i-f ampl.)	27-6265
Socket, 12AU6 (i-f ampl.)	27-6265
Socket, 12AU6 (r-f ampl.)	27-6275-1
Socket, 12AT7	27-6203-6
Socket, 19V8	27-6203-6
Socket, 35C5	27-6203-12
Shield, tube (2)	56-5629-3
Shield, tube base (1)	56-3978-1FA3
Shield, tube base (2)	56-5628-1FA3
Socket, assembly, pilot lamp	27-6233-21
Spring, hairpin	28-8610

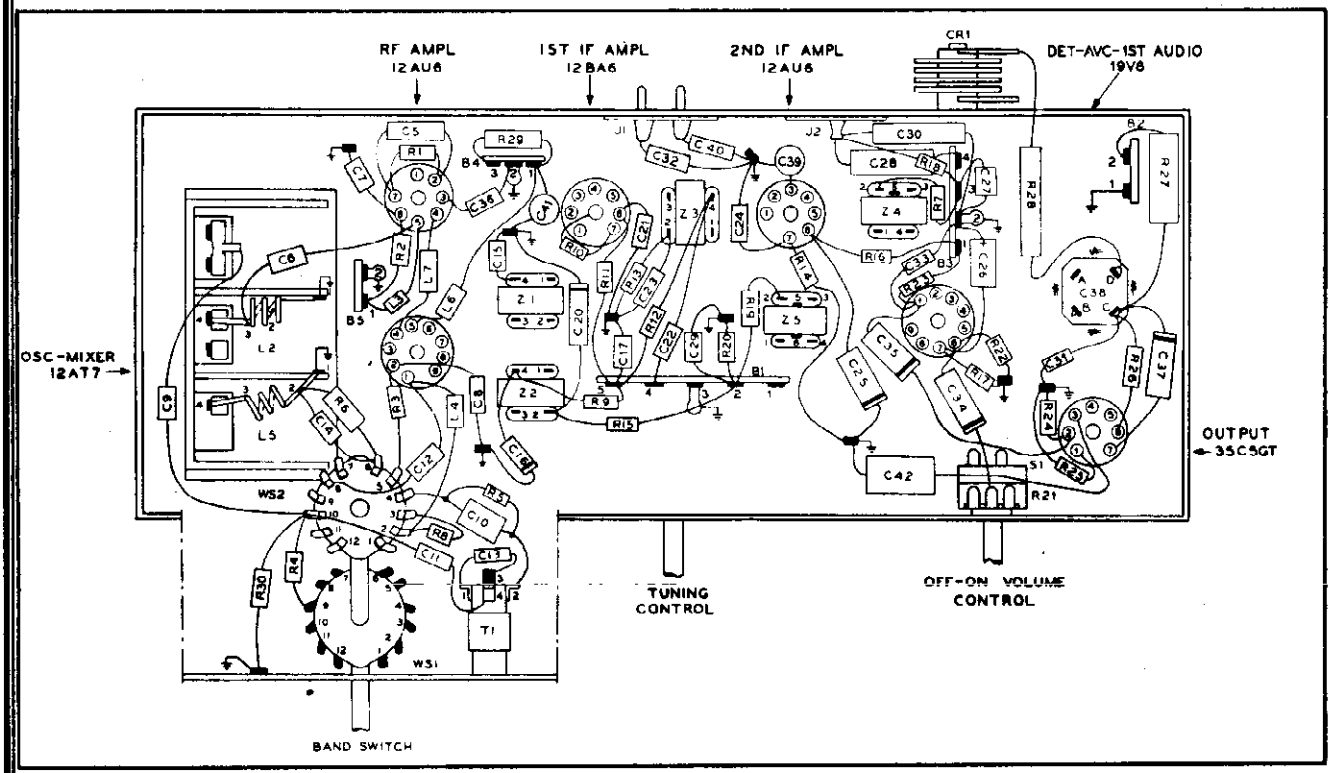
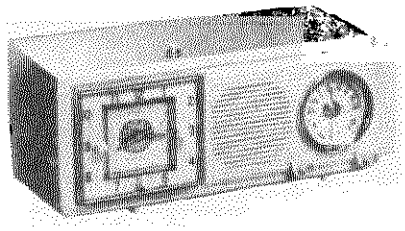


Figure 5. Base View, Showing Parts Placement

SPECIFICATIONS

CABINET	Molded plastic
CIRCUIT	Five-tube Superheterodyne (plus rectifier)
FREQUENCY RANGES	
Standard Broadcast	540—1620 kc.
Special Services	1700—3400 kc.
AUDIO OUTPUT	1 watt
OPERATING VOLTAGE	117 volts, a.c.
POWER CONSUMPTION	30 watts
AERIAL	High-impedance loop
INTERMEDIATE FREQUENCY	455 kc.
PHILCO TUBES	12BE6 converter, 12BA6 i-f amplifier, 12AV6 det.—a.v.c.—1st audio, 35C5 output, 35W4 rectifier



MODEL B714, CODES 121 AND 123

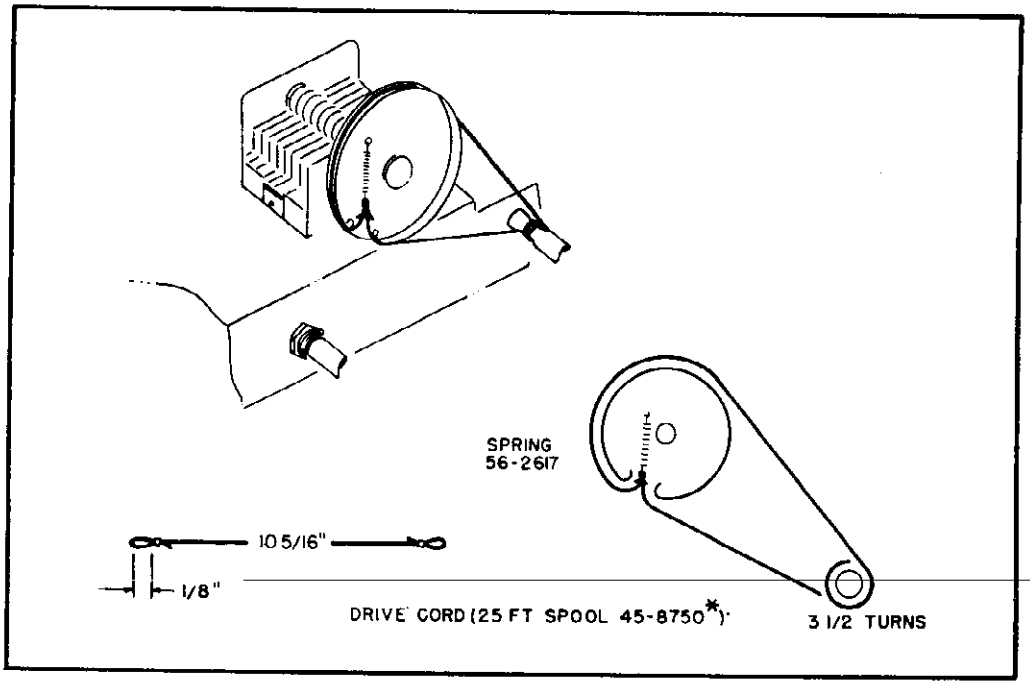


Figure 1. Drive-Cord Installation Details

MODEL B714, Codes 121, 123

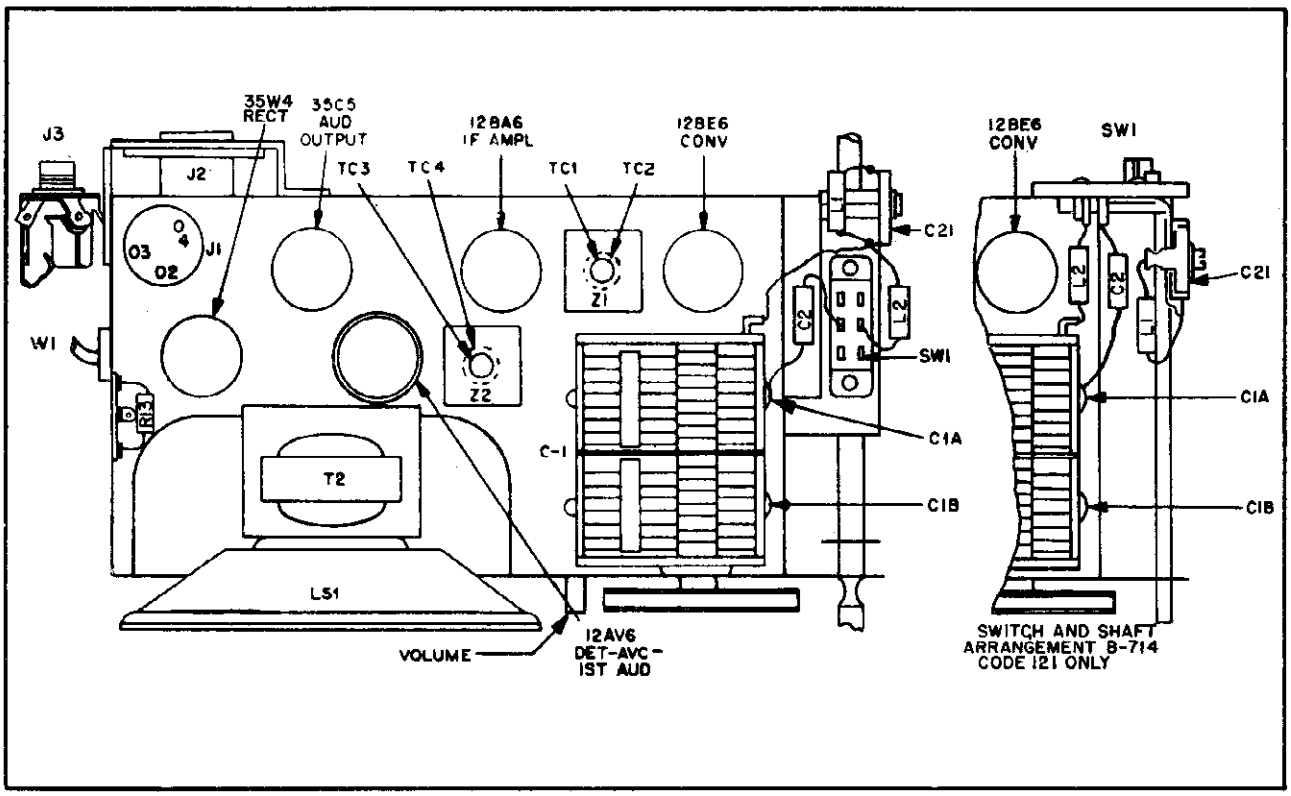
ALIGNMENT PROCEDURE

RADIO CONTROLS—Set volume control to maximum. Set tuning control and band switch 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.



TP3-940

Figure 2. Top View, Showing Trimmer Locations

ALIGNMENT CHART

STEP	SIGNAL GENERATOR		RADIO			ADJUST
	CONNECTION TO RADIO	DIAL SETTING	DIAL SETTING	BAND SWITCH SETTING	SPECIAL INSTRUCTIONS	
1	Ground lead to B–; output lead through a .1-μf. condenser to grid (pin 7) of 12BE6.	455 kc.	Tuning gang fully open	Broadcast	Adjust tuning cores, in order given, for maximum output. (TC1 and TC3 are located at top of transformers.)	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).	1620 kc.	*1620 kc.	Broadcast	Adjust trimmer for maximum output.	C1-B—osc.
3	Same as step 2.	1500 kc.	1500 kc.	Broadcast	Adjust trimmer for maximum output.	C1-A—aerial (broadcast)
4	Same as step 2.	3200 kc.	3200 kc.	Special Services	Adjust trimmer for maximum output.	C2I—aerial (special services)

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

* For proper adjustment of the oscillator trimmer, fully open the tuning gang and insert a .006-inch, non-metallic shim between the heel of the rotor and the top of the stator plates. Close the tuning gang sufficiently to hold the shim in place, and then remove the shim without disturbing the gang setting.

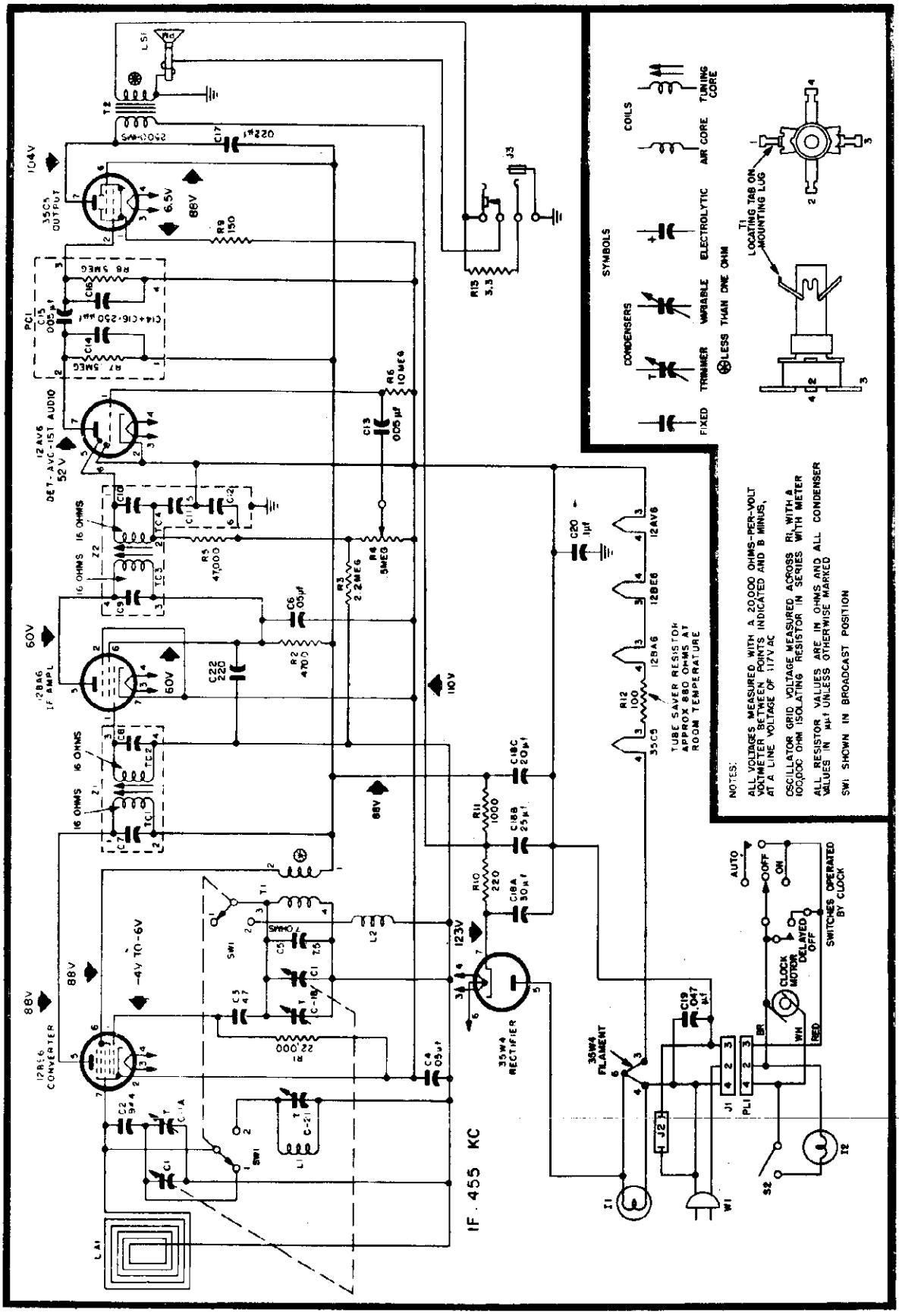


Figure 3. Philco Radio-Clock Model B714, Codes 121 and 123, Schematic Diagram

MODEL B714, Codes 121, 123

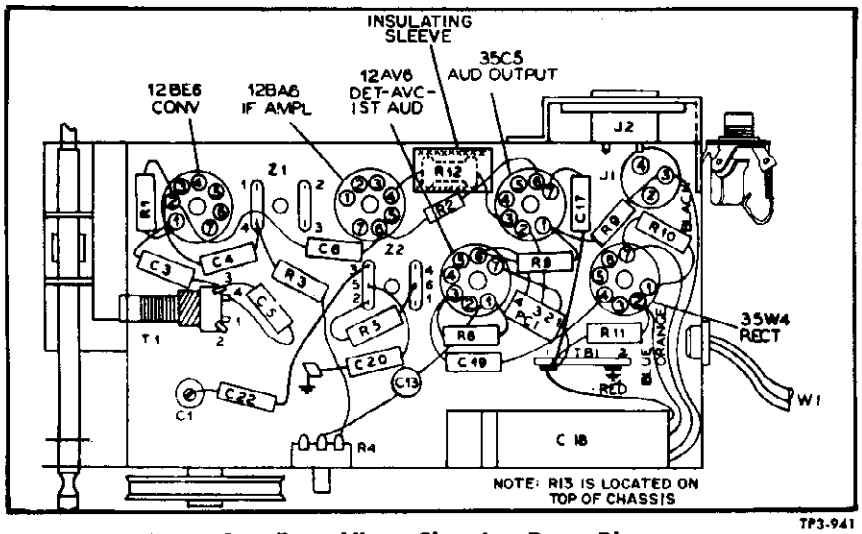


Figure 4. Base View, Showing Parts Placement

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 unchanged. When ordering replacements, use only the "Service Part No."

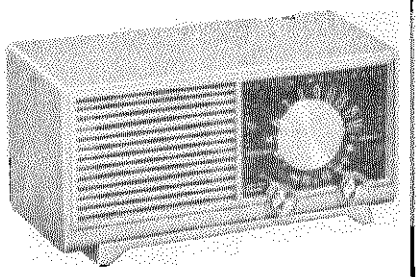
Reference Symbol	Description	Service Part No.
C1	Condenser, tuning gang	31-2751-14
C1A	Condenser, r-f trimmer	Part of C1
C1B	Condenser, oscillator trimmer	Part of C1
C2	Condenser, aerial series tracker, 944 μμf.	30-1220-65
C3	Condenser, oscillator grid, 47 μμf.	30-1230-4
C4	Condenser, a-v-c by-pass, .05 μf.	30-4650-45*
C5	Condenser, drift compensation, 7.5 μμf.	30-1224-83
C6	Condenser, screen by-pass, .05 μf.	30-4650-45*
C7	Condenser, i-f tuning	Part of Z1
C8	Condenser, i-f tuning	Part of Z1
C9	Condenser, i-f tuning	Part of Z2
C10	Condenser, i-f tuning	Part of Z2
C11	Condenser, detector filtering	Part of Z2
C12	Condenser, detector filtering	Part of Z2
C13	Condenser, audio coupling, .005 μf.	30-1238-1*
C14	Condenser, plate by-pass	Part of PC1
C15	Condenser, audio coupling, .005 μf.	Part of PC1
C16	Condenser, compensating	Part of PC1
C17	Condenser, tone compensation, .022 μf.	30-4650-43*
C18	Condenser, electrolytic, 3-section	30-2573
C18A	Condenser, filter, 30 μf., 150v	Part of C18
C18B	Condenser, filter, 25 μf., 150v	Part of C18
C18C	Condenser, filter, 20 μf., 150v	Part of C18
C19	Condenser, line by-pass, .047 μf.	30-4650-45*
C20	Condenser, B minus to chassis, .1 μf.	30-4650-47*
C21	Condenser, trimmer, special services	31-6473-29
C22	Condenser, a-v-c decoupling, 220 μμf.	62-122001001*
I1	Lamp, pilot	34-2068
I2	Lamp, night light	34-2477
J1	Jack; clock	27-6273
J2	Jack, appliance receptacle, a-c	76-3931
J3	Private listening unit	42-1975-2
L1	Coil, aerial, special services	32-4561-3
L2	Coil, oscillator shunt	32-4562-2
LA1	Loop, antenna	Part of back-and-loop ass'y.
LS1	Speaker, p-m	36-1627-8
PC1	Coupling network	30-6001
PL1	Plug, clock assembly	54-4878-2
R1	Resistor, oscillator grid, 22,000 ohms	66-3228340*
R2	Resistor, i-f screen dropping, 4700 ohms	66-2478340*
R3	Resistor, a-v-c filter 2.2 megohms	66-5228340*
R4	Resistor, volume control, .5 megohm	33-5565
R5	Resistor, diode load, 47,000 ohms	66-3478340*
R6	Resistor, grid return, 10 megohms	66-6108340*
R7	Resistor, plate load, 500,000 ohms	Part of PC1
R8	Resistor, grid return, 500,000 ohms	Part of PC1
R9	Resistor, cathode bias, 150 ohms	66-1158340*
R10	Resistor, B plus filter, 220 ohms, 1 watt	66-1224340*
R11	Resistor, B plus filter, 1000 ohms	66-2108340*
R12	Resistor, tube saver, 100 ohms	33-1343-3
R13	Resistor, private listening unit, 3.3 ohms	66-9333540
S2	Switch, night light	42-2023
SW1	Switch, broadcast-special services	42-1796-2
T1	Transformer, oscillator	32-4453-6
T2	Transformer, output	32-8384*
W1	Line cord	L-2183*
Z1	Transformer, 1st i-f	32-4161A
Z2	Transformer, 2nd i-f	32-4240A

MISCELLANEOUS

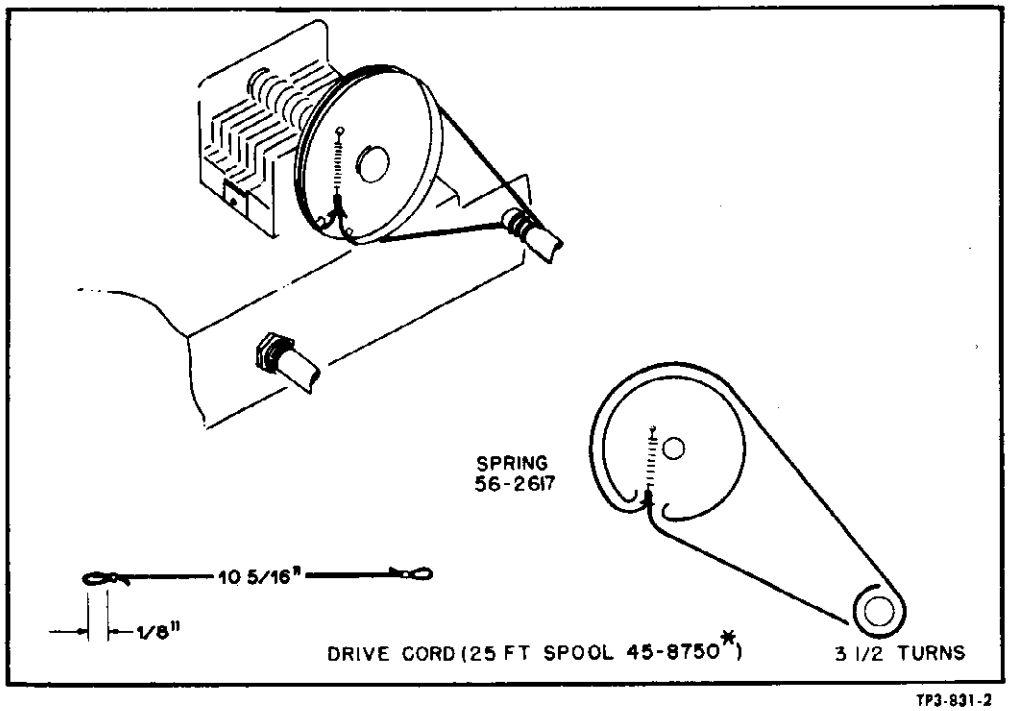
Description	Service Part No.
Cabinet	
White	10940-6
Knobs	
Clock (3)	54-4983-5
Tuning and volume	54-4986-3
Clock	41-2042-2
Back-and-loop assembly	76-7807
Backplate and clip assembly, pilot lamp	76-8720
Scale	
Radio	54-4985
Clock	54-4984
Pointer	56-9846
Clock cover	54-4989
Shaft, tuning	56-9807
Shield, tube	56-5629FA3
Shield, tube base	56-3978FA3
Socket, tube (4)	27-6265
Socket, tube, 12BE6	27-6203-14
Socket assembly, pilot lamp	27-6233-6
Socket assembly, night light	27-6233-110
Spring, drive cord	56-2617
Spring, retaining	28-8610
Drive cord, 25-ft. spool	45-8750*

SPECIFICATIONS

CABINET	Molded plastic
CIRCUIT	Four-tube superheterodyne (plus rectifier)
FREQUENCY RANGE	
Standard Broadcast	540 kc. to 1620 kc.
Special Services	1700 kc. to 3400 kc.
AUDIO OUTPUT	1 watt
OPERATING VOLTAGE	105 to 120 volts, a.c. or d.c.
POWER CONSUMPTION	30 watts
AERIAL	High-impedance loop
INTERMEDIATE FREQUENCY	455 kc.
PHILCO TUBES	12BE6 converter, 12BA6 i-f amplifier, 12AV6 det.-a.v.c.-1st audio, 35C5 output, 35W4 rectifier



MODEL B574, CODE 121



TP3-831-2

Figure 1. Dial-Cord Installation Details

ALIGNMENT PROCEDURE

RADIO CONTROLS—Set volume control to maximum. Set tuning control and band switch, SW1, 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.

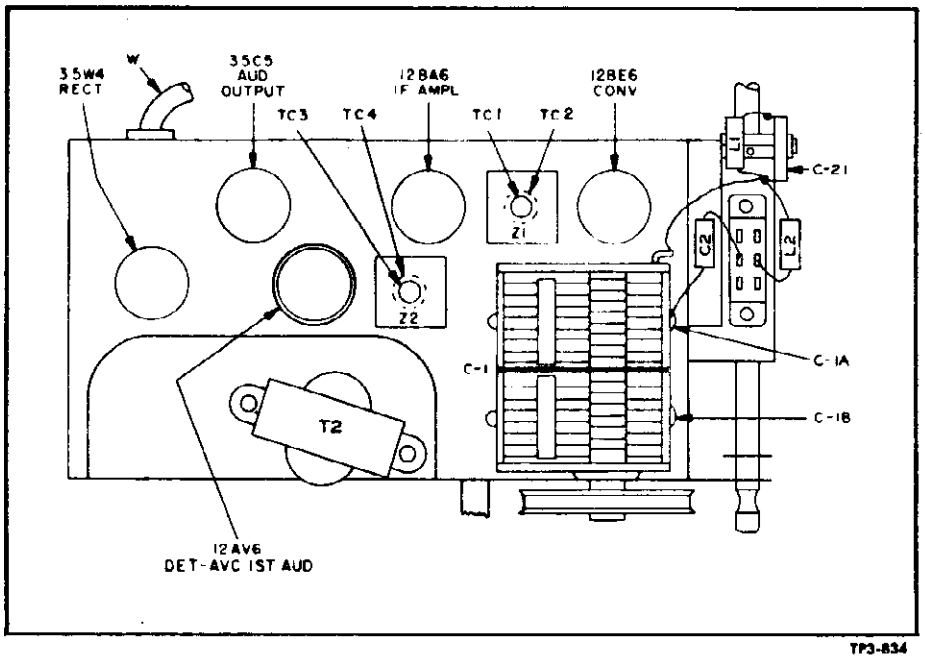


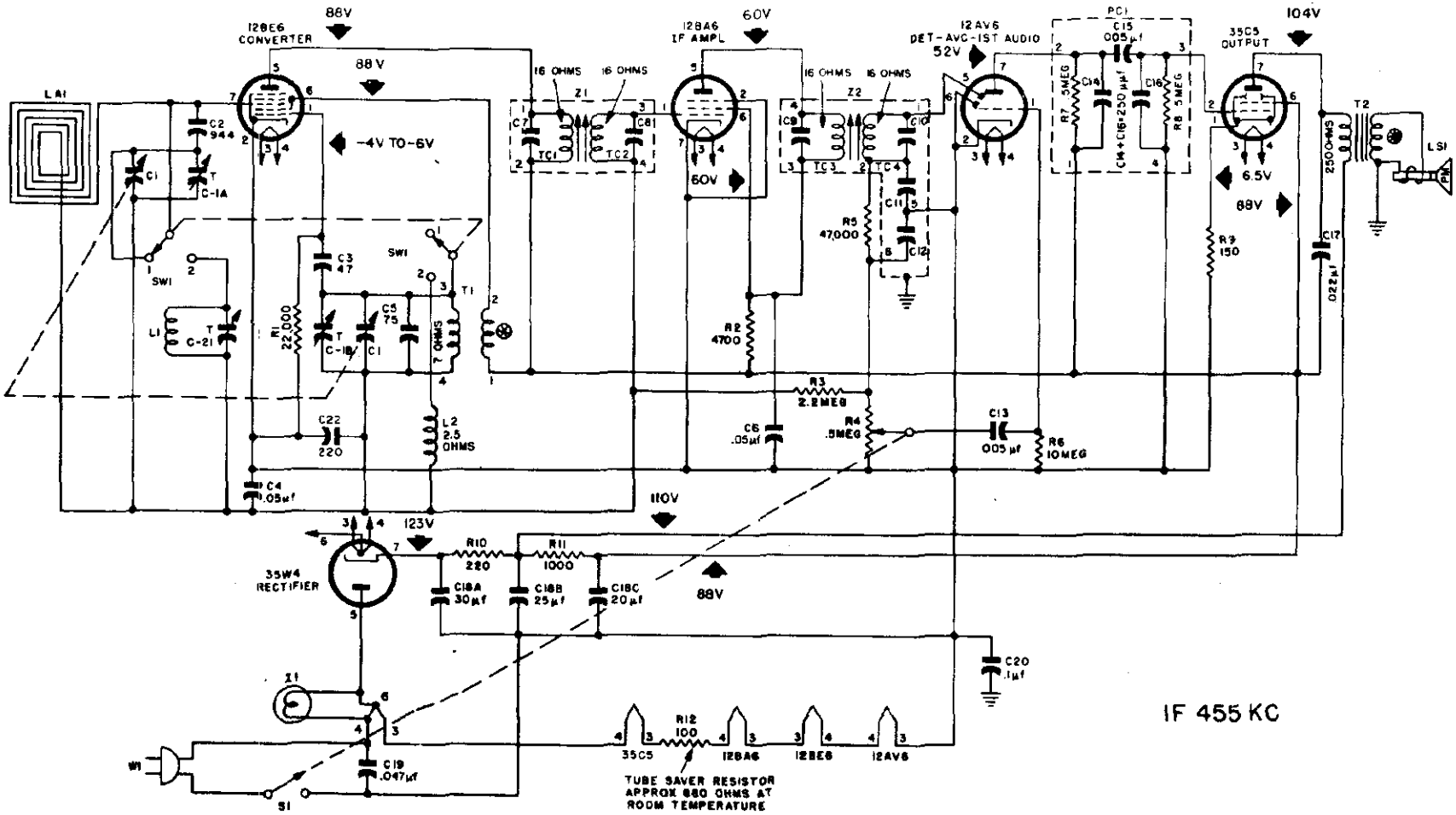
Figure 2. Top View, Showing Trimmer Locations

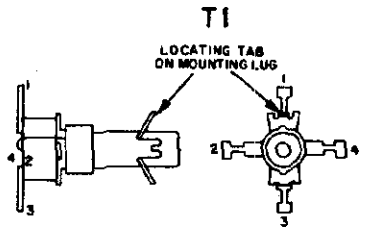
ALIGNMENT CHART

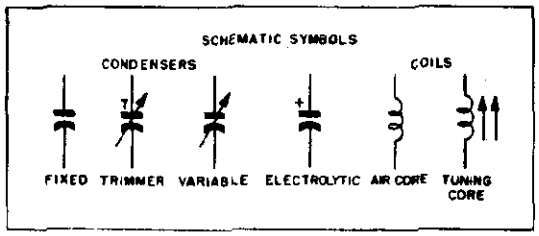
STEP	SIGNAL GENERATOR		RADIO			ADJUST
	CONNECTION TO RADIO	DIAL SETTING	DIAL SETTING	BAND SWITCH SETTING	SPECIAL INSTRUCTIONS	
1	Ground lead to B-; output lead through a .1-μf. condenser to grid (pin 7) of 12BE6.	455 kc.	Tuning gang fully open.	Broadcast	Adjust tuning cores, in order given, for maximum output. (TC1 and TC3 are located at top of transformers.)	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).	1620 kc.	*1620 kc.	Broadcast	Adjust trimmer for maximum output.	C1-B osc.
3	Same as step 2.	1500 kc.	1500 kc.	Broadcast	Adjust trimmer for maximum output.	C1-A aerial (broadcast).
4	Same as step 2.	3200 kc.	3200 kc.	Special services	Adjust trimmer for maximum output.	C-21—aerial (special services).

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

* For proper adjustment of the oscillator trimmer, fully open the tuning gang and insert a .006-inch nonmetallic shim between the heel of the rotor and the top of the stator plates. Close the tuning gang sufficiently to hold the shim in place, and then remove the shim without disturbing the gang setting.







NOTES:
ALL VOLTAGES MEASURED WITH A 20,000 OHMS-PER-VOLT VOLTMETER BETWEEN POINTS INDICATED AND B MINUS, AT A LINE VOLTAGE OF 117 V AC

OSCILLATOR GRID VOLTAGE MEASURED ACROSS R1 WITH A 100,000 OHM ISOLATING RESISTOR IN SERIES WITH METER

ALL RESISTOR VALUES ARE IN OHMS AND ALL CONDENSER VALUES IN µµf UNLESS OTHERWISE MARKED

SW1 SHOWN IN STANDARD BROADCAST POSITION

⊛ LESS THAN 1 OHM

TP2-1408-3

Figure 3. Philco Radio Model B574, Code 121, Schematic Diagram

MODEL B574, Code 121

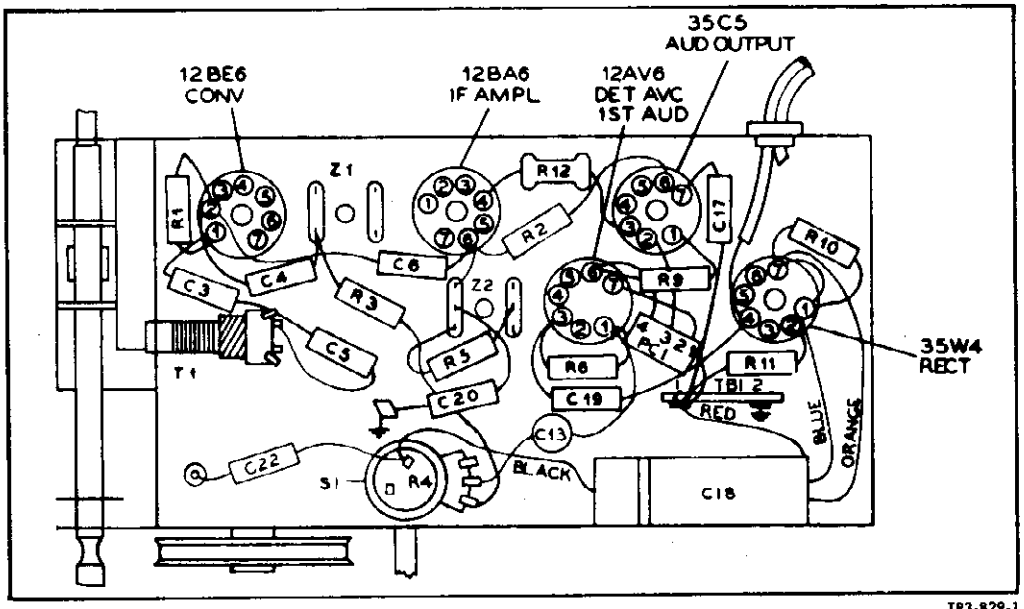


Figure 4. Base View, Showing Symbolized Chassis

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 unchanged. When ordering replacements, use only the "Service Part No."

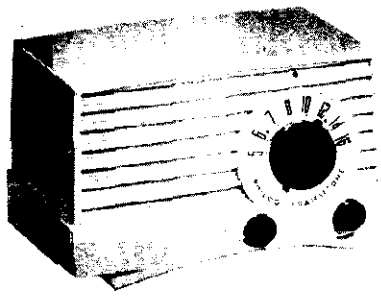
Reference Symbol	Description	Service Part No.
C1	Condenser, tuning gang	31-2751-14
C1A	Condenser, aerial trimmer	Part of C1
C1B	Condenser, osc. trimmer	Part of C1
C2	Condenser, aerial series tracker, 944 μμf.	30-1220-65
C3	Condenser, oscillator grid, 47 μμf.	30-1230-4
C4	Condenser, a-v-c by-pass, .05 μf.	45-3505-28*
C5	Condenser, drift compensation, 7.5 μμf	30-1224-83
C6	Condenser, screen by-pass, .05 μf.	45-3505-28*
C7	Condenser, i-f tuning	Part of Z1
C8	Condenser, i-f tuning	Part of Z1
C9	Condenser, i-f tuning	Part of Z2
C10	Condenser, i-f tuning	Part of Z2
C11	Condenser, detector filtering	Part of Z2
C12	Condenser, detector filtering	Part of Z2
C13	Condenser, audio coupling, .005 μf.	30-1238-1
C14	Condenser, plate by-pass	Part of PC1
C15	Condenser, audio coupling, .005 μf.	Part of PC1
C16	Condenser, compensating	Part of PC1
C17	Condenser, tone compensation, .022 μf.	45-3505-43*
C18	Condenser, electrolytic, 3-section	30-2575-34
C18A	Condenser, filter, 30 μf., 150v	Part of C18
C18B	Condenser, filter, 25 μf., 150v	Part of C18
C18C	Condenser, filter, 20 μf., 150v	Part of C18
C19	Condenser, line by-pass, .047 μf.	30-4650-45
C20	Condenser, B- to chassis, .1 μf.	45-3505-47*
C21	Condenser, trimmer, special service	31-6473-32
I1	Lamp, pilot	34-2068
LA1	Loop, aerial	Part of back-and-loop ass'y.
L1	Coil, antenna, special services	32-4561-3
L2	Coil, oscillator shunt	32-4562-2
LS1	Speaker, p-m	36-1627-8
PC1	Printed circuit	30-6001
R1	Resistor, oscillator grid, 22,000 ohms	66-3228340*
R2	Resistor, i-f screen dropping, 4700 ohm.	66-2478340*
R3	Resistor, a-v-c filter, 2.2 megohms	66-5228340*
R4	Resistor, volume control	33-5566-41
R5	Resistor, diode load, 47,000 ohms	66-3478340*
R6	Resistor, grid return, 10 megohms	66-6108340*
R7	Resistor, plate load, 500,000 ohms	Part of PC1
R8	Resistor, grid return, 500,000 ohms	Part of PC1
R9	Resistor, cathode bias, 150 ohms	66-1158340*
R10	Resistor, B plus filter, 220 ohms	66-1224340*
R11	Resistor, B plus filter, 1000 ohms	66-2108340*
R12	Resistor, tube saver, 100 ohms	33-1343-3
S1	Switch, off-on	Part of R4
SW1	Switch, broadcast-special services	42-1796-2
T1	Transformer, oscillator	32-4453-6
T2	Transformer, output	32-8384-4
W1	Line cord	L-2183*
Z1	Transformer, 1st i-f	32-4161A
Z2	Transformer, 2nd i-f	32-4240A

MISCELLANEOUS

Description	Service Part No.
Cabinet, spruce	10926-29
Back-and-loop ass'y.	76-8362-1
Knob (2)	54-4773-3
Drive cord, 25-foot spool	45-8750
Pointer, dial	28-9502FCP
Shaft, tuning	28-9475FA11
Socket ass'y., pilot lamp	27-6233-80
Socket, 7-pin miniature, 12AV6	27-6203-14
Socket, 7-pin miniature, 12BE6, 12BA6	27-6265
Socket, 7-pin miniature, 35C5, 35W4	27-6265-2
Spring, retaining (3)	1W60980FE7
Spring, drive cord	56-2617
Bracket, switch operating	28-9473FA3
Bracket, switch mounting	28-9474FA3
Switch bracket and padder ass'y.	76-8477

SPECIFICATIONS

CABINET	Molded plastic
CIRCUIT	Four-tube superheterodyne (plus rectifier)
FREQUENCY RANGE	
Standard Broadcast	540 kc. to 1620 kc.
AUDIO OUTPUT	1 watt
OPERATING VOLTAGE	105 to 120 volts, a.c. or d.c.
POWER CONSUMPTION	30 watts
AERIAL	High-impedance loop
INTERMEDIATE FREQUENCY	455 kc.
PHILCO TUBES	12BE6 converter, 12BA6 i-f amplifier, 12AV6 det.-a.v.c.-1st audio, 35C5 output, 35W4 rectifier



MODEL B570

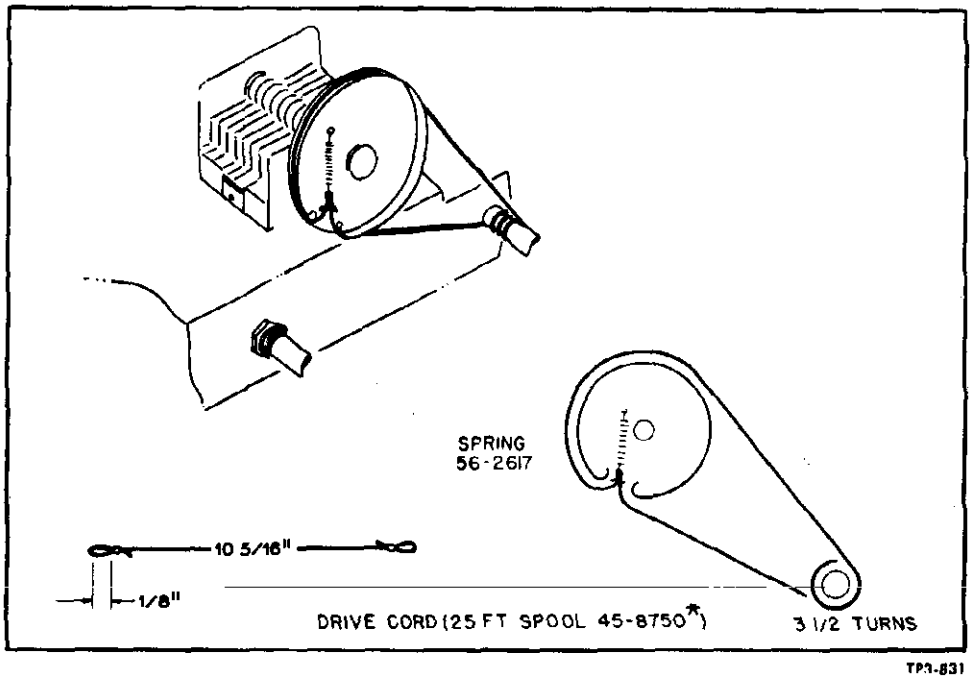


Figure 1. Dial-Cord Installation Details

MODEL B570, Code 121

ALIGNMENT PROCEDURE

RADIO CONTROLS—Set volume control to maximum. Set tuning control and band switch, SW1, 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.

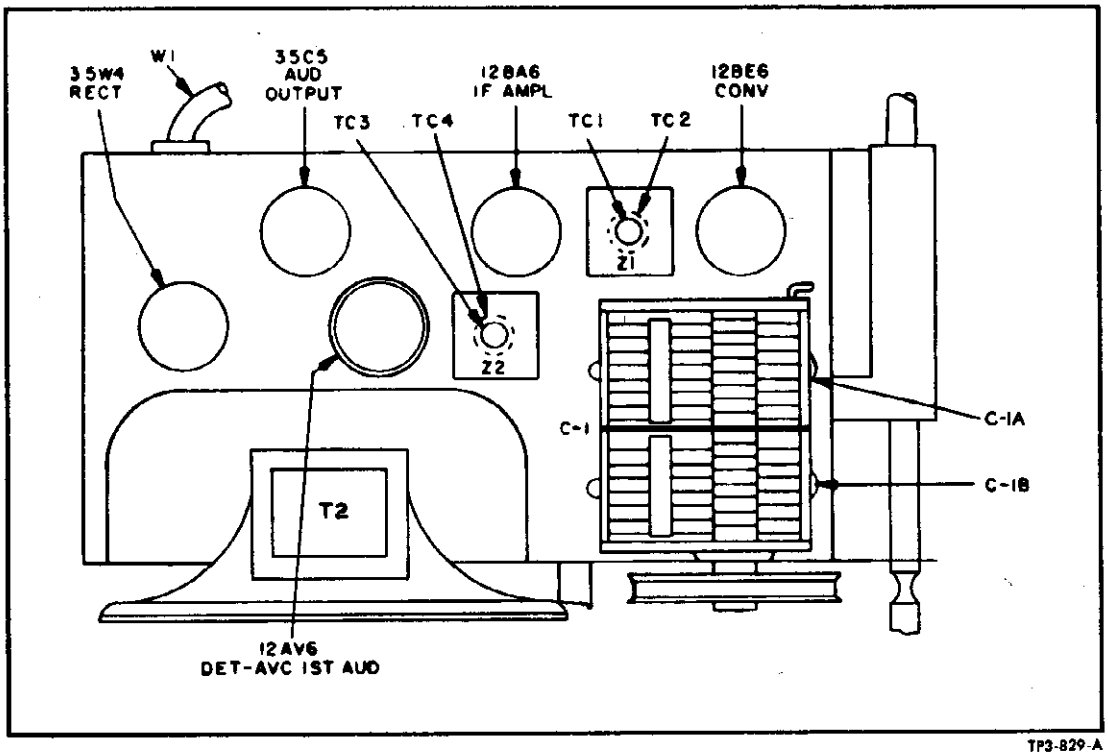


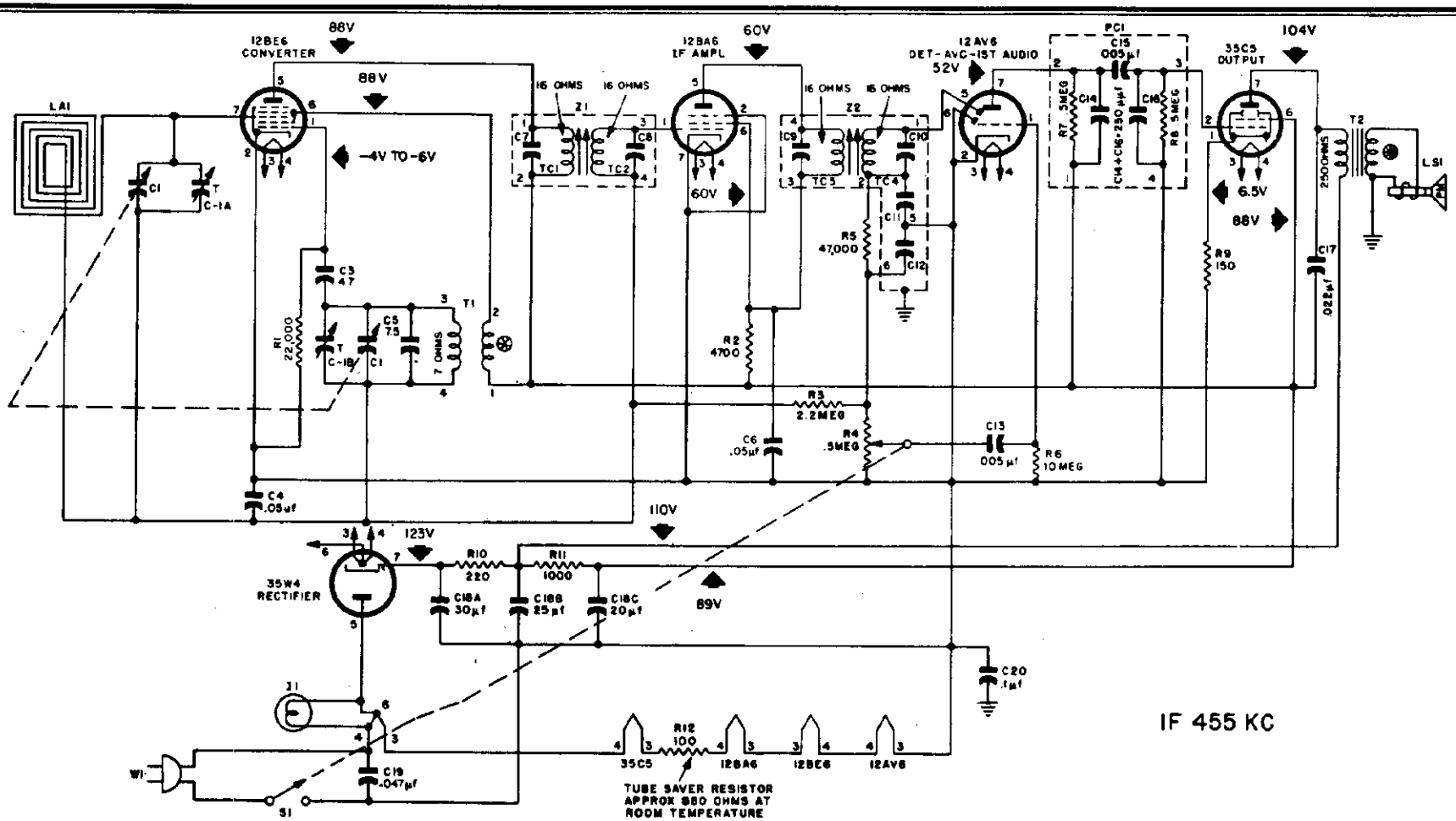
Figure 2. Top View, Showing Trimmer Locations

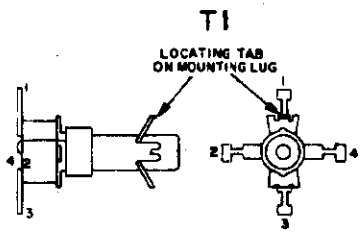
ALIGNMENT CHART

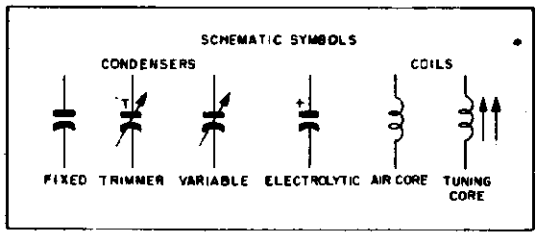
STEP	SIGNAL GENERATOR		RADIO			ADJUST
	CONNECTION TO RADIO	DIAL SETTING	DIAL SETTING	BAND SWITCH SETTING	SPECIAL INSTRUCTIONS	
1	Ground lead to B-; output lead through a .1-μf. condenser to grid (pin 7) of 12BE6.	455 kc.	Tuning gang fully open.	Broadcast	Adjust tuning cores, in order given, for maximum output. (TC1 and TC3 are located at top of transformers).	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).	1620 kc.	*1620 kc.	Broadcast	Adjust trimmer for maximum output.	C1-B osc.
3	Same as step 2.	1500 kc.	1500 kc.	Broadcast	Adjust trimmer for maximum output.	C1-A aerial (broadcast).

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

* For proper adjustment of the oscillator trimmer, fully open the tuning gang and insert a .006-inch nonmetallic shim between the heel of the rotor and the top of the stator plates. Close the tuning gang sufficiently to hold the shim in place, and then remove the shim without disturbing the gang setting.







NOTES:

ALL VOLTAGES MEASURED WITH A 20,000 OHMS-PER-VOLT VOLTMETER BETWEEN POINTS INDICATED AND B MINUS, AT A LINE VOLTAGE OF 117 V AC

OSCILLATOR GRID VOLTAGE MEASURED ACROSS R1, WITH A 100,000 OHM ISOLATING RESISTOR IN SERIES WITH METER

ALL RESISTOR VALUES ARE IN OHMS AND ALL CONDENSER VALUES IN µµf UNLESS OTHERWISE MARKED

SW1 SHOWN IN STANDARD BROADCAST POSITION

⊕ LESS THAN 1 OHM

TP2-1408-1

MODEL B570, Code 121

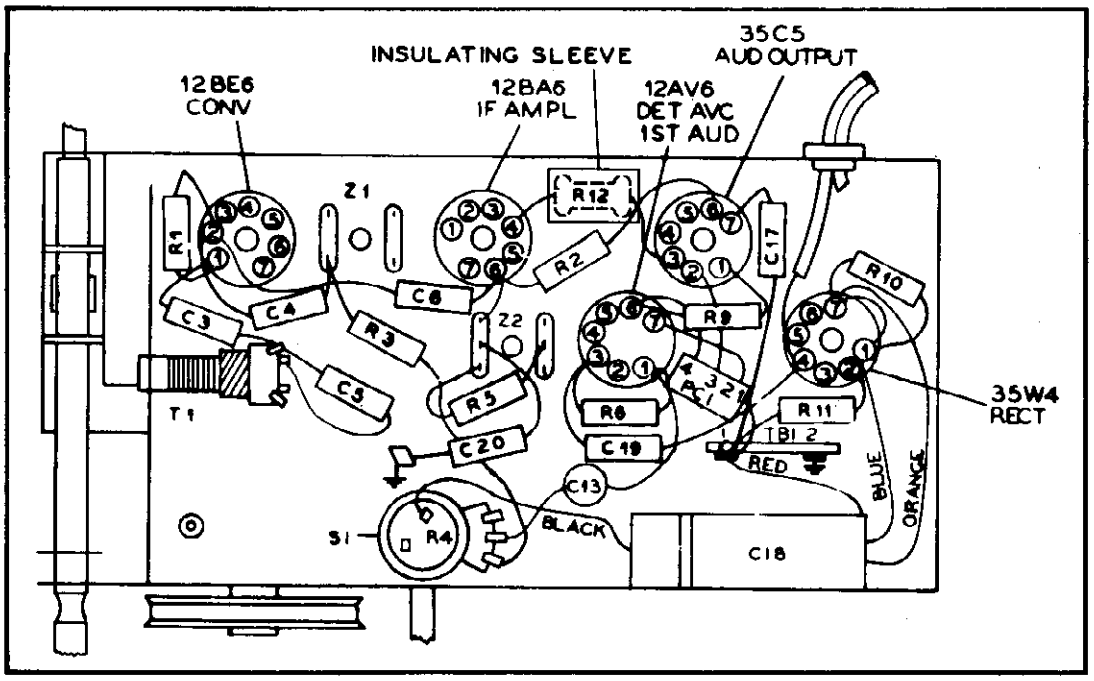


Figure 4. Base View, Showing Symbolized Chassis

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 unchanged. When ordering replacements, use only the "Service Part No."

Reference Symbol	Description	Service Part No.
C1	Condenser, tuning gang	31-2751-14
C1A	Condenser, aerial trimmer	Part of C1
C1B	Condenser, osc. trimmer	Part of C1
C3	Condenser, oscillator grid, 47 μμf.	30-1230-4
C4	Condenser, a-v-c by-pass, .05 μf.	45-3505-28*
C5	Condenser, drift compensation 7.5 μμf.	30-1224-83
C6	Condenser, screen by-pass, .05 μf.	45-3505-28*
C7	Condenser, i-f tuning	Part of Z1
C8	Condenser, i-f tuning	Part of Z1
C9	Condenser, i-f tuning	Part of Z2
C10	Condenser, i-f tuning	Part of Z2
C11	Condenser, detector filtering	Part of Z2
C12	Condenser, detector filtering	Part of Z2
C13	Condenser, audio coupling, .005 μf.	30-1238-1
C14	Condenser, plate by-pass	Part of PC1
C15	Condenser, audio coupling, .005 μf.	Part of PC1
C16	Condenser, compensating	Part of PC1
C17	Condenser, tone compensation, .022 μf.	45-3505-43*
C18	Condenser, electrolytic, 3-section	30-2575-34
C18A	Condenser, filter, 30 μf., 150v	Part of C18
C18B	Condenser, filter, 25 μf., 150v	Part of C18
C18C	Condenser, filter, 20 μf., 150v	Part of C18
C19	Condenser, line by-pass, .05 μf.	30-4650-45
C20	Condenser, B- to chassis, .1 μf.	45-3505-47*
I1	Lamp, pilot	34-2068
LA1	Loop, aerial	Part of back-and-loop ass'y.
LS1	Speaker, p-m	36-1627-8
PC1	Printed circuit	30-6001
R1	Resistor, oscillator grid, 22000 ohms	66-3228340*
R2	Resistor, i-f screen dropping, 4700 ohms	66-2478340*
R3	Resistor, a-v-c filter, 2.2 megohms	66-5228340*
R4	Resistor, volume control	33-5566-41
R5	Resistor, diode load, 47,000 ohms	66-3478340*
R6	Resistor, grid return, 10 megohms	66-6108340*
R7	Resistor, plate load, 500,000 ohms	Part of PC1
R8	Resistor, grid return, 500,000 ohms	Part of PC1
R9	Resistor, cathode bias, 150 ohms	66-1158340*
R10	Resistor, B plus filter, 220 ohms	66-1224340*
R11	Resistor, B plus filter, 1000 ohms	66-2108340*
R12	Resistor, tube saver, 100 ohms	33-1343-3
S1	Switch, off-on	Part of R4
T1	Transformer, oscillator	32-4453-6
T2	Transformer, output	32-8384*
W1	Line cord	L-2183*
Z1	Transformor, 1st i-f	32-4161A
Z2	Transformer, 2nd i-f	32-4240A

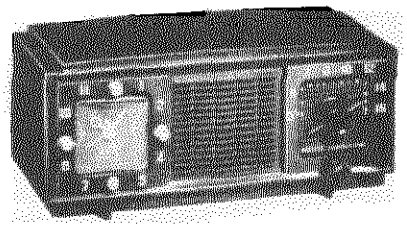
MISCELLANEOUS

Description	Service Part No.
Cabinet	
Cardinal	10990
Sand	10990-1
Back-and-loop ass'y.	76-8515-1
Knob (2)	54-6062
Drive cord, 25-foot spool	45-8750
Pointer, dial	
Cardinal cabinet	54-6061
Sand cabinet	54-6061
Shaft, tuning	28-9475FA11
Socket ass'y., pilot lamp	27-6233-80
Socket, 7-pin miniature, 12AV6	27-6303-14
Socket, 7-pin miniature, 12BE6, 12BA6	27-6265
Socket, 7-pin miniature, 35C5, 35W4	27-6265-2
Spring, retaining (3)	1W60980FE7
Spring, drive cord	56-2617
Bracket, switch operating	28-9473FA3
Bracket, switch mounting	28-9474FA3
Switch bracket and padder ass'y.	76-8477

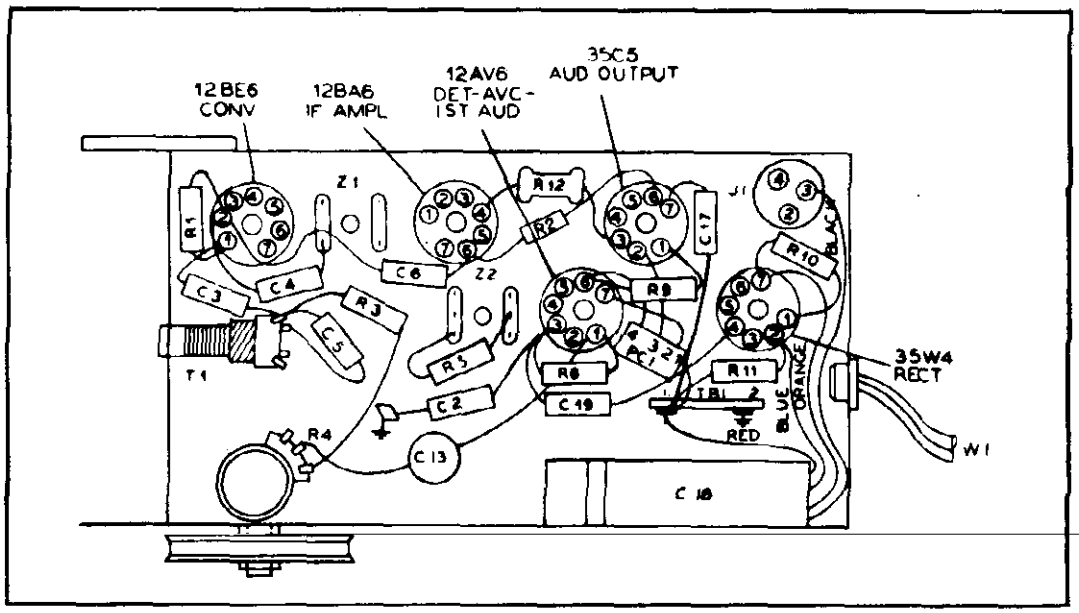
SPECIFICATIONS

CABINET	Molded phenolic
CIRCUIT	Four-tube superheterodyne (plus rectifier)
FREQUENCY RANGE	*540—1620 kc.*
AUDIO OUTPUT	1 watt
OPERATING VOLTAGE	117 volts, a.c.
POWER CONSUMPTION	30 watts
ANTENNA	High-impedance loop
INTERMEDIATE FREQUENCY	455 kc.
PHILCO TUBES	12BE6, converter; 12BA6, i-f amplifier; 12AV6, det.—a.v.c.—1st audio; 35C5, output; 35W4, rectifier

NOTE: The antenna is mounted on the cabinet back. When removing the cabinet back, use care to avoid breaking the antenna leads.



MODEL B710



TP3-832

Figure 1. Base View, Showing Parts Placement

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.

ALIGNMENT CHART

STEP	SIGNAL GENERATOR		RADIO		ADJUST
	CONNECTION TO RADIO	DIAL SETTING	DIAL SETTING	SPECIAL INSTRUCTIONS	
1	Ground lead to B−; output lead through a .1-μf. condenser to grid (pin 7) of 12BE6.	455 kc.	Tuning gang fully open.	Adjust tuning cores, in order given, for maximum output. (TC1 and TC3 are located at top of transformers.)	TC4—2nd i-f sec. TC3—2nd i-f pri. TC-2—1st i-f sec. TC1—1st i-f pri.
2	Radiating loop (see note below).	1620 kc.	1620 kc.*	Adjust trimmer for maximum output.	C1B—osc.
3	Same as step 2.	1500 kc.	1500 kc.†	Adjust trimmer for maximum output.	C1A—antenna

NOTE: make a 6—8 turn, 6-inch-diameter loop from insulated wire; connect to signal-generator leads, and place about 1 foot from radio loop. The position of the radio loop with respect to the chassis should be approximately the same as when both are mounted in the cabinet.

* To set the tuning gang to 1620 kc., fully open the gang and insert a .006-inch, nonmetallic shim between the heel of the rotor and the top of the stator plates. Close the gang sufficiently to hold the shim in place, and then remove the shim without disturbing the gang setting.

† To set the radio to 1500 kc., place chassis in cabinet, attach knob to indicate previous setting of 1620 kc., and tune until pointer indicates 1500 kc. Then remove knob and take chassis from cabinet without disturbing gang setting.

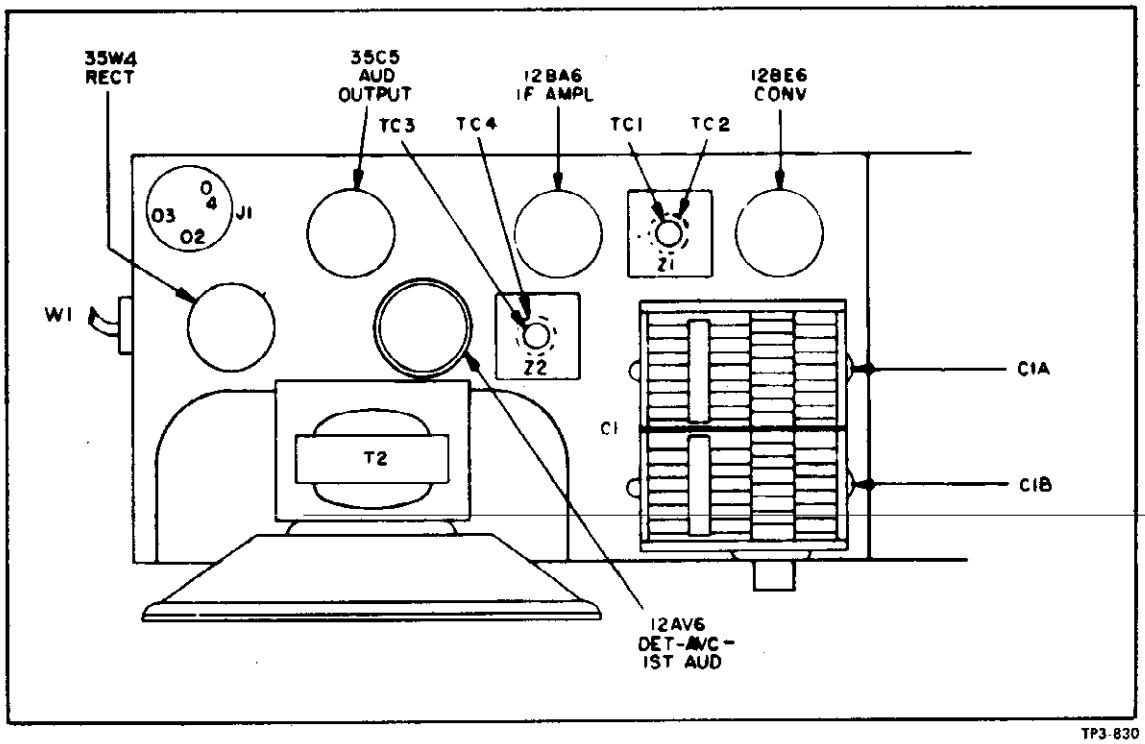


Figure 2. Top View, Showing Tuning Adjustments

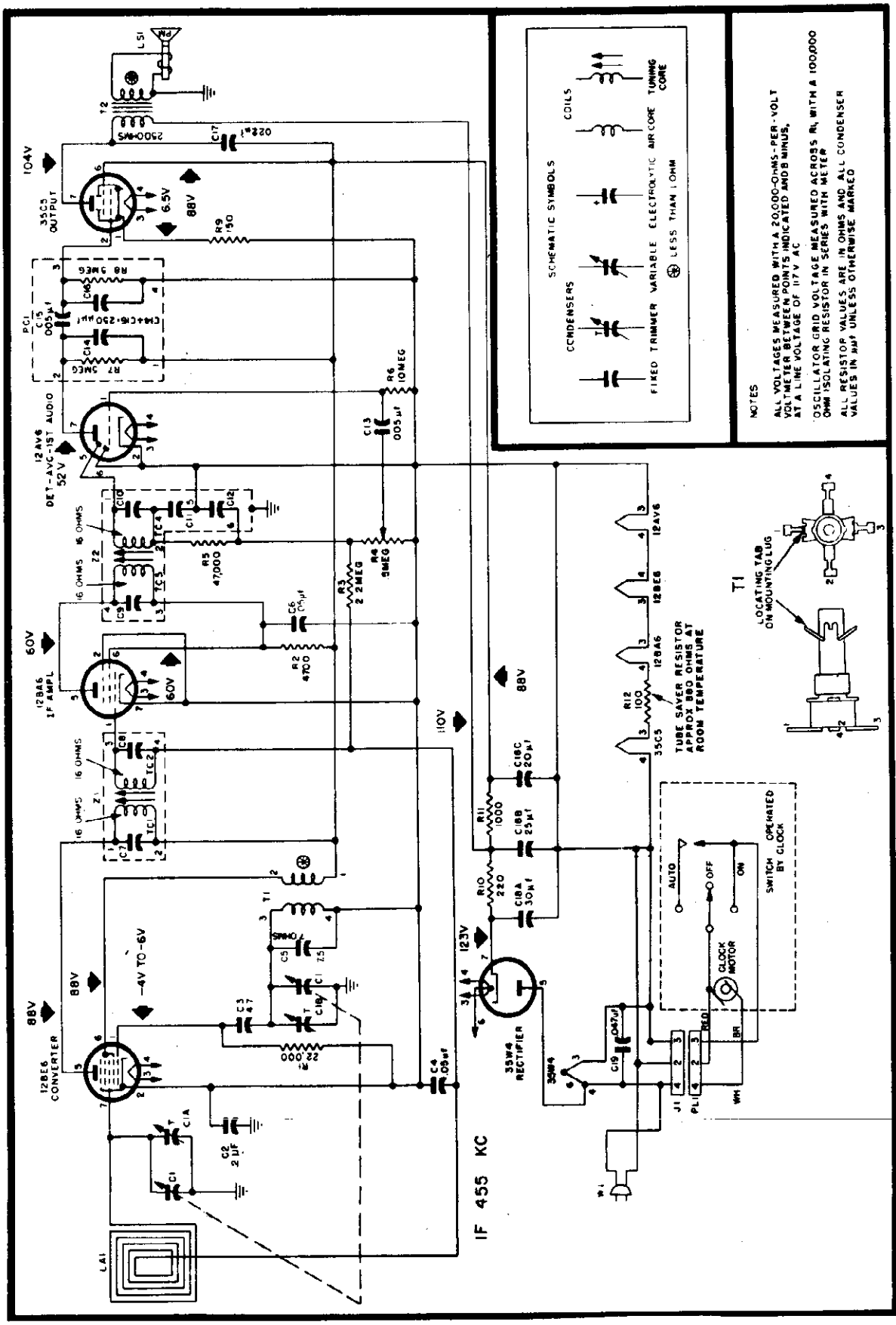


Figure 3. Philco Radio-Clock Model B710, Schematic Diagram

MODEL B710

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 unchanged. When ordering replacements, use only the "Service Part No."

Reference Symbol	Description	Service Part No.
C1	Condenser, tuning gang	31-2751-13
C1A	Condenser, r-f trimmer	Part of C1
C1B	Condenser, oscillator trimmer	Part of C1
C2	Condenser, B— to chassis, .2 μf.	30-4650-49
C3	Condenser, oscillator grid, 47 μμf.	30-1230-4
C4	Condenser, a-v-c by-pass, .05 μf.	30-4650-45*
C5	Condenser, drift compensation, 7.5 μμf.	30-1224-83
C6	Condenser, screen by-pass, .05 μf.	30-4650-45*
C7	Condenser, i-f tuning	Part of Z1
C8	Condenser, i-f tuning	Part of Z1
C9	Condenser, i-f tuning	Part of Z2
C10	Condenser, i-f tuning	Part of Z2
C11	Condenser, detector filtering	Part of Z2
C12	Condenser, detector filtering	Part of Z2
C13	Condenser, audio coupling, .005 μf.	30-1238-1
C14	Condenser, plate by-pass	Part of PC1
C15	Condenser, audio coupling, .005 μf.	Part of PC1
C16	Condenser, compensating	Part of PC1
C17	Condenser, tone compensation, .022 μf.	30-4650-43*
C18	Condenser, electrolytic, 3-section	45-3037
C18A	Condenser, filter, 30 μf., 150v	Part of C18
C18B	Condenser, filter, 25 μf., 150v	Part of C18
C18C	Condenser, filter, 20 μf., 150v	Part of C18
C19	Condenser, line by-pass, .05 μf.	30-4650-45*
J1	Jack clock	27-6273
LA1	Loop	Part of cabinet back
LS1	Speaker ass'y., p-m	36-1627-23
PC1	Printed circuit	30-6001
PL1	Plug, clock assembly	54-4878-2
R1	Resistor, oscillator grid, 22,000 ohms	66-3228340*
R2	Resistor, i-f screen dropping, 4700 ohms	66-2478340*
R3	Resistor, a-v-c filter, 2.2 megohms	66-5228340*
R4	Resistor, volume control, .5 megohm	33-5565
R5	Resistor, diode load, 47,000 ohms	66-3478340*
R6	Resistor, grid return, 10 megohms	66-6108340
R7	Resistor, plate load, 500,000 ohms	Part of PC1
R8	Resistor, grid return, 500,000 ohms	Part of PC1
R9	Resistor, cathode bias, 150 ohms	66-1158340*
R10	Resistor, B plus filter, 220 ohms, 1 watt	66-1224340*
R11	Resistor, B plus filter, 1000 ohms	66-2108340*
R12	Resistor, tube saver, 100 ohms	33-1343-3
T1	Transformer, oscillator	33-4453-6
T2	Transformer, output	Part of LS1
W1	Line cord	L2183*
Z1	Transformer, 1st i-f	32-4161A
Z2	Transformer, 2nd i-f	32-4240A

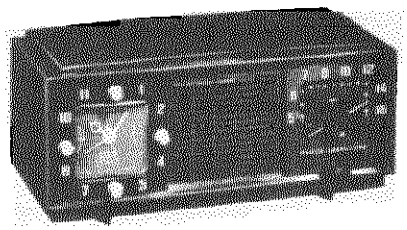
MISCELLANEOUS

Description	Service Part No.
Cabinet	10924-11
Knobs	
Clock (3 required)	54-4983-6
Station selector	54-4978-5
Off-on	54-4815-8
Clock	41-2041-4
Back-and-loop assembly	76-7757-3
Shield, tube	56-5629FA3
Socket, miniature (4 required)	27-6265*
Socket, miniature (12AV6)	27-6203-14
Window, radio dial	54-4977-5

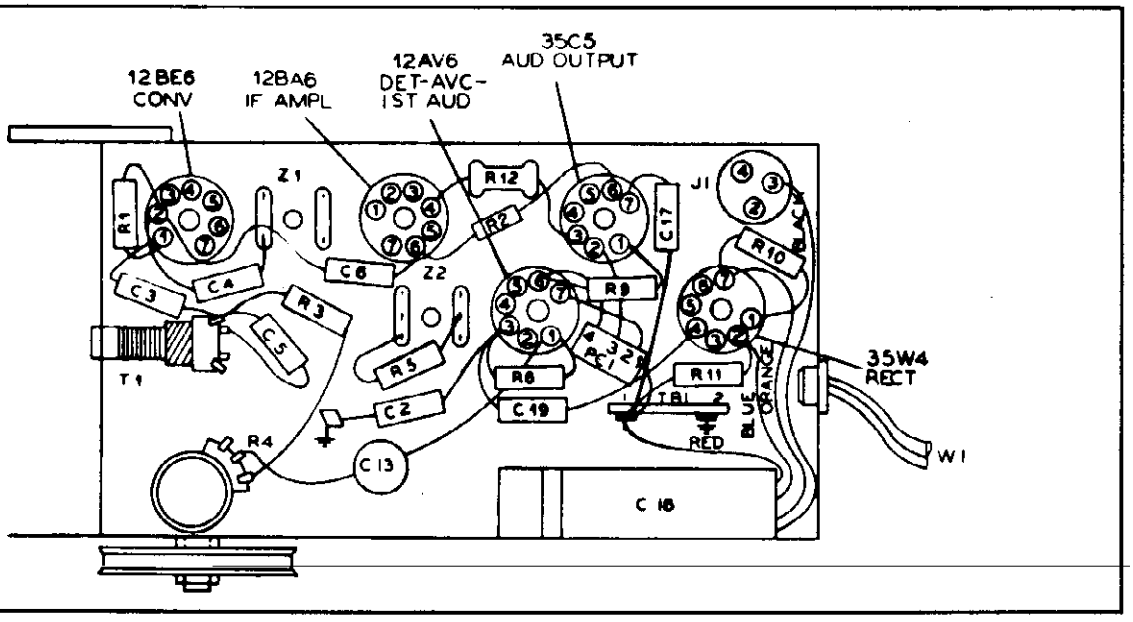
SPECIFICATIONS

CABINET	Molded phenolic
CIRCUIT	Four-tube superheterodyne (plus rectifier)
FREQUENCY RANGE	540—1620 kc.
AUDIO OUTPUT	1 watt
OPERATING VOLTAGE	117 volts, a.c.
POWER CONSUMPTION	30 watts
ANTENNA	High-impedance loop
INTERMEDIATE FREQUENCY	455 kc.
PHILCO TUBES	12BE6, converter; 12BA6, i-f amplifier; 12AV6, det.—a.v.c.—1st audio; 35C5, output; 35W4, rectifier

NOTE: The antenna is mounted on the cabinet back. When removing the cabinet back, use care to avoid breaking the antenna leads.



MODEL B711



TP3-832-1

Figure 1. Base View, Showing Parts Placement

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.

ALIGNMENT CHART

STEP	SIGNAL GENERATOR		RADIO		ADJUST
	CONNECTION TO RADIO	DIAL SETTING	DIAL SETTING	SPECIAL INSTRUCTIONS	
1	Ground lead to B—; output lead through a .1-μf. condenser to grid (pin 7) of 12BE6.	455 kc.	Tuning gang fully open.	Adjust tuning cores, in order given, for maximum output. (TC1 and TC3 are located at top of transformers.)	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).	1620 kc.	1620 kc.*	Adjust trimmer for maximum output.	C1B—osc.
3	Same as step 2.	1500 kc.	1500 kc.†	Adjust trimmer for maximum output.	C1A—antenna

NOTE: Make a 6—8 turn, 6-inch-diameter loop from insulated wire; connect to signal-generator leads, and place about 1 foot from radio loop. The position of the radio loop with respect to the chassis should be approximately the same as when both are mounted in the cabinet.

* To set the tuning gang to 1620 kc., fully open the gang and insert a .006-inch, nonmetallic shim between the heel of the rotor and the top of the stator plates. Close the gang sufficiently to hold the shim in place, and then remove the shim without disturbing the gang setting.

† To set the radio to 1500 kc., place chassis in cabinet, attach knob to indicate previous setting of 1620 kc., and tune until pointer indicates 1500 kc. Then remove knob and take chassis from cabinet without disturbing gang setting.

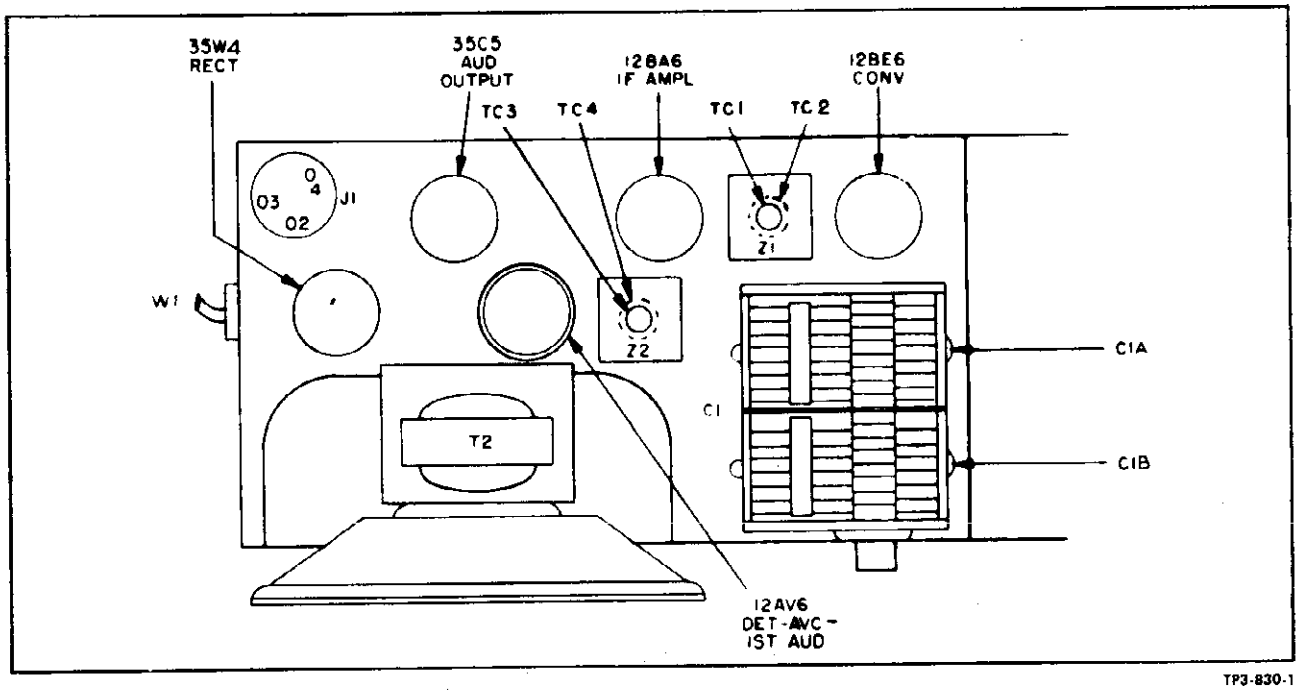


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Figure 2. Top View, Showing Tuning Adjustments

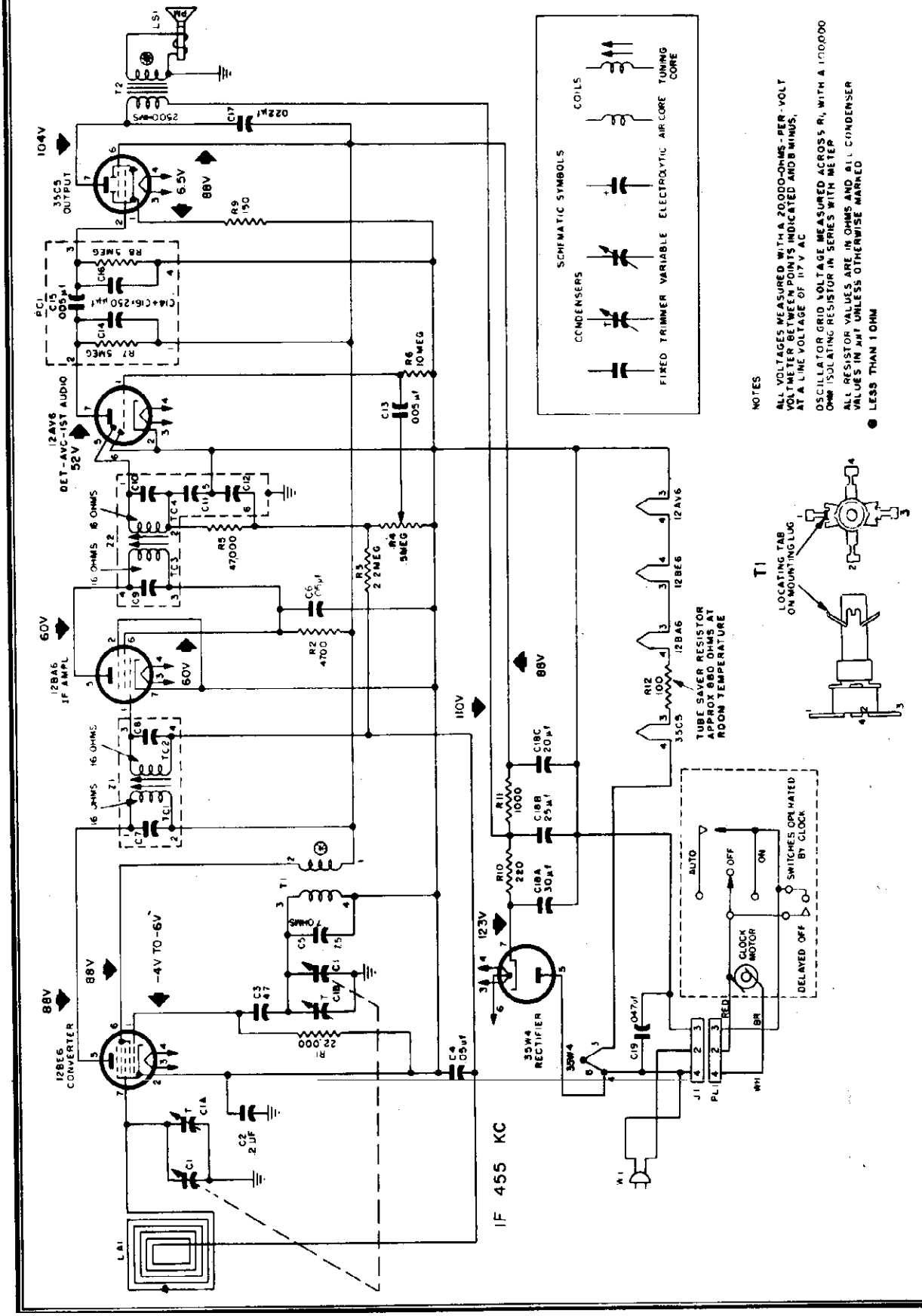


Figure 3. Philco Radio-Clock Model B711, Code 121, Schematic Diagram

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 unchanged. When ordering replacements, use only the "Service Part No."

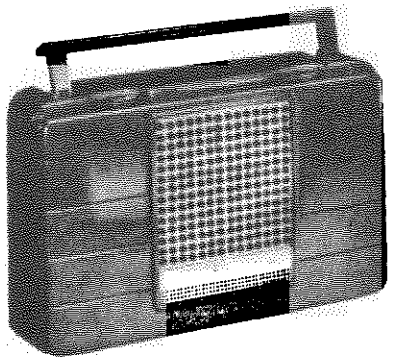
Reference Symbol	Description	Service Part No.
C1	Condenser, tuning gang	31-2751-13
C1A	Condenser, r-f trimmer	Part of C1
C1B	Condenser, oscillator trimmer	Part of C1
C2	Condenser, B– to chassis, .2 μf.	30-4650-49
C3	Condenser, oscillator grid, 47 μμf.	30-1230-4
C4	Condenser, a-v-c by-pass, .05 μf.	30-4650-45*
C5	Condenser, drift compensation, 7.5 μμf.	30-1224-83
C6	Condenser, screen by-pass, .05 μf.	30-4650-45*
C7	Condenser, i-f tuning	Part of Z1
C8	Condenser, i-f tuning	Part of Z1
C9	Condenser, i-f tuning	Part of Z2
C10	Condenser i-f tuning	Part of Z2
C11	Condenser, detector filtering	Part of Z2
C12	Condenser, detector filtering	Part of Z2
C13	Condenser, audio coupling, .005 μf.	30-1238-1
C14	Condenser, plate by-pass	Part of PC1
C15	Condenser, audio coupling, .005 μf.	Part of PC1
C16	Condenser, compensating	Part of PC1
C17	Condenser, tone compensation, .022 μf.	30-4650-43*
C18	Condenser, electrolytic, 3-section	45-3037
C18A	Condenser, filter, 30 μf., 150v	Part of C18
C18B	Condenser, filter, 25 μf., 150v	Part of C18
C18C	Condenser, filter, 20 μf., 150v	Part of C18
C19	Condenser, line by-pass, .047 μf.	30-4650-45*
J1	Jack, clock	27-6273
LA1	Loop	Part of cabinet back
LS1	Speaker ass'y., p-m	36-1627-23
PC1	Printed circuit	30-6001
PL1	Plug, clock assembly	54-4878-2
R1	Resistor, oscillator grid, 22,000 ohms	66-3228340*
R2	Resistor, i-f screen dropping, 4700 ohms	66-2478340*
R3	Resistor, a-v-c filter, 2.2 megohms	66-5228340*
R4	Resistor, volume control, .5 megohm	33-5565
R5	Resistor, diode load, 47,000 ohms	66-3478340*
R6	Resistor, grid return, 10 megohms	66-6108340
R7	Resistor, plate load, 500,000 ohms	Part of PC1
R8	Resistor, grid return, 500,000 ohms	Part of PC1
R9	Resistor, cathode bias, 150 ohms	66-1158340*
R10	Resistor, B plus filter, 220 ohms, 1 watt	66-1224340*
R11	Resistor, B plus filter, 1000 ohms	66-2108340*
R12	Resistor, tube saver, 100 ohms	33-1343-3
T1	Transformer, oscillator	33-4453-6
T2	Transformer, output	Part of LS1
W1	Line cord	L2183*
Z1	Transformer, 1st i-f	32-4161A
Z2	Transformer, 2nd i-f	32-4240A

MISCELLANEOUS

Description	Service Part No.
Cabinet	10924-12
Knobs	
Clock (4 required)	54-4983-6
Station selector	54-4978-5
Off-on	54-4815-8
Clock	41-2041-6
Back-and-loop assembly	76-7757-3
Shield, tube	56-5629FA3
Socket, miniature (4 required)	27-6265*
Socket, miniature, 12BE6	27-6203-14
Window, radio dial	54-4977-5

SPECIFICATIONS

CABINET	Plastic portable
CIRCUIT	Four-tube superheterodyne
AUDIO OUTPUT	75 milliwatts
OPERATING VOLTAGE	1.5-volt "A" battery and 75-volt "B" battery.
POWER CONSUMPTION	10 ma. from 75-volt "B" battery 260 ma. from 1.5-volt "A" battery
ANTENNA	Magnecor high-impedance
INTERMEDIATE FREQUENCY	455 kc.
PHILCO TUBES	1R5 converter, 1U4 i-f amplifier, 1U5 detector-a.v.c. 1st audio, 3V4 output
BATTERY TYPE	P144 "B" battery P77 "A" battery



MODEL B650

ALIGNMENT PROCEDURE

GENERAL—Allow the set and the test equipment to warm up for fifteen minutes before starting the alignment procedure.

TUNING DIAL—Before proceeding with the alignment, set the index mark on the tuning dial to coincide with the index mark located on the chassis. See figure 1. The plates of the tuning condensers will be fully meshed.

OUTPUT INDICATOR—Connect the output indicator (a 1000-ohm-per-volt, a-c voltmeter, or an oscilloscope) across the voice-coil terminals.

SIGNAL GENERATOR—Use an AM r-f signal generator. Connect the ground lead to the chassis, and connect the output lead as indicated in the alignment chart.

OUTPUT LEVEL — Attenuate the signal-generator output throughout the alignment so as to maintain the output level below .3 volt.

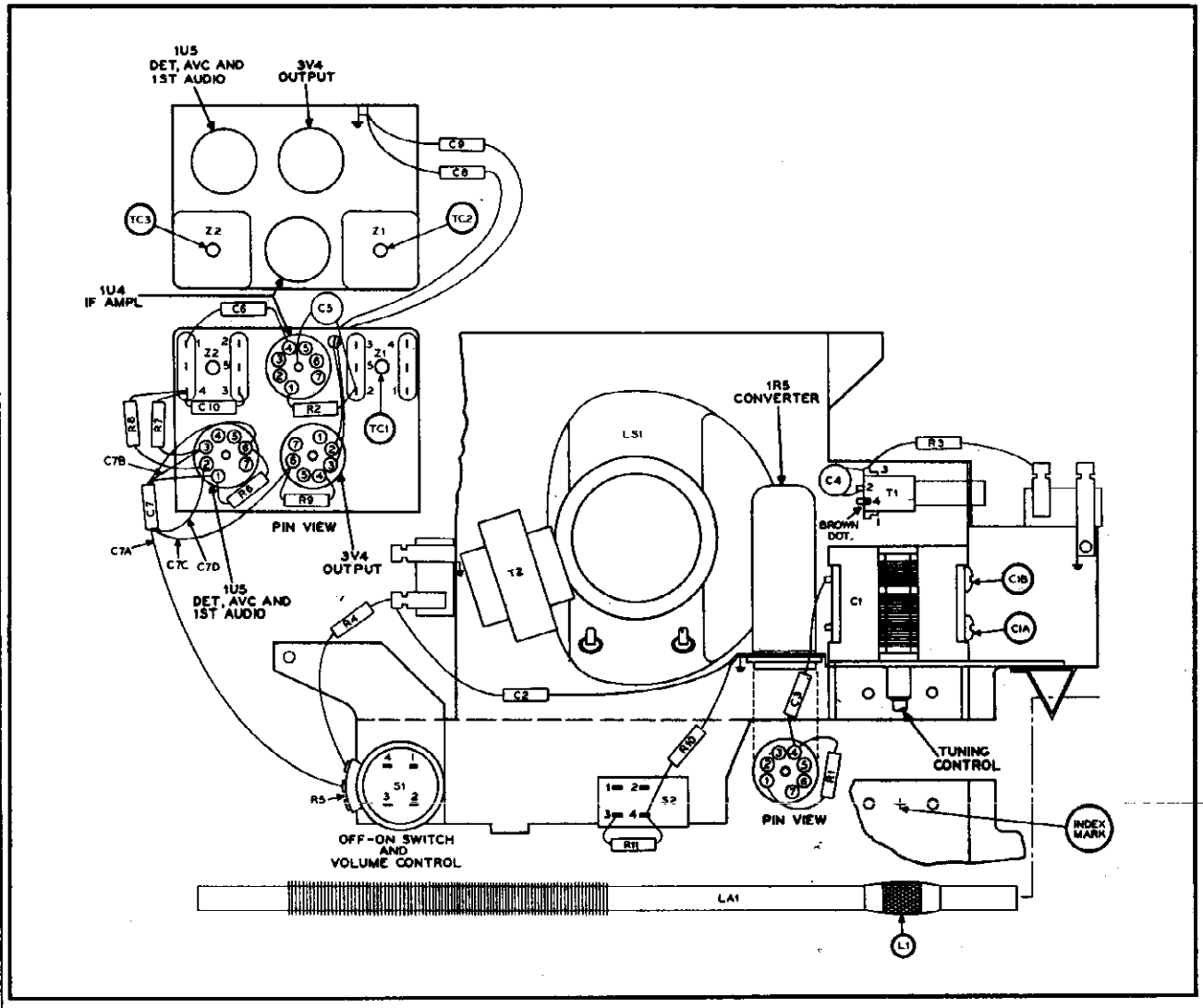
RADIO CONTROLS—Set the volume control to maximum. Set the tuning control as indicated in the alignment chart. Set the Battery Saver Switch to the HI position.

ALIGNMENT CHART

STEP	SIGNAL GENERATOR		RADIO		ADJUST
	CONNECTION TO RADIO	DIAL SETTING	DIAL SETTING	SPECIAL INSTRUCTIONS	
1	Connect signal generator through a .1-μf. condenser to pin 6 (converter grid) of 1R5.	455 kc.	Tuning gang fully open.	Adjust for maximum output in order given.	TC3—2nd i-f sec. TC2—1st i-f sec. TC1—1st i-f pri.
2	Use radiating loop. (See NOTE 1 below.)	1620 kc.	1620 kc. (See NOTE 2 below.)	Adjust for maximum output.	C1B—osc. trimmer
3	Same as step 2.	1400 kc.	1400 kc. (See NOTE 2 below.)	Adjust for maximum output.	C1A—antenna trimmer
4	Same as step 2.	600 kc.	600 kc. (See NOTE 2 below.)	Adjust for maximum output. Rock tuning gang while making this adjustment.	L1—antenna adjusting winding
5	Repeat steps 2, 3, and 4 until no further improvement is obtained.				

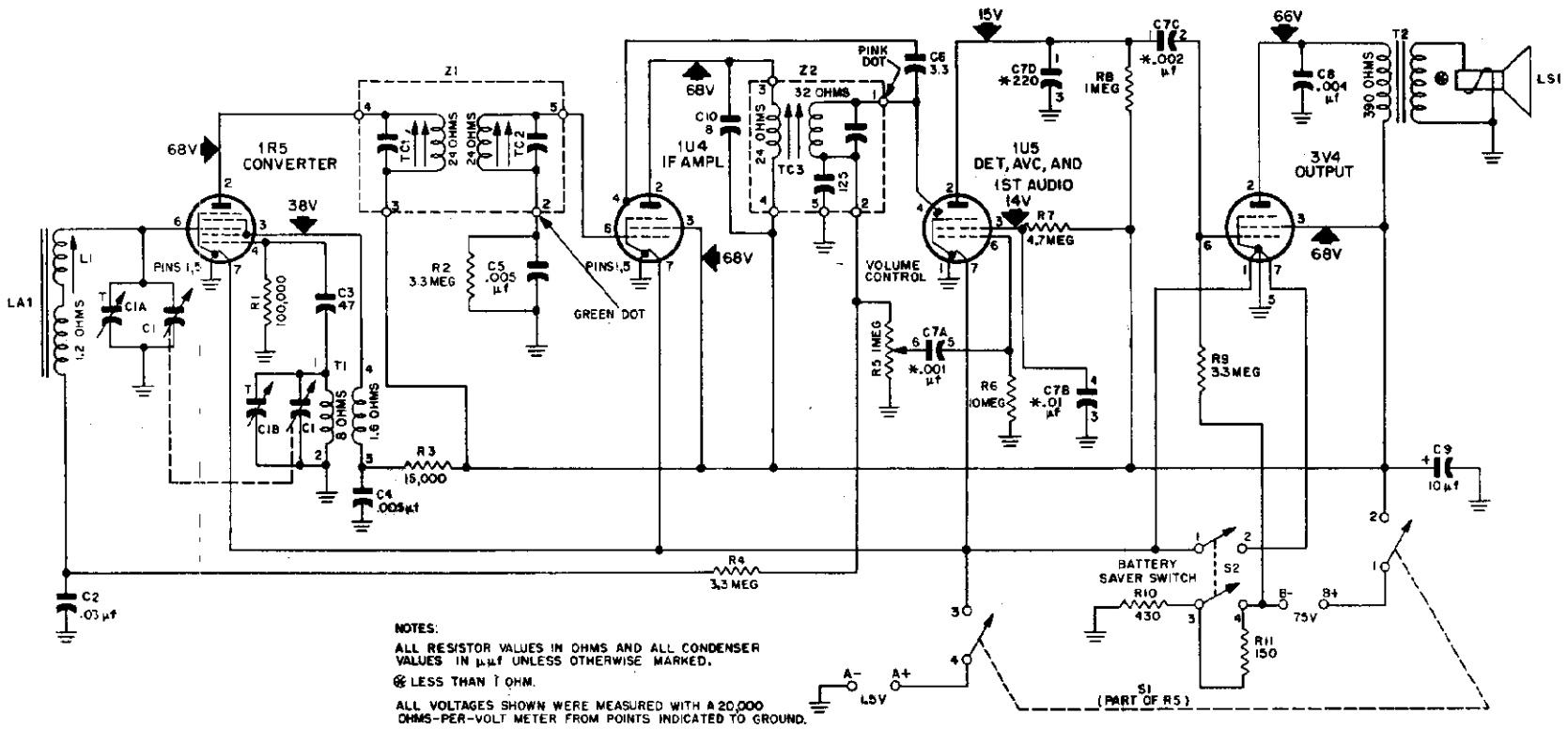
NOTE 1: Use a 6-to-8-turn, 6-inch-diameter loop made up of insulated wire. Connect to generator terminals, and place about one foot from radio loop.

NOTE 2: The tuning condenser can be set to the proper frequency by turning the tuning dial until the frequency setting indicated in the chart coincides with the index mark on the chassis. See figure 1.



TP3-836

Figure 1. View Showing Tuning Adjustments and Parts Placement

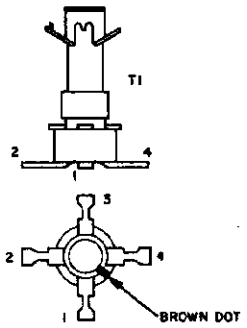


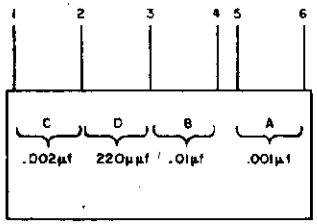
NOTES:

ALL RESISTOR VALUES IN OHMS AND ALL CONDENSER VALUES IN µµf UNLESS OTHERWISE MARKED.

@ LESS THAN 1 OHM.

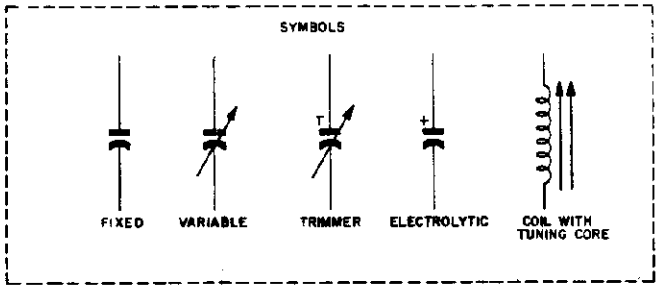
ALL VOLTAGES SHOWN WERE MEASURED WITH A 20,000 OHMS-PER-VOLT METER FROM POINTS INDICATED TO GROUND.





* C7 FOUR SECTION CONDENSER

IF = 455KC



TP3-856

PHILCO PAGE 23-1
MODEL B6

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 unchanged. When ordering replacements, use only the "Service Part No."

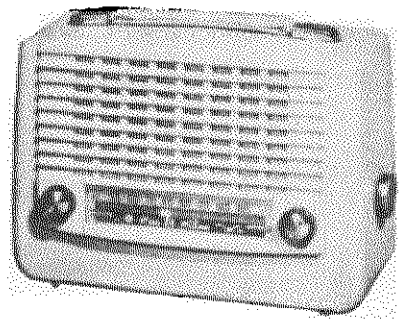
Reference Symbol	Description	Service Part No.
C1	Condenser, tuning gang	31-2772
C1A	Condenser, trimmer, antenna	Part of C1
C1B	Condenser, trimmer, oscillator	Part of C1
C2	Condenser, a-v-c by-pass, .03 μf.	30-4650-0
C3	Condenser, d-c blocking, 47 μμf.	62-047009011
C4	Condenser, screen by-pass, .005 μf.	30-1238-1
C5	Condenser, grid by-pass, .005 μf.	30-1238-1
C6	Condenser, neutralizing, 3.3 μμf.	30-1221
C7	Condenser, audio circuit	30-1237
C7A	Condenser, audio coupling, .001 μf.	Part of C7
C7B	Condenser, screen by-pass, .01 μf.	Part of C7
C7C	Condenser, d-c blocking, .002 μf.	Part of C7
C7D	Condenser, plate by-pass, 220 μμf.	Part of C7
C8	Condenser, tone compensation, .004 μf.	30-4650-56
C9	Condenser, electrolytic, filter, 10 μf.	30-2417-32
C10	Condenser, plate by-pass, 8 μμf.	30-1224-46
LA1	Coil, antenna	32-4600
LS1	Loudspeaker	36-1652
R1	Resistor, grid leak, 100,000 ohms	66-4108340
R2	Resistor, grid leak, 3.3 megohms	66-5338340
R3	Resistor, screen dropping, 15,000 ohms	66-3158340
R4	Resistor, a-v-c load, 3.3 megohms	66-5338340
R5	Resistor, volume control, 1 megohm	33-5566-50
R6	Resistor, grid leak, 10 megohms	66-6108340
R7	Resistor, screen dropping, 4.7 megohms	66-5478340
R8	Resistor, plate load, 1 megohm	66-5108340
R9	Resistor, grid leak, 3.3 megohms	66-5338340
R10	Resistor, bias, 3V4, 430 ohms	66-1438340
R11	Resistor, battery economizer, 150 ohms	66-1158340

Reference Symbol	Description	Service Part No.
S1	Switch, on-off	Part of R5
S2	Switch, battery economizer	42-1796-6
T1	Transformer, oscillator	32-4574
T2	Transformer, output	32-8628
Z1	Transformer, 1st i-f	32-4160-13A
Z2	Transformer, 2nd i-f	32-4454-1A

MISCELLANEOUS

Description	Service Part No.
Cabinet, cherry	11006-3
Back, cabinet, cherry	54-6077-3
Handle, cabinet, cherry	54-6078-3
Cabinet, sand	11006-1
Back, cabinet, sand	54-6077-1
Handle, cabinet, sand	54-6078-1
Cabinet, colonial green	11006-2
Back, cabinet, colonial green	54-6077-2
Handle, cabinet, colonial green	54-6078-2
Cable, battery	41-3988-3
Dial scale	54-6083
Handle, battery-saver switch	54-6081
Knob, volume	54-6082
Knob, tuning	54-6082-1
Socket, tube (2), 1U5, 3V4	27-6265-6
Socket, tube (2), 1R5, 1U4	27-6265-7

SPECIFICATIONS



MODEL B656

CABINET	
B656	Molded plastic
CIRCUIT	Five-tube superheterodyne (plus selenium rectifier)
FREQUENCY RANGES	
Standard broadcast	550—1600 kc.
Special services	1700—3400 kc.
AUDIO OUTPUT	160 milliwatts
OPERATING VOLTAGES	117 volts, a.c. or d.c.; or 9-volt "A" battery and 90-volt "B" battery
POWER CONSUMPTION	
A-c or d-c operation	15 watts
Battery operation	55 ma. at 9 volts, and 15 ma. at 90 volts
AERIAL	Magnecor high-impedance loop; provision for connecting external aerial
INTERMEDIATE FREQUENCY	265 kc.
PHILCO TUBES	1T4 r-f amplifier, 1R5 converter, 1U4 i-f amplifier, 1U5 det.—a.v.c.—1st audio 3V4 output
BATTERY TYPE	Philco P-274

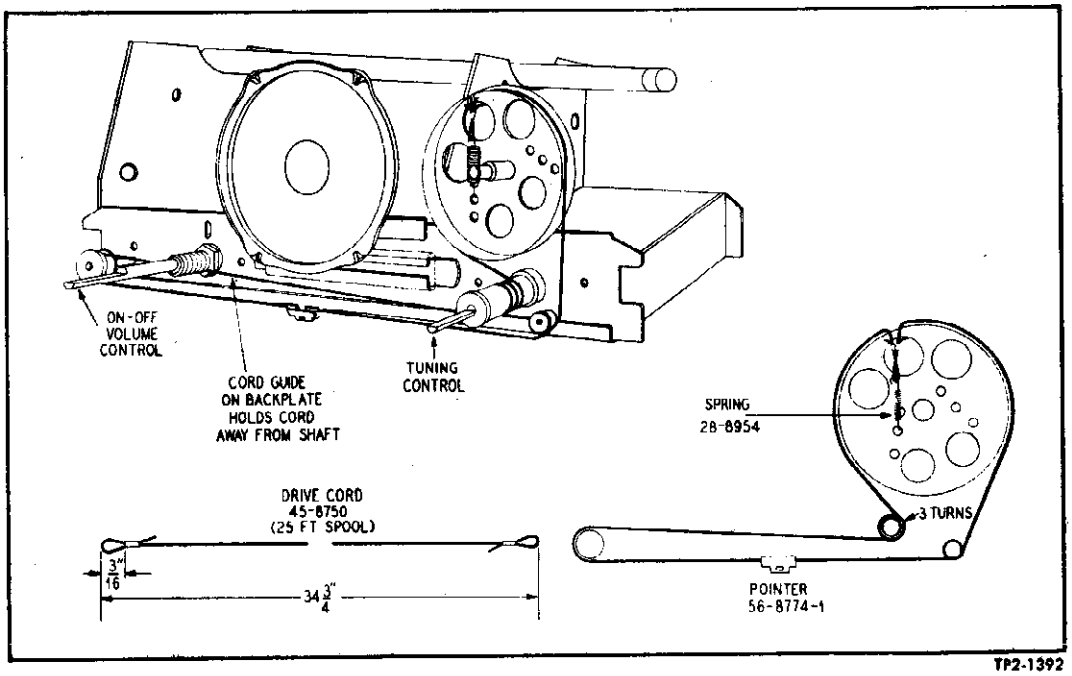


Figure 1. Drive-Cord Installation Details

MODEL B656

ALIGNMENT PROCEDURE

POINTER—Set pointer to coincide with first index mark from left side of dial backplate (looking at front of dial backplate).

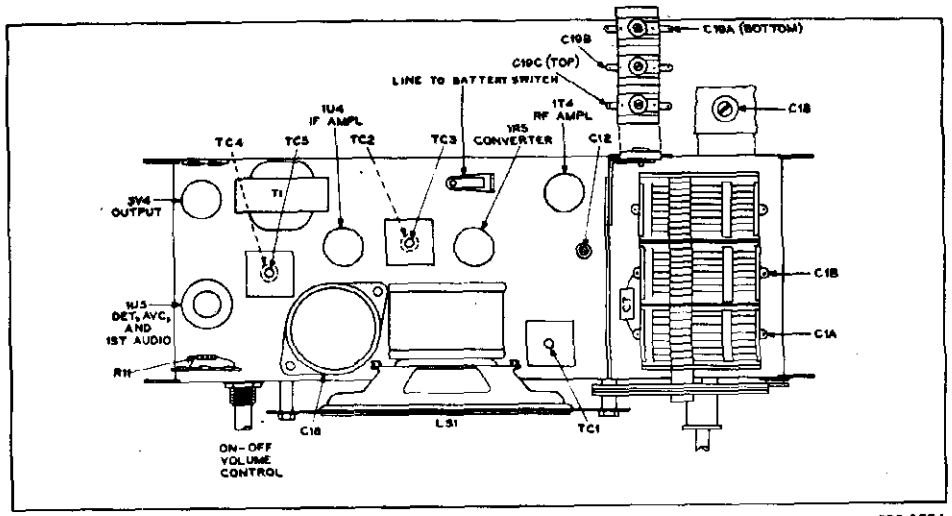
RADIO CONTROLS—Set volume control to maximum; set broadcast-special services switch, SW1, as indicated in chart.

OUTPUT METER—Connect across voice-coil terminals.

SIGNAL GENERATOR—Use modulated output.

OUTPUT LEVEL—During alignment, adjust signal-generator output to maintain output-meter indication below .5 volt.

CRITICAL LEAD DRESS—To secure proper padding capacity, the green lead from pin 6 of the 1R5 tube to Z1 must be dressed over the wiring panel, away from the chassis. The white lead which connects the low end of the aerial (LA1) to the broadcast-special services switch (SW1), must be dressed taut between the low-end tie lug and the retaining spring.



TP2-1394

Figure 2. Top View, Showing Trimmer Locations

STEP	SIGNAL GENERATOR		RADIO		ADJUST TRIMMER
	CONNECTION TO RADIO	DIAL SETTING	DIAL SETTING	SPECIAL INSTRUCTIONS	
1	Through a .1-mf. condenser to pin 6 of 1R5 converter.	265 kc.	1630 kc. (gang fully open)	Set broadcast-special services switch to broadcast position. Adjust, in order given, for maximum output.	TC5—2nd i-f sec. TC4—2nd i-f pri. TC2—1st i-f pri. TC3—1st i-f sec.
2	Radiating loop. See note below.	1630 kc.	*1630 kc. (gang fully open)	Adjust for maximum output. If low-frequency dial tracking is far off, make adjustments in steps 3 and 4 before making this adjustment.	C1B—osc. shunt
3	Same as step 2.	580 kc.	580 kc.	Adjust for maximum output while rocking tuning control.	C12—osc. series
4	Same as step 2.	580 kc.	580 kc.	Adjust for maximum output. This adjustment should not be made unless dial tracking is off, or sensitivity is low at low-frequency end (580 kc.).	TC1—r-f sec.
5	Same as step 2.	1500 kc.	1500 kc. (index mark at right)	Adjust, in order given, for maximum output.	C1A—r-f C19A—BC aerial
6	Repeat steps 3 and 5 until no further improvement is obtained.				
7	Same as step 2.	3000 kc.	3000 kc.	Set broadcast-special services switch to special services position. Adjust, in order given, for maximum output.	C19C—SS aerial C18—r-f
8	Same as step 2.	1900 kc.	1900 kc.	Adjust, in order given, for maximum output.	C19B—SS aerial series tracker
9	Repeat steps 7 and 8, and then repeat step 5.				

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

*** For proper adjustment of the oscillator trimmer, fully open the tuning gang and insert a .006-inch, non-metallic shim between the heel of the rotor and the top of the stator plates. Close the tuning gang sufficiently to hold the shim in place, and then remove the shim without disturbing the gang setting.**

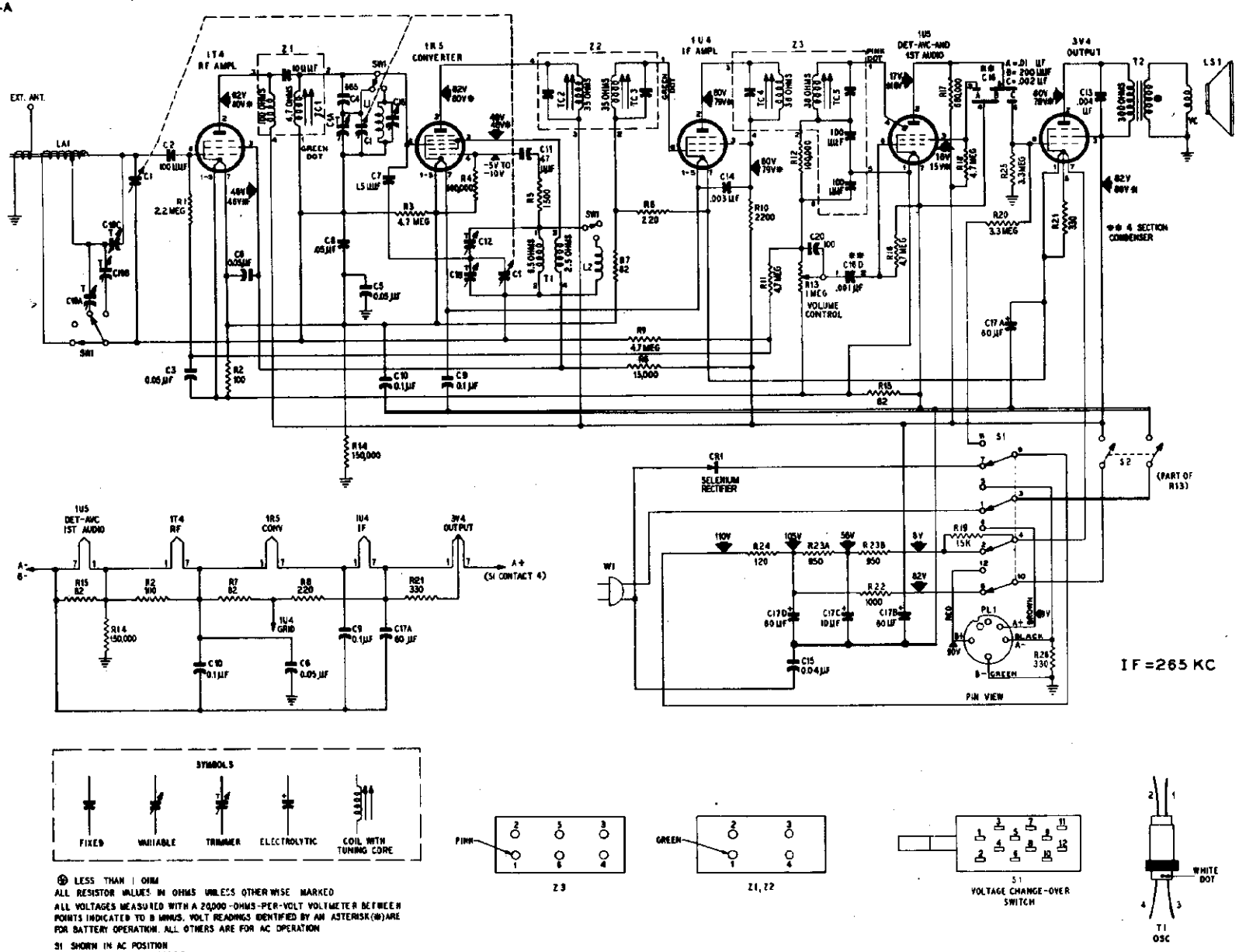


Figure 3. Philco Radio Model B656, Schematic Diagram

MODEL B656

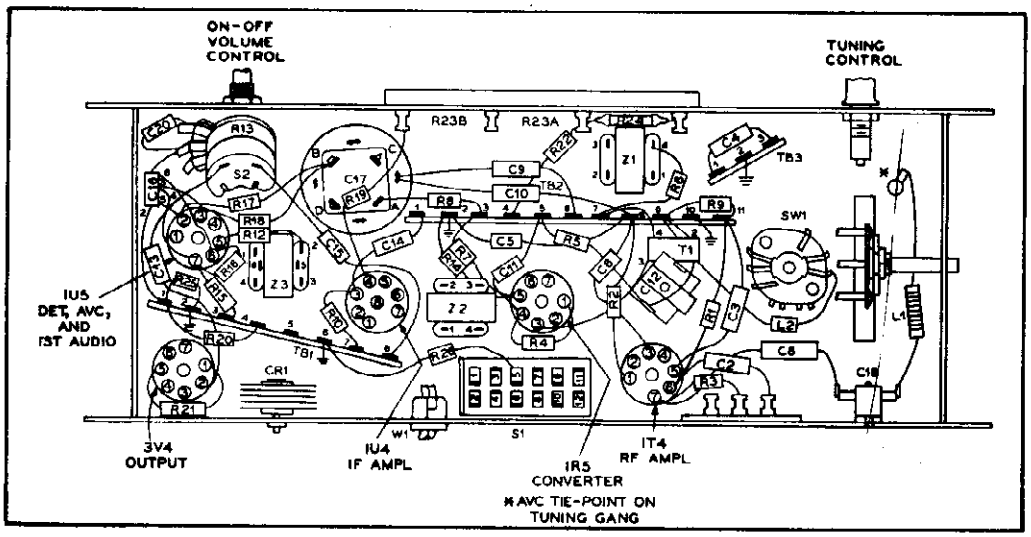


Figure 4. Bottom View, Showing Symbolized Chassis TP2-1393-A

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 unchanged. When ordering replacements, use only the "Service Part No."

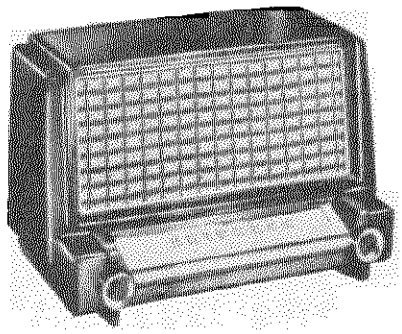
Reference Symbol	Description	Service Part No.
C1	Condenser, tuning gang, 3-section	31-2748-5
C1A	Condenser, r-f trimmer	Part of C1
C1B	Condenser, osc. trimmer	Part of C1
C2	Condenser, d-c blocking, 100 μμf.	62-110009001*
C3	Condenser, bias filter, .05 μf.	61-0122*
C4	Condenser, converter tracking, 665 μμf.	30-1220-66
C5	Condenser, filament by-pass .05 μf.	61-0122*
C6	Condenser, screen by-pass, .05 μf.	61-0122*
C7	Condenser, neutralization, 1.5 μμf.	30-1221-3
C8	Condenser, a-v-c filter, .05 μf.	61-0122*
C9	Condenser, filament by-pass, .1 μf.	61-0113*
C10	Condenser, filament by-pass, .1 μf.	61-0113*
C11	Condenser, d-c blocking, 47 μμf.	60-00475420
C12	Condenser, osc. series padder, 700 to 900 μμf.	31-6473-28
C13	Condenser, tone compensation .004 μf.	61-0179
C14	Condenser, screen neutralizing .003 μf.	45-3505-61
C15	Condenser, line by-pass, .04 μf.	45-3500-2*
C16	Condenser, ceramic, 4-section	30-1237
C16A	Condenser, screen by-pass, .01 μf.	Part of C16
C16B	Condenser, by-pass, 200 μμf.	Part of C16
C16C	Condenser, d-c blocking, .002 μf.	Part of C16
C16D	Condenser, d-c blocking, .001 μf.	Part of C16
C17	Condenser, electrolytic, 4-section	30-2568-58
C17A	Condenser, filament by-pass, 60 μf.	Part of C17
C17B	Condenser, filter, 60 μf.	Part of C17
C17C	Condenser, filter, 10 μf.	Part of C17
C17D	Condenser, filter, 60 μf.	Part of C17
C18	Condenser, SS hi-frequency r-f trimmer	31-6476-27
C19	Condenser, aerial trimmer, 3-section	31-6477-16
C19A	Condenser, BC hi-frequency	Part of C19
C19B	Condenser, SS low-frequency	Part of C19
C19C	Condenser, SS hi-frequency	Part of C19
C20	Condenser, compensating, high-frequency, 100 μμf.	62-110009001*
CR1	Selenium rectifier	34-8003*
L2	Coil, oscillator shunt	32-4562
LA1	Coil, aerial	32-4565
LS1	Speaker, 5-inch	36-1625
PL1	Plug-and-cable assembly, battery	41-3712-5
R1	Resistor, grid return, 2.2 megohms	66-5228340*
R2	Resistor, current limiting, 100 ohms	66-1108340*
R3	Resistor, grid return, 4.7 megohms	66-5478340*
R4	Resistor, grid return, 100,000 ohms	66-4108340*
R5	Resistor, oscillator coupling, 1500 ohms	66-2158340*
R6	Resistor, dropping, 15,000 ohms	66-3158340*
R7	Resistor, grid return, 82 ohms	66-0828340*
R8	Resistor, grid return, 220 ohms	66-1228340*
R9	Resistor, a-v-c filter, 4.7 megohms	66-5478340*
R10	Resistor, neutralization, 2200 ohms	66-2228340*
R11	Resistor, a-v-c filter, 4.7 megohms	66-5478340*
R12	Resistor, i-f filter, 100,000 ohms	66-4108340*
R13	Resistor, volume control, 1 megohm	45-5001-21
R14	Resistor, leakage, 150,000 ohms	66-4158340*
R15	Resistor, current limiting, 82 ohms	66-0828340*
R16	Resistor, grid return, 4.7 megohms	66-5478340*
R17	Resistor, plate load, 680,000 ohms	66-4688340*
R18	Resistor, screen dropping, 4.7 megohms	66-5478340*
R19	Resistor, filament, 15,000 ohms	66-3153546
R20	Resistor, grid return, 3.3 megohms	66-5338340*
R21	Resistor, current limiting, 330 ohms	66-1338340*
R22	Resistor, filter, 1000 ohms	66-2108340*
R23	Resistor, wire-wound, 2-section	33-3431-7
R23A	Resistor, filament dropping, 950 ohms	Part of R23
R23B	Resistor, filament dropping, 950 ohms	Part of R23
R24	Resistor, wire-wound, current limiting, 120 ohms	33-1334-14
R25	Resistor, grid return, 3.3 megohms	66-5338340
R26	Resistor, bias resistor (battery operation), 330 ohms	66-1338340*
S1	Switch, change-over	42-1899
S2	Switch, on-off	Part of R13
SW1	Band switch	42-1986
T1	Transformer, oscillator	32-4263-6
T2	Transformer, output	32-8528
W1	Line cord	L2183
Z1	Transformer, r-f	32-4399-6A
Z2	Transformer, 1st i-f	32-4160-2A
Z3	Transformer, 2nd i-f	32-4240-6A

MISCELLANEOUS

Description	Service Part No.
Cabinet, light beige	10883-4
Back, light beige	54-4903
Clip, back (2)	56-3807-3
Handle assembly	76-7719
Scale, light beige	54-5148
Knob (2)	54-4773-1
Knob (1)	54-4816-4
Cabinet, pine green	10883-5
Back, pine green	54-4903-2
Clip, back (2)	56-3807-3
Handle assembly	76-7719
Scale, pine green	54-5148
Knob (2)	54-4773-5
Knob (1)	76-6206-1
Cabinet, charcoal gray	10883-6
Back, charcoal gray	54-4903-3
Clip, back (2)	56-3807-3
Handle assembly	76-7719-2
Scale, charcoal gray	54-5148-1
Knob (2)	54-4773-6
Knob (1)	54-4816-6
Dial-backplate assembly	76-7720
Drive cord, 25-ft. spool	45-8750*
Pointer	56-8774-1
Spring, drive cord	28-8954
Shaft-and-pulley assembly	76-7637
Mount, rubber (3)	27-4596
Spring, retaining	57-1868FA11
Shield, 1U5 tube	58-5629FA3
Socket (3)	27-6203
Socket, 1U5 tube (1)	27-6203-22
Socket, 3V4 tube (1)	27-6203-12

SPECIFICATIONS

CABINET	Phenolic, brown
CIRCUIT	Five-tube superheterodyne (plus rectifier)
FREQUENCY RANGE	
Broadcast	540—1620 kc.
Special Services	1700—3400 kc.
AUDIO OUTPUT	1 watt
OPERATING VOLTAGE	105—120 volts, a.c. or d.c.
POWER CONSUMPTION	30 watts
ANTENNA	Built-in, high-impedance loop
INTERMEDIATE FREQUENCY	455 kc.
PHILCO TUBES	6BJ6 r-f ampl.; 12BE6 converter; 6BJ6 i-f ampl.; 6AQ6 det., a.v.c., 1st audio; 35C5 output; 35W4 rectifier



MODEL B964

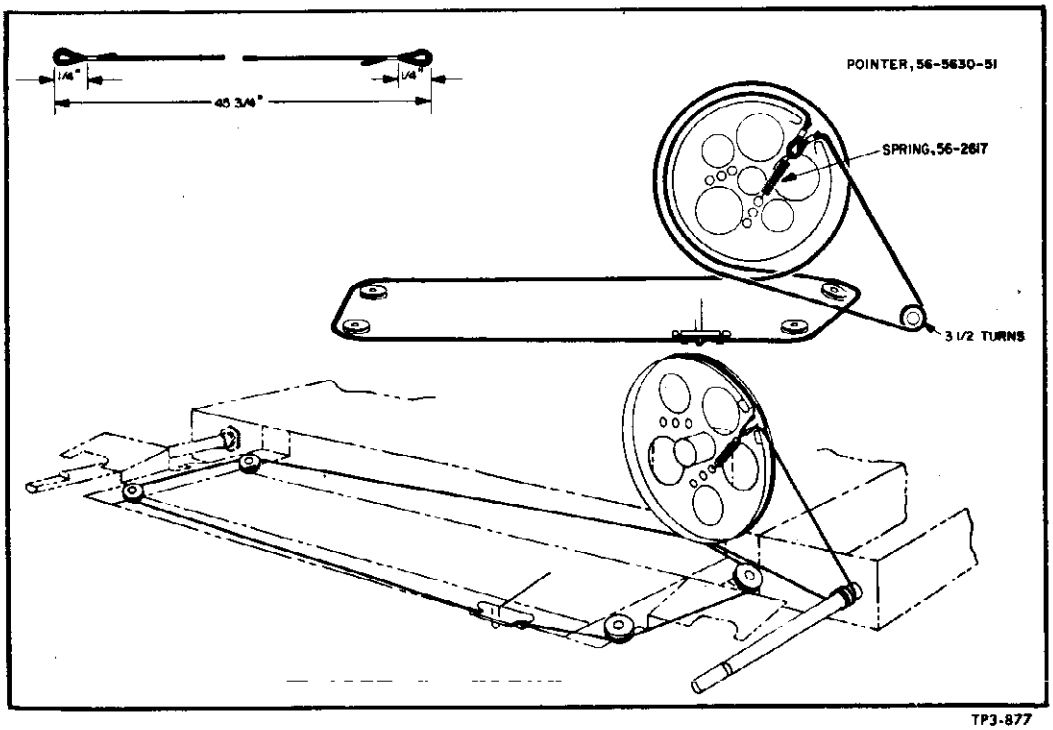


Figure 1. Drive-Cord Installation Details

ALIGNMENT PROCEDURE

GENERAL

RADIO CONTROLS—Set volume control for maximum output and tuning control as given in the alignment chart. Set band switch to broadcast position for first 5 steps, and to special services position for steps 6 and 7.

OUTPUT INDICATOR—Connect output indicator (either on oscilloscope or a 1000-ohms-per-volt, a-c voltmeter) across voice-coil terminals.

SIGNAL GENERATOR—Use an AM r-f generator, connected as indicated in the alignment chart.

OUTPUT LEVEL—During alignment, attenuate signal-generator output to maintain output indication below 1 volt.

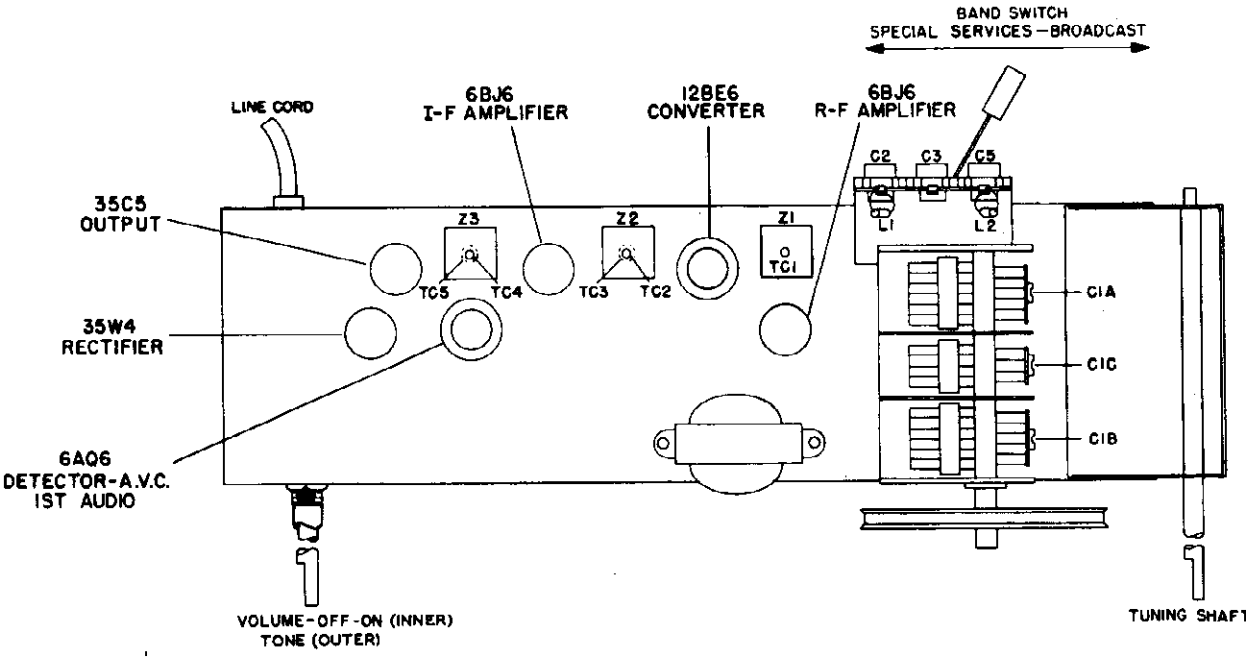
DIAL POINTER—Before the alignment is started, the dial pointer should be set to coincide with the dial scale mark to the left of "55" when the tuning gang is fully meshed.

ALIGNMENT CHART

STEP	SIGNAL GENERATOR		RADIO		ADJUST
	CONNECTION TO RADIO	DIAL SETTING	DIAL SETTING	SPECIAL INSTRUCTIONS	
1	Ground lead to B— Output lead through a .01-μf. condenser to pin 7 (mixer grid) of 12BE6, converter.	455 kc.	Tuning gang fully open.	Adjust in order given in next column, 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 1 below.	1620 kc.	1620 kc. See note 2 below.	Adjust for maximum output.	C1C—osc. trimmer
3	Same as step 2.	1520 kc.	Tune radio to generator signal.	Adjust for maximum output. (High-frequency adjustment)	C1B—mixer-grid trimmer C1A—r-f trimmer
4	Same as step 2.	580 kc.	Same as step 3.	Adjust for maximum output. (Low-frequency adjustment)	TC1—r-f transformer
5	Repeat steps 3 and 4 until no further improvement is obtained.				
6	Same as step 2.	3200 kc.	Same as step 3.	Adjust for maximum output.	C5—special-services mixer-grid trimmer C2—special-services r-f trimmer
7	Same as step 2.	1800 kc.	Same as step 3.	Adjust for maximum output.	C3—special-services r-f padder

NOTE 1: Make up a 6—8 turn, 6-inch-diameter loop from insulated wire; connect to signal-generator leads and place near radio loop antenna. The loop antenna must be connected to the radio.

NOTE 2: To set the tuning gang to 1620 kc., place a piece of 6-mil flat shim stock beneath the heel of the rotor, and turn the rotor until it holds the shim firmly in place. Then remove the shim.



TP3-878

Figure 2. Top View, Showing Tuning Adjustments

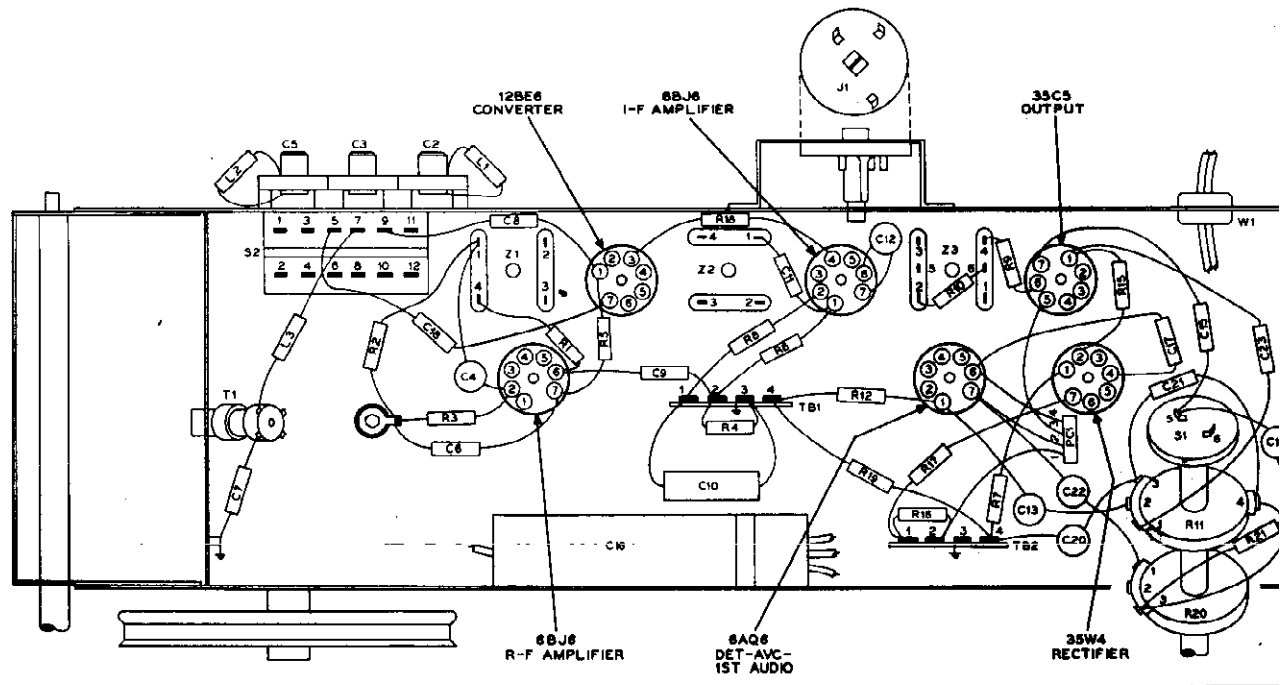


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Figure 3. Base View, Showing Parts Placement

MODEL B964

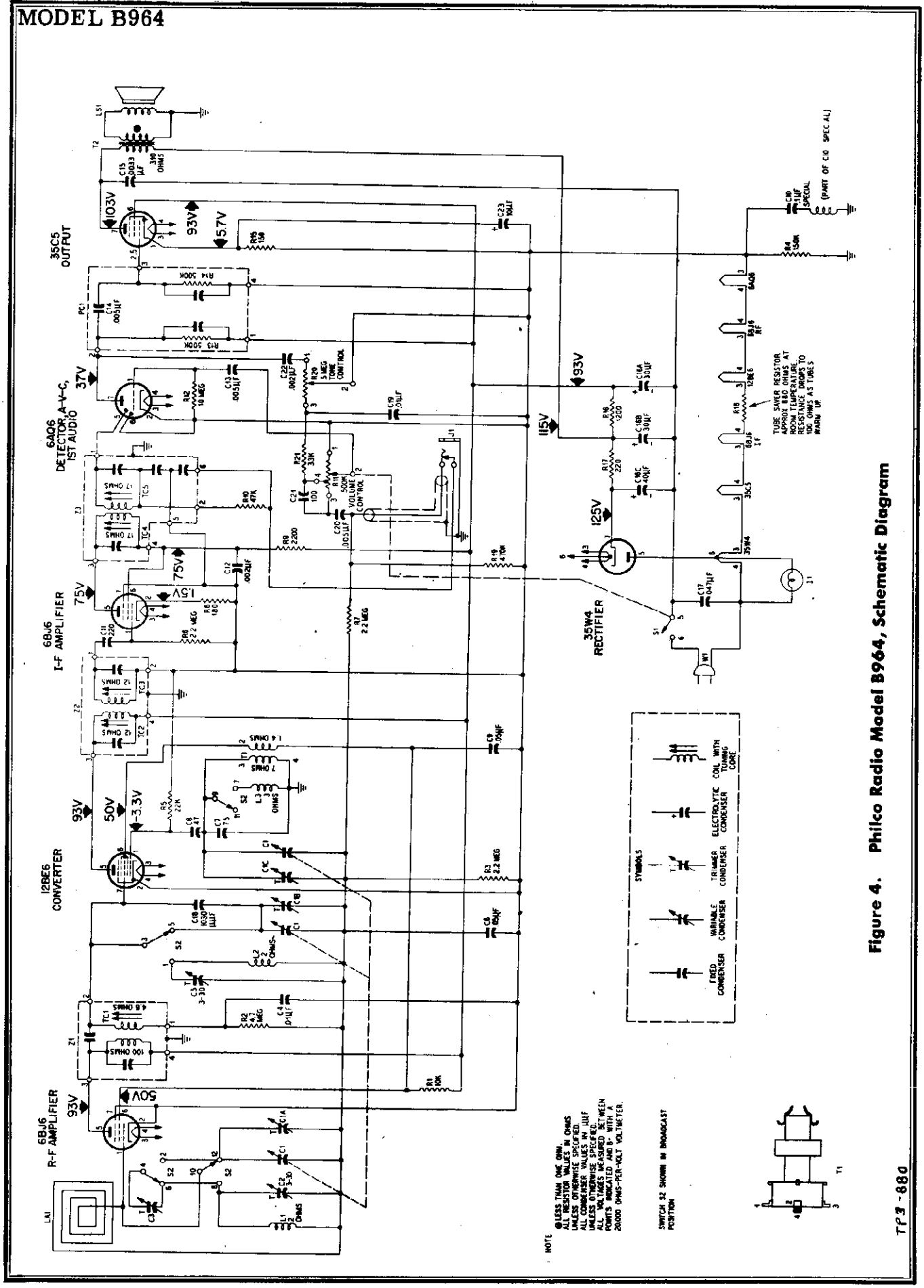


Figure 4. Philco Radio Model B964, Schematic Diagram

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 unchanged. When ordering replacements, use only the "Service Part No."

Reference Symbol	Description	Service Part No.
C1	Condenser, tuning gang, 3 section	31-2771-1
C1A	Condenser, trimmer, antenna	Part of C1
C1B	Condenser, trimmer, r-f	Part of C1
C1C	Condenser, trimmer, oscillator	Part of C1
C2	Condenser, trimmer, special services r-f	Part of CA1
C3	Condenser, padder, special services r-f	Part of CA1
C4	Condenser, r-f by-pass, .01 μf.	30-1238-2*
C5	Condenser, trimmer, special services mixer-grid	Part of CA1
C6	Condenser, a-v-c by-pass .05 μf.	30-4650-45*
C7	Condenser, fixed trimmer, 7.5 μμf.	30-1224-65
C8	Condenser, d-c blocking, 47 μμf.	60-00475420
C9	Condenser, screen by-pass, .05 μf.	30-4650-45*
C10	Condenser, special, B– to chassis, .1 μf.	30-4644-3
C11	Condenser, i-f coupling, 220 μμf.	62-122001001*
C12	Condenser, screen by-pass, .002 μf.	30-1238-8*
C13	Condenser, audio coupling, .005 μf.	30-1238-1*
C14	Condenser, d-c blocking, .005 μf.	Part of PC1
C15	Condenser, tone compensation, .0033 μf.	30-4650-55
C16	Condenser, electrolytic filter	45-3037-3
C16A	Condenser, filter, 30 μf., 150v	Part of C16
C16B	Condenser, filter, 30 μf., 150v	Part of C16
C16C	Condenser, filter, 40 μf., 150v	Part of C16
C17	Condenser, line by-pass, .047 μf.	30-4650-45*
C18	Condenser, fixed padder, 1030 μμf.	30-1220-72
C19	Condenser, bass comp., .01 μf.	30-1238-2
C20	Condenser, phono coupling, .005 μf.	30-1238-1
C21	Condenser, high comp., 100 μμf.	62-110009001
C22	Condenser, tone comp., .002 μf.	30-1238-8
C23	Condenser, cathode by-pass, 10 μf., 50v	45-3035-6
CA1	Condenser assembly, trimmer	31-6477-17
I1	Lamp, pilot	34-2068
L1	Coil, special services r-f	32-4561-5
L2	Coil, special services mixer-grid	32-4561-5
L3	Coil, oscillator shunt	32-4562-1
PC1	Printed circuit	30-6001
R1	Resistor, screen dropping, 10,000 ohms	66-3108340*
R2	Resistor, a-v-c load, 4.7 megohms	66-5478340*
R3	Resistor, a-v-c load, 2.2 megohms	66-5228340*
R4	Resistor, B– to chassis, 150,000 ohms	66-4158340*
R5	Resistor, grid leak, 22,000 ohms	66-3228340*
R6	Resistor, grid leak, 2.2 megohms	66-5228340*
R7	Resistor, a-v-c load, 2.2 megohms	66-5228340*
R8	Resistor, cathode bias, 180 ohms	66-1188340*
R9	Resistor, screen dropping, 2200 ohms	66-2228340*
R10	Resistor, i-f filter, 47,000 ohms	66-3478340*
R11	Volume control, 500,000 ohms	33-5563-64
R12	Resistor, grid leak, 10 megohms	66-6108340*
R13	Resistor, plate load, 500,000 ohms	Part of I
R14	Resistor, grid leak, 500,000 ohms	Part of I
R15	Resistor, cathode bias, 150 ohms, 1 watt	66-11543
R16	Resistor, B+ filter, 1200 ohms	66-21283
R17	Resistor, B+ filter, 220 ohms, 1 watt	66-12243
R18	Resistor, tube saver, 100 ohms	33-134
R19	Resistor, diode load, 470,000 ohms	66-4478
R20	Resistor, tone control, 5 megohms	Part of
R21	Resistor, tone compensation, 33,000 ohms	66-3338
S1	Switch, off-on	Part of
S2	Switch, broadcast-special services	42-18
T1	Transformer, oscillator	32-44
T2	Transformer, output	32-831
W1	Line cord	L-21
Z1	Transformer, r-f	32-4399
Z2	Transformer, 1st i-f	32-41
Z3	Transformer, 2nd i-f	32-42

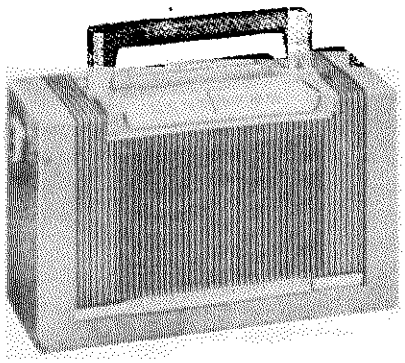
MISCELLANEOUS

PARTS COMMON TO ALL MODELS

Description	Service Part
Drive cord, 25-ft. spool	45-87
Spring, drive cord	56-2
Rubber mount, gang mtg. (3)	27-4
Shield, tube (2)	56-5629
Socket assembly, pilot lamp	27-623
Socket, tube (2)	27-6203
Socket, tube (4)	27-6
Speed nut (4)	1W56920
Cabinet	10
Cabinet back and loop assembly	76-8
Knob, band switch	54-4
Knob, off-on-volume	54-484
Knob, tone	76-635
Knob, tuning	76-635
Panel, diffusing	54-8
Clip, panel diffusing	56-358
Pointer	56-5630
Pointer rail assembly	76-8
Scale, dial	54-5
Shaft, tuning	56-980
Spring, retaining	28-8
Speaker	36-1641

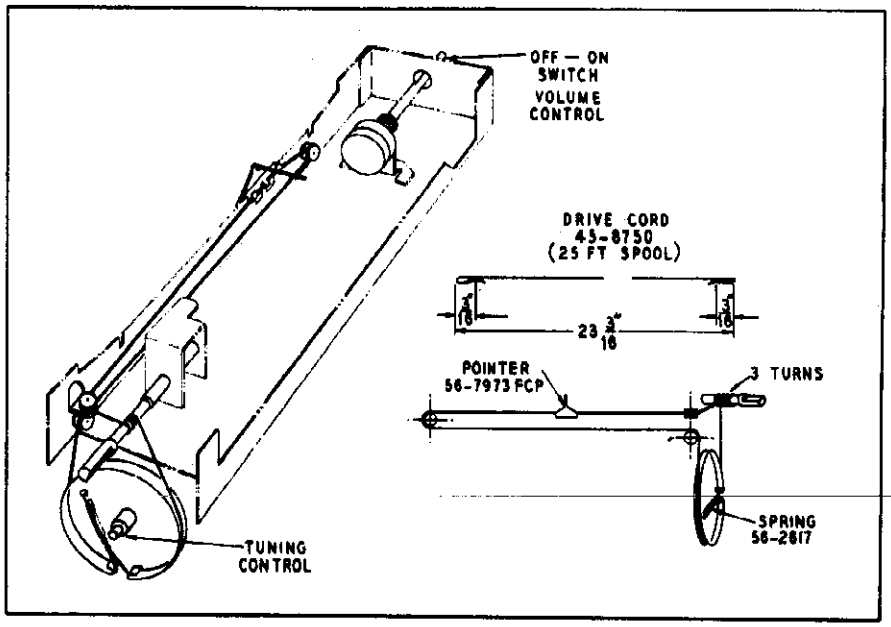
MODEL B651

SPECIFICATIONS



MODEL B651

MODEL B651	
CABINET	Molded plastic
CIRCUIT	Four-tube superheterodyne (plus selenium rectifier)
FREQUENCY RANGE	540 kc.—1620 kc.
AUDIO OUTPUT	
A.C. or d.c.	150 milliwatts
Battery	75 milliwatts
OPERATING VOLTAGE	
Line operation	117 volts, a.c. or d.c.
Battery operation	2 D cells and 67½-volt "B" battery
POWER CONSUMPTION	
A-C or d-c operation	15 watts
Battery operation	10 ma. from 67½-volt "B" battery; 260 ma. from 2 D cells
ANTENNA	Magnecor high-impedance loop with provision for external antenna
INTERMEDIATE FREQUENCY	455 kc.
PHILCO TUBES	1R5, converter; 1U4, i-f amplifier; 1U5, detector-a.v.c.-1st audio; 3V4, output
BATTERY TYPE	P67 "B" battery; 2 D cells



TPD-390

Figure 1. Drive-Cord Stringing Arrangement

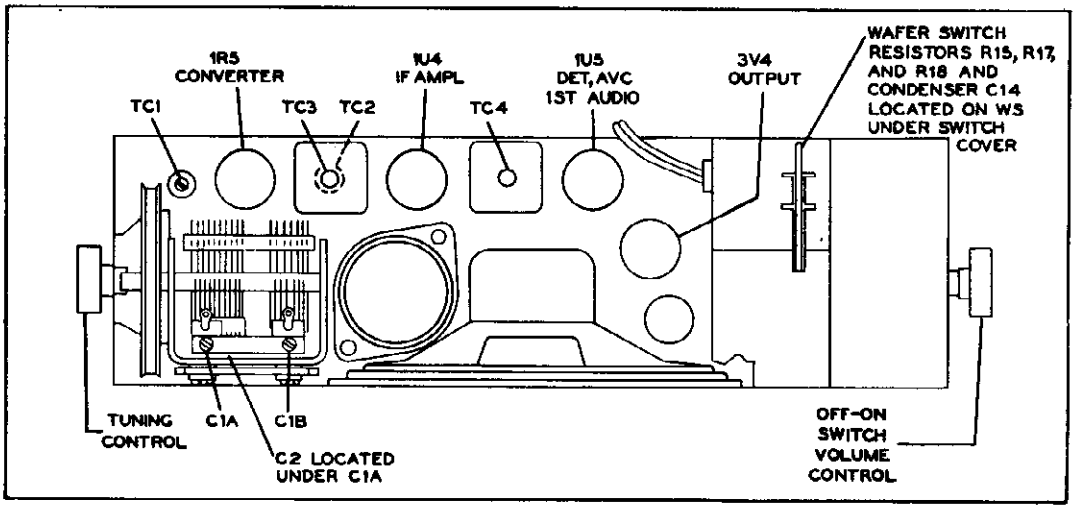


Figure 2. Top View, Showing Tuning Adjustments

ALIGNMENT PROCEDURE

DIAL POINTER—With tuning-condenser plates fully meshed, set pointer to coincide with alignment index mark on bottom of chassis.

OUTPUT INDICATOR — Connect output indicator (oscilloscope or 1000-ohms-per-volt a-c voltmeter) across voice-coil terminals.

SIGNAL GENERATOR—Use AM r-f signal generator. Connect output leads as indicated in alignment chart.

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

OUTPUT LEVEL — During alignment, attenuate signal-generator output to maintain output level belo .5 volt.

NOTE: While the radio is being aligned, the batteri should be in the same position with respect to chass and loop as they are when in the cabinet.

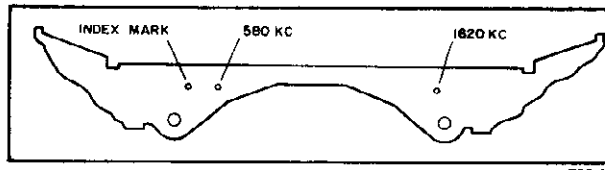


Figure 3. Front View of Pointer Rail, Showing Alignment Marks

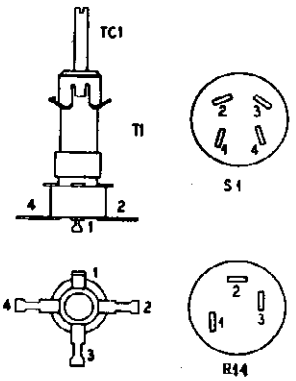
ALIGNMENT CHART

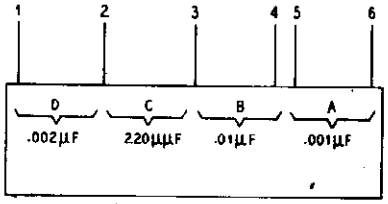
STEP	SIGNAL GENERATOR		RADIO		ADJUST
	CONNECTION TO RADIO	DIAL SETTING	DIAL SETTING	SPECIAL INSTRUCTIONS	
1	Output lead through a .1-μf. condenser to antenna section of tuning condenser or to pin 6 of converter (1R5). Ground lead to B–.	455 kc.	Tuning gang fully open.	Adjust, in order given for maximum output.	TC4—2nd i-f sec. TC2—1st i-f pri. TC3—1st i-f sec.
2	Radiating loop. See NOTE below.	1620 kc.	1620 kc.†	Adjust for maximum output.	C1B—osc. trimme
3	Same as step 2.	Between 1400 and 1500 kc.	Tune radio to generator signal.	Adjust for maximum output.	C1A—antenna trimmer
4	Same as step 2.	580 kc.	580 kc.†	Adjust for maximum output. Rock tuning gang while making this adjustment.	TC1—osc. core
5	Repeat steps 2, 3, and 4 until no further improvement is obtained.				

NOTE: Use a 6—8 turn, 6-inch diameter loop made up of insulated wire. Connect to signal-generator leads, and place about 1 foot from radio loop antenna.

† The radio can be set to this frequency by tuning it until the dial pointer coincides with the proper alignment mark on the bottom of the chassis. See figure 3.

MODEL B651

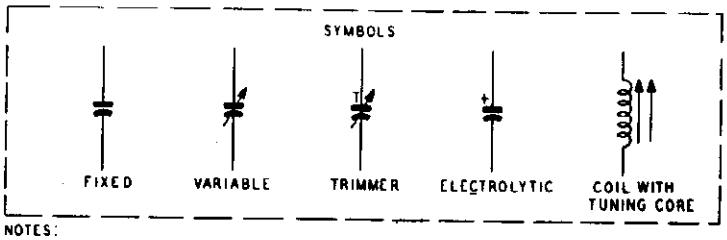




* C10 FOUR SECTION CONDENSER

TUBE SOCKET VOLTAGES

B SUPPLY	1R5		1U4		1U5		3V4	
	RF PLATE PIN 2	OSC PLATE PIN 3	PLATE PIN 2	SCREEN PIN 3	PLATE PIN 2	SCREEN PIN 3	PLATE PIN 2	SCREEN PIN 3
PWR LINE (AC OR DC)	90	55	90	90	18	16	86	90
67½V BATTERY	65	38	65	65	17	16	62	65



NOTES:
ALL RESISTOR VALUES IN OHMS AND ALL CONDENSER VALUES IN µµF 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-.

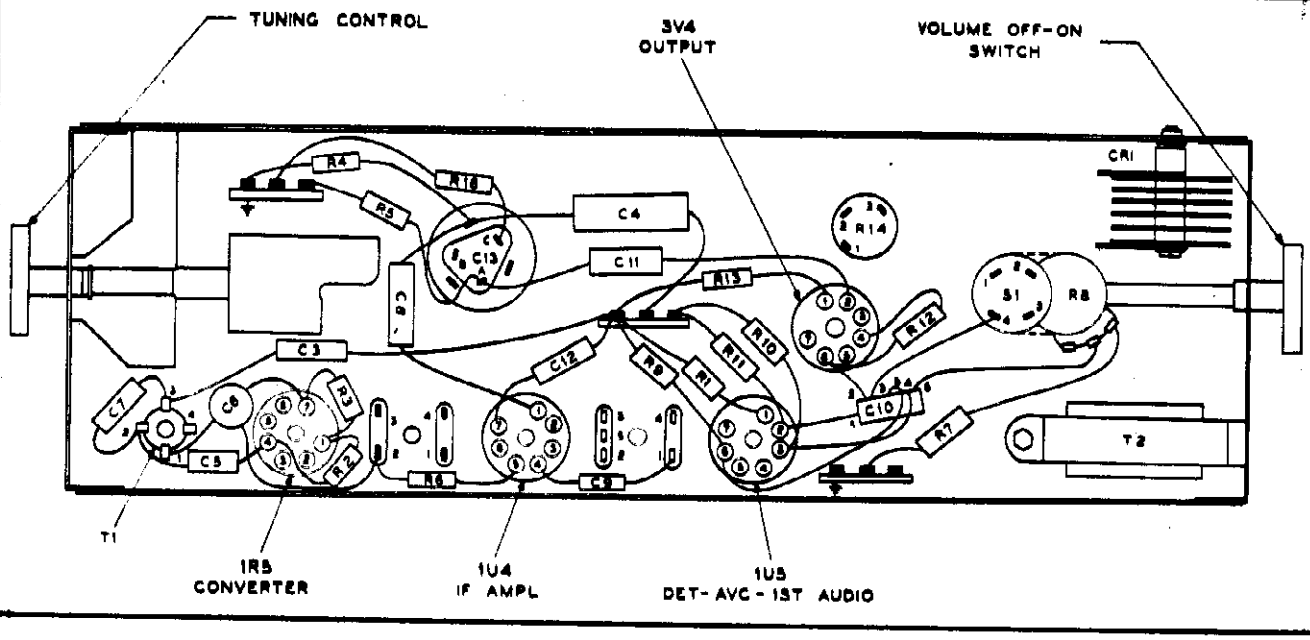


Figure 5. Base View, Showing Parts Placement

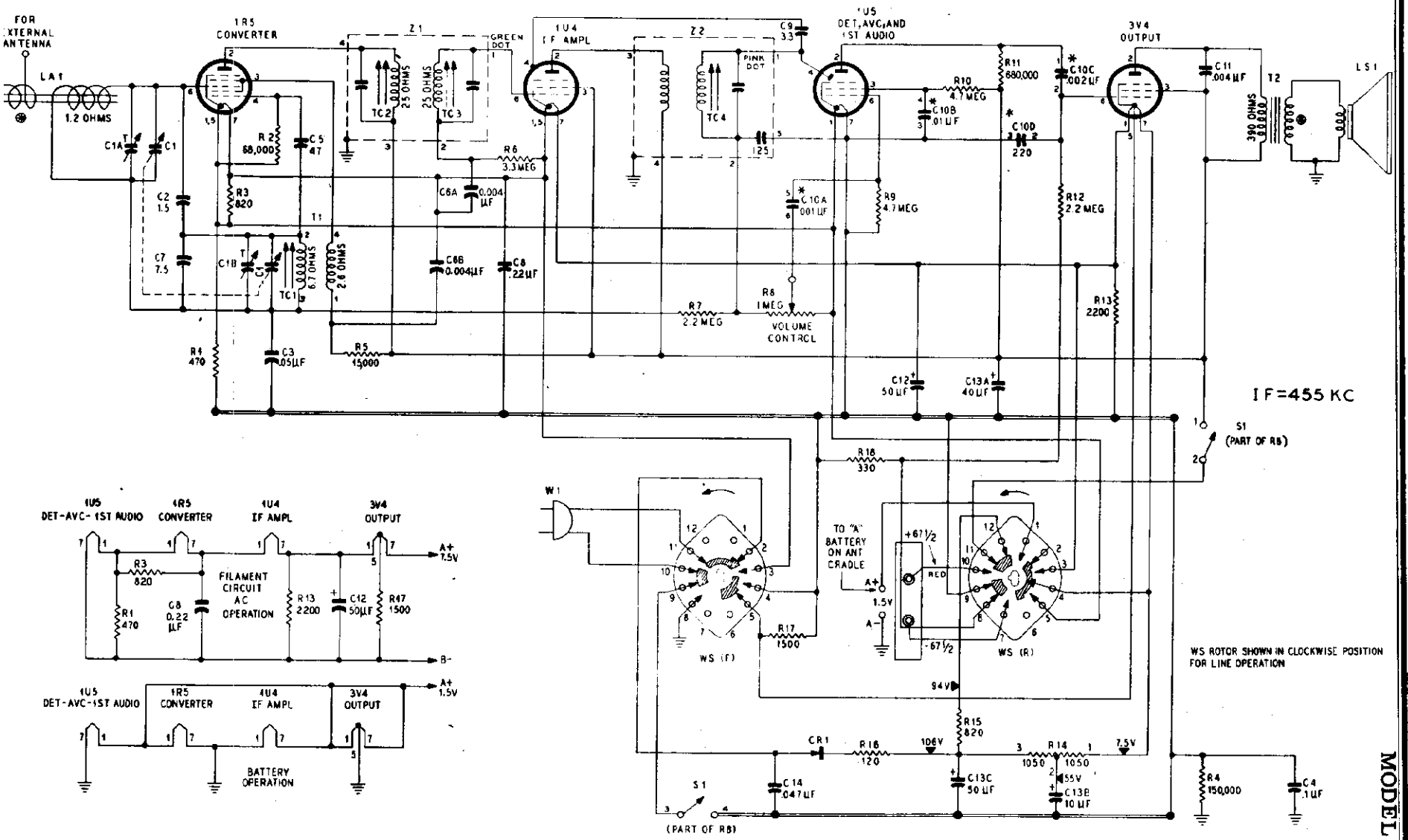


Figure 4. Philco Portable Radio Model B651, Schematic Diagram

MODEL B651

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 unchanged. 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, 1.5μμf.	30-1221-3
C3	Condenser, a-v-c by-pass, .05 μf.	30-4650-45*
C4	Condenser, B- to ground, .1 μf.	30-4650-47*
C5	Condenser, d-c blocking, 47 μμf.	60-00475420
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 μμf.	30-1224-83
C8	Condenser, filament by-pass, .25 μf.	30-4656-1
C9	Condenser, neutralizing, 3.3 μμf.	30-1221
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 μμf.	Part of C10
C11	Condenser, tone compensation, .004 μf.	30-4650-56*
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.	30-4650-45*
CR1	Selenium rectifier, 75 ma. at 117 volts	34-8003
LA1	Loop antenna	32-4455-10
LS1	Speaker, 4-inch, p-m	36-1637
R1	Resistor, current limiting, 470 ohms	66-1478340*
R2	Resistor, grid return, 68,000 ohms	66-3688340*
R3	Resistor, bias, 820 ohms	66-1828340*
R4	Resistor, leakage, 150,000 ohms	66-4158340*
R5	Resistor, oscillator dropping, 15,000 ohms	66-3158340*
R6	Resistor, grid return, 3.3 megohms	66-5338340*
R7	Resistor, a-v-c filter, 2.2 megohms	66-5228340*
R8	Resistor, 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, 680,000 ohms	66-4688340*
R12	Resistor, grid return, 2.2 megohms	66-5228340*
R13	Resistor, bias, 2200 ohms	66-2228340*
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	32-4453-1
T2	Transformer, output	32-8434
W1	Line cord	L2163
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, sand	10799-28
Back, cabinet, sand	54-4767-25
Cabinet, driftwood	10799-26
Back, cabinet, driftwood	54-4767-23
Cabinet, spruce green	10799-25
Back, cabinet, spruce green	54-4767-22
Cable, battery	41-3988
Cover, sub-base	56-7912
Cover, switch	56-7911
Dial scale	54-5087
Drive cord (25-ft. spool)	45-8750*
Fastener, baffle mtg. (4 required)	W2235-7FA9
Handle	54-4883
Hinge, R.H.	56-7915-1
Hinge, L.H.	56-7915
Insulator, capacitor mtg.	27-9508
Knob (2 required)	54-4773
Nameplate	54-4884
Pointer	56-7978-1
Ring, shaft retaining	28-8610
Rubber mount, tuning capacitor (3 required)	27-4099-3
Screw, hinge (2 required)	W2537-15FA1
Speed nuts, nameplate mtg. (2 required)	1W56912FE7
Shaft, tuning	56-7906FA42
Shield, tube (1U5)	56-3978-1FA3
Socket	27-6203
Socket	27-6203-12
Battery cradle and antenna ass'y.	76-5740-1

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 057 Battery

(Average battery life — 100 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 ..... Det. — AVC — 1st A.F.
(5) RCA 3V4 ..... Output

A selenium rectifier is used.

Weight (Approx.)
Without battery...5 lb. 10 oz. With battery...9 lb. 6 oz

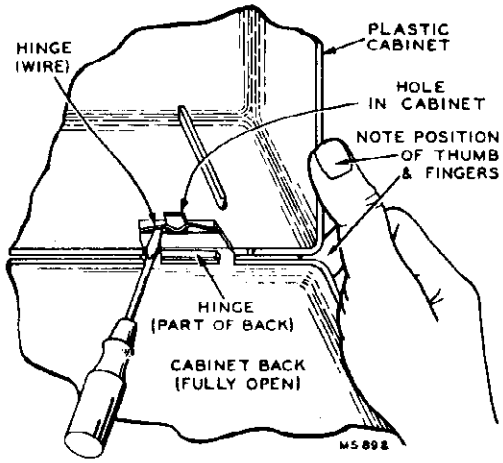
Power Output
Undistorted ..... .150 wat
Maximum ..... .325 wat

Loudspeaker ..... 4 in. P.M
Voice coil impedance ..... 3.2 ohms at 400 cycle

Cabinet Dimensions
Height....8⅝ in. Width....12¾ in. Depth....5⅝ ir

To Remove Hinges

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



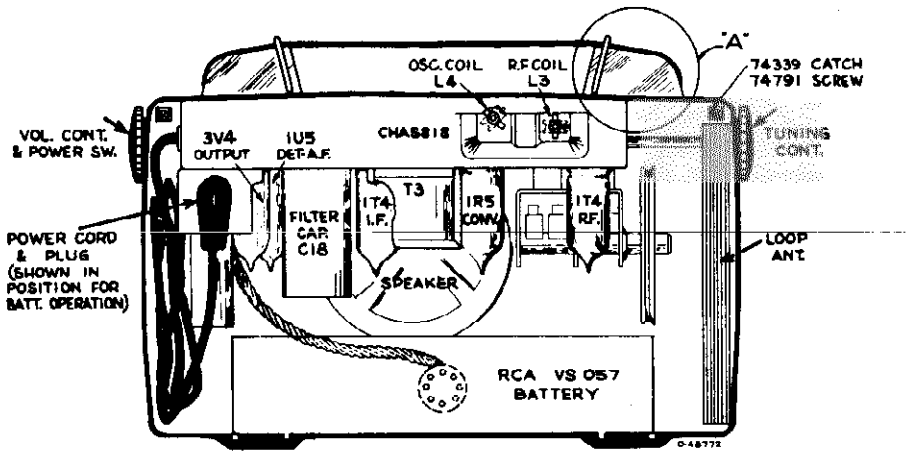
Removal of Cabinet Back

To Remove Chassis:

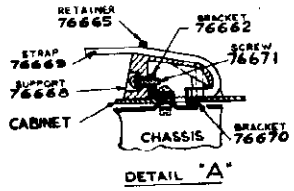
1. Pull out battery and disconnect battery plug.
2. Unsolder the two loop antenna leads.
3. Remove handle, remove the two large screws (unde handle) in the top of the case.

To Remove Cabinet Back

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.



Rear View With Back Removed



MODEL PX600, Ch. RC-1110

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.

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.

Step	Connect High Side of Sig. Gen. to —	Sig. Gen. Output	Dial Pointer Setting	Adjust for Max. Output
1	Disconnect loop—remove chassis—remove bottom plate.			
2	Pin #6 of 1T4 I.F. Amplifier thru .005 mf.	455 kc	Quiet point near 1600 kc	2nd I.F. Trans. T2 Top & Bottom
3	Pin #6 of 1R5 Converter thru .005 mf.			1st I.F. Trans. T1 Top & Bottom
4	Replace bottom cover and install chassis in cabinet. Re-connect loop.			
5	Short wire placed near loop for radiated signal	1620 kc	min. cap.	1600 kc osc. trimmer C1-3T
6		1400 kc	1400 kc Signal	1400 kc r.f. & ant. trimmers*
7		Connect a 22,000 ohm resistor in parallel with r.f. tuning cond. C1-2		
8		600 kc	600 kc Signal	L4 osc. core* while rocking gang
9		Remove the 22,000 ohm resistor from r.f. tuning cond. C1-2.		
10		600 kc	600 kc Signal	L3 r.f. core
11	Repeat Steps 5, 6, 7, 8, 9 and 10.			

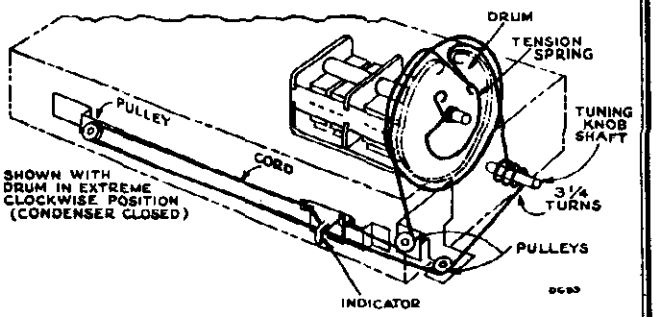
* The position of the battery affects loop inductance. The battery should be in place during steps 5 to 11.

Critical Lead Dress

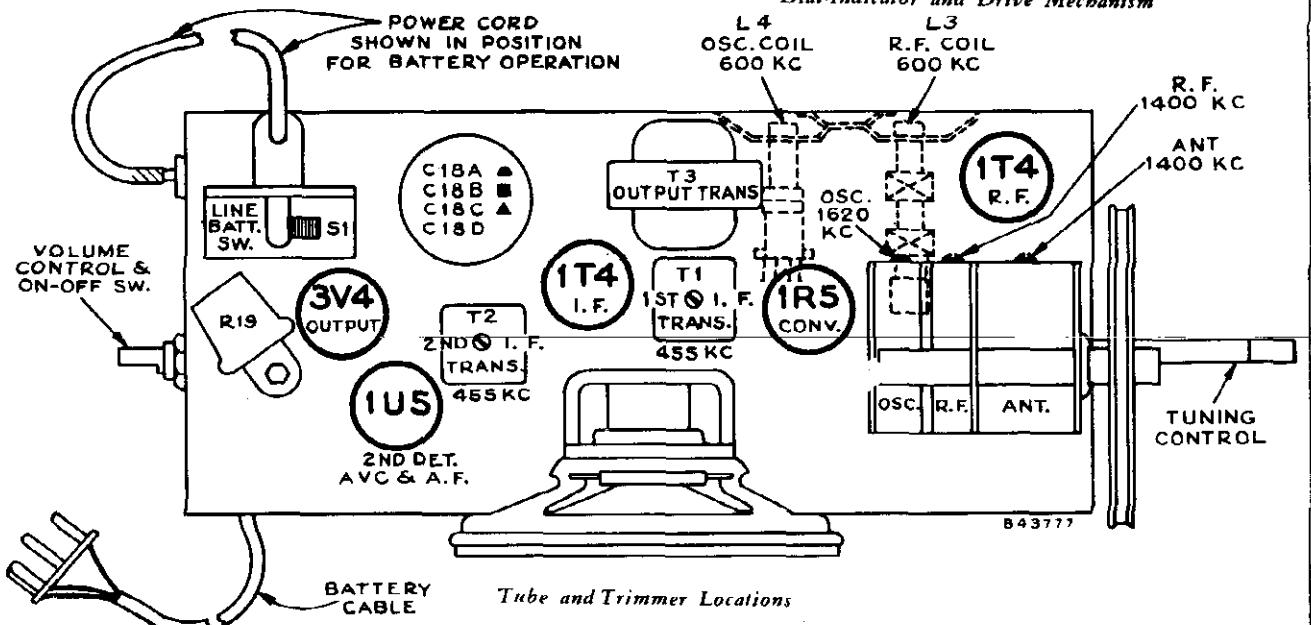
1. Dress all filament leads next to chassis.
2. Keep the leads short on the end of the three components (R1, R2, C2), which connect to the grid terminal (#6) of the r.f. socket.
3. Dress tuning condenser leads direct and avoid excess *lead length.*
4. Dress loop leads away from tuning drum and battery.
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 (R15) up and *away* from other wiring.
9. Dress all leads away from the ballast resistor. (R19).
10. Dress 1st a.f. grid resistor (R12) close to chassis.
11. Dress capacitor C3 in air between end apron and r.f. coil with foil end to tuning condenser frame.

CAUTION. —

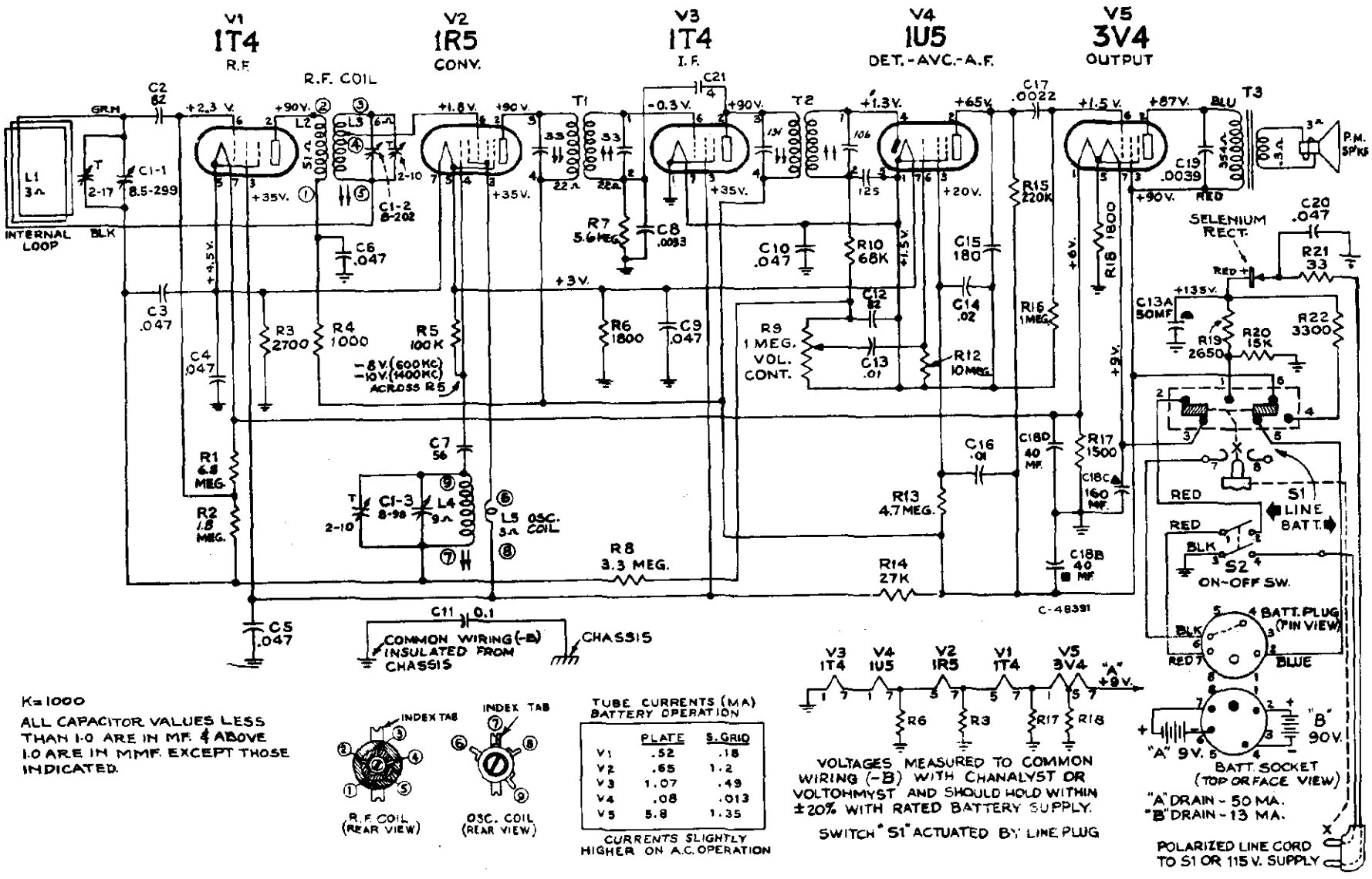
Do not remove any tubes from the chassis with the set operating and the plug connected to the power line. Damage to tubes may result.



Dial-Indicator and Drive Mechanism



Tube and Trimmer Locations



K=1000

ALL CAPACITOR VALUES LESS THAN 1.0 ARE IN MF. & ABOVE 1.0 ARE IN MMF. EXCEPT THOSE INDICATED.

TUBE CURRENTS (MA) BATTERY OPERATION

	PLATE	S.GRID
V1	.52	.18
V2	.65	1.2
V3	1.07	.49
V4	.08	.013
V5	5.8	1.35

CURRENTS SLIGHTLY HIGHER ON A.C. OPERATION

VOLTAGES MEASURED TO COMMON WIRING (-B) WITH CHANALYST OR VOLTOHMYST AND SHOULD HOLD WITHIN ±20% WITH RATED BATTERY SUPPLY.

SWITCH "S1" ACTUATED BY LINE PLUG

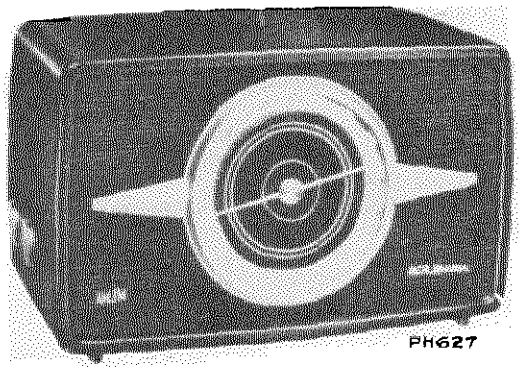
"A" DRAIN - 50 MA.
"B" DRAIN - 13 MA.

RADIO CORPORATION OF AMERICA PAGE
MODEL PX600, Ch. RC-

MODEL PX600, Ch. RC-1110

STOCK No.	DESCRIPTION
	CHASSIS ASSEMBLIES RC 1110
76660	Capacitor—Variable tuning capacitor complete with drive drum C1-1, C1-2, C1-3
73153	Capacitor—Ceramic, 4 mmf. C21
39622	Capacitor—Mica, 56 mmf. C7
71514	Capacitor—Ceramic, 82 mmf. C2, C12
76659	Capacitor—Electrolytic, comprising 1 section of 50 mfd., 150 volts, 1 section of 40 mfd., 150 volts, 1 section of 160 mfd., 25 volts and 1 section of 40 mfd., 25 volts C18A, C18B, C18C, C18D
73595	Capacitor—Tubular, paper, .0022 mfd., 600 volts ..C17
73795	Capacitor—Tubular, paper, .0033 mfd., 600 volts ..C8
73796	Capacitor—Tubular, paper, .0039 mfd., 600 volts ..C19
73561	Capacitor—Tubular, paper, .01 mfd., 400 volts C13, C16
73562	Capacitor—Tubular, paper, .022 mfd., 400 volts ..C14
73558	Capacitor—Tubular, paper, .047 mfd., 200 volts C4, C5
73553	Capacitor—Tubular, paper, .047 mfd., 400 volts C3, C6, C9, C10
75071	Capacitor—Tubular, moulded paper, .047 mfd., 400 volts C20
73551	Capacitor—Tubular, paper, 0.1 mfd., 400 volts ..C11
73935	Clip—Mounting clip for I.F. transformers
73114	Coil—Oscillator coil complete with adjustable core L4, L5
74992	Coil—R.F. coil complete with adjustable core L2, L3
71041	Connector—5 contact male connector for battery cable
74285	Control—Volume control and power switch ..R9, S2
†72953	Cord—Drive cord (approx. 47" overall length required)
70022	Cord—Power cord and plug
74838	Grommet—Power cord strain relief (1 set)
72283	Grommet—Rubber grommet to mount tuning capacitor (3 required)
18469	Plate—Bakelite mounting plate for electrolytic capacitor
76656	Pointer—Station selector pointer
72602	Pulley—Drive cord pulley
74322	Rectifier—Selenium rectifier
74319	Resistor—Wire wound, 2650 ohms, 7 watts R19
73237	Resistor—Wire wound, 33 ohms, fuse type R21
	Resistors—Fixed, composition:
504210	1000 ohms, ±20%, ½ watt R4
503215	1500 ohms, ±10%, ½ watt R17
503218	1800 ohms, ±10%, ½ watt R6, R18
503227	2700 ohms, ±10%, ½ watt R3
513233	3300 ohms, ±10%, 1 watt R22
504315	15,000 ohms, ±20%, ½ watt R20
503327	27,000 ohms, ±10%, ½ watt R14
504368	68,000 ohms, ±20%, ½ watt R10
504410	100,000 ohms, ±20%, ½ watt R5
504422	220,000 ohms, ±20%, ½ watt R15
504510	1 megohm, ±20%, ½ watt R16
503518	1.8 megohm, ±10%, ½ watt R2
504547	4.7 megohm, ±20%, ½ watt R13
503556	5.6 megohm, ±10%, ½ watt R7
503533	3.3 megohm, ±10%, ½ watt R8
503568	6.8 megohm, ±10%, ½ watt R1
504610	10 megohm, ±20%, ½ watt R12
76658	Shaft—Tuning knob shaft
73117	Socket—Tube socket
76368	Spring—Drive cord spring
71039	Switch—"Line-Battery" switch S1
71047	Transformer—Output transformer T3
73129	Transformer—First I.F. transformer T1
75487	Transformer—Second I.F. transformer T2
33726	Washer—"C" washer for tuning knob shaft
	SPEAKER ASSEMBLIES 971495-2
76402	Speaker—4" P.M. speaker complete with cone and voice coil (3.2 ohms)
	MISCELLANEOUS
76664	Antenna—Antenna loop L1
76667	Back—Cabinet back complete with hinges
76661	Board—Antenna loop lead terminal board complete with clip
76670	Bracket—Carrying handle strap bracket
76662	Bracket—Mounting bracket for handle (2 required)
76666	Cabinet—Cabinet complete with escutcheon, dial, "RCA Victor" emblem, grille, baffle and loop—less back and hinges
74339	Catch—Cabinet back clip catch—fastens to cabinet front (2 required)
74790	Hinge—Cabinet hinge (2 required)
76663	Knob—Control knob
76665	Retainer—Retainer for carrying handle strap (2 required)
74791	Screw—#4 x 5/16" cross recessed pan head thread cutting screw for catch #74339
76671	Screw—#6 x ½" cross recessed round head thread cutting screw for carrying handle
74734	Spring—Spring clip for knob
76669	Strap—Carrying handle strap
76668	Support—Handle assembly support (polystyrene) (2 required)

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



Model 1R81 "Livingston"

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) RCA 6AU6...Chassis RC-1102.....R. F. Amp.
RCA 6CB6...Chassis RC-1102A, RC-1102B, & RC-1102C .....R. F. Amp.
(2) RCA 6X8 ..... 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. Amp.
(7) RCA 6V6GT..... Output
(8) RCA 5Y3GT..... Rectifier

Circuit Description

The receiver is provided with a tuned RF stage (V1 6AU6 or 6CB6) on both AM and FM bands.

The mixer section of the 6X8 tube (V2) operates as a pentode on AM reception and as a triode on FM reception. This provides best signal to noise ratio.

The range switch has five functions:

1. Selection of AM or FM tuning ranges.
2. Selection and distribution of AVC voltages. Full AVC is applied to V1, V2 and V3 in AM position. Delayed AVC is applied to V1 and V3 in FM position (V2 is not controlled).
3. Controls the application of B+ voltages to the plate and screen circuits of V1 and V2 (disconnected in phono position).
4. Controls audio input to volume control.
5. Switches mixer section of V2 (6X8) from pentode operation on AM to triode operation in FM position.

The driver V4 (6AU6) and ratio detector V5 (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 V6 (6AV6) and V7 (6V6GT).

The rectifier (V8) is type 5Y3GT.

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

Loudspeaker
Type.....8 in. P.
Voice coil impedance at 400 cycles..... 3.2 oh

Tuning Drive Ratio.....7¼:1 (3⅝ turns of kn

Dial Lamps (2)..... Type No. 44, 6-8 volts, 0.25 ar

Power Output
Maximum .....3.5 wa
Undistorted .....2.5 wa

Cabinet Dimensions
Height..10 in. Width..16½ in. Depth..9

Weight .....19½ l

Antennas:

The receiver has a built-in Ferrite rod antenna for A band and the FM antenna input is capacity coupled power line.

Under average conditions the receiver does not requ an external antenna. However, provision is made for t use of external antenna if desired—connect as indicat below:

AM antenna: Open the link (normally connects t minals #1 and #2). Connect a single wire antenna terminal #1.

FM antenna: Remove the built-in antenna lead fr #3 terminal. Connect the transmission line (3 ohm) from an external dipole antenna to termin #2 and #3.

Ground: An external ground can be attached to t minal #2 if desired. Under some conditions an e ternal ground is detrimental to FM reception.

NOTE: *For satisfactory reception on FM when using t built-in FM antenna the power cord must be fully extend and must not be coiled or hanked up.*

Transformer Substitution:

A few receivers were manufactured using a substitute transformer (T-3 2nd P.M.). The connections to this tr former differ from that shown in the schematic diagram follows:

THE ORIGINAL TRANSFORMER IS STAMPED 971169-3.
IN TRANSFORMERS STAMPED 971169-2, CONNECTIO TO TERMINALS B AND D ARE INTERCHANGED.
D IS CONNECTED TO CHASSIS.
B IS CONNECTED TO NO. 3 TERMINAL OF T4.

MODEL 1R81, Ch. RC1102, A, B, C

ALIGNMENT PROCEDURE—LEAD DRESS

Alignment Procedure

Due to the use of separate I.F. transformers, there is little interaction between the 10.7 mc. and the 455 kc. adjustments.

There is a slight interaction of adjustments on the tuning condenser between AM and FM.

If a large amount of adjustment is required of any circuit, all others should be checked in the following order:

FM I.F.
AM I.F.
AM Osc., ant. and r.f.
FM Osc., ant. and r.f.

Alignment Indicators:

For measuring the developed d c voltage across C29 during FM alignment an RCA VoltOhmyst or an equivalent meter should be used. An output meter connected across the voice coil is also needed to indicate minimum audio output during FM Ratio Detector alignment.

The RCA VoltOhmyst can also be used to indicate audio output voltage across the voice coil or developed voltage on the AVC bus.

Signal Generator:

For alignment operations connect the low side of the signal generator to the receiver chassis. The output of the signal generator should always be controlled to prevent over-loading or excessive AVC action.

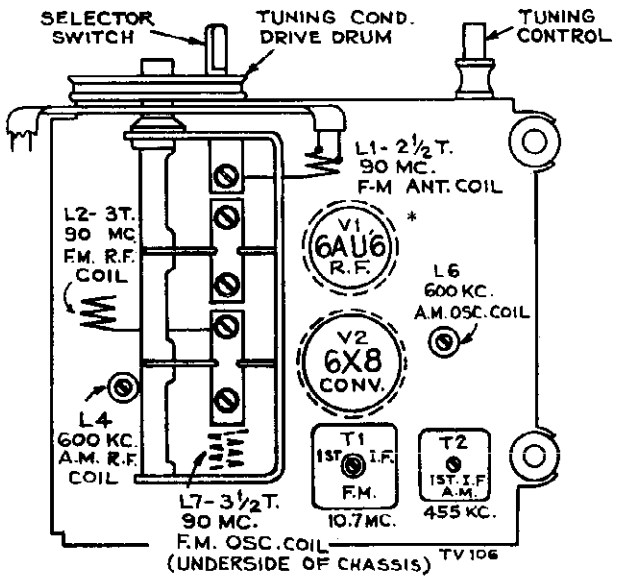
Oscilloscope Alignment:

It is preferable to use a sweep generator and oscilloscope for aligning I.F. and R.F. circuits to obtain a visual observation of curve shape during alignment.

With FM sweep generator connected between FM ant. (#3) terminal and chassis and oscilloscope connected between the junction of R28-C30 and chassis the overall FM response may be observed. There should be a peak to peak separation of not less than 180 kc. with 50,000 mv. input.

CRITICAL LEAD DRESS

1. Dress diode lead from second I. F. away from filament lead going to 6AV6 1st audio tube socket.
2. Lead from lug terminal "B" of the 1st FM transformer to rear switch wafer terminal #10 should not be changed from the original, 3 inches long plus or minus ¼" of #22 copper vinylite covered.
3. A.C. leads from power switch on volume control should be dressed as far as possible from the audio-leads and audio coupling condensers near or connecting to the volume control terminals.
4. Ground straps between the R.F. shelf and the main chassis should not be relocated.
5. The connection point of capacitor C10 is critical, therefore should not be altered. It must be connected to the function switch and not to the I.F. transformer.



6AU6 is used as R.F. Amp. in RC-1102
6CB6 is used as R.F. Amp. in RC-1102A, RC-1102B, RC-1102C

FM Coil Locations

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	Pin 1 of V3 6BA6 in series with .01 mfd.	455 kc.	Quiet point at low freq. end.	T4 bottom core (pri.). T4 top core (sec.).
2	Pin 7 of V2 6X8 in series with .01 mfd.			T2 top core (sec.). T2 bottom core (pri.).
3	No. 1 terminal on ant. input strip	1620 kc.	High freq. end of dial (min. cap.)	C1-5T
4		1400 kc.	1400 kc. signal	C1-2T ant. C1-3T r.f.
5		Shunt a 10,000 ohm resistor across the r.f. section of the gang.		
6		600 kc.	600 kc. signal	L6 osc.* (Rock gang.)
7		Remove the 10,000 ohm resistor and peak L4 r.f.*		
8	Repeat 3, 4, 5, 6 and 7			

* The correct adjustment of the OSC. (L6) core is that peak obtained with core fartherest away from the coil mounting clips. R.F. (L4) core should be set to the peak obtained (2 peaks are seldom obtainable) with core closest to the mounting clips.

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 C29 and the common lead to chassis.			
2	Pin 1 of V4 6AU6 in series with .01 mfd.	10.7 mc. modulated 30% 400 cycles AM	Quiet point at low freq. end.	T5 top core for max. d-c voltage across C29. T5 bottom core for min. audio output.*
3	Pin 1 of V3 6BA6 in series with .01 mfd.	Adjust to provide 3 to 4 volts indication on VoltOhmyst during alignment.		†† T3 top core (sec.). T3 bottom core (pri.).
4	Pin 7 of V2 6X8 in series with .01 mfd.			†† T1 top core (sec.). T1 bottom core (pri.).
5	#3 ant. term. in series with a 300 ohm resistor. (Remove ant. lead from #3 term.)	90 mc.	90 mc.	L7 osc.**
6		106 mc.	106 mc. signal	C1-1T ant. C1-4T r.f.
7		90 mc.	90 mc. signal	L1 ant.** L2 r.f.**
8	Repeat Steps 5, 6 and 7 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.

†† Alternate loading may be necessary to provide accurate observation of peaks.

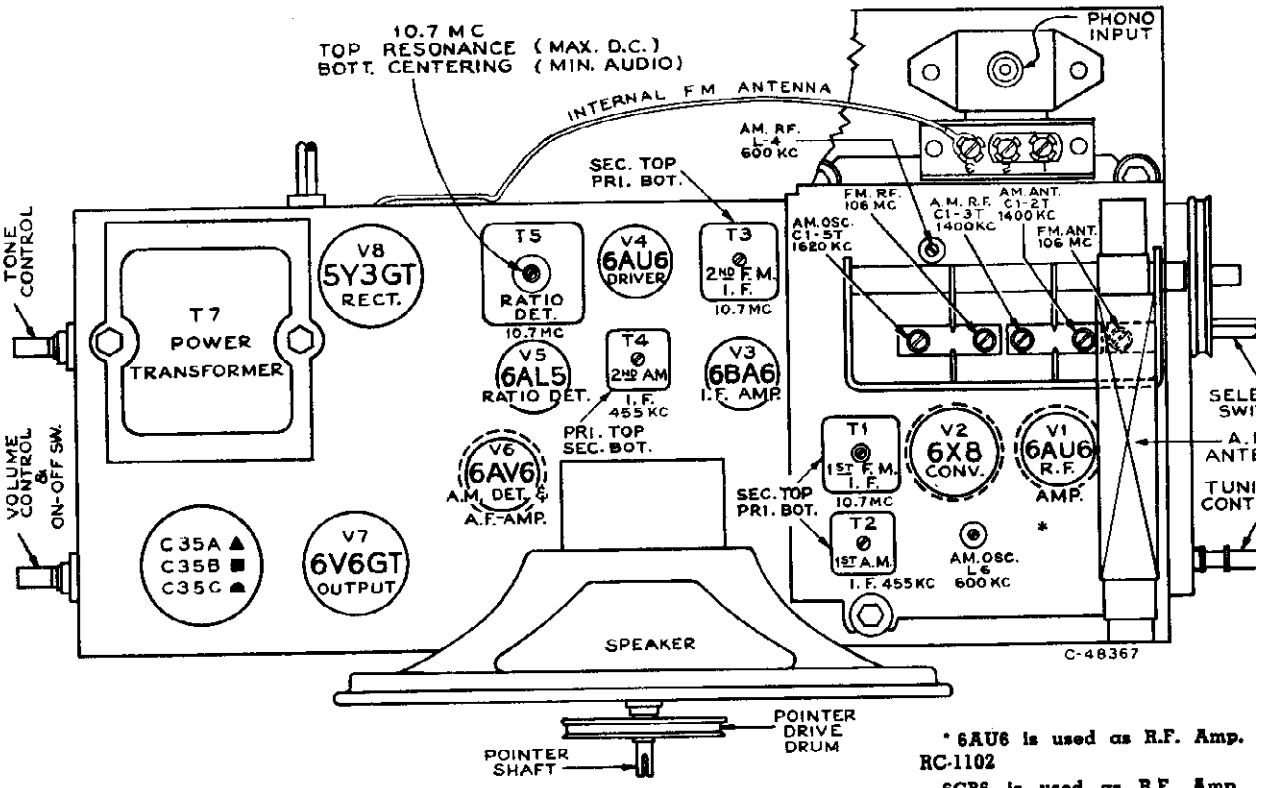
Alternate loading involves the use of a 680 ohm resistor to load the plate winding while the grid winding of the SAME TRANSFORMER is being peaked. Then the grid winding is loaded with the resistor while the plate winding is peaked. Only one winding is loaded at any one time. Remove the 680 ohm resistor after T3 and T1 have been aligned.

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

Extreme care should be used to avoid running the I.F. cores all the way through the winding and out the other end. Double peaks or serious overcoupling will result. The correct adjustment may be determined by starting the core all the way out (threads extended). The first peak obtained when tuning should be the correct peak.

** Note: FM antenna, mixer and oscillator coils are adjustable by increasing or decreasing the spacing between turns. The location of the tap on the antenna coil is ⅝ turn ± ⅛ turn from the ground end.

TUBE AND TRIMMER LOCATIONS—VOLTAGE DATA



Tube and Trimmer Locations

* 6AU6 is used as R.F. Amp. RC-1102

6CB6 is used as R.F. Amp. RC-1102A, RC-1102B and RC-1102

VOLTAGE CHART

Tube	Type	Elements	Pin No.	"A"	"FM"	Phono.
1	RF amp. 6AU6 (RC-1102)	Plate	5	195	178	—
		Screen	6	100	80	—
		Cathode	7	0.2	0.3	—
		Grid	1	−1.0	−0.6	—
	RF amp. 6CB6 (RC-1102A)	Plate	5	195	151	—
		Screen	6	84	64	—
		Cathode	2	0.4	0.45	—
		Grid	1	−0.4	−.5	—
2	Mixer 6X8	Plate	9	64	65	—
		Screen	8	64	65	—
		Grid	7	−3.1	−2.2	—
	Osc. 6X8	Plate	3	83	77	—
		Grid	2	−5.3	−1.1	—
3	IF amp. 6BA6	Plate	5	200	200	210
		Screen	6	122	110	124
		Cathode	7	0.7	0.9	0.9
		Grid	1	−1.4	−0.4	−0.7
4	Driver 6AU6	Plate	5	199	202	220
		Screen	6	130	138	150
		Cathode	7	1.2	1.2	1.6
5	Ratio Det. 6AL5	—	—	—	—	—
6	AF amp. 6AV6	Plate	7	72	72	75
		Grid	1	−0.8	−0.7	−0.7
7	Output 6V6GT	Plate	3	244	248	248
		Screen	4	200	210	230
		Cathode	8	10	10.5	12
8	Rectifier 5Y3GT	Fil.	8	260	262	265

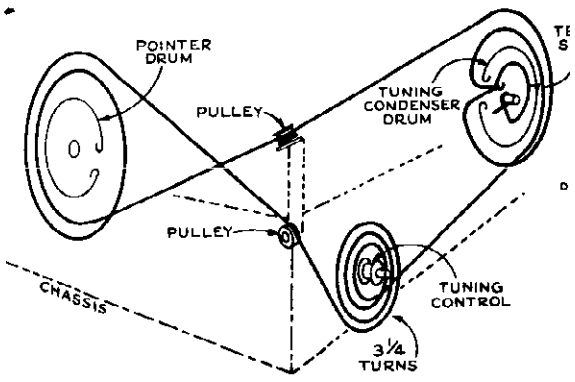
The heater voltage of the mixer/oscillator tube (6X8) is approx. .4 volt lower than other tubes in the same circuit. This is due to the filament choke coils L10 and L11.

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

RCA VoltOhmyst used for measuring all voltages.

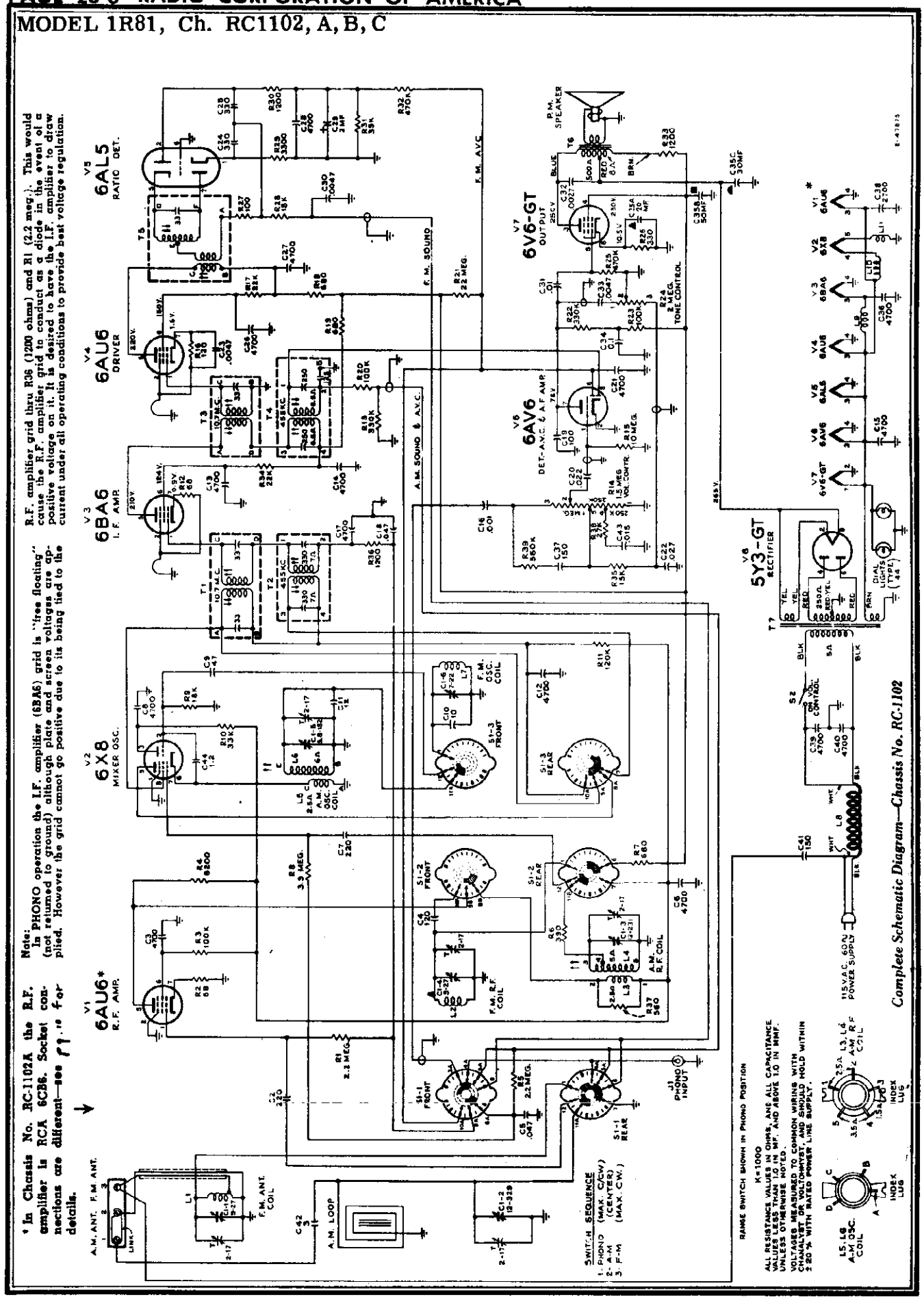
CATHODE CURRENTS (MA)

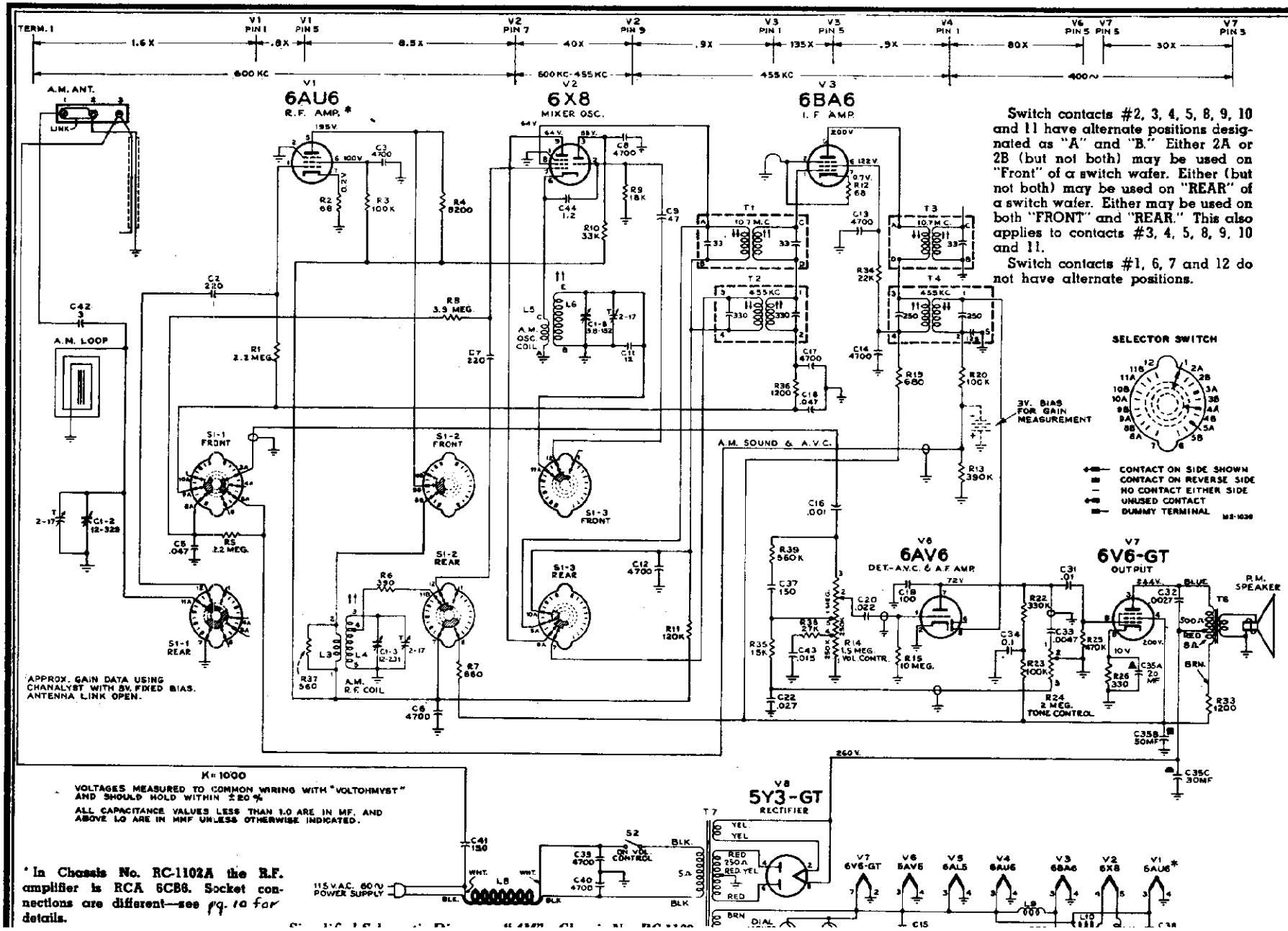
Tube		Terminal	A.M.	F.M.	Ph
1	6AU6 (RC-1102)	7	2.9	4.0	–
	6CB6 (RC-1102A)	2	5.1	5.9	–
2	6X8	6	4.6	4.6	–
3	6BA6	7	11.6	13.2	1
4	6AU6	7	10.4	10.2	1
5	6AL5	—	—	—	–
6	6AV6	2	0.3	0.3	0.
7	6V6GT	8	34	33.4	
8	5Y3GT	8	65	66	



Dial Cord and Drive Assembly

MODEL 1R81, Ch. RC1102, A, B, C





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 wafer. Either (but not both) may be used on "REAR" of a switch wafer. Either may be used on both "FRONT" and "REAR." This also applies to contacts #3, 4, 5, 8, 9, 10 and 11.

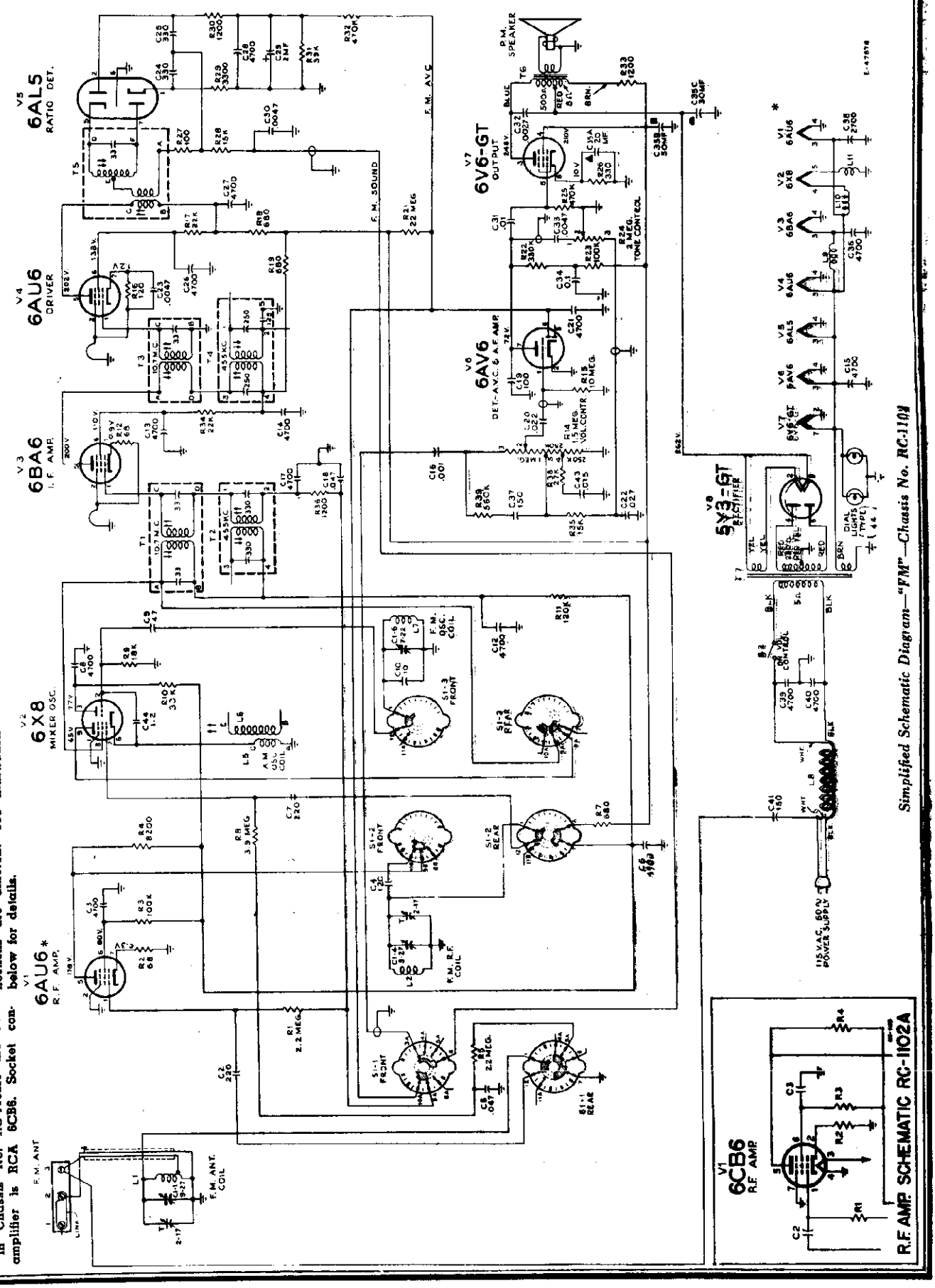
Switch contacts #1, 6, 7 and 12 do not have alternate positions.

* In Chassis No. RC-1102A the R.F. amplifier is RCA 6CB6. Socket connections are different—see pg. 10 for details.

RADIO CORPORATION OF AMERICA PAGE

MODEL 1R81, Ch. RC1102, A, E

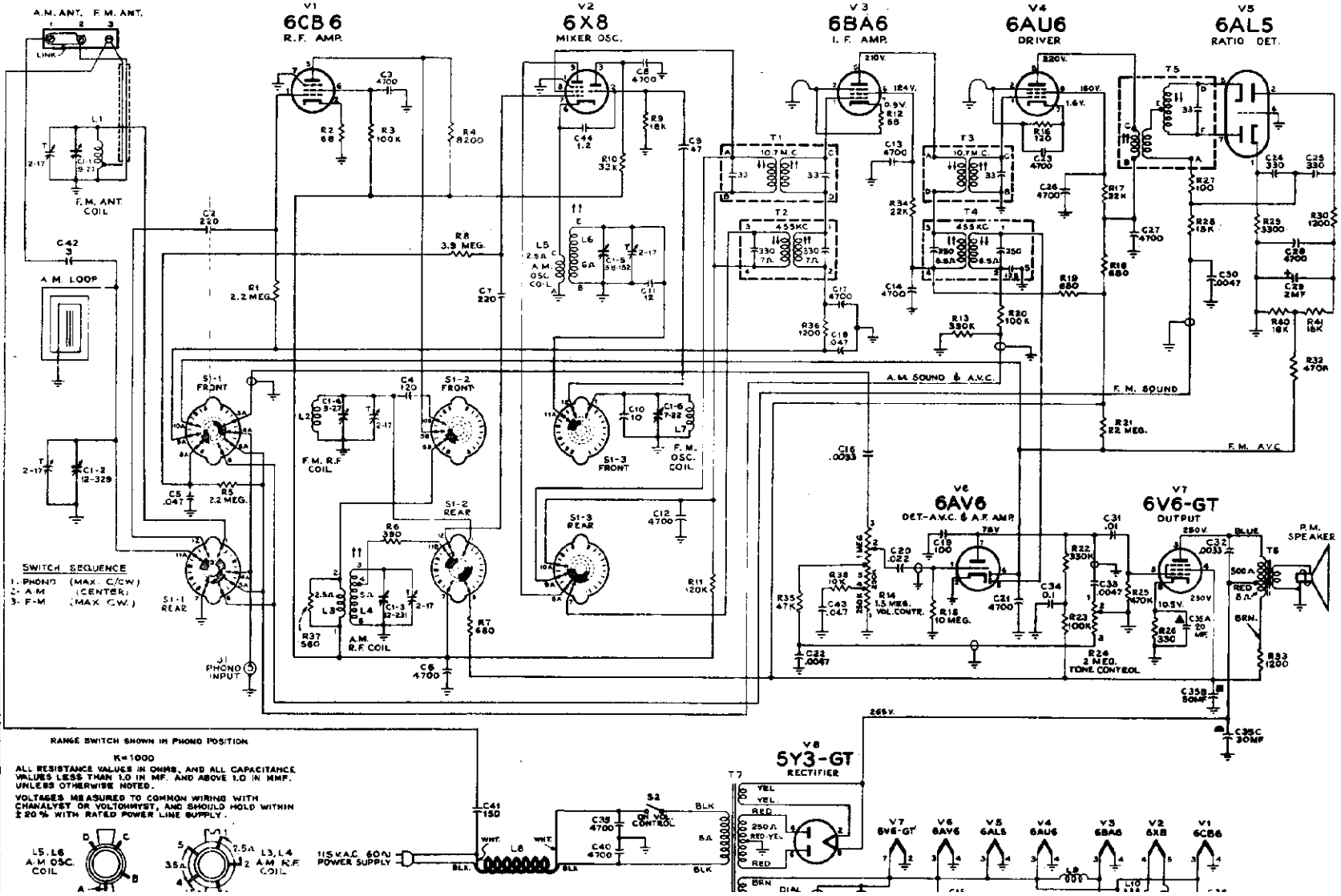
MODEL 1R81, Ch. RC1102, A, B, C



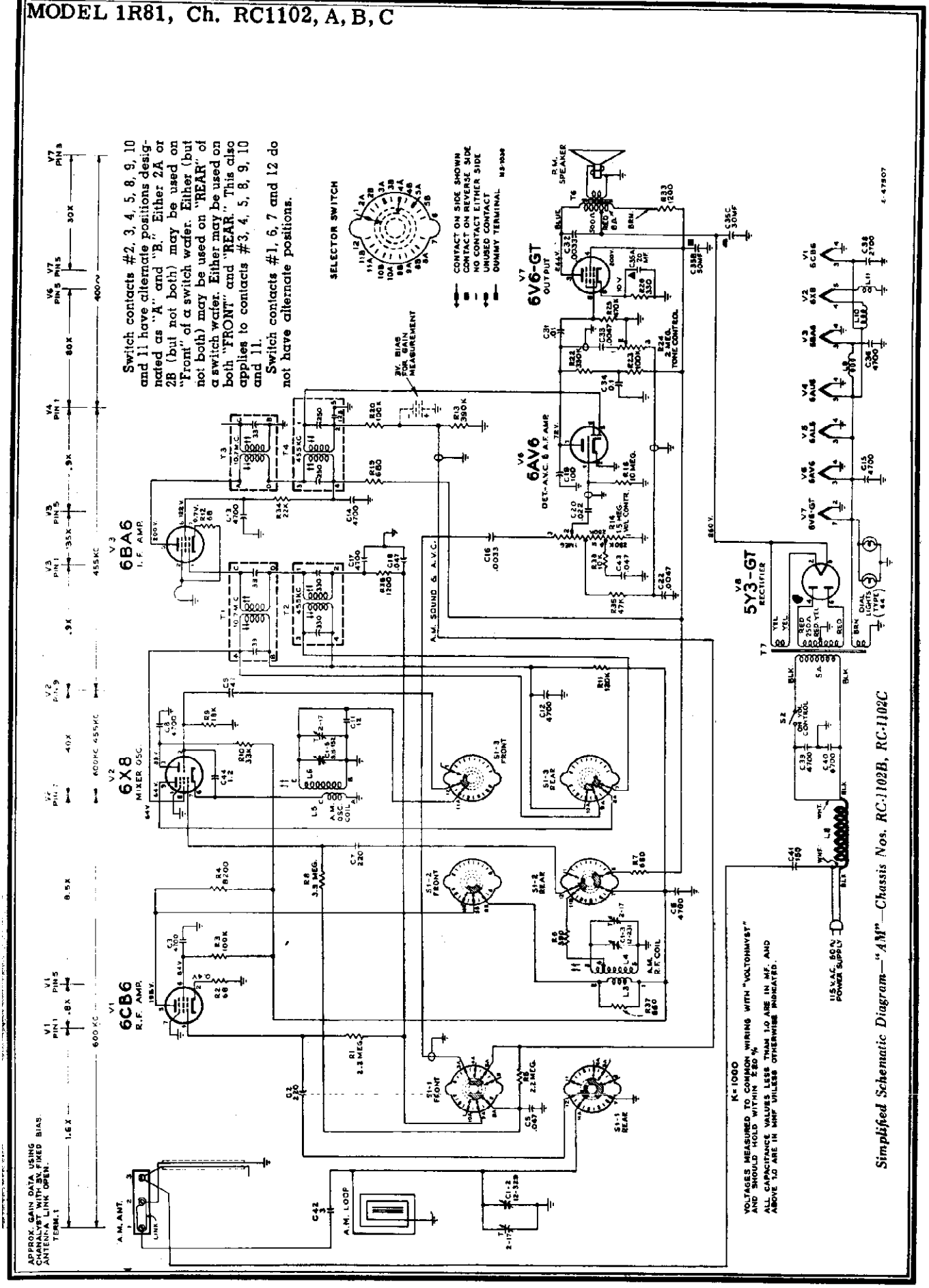
Simplified Schematic Diagram—"FM"—Chassis No. RC-1104

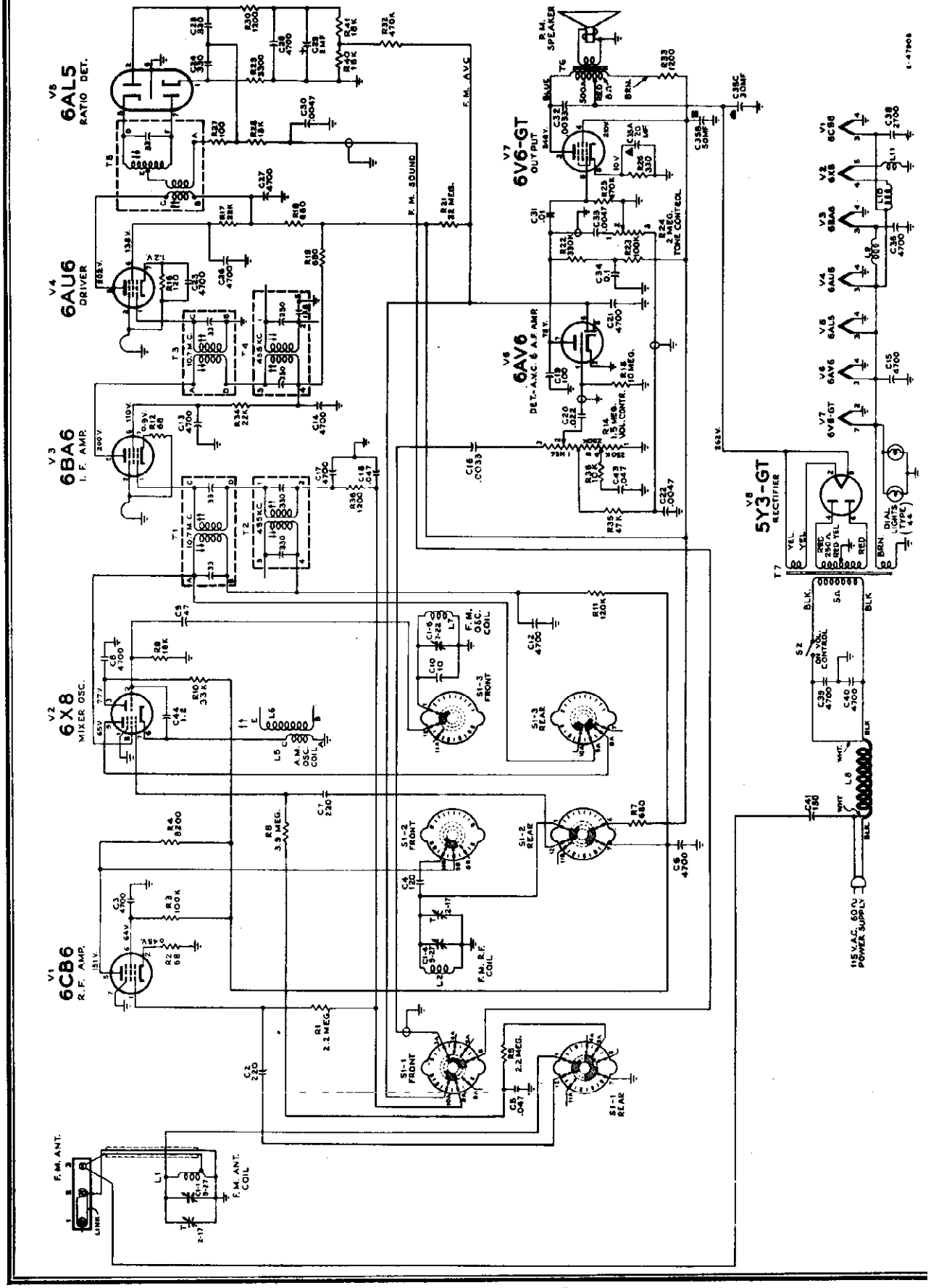
* In Chassis No. RC-1102A the R.F. sections are different—see illustration below for details. Socket connections for the 6AU6 amplifier is RCA 6CB6.

Note:
In PHONO operation the I.F. amplifier (6BA6) grid is "free floating" (not returned to ground) although plate and screen voltages are applied. However the grid cannot go positive due to its being tied to the R.F. amplifier grid thru R36 (1200 ohms) and R1 (2.2 meg.). This would cause the R.F. amplifier grid to conduct as a diode in the event of a positive voltage on it. It is desired to have the I.F. amplifier to draw current under all operating conditions to provide best voltage regulation.



MODEL 1R81, Ch. RC1102, A, B, C

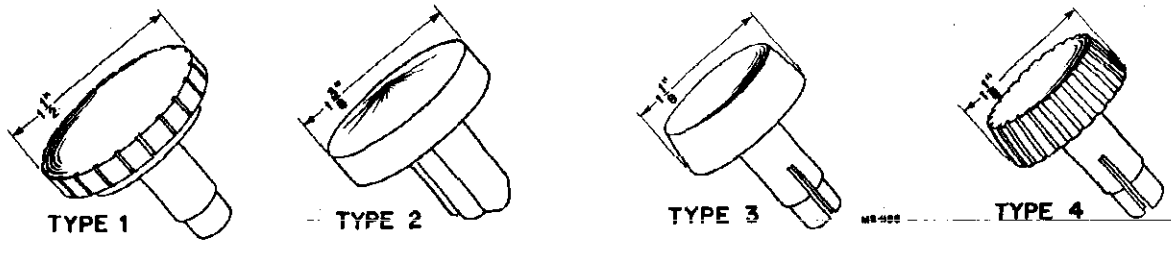



V1 6CB6 R.F. AMP.
V2 6X8 MIXER OSC.
V3 6BA6 I.F. AMP.
V4 6AU6 DRIVER
V5 6AL5 RATIO DET.
V6 6AV6 DET.-A.V.C. & A.F. AMP.
V7 6V6-GT OUT PUT
V8 5Y3-GT RECTIFIER
P.M. SPEAKER
F.M. ANT.
F.M. ANT. COIL
F.M. R.F. COIL
F.M. OSC. COIL
A.M. OSC. COIL
F.M. SOUND
F.M. A.V.C.
ON VOL. CONTROL
TONE CONTROL
VOL. CONTR.
DIAL LIGHTS (3 TYPE 44)
115 V.A.C. 60 ~ POWER SUPPLY

MODEL 1R81, Ch. RC1102, A, B, C

Stock No.	DESCRIPTION
	CHASSIS ASSEMBLIES RC 1102, RC 1102A
76343	Antenna—Ferrite rod antenna complete with coil less masonite support and grommets
12717	Board—Antenna terminal board
76325	Bracket—Drive cord pulley bracket with two (2) pulleys
76333	Capacitor—Variable tuning capacitor (C1-1, C1-2, C1-3, C1-4, C1-5, C1-6)
75677	Capacitor—Ceramic, 1.2 mmf. (C44)
57090	Capacitor—Ceramic, 3 mmf. (C42)
76350	Capacitor—Ceramic, 10 mmf. (C10)
76349	Capacitor—Ceramic, 12 mmf. (C11)
76348	Capacitor—Ceramic, 47 mmf. (C9)
75437	Capacitor—Ceramic, 100 mmf. (C19)
76347	Capacitor—Ceramic, 120 mmf. (C4)
44202	Capacitor—Ceramic, 150 mmf. (C37 in RC-1102, RC-1102A)
39632	Capacitor—Mica, 150 mmf. (C41)
75611	Capacitor—Ceramic, 220 mmf. (C2, C7)
39640	Capacitor—Mica, 330 mmf. (C24, C25)
39662	Capacitor—Mica, 2700 mmf. (C38)
73473	Capacitor—Ceramic, 4700 mmf. (C3, C6, C8, C13, C14, C15, C17, C21) (C23 in RC-1102B, RC-1102C) (C26, C27, C28, C36, C39, C40)
39668	Capacitor—Mica, 4700 mmf. (C12)
73747	Capacitor—Electrolytic, 2 mfd., 50 volts (C29)
76330	Capacitor—Electrolytic comprising 1 section of 30 mfd., 350 volts, 1 section of 50 mfd., 300 volts and 1 section of 20 mfd., 25 volts (C35A, C35B, C35C)
75249	Capacitor—Tubular, paper, .001 mf., 600V (C16 in RC-1102, RC-1102A)
73818	Capacitor—Tubular, paper, .0027 mf., 1600V (C32 in RC-1102, RC-1102A)
73795	Capacitor—Tubular, paper, .0033 mf., 600V (C16 in RC-1102B, RC-1102C)
73819	Capacitor—Tubular, paper, .0033 mf. 1600V (C32 in RC-1102B, RC-1102C)
73920	Capacitor—Tubular, paper, .0047 mf., 600V (C22 in RC-1102B, RC-1102C) (C23 in RC-1102, RC-1102A) (C30, C33)
73561	Capacitor—Tubular, paper, .01 mfd., 400 volts (C31)
73797	Capacitor—Tubular, paper, .015 mf., 600V (C43 in RC-1102, RC-1102A)
73562	Capacitor—Tubular, paper, .022 mfd., 400 volts (C20)
73554	Capacitor—Tubular, paper, .027 mf., 400V (C22 in RC-1102, RC-1102A)
73558	Capacitor—Tubular, paper, .047 mf., 200V (C5, C18) (C43 in RC-1102B, RC-1102C)
73784	Capacitor—Tubular, paper, 0.1 mfd., 200 volts (C34)
73935	Clip—Mounting clip for A.M.—I.F. transformers
76337	Coil—Oscillator coil—A.M.—complete with adjustable core (L5, L6)
76338	Coil—RF coil—A.M.—complete with adjustable core (L3, L4)
76352	Coil—Oscillator coil—F.M. (L7)
76353	Coil—RF coil—F.M. (L2)
76354	Coil—Antenna coil—F.M. (L1)
71942	Coil—Filament choke coil (L9)
76351	Coil—Filament choke coil (L10, L11)
70342	Control—Volume control and power switch (R14, S2)
75538	Control—Tone control (R24)
70392	Cord—Power cord and plug
†72953	Cord—Drive cord (approx. 51" overall length required)
74839	Fastener—Push fastener for RF shelf mounting (4 req'd)
74838	Grommet—Power cord strain relief (1 set)
16058	Grommet—Rubber grommet for RF shelf (4 req'd)
76344	Grommet—Rubber grommet for mounting ferrite rod antenna to masonite support (2 req'd)
76345	Insert—Hard rubber insert for antenna mounting grommets (2 req'd)
76340	Pan—Speaker pan assembly complete less station selector pointer shaft and pulley
76341	Pulley—Station selector pointer shaft and pulley
76346	Resistor—Wire wound, 1200 ohms, 4 watts (R33)
	Resistors—Fixed, composition:
503068	68 ohms, ±10%, ½ watt (R2, R12)
503110	100 ohms, ±10%, ½ watt (R27)
503712	120 ohms, ±10%, ½ watt (R16)
513133	330 ohms, ±10%, 1 watt (R26)
503139	390 ohms, ±10%, ½ watt (R6)
503156	560 ohms, ±10%, ½ watt (R37)
503168	680 ohms, ±10%, ½ watt (R7, R18, R19)
503212	1,200 ohms, ±10%, ½ watt (R30, R36)
503233	3,300 ohms, ±10%, ½ watt (R29)
503282	8,200 ohms, ±10%, ½ watt (R4)
503310	10,000 ohms, ±10%, ½ watt (R38 in RC-1102B, RC-1102C)
503315	15,000 ohms, ±10%, ½ watt (R28) (R35 in RC-1102, RC-1102A)
503318	18,000 ohms, ±10%, ½ watt (R9) (R40, R41, in RC-1102B, RC-1102C)
503322	22,000 ohms, ±10%, ½ watt (R17, R34)
503327	27,000 ohms, ±10%, ½ watt (R38 in RC-1102, RC-1102A)
513333	33,000 ohms, ±10%, 1 watt (R10)
503339	39,000 ohms, ±10%, ½ watt (R31 in RC-1102, RC-1102A)
503347	47,000 ohms, ±10%, ½ watt (R35 in RC-1102B, RC-1102C)
503410	100,000 ohms, ±10%, ½ watt (R3, R20, R23)
503412	120,000 ohms, ±10%, ½ watt (R11)
503433	330,000 ohms, ±10%, ½ watt (R22)
503439	390,000 ohms, ±10%, ½ watt (R13)
504447	470,000 ohms, ±20%, ½ watt (R25, R32)
503456	560,000 ohms, ±10%, ½ watt (R39 in RC-1102, RC-1102A)
504522	2.2 megohm, ±20%, ½ watt (R1, R5)
503539	3.9 megohm, ±10%, ½ watt (R8)
504610	10 megohm, ±20%, ½ watt (R15)
504622	22 megohm, ±20%, ½ watt (R21)
76339	Shaft—Tuning knob shaft
73584	Shield—Tube shield for V1, V6
76331	Shield—Tube shield for V2
35787	Socket—Phono input socket (J1)
73117	Socket—Tube socket, 7 pin, miniature
70827	Socket—Tube socket, octal, wafer
76336	Socket—Tube socket, 9 pin, miniature, saddle mounted
35574	Socket—Dial lamp socket
76332	Spring—Drive cord spring
76342	Support—Antenna support (masonite) only
76334	Switch—Function switch (S1-1, S1-2, S1-3)
76326	Transformer—Power transformer 117 volt 60 cycle (T7)
76327	Transformer—Output transformer (T6)
73743	Transformer—Ratio detector transformer (T5)
76335	Transformer—First I.F. transformer—A.M. (T2)
75559	Transformer—First I.F. transformer—F.M. (T1)
76328	Transformer—Second I.F. transformer—A.M. (T4)
76329	Transformer—Second I.F. transformer—F.M. (T3)
33726	Washer—"C" washer for tuning knob shaft or for station selector shaft and pulley
	SPEAKER ASSEMBLIES Stamped 92586-6W, 92586-7W or 92586-8W RMA 274
75023	Cap—Dust cap
75024	Cone—Cone and voice coil assembly (3.2 ohms)
76392	Speaker—8" P.M. (92586-7W) speaker complete with cone and voice coil
74664	Speaker—8" P.M. speaker (92586-8W) complete with cone and voice coil
	MISCELLANEOUS
76359	Back—Cabinet back
76355	Bezel—Decorative bezel—round—for front of cabinet
Y2328	Cabinet—Plastic cabinet—maroon
76678	Clip—Spring clip for cabinet back
76363	Decal—Control function decal—early type (below knobs)
76767	Decal—Control function decal—late type (above knobs)
76356	Dial—Polystyrene dial scale
74782	Emblem—"RCA Victor" emblem
76360	Knob—Function switch knob—type #1
73378	Knob—Function switch knob—type #2
75712	Knob—Function switch knob—type #3
76765	Knob—Function switch knob—type #4
76361	Knob—tuning control, tone control or volume control and power switch knob—type #1
74711	Knob—tuning control, tone control or volume control and power switch knob—type #2
75714	Knob—tuning control, tone control or volume control and power switch knob—type #3
76766	Knob—tuning control, tone control or volume control and power switch knob—type #4
11891	Lamp—Dial lamp—Mazda 44
76425	Nameplate—"AM-FM" nameplate (tenite)
72765	Nut—Speed nut to fasten bezel assembly (4 req'd)
76362	Pointer—Station selector pointer
76357	Reflector—Dial scale reflector
76358	Screen—Grille screen
74734	Spring—Retaining spring for knobs—types #1, #3, and #4
14270	Spring—Retaining spring for knobs—type #2

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



Differing Types of Knobs—Model 1R81

Change in Parts List:

CHASSIS ASSEMBLIES

Delete:

76347	Capacitor—Ceramic, 120 mmf (C4)
73784	Capacitor—Tubular, paper, 0.1 mf. 200 volts (C34)

Add:

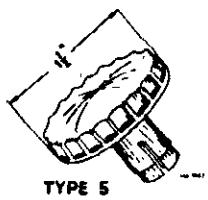
76958	Capacitor—Ceramic, 120 mmf (C4)
73551	Capacitor—Tubular, paper, 0.1 mf. 400 volts (C34)

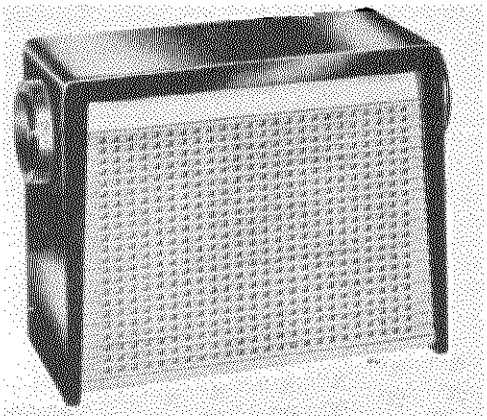
MISCELLANEOUS

Add:

77232	Knob—Function switch knob—type 5
77233	Knob—Tuning control, tone control or volume control and power switch knob—type 5

(Type 5 knob is illustrated





2R51
Black & Gray

2R52
Tan & Ivory

SPECIFICATIONS

Tuning Range ..... 540-1600 kc
Intermediate Frequency ..... 455 kc
Tube Complement:
(1) RCA 12BE6 ..... Converter
(2) RCA 6BJ6 ..... I.F. Amplifier
(3) RCA 12AV6 ..... Det.-AVC-A.F. Amp.
(4) RCA 6AK6 ..... Output
RCA Stock No. 77292 ..... Rectifier
Dial Lamp (1) ..... Type No. 51, 6-8 volts, 0.2 amp.
Power Supply Rating:
115 volts a.c., 60 cycles ..... 18 watts

CAUTION:—DO NOT OPERATE ON D.C.

Loudspeaker:
Size and type ..... 4 x 6 in. P.M.
Voice Coil impedance ..... 3.2 ohms at 400 cycles

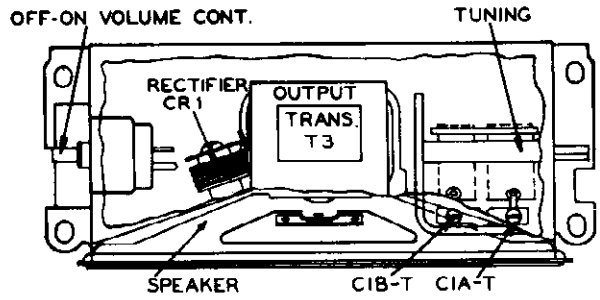
Power Output:
Undistorted ..... 0.30 watts
Maximum ..... 0.45 watts

Tuning Drive Ratio ..... 1 to 1 (Direct Drive)

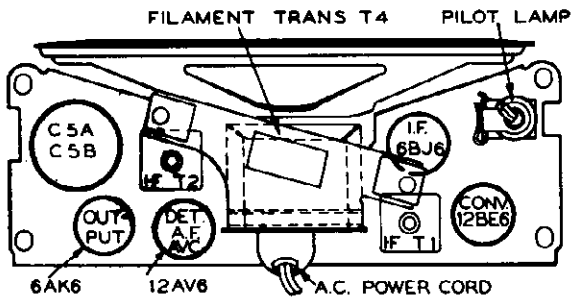
Weight ..... 4 lbs.

Cabinet Dimensions:
Height...5⅝" Width...8⅜" Depth...3⅝"

Top View



Tube and Trimmer Locations



Bottom View

CRITICAL LEAD DRESS

1. Oscillator coil should be centered in space provided and have at least ¼ inch between winding and chassis.
2. The filament wiring should be dressed down on chassis and away from audio leads and audio coupling condensers.
3. The I.F. plate and grid leads, including the 2nd I.F. diode lead should be as short as practical.
4. The output plate by pass condenser should be dre against the side of the chassis and away from th audio grid condenser and the diode filter resistor.
5. Output transformer primary leads should be dre away from the selenium rectifier.
6. The loop antenna should be accurately centered i position on the fishpaper cover. The ends must not ject beyond the fishpaper.

ALIGNMENT PROCEDURE

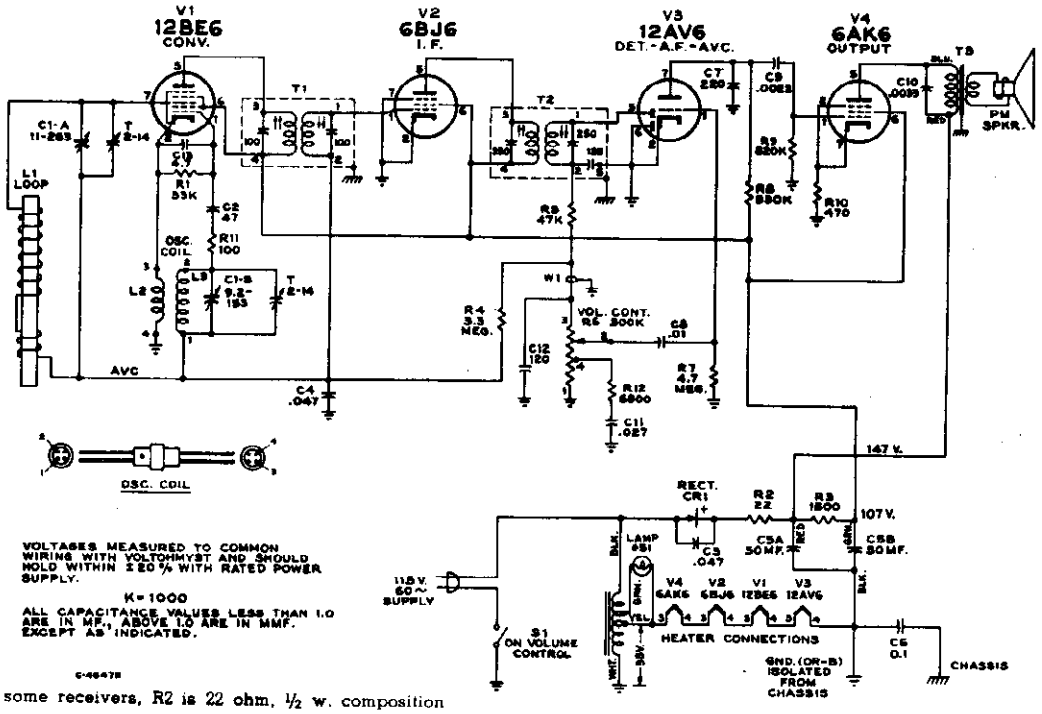
Test-Oscillator—For all alignment operations, connec low side of the test-oscillator to the receiver chassis, keep the oscillator output as low as possible to avoid action.

On a.c. operation an isolation transformer (115 v./1 may be necessary for the receiver if the test oscilla also a.c. operated.

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

Step	Connect the high side of test-oscillator to—	Tune test-osc. to—	Turn radio dial to—	Adjust followin max. ou
1	6BJ6 I-F grid through .01 mfd. capacitor	455 kc	Quiet-point 1600 kc end of dial	T2 (tc and bot 2nd I-F. t
2	Stator of C1A through .01 mfd.			T1 (tc and bot 1st I-F tr
3	Short wire placed near loop to radiate signal	1620 kc	Min. cap.	osc. trim C1B-
4		1400 kc	1400 kc signal	ant. trim C1A-
5		Repeat steps 3 and 4		

MODELS 2-R-51, 2-R-52



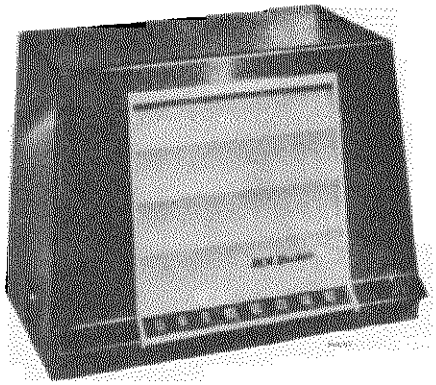
Note: In some receivers, R2 is 22 ohm, ½ w. composition

Schematic Diagram

STOCK NO.	DESCRIPTION
	CHASSIS ASSEMBLIES RC 1119—2R51 RC 1119A—2R52
77438	Antenna—Ferrite rod antenna complete with windings....L1
77440	Capacitor—Variable tuning capacitor.....C1A, C1B
77471	Capacitor—Ceramic, 4.7 mmf.....C13
75609	Capacitor—Ceramic, 47 mmf.....C2
76347	Capacitor—Ceramic, 120 mmf.....C12
75611	Capacitor—Ceramic, 220 mmf.....C7
77443	Capacitor—Electrolytic comprising 1 section of 50 mfd., 150 volts and 1 section of 30 mfd., 150 volts.....C5A, C5B
77446	Capacitor—Tubular, paper, .0022 mfd., 400 volts.....C9
77447	Capacitor—Tubular, paper, .0033 mfd., 400 volts.....C10
77424	Capacitor—Tubular, paper, .01 mfd., 200 volts.....C8
77448	Capacitor—Tubular, paper, .027 mfd., 200 volts.....C11
77422	Capacitor—Tubular, paper, .047 mfd., 400 volts.....C4
75071	Capacitor—Tubular, moulded paper, .047 mfd., 400 volts..C3
77423	Capacitor—Tubular, paper, 0.1 mfd., 400 volts.....C6
73935	Clip—Mounting clip for I.F. transformer
77450	Coil—Oscillator coil.....L2, L3
77442	Control—Volume control and power switch.....R6, S1
70392	Cord—Power cord and plug
77439	Cover—Insulating cover for chassis
74838	Grommet—Power cord strain relief (1 set)
77405	Insulator—Bakelite insulator for variable tuning capacitor
77444	Nut—Speed nut for output transformer mounting screws
28452	Plate—Bakelite mounting plate for electrolytic
77292	Rectifier—Selenium rectifier.....CR1
77571	Resistor—Wire wound, fuse type, 22 ohms, 0.4 amps.....R2
	Resistor—Fixed, composition:—
503110	100 ohms, ±10%, ½ watt.....R11
503147	470 ohms, ±10%, ½ watt.....R10
523215	1500 ohms, ±10%, 2 watts.....R3
503268	6800 ohms, ±10%, ½ watt.....R12
503333	33,000 ohms, ±10%, ½ watt.....R1
503347	47,000 ohms, ±10%, ½ watt.....R5
503433	330,000 ohms, ±10%, ½ watt.....R8
503482	820,000 ohms, ±10%, ½ watt.....R9
503533	3.3 megohm, ±10%, ½ watt.....R4
503547	4.7 megohm, ±10%, ½ watt.....R7
76723	Socket—Lamp socket
75780	Socket—Tube socket, 7 pin, miniature saddle-mounted
77441	Transformer—Filament transformer 117 volts AC.....T4
74445	Transformer—Output transformer.....T3
77416	Transformer—1st I.F. transformer complete with adjustable cores.....T1
77417	Transformer—2nd I.F. transformer complete with adjustable cores.....T2
77420	Washer—Shoulder washer (nylon) for mounting variable tuning capacitor
	SPEAKER ASSEMBLIES 922258-7
77451	Speaker—4" x 6" P.M. speaker complete with cone and voice coil (3.2 ohms)
	MISCELLANEOUS
77457	Case—Polystyrene case—black & beige—complete with speaker baffle and screen assemblies less bottom cover for Model 2R51
77465	Case—Polystyrene case—tan & ivory—complete with speaker baffle and screen assemblies less bottom cover for Model 2R52
77456	Clip—Spring clip to mount station selector pointer
77458	Cover—Bottom cover—beige—for Model 2R51
77466	Cover—Bottom cover—ivory—for Model 2R52
77453	Dial—Dial knob—black & gold—for Model 2R51
77464	Dial—Dial knob—tan & gold—for Model 2R52
77452	Knob—Volume control and power switch knob—black & gold—for Model 2R51
77463	Knob—Volume control and power switch knob—tan & gold—for Model 2R52
11765	Lamp—Pilot lamp—Mazda 51
77455	Pointer—Station selector pointer
77454	Screw—#8-32 x ⅜" cross recessed truss head machine screw for fastening bottom cover
76783	Shield—Pilot lamp shield
74734	Spring—Spring clip for volume control knob or dial knob

APPLY TO YOUR RCA DISTRIBUTOR FOR PRICES OF REPLACEMENT PARTS

MODELS 1X591, C
RC1079K; 1X592, C
RC1079L



1X591
Maroon

1X592
Ivory

Specifications

Tuning Range ..... 540-1600 kc

Intermediate Frequency ..... 455 kc

Tube Complement

(1) RCA 12SA7 ..... Converter
(2) RCA 12SK7 ..... I-F Amplifier
(3) RCA 12SQ7 ..... Det.—A.V.C.—A-F Amp.
(4) RCA 50L6GT ..... Output
(5) RCA 35Z5GT ..... Rectifier

Power Supply Rating

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

Power Output
Undistorted ..... .85 wa
Maximum ..... 1.1 wa

Dial Lamps (2) ..... Mazda type 1490, 3.2 volts, .16 am

Loudspeaker
Size and Type ..... 8 in. P
Voice Coil Impedance ..... 3.2 ohms at 400 cycl

Cabinet Dimensions
Height ..... 9½" Width ..... 12½" Depth 8½

Weight ..... 9 lb

Tuning Drive Ratio ..... 9 to 1 (4½ turns of kno

Alignment Procedure

Lead Dress

1. Dress all heater leads down to chassis and away from all audio grid and plate wiring.
2. Dress power cord against chassis base.
3. Dress capacitor C18 against back apron.
4. Dress capacitor C13 down to base alongside of shielded lead.
5. Dress output transformer leads down to chassis.
6. Dress capacitors C9 and C15 as direct as possible.
7. Dress dial lamp leads on top of chassis between 12SQ7 and 50L6GT tubes; below chassis, as short as possible to rectifier socket.
8. Dress excess loop leads away from tubes and clear of tuning condenser.

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

Dial Calibration

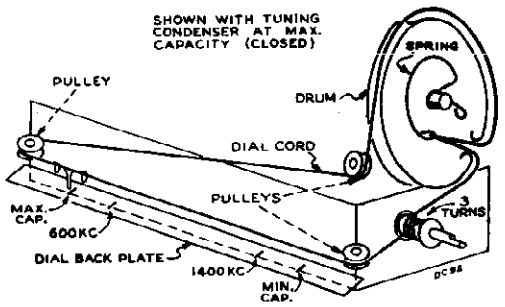
With the tuning condenser fully meshed, the dial pointer should be set to the first score mark at the left-hand end of the dial back plate. The four score marks represent:
Max cap. 600 kc 1400 kc min. cap.

Steps	Connect the high side of test-oscillator to—	Tune test-osc. to—	Turn radio dial to—	Adjust the following f max. outpu
1	12SK7 I-F grid through 0.1 mfd. capacitor	455 kc	Quiet-point 1600 kc end of dial	T2 (top and bottom 2nd I-F tra
2	Stator of C1 through 0.1 mfd.			*T1 (top and bottom 1st I-F tra
3	Short wire placed near loop to radiate signal	1620 kc	Min. cap.	C4 (osc.)
4		1400 kc	1400 kc signal	†C2 (ant.)
5		600 kc	600 kc signal	L3 (osc.) Rock gan
6		Repeat steps 3, 4 and 5.		

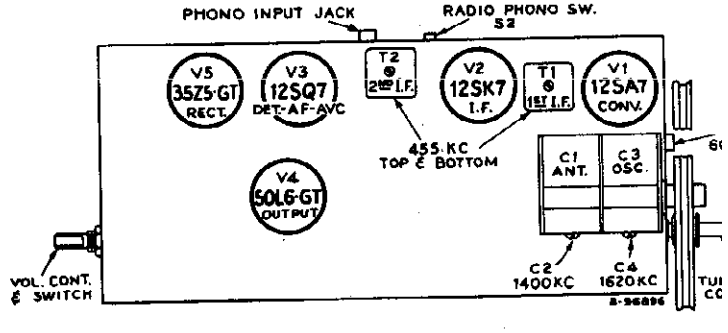
* Do not readjust T2 when test oscillator is connected to C1.

† When adjusting C2 (ant. trimmer) it is necessary to have speaker and loop in the same position and spacing as they have when assembled in the cabinet.

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

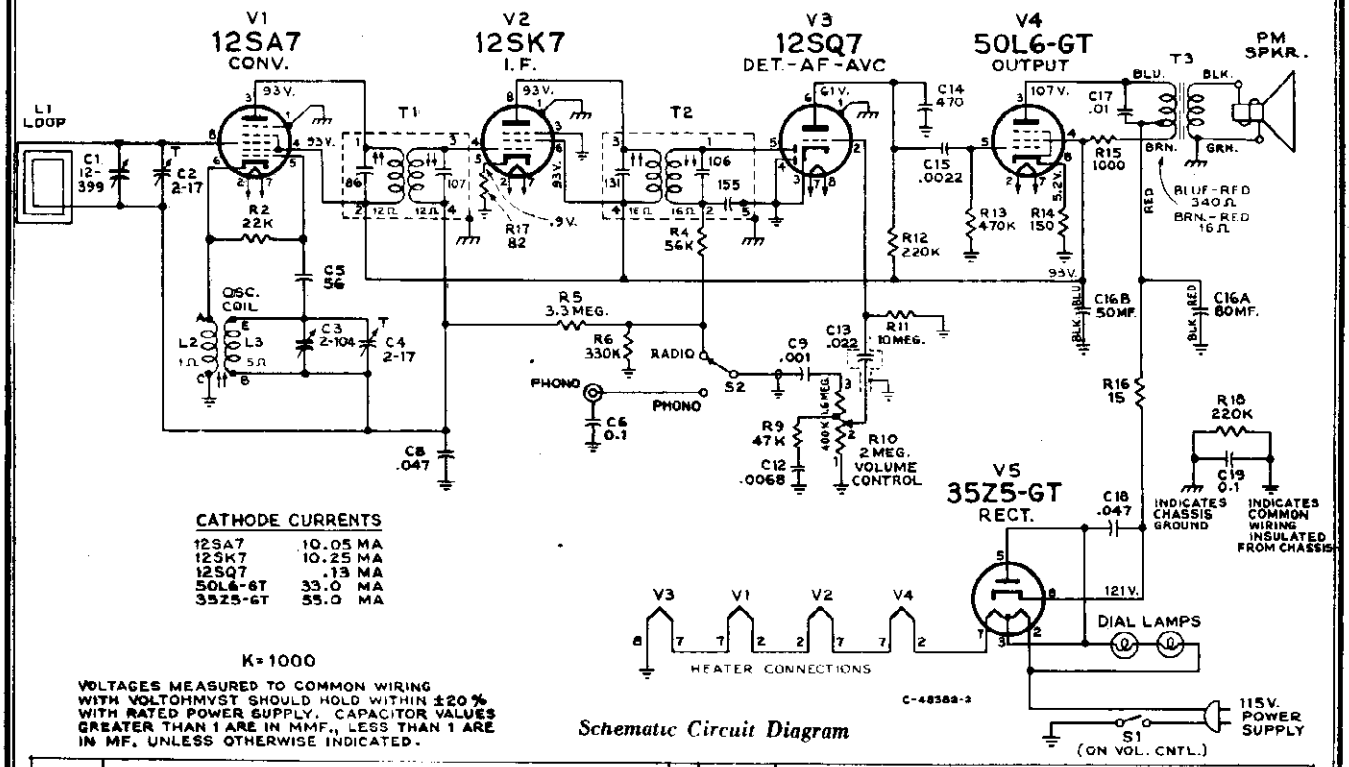


Dial Indicator and Drive Cord



Tube and Trimmer Locations

MODELS 1X591, Ch. RC1079K; 1X592, Ch. RC1079L



Schematic Circuit Diagram

CATHODE CURRENTS

12SA7	10.05 MA
12SK7	10.25 MA
12SQ7	.13 MA
50L6-GT	33.0 MA
35Z5-GT	55.0 MA

K=1000

VOLTAGES MEASURED TO COMMON WIRING WITH VOLTOHMYST SHOULD HOLD WITHIN ±20% WITH RATED POWER SUPPLY. CAPACITOR VALUES GREATER THAN 1 ARE IN MMF., LESS THAN 1 ARE IN MF. UNLESS OTHERWISE INDICATED.

Stock No.	DESCRIPTION
	CHASSIS ASSEMBLIES
	RC 1079K—1X591
	RC 1079L—1X592
76584	Antenna—Antenna loop and back cover (L1)
74653	Capacitor—Variable tuning capacitor (C1, C2, C3, C4)
71924	Capacitor—Ceramic, 56 mmf. (C5)
75198	Capacitor—Ceramic, 470 mmf. (C14)
74662	Capacitor—Electrolytic, comprising 1 section of 80 mfd., 150 volts, and 1 section of 50 mfd., 150 volts (C16A, C16B)
75643	Capacitor—Tubular, paper, .001 mfd., 1000 volts (C9)
73595	Capacitor—Tubular, paper, .0022 mfd., 600 volts (C15)
73789	Capacitor—Tubular, paper, .0068 mfd., 400 volts (C12)
73561	Capacitor—Tubular, paper, .01 mfd., 400 volts (C17)
73562	Capacitor—Tubular, paper, .022 mfd., 400 volts (C13)
73553	Capacitor—Tubular, paper, .047 mfd., 400 volts (C8, C18)
73551	Capacitor—Tubular, paper, 0.1 mfd., 400 volts (C6, C19)
73935	Clip—Mounting clip for I.F. transformer
74448	Coil—Oscillator coil complete with adjustable core (L2, L3)
35787	Connector—Phono input connector (socket)
75474	Connector—Single contact male connector for speaker cable
74133	Control—Volume control and power switch (R10, S1)
†72953	Cord—Drive cord (approx. 43" overall length required)
70392	Cord—Power cord and plug
73693	Grommet—Power cord strain relief (1 set)
72283	Grommet—Rubber grommet for mounting variable tuning capacitor
71116	Lamp—Dial lamp, Mazda #1490
76585	Pointer—Station selector pointer
72602	Pulley—Drive cord pulley
	Resistors—Fixed, composition:
504015	15 ohms, ±20%, ½ watt (R16)
503082	82 ohms, ±10%, ½ watt (R17)
503115	150 ohms, ±10%, ½ watt (R14)
513210	1000 ohms, ±10%, 1 watt (R15)
503322	22,000 ohms, ±10%, ½ watt (R2)
503347	47,000 ohms, ±10%, ½ watt (R9)
503356	56,000 ohms, ±10%, ½ watt (R4)
503422	220,000 ohms, ±10%, ½ watt (R12, R18)
503433	330,000 ohms, ±10%, ½ watt (R6)
503447	470,000 ohms, ±10%, ½ watt (R13)
503533	3.3 megohm, ±10%, ½ watt (R5)
503610	10 megohm, ±10%, ½ watt (R11)
74659	Shaft—Tuning knob shaft and pulley
74697	Socket—Dial lamp socket
31251	Socket—Tube socket, octal, wafer
76368	Spring—Drive cord spring
33834	Switch—Radio-phono switch (S2)
74654	Transformer—Output transformer (T3)
74918	Transformer—First I.F. transformer (T1)
73037	Transformer—Second I.F. transformer (T2)
33726	Washer—"C" washer for tuning knob shaft
	SPEAKER ASSEMBLIES
	92586-5W
	RL 105 C13
	RMA 274
75023	Cap—Dust cap
75024	Cone—Cone and voice coil
76392	Speaker—8" P.M. speaker complete with cone and voice coil
	NOTE:—If stamping on speaker in instrument does not agree with above speaker numbers, order replacement parts by referring to model number of instrument, number stamped on speaker and full description of part required.
	MISCELLANEOUS
Y2358	Cabinet—Plastic cabinet—maroon—for Model 1X591
Y2359	Cabinet—Plastic cabinet—ivory—for Model 1X592
X3231	Cloth—Grille cloth only
76588	Dial—Polystyrene dial scale
76588	Emblem—"RCA Victor" emblem
76587	Grille—Speaker grille and cloth assy.
74666	Knob—Control knob—maroon—for Model 1X591
74667	Knob—Control knob—ivory—for Model 1X592
74734	Spring—Retaining spring for knob

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

Change in Resistor:

In late production of these receivers the fuse resistor R16 is changed from 15 ohms, ½ watt to 33 ohms, 1 watt. The Stock No. of the 33 ohm resistor is 514033.

Change in Parts List:

The Service Data for these models lists only one emblem. The listed emblem (Stock No. 76588) is correct for Model 1X591 only and is maroon color. The correct emblem for Model 1X592 is Stock No. 74782 and is gold finish.

Change in Control Knob:

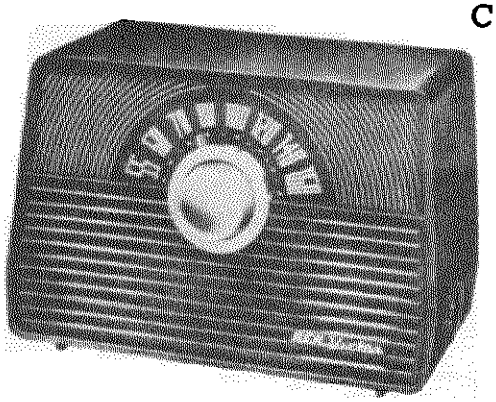
Late production of these models use control knobs with a dimpled edge.

The stock Nos. of the dimpled knobs are as follows:

77234 Knob—Control knob—maroon—for Model 1X591

77235 Knob—Control knob—ivory—for Model 1X592

MODELS 1X51, 1X52, 1X53 1X54, 1X55, 1X56, 1X57, CI RC1104, A, B, -1, A-1, B-1, C, D, E



1X51 SERIES:

1X51 (Maroon) *1X52 (Ivory)* *1X53 (Green)*
1X54 (Tan) *1X55 (Blue)* *1X56 (Red)*
1X57 (White)

Specifications

Tuning Range .....540-1600 kc
Intermediate Frequency .....455 kc

Tube Complement

CHASSIS NO. RC 1104, RC 1104A, RC 1104B

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

CHASSIS NO. RC 1104-1, RC 1104A-1, RC 1104B-1

Same as above except rectifier is RCA 35W4 instead of RCA 35Z5GT.

CHASSIS NO. RC 1104C, RC 1104D, RC 1104E

(1) RCA 12BE6 .....Converter
(2) RCA 12BA6 .....I.F. Amplifier
(3) RCA 12AV6 .....Det.—A.V.C.—A.F. Amp.
(4) RCA 50C5 .....Output
(5) RCA 35W4 .....Rectifier

Dial Lamp .....Type 47, 6-8 volts, 0.15 amp.

Chassis Identification

Model No.	1X51	1X52 1X57	1X53, 1X54 1X55, 1X56
Chassis No.	RC 1104 RC 1104-1 RC 1104C	RC 1104A RC 1104A-1 RC 1104D	RC 1104B RC 1104B-1 RC 1104E

Power Supply Rating
115 volts, AC, 50 or 60 cycles, or DC .....30 watts

Loudspeaker
Size and Type .....4-inch PM
V.C. Impedance .....3.2 ohms at 400 cycles

Power Output
Undistorted .....1.1 watt
Maximum .....1.4 watt

Dimensions (Overall)
Height.....7⅜" Width.....11⁹⁄₁₆" Depth.....6¾

Weight .....6 lbs. ne

Dial Centering

If the mounting of the tuning condenser has been disturbed, it may be necessary to adjust its position after replacing the chassis in the cabinet. This may be done in the following manner:

1. Replace tuning knob.
2. Install chassis and tighten the mounting screws.
3. Loosen the two screws which hold the tuning condenser mounting bracket to the chassis.
4. Adjust the position of the tuning condenser mounting bracket so that the tuning knob may be rotated without binding on the cabinet.
5. The two screws should then be tightened to maintain this position.

Power Supply Polarity

For operation on d-c, the power plug must be inserted in th outlet for correct polarity. If the set does not function, revers the plug. On a-c, reversal of the plug may reduce hum.

Replacement of Dial Lamp

To replace the dial lamp the back cover must be removed It is secured to the cabinet with four spring clips. Use car to avoid breaking the lead wires from the back cover to th chassis. The dial lamp socket is located at the upper le corner of the speaker and may be removed by pullin diagonally up and to the right.

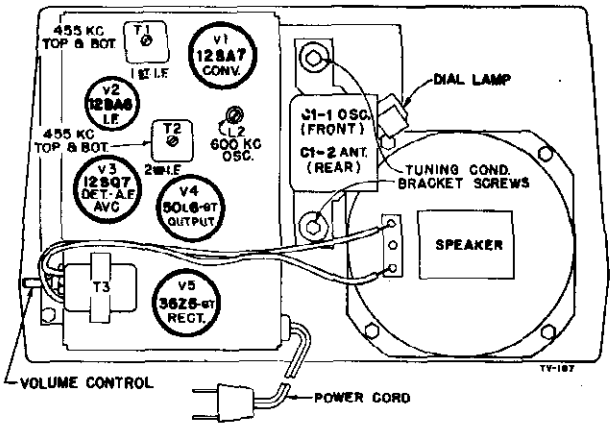
If higher than normal line voltage causes repeated burnin out of the dial light, it may be replaced with a type #4 lamp instead of the specified type #47. Type #44 wi provide less illumination than type #47, but it will last longe

MODELS 1X51 Series, Ch. RC1104, A, B, -1, A-1, B-1, C, D, E

Alignment Procedure

Critical Lead Dress

1. Dress all capacitors down against chassis. Connect outside foil of all capacitors as indicated in schematic diagram.
2. Locate C-10 in its mounting clip so that it butts against end of chassis.
3. Dress all circuit wiring against chassis.
4. Dress R-11 away from R-4.
5. Dress junction of R-2 and C-2 to prevent short circuits to chassis and dial back plate.



Tube and Trimmer Locations
Chassis No. RC 1104, RC 1104A, RC 1104B

For Chassis No. RC 1104-1, RC 1104A-1 and RC-1104B-1 the rectifier tube is type 35W4 instead of 35Z5GT.

Test-Oscillator

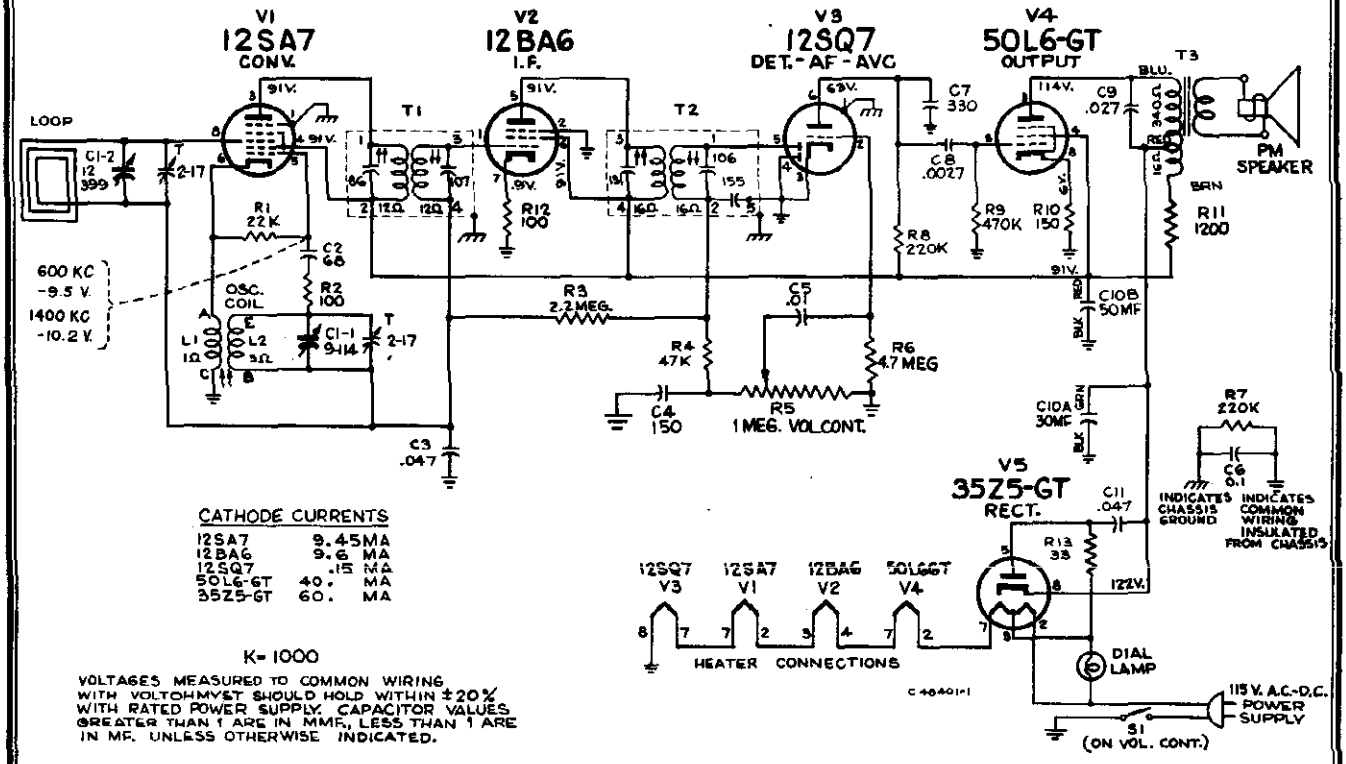
For all alignment operations, connect the low side of the test-oscillator to the receiver chassis, and keep the oscillator output as low as possible to avoid a-v-c action.

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

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	Extreme clockwise (plates fully open)	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.		

* Do not readjust T2 when test oscillator is connected to C1-2.

† When adjusting ant. trimmer it is necessary to have the loop in the same position and spacing as it will have when assembled in the cabinet. This spacing is approximately 5½" from dial back plate to loop.



CATHODE CURRENTS

12SA7	9.45MA
12BA6	9.6 MA
12SQ7	.15 MA
50L6-GT	40. MA
35Z5-GT	60. MA

K= 1000

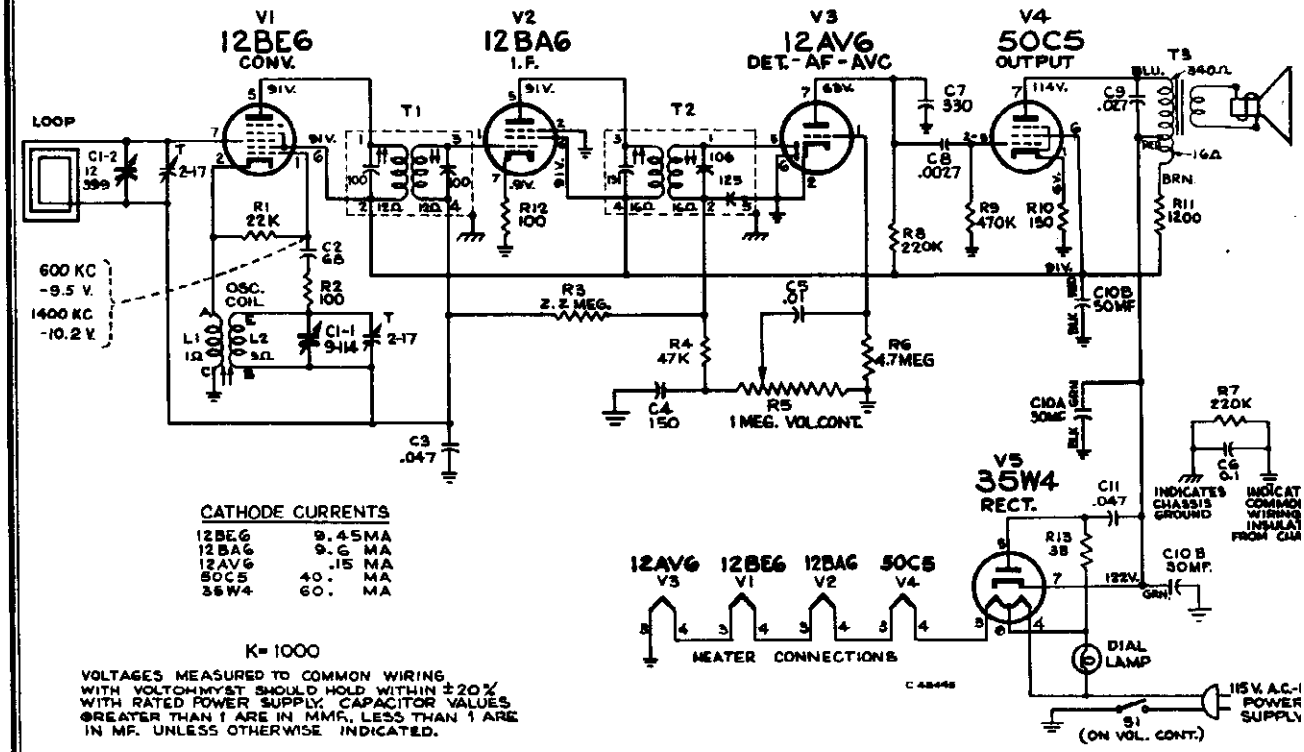
VOLTAGES MEASURED TO COMMON WIRING WITH VOLTOHMYST SHOULD HOLD WITHIN ±20% WITH RATED POWER SUPPLY. CAPACITOR VALUES GREATER THAN 1 ARE IN MMF., LESS THAN 1 ARE IN MF. UNLESS OTHERWISE INDICATED.

CHASSIS NO. RC 1104, RC 1104A, RC 1104B

Schematic Circuit Diagram

For Chassis No. RC 1104-1, RC 1104A-1 and RC-1104B-1 the rectifier tube is type 35W4 instead of 35Z5GT.

MODELS 1X51 Series, Ch. RC1104 A, B, -1, A-1, B-1, C, D, E



Schematic Circuit Diagram

CHASSIS NO. RC 1104C, RC 1104D, RC 1104E

Production Changes

In early production RC 1104, RC 1104A and RC 1104B:

R3 was 3.3 megohm (now 2.2 meg.).

R6 was 10 megohm (now 4.7 meg.).

R13 was omitted (plate circuit of rectifier tube).

A few 1st I.F. transformers (T1) were used which had an incorrect primary capacitor. To permit the use of these transformers, two 5 mmf. ceramic capacitors were added across the primary (Term. #1 to Term. #2).

In early production RC 1104-1, RC 1104A-1, and RC 1104B-1:
R13 was omitted (plate circuit of rectifier tube).

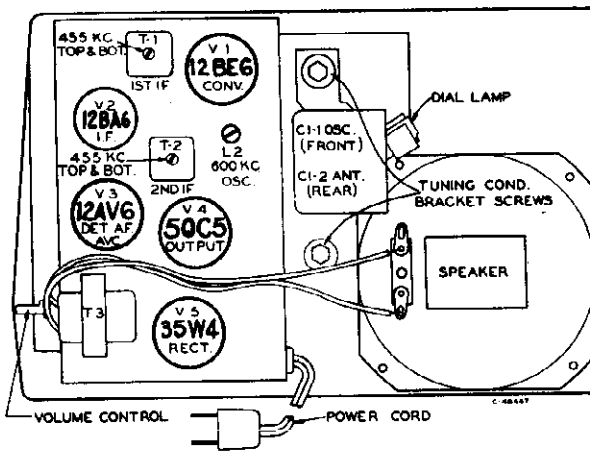
Change in Power Cord Location:

To facilitate wiring, the power cord in late production of these receivers has been changed to enter the chassis at the outer lower corner instead of the corner close to the speaker.

Change in Volume Control Knob:

The original volume control knob had a smooth outer edge. The knob used in late production has a dimpled edge. The Stock Nos. of the new knobs are listed below.

77140 Knob—Volume control knob—maroon—Model 1X51
77235 Knob—Volume control knob—ivory —Model 1X52
77237 Knob—Volume control knob—green —Model 1X53
77238 Knob—Volume control knob—tan —Model 1X54
77239 Knob—Volume control knob—blue —Model 1X55
77240 Knob—Volume control knob—red —Model 1X56
77236 Knob—Volume control knob—white —Model 1X57



Tube and Trimmer Locations
Chassis No. RC 1104C, RC 1104D, RC 1104E

MODELS 1X51 Series, Ch. RC1104
A, B, -1, A-1, B-1, C, D, E

Stock No.	DESCRIPTION
	CHASSIS ASSEMBLIES
	RC 1104, RC 1104-1, RC 1104C Model 1X51
	RC 1104A, RC 1104A-1, RC 1104D Models 1X52, 1X57
	RC 1104B, RC 1104B-1, RC 1104E Models 1X53, 1X54, 1X55, 1X56
76712	Antenna—Antenna loop and back cover for Models 1X51, 1X53, 1X54, 1X55 and 1X56
76730	Antenna—Antenna loop and back cover for Models 1X52 and 1X57
76715	Capacitor—Variable tuning capacitor (C1-1, C1-2)
39624	Capacitor—Mica, 68 mmf. (C2)
39632	Capacitor—Mica, 150 mmf. (C4)
72571	Capacitor—Mica, 330 mmf. (C7)
76718	Capacitor—Electrolytic comprising 1 section of 50 mfd., 150 volts and 1 section of 30 mfd., 150 volts (C10A, C10B)
73599	Capacitor—Tubular, paper, .0027 mfd., 600 volts (C8)
73561	Capacitor—Tubular, paper, .01 mfd., 400 volts (C5)
73554	Capacitor—Tubular, paper, .027 mfd., 400 volts (C9)
73553	Capacitor—Tubular, paper, .047 mfd., 400 volts (C3, C11)
73551	Capacitor—Tubular, paper, oil impregnated, 0.1 mfd., 400 volts (C6)
73935	Clip—Mounting clip for I.F. transformer
74448	Coil—Oscillator coil complete with adjustable core (L1, L2)
74285	Control—Volume control and power switch (R5, S1)
70392	Cord—Power cord and plug
74838	Grommet—Power cord strain relief (1 set)
72283	Grommet—Rubber grommet for mounting variable capacitor
76713	Knob—Tuning control knob
31480	Lamp—Dial lamp—Mazda #47
	Resistors—Fixed, composition:—
514033	33 ohms, ±20%, 1 watt (R13)
504110	110 ohms, ±20%, ½ watt (R2, R12)
503115	150 ohms, ±10%, ½ watt (R10)
513212	1200 ohms, ±10%, 1 watt (R11)
504322	22,000 ohms, ±20%, ½ watt (R1)
504347	47,000 ohms, ±20%, ½ watt (R4)
504422	220,000 ohms, ±20%, ½ watt (R7, R8)
504447	470,000 ohms, ±20%, ½ watt (R9)
504522	2.2 megohm, ±20%, ½ watt (R3)
504547	4.7 megohm, ±20%, ½ watt (R6)
76802	Shield—Dial lamp shield for Models 1X52, 1X53, 1X54, 1X55, 1X56 and 1X57
73584	Shield—Tube shield for 12AV6 tube
76723	Socket—Dial lamp socket complete with leads
76716	Socket—Tube socket, 7 pin miniature, wafer with center shield for 12BE6, 12BA6 and 12AV6 tubes
74822	Socket—Tube socket, 7 pin miniature, wafer less center shield for 50C5 and 35W4 tubes
74734	Spring—Spring clip for tuning control knob
54414	Socket—Tube socket, octal, moulded, saddle-mounted for 12SA7 and 12SQ7 tubes
70827	Socket—Tube socket, octal, wafer for 35Z5GT and 50L6GT tubes
76714	Transformer—Output transformer (T3)
75486	Transformer—First I.F. transformer (T1)
75487	Transformer—Second I.F. transformer (T2)
	SPEAKER ASSEMBLIES
	971495-1
76391	Speaker—4" P.M. speaker complete with cone and voice coil
	MISCELLANEOUS
Y2379	Cabinet—BLUE plastic cabinet less "RCA Victor" emblem for Model 1X55
Y2377	Cabinet—GREEN plastic cabinet less "RCA Victor" emblem for Model 1X53
Y2375	Cabinet—IVORY plastic cabinet less "RCA Victor" emblem for Model 1X52
Y2373	Cabinet—MAROON plastic cabinet less "RCA Victor" emblem for Model 1X51
Y2380	Cabinet—RED plastic cabinet less "RCA Victor" emblem for Model 1X56
Y2378	Cabinet—TAN plastic cabinet less "RCA Victor" emblem for Model 1X54
Y2376	Cabinet—WHITE plastic cabinet less "RCA Victor" emblem for Model 1X57
76798	Clip—Speed clip for dial back plate (lower) (2 req'd) for Models 1X51, 1X53, 1X54, 1X55, 1X56
76799	Clip—Speed clip for dial back plate (lower) (2 req'd) for Models 1X52, 1X57
76797	Clip—Speed clip for dial back plate (upper) (2 req'd)
73494	Clip—Spring clip to fasten antenna and back assembly to cabinet (4 req'd)
76720	Dial—Polystyrene dial scale
74782	Emblem—"RCA Victor" emblem
76760	Knob—Volume control knob—BLUE—for Model 1X55
76758	Knob—Volume control knob—GREEN—for Model 1X53
74667	Knob—Volume control knob—IVORY—for Model 1X52
76719	Knob—Volume control knob—MAROON—for Model 1X51
76761	Knob—Volume control knob—RED—for Model 1X56
76759	Knob—Volume control knob—TAN—for Model 1X54
74007	Knob—Volume control knob—WHITE—for Model 1X57
76721	Ring—Decorative ring for tuning knob (fastens to cabinet)
74734	Spring—Spring clip for volume control knob

APPLY TO YOUR RCA DISTRIBUTOR FOR PRICES ON REPLACEMENT PARTS

MODELS 2B400, 2B
2B402, 2B403, 2B40
2B405, Ch. RC1114

2 B 400 SERIES

2 B 400 *Grey*	*2 B 401* *Black*	*2 B 402* *Ivory*
2 B 403 *Green*	*2 B 404* *Tan*	*2 B 405* *Red*

Specifications

Tuning Range .....540-1600 kc

Intermediate Frequency .....455 kc

Tube Complement:

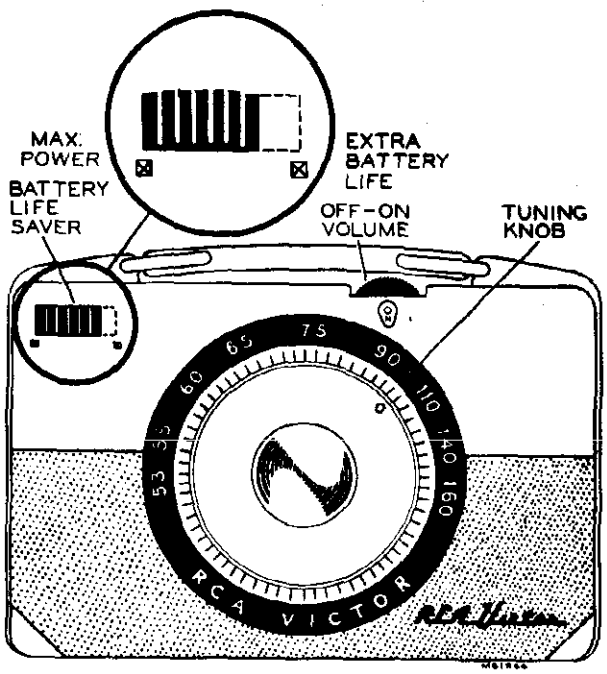
1. RCA 1R5 .....Converter
2. RCA 1U4 .....I.F. Amplifier
3. RCA 1U5 .....Det. A.F.Amp. A.V.C.
4. RCA 3V4 .....Output

Loudspeaker

Size and type .....2" x 3" P.M.

Voice coil impedance .....11¾ ohms at 1000 cycles

Weight (with batteries) .....approx. 3¾ lbs.



Controls

Batteries Required:

Type of Battery	Current Drain Normal Pos.	Current Drain Saver Pos.
"A"—1.5 volt (two) RCA VS 236	0.25 amp.	0.20 amp.
"B"—67.5 volts RCA VS 216	8.45 ma.	5.45 ma.

Battery life is approximately 100 hrs. intermittent service battery-saver switch in *"Normal" position. With switc* "Saver" position, battery life is increased approximately

Power Output:

Undistorted 075

Maximum 0.10

Dimensions (over-all) .....approx. 8⅞" x 5⅞" x 2

Case Back

To remove—insert small coin in the slot at top rear of and pry open.

To replace—insert bottom edge into case and snap top in place.

Off-On Indicator

A window in the case (just below edge of volume co knob) indicates whether set is turned ON or OFF. "ON" pears in window when set is turned ON and disappears set is turned OFF.

Battery-Life Saver Switch

Maximum power is obtained when the slider button is pu toward left (outer edge of case). Extra battery life with effect on performance is obtained with the slider button pu to the right (toward center of case).

Battery Life

The life of the "A" and "B" batteries is approximately e For best performance all batteries should be replaced a same time.

MODELS 2B400, 2B401, 2B402, 2B403, 2B404, 2B405, Ch. RC1114

Output Meter.—Connect meter to voice coil terminals. Turn volume control to maximum position.

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.

Note:—The ant. coil is supplied pre-adjusted and cemented to rod. This makes further adjustment unnecessary. However when replacing ant. assembly make certain that the coil end of the rod is fully entered in its rubber mounting grommet but does not extend through the grommet more than is required to permit the opposite end to fit inside the case.

Steps	Connect high side of test osc. to—	Tune test-osc. to—	Turn radio dial to—	Adjust the following for max. output—
1	High side of ant. coil (terminal lug on coil which is connected to Pin #6 of 1R5 tube)	455 kc	Quiet point near 1600 kc	Trimmers of 2nd I-F trans
2				Trimmers of 1st I-F trans.
3		Repeat steps 1 and 2		
4	Short wire placed near ant. coil for radiated signal	1400 kc	14 Rock gang	C1-1T (osc.)
5		600 kc	60 Rock gang	L2 (osc.)
6		Repeat steps 4 and 5		

Replacement of Component Parts

I. To Remove Back Cover

a. Depress top of case midway between the handle supports, until the top end of the back separates from the main case.

b. Pull the back cover back and up, thereby unhooking the retaining lugs in the bottom of the main case.

II. To Replace Batteries

a. Remove back cover.

b. Remove both "A" and "B" batteries. The "B" battery snap fasteners can best be removed by inserting a screwdriver under the snap fastener strip and prying upward.

c. The "A" batteries can easily be removed by pulling up on the spring wire clips.

Note: The "A" and "B" batteries have approximately equal life and therefore it is advisable to replace all batteries at one time.

III. To Remove Chassis

a. Remove dial knob by grasping with finger tips at two sides and pulling.

b. Remove back cover.

c. Remove batteries.

d. Remove "A+" contacts by squeezing against case and sliding out of slots in case.

e. Remove the four screws "A."

f. Grasp the assembly by the speaker and pull the bottom end down and outward to clear the volume control knob.

IV. To Replace Chassis

a. Observe the position of the battery save button extension in relation to the "battery-save" switch. This extension must engage with the center of the battery save switch.

b. Replace in reverse order to that given for chassis removal.

V. To Remove Handle

a. Spread the square spring wire clips by pulling on one side of a clip.

b. Allow the clip to return to its original shape but resting on the outside of the case.

c. Pull the other side of the clip out of the case.

VI. To Replace Battery Save Switch Button

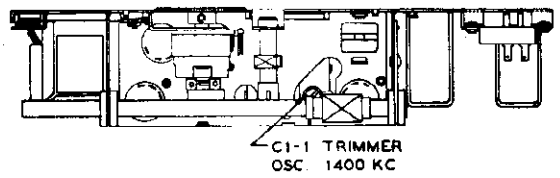
a. Remove chassis.

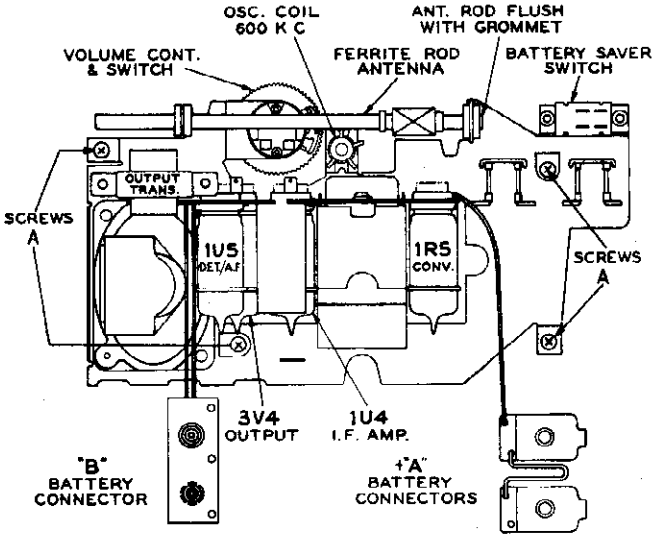
b. Spread the open end of the spring clip retainer no more than necessary to permit removal of clip.

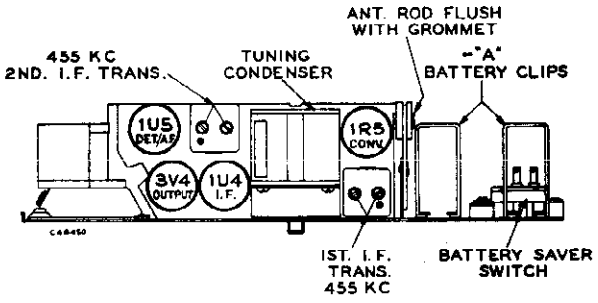
c. Slide the clip clear of the slider button.

d. Turn slider button one-quarter turn and pull out of case.

e. Replace button in reverse order—do not use excessive force in replacing spring clip.

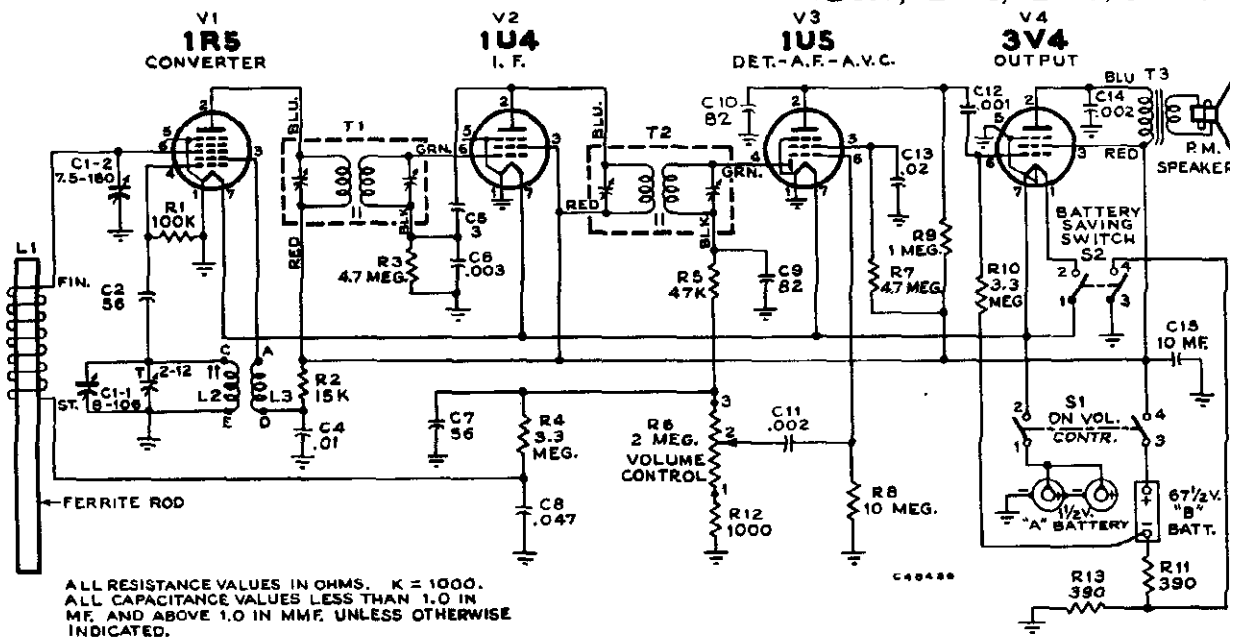




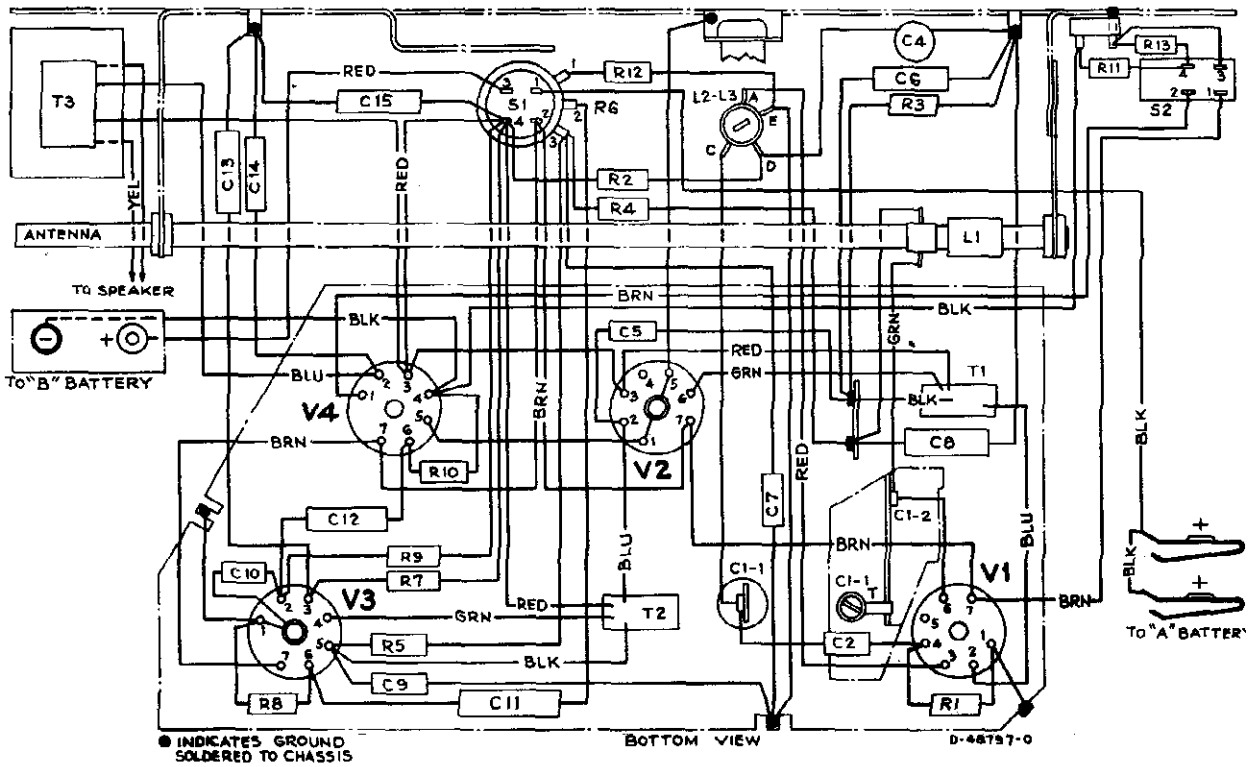


Tube and Trimmer Locations

MODELS 2B400, 2B401, 2B40
2B403, 2B404, 2B405, Ch. RC1



Schematic Diagram



Connection Diagram

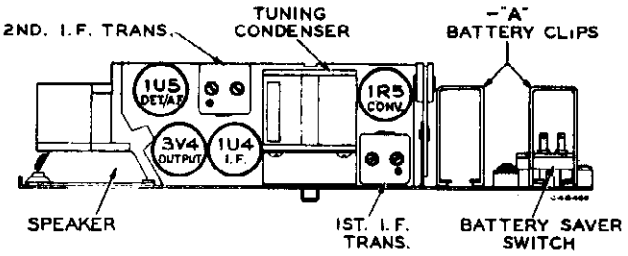
CRITICAL LEAD DRESS

1. Position Ferrite antenna rod as described above.
2. Dress all bus wires, pigtail leads and non-insulated components away from chassis base and away from each other.
3. Dress neutralizing capacitor C5 against front of chassis and with clearance under volume control knob. Utilize shielding effect of oscillator coil mounting bracket.
4. Dress all I-F transformer leads down to base.

MODELS 2B400, 2B401, 2B402, 2B403, 2B404, 2B405, Ch. RC1114

Incorrect Tube Location Label:

A few receivers were shipped with an incorrect tube location label in which the designation of 3V4 and 1U5 tubes were transposed. These may be readily identified by the label color. The incorrect label is BLUE, the correct label is YELLOW. The correct tube locations are illustrated below.



"A" Battery Lead:

A rubber band is used for the purpose of holding the "A" battery lead in a position where it will not be accidentally torn loose when replacing the battery. When servicing one of these receivers, make sure that this rubber band is around the i-f transformer shield can and holding the "A" battery lead against the chassis.

Correct Tonal Response:

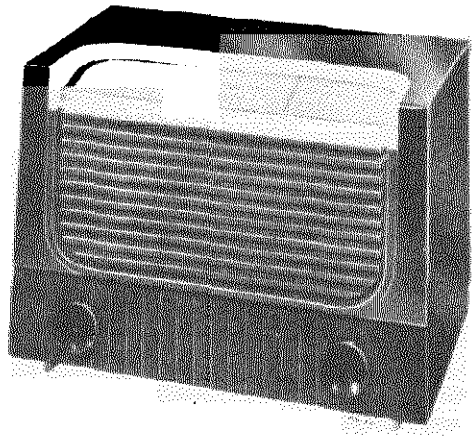
For correct tonal response it is necessary that the holes in the case, where the metal grille is attached, be closed. This is done at the factory by covering the tabs, on the inside of the case, with tape. Absence of this tape will adversely affect the tonal response of these receivers.

Correction to Parts List:

The Stock No. of the GREY case assembly for Model 2B400 is incorrectly listed as 76860. The correct Stock No. is 76838.

STOCK No.	DESCRIPTION
	CHASSIS ASSEMBLIES RC 1114
76847	Antenna—Ferrite rod antenna (L1)
76846	Capacitor—Variable tuning capacitor (C1-1, C1-2)
57090	Capacitor—Ceramic, 3 mmf. (C5)
75784	Capacitor—Ceramic, 56 mmf. (C2, C7)
75785	Capacitor—Ceramic, 82 mmf. (C9, C10)
73960	Capacitor—Ceramic, 10,000 mmf. (C4)
73964	Capacitor—Electrolytic, 10 mfd., 70 volts (C15)
72792	Capacitor—Tubular, paper, .001 mfd., 200 volts (C12)
73750	Capacitor—Tubular, paper, .002 mfd., 200 volts (C11, C14)
73961	Capacitor—Tubular, paper, .003 mfd., 200 volts (C6)
71928	Capacitor—Tubular, paper, .02 mfd., 200 volts (C13)
73558	Capacitor—Tubular, paper, .047 mfd., 200 volts (C8)
76852	Clip—"A" battery mounting clip (formed spring wire) (2 required)
75010	Clip—"C" clip and screw to mount output transformer
75774	Coil—Oscillator coil complete with adjustable core (L2, L3)
76854	Contact—"A" battery contact (2 required)
75773	Control—Volume control and power switch (R6, S1)
37398	Grommet—Rubber grommet for antenna rod (2 required)
76853	Insulator—Bakelite insulator for ferrite rod antenna
76851	Knob—Volume control and power switch knob—less set screw
76855	Lead—"B" battery lead complete with connector
	Resistor—Fixed, composition:—
503139	390 ohms, ±10%, ½ watt (R11, R13)
504210	1000 ohms, ±20%, ½ watt (R12)
503315	15,000 ohms, ±10%, ½ watt (R2)
504347	47,000 ohms, ±20%, ½ watt (R5)
504410	100,000 ohms, ±20%, ½ watt (R1)
504510	1 megohm, ±20%, ½ watt (R9)
504533	3.3 megohm, ±20%, ½ watt (R4, R10)
504547	4.7 megohm, ±20%, ½ watt (R3, R7)
504610	10 megohm, ±20%, ½ watt (R8)
70527	Screw—#6-32 x 3/16" socket head set screw for volume control knob
75780	Socket—Tube socket, 7 pin, miniature, saddle mounted
76848	Switch—Battery saver switch (S2)
76849	Transformer—First I.F. transformer (T1)
76850	Transformer—Second I.F. transformer (T2)
75777	Transformer—Output transformer (T3)
	SPEAKER ASSEMBLY 92523-W
76373	Speaker—2" x 3" P.M. speaker complete with cone and voice coil
	MISCELLANEOUS
76841	Back—Case back—GREY—for Model 2B400
77159	Back—Case back—BLACK—for Model 2B401
77160	Back—Case back—IVORY—for Model 2B402
77161	Back—Case back—GREEN—for Model 2B403
77162	Back—Case back—TAN—for Model 2B404
77163	Back—Case back—RED—for Model 2B405
76859	Button—Battery saver switch slider button—GREY—for Model 2B400
77164	Button—Battery saver switch slider button—BLACK—and spring clip for Model 2B401
77165	Button—Battery saver switch slider button—IVORY—and spring clip for Model 2B402
77166	Button—Battery saver switch slider button—GREEN—and spring clip for Model 2B403
77167	Button—Battery saver switch slider button—TAN—and spring clip for Model 2B404
77168	Button—Battery saver switch slider button—RED—and spring slip for Model 2B405
76860	Case—Case assembly—GREY—less handle, links and back for Model 2B400
77154	Case—Case assembly—BLACK—less handle, links and back for Model 2B401
77155	Case—Case assembly IVORY—less handle, links and back for Model 2B402
77156	Case—Case assembly—GREEN—less handle, links and back for Model 2B403
77157	Case—Case assembly—TAN—less handle, links and back for Model 2B404
77158	Case—Case assembly RED—less handle, links and back for Model 2B405
76860	Clip—Retaining spring clip for battery saver switch slider button
76842	Dial—Polystyrene dial scale—GREY—for Model 2B400
77169	Dial—Polystyrene dial scale—BLACK—for Model 2B401
77170	Dial—Polystyrene dial scale—IVORY—for Model 2B402
77171	Dial—Polystyrene dial scale—GREEN—for Model 2B403
77172	Dial—Polystyrene dial scale—TAN—for Model 2B404
77173	Dial—Polystyrene dial scale—RED for Model 2B405
75844	Emblem—"RCA Victor" emblem
73843	Grille—Metal grille—perforated—GREY—for Model 2B400
77179	Grille—Metal grille—perforated—GOLD—for Models 2B401 and 2B402
77180	Grille—Metal grille—perforated—GREEN—for Model 2B403
77181	Grille—Metal grille—perforated—TAN—for Model 2B404
77182	Grille—Metal grille—perforated—RED—for Model 2B405
73839	Handle—Carrying handle—BLACK—for Models 2B400 and 2B401
77183	Handle—Carrying handle—BEIGE—for Model 2B402
77184	Handle—Carrying handle—GREEN—for Model 2B403
77185	Handle—Carrying handle BROWN—for Model 2B404
77186	Handle—Carrying handle—RED—for Model 2B405
76856	Knob—Tuning control knob—GREY—for Model 2B400
77174	Knob—Tuning control knob BLACK—for Model 2B401
77175	Knob—Tuning control knb—IVORY— for Model 2B402
77176	Knob—Tuning control knob—GREEN—for Model 2B403
77177	Knob—Tuning control knob—TAN—for Model 2B404
77178	Knob—Tuning control knob—RED—for Model 2B405
73840	Link—Carrying handle link (2 req'd)
73858	Ring—Bearing ring for tuning knob
70857	Screw—#4-40 x 3/16" cross recessed binder head machine screw for mounting chassis (4 req'd)
74734	Spring—Spring clip for tuning control knob

MODELS 2X61, 2X62, C
RC1080C, RC1080D



Model 2X61 Maroon *Model 2X62 Ivory*

SPECIFICATIONS

Tuning Range ..... 540—1600 kc
Intermediate Frequency ..... 455 kc

Tube Complement

(1) RCA 12SK7 ..... R.F. Amplifier
(2) RCA 12SA7 ..... Converter
(3) RCA 12SK7 ..... I.F. Amplifier
(4) RCA 12SQ7 ..... Det.-A.V.C.-A.F. Amp.
(5) RCA 35L6GT ..... Output
(6) RCA 35Z5GT ..... Rectifier

Power Supply Rating
115 volts d. c. or 50 to 60 cycles a. c. ..... 35 watts

Dial Lamp ..... 2 Mazda type 1490, 3.2 volts, 0.15 am

Loudspeaker
Size and type ..... 4-in. P.
Voice coil impedance ..... 3.2 ohms at 400 cyc

Power Output
Undistorted ..... 0.85 wa
Maximum ..... 1.15 wa

Tuning Drive Ratio ..... 8.5 to 1 (4¼ turns of kno

Weight ..... 8 l

Cabinet Dimensions
Height ....8⅝" Width ....11¾" Depth 7

STOCK No.	DESCRIPTION	STOCK No.	DESCRIPTION
	CHASSIS ASSEMBLIES RC 1080C—Model 2X61 RC 1080D—Model 2X62	503112	120 ohms, ±10%, ½ watt, R4, R11
77143	Antenna—Antenna loop and back cover assembly—maroon—for Model 2X61	503118	180 ohms, ±10%, ½ watt, R1
77144	Antenna—Antenna loop and back cover assembly—ivory—for Model 2X62	503127	270 ohms, ±10%, ½ watt, R15
77143	Back—Cabinet back cover and antenna loop assembly—maroon—for Model 2X61	513212	1200 ohms, ±10%, 1 watt, R12
77144	Back—Cabinet back cover and antenna loop assembly—ivory—for Model 2X62	503312	12,000 ohms, ±10%, ½ watt, R2
77145	Capacitor—Variable tuning capacitor complete with drive drum, C1, C2, C3, C4, C5, C6	503322	22,000 ohms, ±10%, ½ watt, R3
39042	Capacitor—Ceramic, 47 mmf., C8	503356	56,000 ohms, ±10%, ½ watt, R7
71924	*Capacitor—Ceramic, 56 mmf., C9*	503410	100,000 ohms, ±10%, ½ watt, R16
73501	Capacitor—Ceramic, 150 mmf., C12, C13	503422	220,000 ohms, ±10%, ½ watt, R5, R6
73473	Capacitor—Ceramic, 4700 mmf., C20	503447	470,000 ohms, ±10%, ½ watt, R10
74662	Capacitor—Electrolytic comprising 1 section of 80 mfd., 150 volts and 1 section of 50 mfd., 150 volts, C19A, C19B	503522	2.2 megohm, ±10%, ½ watt, R8
73595	Capacitor—Tubular, paper, .0022 mfd., 600 volts, C14	503547	4.7 megohm, ±10%, ½ watt, R9
73797	Capacitor—Tubular, paper, .015 mfd., 600 volts, C16	74691	Shaft—Tuning knob shaft
73562	Capacitor—Tubular, paper, .022 mfd., 400 volts, C15	74697	*Socket—Dial lamp socket*
73553	Capacitor—Tubular, paper, .047 mfd., 400 volts, C17, C18	54414	Socket—Tube socket
73551	Capacitor—Tubular, paper, 0.1 mfd., 400 volts, C10, C11	76368	Spring—Drive cord spring
73794	Capacitor—Tubular, paper, 0.22 mfd., 400 volts, C21	33634	Switch—"Radio-Phono" switch, S2
73935	Clip—Mounting clip for I.F. transformer	73036	Transformer—First I.F. transformer complete with adjustable cores, T1
74693	Coil—Oscillator coil complete with adjustable cores, L3, L4	73037	Transformer—Second I.F. transformer complete with adjustable cores, T2
73677	Coil—R.F. coil complete with adjustable cores, L1, L2	73976	Transformer—Output transformer, T3
35787	Connector—Phono input connector	35969	Washer—"C" washer for tuning knob shaft
75474	Connector—Single contact male connector for output transformer leads (2 req'd)		**SPEAKER ASSEMBLIES** 971495-3
38410	Control—Volume control and power switch, R14, S1	76391	Speaker—4" P.M. speaker complete with cone and vo *coil (3.2 ohms)*
72953	Cord—Drive cord (approx. 50" overall)		**MISCELLANEOUS**
70392	Cord—Power cord and plug	Y2445	Cabinet—Plastic cabinet—maroon—complete with escutcheon for Model 2X61
73693	Grommet—Power cord strain relief (1 set)	Y2446	Cabinet—Plastic cabinet — ivory — complete with escutcheon for Model 2X62
72283	Grommet—Rubber grommet for mounting tuning capacitor	77146	Dial—Polystyrene dial scale
77142	Pointer—Station selector pointer	77241	Escutcheon—Dial escutcheon
72602	Pulley—Drive cord pulley	74931	Knob—Control knob—maroon—for Model 2X61
	Resistor—Fixed, composition:—	72545	Knob—Control knob—ivory—for Model 2X62
514033	*33 ohms, ±20%, 1 watt, R13*	71116	Lamp—Dial lamp—Mazda 1490
		74301	Screw—#8 x ⅜" binder head screw (cross recesse for mounting dial
		30900	Spring—Retaining spring for knobs

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

APPLY TO YOUR RCA DISTRIBUTOR FOR PRICES OF REPLACEMENT PARTS

MODELS 2X61, 2X62, Ch. RC1080C, RC1080D

NOTE.—If reception is not obtained on d. c. operation, reverse plug in outlet receptacle. On a. c. operation this may reduce hum.

The position of the speaker is adjustable; the correct position is indicated on the illustration "Tube and Trimmer Locations."

ALIGNMENT PROCEDURE

Cathode Ray Alignment is the preferable method. Connections for the oscilloscope are shown on the schematic diagram.

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

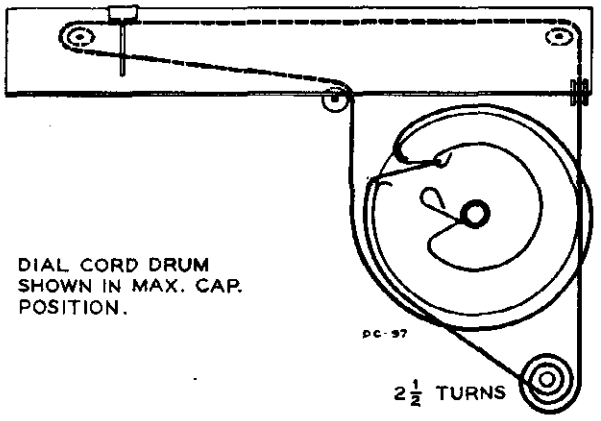
Test Oscillator.—Connect low side of test oscillator to common wiring in series with a .1 mf. capacitor. If the test oscillator is a. c. operated it may be necessary to use an isolation transformer for the receiver during alignment and the low side of the test oscillator connected directly to common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

Step	Connect high side of sig. gen. to—	Sig. gen. output	Turn radio dial to—	Adjust for peak output
1	Pin No. 4 of 12SK7 tube	455 kc	Quiet point near 600 kc	Top and bottom cores of T2
2	Pin No. 8 of 12SA7 tube			Top and bottom cores of T1
3	"External Antenna" terminal through 100 mmf. capacitor	1620 kc	1620 kc	C6 Osc. C5 R.F. C4 Ant.
4		Shunt C5 with 22,000 ohm resistor		
		600 kc	600 kc	L4 Osc. (Rock gang)
5		Remove 22,000 ohm resistor from C5		
		600 kc	600 kc	L2 R.F.
6		Repeat steps 3, 4 and 5		

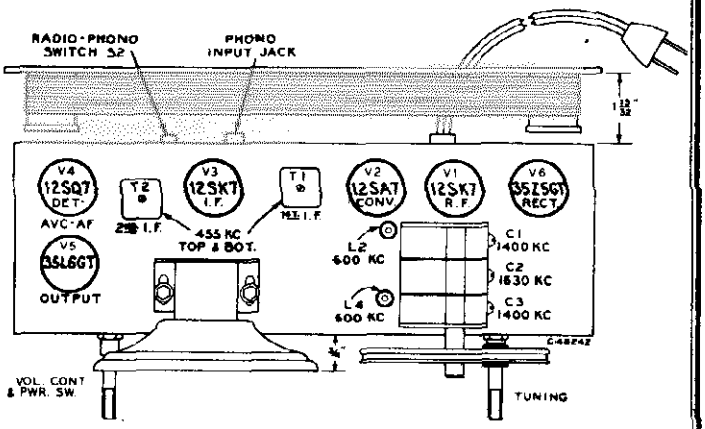
The position of the loop antenna in relation to the chassis affects adjustment of C4. The correct position is indicated on the illustration "Tube and Trimmer Locations."

Correction to Alignment Procedure:

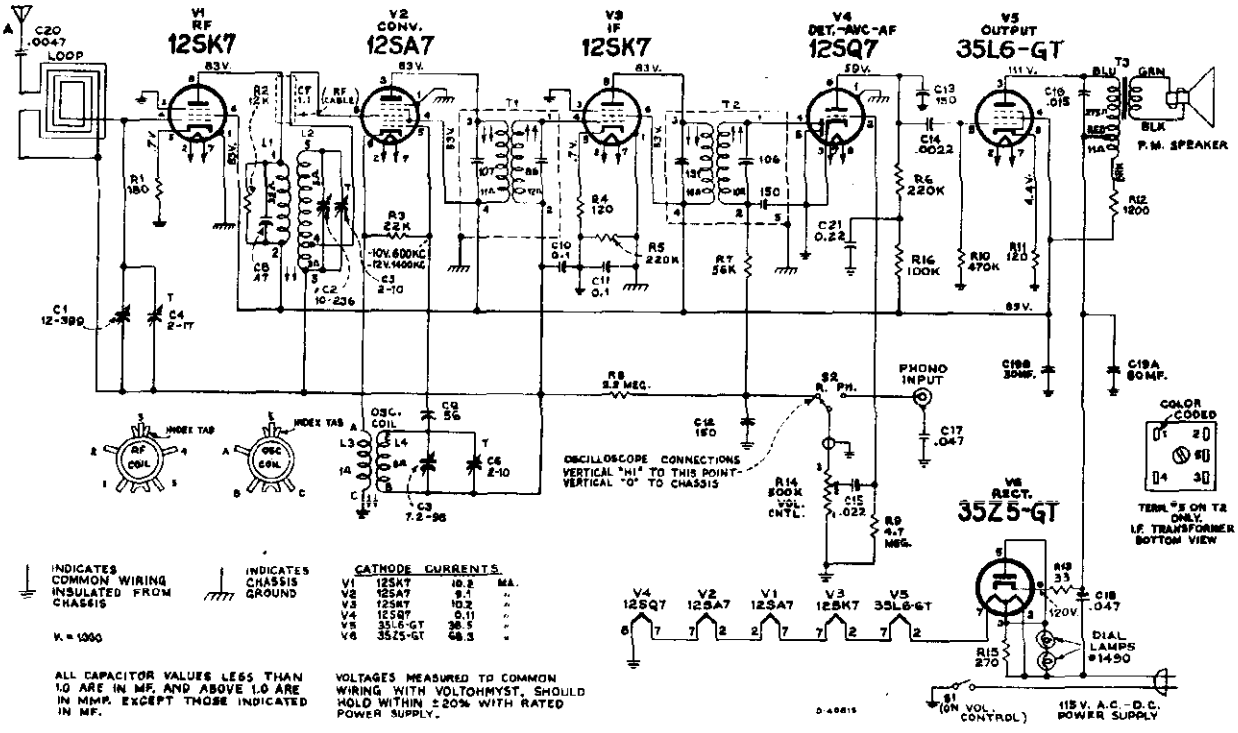
The oscillator trimmer C6 should be adjusted at 1620 kc as stated in the Service Data, but the r.f. trimmer (C5) and the antenna trimmer (C4) should be adjusted for maximum when the receiver is tuned to a 1400 kc signal.



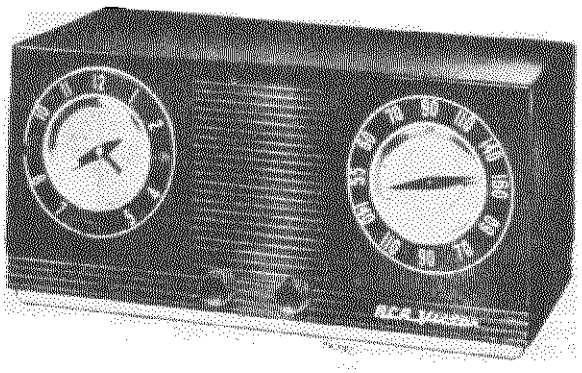
Dial Indicator and Drive Mechanism



Tube and Trimmer Locations



MODELS 2C521, 2C522, 2C52
Ch. RC1120, A, B, C



2C521 *Maroon* | *2C522* *Ivory* | *2C527* *White*

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. Amp.
(4) RCA 50C5 ..... Output
(5) RCA 35W4 ..... Rectifier
Power Supply Rating:
115 volts a.c., 60 cycles ..... 30 watts
CAUTION:—DO NOT OPERATE ON D.C.

Appliance Rating ..... 115 volts, 15 a.

Loudspeaker:
Size and type ..... 4 in. P
Voice Coil impedance ..... 3.2 ohms at 400 cyc

Power Output:
Undistorted ..... 1.2 wc
Maximum ..... 1.6 wc

Tuning Drive Ratio ..... 10 to 1 (5 turns of knc
Weight ..... 5½ l

Cabinet Dimensions:
Height...6⅛" Width...11¾" Depth...5½'

Operating Instructions

This instrument can be used in any one of several ways. It may be used as a clock with alarm alone, radio, phonograph amplifier, or clock-controlled radio or appliance outlet. Instructions for the various uses follow:

Clock—Plug instrument into a.c. outlet. The clock will start to operate immediately. Set the correct time with the "TIME-SET" knob on the back panel of the instrument. To set the alarm, pull out the "ALARM" knob and turn counter-clockwise until the desired time is indicated by the alarm pointer. Leave knob out for alarm buzzer operation. Push knob in to turn off buzzer.

Radio—1. Push "RADIO" slide switch lever to the right, as viewed from the back. Turn "RADIO" knob on clock from "OFF" to "ON" position. Adjust volume and tuning knobs as required after 30 second warm-up. Turn clock "RADIO" knob to "OFF" position when finished listening.

2. To have radio turn itself off after a period of up to 60 minutes, set "SLEEP" knob to desired playing time. Turn clock "RADIO" knob "OFF."

3. To have radio turn itself on, turn tuning and volume knobs to desired position, and then set the alarm as explained above. Turn clock "RADIO" knob to "AUTO" position.

4. To have the radio turn itself off during any time within a 60 minute period and then turn itself on, after an off period of up to twelve hours, set the "SLEEP" and "ALARM" knobs, and volume and tuning controls as explained p viously. Turn clock "RADIO" knob to "AUTO" position

Appliances—1. To use appliance outlet, plug applia into rear receptacle, and turn clock "RADIO" knob to "O position. If operation of the radio is not desired at same time, push radio slide-switch lever on the back pa to the off position (lever pushed to the left).

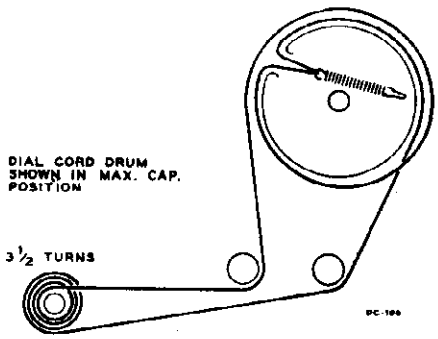
2. To start appliance automatically, proceed as abo except that the "ALARM" knob should be set to the desi starting time, and the clock "RADIO" knob set to "AUTO" position. To turn off appliance, turn clock "RADI knob to "OFF" position, or remove appliance plug if ra operation is desired.

3. To operate appliance for any time within a 60 min period, have appliance plugged in, with clock "RADI knob turned to "OFF" position. Set "SLEEP" knob desired operating period. Appliance will be turned automatically at the end of this period.

Phonograph—1. Make sure radio slide switch is (lever pushed to the right). Plug phonograph attachm audio plug into jack provided. Turn clock "RADIO" kn to "ON" position. If a spare a.c. receptacle is not availa for the record changer, the appliance outlet may be u to provide power.

CAUTION:—Keep clock "RADIO" knob "OFF" wh instrument is not in use.

MODELS 2-C-521 Series, Ch. RC1120, A, B, C



Dial Cord Drive

RADIO CHASSIS AND CLOCK SERVICE

Tube Service—To make tubes accessible for testing, remove the hex head screw at the lower right hand corner and the hex head screw at the left side of the appliance outlet on the back panel. The loop antenna and antenna trimmer are located on this back panel.

Radio Chassis Service—Proceed as above, removing the volume and tuning control knobs by pulling off, and also removing the three hex head screws and washers on the underside of the cabinet. Do Not remove the clock from the cabinet unless this is necessary for service. Lift off the shield on the underside of the chassis.

Clock Service—Proceed as above. Remove the three clock control knobs from the front of the cabinet by pulling off, taking care not to damage the clock control shafts. Using a small screwdriver or a small pry tool, remove the five sheet metal clips holding the clock to the cabinet. The clips will be found embedded in the plastic. The seal between the plastic and the metal teeth on the clips should be broken by lifting the metal edges till the teeth clear the plastic. To prevent scratching the plastic dial faces of the radio and clock, place the instrument face down on a thick soft cloth. When removing the clock, take care not to damage the molded-in plastic rim for mounting the clock.

In remounting the clock, new sheet metal clips should be used. These should be heated until hot enough to soften the plastic slightly upon contact. Place the clock in its mounting rim and push the heated clips on tightly, using a pair of pliers or other holding tool.

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 from the back 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.

Alignment Procedure

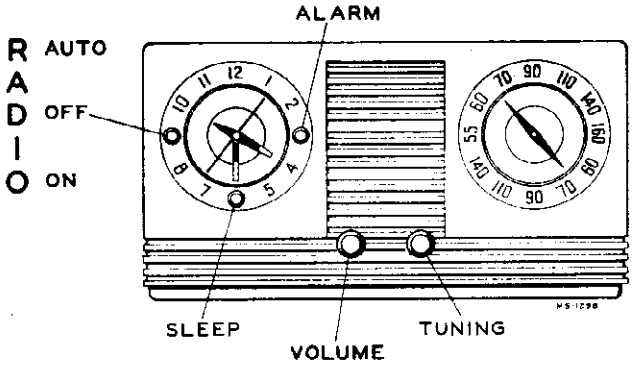
Step	Connect the high side of test-oscillator to—	Tune test-osc. to—	Turn radio dial to—	Adjust the following for max. output
1	12BA6 I-F grid through .1 mfd. capacitor	455 kc	Quiet-point 1600 kc end of dial	T2 (top and bottom) 2nd I-F trans.
2	Stator of C1-2 through .1 mfd.			T1 (top and bottom) 1st 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		Repeat steps 3 and 4.		

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.

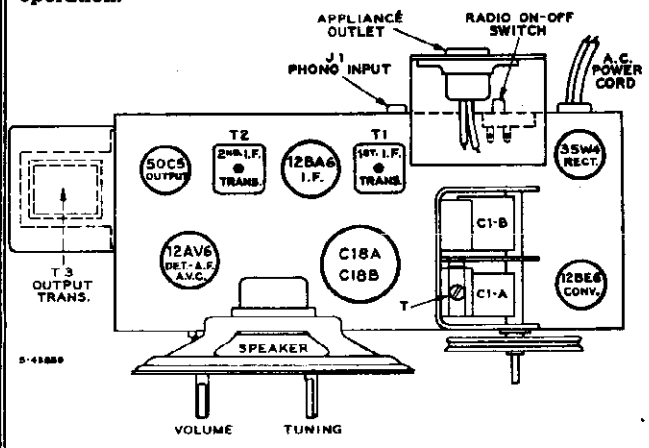
On a.c. operation an isolation transformer (115 v./115 v.) may be necessary for the receiver if the test oscillator is also a.c. operated.

Lead Dress

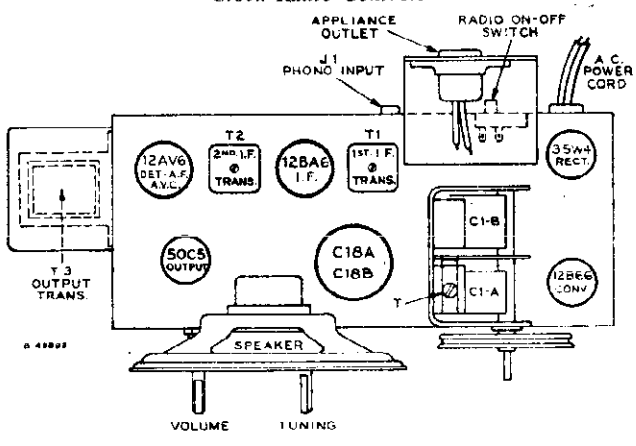
1. Dress all capacitors down against chassis.
2. C-15 must be located so that connection to Pin #1 of 12AV6 is short as possible and condenser butts against rim of volume control.
3. Connect outside foil of all condensers as indicated in schematic diagram.
4. Dress Filament, B+ and B- leads down against chassis.
5. Dress R2, 12BA6 cathode resistor, down against tube center post with leads to Pin 2 and Pin 7 as short as possible.
6. Dress R3 above and away from R7.



Clock Radio Controls

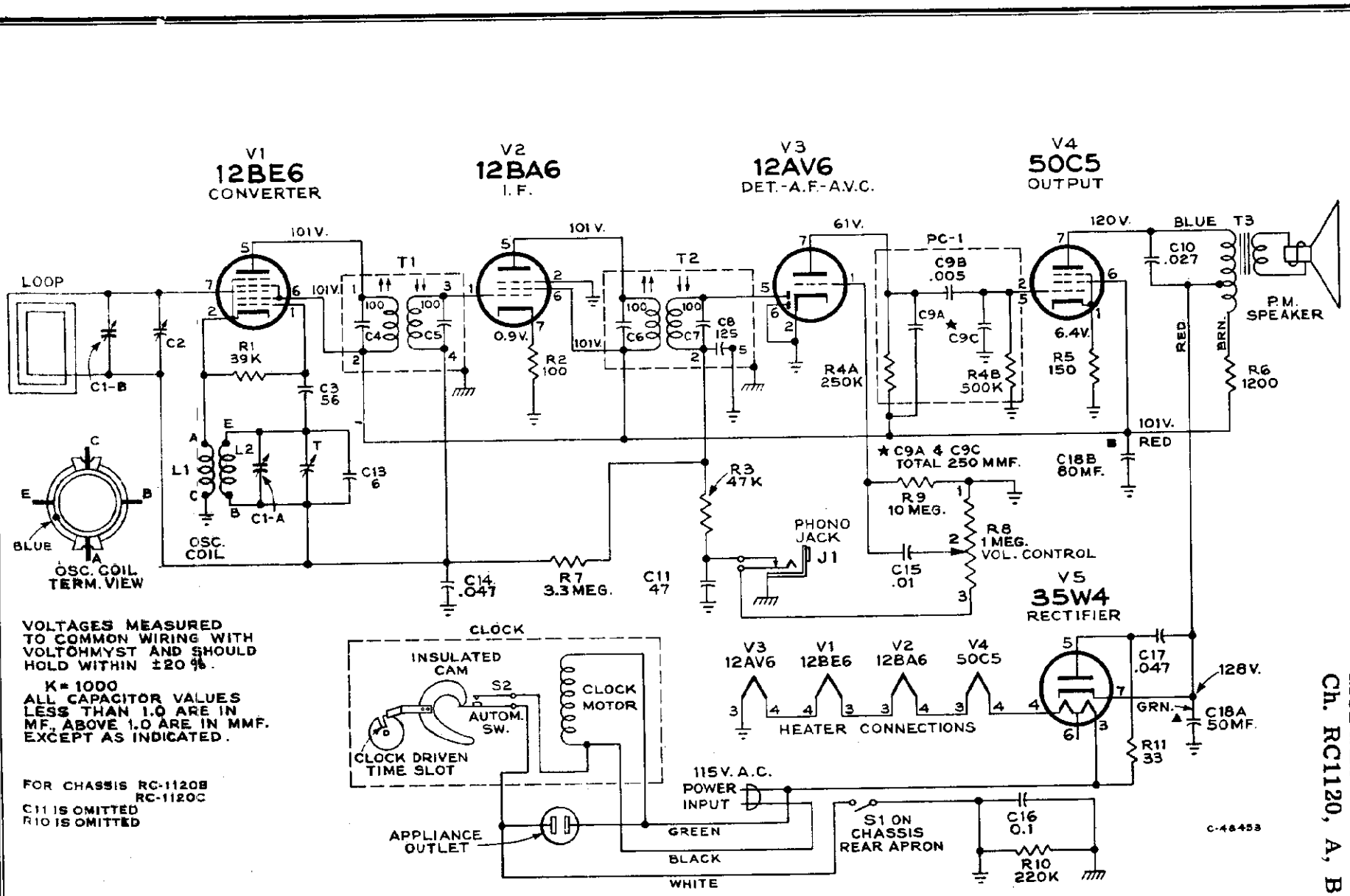


Chassis RC-1120, RC-1120A



Chassis RC-1120B, RC-1120C

Tube and Trimmer Locations



VOLTAGES MEASURED TO COMMON WIRING WITH VOLTOHMYST AND SHOULD HOLD WITHIN ±20%.

K = 1000
ALL CAPACITOR VALUES LESS THAN 1.0 ARE IN MF. ABOVE 1.0 ARE IN MMF. EXCEPT AS INDICATED.

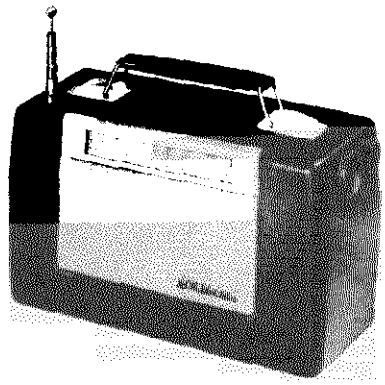
FOR CHASSIS RC-1120B
RC-1120C
C11 IS OMITTED
R10 IS OMITTED

MODELS 2-C-521 Series, Ch. RC1120, A, B, C

STOCK NO.	DESCRIPTION
	CHASSIS ASSEMBLIES
	RC-1120, RC-1120B—Model 2-C-521 RC-1120A, RC-1120C—Models 2-C-522, 2-C-527
77357	Capacitor—Variable tuning capacitor complete with drive drum C1A, C1A-T, C1B
77364	Capacitor—Ceramic, 6 mmf. C13
76348	Capacitor—Ceramic, 47 mmf. C11
77116	Capacitor—Ceramic, 56 mmf. C3
73520	Capacitor—Electrolytic comprising 1 section of 80 mfd., 150 volts and 1 section of 50 mfd., 150 volts, ...C18A, C18B
73561	Capacitor—Tubular, paper, .01 mfd., 400 volts..C15
73554	Capacitor—Tubular, paper, .027 mfd., 400 volts..C10
73553	Capacitor—Tubular, paper, .047 mfd., 400 volts C14, C17
73551	Capacitor—Tubular, paper, 0.1 mfd., 400 volts..C16
73935	Clip—Mounting clip for I.F. transformer
77356	Coil—Oscillator coil L1, L2
75482	Connector—Phono input connector J1
52131	Connector—2 contact female connector for applicance outlet (RC-1120, RC-1120A)
77901	Connector—2 contact female connector for appliance outlet (RC-1120B, RC-1120C)
77359	Control—Volume control R8
72953	Cord—250' Drive Cord Reel (approx. 26" required)
70392	Cord—Power cord and plug
28451	Cover—Insulating cover for electrolytic
77360	Grommet—Rubber grommet for mounting tuning capacitor
28452	Plate—Bakelite mounting plate for electrolytic
77355	Plate—Dial back plate complete with pointed escutcheon (RC-1120, RC-1120A)
77900	Plate—Dial back plate (RC-1120B, RC-1120C)
77354	Pointer—Station selector pointer
77365	Printed Circuit . PC1 (C9A, C9B, C9C, R4A, R4B)
77363	Pulley—Drive cord idler pulley
	Resistor—Fixed, composition:—
503033	33 ohms, ±10%, ½ watt R11
503110	100 ohms, ±10%, ½ watt R2
503115	150 ohms, ±10%, ½ watt R5
513212	1200 ohms, ±10%, 1 watt R6
503339	39,000 ohms, ±10%, ½ watt R1
503347	47,000 ohms, ±10%, ½ watt R3
503422	220,000 ohms, ±10%, ½ watt R10
503533	3.3 megohm, ±10%, ½ watt R7
503610	10 megohm, ±10%, ½ watt R9
77358	Shaft—Tuning knob shaft (RC-1120, RC-1120A)
77909	Shaft—Tuning knob shaft (RC-1120B, RC-1120C)
76870	Shield—Tube shield
77115	Socket—Tube socket, 7 pin, miniature, moulded
51955	Socket—Tube socket, 7 pin, miniature, moulded, saddle-mounted
77361	Spring—Drive cord spring (RC-1120, RC-1120A)
77902	Spring—Drive cord spring (RC-1120B, RC-1120C)
32875	Switch—Radio power switch S1
75486	Transformer—First I.F. transformer, complete with adjustable cores T1, C4, C5
75487	Transformer—Second I.F. transformer, complete with adjustable cores T2, C6, C7, C8
77362	Transformer—Output transformer (RC-1120, RC-1120A) T3
77903	Transformer—Output transformer (RC-1120B, RC-1120C)
33726	Washer—"C" washer for tuning knob shaft

STOCK NO.	DESCRIPTION
	SPEAKER ASSEMBLIES
	B12A512 RL108E7
77226	Speaker—4" P.M. speaker complete with cone and voice coil (3.2 ohms)
	MISCELLANEOUS
77367	Antenna—Antenna loop complete with back cover —maroon—for Model 2C521 (RC-1120, RC-1120A) Includes C2
77904	Antenna—Antenna loop complete with back cover —maroon—for Model 2C521 (RC-1120B, RC-1120C)
77368	Antenna—Antenna loop complete with back cover —ivory—for Models 2C522, and 2C527 (RC-1120, RC-1120A) .....Includes C2
77905	Antenna—Antenna loop complete with back cover —ivory—for Models 2C522, 2C527 (RC-1120B, RC-1120C)
77367	Back—Cabinet back—maroon—and antenna loop for Model 2C521 (RC-1120, RC-1120A), Includes C2
77904	Back—Cabinet back complete with antenna loop—maroon—for Model 2C521 (RC-1120B, RC-1120C)
77368	Back—Cabinet back—ivory—and antenna loop for Models 2C522 and 2C527 (RC-1120, RC-1120A), Includes C2
77905	Back—Cabinet back complete with antenna loop—ivory—for Models 2C522, 2C527 (RC-1120B, RC-1120C)
X3304	Baffle—Baffle board and grille cloth for Model 2C521
X3305	Baffle—Baffle board and grille cloth for Models 2C522 and 2C527
Y2463	Cabinet—Plastic cabinet—maroon—complete with crystals (2) for Model 2C521
Y2464	Cabinet—Plastic cabinet—ivory—complete with crystals for Model 2C522
Y2465	Cabinet—Plastic cabinet—white—complete with crystals for Model 2C527
77372	Clip—Spring clip for mounting timer assembly (5 req'd)
77033	Emblem—"RCA Victor" emblem
77369	Knob—Timer control knob—maroon—for Model 2C521
77370	Knob—Timer control knob—ivory—for Model 2C522
77371	Knob—Timer control knob—white—for Model 2C527
77373	Knob—Tuning control or volume control knob—maroon—for Model 2C521
77374	Knob—Tuning control or volume control knob—ivory—for Model 2C522
77375	Knob—Tuning control or volume control knob—white—for Model 2C527
77013	Nut—Speed nut to fasten "RCA Victor" emblem to cabinet
77491	Window—Polystyrene window for radio or timer dials
	CLOCK ASSEMBLY
	Clock—If clock mechanism repair becomes necessary, remove the clock from the radio. The RCA Victor Distributor in your area will advise you of the address of the nearest authorized service station for clock mechanisms. Repair facilities and replacement parts are available at these authorized service stations.

APPLY TO YOUR RCA DISTRIBUTOR FOR PRICES OF REPLACEMENT PARTS



Specifications

Tuning Ranges

Standard Broadcast ("A" Band) .....520-1605 kc. (576-186 m.)
Medium Wave ("B" Band) .....2.3-7 mc. (131-42.8 m.)
Short Wave ("C" Band) .....7-22 mc. (42.8-13.7 m.)

Intermediate Frequency .....455 kc.

Tube Complement

(1) RCA 1T4 .....R.F. Amplifier
(2) RCA 1L6 .....Converter
(3) RCA 1T4 .....I.F. Amplifier
(4) RCA 1U5 .....Det.-A.V.C.-A.F. Amp.
(5) RCA 3V4 .....Output

One selenium rectifier is used for 105/125 v. operation. Two selenium rectifiers are used for 210/250 v. operation.

Power Supply Ratings

Power Line Operation

Chassis RC-1116 .....105/125 v. d.c. or 50/60 cycles a.c.
Chassis RC-1116A .....105/125 v. or 210/250 v. d.c. or 50/60 cycles a.c.

A three-position switch on chassis RC-1116A must be in the correct position for the available power supply.

Power Consumption

117 v. a.c.....10 watts 117 v. d.c.....7 watts
234 v. a.c.....22 watts 234 v d.c.....14 watts

Battery Pack Operation:

Battery pack .....RCA #VS-057
Current consumption ....."A" (9 v.) 50 ma.; "B" (90 v.) 14 ma.
Average battery life .....100 hrs. intermittent service

Power Output

Maximum ....270 milliwatts.....With 10% distortion—150 milliwatts

Loudspeaker

Size and type .....4" (10.2 cm.) P.M. dynamic
Voice coil impedance .....3.2 ohms at 400 cycles

Dimensions (overall)

Height.....8½" Width.....12¾" Depth.....5½"
Weight .....7 lbs. less battery
10¾ lbs. with battery

Antennas

This receiver has a built-in loop antenna for "A" band reception and a telescoping rod antenna for "B" and "C" bands. The telescoping rod antenna should be extended to its full height for best short wave reception.

An external antenna and ground may be connected to the ANT and GND screws at the end of the chassis. This may improve reception on all bands.

Alignment Procedure

Cathode-Ray Alignment is the preferable method. Connecti for the oscilloscope are shown in the Schematic Diagram.

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

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

NOTE—If the test-oscillator is also a.c. operated it may be nec sary to use an isolation transformer for the receiver during all ment and to connect the low side of the test oscillator to comm wiring—reversal of the plug may reduce hum.

Dial Indicator—With tuning condenser in full mesh, the in cator should be set to the position shown in the illustration "D Indicator and Drive Mechanism."

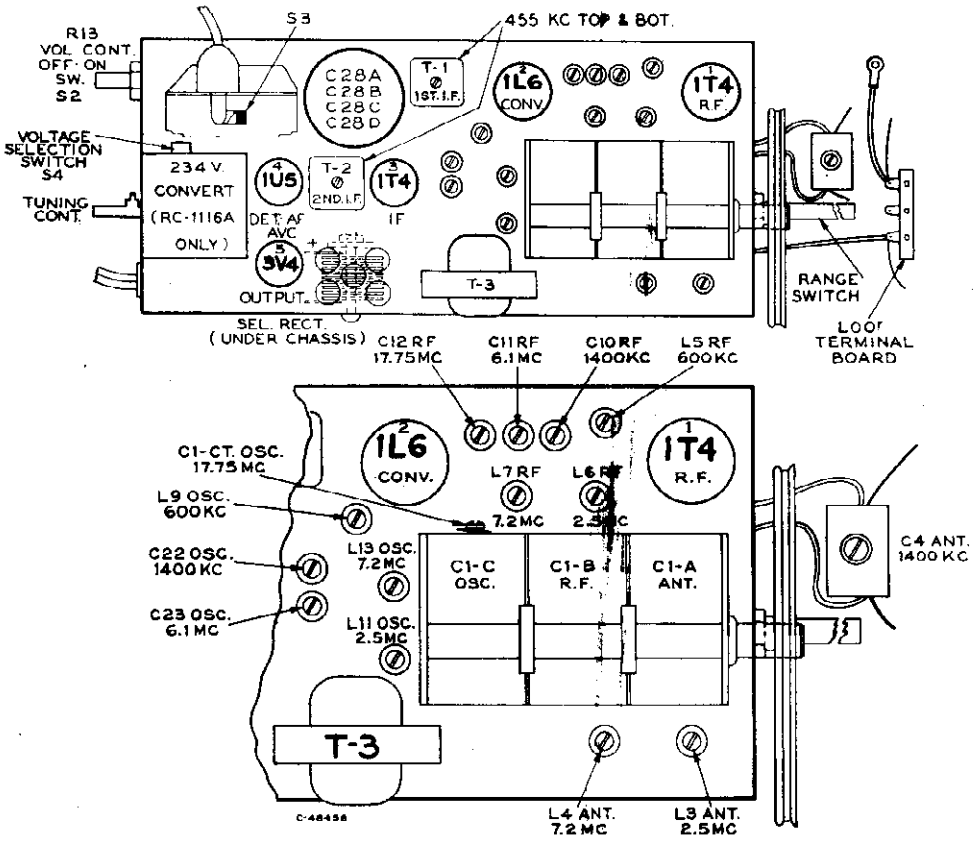
Oscillator tracks above signal on all bands. Use minimum pacity peak on oscillator trimmer adjustments and maximum pacity peak on ant. and R.F. trimmer adjustments.

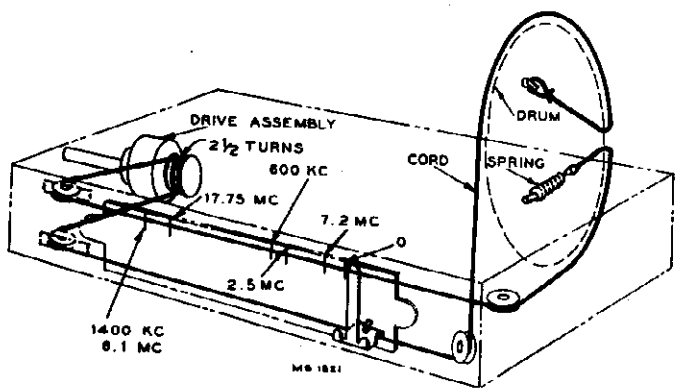
Step	Connect high side of test osc. to—	Tune test osc. to—	Range Switch	Turn radio dial to—	Adjust f maximu output—
1	I.F amp. grid (pin #6) in series with .01 mf.	455 kc.	A	quiet point near 600 kc.	T2 top & bott
2	Converter grid (pin #6) in series with .01 mf.				T1 top & bott
3	Rod ant. lead in series with dummy ant. (33 ohms in series with 18 mmf.)	17.75 mc.	C	17.75 mc.	C1C-T (os C12 (R.F.
4		7.2 mc.		7.2 mc.	L13 (osc L7 (R.F. L4 (ant.
5		Repeat Steps 3 and 4.			
6		6.1 mc.	B	6.1 mc.	C23 (os C11 (R.F
7		2.5 mc.		2.5 mc.	L11 (osc L6 (R.F. L3 (ant.
8		Repeat Steps 6 and 7.			
9	Yellow loop lead in series with .01 mf.	1400 kc.	A	1400 kc.	C22 (os C10 (R.F
10		600 kc.		600 kc.	L9 (osc L5 (R.F.
11		Repeat Steps 9 and 10.			
12	Assemble receiver, connect loop ant. leads. Connect ant. lead. Install and connect battery.				
13	Short wire placed near receiver for radiated signal	1400 kc.	A	1400 kc.	C4 (loo
14		2.5 mc.	B	2.5 mc.	*†L3 (an
15		7.2 mc.	C	7.2 mc.	*†L4 (an

* Rock gang while adjusting.
† Extend rod antenna to full height.

MODEL 36QP, Ch. RC1116, RC1116A

Tube and Trimmer Locations (Top View)

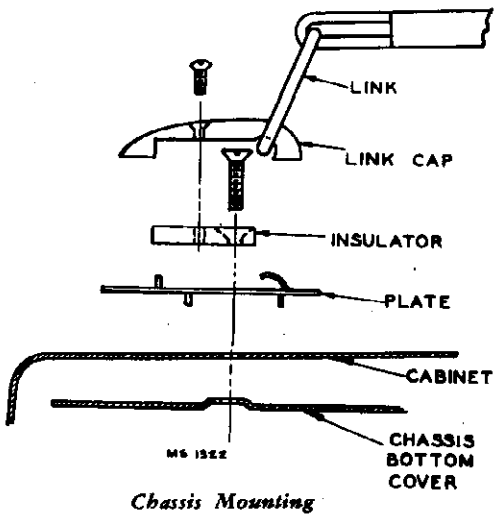




Dial Indicator and Drive Mechanism

Cord and indicator shown in position with drum in extreme clockwise position (condenser plates closed).

The left hand edge of indicator should coincide with the score marks on the dial back plate at the frequencies indicated.



Chassis Mounting

To Remove Chassis

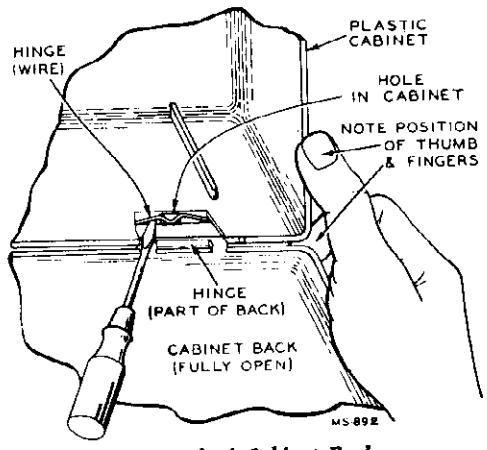
1. Pull out battery and disconnect battery plug.
2. Remove red wire from rod antenna.
3. Pull out on the two plastic loop supports to permit the loop antenna to be removed. When reinstalling, wedge the supports to the cabinet with two small pieces of wood (toothpick or equivalent).
4. Unsolder speaker voice coil leads.
5. Remove handle (see illustration above). Remove knobs (pull out).
6. Remove the two screws under link caps (visible when link caps are removed).

To Remove Hinges

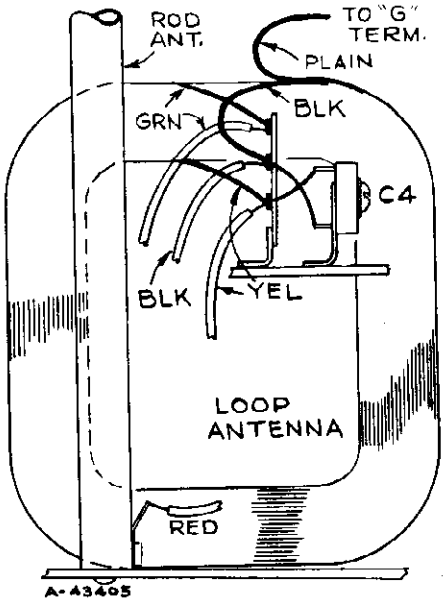
Remove back from cabinet as described above. Spread the hinge apart to remove it from the cabinet back.

To Remove Cabinet Back

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.



Removal of Cabinet Back



Loop Antenna Connections

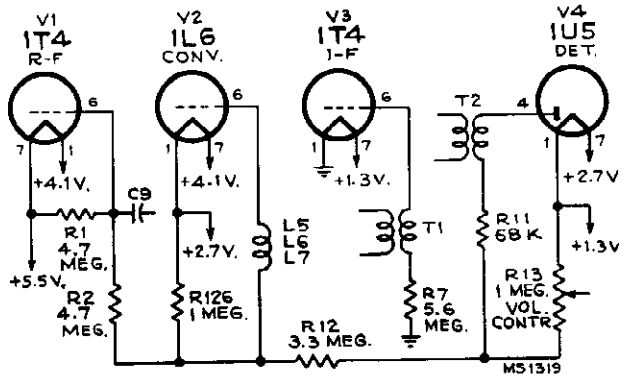
CRITICAL LEAD DRESS

1. Dress all filament leads close to the chassis.
2. Dress 33 ohm fuse resistor (R-18) up and away from all wiring.
3. Dress R-21 up and away from chassis.
4. Dress five section ceramic capacitor (C-27) close to chassis.
5. Keep "hot-side" lead of neutralizing capacitor (C-18) as short as possible and dress capacitor away from IF tube socket.
6. Dress C-19 up and away from IF transformer.
7. Dress all leads away from "C" oscillator coil.
8. Dress C-25 away from "B" oscillator coil.
9. Keep leads on R-3 as short as possible and dress close to 1L6 socket.
10. Dress R-1 and R-2 close to chassis base.
11. Dress loop leads away from tuning drum.
12. Dress lead from oscillator grid of 1L6 (pin #6) with ¼" to ⅛" spacing from capacitor-resistor assembly C-14/R-6.

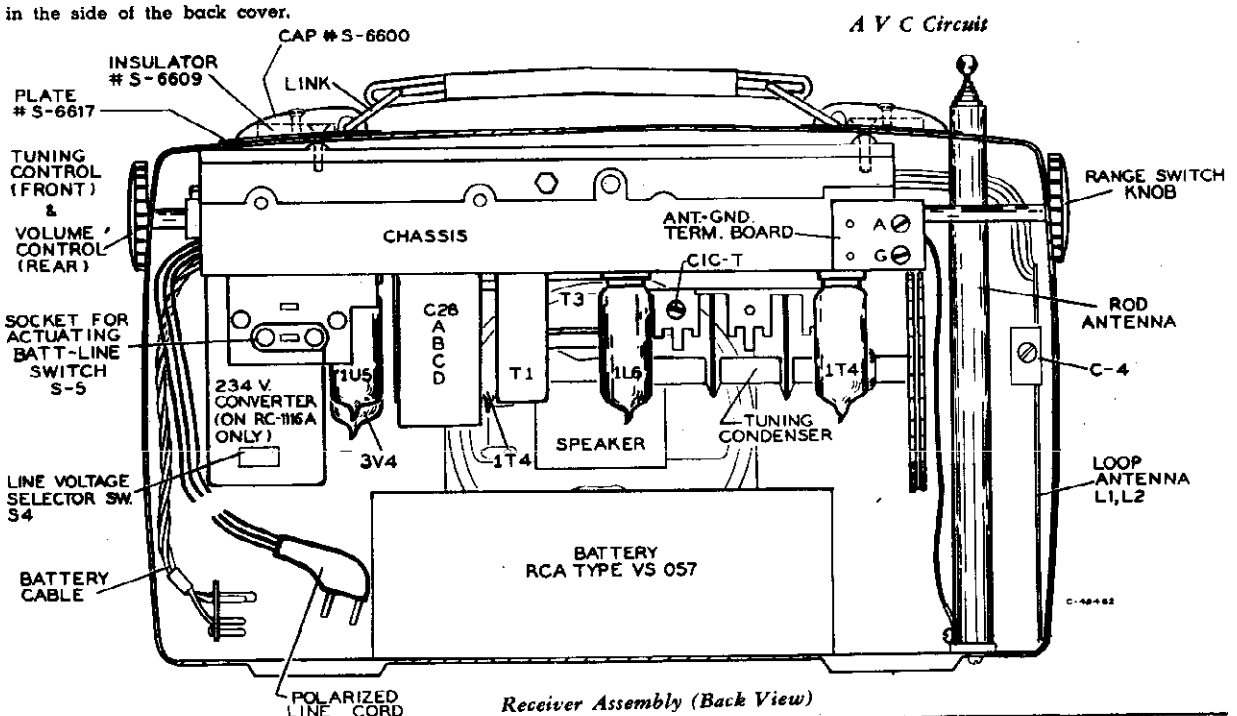
Power Line Operation

A power cord is stored alongside of the battery inside the case. Its plug is inserted in a socket on the chassis. For power line operation: remove the plug from its socket and insert it into a convenient power supply outlet.

Make sure that the power cord passes through the notch provided in the side of the back cover.

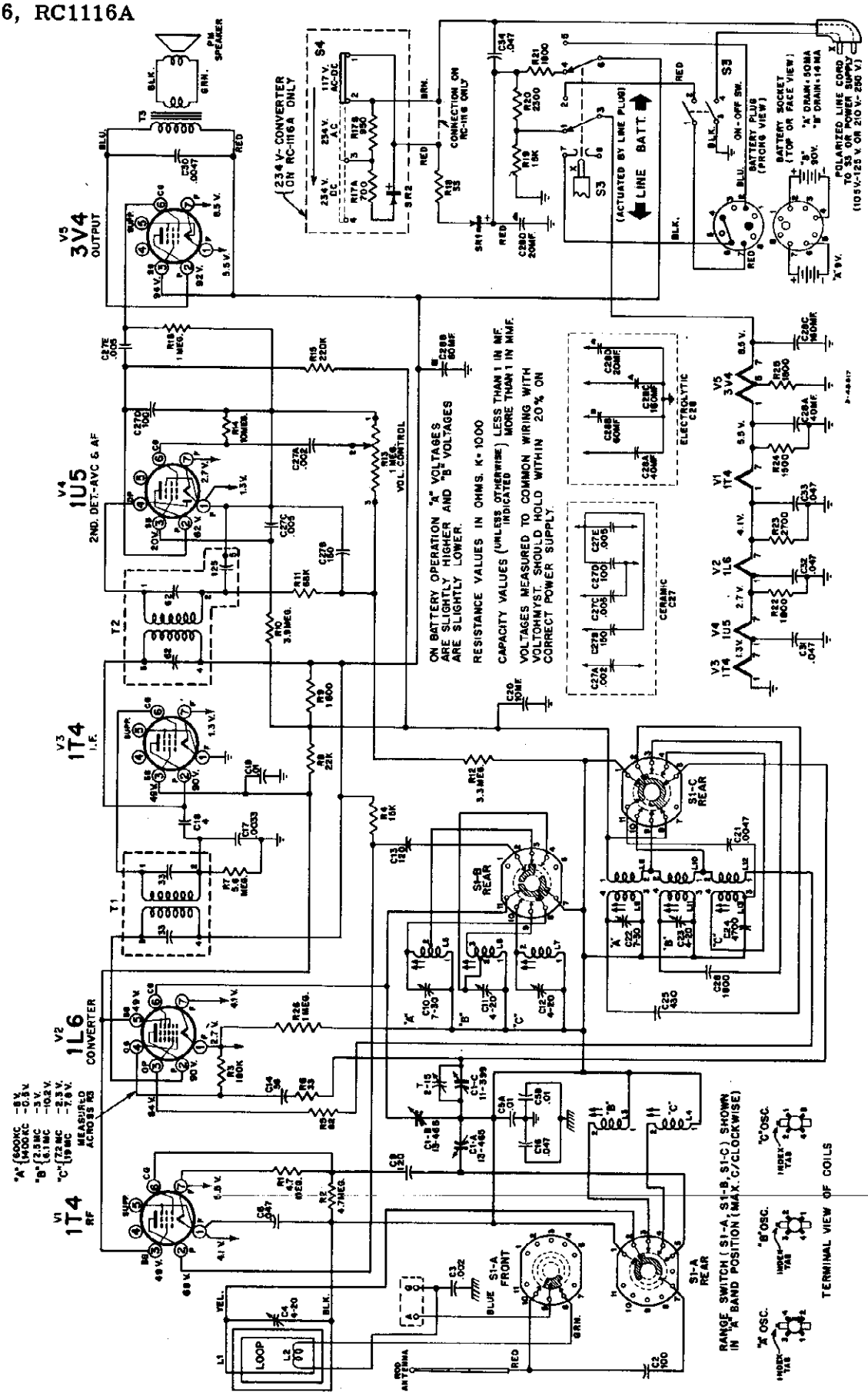


A V C Circuit



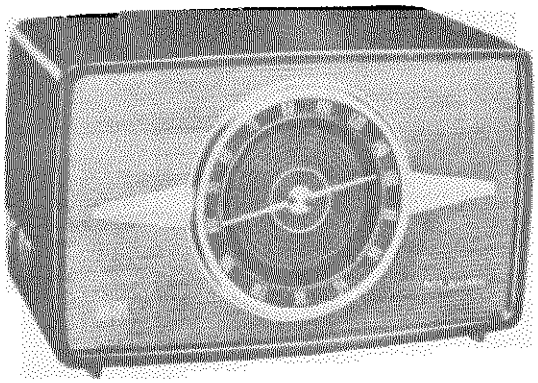
Receiver Assembly (Back View)

MODEL 36QP, Ch.
RC1116, RC1116A



STOCK No.	DESCRIPTION
	CHASSIS ASSEMBLY RC1116
S-6561	Board—ANT-GND terminal board
S-6562	Bracket—Dial cord pulley bracket complete with two pulleys—(tuning drum end.)
S-6563	Capacitor—Trimmer capacitor, 4-20 mmf. (C11, C12, C23)
75189	Capacitor—Trimmer capacitor, 7-30 mmf. (C10, C22)
	Capacitors—Fixed
S-5128	Ceramic, 4 mmf. (C18)
45233	Ceramic, 100 mmf. (C2)
S-5131	Ceramic, 120 mmf. (C9, C13)
S-6724	Mica, 430 mmf. (C25)
S-5136	Mica, 1800 mmf. (C26)
S-5942	Mica, 4700 mmf. (C24)
S-6564	Ceramic, .0022 mf. (C3)
S-4853	Molded paper, .0033 mf., 600V. (C17)
S-9371	Ceramic, .0047 mf. (C21)
S-5469	Molded paper, .0047 mf., 600V. (C30)
S-6326	Ceramic, .01 mf. (C19)
75877	Ceramic, dual, two sections of .01 mf. (C5A, C5B)
S-6565	Ceramic, five sections, (.002 mf. C27A) (150 mmf. C27B) (.005 mf. C27C) (100 mmf. C27D) (.005 mf. C27E)
S-4706	Molded paper, .047 mf., 400V. (C6, C16, C31, C32, C33)
S-5144	Molded paper, .047 mf., 600V. (C34)
S-5145	Electrolytic, 10 mf., 150V. (C20)
S-5146	Electrolytic, comprising one section of 40 mf., 25V., one section of 60 mf., 150V., one section of 160 mf., 25V., and one section of 20 mf., 150V. (C28A, C28B, C28C, C28D)
S-4523	Capacitor and Resistor—Assembly comprising 56 mmf. capacitor and 33 ohm resistor (C14, R6)
S-4454	Clip—Clip for mounting I-F transformers (2 req'd)
S-6567	Coil—"A" band oscillator coil complete with adjustable core (L8, L9)
S-6568	Coil—"B" band oscillator coil complete with adjustable core (L10, L11)
S-6569	Coil—"C" band oscillator coil complete with adjustable core (L12, L13)
S-6570	Coil—"A" band R-F coil complete with adjustable core (L5)
S-6571	Coil—"B" band R-F coil complete with adjustable core (L6)
S-6572	Coil—"C" band R-F coil complete with adjustable core (L7)
S-6573	Coil—"B" band ant. coil (L3)
S-6574	Coil—"C" band ant. coil (L4)
S-6575	Condenser—Variable tuning condenser (C1-A, C1-B, C1-C)
S-6576	Control—Volume control and on-off switch (R13, S2)
S-6577	Cover—Chassis bottom cover
S-6578	Cord—Tuning indicator drive cord (41 inches required)
S-5149	Cord—Power line attachment cord
S-4464	Grommet—Rubber grommet to mount tuning condenser (3 req'd)
S-6579	Indicator—Tuning indicator pointer
S-6580	Pin—Axle pin for drive cord pulleys (tuning control end)
S-6581	Plate—Dial back plate
18469	Plate—Insulating plate to mount electrolytic capacitor
S-5159	Plug—Five pin plug for battery cable
S-5123	Pulley—Drive cord pulley (tuning control end) (2 req'd)
S-6582	Rectifier—Selenium rectifier (SR1)
S-6583	Resistor—Armored wire wound, 2300 ohms, 7 watt (R20)
	Resistors—Fixed Composition
S-6584	33 ohms, 1 watt (R18)
S-6723	82 ohms, ½ watt (R5)
S-5163	1500 ohms, ½ watt (R24)
S-5164	1800 ohms, ½ watt (R9, R21, R22, R25)
S-5167	2700 ohms, ½ watt (R23)
36714	15,000 ohms, ½ watt (R4)
S-6585	15,000 ohms, 1 watt (R19)
S-6395	22,000 ohms, ½ watt (R8)
S-6173	68,000 ohms, ½ watt (R11)
S-6586	180,000 ohms, ½ watt (R3)
S-5647	220,000 ohms, ½ watt (R15)
S-6240	1 megohm, ½ watt (R16, R26)
S-5175	3.3 megohm, ½ watt (R12)
S-6587	3.9 megohm, ½ watt (R10)
S-5176	4.7 megohm, ½ watt (R1, R2)
S-5177	5.6 megohm, ½ watt (R7)
S-6588	10 megohm, ½ watt (R14)
S-6589	Shaft—Tuning control drive shaft assembly
S-6322	Socket—Tube socket for V1 (1T4) or V2 (1L6)
S-6590	Socket—Tube socket for V3 (1T4)
S-6591	Socket—Tube socket for V4 (1U5) or V5 (3V4) tubes
S-4511	Spacer—Metal spacer for mounting tuning condenser (3 req'd)
S-4485	Spring—Drive cord tension spring
S-6592	Switch—Tuning range switch (S1-A, S1-B, S1-C)
S-5186	Switch—Battery-line switch assembly (S3)
S-5229	Transformer—First I-F transformer (T1)
S-5230	Transformer—Second I-F transformer (T2)
S-6593	Transformer—Output transformer (T3)
	CHASSIS ASSEMBLIES RC1116A Same as RC1116 except for addition of 234V. converter
S-6594	Converter—117V./234V. converter assembly complete
74322	Rectifier—Selenium rectifier (SR2)
S-6595	Resistor—Tapped wire wound resistor 700 and 950 ohm (R17A, R17B)
S-6596	Switch—117V./234V. converter switch (S4)
	SPEAKER ASSEMBLY STAMPED 970654-2
S-6597	Speaker—4 inch PM speaker complete with cone and voi coil
	MISCELLANEOUS
S-6598	Antenna—"A" band loop antenna (L2)
S-6599	Antenna—Telescoping rod antenna
S-6622	Back—Cabinet back—GREY
S-6623	Back—Cabinet back—RED
S-6600	Cap—Carrying handle link cap (2 req'd)
S-6601	Capacitor—Trimmer capacitor and bracket assembly (C
S-6602	Case—Plastic case (front and back) GREY—less handl grille and loop antenna
S-6603	Case—Plastic case (front and back) RED—less handl grille and loop antenna
S-6604	Catch—Metal catch (on case front) to hold cabinet ba (2 req'd)
S-6605	Clip—Metal clip (on case back) to hold cabinet back (req'd)
S-6606	Grille—Perforated metal grille
S-4463	Grommet—Rubber grommet for speaker mounting (4 req'd)
S-6607	Dial—Plastic dial scale
S-6355	Emblem—"RCA Victor" emblem
74790	Hinge—Cabinet hinge (2 req'd)
S-6608	Handle—Carrying handle—less links
S-6609	Insulator—Insulating plate (under link caps)
S-6610	Knob—Tuning knob—GREY
S-6611	Knob—Tuning knob—RED
S-6612	Knob—Range switch knob—GREY
S-6613	Knob—Range switch knob—RED
S-6614	Knob—Volume control knob—GREY
S-6615	Knob—Volume control knob—RED
S-6616	Link—Carrying handle link (2 req'd)
S-6617	Plate—Decorative plate for top of cabinet (under li caps) (2 req'd)
S-6618	Screw—#6-32 X 5/16" hex head machine screw for mou ing speaker (4 req'd)
S-6619	Screw—#4 self tapping screw to hold clip catch to ca inet front (2 req'd)
S-6620	Screw—#6 self tapping oval head screw to hold dial cabinet (2 req'd) or link caps to insulator plate (req'd)
S-6621	Spacer—Metal spacer for speaker mounting (4 req'd)
S-6086	Spring—Retaining spring for knobs

MODEL 3-RF-91, Ch. RC1129



Model 3-RF-91 "Woodland"
Maroon

SPECIFICATIONS

TUNING RANGES

Standard Broadcast (AM)	540-1600 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 6X8	Mixer-Oscillator
(3) RCA 6BA6	(AM-FM) I.F. Amplifier
(4) RCA 6AU6	2nd FM I.F. Stage
(5) RCA 6AU6	3rd FM I.F. Stage
(6) RCA 6AL5	F.M. Detector
(7) RCA 6AV6	AM Det.-AVC-Audio
(8) RCA 6V6-GT	Audio Output
(9) RCA 5Y3-GT	Rectifier

POWER SUPPLY RATING

115 volts, 60 cycles	80 watts
DIAL LAMPS	2 No. 44, 6-8 volts, 0.25 amp.

LOUDSPEAKER

Size and Type	8" P.M.
Voice Coil Impedance	3.2 ohms

AUDIO POWER OUTPUT

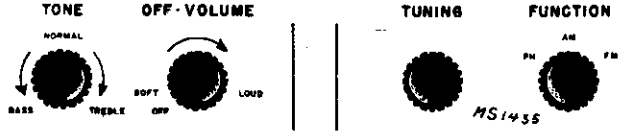
Undistorted	2.5 watts
Maximum	3.5 watts
TUNING DRIVE RATIO	7¼:1 (3⅝ turns of knob)
NET WEIGHT	19 lbs.

DIMENSIONS (Overall)

Height 10" Width 16½" Depth 9"

CIRCUIT DESCRIPTION

This instrument, a deluxe AM-FM table radio, has nine tubes, including rectifier. RF circuits, contained on a two tube sub-chassis, include RF amplification for both bands and a combination mixer-oscillator circuit. Special shielding and filtering have been incorporated to reduce oscillator radiation. The mixer is pentode connected for AM operation; triode connected for FM operation. AM IF circuits use an IF amplifier and conventional diode detector with AVC. FM IF circuits include three IF stages and a ratio detector. The two tube audio amplifier has an adjustable tone control circuit with combination bass and, treble compensation. A hum-bucking circuit uses the tapped-winding output transformer. A ferrite core AM antenna, and line cord FM antenna, allow reception without the use of external antennas. A phono jack at the instrument rear permits the use of a record player attachment.



(Left side of cabinet) (Right side of cabinet)

Radio Controls

OPERATING INSTRUCTIONS

RADIO—Turn OFF-VOLUME control about half-way in a clockwise direction to turn receiver ON and provide for medium VOLUME. Allow a short warm-up period. Set FUNCTION control at desired service—AM or FM. Rotate TUNING control to move the pointer to the desired AM or FM frequency. Adjust VOLUME and TONE controls as desired.

PHONOGRAPH—Connect attachment to PHONO jack at instrument rear. Switch the FUNCTION control to "PH" position. Turn on receiver and adjust VOLUME and TONE controls as desired.

ANTENNAS:

Under average conditions the receiver does not require an external antenna. However, provision is made for the use of external antenna if desired—connect as indicated below:

AM antenna: Open the link (normally connects terminals #1 and #2). Connect a single wire antenna to terminal #1.

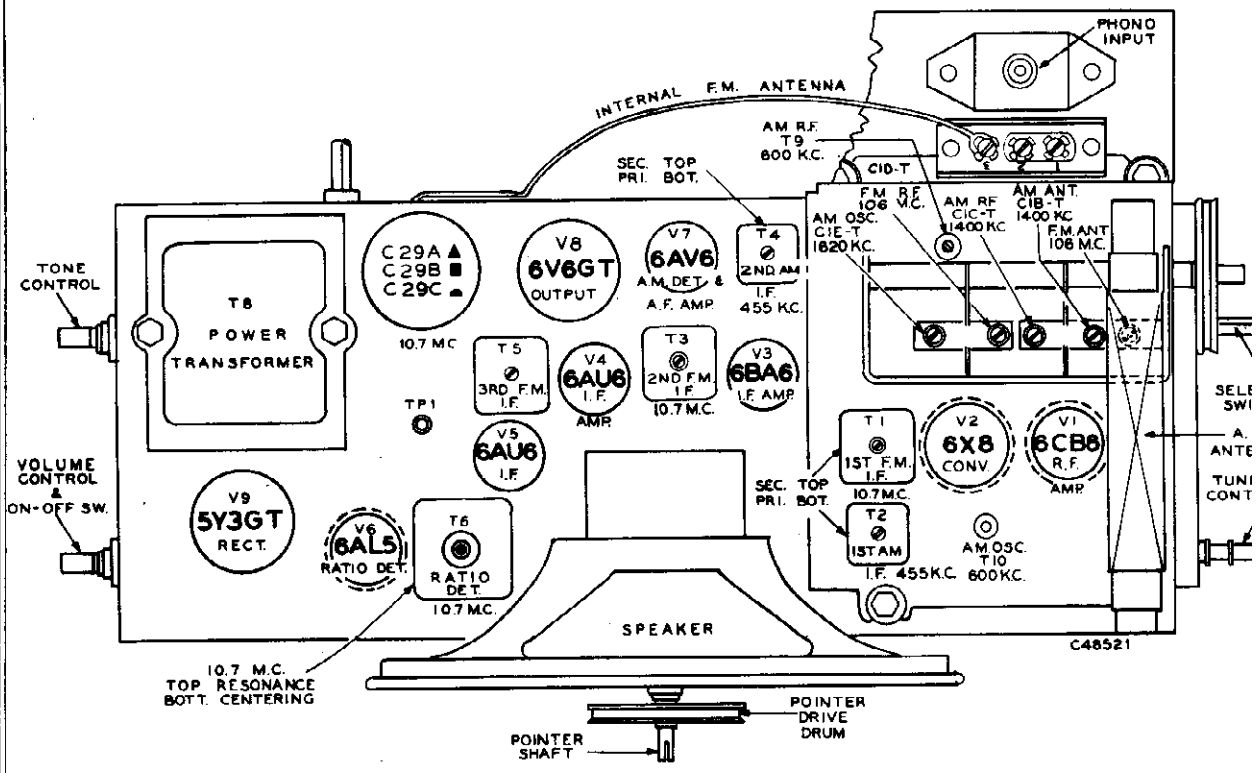
FM antenna: Remove the built-in antenna lead from #3 terminal. Connect the transmission line (300 ohm) from an external dipole antenna to terminals #2 and #3.

Ground: An external ground can be attached to terminal #2 if desired. Under some conditions an external ground is detrimental to FM reception.

NOTE: *For satisfactory reception on FM when using the built-in FM antenna the power cord must be fully extended and must not be coiled or hanked up.*

MODEL 3-RF-
Ch. RC1129

TUBE AND TRIMMER LOCATIONS—VOLTAGE DATA



Tube and Trimmer Locations

VOLTAGE CHART

Tube	Type	Elements	Pin No.	"AM"	"FM"	Phono.
1	RF amp. 6CB6	Plate	5	195	128	—
		Screen	6	96	65	—
		Cathode	2	0.4	0.5	—
		Grid	1	-1.4	-0.2	—
2	Mixer 6X8	Plate	9	39	38	—
		Screen	8	39	38	—
		Grid	7	-2.8	-1.5	—
	Osc. 6X8	Plate	3	79	66	—
		Grid	2	-6.1	-2.3	—
3	IF amp. 6BA6	Plate	5	195	187	218
		Screen	6	122	100	130
		Cathode	7	0.8	0.9	0.9
		Grid	1	-1.6	—	-1.2
4	IF amp. 6AU6	Plate	5	200	195	222
		Screen	6	65	62	69
		Cathode	7	0.55	0.55	0.65
5	IF amp. 6AU6	Plate	5	52	50	56
		Screen	6	49	47	53
		Cathode	7	0.36	0.35	0.4
		Grid	1	-0.34	-0.34	-0.3
6	Ratio Det. 6AL5	—	—	—	—	—
7	AF amp. 6AV6	Plate	7	69	68	73
		Grid	1	-0.8	-0.8	-0.8
8	Output 6V6GT	Plate	3	242	240	243
		Screen	4	200	195	222
		Cathode	8	11.1	10.7	12.6
9	Rectifier 5Y3GT	Fil.	8	257	254	260

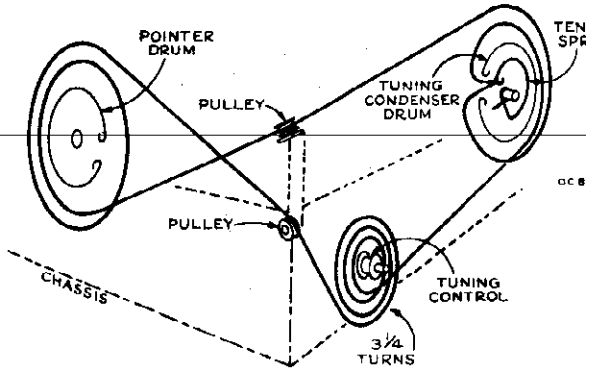
The heater voltage of the mixer/oscillator tube (6X8) is approx. 0.4 volt lower than other tubes in the same circuit. This is due to the filament choke coils L7 and L8.

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

RCA VoltOhmyst used for measuring all voltages.

CATHODE CURRENTS (MA)

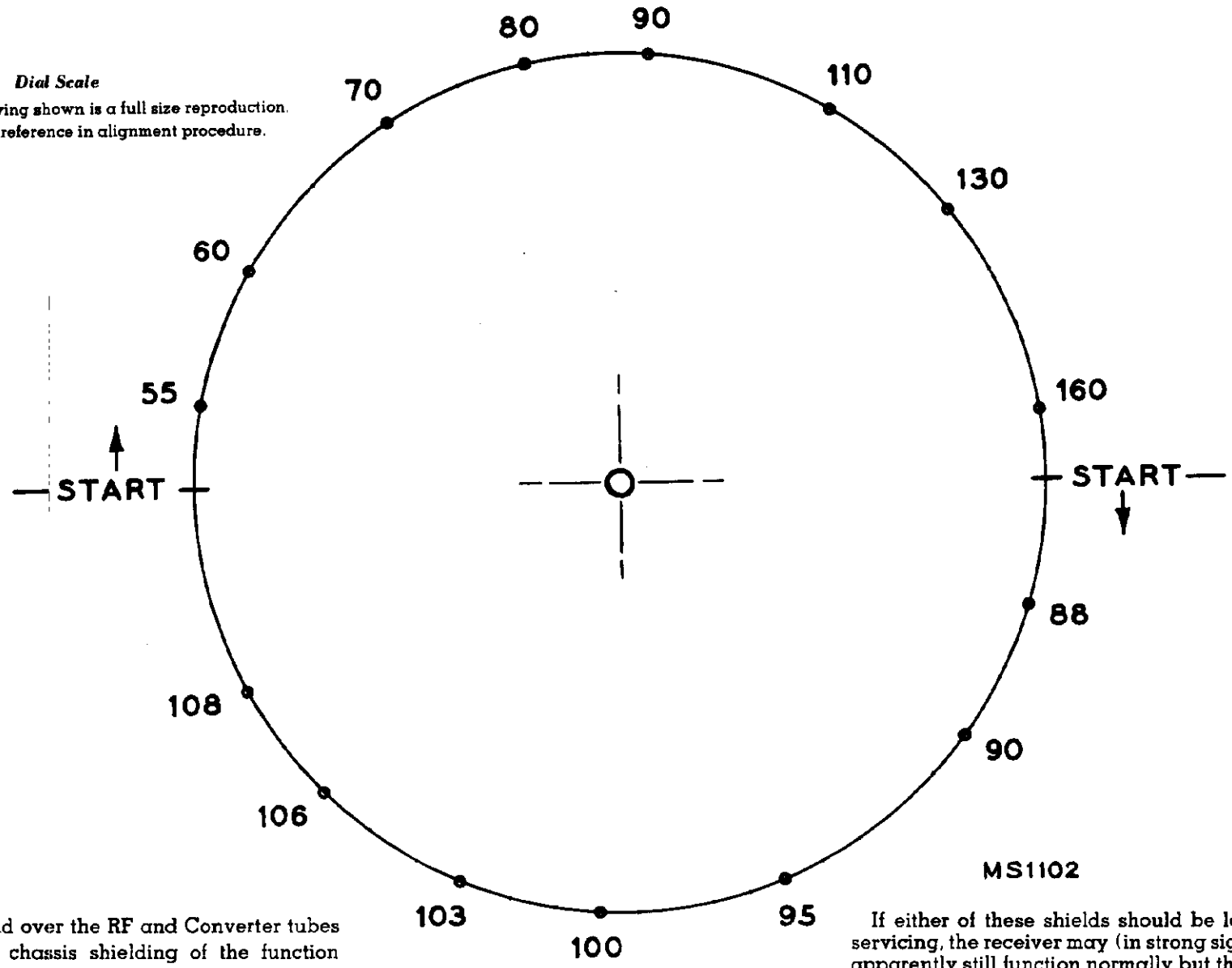
	Tube	Terminal	"AM"	"FM"	Phono.
1	6CB6	2	6.2	7.9	—
2	6X8	6	5.2	5.2	—
3	6BA6	7	11.6	13.4	13.8
4	6AU6	7	5.0	4.7	5.4
5	6AU6	7	3.3	3.0	3.6
6	6AL5	—	—	—	—
7	6AV6	2	0.3	0.3	0.36
8	6V6GT	8	34	33	37
9	5Y3GT	8	67	69	62



Dial Cord and Drive Assembly

Dial Scale

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



MS1102

SHIELDING

The box shield over the RF and Converter tubes and the under chassis shielding of the function switch reduces the FM oscillator radiation of Model 3-RF-91 to a point within limits established by the Federal Communications Commission.

ALWAYS REPLACE ALL SHIELDS

If either of these shields should be left off after servicing, the receiver may (in strong signal areas) apparently still function normally but the FM oscillator radiation will be greatly increased. This radiation will have an adverse effect on nearby television receivers and other FM radios.

ALIGNMENT PROCEDURE

Due to the use of separate I.F. transformers, there is little interaction between the 10.7 mc. and the 455 kc. adjustments.

There is a slight interaction of adjustments on the tuning condenser between AM and FM.

If a large amount of adjustment is required of any circuit, all others should be checked in the following order:

FM I.F.
AM I.F.
AM Osc., ant. and r.f.
FM Osc., ant. and r.f.

Final adjustment of AM ant. trimmer should be made with chassis and antenna in cabinet.

Alignment Indicators:

For measuring the developed d-c voltage across C36 during FM alignment an RCA VoltOhmyst or an equivalent meter should be used. An output meter connected across the voice coil is also needed to indicate minimum audio output during FM Ratio Detector alignment.

The RCA VoltOhmyst can also be used to indicate audio output voltage across the voice coil or developed voltage on the AVC bus.

Signal Generator:

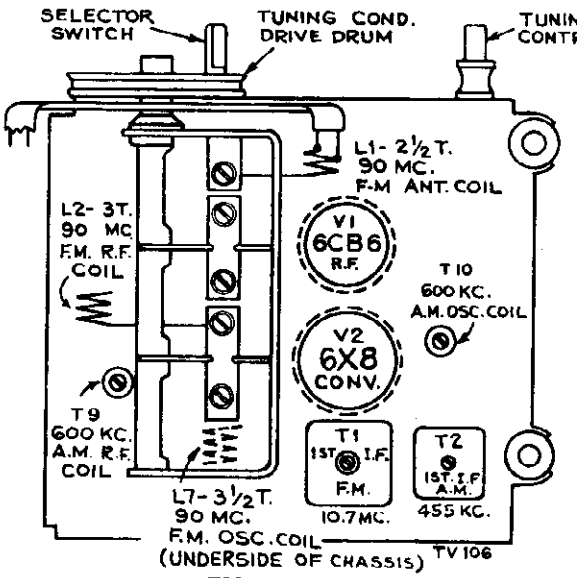
For alignment operations connect the low side of the signal generator to the receiver chassis. The output of the signal generator should always be controlled to prevent over-loading or excessive AVC action.

Oscilloscope Alignment:

It is preferable to use a sweep generator and oscilloscope for aligning I.F. and R.F. circuits to obtain a visual observation of curve shape during alignment.

With FM sweep generator connected between FM ant. (#3) terminal and chassis, and oscilloscope connected between the junction of R39-C32 and chassis, the overall FM linearity may be observed. With 100% FM modulation there should be a peak-to-peak separation of 150 kc. with 50,000 microvolts input before noticeable distortion of the sine wave is present.

For FM alignment of the ratio detector, connect oscilloscope to junction of 56K resistors as in alignment table, adjusting T6 top and bottom cores for 10.7 mc. crossover and balanced peaks. When aligning other FM tuned circuits, connect oscilloscope to TP1. Follow alignment table sequence, adjusting for maximum gain and symmetry.



FM Coil Locations

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 outpu
1	Pin 1 of V3 6BA6 in series with .01 mfd.	455 kc.	Quiet point at low freq. end	T4 bottom core (pri.) T4 top core (sec.)
2	Tap terminal T9 term. 4 in series with .01 mfd.			T2 top core (sec.) T2 bottom core (pri.)
3	No. 1 terminal on ant. input strip	1620 kc.	High freq. end of dial (min. cap.)	C1E-T
4		1400 kc.	1400 kc. signal	C1B-T ant. C1C-T r.f.
5		Shunt a 10,000 ohm resistor across the r.f. section of the gang.		
6		600 kc.	600 kc. signal	T10 osc.* (Rock gang
7		Remove the 10,000 ohm resistor and peak T9 r.f.*		
8	Repeat 3, 4, 5, 6 and 7			

* The correct adjustment of the Osc. (T10) core is that j obtained with core furtherest away from the coil moun clips. R.F. (T9) core should be set to the peak obtaine peaks are seldom obtainable) with core closest to the m ing clips.

MODEL 3-RF-91,
Ch. RC1129

CRITICAL LEAD DRESS

1. Lead from lug terminal "B" of the 1st FM transformer to rear switch wafer terminal #10 should not be changed from the original, 3 inches long plus or minus ¼" of #22 copper vinylite covered.
2. A.C. leads from power switch on volume control should be dressed as far as possible from the audio-leads and audio coupling condensers near or connecting to the volume control terminals.
3. Ground straps between the R.F. shelf and the main chassis should not be relocated.
4. The connection point of capacitor C13 is critical, therefore should not be altered. It must be connected to the function switch and not to the I.F. transformer.

RANGE SWITCH FUNCTIONS

The range switch has five functions:

1. Selection of AM or FM tuning ranges.
2. Selection and distribution of AVC voltages. Full AVC is applied to V1, V2 and V3 in AM position. No AVC is used on FM operation, the grid circuits of V1, V2, V3 being grounded through S1A.
3. Controls the application of B+ voltages to the plate and screen circuits of V1 and V2 (disconnected in phono position).
4. Controls audio input to volume control.
5. Switches mixer section of V2 (6X8) from pentode operation on AM to triode operation in FM position, and selects proper I.F. transformer (AM or FM).

FM Alignment

†† Alternate loading may be necessary to provide accurate observation of peaks.

Alternate loading involves the use of a 680 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 680 ohm resistor after T3 and T1 have been aligned.

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

Extreme care should be used to avoid running the I.F. cores all the way through the winding and out the other end.

** Note: FM antenna, mixer and oscillator coils are adjustable by increasing or decreasing the spacing between turns. The location of the tap on the antenna coil is ⅝ turn to ¾ turn from the ground end.

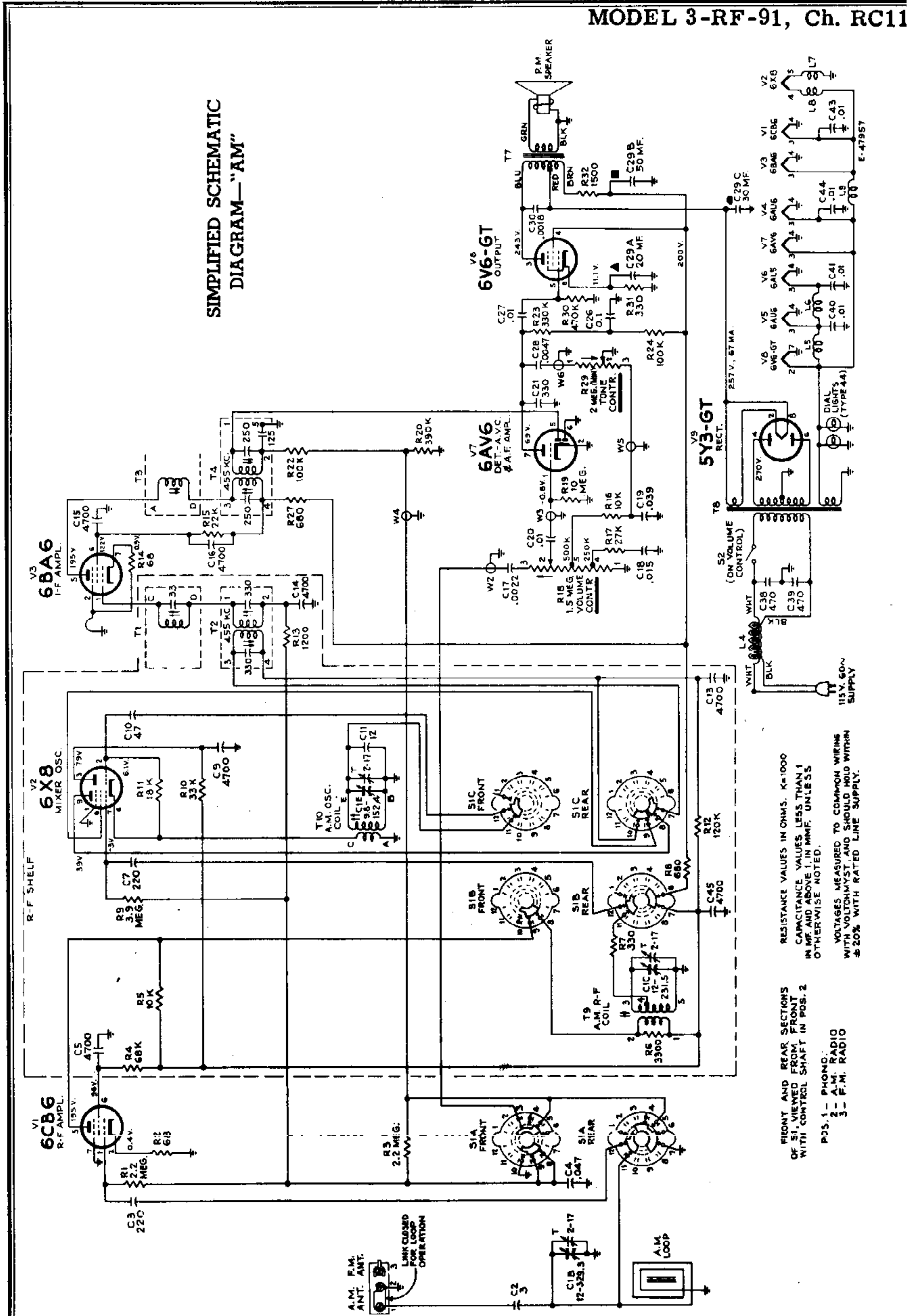
RANGE SWITCH IN FM POSITION—
VOLUME CONTROL MAXIMUM—TONE CONTROL CENTER

Steps	Connect high side of sig. gen. to—	Sig. gen. output	Turn radio dial to—	Adjust for peak output
1	Pin 1 of V5 6AU6 in series with .01 mfd.	10.7 mc. modulated 30% 400 cycles	Quiet point at low freq. end	
2	Connect VoltOhmyst across R41-39K resistor. Adjust Sig. gen. output to give 1 volt d-c on VoltOhmyst.			T6 top core for max. d-c voltage across C36
3	Shunt R41 with two 56K ±1% resistors connected in series. Connect VoltOhmyst from center junction of 56K resistors to junction of R39 and C32.			T6 bottom core for 0 volts d-c
4	Pin 1 of V3 6BA6 in series with .01 mfd.	.10.7 mc. modulated 30% 400 cycles	Quiet point at low freq. end	VoltOhmyst conn. to TP1. ††T5 top core. T3 top & bottom cores.
5	Stator of C1D in series with .01 mfd.			††T1 top and bottom cores
6	FM Ant. terminals 270 ohm resistor in series #3 term.	90 mc.	90 mc.	Remove bottom shield. **Osc. coil L3
7		106 mc.	106 mc. signal	Replace bottom shield. C1A-T ant., C1D-T r.f.
8		90 mc.	90 mc.	**L1 ant. L2 r.f.
9	Repeat steps 6, 7, and 8 until further adjustment does not improve calibration.			

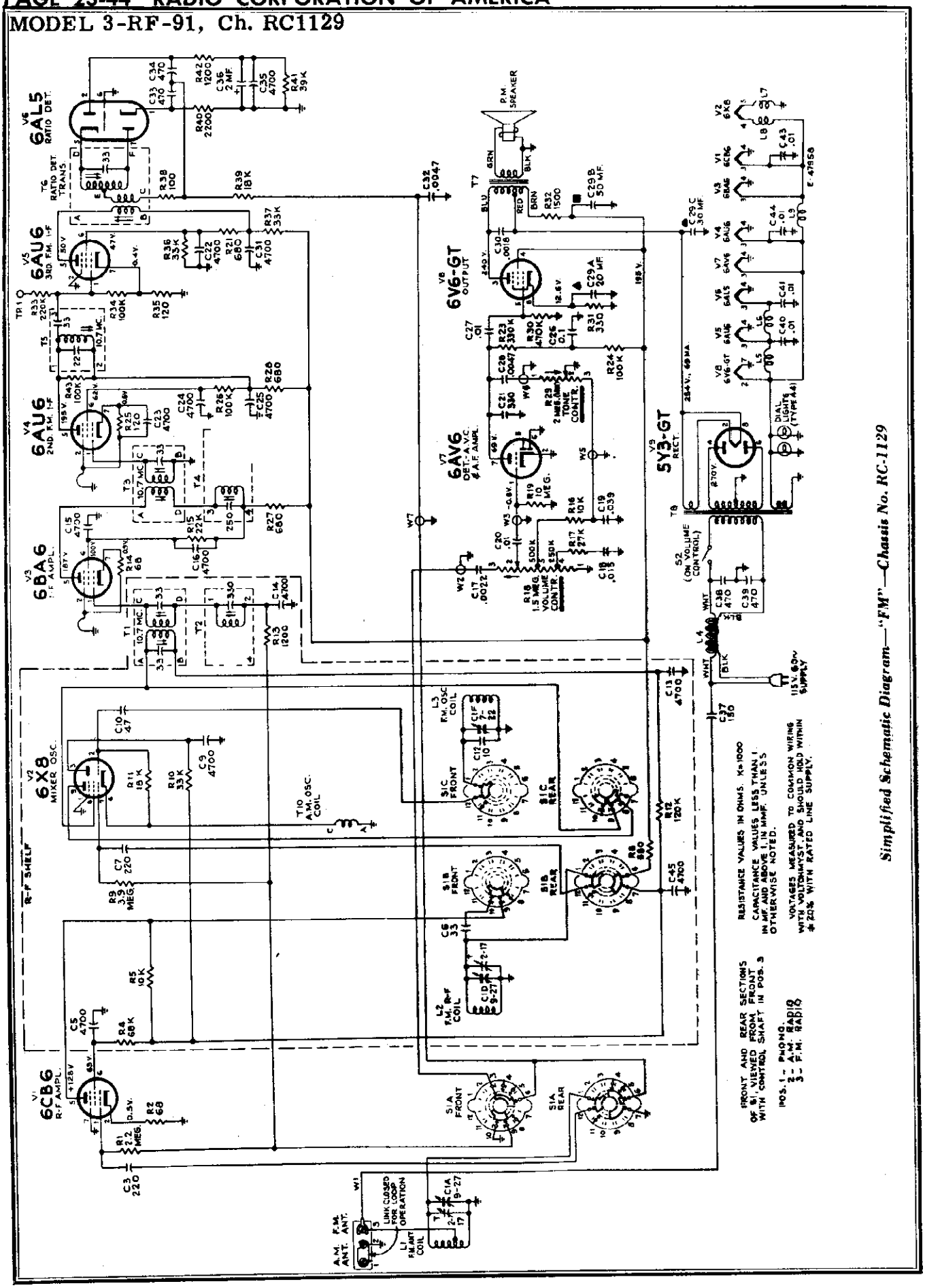
CORE PEAKING

Incorrect peaking can seriously affect gain and bandwidth. The correct peak is noted for the various coils and transformers.

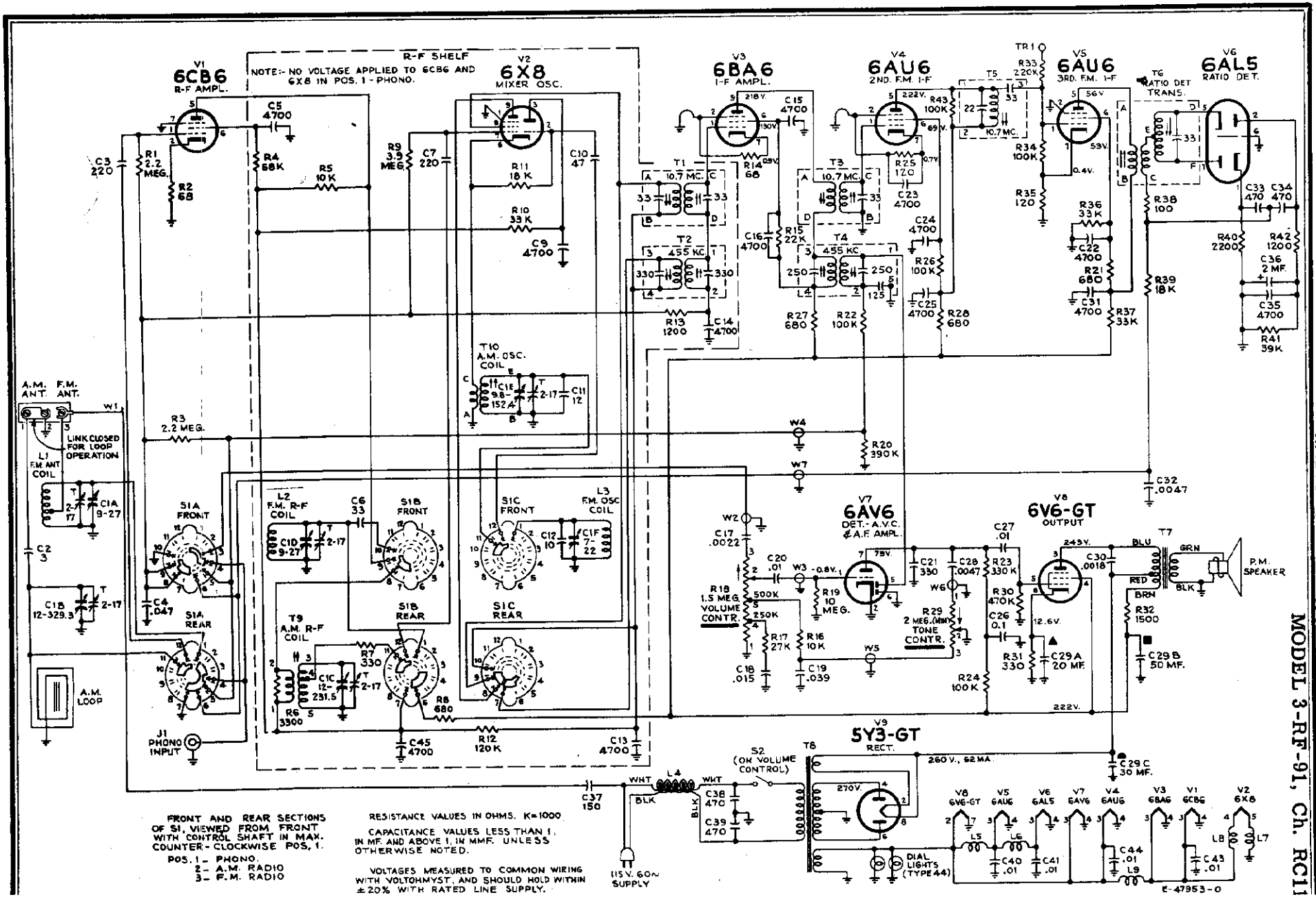
1. The RF transformer core screw should be adjusted on the peak position furtherest removed from the coil mounting clip. An incorrect peak may sometimes be obtained with the core screw almost all the way into the clip.
2. The oscillator coil (AM) should be adjusted on the peak obtained with the core coming out the lug end of the coil. When adjusting from the top of the chassis, this is the peak with the core furtherest into the coil.
3. The position of the FM IF transformer screws should be noted after adjustment. These cores should be peaked with the core part way out of the coil toward the adjusting hole. It is possible to run the IF cores all the way through the FM windings and obtain a second peak. This will cause serious overcoupling and should be avoided by using a marked adjusting stick. The correct peak is always the first peak obtained when the core is started in from the "backed all the way out" position.


SIMPLIFIED SCHEMATIC
DIAGRAM—"AM"
V1 6CB6 R-F AMPL.
V2 6X8 MIXER OSC.
V3 6BA6 I-F AMPL.
V7 6AV6 DET.-A.V.C. & A.F. AMPL.
V8 6V6-GT OUTPUT
V9 5Y3-GT RECT.
P.M. SPEAKER
R-F SHELF
A.M. LOOP
115 V. 60~ SUPPLY
RESISTANCE VALUES IN OHMS. K=1000
CAPACITANCE VALUES LESS THAN 1 IN MF. AND ABOVE 1 IN MMF. UNLESS OTHERWISE NOTED.
VOLTAGES MEASURED TO COMMON WIRING WITH VOLTOHMYST AND SHOULD HOLD WITHIN ±20% WITH RATED LINE SUPPLY.
FRONT AND REAR SECTIONS OF S1, VIEWED FROM FRONT WITH CONTROL SHAFT IN POS. 2
POS. 1 - PHONO
2 - A.M. RADIO
3 - F.M. RADIO
E-47957

MODEL 3-RF-91, Ch. RC1129



Simplified Schematic Diagram—"FM"—Chassis No. RC-1129

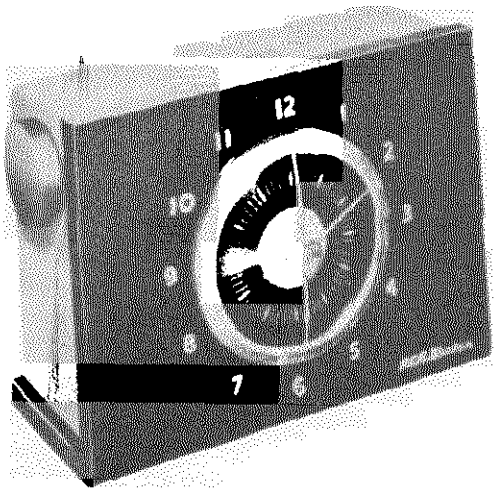

RADIO CORPORATION OF AMERICA PAGE 23
MODEL 3-RF-91, Ch. RC11
R-F SHELF
NOTE:- NO VOLTAGE APPLIED TO 6CB6 AND 6X8 IN POS. 1 - PHONO.
V1 6CB6 R-F AMPL.
V2 6X8 MIXER OSC.
V3 6BA6 I-F AMPL.
V4 6AU6 2ND. F.M. I-F
V5 6AU6 3RD. F.M. I-F
V6 6AL5 RATIO DET.
TR1
T6 RATIO DET TRANS.
V7 6AV6 DET.- A.V.C. & A.F. AMPL.
V8 6V6-GT OUTPUT
V9 5Y3-GT RECT.
T7
P.M. SPEAKER
T8
S1 (ON VOLUME CONTROL)
A.M. F.M. ANT.
LINK CLOSED FOR LOOP OPERATION
L1 F.M. ANT COIL
L2 F.M. R-F COIL
L3 F.M. OSC COIL
T9 A.M. R-F COIL
T10 A.M. OSC. COIL
S1A FRONT
S1A REAR
S1B FRONT
S1B REAR
S1C FRONT
S1C REAR
A.M. LOOP
J1 PHONO INPUT
115 V. 60~ SUPPLY
DIAL LIGHTS (TYPE 44)
FRONT AND REAR SECTIONS OF S1, VIEWED FROM FRONT WITH CONTROL SHAFT IN MAX. COUNTER-CLOCKWISE POS. 1.
POS. 1 - PHONO.
2 - A.M. RADIO
3 - F.M. RADIO
RESISTANCE VALUES IN OHMS. K=1000
CAPACITANCE VALUES LESS THAN 1, IN MF. AND ABOVE 1, IN MMF. UNLESS OTHERWISE NOTED.
VOLTAGES MEASURED TO COMMON WIRING WITH VOLTOHMYST, AND SHOULD HOLD WITHIN ±20% WITH RATED LINE SUPPLY.
E-47953-0

MODEL 3-RF-91, Ch. RC1129

STOCK No.	DESCRIPTION
	CHASSIS ASSEMBLIES RC1129
12717	Board—Antenna terminal board
76333	Capacitor—Variable tuning capacitor (C1A, C1B, C1C, C1D, C1E, C1F)
73473	Capacitor—Fixed, ceramic, 4700 mmf., +100%, —0%, 500 volts D.C., High "K" disc (C5, C9, C14, C15, C16, C22, C23, C24, C25, C31, C35, C45)
73960	Capacitor—Fixed, ceramic, 10,000 mmf., +100%, —0%, 500 volts D.C., High "K" disc (C40, C41, C43, C44)
76552	Capacitor—Fixed, ceramic, insulated, 330 mmf., ±10%, 500 volts D.C., High "K" disc (C21)
77277	Capacitor—Fixed, ceramic, non-insulated, 3 mmf., ±1 mmf., 500 volts D.C., Temp. coef. = 0 (C2)
76350	Capacitor—Fixed, ceramic, non-insulated, 10 mmf., ±0.5 mmf., 500 volts D.C. Temp coef. = —470 (C12)
76349	Capacitor—Fixed, ceramic, non-insulated, 12 mmf., ±10%, 500 volts D.C. Temp coef. = —330 (C11)
70596	Capacitor—Fixed, ceramic, non-insulated, 33 mmf., ±10%, 500 volts D.C. Temp coef. = 0 (C6)
39042	Capacitor—Fixed, ceramic, non-insulated, 47 mmf., ±10%, 500 volts D.C. Temp coef. = —750 (C10)
71920	Capacitor—Fixed, ceramic, non-insulated, 220 mmf., ±10%, 500 volts D.C. Temp. coef. = —750 (C3, C7)
	Capacitor—Fixed, mica:
39632	150 mmf., ±10%, 500 volts D.C. (C37)
77941	470 mmf., ±10%, 300 volts D.C. (C33, C34)
39644	470 mmf., ±20%, 500 volts D.C. (C38, C39)
39668	4700 mmf., ±20%, 500 volts D.C. (C13)
73747	Capacitor—Electrolytic, 2 mfd., 50 volts (C36)
76330	Capacitor—Electrolytic comprising 1 section of 30 mfd., 350 volts, 1 section of 50 mfd., 300 volts, and 1 section of 20 mfd., 25 volts (C29A, C29B, C29C)
	Capacitor—Fixed, tubular, paper:
77942	0.0022 mfd., 200 volts (C17)
73920	0.0047 mfd., 600 volts (C28, C32)
77424	0.01 mfd., 200 volts (C20)
73561	0.01 mfd., 400 volts (C27)
77943	0.015 mfd., 200 volts (C18)
77989	0.039 mfd., 200 volts (C19)
73558	0.047 mfd., 200 volts (C4)
73551	0.1 mfd., 400 volts (C26)
73851	0.0018 mfd., 1600 volts, oil impregnated (C30)
73935	Clip—Mounting clip for I.F. transformer
76354	Coil—Antenna coil—F.M. (L1)
71942	Coil—Filament choke coil (L5, L6, L9)
76351	Coil—Filament choke coil (L7, L8)
76337	Coil—Oscillator coil—A.M.—complete with adjustable core (T10)
77973	Coil—Oscillator coil—F.M. (L3)
76338	Coil—R.F. coil—A.M.—complete with adjustable core (T9)
76353	Coil—RF coil—F.M. (L2)
35787	Connector—Phono input connector (J1)
76460	Contact—Test point contact (TP1)
77936	Control—Tone control (R29)
70342	Control—Volume control and power switch (R18, S2)
72953	Cord—250' Drive cord reel—approx. 50" overall required
70392	Cord—Power cord and plug
74839	Fastener—Push fastener for mounting RF shelf
74838	Grommet—Power cord strain relief (1 set)
16058	Grommet—Rubber grommet for RF shelf (4 required)
11891	Lamp—Dial lamp—Mazda 44
76340	Pan—Speaker pan assembly complete less station selector pointer shaft and pulley
76341	Pulley—Station selector pointer shaft and pulley
52436	Resistor—Fixed, wire wound, 1500 ohms, 4 watts (R32)
	Resistor—Fixed, composition:
503068	68 ohms, ±10%, ½ watt (R2, R14)
503110	100 ohms, ±10%, ½ watt (R38)
503112	120 ohms, ±10%, ½ watt (R25, R35)
503133	330 ohms, ±10%, ½ watt (R7)
513133	330 ohm, ±10%, 1 watt (R31)
503168	680 ohms, ±10%, ½ watt (R8, R21, R27, R28)
503212	1200 ohms, ±10%, ½ watt (R13, R42)
503222	2200 ohms, ±10%, ½ watt (R40)
503233	3300 ohms, ±10%, ½ watt (R6)
503310	10,000 ohms, ±10%, ½ watt (R5, R16)
503318	18,000 ohms, ±10%, ½ watt (R11, R39)
503322	22,000 ohms, ±10%, ½ watt (R15)
503327	27,000 ohms, ±10%, ½ watt (R17)
503333	33,000 ohms, ±10%, ½ watt (R36)
513333	33,000 ohms, ±10%, 1 watt (R10, R37)
503339	39,000 ohms, ±10%, ½ watt (R41)
503368	68,000 ohms, ±10%, ½ watt (R4)
503410	100,000 ohms, ±10%, ½ watt (R22, R24, R26, R34, R43)
503412	120,000 ohms, ±10%, ½ watt (R12)
503422	220,000 ohms, ±10%, ½ watt (R33)
503433	330,000 ohms, ±10%, ½ watt (R23)
503439	390,000 ohms, ±10%, ½ watt (R20)
503447	470,000 ohms, ±10%, ½ watt (R30)
503522	2.2 megohm, ±10%, ½ watt (R1, R3)
503539	3.9 megohm, ±10%, ½ watt (R9)
503610	10 megohm, ±10%, ½ watt (R19)
76339	Shaft—Tuning knob shaft
73584	Shield—Tube shield for V2
76331	Shield—Tube shield for V1, V6
35574	Socket—Dial lamp socket
73117	Socket—Tube socket, 7 pin, miniature, wafer for V1 and V7
77937	Socket—Tube socket, 7 pin, miniature, wafer for V3, V4, V5, V6
70827	Socket—Tube socket, octal, wafer for V8, V9
76336	Socket—Tube socket, 9 pin, miniature, saddle mounted for V2
76332	Spring—Drive cord spring
76334	Switch—Function switch (S1)
76335	Transformer—First I.F. transformer—A.M. (T2)
75559	Transformer—First I.F. transformer—F.M. (T1)
76328	Transformer—Second I.F. transformer—A.M. (T4)
76329	Transformer—Second I.F. transformer—F.M. (T3)
77939	Transformer—Third I.F. transformer—F.M.—complete with adjustable core (T5)
77940	Transformer—Output transformer (T7)
76326	Transformer—Power transformer, 117 volts, 60 cycle (T8)
77938	Transformer—Ratio detector transformer complete with adjustable core (T6)
33726	Washer—"C" washer for station selector pointer shaft and pulley and for tuning knob shaft
	SPEAKER ASSEMBLIES 92586-8-W RMA-274
75024	Cone—Cone and voice coil (3.2 ohms)
74664	Speaker—8" P.M. speaker complete with cone and voice coil (3.2 ohms)
	MISCELLANEOUS
76343	Antenna—Ferrite rod antenna complete with coil less masonite support and grommets
76359	Back—Cabinet back
77944	Bezel—Decorative bezel—round—for front of cabinet
Y2519	Cabinet—Plastic cabinet less decals
76678	Clip—Mounting clip for cabinet back (4 required)
76767	Decal—Control function decal
76356	Dial—Polystyrene dial scale
77033	Emblem—"RCA Victor" emblem
77950	Grommet—Rubber grommet for mounting ferrite rod antenna to masonite support (2 required)
77951	Insert—Hard rubber insert for antenna mounting grommets (2 required)
77232	Knob—Function switch knob—maroon
77233	Knob—Tuning control, tone control or volume control and power switch knob—maroon
77947	Nameplate—"AM-FM" nameplate
72765	Nut—Speed nut to fasten bezel to cabinet (4 required)
73203	Nut—Speed nut to fasten "RCA Victor" or "AM-FM" emblems to cabinet
77948	Pointer—Station selector pointer
77945	Reflector—Dial scale reflector
77946	Screen—Grille screen
74734	Spring—Spring clip for control knobs
77949	Support—Antenna support (masonite) only

APPLY TO YOUR RCA DISTRIBUTOR FOR PRICES OF REPLACEMENT PARTS

MODELS 2C511, 2C51
2C513, 2C514, Ch. RC1



2C511 *Black & Gray* — *2C512* *Ivory* — *2C513* *Red* — *2C514* *Two Tone Gray*

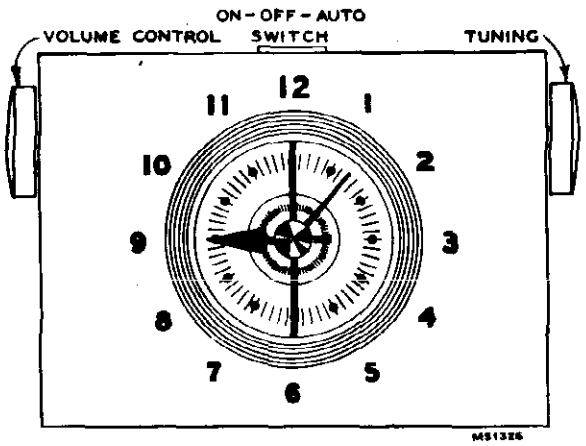
SPECIFICATIONS

Tuning Range ..... 540-1600 kc
Intermediate Frequency ..... 455 kc
Tube Complement:
(1) RCA 12BE6 ..... Converter
(2) RCA 6BJ6 ..... I.F. Amplifier
(3) RCA 12AV6 ..... Det.-AVC-A.F. Amp.
(4) RCA 6AK6 ..... Output
RCA Stock No. 77292 ..... Rectifier
Power Supply Rating:
115 volts a.c., 60 cycles ..... 20 watts
CAUTION: DO NOT OPERATE ON D.C.

Loudspeaker:
Size and type ..... 3 in
Voice Coil impedance ..... 3.2 ohms at 400 c
Power Output:
Undistorted 0.19
Maximum 0.35
Tuning Drive Ratio ..... 1 to 1 (Direct I
Weight 4
Dimensions (overall):
Height....6" Width....8½" Depth....4

OPERATING INSTRUCTIONS

This instrument contains a timer-type electric clock mechanism which may be used to automatically actuate the self-contained a.c. radio. The radio may also be operated independently of the clock mechanism.



Clock Radio Controls

CLOCK—1. Plug instrument into 115 v. a.c. outlet clock will start to operate immediately. Set the correc by turning clockwise, the "TIME" knob located c center of the instrument back. To set the alarm, tur "ALARM" knob clockwise until the desired time is cated by the alarm pointer extension on the hour l Pull knob out for alarm buzzer operation. To turn off bu push knob in.

RADIO—1. To obtain radio operation independen the clock, push the slide switch lever at the top c cabinet to the left "ON" position. Adjust volume and ing control knobs as required after approximately 3(ond warm-up. To increase volume turn knob clockwi viewed from volume control side panel. Push slide s lever to the center "OFF" position when finished liste

2. To automatically actuate the radio by the clock r anism, make initial volume and station setting described in section 1 above. Set the "ALARM" kn the time desired. Push slide switch lever to the "AUTO" position. If the alarm buzzer knob is pulle the alarm will sound approximately ten minutes aft radio starts operating. *Push alarm knob in to tu* alarm. The radio will turn itself off after a peri approximately one hour if the slide switch remains "AUTO" position after start of playing.

CAUTION—Keep slide switch "ON-OFF-AUTO" le "OFF" position when instrument is not in use. Locate i ment so that "TIME" and "ALARM" knobs have movement.

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.

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.

ALIGNMENT TABULATION

Step	Connect the high side of test-oscillator to—	Tune test-osc. to—	Turn radio dial to—	Adjust the following for max. output
1	6BJ6 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-A 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 C1B-T
4		1400 kc	1400 kc signal	ant. trimmer C1A-T
5		600 kc	600 kc (rock)	(osc. coil) Slug L3
6		Repeat steps 3, 4, and 5		

RADIO CHASSIS AND CLOCK SERVICE

TOOL REQUIREMENTS—A small #1 size cross-head screwdriver is required for disassembly of the radio into its major cabinet and chassis components.

TUBE SERVICE—Disassembly—To make tubes accessible for testing, remove the volume and tuning control knobs by pulling off. Unscrew counterclockwise the alarm and time knobs from their shafts. Invert the cabinet and remove only the two cross-head screws along the back underside of the cabinet. Place the cabinet in its normal position. Using only firm hand pressure, press down alternately at front right and left sides of the cabinet top, midway between the "ON-OFF-AUTO" slide switch lever and the cabinet sides, forcing down and backward, to disengage the molded-in plastic catches. Then lift off the cabinet rear cover.

Assembly—To reassemble, proceed in the reverse order, sliding the cabinet rear cover into its track on the cabinet base. Lift the front corners up slightly to clear the two molded-in pads at each front corner of the cabinet base. Then press down and snap-in the upper front edge of the cabinet rear cover under the top rim of the cabinet base. Make sure the slide switch and switch lever are in corresponding center "OFF" positions. Reassemble clock and radio knobs, and the two screws securing the cabinet rear cover.

RADIO CHASSIS SERVICE—Disassembly—To service chassis, open base as described above. In addition, remove the single cross-head screw remaining at the front underside of the cabinet and also the two cross-head screws located on the chassis near the tuning gang and the volume control. Lift out the chassis and remove the four self-tapping cross-head screws holding the bottom cover to the chassis. Lift off the bottom cover.

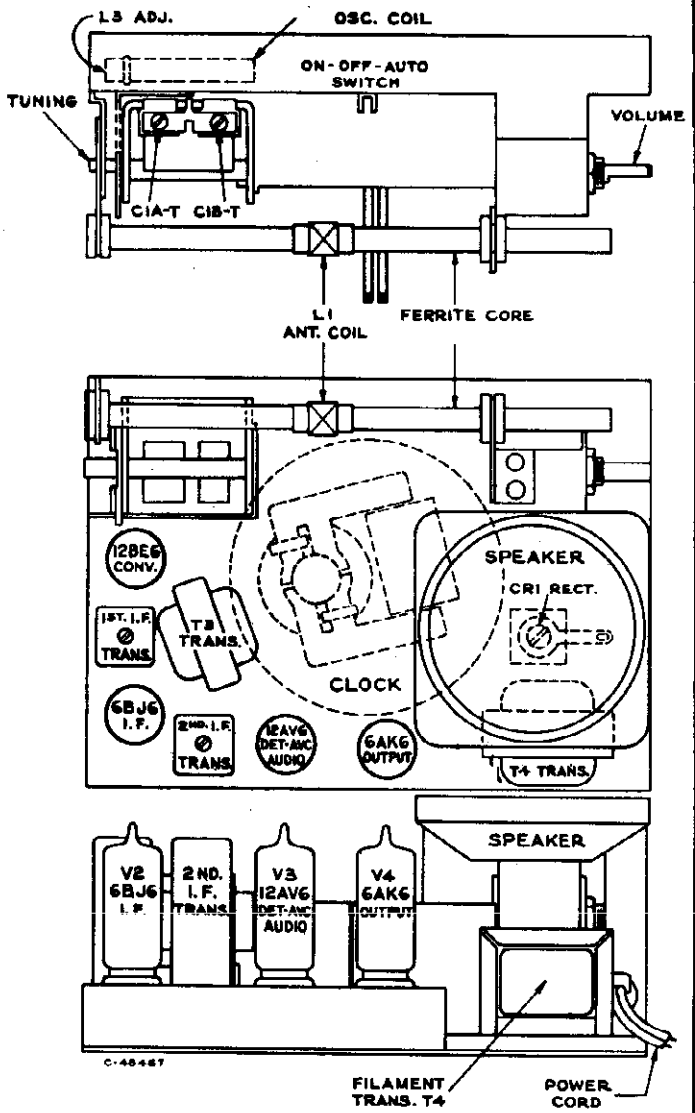
Assembly—Reassemble in the reverse order. Secure the bottom cover to the chassis with the four self-tapping screws. Next, insert the single self-tapping screw holding the chassis to the bottom of the cabinet base. Center the chassis mounting holes so that they line up with the holes in the cabinet and replace the two cross-head machine screws. Tighten just sufficiently to hold the chassis firmly. Do not turn the screws to the possible limit of travel unless this is necessary to hold the chassis firmly. The average receiver may have a 1/32" clearance between the chassis metal panel and molded plastic boss. If any of the four foam rubber cushions on the bottom cover register in the clock face after assembly, push the excess length under the "Z" tabs of the bottom cover.

CLOCK SERVICE—Disassembly—To service clock, remove chassis and bottom cover as described above. In addition, remove the three screws holding the speaker to the speaker mounting bracket. Remove the two hex nuts holding the clock to the chassis pan recess. Lift the clock out. Unsolder the clock leads at the clock terminals.

Assembly—Proceed in the reverse order. Solder clock leads, and secure clock to chassis pan with two hex head nuts. Reassemble speaker to speaker mounting bracket.

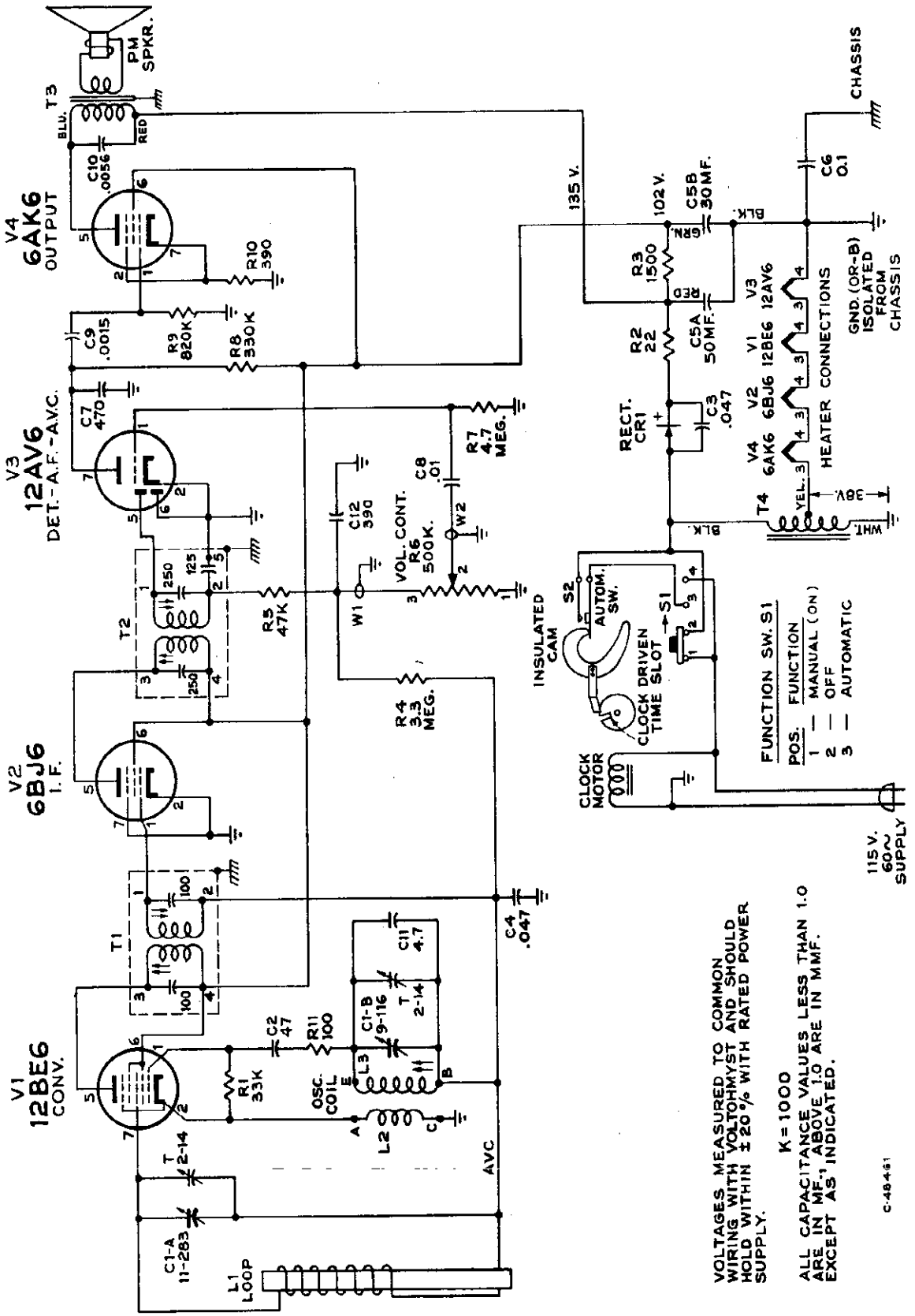
CRITICAL LEAD DRESS

1. Filament leads should be dressed away from secondary output lead, terminal #1, of 2nd I.F. Transformer and secondary output lead, terminal #1, of 1st I.F. transformer.
2. Connect the outside foil of capacitors as shown on schematic.
3. Dress electrolytic capacitor leads and filament transformer leads away from selenium rectifier.
4. Plate and grid leads of 12BE6 and 6BJ6 tubes should be kept as short and direct as possible.



Tube and Trimmer Locations

MODELS 2C511, 2C512
2C513, 2C514, Ch. RC11



VOLTAGES MEASURED TO COMMON WIRING WITH VOLTOHMYST AND SHOULD HOLD WITHIN ±20% WITH RATED POWER SUPPLY.

K=1000

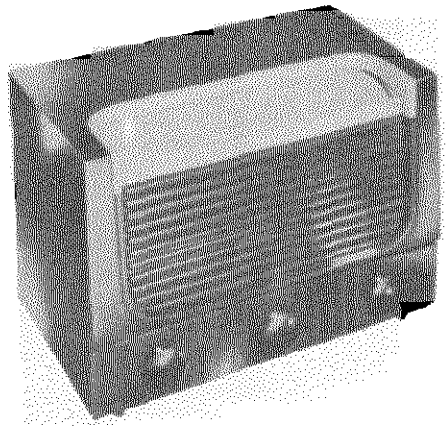
ALL CAPACITANCE VALUES LESS THAN 1.0 ARE IN MF.' ABOVE 1.0 ARE IN MMF. EXCEPT AS INDICATED.

C-48481

MODELS 2C511, 2C512, 2C513, 2C514, Ch. RC1118

STOCK NO.	DESCRIPTION
	CHASSIS ASSEMBLIES
	RC 1118—Model 2C511 RC 1118A—Model 2C512
	RC 1118B—Model 2C513 RC 1118C—Model 2C514
77410	Antenna—Ferrite rod antenna complete with windings L1
77408	Capacitor—Variable tuning capacitor C1A, C1B
77471	Capacitor—Ceramic, 4.7 mmf. C11
75609	Capacitor—Ceramic, 47 mmf. C2
75641	Capacitor—Ceramic, 390 mmf. C12
75198	Capacitor—Ceramic, 470 mmf. C7
77427	Capacitor—Electrolytic comprising 1 section of 50 mfd., 150 volts and 1 section of 30 mfd., 150 volts C5A, C5B
77425	Capacitor—Tubular, paper, .0015 mfd., 200 volts C9
77488	Capacitor—Tubular, paper, .0056 mfd., 400 volts C10
77424	Capacitor—Tubular, paper, .01 mfd., 200 volts C8
77422	Capacitor—Tubular, paper, .047 mfd., 400 volts C4
75071	Capacitor—Tubular, moulded, .047 mfd., 400 volts C3
77423	Capacitor—Tubular, paper, 0.1 mfd., 400 volts C6
77421	Clip—"C" clip for mounting speaker
75010	Clip—"C" clip for mounting output transformer
73935	Clip—Mounting clip for I.F. transformer
77411	Coil—Oscillator coil complete with adjustable core L2, L3
77409	Control—Volume control R6
70392	Cord—Power cord and plug
77404	Cover—Chassis bottom cover
77419	Cushion—Foam rubber cushion for speaker rim or bottom cover
74838	Grommet—Power cord strain relief (1 set)
77418	Grommet—Rubber grommet for mounting ferrite rod antenna
77405	Insulator—Bakelite insulator for variable tuning capacitor
77406	Insulator—Ferrite rod antenna mounting insulator —L.H.
77407	Insulator—Ferrite rod antenna mounting insulator —R.H.
77292	Rectifier—Selenium rectifier CR1
	Resistor—Fixed, composition:—
503022	22 ohms, ±10%, ½ watt R2
503110	100 ohms, ±10%, ½ watt R11
503139	390 ohms, ±10%, ½ watt R10
532215	1500 ohms, ±10%, 2 watts R3
503333	33,000 ohms, ±10%, ½ watt R1
503347	47,000 ohms, ±10%, ½ watt R5
503433	330,000 ohms, ±10%, ½ watt R8
503482	820,000 ohms, ±10%, ½ watt R9
503533	3.3 megohm, ±10%, ½ watt R4
503547	4.7 megohm, ±10%, ½ watt R7
75780	Socket—Tube socket, 7 pin, miniature, saddle mounted
77415	Switch—Function switch S1
77413	Transformer—Filament transformer 117 volts A.C. input T4
77414	Transformer—Output transformer T3
77416	Transformer—1st. I.F. transformer complete with adjustable cores T1
77417	Transformer—2nd. I.F. transformer complete with adjustable cores T2
77420	Washer—Shoulder washer (nylon) for variable tuning capacitor mounting (3 req'd)
	SPEAKER ASSEMBLIES
	971920-1
77428	Speaker—3" P.M. speaker complete with cone and voice coil (3.2 ohms)
	MISCELLANEOUS
77430	Back—Polystyrene cabinet back—gray tan—for Model 2C511
77505	Back—Polystyrene cabinet back—ivory—for Model 2C512
77507	Back—Polystyrene cabinet back—red—for Model 2C513
77509	Back—Polystyrene cabinet back—gray—for Model 2C514
77433	Button—Slide button for function switch less clip
77429	Case — Polystyrene case front — black — complete with window less back for Model 2C511
77504	Case — Polystyrene case front — ivory — complete with window less back for Model 2C512
77506	Case—Polystyrene case front—red—complete with window less back for Model 2C513
77508	Case — Polystyrene case front — gray — complete with window less back for Model 2C514
77434	Clip—Spring clip for function switch slide button
77431	Dial—Dial knob—gray tan—for Model 2C511
77498	Dial—Dial knob—ivory—for Model 2C512
77499	Dial—Dial knob—red—for Model 2C513
77500	Dial—Dial knob—gray—for Model 2C514
77432	Knob—Volume control knob—gray tan—for Model 2C511
77501	Knob—Volume control knob—ivory—for Model 2C512
77502	Knob—Volume control knob—red—for Model 2C513
77503	Knob—Volume control knob—gray—for Model 2C514
77412	Knob—Timer knob
77437	Screw—#6 x 5/16" cross recessed truss head tapping screw for mounting chassis
77436	Screw—#6-32 x 3/8" cross recessed truss head machine screw for mounting chassis to case
77435	Screw—#6-32 x 5/16" cross recessed truss head machine screw for fastening case assembly
74734	Spring—Spring clip for dial knob or volume control knob
77467	Washer—Knob Washer—felt
	CLOCK ASSEMBLY
* * *	Clock—If clock mechanism repair becomes necessary, remove the clock from the radio. The RCA Victor Distributor in your area will advise you of the address of the nearest authorized service station for clock mechanisms. Repair facilities and replacement parts are available at these authorized service stations.

APPLY TO YOUR RCA DISTRIBUTOR FOR PRICES OF REPLACEMENT PARTS



Specifications

Tuning Ranges

Standard Broadcast ("A" Band)..... 540-1600 kc
Short Wave ("C" Band)..... 5.8-18.0 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 .....2 Type 1490, 3.2 volts, 0.15 amp.

Power Supply Rating

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

Loudspeaker

Type 971495-9W .....4 in. P.M
V. C. Impedance.....3.2 ohms at 400 cycle

Power Output

Undistorted ..... 0.85 watt
Maximum ..... 1.2 watt

Weight .....8 lb

Cabinet Dimensions

Height...8⅝ in. Width...11¾ in. Depth...7½ in

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

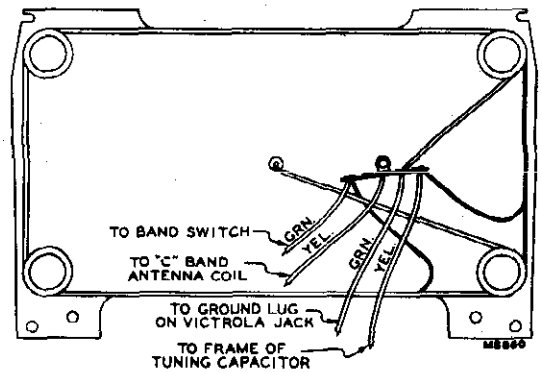
NOTE: If reception is not obtained on DC, revers plug in outlet receptacle. This may also reduce hum o AC operation.

Operating Instructions

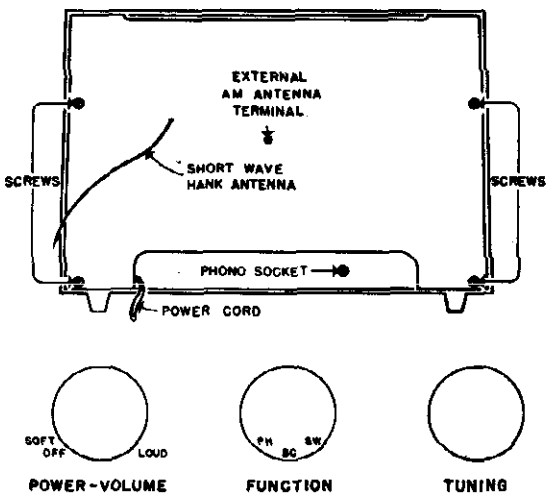
Radio—Turn power on with POWER-VOLUME control and set about half-way for volume. Set the FUNCTION Control for the type of program desired and allow 30 to 40 second warm-up period when the dial will be fully illuminated.

Tune in desired station with TUNING Control making slow and careful setting in conjunction with volume control for Short Wave reception. Make final setting of VOLUME control to suit requirements.

Phonograph Operation—Plug in record changer attach ment to phono socket on lower chassis apron. Set FUNC TION switch to "PH" (phono) position. Adjust VOL UME control for listening requirements.

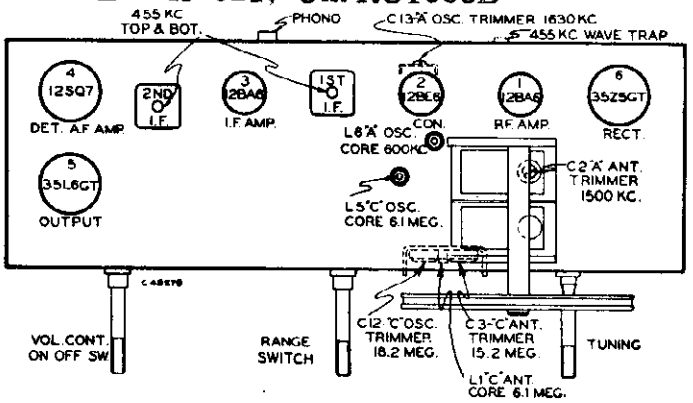


Loop Antenna Leads

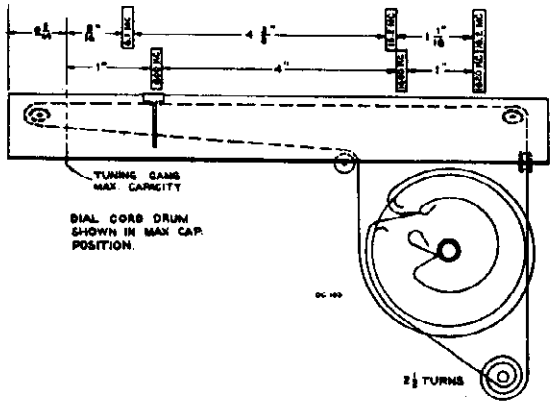


Radio Controls

MODEL 2-X-621, Ch. RC1085B



Tube and Trimmer Locations



Dial Indicator and Drive Mechanism

ALIGNMENT PROCEDURE

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.	1620 kc.	"A"	1620 kc. (Cap. min.)	C-13 "A" Osc.
5		1400 kc.		1400 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.				

*Use 18K resistor across primary when aligning secondary, across secondary when aligning primary.

**Two peaks should be found, use one having lowest capacity.

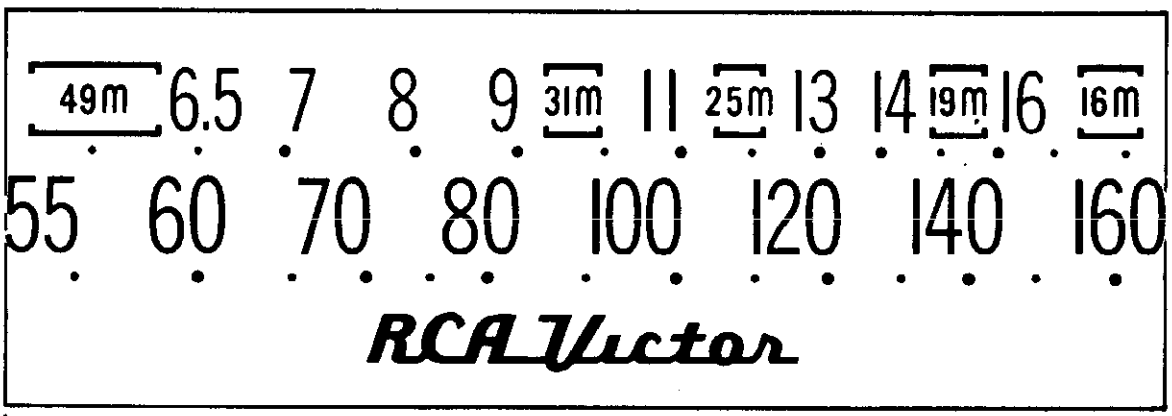
***Two peaks should be found, use one having highest capacity.
Note: Check for image frequences.

†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.

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.

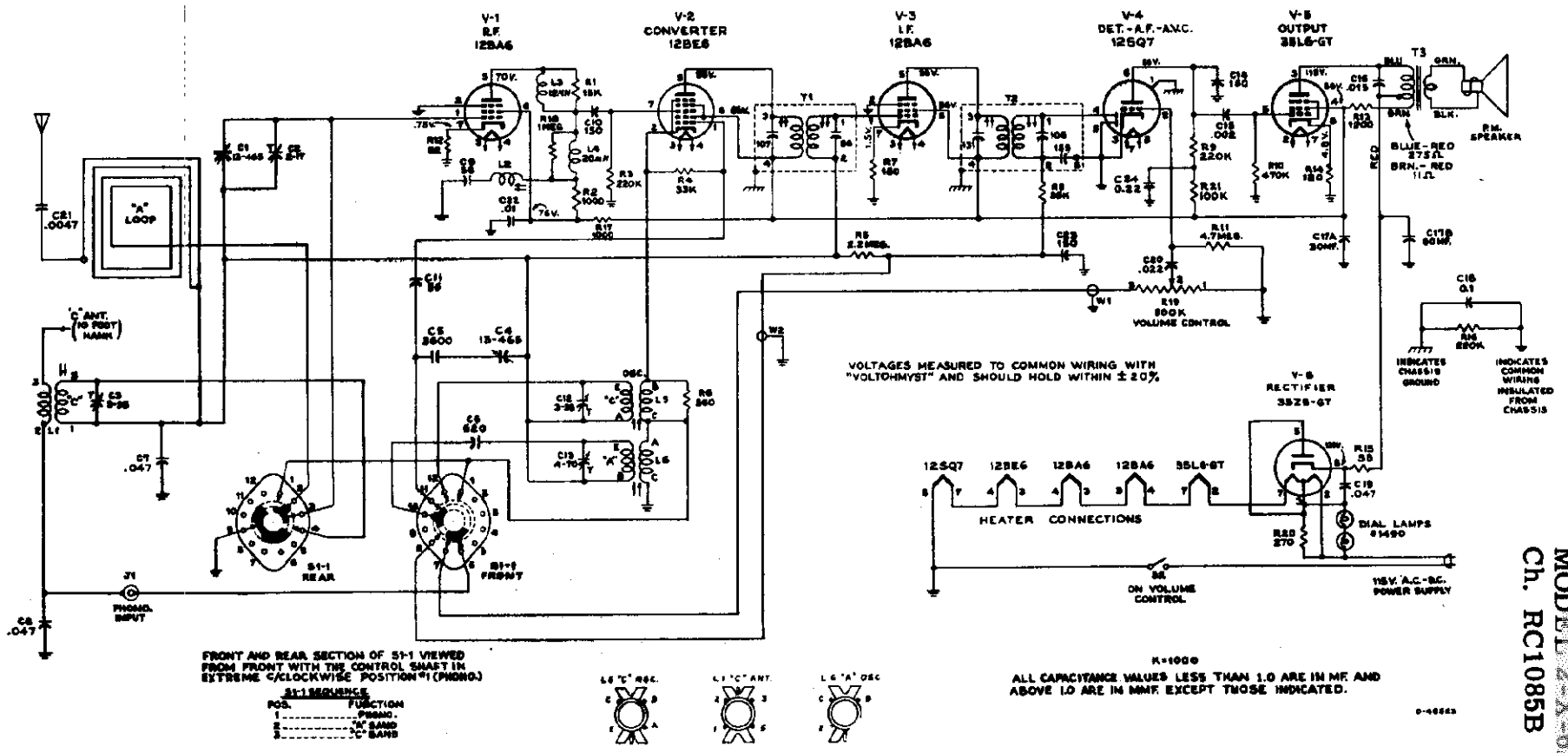
Output Meter Alignment—If this method is used, connect the meter across the voice coil and turn the receiver volume control to maximum.



Dial Scale Actual Size

CRITICAL LEAD DRESS

1. Dress all heater leads and pilot light leads down to chassis and away 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. 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.
4. All R.F. leads to coils should be short and direct. Dress other leads and components away from coils.



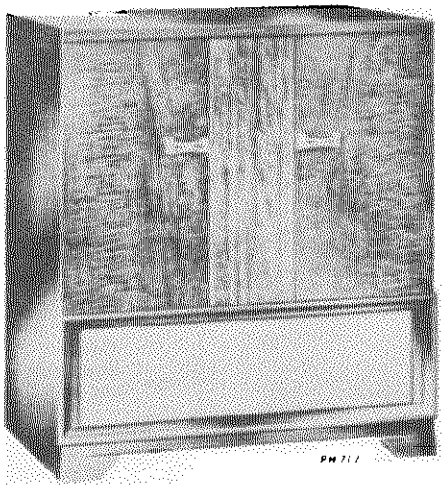
MODEL 2-X-621,
Ch. RC1085B

STOCK NO.	DESCRIPTION
	CHASSIS ASSEMBLIES RC-1085B
77217	Antenna—Antenna loop and back cover—maroon
77217	Back—Cabinet back cover and antenna loop assembly—maroon
71042	Button—Plug button for trimmer adjustment hole
77216	Capacitor—Variable tuning capacitor complete with drive drum C1, C2, C4
74924	Capacitor—Mica trimmer, dual 3-35 mmf. C3, C12
74923	Capacitor—Mica trimmer, 4-70 mmf. C13
71924	Capacitor—Ceramic, 56 mmf. C9, C11
73501	Capacitor—Ceramic, 150 mmf. C10, C14, C23
38831	Capacitor—Mica, 620 mmf. C6
39665	Capacitor—Mica, 3600 mmf. C5
73473	Capacitor—Ceramic, 4700 mmf. C21
72312	Capacitor—Electrolytic comprising 1 section of 30 mfd., 150 volts and 1 section of 80 mfd., 150 volts C17A, C17B
73595	Capacitor—Tubular, paper, .0022 mfd., 600 volts C15
73561	Capacitor—Tubular, paper, .01 mfd., 400 volts C22
73797	Capacitor—Tubular, paper, .015 mfd., 600 volts C16
73562	Capacitor—Tubular, paper, .022 mfd., 400 volts C20
73553	Capacitor—Tubular, paper, .047 mfd., 400 volts C7, C8, C19
73551	Capacitor—Tubular, paper, 0.1 mfd., 400 volts C18
73794	Capacitor—Tubular, paper, 0.22 mfd., 400 volts C24
73935	Clip—Mounting clip for I.F. transformer
74927	Coil—Antenna coil—"C" band L1
74925	Coil—Oscillator coil—"A" band—complete with adjustable core L6
74926	Coil—Oscillator coil—"C" band—complete with adjustable core L5
74930	Coil—Peaking coil (12 muh.) L3, R1
72618	Coil—Peaking coil (20 muh.) L4, R18
74928	Coil—Series wavetrap coil (455 KC) complete with adjustable core L2
35787	Connector—Phono input connector J1
75474	Connector—Single contact male connector for output transformer leads (2 req'd.)
38410	Control—Volume control and power switch R19, S2
72953	Cord—250' Drive Cord Reel (approx. 50" req'd.)
70392	Cord—Power cord and plug
74838	Grommet—Power cord strain relief (1 set)
33139	Grommet—Rubber grommet for chassis base
16058	Grommet—Rubber grommet for mounting tuning capacitor
70980	Lead—Antenna lead—"C" band
77142	Pointer—Station selector pointer

STOCK NO.	DESCRIPTION
	Resistor—Fixed, composition:—
514033	33 ohms, ±20%, 1 watt R15
503082	82 ohms, ±10%, ½ watt R12
503112	120 ohms, ±10%, ½ watt R14
503118	180 ohms, ±10%, ½ watt R7
503127	270 ohms, ±10%, ½ watt R20
503156	560 ohms, ±10%, ½ watt R6
503210	1000 ohms, ±10%, ½ watt R2, R17
513212	1200 ohms, ±10%, 1 watt R13
503333	33,000 ohms, ±10%, ½ watt R4
503356	56,000 ohms, ±10%, ½ watt R8
503410	100,000 ohms, ±10%, ½ watt R21
503422	220,000 ohms, ±10%, ½ watt R3, R9, R16
503447	470,000 ohms, ±10%, ½ watt R10
504522	2.2 megohm, ±20%, ½ watt R5
504547	4.7 megohm, ±20%, ½ watt R11
74922	Shaft—Tuning knob shaft
74697	Socket—Dial lamp socket
73117	Socket—Tube socket, 7 pin, miniature for V1, V2, V3
54414	Socket—Tube socket, octal, saddle-mounted for V4, V5, V6
76368	Spring—Drive cord spring
74921	Switch—Selector switch S1
74918	Transformer—First I.F. transformer complete with adjustable cores T1
73037	Transformer—Second I.F. transformer complete with adjustable cores T2
73976	Transformer—Output transformer T3
35969	Washer—"C" washer for tuning knob shaft
	SPEAKER ASSEMBLIES 971495-9W
77218	Speaker—4" P.M. speaker complete with cone and voice coil (3.2 ohms)
	MISCELLANEOUS
Y2447	Cabinet—Plastic cabinet—maroon—complete with dial escutcheon
77220	Dial—Polystyrene dial scale
77241	Escutcheon—Dial escutcheon
75761	Grommet—Rubber grommet for mounting speaker (4 req'd.)
77219	Knob—Selector switch knob—maroon
74931	Knob—Tuning control or volume control and power switch knob—maroon
71116	Lamp—Dial lamp—Mazda 1490
74301	Screw—#8 x ⅜" cross recessed binder head screw for mounting dial
30900	Spring—Retaining spring for knobs

APPLY TO YOUR RCA DISTRIBUTOR FOR PRICES OF REPLACEMENT PARTS

MODEL 2-S-
Ch. RC1117D



SPECIFICATIONS

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

Intermediate Frequency ..... 455 kc.

Tube Complement

1. RCA 12BE6 ..... Converter
2. RCA 12BA6 ..... I.F. Amplifier
3. RCA 6AQ6 ..... Detector—A.F. Amplifier
4. RCA 6AQ6 ..... Phase Inverter
5. RCA 35C5 } Push Pull Output
6. RCA 35C5 }

A selenium rectifier Stock #76871 is used.

Power Supply Rating

115 volts A.C., 60 cycles ..... 45 watts

Dial Lamps (2) ..... Mazda type 51, 6-8 volts, 0.2 amp.

Loudspeaker

Size and type ..... 8" P.
Voice coil impedance ..... 3.2 ohms at 400 cycl

Power Output

At 10% distortion ..... 2.0 wat
Maximum ..... 2.9 wat

Cabinet Dimensions

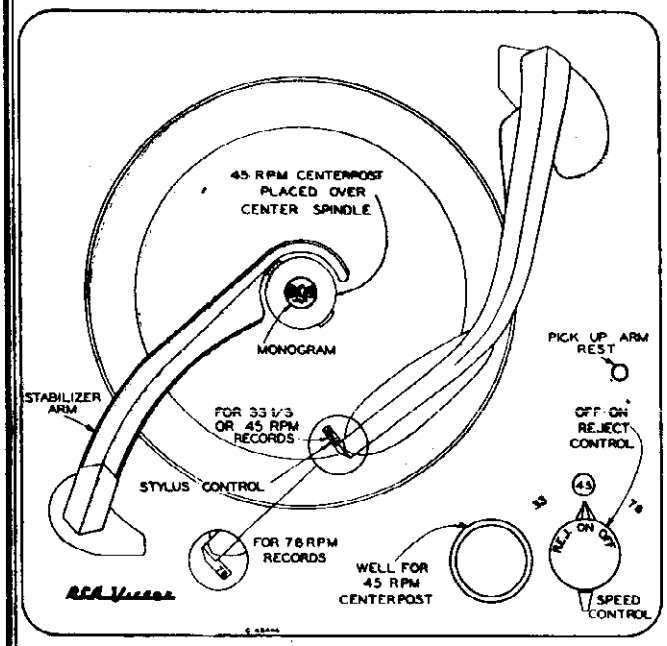
Height 32¼" Width 28½" Depth 19⅛

Tuning Drive Ratio ..... 14¼:1 (7⅛ turns of knob

Record Changer (930409-5, or -10)

Turntable speed ..... 33⅓, 45 or 78 r.p.
Record capacity .... up to fourteen 7 inch RCA type
or twelve 10 inch
or ten 12 inch
or ten 10 in. and 12 in. intermixe
Pickup (Stock No. 75475) .. Crystal with replaceable styl

Weight ..... 66 lbs. n



Record Changer Controls

RECORD CHANGER CONTROLS

The record changer has a dual control on the moto board and a stylus selector control on the pickup arm. Th inner control (circular knob) is the OFF-ON-REJECT contr Turning this knob to the center position energizes the mot and starts the turntable, when turned to the right (clockwis it starts the mechanism into complete automatic operatio The mechanism will shut off automatically after the la record has been played but can be shut off manually b turning this knob to the left (counter-clockwise).

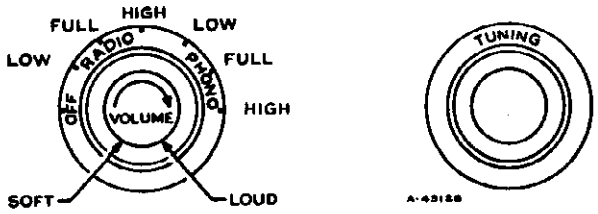
The outer control (double ended lever) is the speed co trol. It has three normal positions, "33", "45", "78" to sele the turntable speed desired and a neutral position (midwa between "45" and "78"). The control should be turned this neutral position if the changer is not expected to be use for an extended period of time.

The stylus control has two normal positions (right an left) and one shipping position (lever pointing up). Wh playing 33⅓ or 45 r.p.m. records the lever is turned so th "33-45" is visible on the TOP of the lever; likewise for r.p.m. records "78" should be visible on the TOP.

The removable centerpost is for use with 45 r.p.m. recor having the large centerhole. It must be placed over t center spindle with the "RCA" trademark monogram FA ING to the FRONT. When not in use it is placed in a w at the front of the motorboard.

To load or remove records, the record stabilizer is lift and turned off-side. After loading it is turned to the cent where it rests on top of the stack of records.

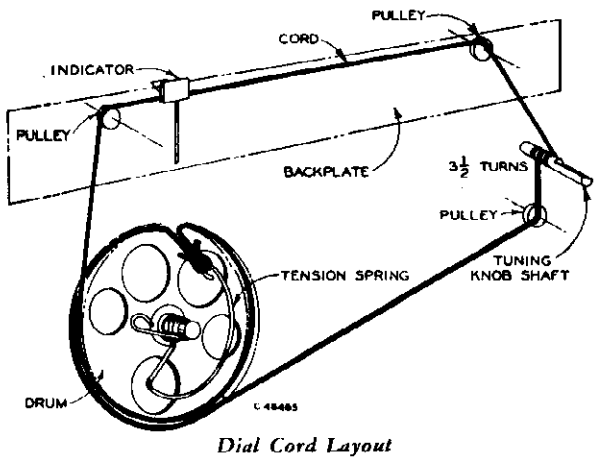
MODEL 2-S-7, Ch. RC1117D



Radio Controls

Critical Lead Dress

1. Dress all leads away from R22.
2. Dress all filament leads down to chassis.
3. Dress output plate leads down to chassis.
4. Dress R12 close to chassis.



Dial Cord Layout

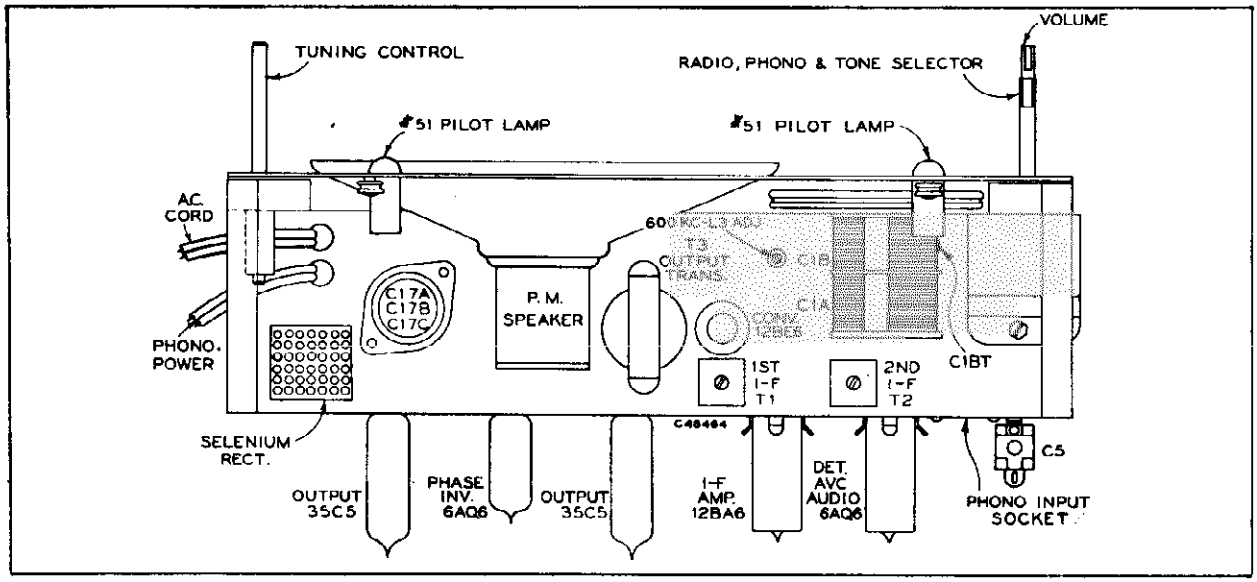
Alignment Procedure

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

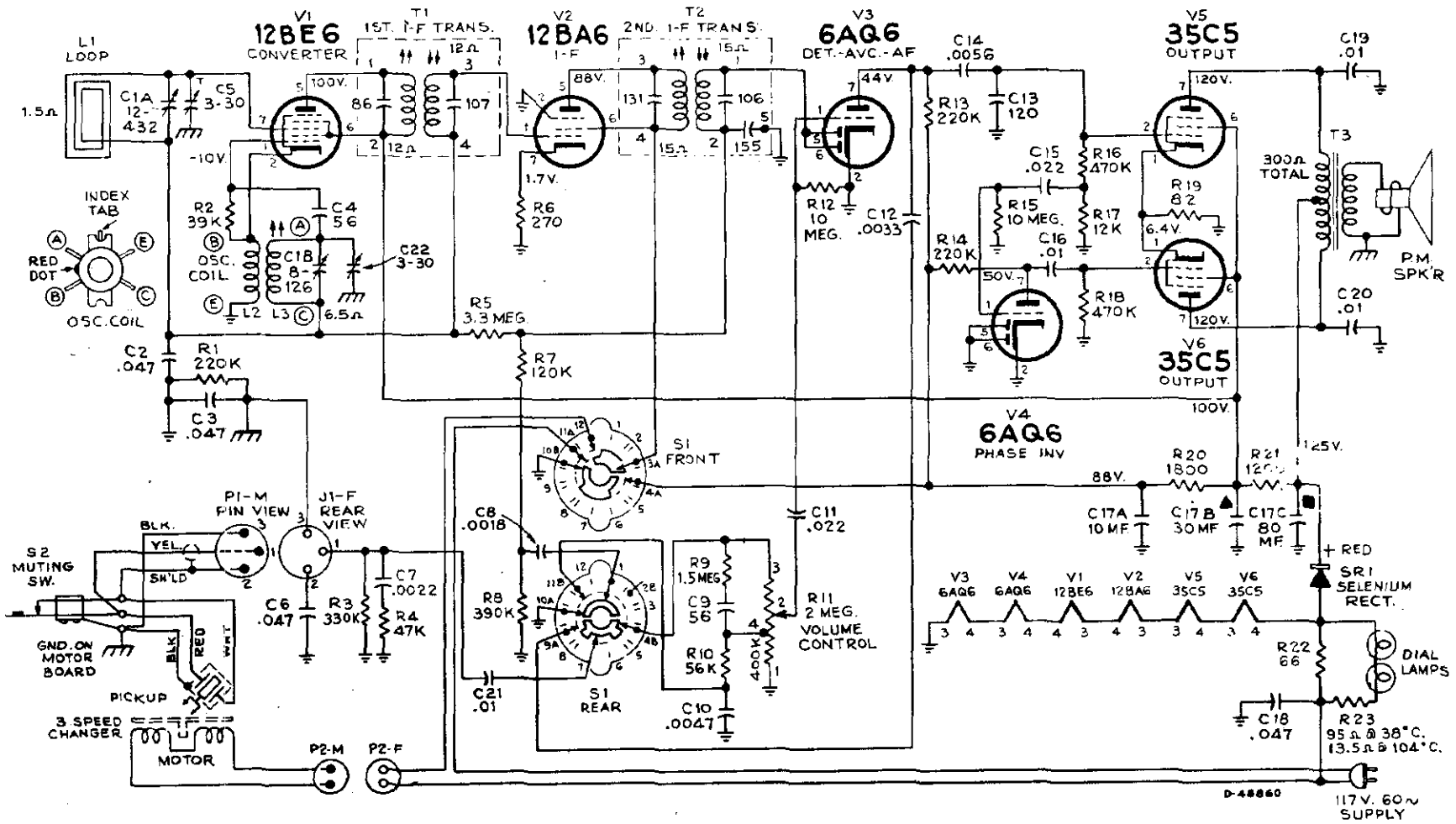
Test Oscillator.—Connect low side of test oscillator to common wiring in series with a .1 mf. capacitor. If the test oscillator is a.c. operated it may be necessary to use an isolation transformer for the receiver during alignment and the low side of the test oscillator connected directly to common wiring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

Steps	Connect the high side of test-oscillator 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 MUST BE IN CABINET FOR THE FOLLOWING				
3	Short wire placed near loop for radiated signal	1,620 kc	Extreme R. H. end (gang open)	C22 (osc.)
4		1,400 kc	1,400 kc	C5 (ant.)
5		600 kc	600 kc Signal	L3 (Rock Gang)
6	Repeat steps 3, 4 & 5 if necessary			

Dial Pointer Adjustment.—Rotate tuning condenser fully counterclockwise (plates fully meshed). Adjust indicator pointer so that it is $3\frac{15}{16}$" from the left hand edge of the dial back plate.



Tube and Trimmer Locations



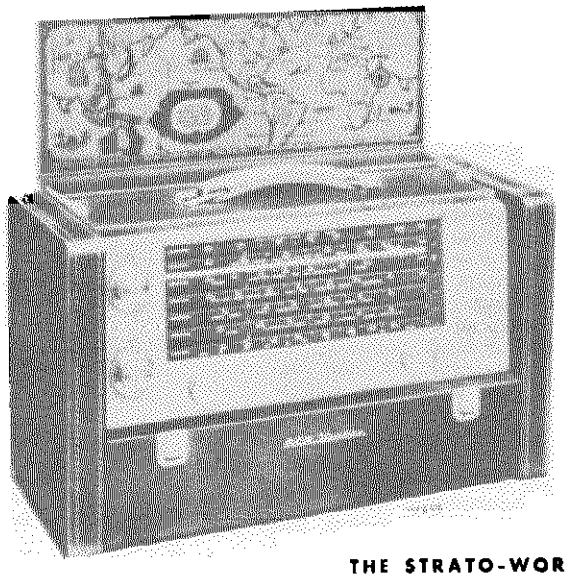
Schematic Diagram—Chassis RC-1117C

MODEL 2-S-7, Ch. RC1117D

STOCK No.	PART DESCRIPTION
	CHASSIS ASSEMBLIES RC1117D
76876	Antenna—Antenna loop and back cover, L1
76867	Capacitor—Variable tuning capacitor, C1A, C1B
76872	Capacitor—Adjustable trimmer, 2.5—30 mmf., C5, C22
77116	Capacitor—Fixed, ceramic, insulated, temp. coef.—-3300, 56 mmf., ±20%, 500 volts DC, C4
93603	Capacitor—Fixed, ceramic, insulated, high K type—56 mmf., ±10%, 500 volts, C9
76347	120 mmf., ±20%, 500 volts, C13
73013	Capacitor—Electrolytic: comprising 1 section of 80 mfd., 150 volts, 1 section of 30 mfd., 150 volts and 1 section of 10 mfd., 150 volts, C17A, C17B, C17C
	Capacitor—Fixed, tubular, paper:
73851	.0018 mfd., 1600 volts, C8, C21
73595	.0022 mfd., 600 volts, C7
73795	.0033 mfd., 400 volts, C12
73920	.0047 mfd., 400 volts, C10
73788	.0056 mfd., 400 volts, C14
73561	.01 mfd., 400 volts, C16, C19, C20
73562	.022 mfd., 400 volts, C11, C15
73553	.047 mfd., 400 volts, C2, C3, C6
75071	Capacitor—Fixed, tubular, moulded paper: .047 mfd., 400 volts, C18
73935	Clip—Mounting clip for I.F. transformer
76866	Coil—Oscillator coil complete with adjustable core, L2, L3
36422	Connector—Phono input connector, J1
77114	Connector—Single contact male connector for loop lead
75474	Connector—Single contact male connector for speaker cable
30868	Connector—2 contact female connector for motor cable, P2
76874	Control—Volume control, R11
72953	Cord—250' Drive Cord Reel (approx. 54" overall req'd)
73690	Cord—Power cord and plug
74838	Grommet—Power cord strain relief (1 set)
72283	Grommet—Rubber grommet for mounting variable capacitor
11765	Lamp—Dial lamp—Mazda 51
28452	Plate—Bakelite mounting plate for electrolytic
77926	Plate—Dial back plate complete less dial
77378	Pointer—Station selector pointer
76871	Rectifier—Selenium rectifier, SR1
73072	Resistor—Normal value 95 ohms, @ 38°C with negative temperature coefficient, R23
77379	Resistor—Wire wound, 66 ohms, 5 watts, R22
	Resistors—Fixed, composition:
503082	82 ohms, ±10%, ½ watt, R19
503127	270 ohms, ±10%, ½ watt, R6
513212	1200 ohms, ±10%, 1 watt, R21
503218	1800 ohms, ±10%, ½ watt, R20
503312	12,000 ohms, ±10%, ½ watt, R17
503339	39,000 ohms, ±10%, ½ watt, R2
503347	47,000 ohms, ±10%, ½ watt, R4
503356	56,000 ohms, ±10%, ½ watt, R10
503412	120,000 ohms, ±10%, ½ watt, R7
503422	220,000 ohms, ±10%, ½ watt, R1, R13, R14
503433	330,000 ohms, ±10%, ½ watt, R3
503439	390,000 ohms, ±10%, ½ watt, R8
503447	470,000 ohms, ±10%, ½ watt, R16, R18
503515	1.5 megohm, ±10%, ½ watt, R9
503533	3.3 megohm, ±10%, ½ watt, R5
503610	10 megohm, ±10%, ½ watt, R12, R15
76869	Shaft—Tuning knob shaft
76870	Shield—Tube shield

STOCK No.	PART DESCRIPTION
74697	Socket—Dial lamp socket
77115	Socket—Tube socket, 7 pin, miniature, moulded
51955	Socket—Tube socket, 7 pin, miniature, moulded saddle-mounted
76368	Spring—Drive cord spring
76873	Switch—Function switch less volume control, S1
77122	Transformer—Output transformer, T3
74918	Transformer—First I.F. transformer complete with adjustable cores, T1
73037	Transformer—Second I.F. transformer complete with adjustable cores, T2
33726	Washer—"C" washer for tuning knob shaft
	SPEAKER ASSEMBLIES 92586-4W RL10504 RMA-274
75024	Cone—Cone and voice coil (3.2 ohms)
74664	Speaker—8" P.M. speaker complete with cone and voice coil (3.2 ohms)
	MISCELLANEOUS
71892	Catch—Bullet catch and strike
70142	Clamp—Dial clamp (1 set)
X3351	Cloth—Grille cloth for blonde mahogany instruments
X3350	Cloth—Grille cloth for mahogany or walnut instruments
30870	Connector—2 contact male connector for motor cable, P2
74192	Connector—3 contact male connector for pickup cable, P1
77898	Decal—Control function decal for blonde mahogany instruments
77897	Decal—Control function decal for mahogany or walnut instruments
74273	Decal—"Victrola" decal
77889	Dial—Glass dial scale
74205	Escutcheon—Dial scale escutcheon less dial
74838	Grommet—Power cord strain relief (1 set)
77402	Handle—Pullout handle for record changer mechanism
74308	Hinge—Door hinge (1 set)
77892	Knob—Function switch knob—beige—for blonde mahogany instruments (outer)
77891	Knob—Function switch knob—maroon—for mahogany or walnut instruments (outer)
77382	Knob—Tuning control knob—beige—for blonde mahogany instruments (inner)
77386	Knob—Tuning control knob—beige—for blonde mahogany instruments (outer)
75945	Knob—Tuning control knob—maroon—for mahogany or walnut instruments (inner)
77385	Knob—Tuning control knob—maroon—for mahogany or walnut instruments (outer)
75464	Knob—Volume control knob—beige for blonde mahogany instruments (inner)
74963	Knob—Volume control knob—maroon—for mahogany or walnut instruments (inner)
77894	Pan—Record changer mounting pan—beige—for blonde mahogany instruments
77893	Pan—Record changer mounting pan—plum—for mahogany or walnut instruments
76421	Pin—Slide mechanism stop pin
77896	Pull—Door pull
74113	Screw—#8-32 x 1" trimit head screw for door pull
77895	Slide—Mounting pan slide mechanism
76422	Spring—Retaining spring for slide mechanism stop pin
30330	Spring—Retaining spring for knobs 74963 and 75464
76837	Spring—Retaining spring for knobs 75945, 77382, 77385, 77386, 77891, 77892
72936	Stop—Door stop

APPLY TO YOUR RCA DISTRIBUTOR FOR PRICES OF REPLACEMENT PARTS



THE STRATO-WORLD

Specifications

Tuning Ranges

Standard Broadcast "A" Band	540-1600 kc
"B" Band	2.0-4.0 mc
"C" Band	4.0-8.0 mc
31 Meter Spread Band	9.45- 9.85 mc
25 Meter Spread Band	11.55-12.05 mc
19 Meter Spread Band	14.90-15.55 mc
16 Meter Spread Band	17.50-18.20 mc

Intermediate Frequency ..... 455 kc

Power Supply Rating

115 volts, d.c., or 25 to 60 cycles a.c. ..... 20 watts

or

Battery Operation ..... using RCA VS047 Battery
Battery voltage ..... "A" 9 volts, "B" 90 volts
Battery current ..... "A" 56 ma., "B" 14.5 ma.

or

230 volts d.c., or 25 to 60 cycles a.c. using RK-186 Converter Accessory

Tube Complement

(1) RCA 1U4	R.F. Amplif
(2) RCA 1L6	Conver
(3) RCA 1U4	I.F. Amplif
(4) RCA 1U5	Det.-AVC-1st A
(5) RCA 3V4	Outp
RCA Stock No. 78101	Selenium Rectif

Loudspeaker

Size and Type	5¼ in. P.
Voice coil impedance	3.2 ohms at 400 cyc

Power Output

Undistorted	0.22 w
Maximum	0.42 w

Tuning Drive Ratio 11½

Weight (Approximate)

Less Battery	16 l
With Battery (RCA VS047)	23 l

Dimensions (Overall)

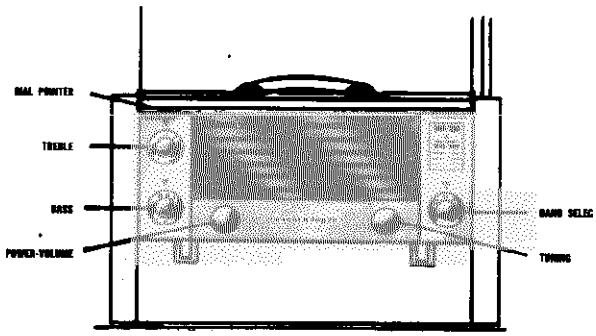
Height 11½ in. Width 17½ in. Depth 8 in.

Operating Instructions

Rotate POWER-VOLUME knob to right until a click is heard, and advance for about half a turn. Rotate BAND SELECTOR knob until desired band marking on knob is directly beneath the red triangle. A white indicator will appear at right of desired band on dial. To obtain reception on any one of the six Short Wave bands, the telescopic rod antenna must be used. See instructions under "General Information." Rotate TUNING knob until dial pointer indicates desired frequency marking on the desired band. Rotate TREBLE and BASS tone control knobs as desired. Treble tone increases as TREBLE knob is rotated clockwise. BASS tone increases as BASS knob is rotated counter-clockwise.

Headphones — A "PHONES" receptacle, for connection of headphones, is located on the rear of the chassis. Should individual listening be desired, any standard headphone set with standard plug may be inserted, automatically disconnecting the speaker.

Ground Terminal — A terminal for ground connection is located on the rear of the chassis. To improve reception in weak-signal areas, connect a ground wire from this t minal ("GND") to a cold-water pipe, or other suitab ground. "GND" connection is not necessary when operati on power line.



Operating Controls

MODEL 3-BX-671, Ch. RC-1125

Circuit Description

The seven band 3BX671 portable instrument is a sensitive three-way receiver designed to operate from an AC or DC power source, or from a self-contained battery pack. With the addition of an RK-186 converter, the receiver may be operated on 210-250 volts AC or DC. A chassis jack is provided for this converter.

The receiver incorporates a 7 band tuner covering the broadcast band "A band"; two short wave bands, 2-4 mc. and 4-8 mc. "B and C bands"; also four short wave spread bands, 31, 25, 19, and 16 meters. The superheterodyne circuit is used with a tuned R.F. stage preceding the pentagrid converter on all bands; one I.F. stage; a combined AVC, detector, and A.F. stage; and a power amplifier stage. A selenium rectifier is used.

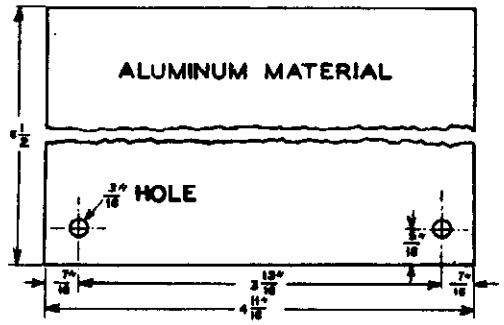
R.F. tuning is done by means of a ganged six section variable capacitor. Three large sections are used for the A, B, and C bands with series tracking capacitors. Also, three small 3 plate sections for electrical band spread are used on the four spread bands. The tuner, including the function switch, coil and trimmer assembly, R.F. and converter tubes and gang capacitor, is a completely detachable unit featuring high efficiency with small physical size. The special design permits access to the coil and trimmer adjustments from the rear.

A headphone jack is located on the chassis rear apron for individual listening. This jack automatically disconnects the speaker when the headphone plug is inserted. The slide rule type dial includes 7 separate scales on a slotted escutcheon to provide speaker openings. Continuously variable treble and bass tone controls are provided. This receiver features 3 separate antenna systems. A large flat loop built within the hinged lid includes a primary for external antenna connection, when desired. A Ferrite rod antenna with a long cable and provided with suction cups to permit mounting on a window or wall for improved pickup in shielded areas is supplied. The preceding antennas are used only on the standard broadcast band. A telescoping vertical rod antenna is provided for use on all short wave bands.

All tubes and the battery may be serviced by opening the hinged back cover. A terminal is provided on the back apron of the cover for an external ground connection, if desired. A line voltage compensator switch is mounted on the chassis rear apron under a caution label of instructions. The switch is to be used only in areas of sub-standard line voltage.

Alignment Fixture

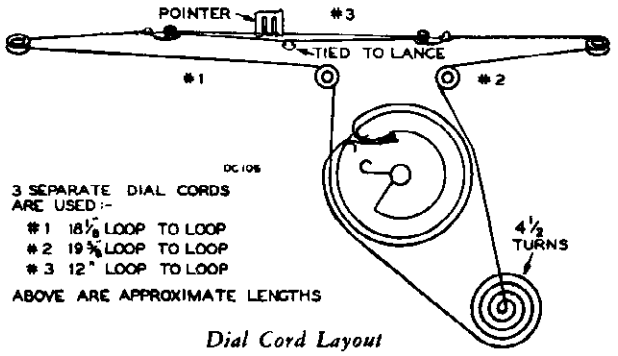
To obtain maximum sensitivity when chassis is reinserted in case after alignment, the alignment fixture shown below should be secured to the tuner side of the chassis during alignment to simulate the effect of the case. The sheet metal clips and hardware on the dust cover base may temporarily be used to hold the fixture to the chassis.



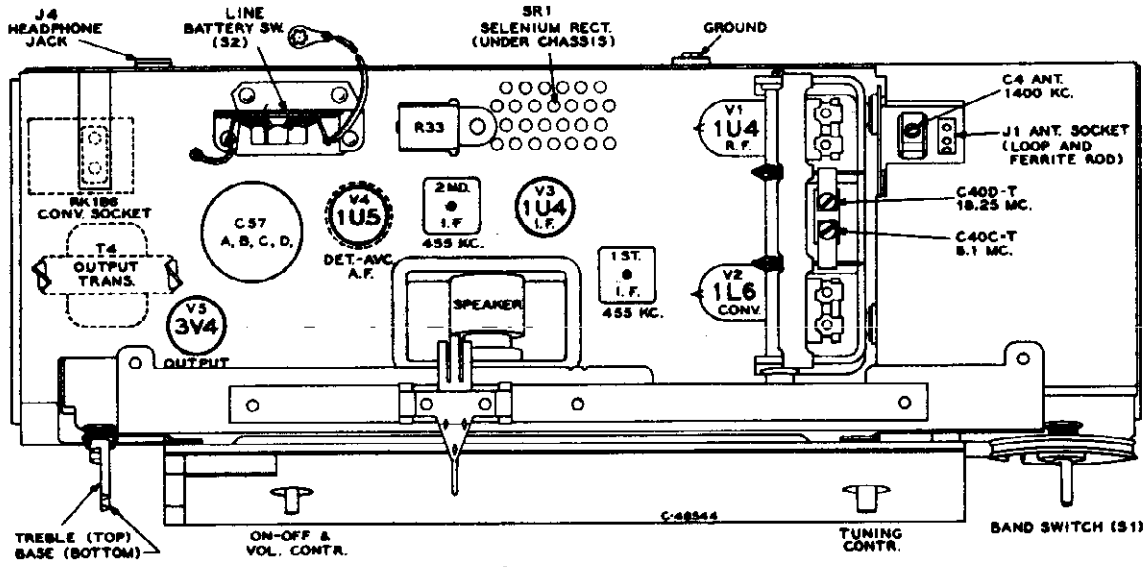
Alignment Fixture

CHASSIS REMOVAL

1. Turn tuning knob until gang is fully closed.
2. Open cabinet back, pull out battery, and disconnect battery plug.
3. Remove pull-off type volume, tuning, band selector, and tone control knobs.
4. Remove the four machine screws holding the chassis to the case.
5. Pull chassis out and simultaneously slightly downward, to enable dial pointer mechanism to clear top back edge of case.



Dial Cord Layout



Chassis Top View

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.

Close gang and set dial pointer to mark on dial plate. Turn volume and treble tone controls to maximum clockwise position. Turn bass tone control to maximum counterclockwise position.

STEP	CONNECT HIGH SIDE OF SIG. GEN. TO—	SIGNAL GEN. OUTPUT	DIAL POINTER SETTING	ADJUST FOR MAXIMUM OUTPUT
1.	Pin #6 of 1U4 I.F. Amp. thru 0.01 mfd.	455 kc	"A" Band Quiet point near 1600 kc	T3 top and bottom cores
2.	Pin #6 of 1L6 Conv. thru 0.01 mfd.			T2 top and bottom cores
3.	Install bottom cover. Secure aluminum alignment fixture in place. Connect 24 mmfd. in series with 22 ohms between sig. generator lead and C39.			
4.	C39, term. 7 on S1D thru dummy load indicated	18.25 mc	16M Band Right hand stop	*C40D-T top of gang
5.		17.5 mc	16M Band Left hand stop	T11 Osc.
6.		17.8 mc	16M Band 17.8 mc Signal	Rock gang, —Peak L11 R.F. + L5 Ant.
7.		14.9 mc	19M Band Left hand stop	T10 Osc.
8.		15.2 mc	19M Band 15.2 mc Signal	Rock gang, —Peak L12 R.F. + L6 Ant.
9.		11.55 mc	25M Band Left hand stop	T9 Osc.
10.		11.8 mc	25M Band 11.8 mc Signal	Rock gang, —Peak L13 R.F. + L7 Ant.
11.		9.45 mc	31M Band Left hand stop	T8 Osc.
12.		9.6 mc	31M Band 9.6 mc Signal	Rock gang, —Peak L14 R.F. + L8 Ant.
13.		8.1 mc	"C" Band Right hand stop	*C40C-T top of gang. C16 R.F. C7 Ant.
14.		3.9 mc	"C" Band Left hand stop	T7 Osc. L9 R.F. L4 Ant.
15.		Repeat steps 13 and 14 until maximum gain is obtained.		
16.		4.05 mc	"B" Band Right hand stop	C32 Osc. C18 R.F. C5 Ant.
17.		1.97 mc	"B" Band Left hand stop	T6 Osc. L10 R.F. L3 Ant.
18.		Repeat steps 16 and 17 until maximum gain is obtained. Remove alignment fixture and install chassis in cabinet. Plug in loop cable.		
19.	Short length of wire near receiver	1620 kc	"A" Band Right hand stop	C31 Osc.
20.		1400 kc	"A" Band 1400 kc Signal	C20 R.F. C4 Ant.
21.		600 kc	"A" Band 600 kc Signal	Rock gang, —Peak T5 Osc. trans., + T1 R.F.
22.		Repeat steps 19, 20 and 21 until maximum gain is obtained. Exchange loop antenna plug with external Ferrite Rod antenna plug. Extend cable to maximum.		
23.		1400 kc	"A" Band 1400 kc Signal	C43 Ferrite Rod Ant.

*The tuning range and dial calibration of the succeeding bands depend upon the accuracy of this adjustment. Avoid aligning on image. The local oscillator is 455 kc higher in frequency than the RF on all bands.

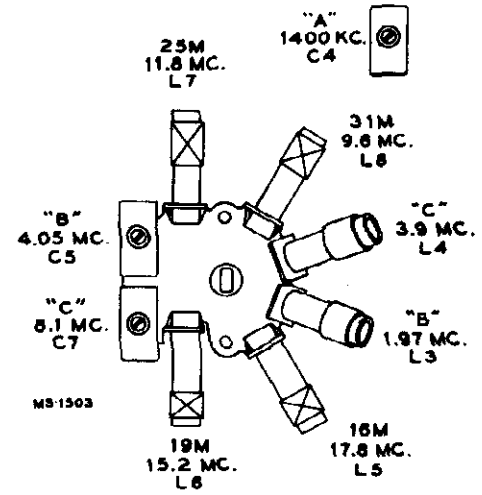
Battery operation of the receiver is preferable duri alignment; on AC operation, an isolation transforn (117v./117v.) may be necessary for the receiver if the t oscillator is also AC operated.

Critical Lead Dress

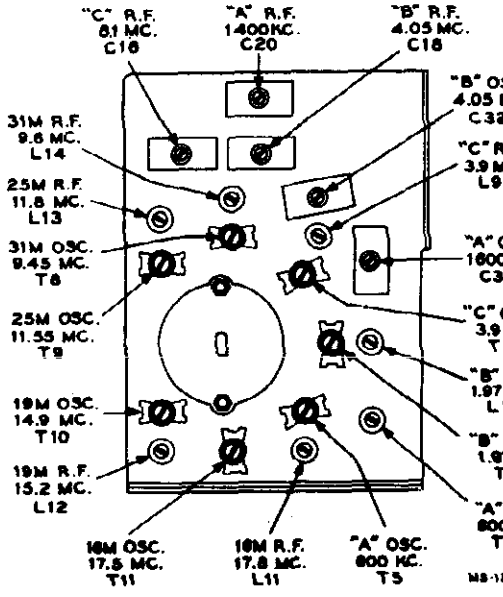
1. Dress all filament leads next to chassis.
2. Use short pigtail leads on all by-pass and coupli capacitors associated with R.F. circuits.
3. Dress gang condenser leads direct and short as possil to switch without strain.
4. Connect neutralizing capacitor C50, 0.51 MMFD acr converter socket with short leads and away from otl components.
5. Dress power line compensator resistor to clear s rounding components and bottom cover.
6. Dress coil pigtail leads away from each other and fr coils.
7. Dress blue converter plate lead down to base.
8. Dress volume control leads down to base.

CAUTION —

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

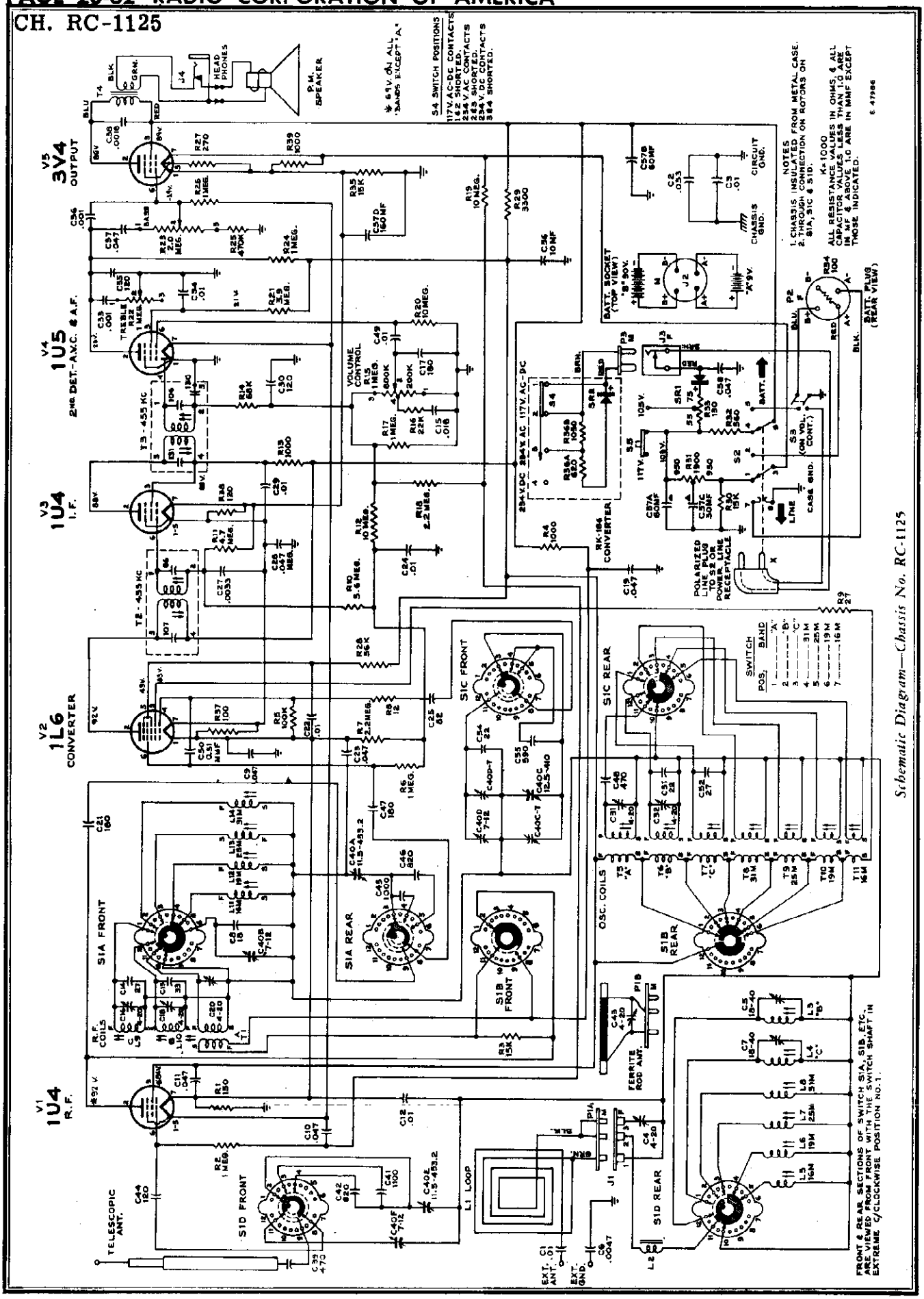


Tuner Adjustment Locations—Antenna



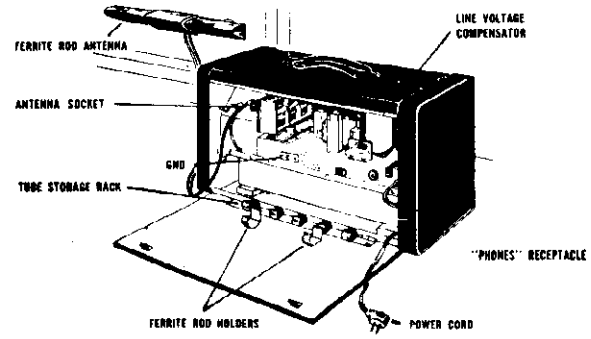
Tuner Adjustment Locations—Oscillator and R.F.

CH. RC-1125



Schematic Diagram—Chassis No. RC-1125

General Information



Rear View

AC-DC OPERATION

For 105 to 125 volts, 25-60 cycles AC or 105 to 125 volts DC operation — Be sure that the power line used has the correct voltage and frequency before turning on the receiver. Open case back, remove power cord plug from chassis socket, and insert in outlet. Feed power cord through the notch on the lower right side of the case back.

RK-186 VOLTAGE CONVERTER

For 210 to 250 volts, 25-60 cycles AC or 210 to 250 volts DC operation — Pull open case back and remove L-shaped metal bracket held by single self-tapping screw located between headphone jack and power cord. Insert RK-186 Converter in socket provided with metal tab facing to the rear. Secure RK-186 Converter to chassis by replacing screw through tab hole.

BATTERY OPERATION

Installation of Battery Pack — Insert battery cable plug into battery socket, installing battery pack with plug side facing toward the front.

For Battery Operation — Insert polarized power cord plug all the way into the chassis socket. Store excess power cord neatly to the right side of the battery pack. Close case back securely.

CARE OF INSTRUMENT CASE

To best preserve the appearance and serviceability of the instrument case, keep it clean. For this purpose, any mild soap will do, if applied as a lather and the dirt removed with a dry, clean cloth. Abrasives, commercial cleaning fluids, nail polish remover and the like should not be used.

Should leather become dry from cleaning or aging, t natural oils should be replaced. For restoration purpos a number of applications of 10 to 20 per cent of sulfonat castor, or neatsfoot, or cod oil may be made as require

LINE VOLTAGE COMPENSATOR

Weak reception may result from sub-normal power li voltage. If determined as the cause (check voltage rati with power company), the Line Voltage Compensator provided to improve reception by switching to "LOW LI VOLTAGE" position. To use, break the caution label se and move the switch slot to the right. Use of this featu is not recommended unless the line voltage is 105 vo or less.

USE OF ANTENNAS

Built-In Loop — For Standard Broadcast

Contained in the hinged lid of the case, this antenna in use as long as it remains plugged into the anten socket. It is possible to improve reception by rotating t receiver.

Ferrite Rod — For Standard Broadcast — Low Signal/No Areas

To improve reception within steel buildings, automobil etc., the ferrite rod antenna may be used. Remove lo antenna plug from its socket. Remove ferrite rod anten from spring clips inside back cover, unwind wire extensi and insert cable plug into antenna socket. The ferrite r antenna may be secured on a window in a horizon position, by pressing the suction cups firmly against t glass. Reception may be improved by changing the po tion of the antenna.

External — For Standard Broadcast — Weak Signal Area

A terminal for outside antenna connection is located the hinged lid of the case. Connect a wire to this termi and suspend approximately 60 to 100 feet in space, least 50 feet in a horizontal position.

Telescopic Rod — For Short Wave

Concealed within the case on the right, this antenna used for reception on any one of the six Short Wa bands. To use, press release button on lower right side case, and antenna top will appear above its openi Grasp antenna top, and pull up antenna sections u a distinct snap or click results. For best reception, sections should be fully extended.

NOTE: Short Wave reception is impossible unless bott (Satin Finish) section of antenna is snapped into elevated position.

Stock No.	DESCRIPTION
	CHASSIS ASSEMBLIES RC 1125
78135	Board—Baffle board and grille screen less speaker
78104	Board—"Gnd" board
78091	Bushing—Fibre bushing for chassis mounting shelf
78108	Capacitor—Variable tuning capacitor complete with drive drum (C40A, C40B, C40C, C40D, C40E, C40F, C40C-T, C40D-T)
78146	Capacitor—Capacitor (82 mmf.) and resistor (12 ohms) assembly (C25, R8)
	Capacitor—Adjustable, mica: —
78130	4-20 mmf. (C4, C16, C18, C20)
78131	4-20 mmf. (C31, C32)
78132	20-50 mmf. (C5, C7)
	Capacitor—Fixed, ceramic, High "K" disc: —
73960	10,000 mmf., +100%, −0%; 500 volts (C, C12, C22, C24, C29, C34)
	Capacitor—Fixed, ceramic, non-insulated:
33101	22 mmf., ±10%, 500 volts Temp. coef. — —750 (C51, C54)
72570	27 mmf., ±10%, 500 volts Temp. coef. — —750 (C52)
	Capacitor—Fixed, ceramic, insulated, High "K" type:
78138	18 mmf., ±10%, 500 volts (C8)
78139	180 mmf., ±10%, 500 volts (C17, C21, C47)
	Capacitor—Fixed, ceramic, non-insulated, High "K" type: —
78141	27 mmf., ±10%, 500 volts (C14)
78140	33 mmf., ±10%, 500 volts (C13)
78142	120 mmf., ±10%, 500 volts (C30, C35, C44)
	Capacitor—Fixed, headed-lead: —
78137	0.51 mmf., ±10%, 500 volts (C50)
	Capacitor—Fixed, mica: —
39644	470 mmf., ±5%, 500 volts (C48)
76932	470 mmf., ±20%, 300 volts (C39)
74929	590 mmf., ±2%, 500 volts (C55)
78143	820 mmf., ±5%, 300 volts (C42, C46)
39652	1000 mmf., ±5%, 300 volts (C45)
78144	1100 mmf., ±2%, 500 volts (C41)
	Capacitor—Electrolytic comprising: —
78095	1 section of 60 mfd., 350 volts, 1 section of 60 mfd 150 volts, 1 section of 30 mfd., 150 volts, 1 sectio of 160 mfd., 25 volts (C57A, C57B, C57C, C57D
	Capacitor—Fixed, electrolytic: —
78145	10 mfd., 150 volts (C56)
	Capacitor—Fixed paper moulded: —
75643	.001 mfd., 1000 volts (C33, C36)
73851	.0018 mfd., 1600 volts (C38)
73795	.0033 mfd., 600 volts (C27)
73920	.0047 mfd., 600 volts (C6)
73561	.01 mfd., 400 volts (C49)
58476	.018 mfd., 400 volts (C15)
73552	.033 mfd., 400 volts (C2)
73558	.047 mfd., 200 volts (C9, C10, C23, C28, C37)
73553	.047 mfd., 400 volts (C11, C19)
73592	.047 mfd., 600 volts (C58)
73935	Clip—Mounting clip for I.F. transformer

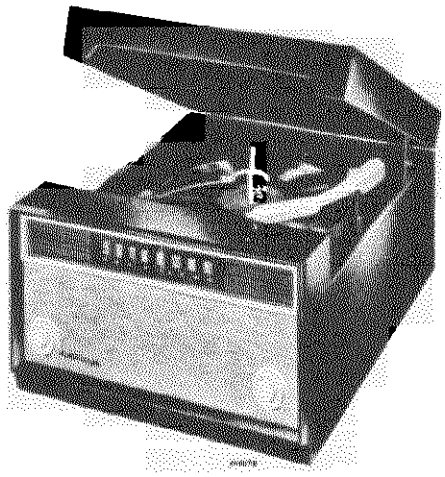
MODEL 3-BX-671, Ch. RC-1125

Stock No.	DESCRIPTION
78123	Coil—Antenna coil—"B" band (L3)
78124	Coil—Antenna coil—"C" band (L4)
78128	Coil—Antenna coil—16 meter band (L5)
78127	Coil—Antenna coil—19 meter band (L6)
78126	Coil—Antenna coil—25 meter band (L7)
78125	Coil—Antenna coil—31 meter band (L8)
78129	Coil—Loading coil (L2)
78109	Coil—Oscillator coil—"A" band (T5)
78110	Coil—Oscillator coil—"B" band (T6)
78111	Coil—Oscillator coil—"C" band (T7)
78115	Coil—Oscillator coil—16 meter band (T11)
78114	Coil—Oscillator coil—19 meter band (T10)
78113	Coil—Oscillator coil—25 meter band (T9)
78112	Coil—Oscillator coil—31 meter band (T8)
78116	Coil—RF coil—"A" band (T1)
78117	Coil—RF coil—"B" band (L10)
78118	Coil—RF coil—"C" band (L9)
78122	Coil—RF coil—16 meter band (L11)
78121	Coil—RF coil—19 meter band (L12)
78120	Coil—RF coil—25 meter band (L13)
78119	Coil—RF coil—31 meter band (L14)
7903	Connector—Earphone jack (J4)
71040	Connector—2 contact female connector for 220 volt operation (J3)
38904	Connector—2 contact female connector for AC line cord
78133	Connector—3 contact female connector for antenna leads (J1)
30567	Connector—4 contact female connector for battery cable (P2)
78094	Control—Bass tone control (R23)
78093	Control—Treble tone control (R22)
78092	Control—Volume control and power switch (R15, S3)
70022	Cord—Power cord and plug
*72953	*Cord—Station selector pointer drive cord (approx. 15" overall)
72953	Cord—Station selector pointer drive cord (approx. 22" overall)
72953	Cord—Station selector pointer or band indicator pointer drive cord (approx. 24" overall)
78242	Cushion—Rubber cushion for baffle board (4⅛" long)
78105	Cushion—Rubber cushion for baffle board (10½" long)
78097	Eyelet—Station selector pointer drive cords connecting eyelet
74838	Grommet—Power cord strain relief (1 set)
16058	Grommet—Rubber grommet for mounting gang capacitor
71851	Grommet—Rubber grommet for speaker mounting
78086	Guide—Station selector pointer guide rail and pulley assembly
78099	Nut—Speed nut for tuner shield
78098	Nut—Speed nut for baffle board mounting (4 req'd) or for tuner shield
78103	Nut—Speed nut (twin type) to fasten pointer bracket
18469	Plate—Bakelite mounting plate for electrolytic
78090	Pointer—Band indicator pointer
78087	Pointer—Station selector pointer
78107	Pulley—Band indicator drive pulley and knob assembly
72502	Pulley—Drive cord pulley—part of pointer guide rail or for station selector pointer drive cord pulley
78101	Rectifier—Selenium rectifier (SR1)
	Resistor—Wire wound:—
78136	comprising 1 section of 75 ohms, 5 watts and 1 section of 55 ohms, 5 watts (R33)
78102	dual 950 ohms, 3½ watts (R31)
	Resistor—Fixed, composition:—
503027	27 ohms, ±10%, ½ watt (R9)
503110	100 ohms, ±10%, ½ watt (R34, R37)
503112	120 ohms, ±10%, ½ watt (R38)
503115	150 ohms, ±10%, ½ watt (R1)
503127	270 ohms, ±10%, ½ watt (R27)
513156	560 ohms, ±10%, 1 watt (R32)
503210	1000 ohms, ±10%, ½ watt (R4, R13, R39)
503233	3300 ohms, ±10%, ½ watt (R29)
503315	15,000 ohms, ±10%, ½ watt (R3, R30, R35)
503322	22,000 ohms, ±10%, ½ watt (R16)
503356	56,000 ohms, ±10%, ½ watt (R28)
503368	68,000 ohms, ±10%, ½ watt (R14)
503410	100,000 ohms, ±10%, ½ watt (R5)
503447	470,000 ohms, ±10%, ½ watt (R25)
503510	1 megohm, ±10%, ½ watt (R2, R6, R17, R24, R26)
503522	2.2 megohm, ±10%, ½ watt (R7, R18)
503539	3.9 megohm, ±10%, ½ watt (R21)
503547	4.7 megohm, ±10%, ½ watt (R11)
503556	5.6 megohm, ±10%, ½ watt (R10)
503610	10 megohm, ±10%, ½ watt (R12, R19, R20)
78088	Shaft—Tuning knob shaft
78089	Shield—Bakelite shield for tuner unit
73584	Shield—Tube shield
78134	Socket—Tube socket, miniature, 7 pin, floating
73117	Socket—Tube socket, miniature, 9 pin, wafer
74305	Spring—Band indicator pointer drive cord spring
76332	Spring—Station selector pointer drive cord spring
71039	Switch—Battery switch (S2)
78096	Switch—Weak signal area switch (S5)
78106	Switch—Range switch (S1)

Stock No.	DESCRIPTION
74918	Transformer—1st I.F. transformer complete with adjustable core (T2)
73037	Transformer—2nd I.F. transformer complete with adjustable core (T3)
78100	Transformer—Output transformer (T4)
33726	Washer—"C" washer for tuning knob shaft
	SPEAKER ASSEMBLIES 971933-2
74378	Gasket—Rubber gasket (3¼") for speaker
78147	Speaker—5¼" P.M. speaker complete with cone and voice coil (3.2 ohms)
	MISCELLANEOUS
78196	Antenna—Ferrite rod antenna complete with winding
78187	Antenna—Lid and antenna loop assembly complete (L1, C1)
78157	Antenna—Telescopic antenna
78184	Back—Case back complete
78158	Bearing—Bearing (phenolic tube) for telescopic antenna
78183	Bearing—Case lid bearing
78174	Bracket—"U" shape bracket (clevis) for carrying handle links
78166	Button—Telescopic antenna push button
78165	Cap—Telescopic antenna screw-on cap
75967	Capacitor—Adjustable, mica, 4-20 mmf. (C43)
78190	Case—Case only for ferrite rod antenna
78153	Case—Case less sides, handle, links, feet front and back cover
78170	Catch—Case catch
78186	Catch—Case back catch—part of case back
78185	Clip—Mounting clip for ferrite rod antenna
78411	Clip—Clip for case catch—bottom
78177	Connector—3 contact male connector for antenna loop and for ferrite rod antenna (P1A, P1B)
78162	Contact—Bottom contact for telescopic antenna
78163	Contact—Formed spring clip and contact for telescopic antenna—upper
78164	Contact—Lower contact and push button catch
78195	Cover—Bottom cover for ferrite rod antenna
78191	Cup—Suction cup for ferrite rod antenna case
78159	Cushion—Adhesive cushion for bottom of antenna bearing
75470	Cushion—Rubber cushion for battery support
78193	Cushion—Rubber spacer cushion (⅛" x 13/16" dia.) for ferrite rod antenna
78194	Cushion—Rubber spacer cushion (⅛" x .328" I.D. x 13/16" O.D.) for ferrite rod antenna
78181	Dial—Dial scale less escutcheon
77012	Emblem—"RCA Victor" emblem
78182	Escutcheon—Dial scale escutcheon less dial
78169	Foot—Rubber foot
78173	Handle—Carrying handle
78156	Hinge—Hinge for back cover (2 req'd)
78167	Insulator—Nylon insulator for case lid
78171	Latch—Latch for back cover
78187	Lid—Case lid and antenna loop assembly (L1, C1)
78175	Link—Carrying handle link
78149	Knob—Bass tone control knob
78151	Knob—Range switch knob
78150	Knob—Treble tone control knob
78148	Knob—Tuning control or volume control and power switch knob
78414	Map—World map and time chart
73203	Nut—Speed nut to fasten "RCA Victor" emblem
78192	Plate—Bakelite plate for ferrite rod antenna trimmer capacitor
78172	Plate—Mounting plate for carrying handle
78180	Rack—Spare tube rack
78183	Screw—#4-40 x ¼" cross recessed flat head tapping screw to fasten dial to escutcheon
77974	Side—Case side—L.H.—complete with leather belting
77975	Side—Case side—R.H.—complete with leather belting
78188	Spring—Case lid spring
78160	Spring—Push-up spring for telescopic antenna
74734	Spring—Spring clip for control knobs
78154	Strap—Leather strap for L.H. case side
78155	Strap—Leather strap for R.H. case side
78413	Strap—Strap for holding ferrite rod antenna lead
78168	Support—Battery support (wood)
78161	Support—Telescopic antenna bearing support—at top of antenna
77467	Washer—Felt washer for knob
78152	Washer—Insulating washer for control knobs
78178	Washer—Insulating washer for case lid pivot
78179	Washer—Vellutex washer for dial and bezel mounting
78412	Washer—Vellutex washer for case catch clip
	RK 186 CONVERTER
78303	Connector—2 contact male connector (P3)
77958	Rectifier—Selenium rectifier (SR2)
78302	Resistor—Wire wound, comprising:—
	1 section of 620 ohms, 10 watts, and 1 section of 1050 ohms, 5 watts (R36)
78304	Switch—Voltage change switch (S4)

*Note:—72953 is a spool containing 250 ft. of cord.

MODEL 2US7
Ch. RC1117A



SPECIFICATIONS

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

Intermediate Frequency ..... 455 kc.

Tube Complement

1. RCA 12BE6 .....Converter
2. RCA 12BA6 .....I.F. Amplifier
3. RCA 6AQ6 .....Detector—A.F. Amplifier
4. RCA 6AQ6 .....Phase Inverter
5. RCA 35C5 ..... } Push Pull Output
6. RCA 35C5 ..... }

A selenium rectifier Stock #76871 is used.

Power Supply Rating

1. 115 volts A.C., 60 cycles (uses 930409-5 or -10 Changer) .....45 watts
2. 115 volts A.C., 50 cycles (uses 930409-11 Changer) .....45 watts

Dial Lamps (2) ..... Mazda type 51, 6-8 volts, 0.2 amp.

Loudspeaker

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

Power Output

Undistorted .....2.0 w
Maximum .....2.4 w

Cabinet Dimensions

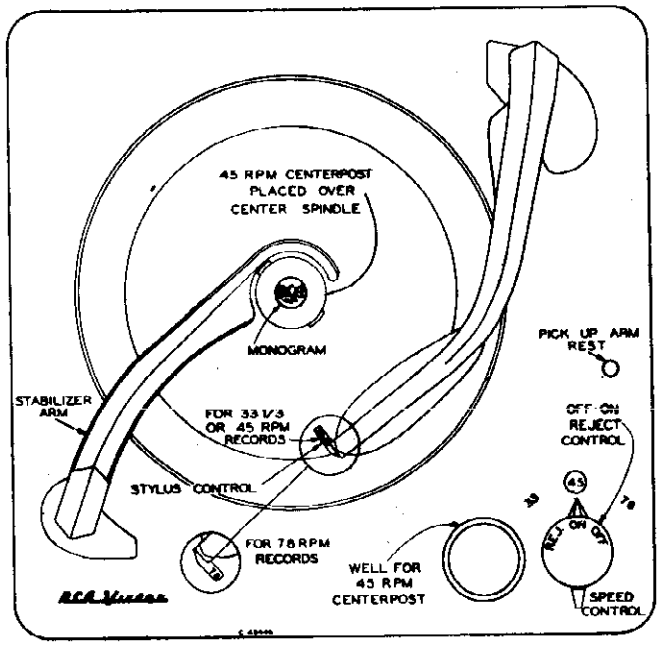
Height 10" Width 16¾" Depth 20

Tuning Drive Ratio ..... 14¼:1 (7⅛ turns of kn

Record Changer (930409-5, -10 or -11)

Turntable speed .....33⅓, 45 or 78 r.p
Record capacity ....up to fourteen 7 inch RCA type
or twelve 10 inch
or ten 12 inch
or ten 10 in. and 12 in. intermi
Pickup (Stock No. 75475)..Crystal with replaceable s

Weight ..... 26 lbs.



Record Changer Controls

RECORD CHANGER CONTROLS

The record changer has a dual control on the m board and a stylus selector control on the pickup arm. inner control (circular knob) is the OFF-ON-REJECT con Turning this knob to the center position energizes the m and starts the turntable, when turned to the right (clockw it starts the mechanism into complete automatic opera The mechanism will shut off automatically after the record has been played but can be shut off manuall turning this knob to the left (counter-clockwise).

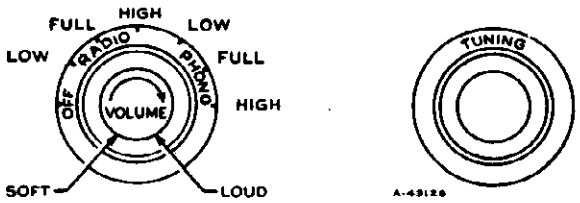
The outer control (double ended lever) is the speed trol. It has three normal positions, "33", "45", "78" to s the turntable speed desired and a neutral position (mid between "45" and "78"). The control should be turne this neutral position if the changer is not expected to b use for an extended period of time.

The stylus control has two normal positions (right left) and one shipping position (lever pointing up). W playing 33⅓ or 45 r.p.m. records the lever is turned so "33-45" is visible on the TOP of the lever; likewise fo r.p.m. records "78" should be visible on the TOP.

The removable centerpost is for use with 45 r.p.m. rec having the large centerhole. It must be placed over center spindle with the "RCA" trademark monogram I ING to the FRONT. When not in use it is placed in a at the front of the motorboard.

To load or remove records, the record stabilizer is l and turned off-side. After loading it is turned to the c where it rests on top of the stack of records.

MODEL 2US7, Ch. RC1117A, C

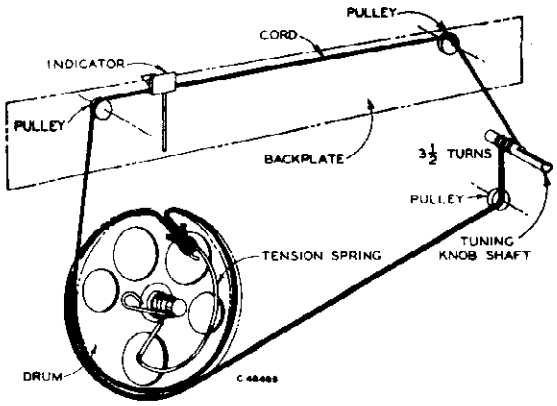


Radio Controls

Service Hints

All tubes, except the 12BE6, are accessible for testing by lifting up one side of the cabinet and removing the tubes from the rear chassis apron. To service the 12BE6 tube and the pilot lights, remove the four wood screws holding the sloping panel at the front of the record changer compartment. This panel also holds the loop antenna.

To remove the radio chassis for service, first remove the push-on type knobs. Secure the record changer pickup arm to the center post and rest the cabinet on its side. Remove loop antenna connections, and pickup arm audio plug. Hook-on connectors are used to connect a.c. power from the radio chassis to the phono motor. These connectors are covered by taped-over black insulating sleeves located in one corner of the cabinet. Push back sleeves and unhook. Remove the four flat-head wood screws holding the chassis mounting board to the bottom of the cabinet. Slide chassis out of cabinet, then remove the three ¼ inch hex head self-tapping screws holding the chassis to the panel.



Dial Cord Layout

Alignment Procedure

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

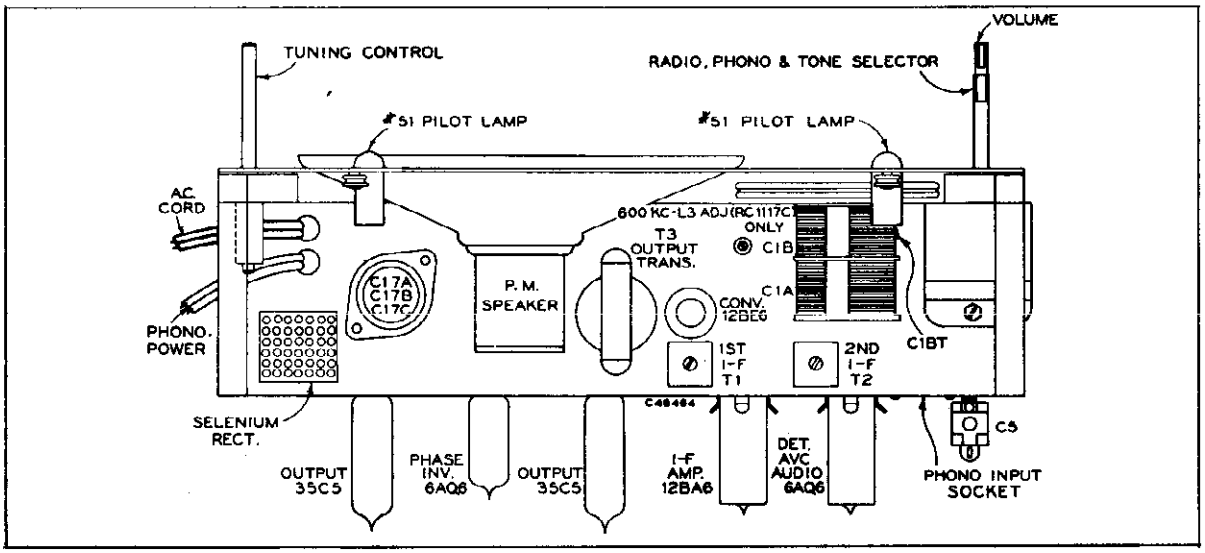
Test Oscillator.—Connect low side of test oscillator to common wiring in series with a .1 mf. capacitor. If the test oscillator is a.c. operated it may be necessary to use an isolation transformer for the receiver during alignment and the low side of the test oscillator connected directly to common wiring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

Steps	Connect the high side of test-oscillator 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	1,620 kc	Extreme R. H. end (gang open)	C1B-T (osc.)
4		1,400 kc	1,400 kc	C5 (ant.)
5		600 kc	600 kc Signal	L3 (Rock Gang)
6	Repeat steps 3, 4 & 5 if necessary			

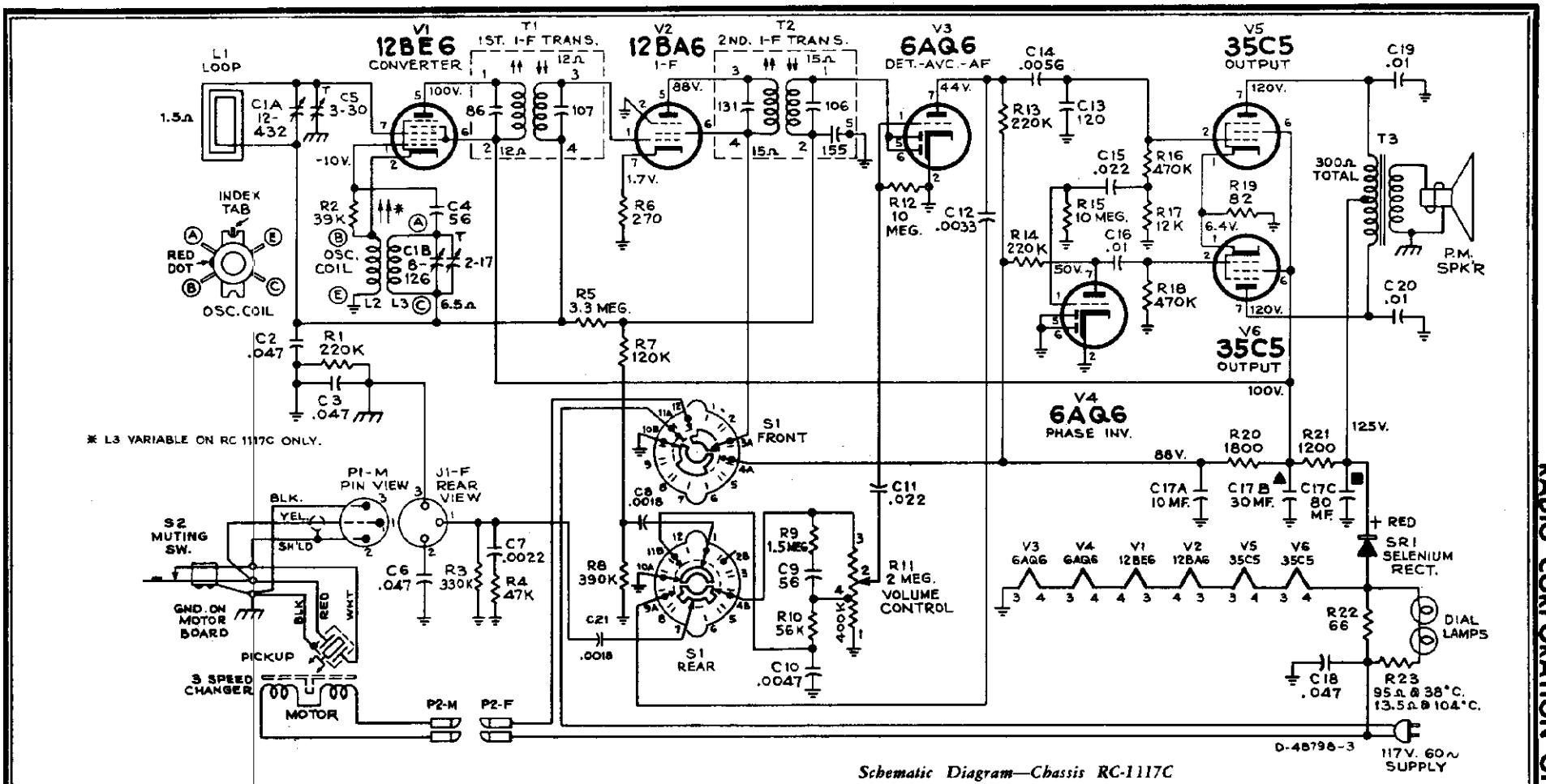
Critical Lead Dress

1. Dress C15 (.022 mfd. at grid of phase inverter) over tube socket away from filament leads.
2. Keep all filament leads close to chassis.
3. Keep leads of R26 (270 ohms at I-F amplifier cathode) short as possible.
4. Connect outside foil of all capacitors as indicated in schematic diagram.
5. Dress output plate bypasses, C19 and C20, as near chassis as possible.

Dial Pointer Adjustment.—Rotate tuning condenser fully counterclockwise (plates fully meshed). Adjust indicator pointer so that it is $3\frac{15}{16}$" from the left hand edge of the dial back plate.

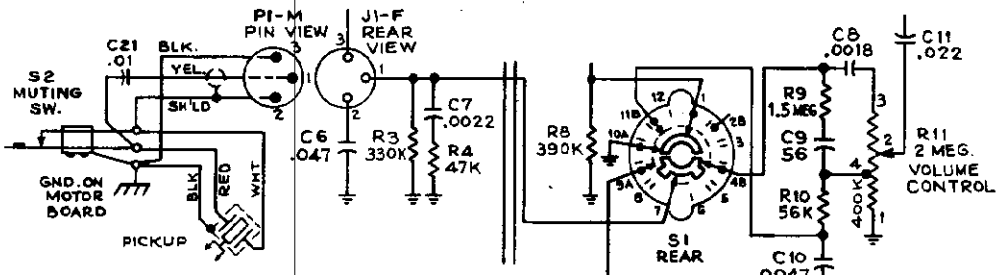


Tube and Trimmer Locations



* L3 VARIABLE ON RC 1117C ONLY.

Schematic Diagram—Chassis RC-1117C



FUNCTION SW. S1 VIEWED FROM FRONT, AND SHOWN IN POSITION NO. 1 (MAX. COUNTER CLOCKWISE).

POS. 1 – OFF.
2 – RADIO – MIN. HIGHS
3 – » – NORMAL
4 – » – MAX. HIGHS
5 – PHONO – MIN. HIGHS
6 – » – NORMAL
7 – » – MAX. HIGHS

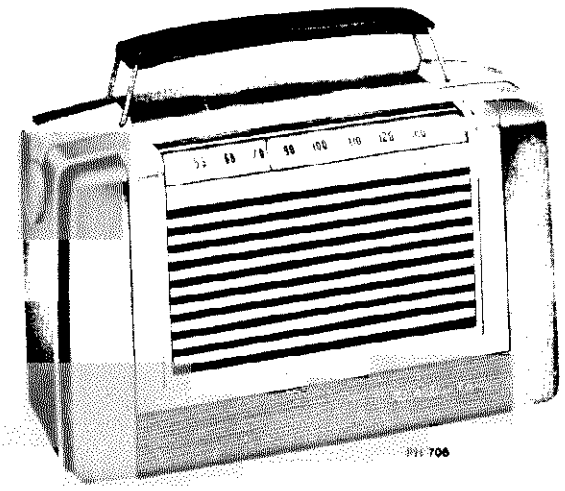
K = 1000
RESISTANCES IN OHMS.
CAPACITANCES LESS THAN 1 MF. AND ABOVE 1 IN MMF. UNLESS OTHERWISE NOTED.

INDICATES CHASSIS GROUND

INDICATES COMMON WIRING INSULATED FROM CHASSIS

MODEL 2US7, Ch. RC1117A, C

STOCK No.	DESCRIPTION
	CHASSIS ASSEMBLIES RC1117A, RC1117C
76867	Capacitor—Variable tuning capacitor complete with drive drum, C1A, C1B
93603	Capacitor—Ceramic, 56 mmf., C9
77116	Capacitor—Ceramic, 56 mmf., C4
76347	Capacitor—Ceramic, 120 mmf., C13
76872	Capacitor—Adjustable trimmer, 2.5—30 mmf., C5
73013	Capacitor—Electrolytic comprising 1 section of 80 mfd., 150 volts, 1 section of 30 mfd., 150 volts and 1 section of 10 mfd., 150 volts, C17A, C17B, C17C
73851	Capacitor—Tubular, paper, .0018 mfd., 1600 volts, C8. C21 (RC1117C only)
73595	Capacitor—Tubular, paper, .0022 mfd., 600 volts, C7
73795	Capacitor—Tubular, paper, .0033 mfd., 400 volts, C12
73920	Capacitor—Tubular, paper, .0047 mfd., 600 volts, C10
73788	Capacitor—Tubular, paper, .0056 mfd., 400 volts, C14
73561	Capacitor—Tubular, paper, .01 mfd., 400 volts, C16, C19, C20
73562	Capacitor—Tubular, paper, .022 mfd., 400 volts, C11, C15
73553	Capacitor—Tubular, paper, .047 mfd., 400 volts, C2, C3, C6
75071	Capacitor—Tubular, moulded paper, .047 mfd., 400 volts, C18
73935	Clip—Mounting clip for I.F. transformer
76866	Coil—Oscillator coil, L2, L3
36422	Connector—3 contact female connector for phono cable, J1
74192	Connector—3 contact male connector for shielded pickup cable, P1
77114	Connector—Single contact male connector for loop lead
76874	Control—Volume control, R11
72953	Cord—250' Drive Cord Reel (approx. 54" required)
70392	Cord—Power cord and plug
74838	Grommet—Power cord strain relief (1 set)
72283	Grommet—Rubber grommet to mount variable tuning capacitor (3 req'd)
11765	Lamp—Dial lamp—Mazda 51
28452	Plate—Bakelite mounting plate for electrolytic
76865	Plate—Dial back plate complete with three (3) pulleys less dial
76868	Pointer—Station selector pointer
76871	Rectifier—Selenium rectifier, SR1
73038	Resistor—Wire wound, 66 ohms, 5 watts, R22
73072	Resistor—Normal value, 95 ohms, @ 38°C with negative temperature coefficient R23
	Resistor—Fixed, composition:
503082	82 ohms, ±10%, ½ watt, R19
503127	270 ohms, ±10%, ½ watt, R6
513212	1200 ohms, ±10%, 1 watt, R21
503218	1800 ohms, ±10%, ½ watt, R20
503312	12,000 ohms, ±10%, ½ watt, R17
503339	39,000 ohms, ±10%, ½ watt, R2
503347	47,000 ohms, ±10%, ½ watt, R4
503356	56,000 ohms, ±10%, ½ watt, R10
503412	120,000 ohms, ±10%, ½ watt, R7
504422	220,000 ohms, ±20%, ½ watt, R1, R13, R14
503433	330,000 ohms, ±10%, ½ watt, R3
503439	390,000 ohms, ±10%, ½ watt, R8
503447	470,000 ohms, ±10%, ½ watt, R16
504447	470,000 ohms, ±20%, ½ watt, R18
503515	1.5 megohm, ±10%, ½ watt, R9
504533	3.3 megohm, ±20%, ½ watt, R5
504610	10 megohm, ±20%, ½ watt, R12, R15
76869	Shaft—Tuning knob shaft
76870	Shield—Tube shield for V1, V2, V3
74697	Socket—Dial lamp socket
51955	Socket—Tube socket, 7 pin, miniature, moulded, saddle-mounted
77115	Socket—Tube socket, 7 pin, miniature, moulded
76368	Spring—Drive cord spring
76873	Switch—Function switch less volume control, S1
77113	Terminal—Phono lead assembly terminal (knife) disconnect type)
74918	Transformer—First I.F. transformer complete with adjustable cores, T1
73037	Transformer—Second I.F. transformer complete with adjustable cores, T2
77122	Transformer—Output transformer, T3
33726	Washer—"C" washer for tuning knob shaft (2 req'd)
	SPEAKER ASSEMBLIES
76875	Speaker—5" x 7" P.M. speaker complete with cone and voice coil (3.2 ohms)
	MISCELLANEOUS
76876	Back—Cabinet back and antenna loop assembly (L1)
77350	Cable—Cable and Capacitor assembly (includes C21) (For RC1117A only)
74273	Decal—"Victrola" decal
76877	Dial—Polystyrene dial scale
76588	Emblem—"RCA Victor" emblem
74225	Escutcheon—Dial escutcheon less dial
76878	Escutcheon—Function switch escutcheon
76879	Escutcheon—Tuning control escutcheon
76895	Foot—Rubber foot (4 req'd)
72692	Hinge—Cabinet lid hinge
76882	Knob—Function switch knob—light gray
76881	Knob—Tuning control knob—(inner) light gray
76883	Knob—Tuning control knob (outer)—light gray
76880	Knob—Volume control knob—light gray
71095	Nut—Speed nut to fasten dial escutcheon
72765	Nut—Speed nut to fasten function switch or tuning control escutcheon
76894	Nut—#10-32 spring nut for mounting stud
30330	Spring—Retaining spring for volume control knob
14270	Spring—Retaining spring for tuning control or function switch knobs
76893	Stud—#10-32 x 1¾" special stud to mount changer in cabinet (2 req'd)
71824	Stud—Stud and screw (1 set) for cabinet lid hinge
77221	Support—Lid Support



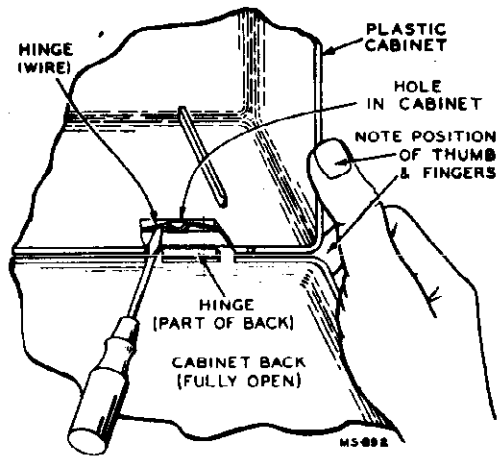
Specifications

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 057W Battery
(Average battery life — 100 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 ..... Det. — AVC — 1st A.F.
(5) RCA 3V4 ..... Output
A selenium rectifier is used.

To Remove Hinges

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



Removal of Cabinet Back

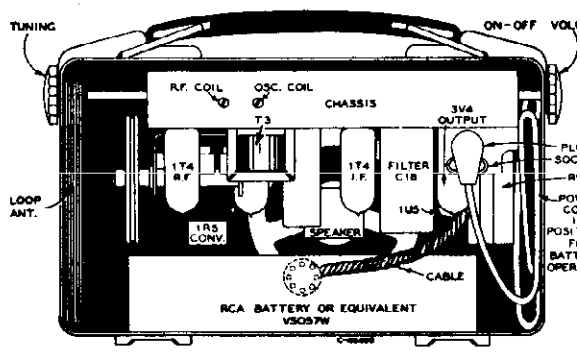
Weight (Approx.)
Without battery ..4 lb. 10 oz. With battery ..7 lb. 12
Power Output
Undistorted ..... 170 w
Maximum ..... 320 w
Loudspeaker ..... 4 in. P
Voice Coil impedance ..... 3.2 ohms at 400 cy
Cabinet Dimensions
Height ....8 in. Width ....12½ in. Depth 5⅝

To Remove Chassis:

1. Pull out battery and disconnect battery plug.
2. Unsolder the two loop antenna leads.
3. Remove the two large screws (under handle) in the of the case.

To Remove Cabinet Back

With the back fully open, grip the cabinet as illustra Insert a screwdriver under one hinge and pry the cente the hinge out of the opening in the cabinet while m taining pressure on the back with the fingers and on cabinet with the thumb. Repeat this procedure with other hinge. Pull the back straight to the rear using h hands.



Rear View With Back Removed

MODEL 2BX63, Ch. RC-1115

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.

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.

Step	Connect High Side of Sig. Gen. to —	Sig. Gen. Output	Dial Pointer Setting	Adjust for Max. Output
1	Disconnect loop—remove chassis—remove bottom plate.			
2	Pin #6 of 1T4 I.F. Amplifier thru .005 mf.	455 kc	Quiet point near 1600 kc	2nd I.F. Trans. T2 Top & Bottom
3	Pin #6 of 1R5 Converter thru .005 mf.			1st I.F. Trans. T1 Top & Bottom
4	Replace bottom cover and install chassis in cabinet. Re-connect loop.			
5	Short wire placed near loop for radiated signal	1620 kc	min. cap.	1600 kc osc. trimmer C1-3T
6		1400 kc	1400 kc Signal	1400 kc r.f. & ant. trimmers*
7		Connect a 22,000 ohm resistor in parallel with r.f. tuning cond. C1-2		
8		600 kc	600 kc Signal	L4 osc. core* while rocking gang
9		Remove the 22,000 ohm resistor from r.f. tuning cond. C1-2.		
10		600 kc	600 kc Signal	L3 r.f. core
11	Repeat Steps 5, 6, 7, 8, 9 and 10.			

* The position of the battery affects loop inductance. The battery should be in place during steps 5 to 11.

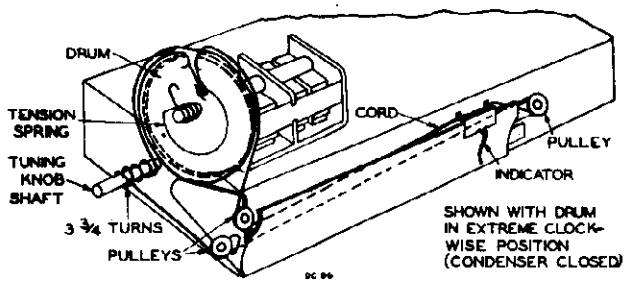
Critical Lead Dress

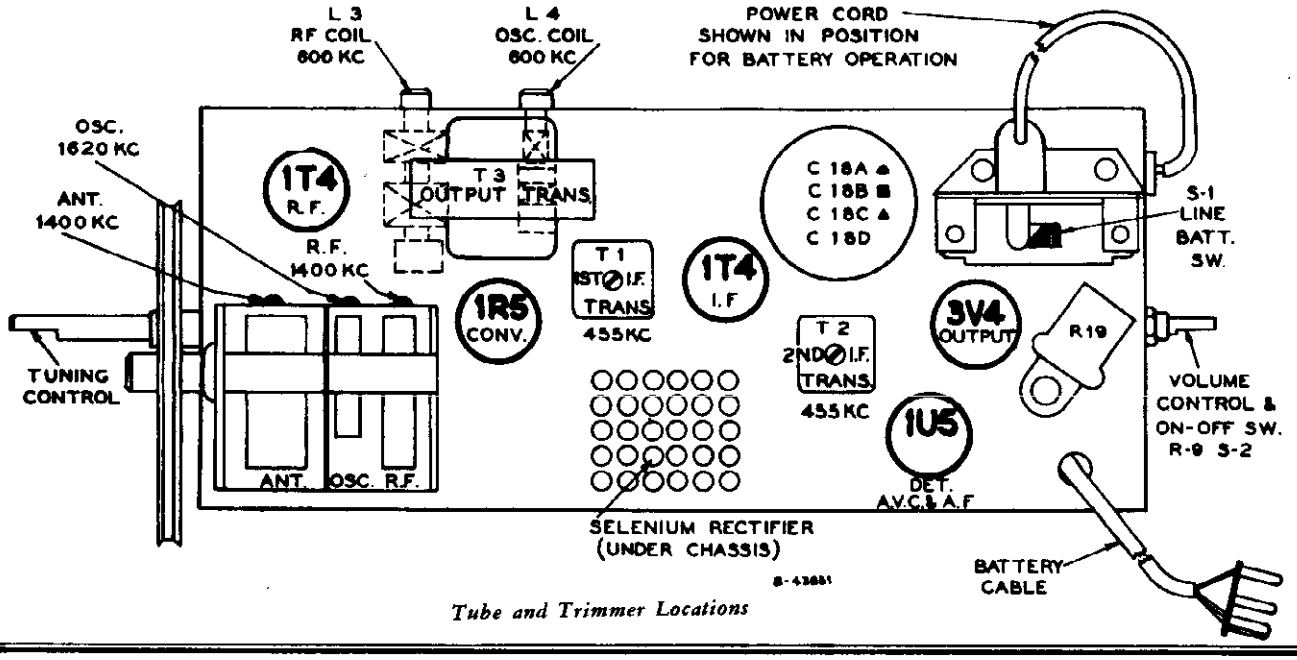
1. Dress all filament leads next to chassis.
2. Use short pigtail leads on components to V1, Pin 6.
3. Dress gang leads direct to avoid excess lead length.
4. Dress loop leads away from gang tuning drum.
5. Dress capacitors C3, C4, C6 for RF shielding.
6. Use short pigtail lead on C21 to V3-2 and dress away from Pin 6.
7. Dress capacitors C13 and C17 direct and down to base.

CAUTION.—

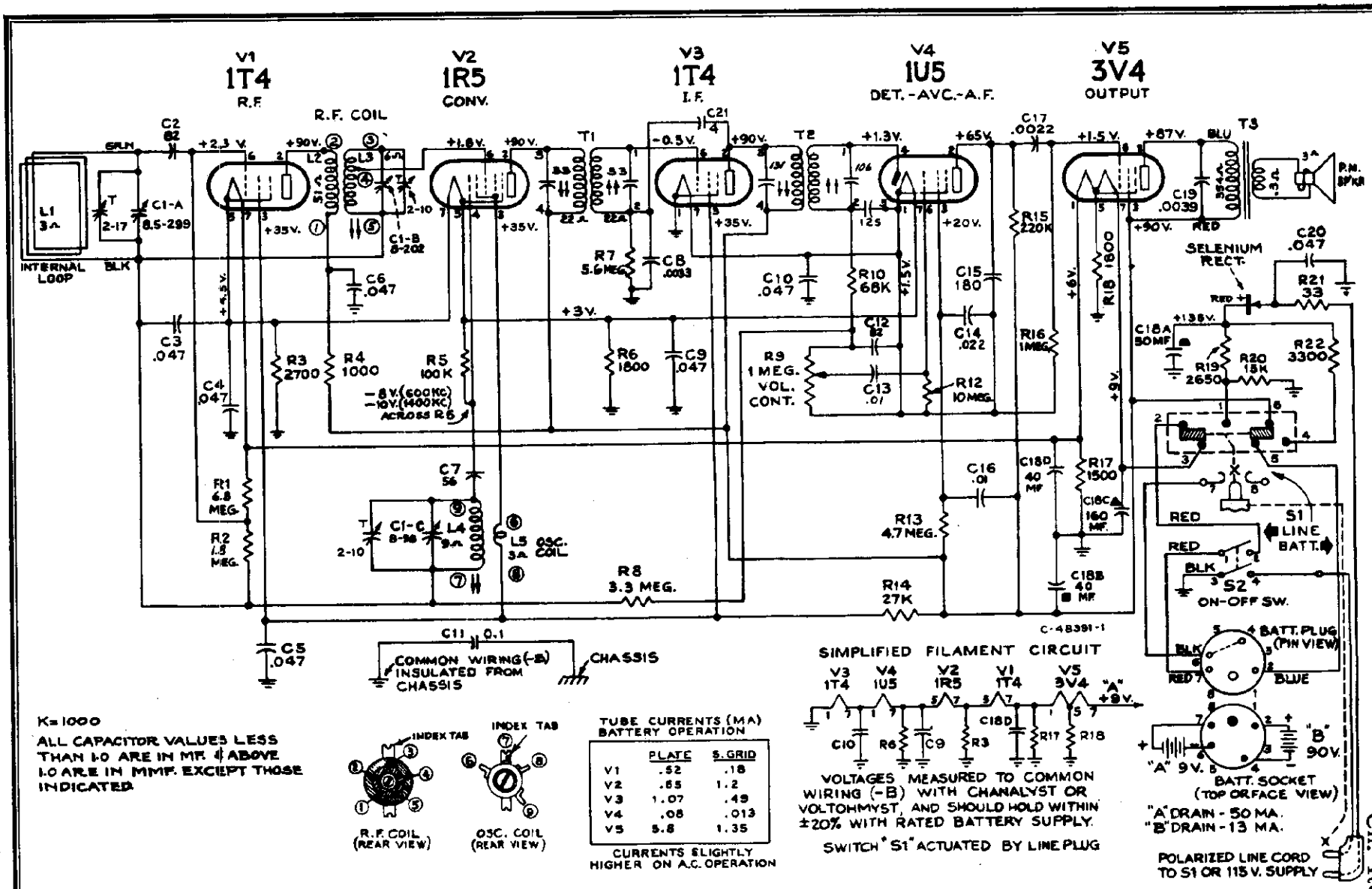
Do not remove any tubes from the chassis with the set operating and the plug connected to the power line. Damage to tubes may result.

Dial-Indicator and Drive Mechanism





Tube and Trimmer Locations



TUBE CURRENTS (MA)
BATTERY OPERATION

	PLATE	S. GRID
V1	.52	.18
V2	.65	1.2
V3	1.07	.49
V4	.08	.013
V5	5.8	1.35

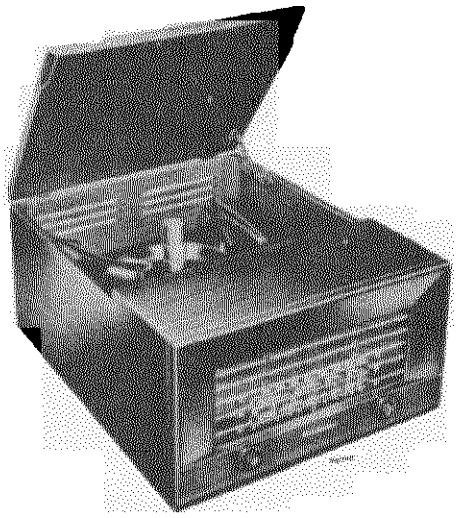
CURRENTS SLIGHTLY HIGHER ON A.C. OPERATION

"A" DRAIN - 50 MA.
"B" DRAIN - 13 MA.

MODEL 2BX63,
Ch. RC-1115

STOCK No.	DESCRIPTION
	CHASSIS ASSEMBLIES RC-1115
77054	Capacitor—Variable tuning capacitor complete with drive drum C1A, C1B, C1C
73153	Capacitor—Ceramic, 4 mmf. C21
39622	Capacitor—Mica, 56 mmf. C7
71514	Capacitor—Ceramic, 82 mmf. C2, C12
51416	Capacitor—Mica, 180 mmf. C15
76659	Capacitor—Electrolytic comprising 1 section of 50 mfd., 150 volts, 1 section of 40 mfd., 150 volts, 1 section of 160 mfd., 25 volts and 1 section of 40 mfd., 25 volts C18A, C18B, C18C, C18D
73595	Capacitor—Tubular, paper, .0022 mfd., 600 volts .. C17
73795	Capacitor—Tubular, paper, .0033 mfd., 600 volts .. C8
73796	Capacitor—Tubular, paper, .0039 mfd., 600 volts .. C19
73561	Capacitor—Tubular, paper, .01 mfd., 400 volts C13, C16
73562	Capacitor—Tubular, paper, .022 mfd., 400 volts.... C14
73558	Capacitor—Tubular, paper, .047 mfd., 200 volts C4, C5, C9, C10
73553	Capacitor—Tubular, paper, .047 mfd., 400 volts C3, C6
75071	Capacitor—Tubular, moulded paper, .047 mfd., 400 volts C20
73551	Capacitor—Tubular, paper, oil impregnated, 0.1 mfd., 400 volts C11
73935	Clip—Mounting clip for I.F. transformer
73114	Coil—Oscillator coil complete with adjustable core L4, L5
74992	Coil—RF coil complete with adjustable core .. L2, L3
71041	Connector—5 contact male connector or battery cable
72776	Connector—Single contact pin connector or output transformer leads (2 req'd)
75474	Connector—Single contact male connector for output transformer leads
74285	Control—Volume control and power switch ... R9, S2
72953	Cord—250' Drive Cord Reel (approx. 50" required)
70022	Cord—Power cord and plug
77051	Dial—Metal dial scale complete with (3) pulleys
74838	Grommet—Power cord strain relief (1 set)
72283	Grommet—Rubber grommet for mounting variable capacitor
18469	Plate—Bakelite mounting plate for electrolytic
77053	Pointer—Station selector pointer
72602	Pulley—Drive cord pulley
74322	Rectifier—Selenium rectifier
74319	Resistor—Wire wound, 2650 ohms, 7 watts R19
	Resistor—Fixed, composition:—
514033	33 ohms, ±20%, 1 watt R21
504210	1000 ohms, ±20%, ½ watt R4
503215	1500 ohms, ±10%, ½ watt R17
503218	1800 ohms, ±10%, ½ watt R6, R18
503227	2700 ohms, ±10%, ½ watt R3
513233	3300 ohms, ±10%, 1 watt R22
504315	15,000 ohms, ±20%, ½ watt R20
503327	27,000 ohms, ±10%, ½ watt R14
504368	68,000 ohms, ±20%, ½ watt R10
504410	100,000 ohms, ±20%, ½ watt R5
503422	220,000 ohms, ±10%, ½ watt R15
504510	1 megohm, ±20%, ½ watt R16
503518	1.8 megohm, ±10%, ½ watt R2
503533	3.3 megohm, ±10%, ½ watt R8
504547	4.7 megohm, ±20%, ½ watt R13
503556	5.6 megohm, ±10%, ½ watt R7
503568	6.8 megohm, ±10%, ½ watt R1
504610	10 megohm, ±20%, ½ watt R12
73117	Socket—Tube socket, 7 pin, miniature
76368	Spring—Drive cord spring
71039	Switch—"Line-Battery" switch S1
73129	Transformer—First I.F. transformer complete with adjustable cores T1
75487	Transformer—Second I.F. transformer complete with adjustable cores T2
71047	Transformer—Output transformer T3
33726	Washer—"C" washer for tuning knob shaft
	SPEAKER ASSEMBLIES 971495-7W RL-108B10
77055	Speaker—4" P.M. speaker complete with cone and voice coil (3.2 ohms)
	MISCELLANEOUS
77068	Antenna—Antenna loop assembled to polystyrene frame and support L1
77060	Back — Cabinet back — polystyrene — complete with strikes
77061	Cap—Carrying handle cap and chassis support
77065	Case—Case front—less handle, handle support, caps, links and chassis mounting screw
77064	Emblem—"RCA Victor" emblem
77057	Eyelet—Metal eyelet for mounting loop assembly
77066	Grille—Metal grille
77056	Grommet—Rubber grommet for mounting loop assembly
77063	Handle—Carrying handle
74790	Hinge—Cabinet hinge (2 req'd)
77248	Knob—Control knob
77062	Link—Carrying handle link
77013	Nut—Speed nut for fastening "RCA Victor" emblem
76671	Screw—#6 x ½" cross recessed self-tapping round head screw for mounting loop
77058	Screw—#8-32 x 7/16" cross recessed pan head machine screw for mounting loop
74734	Spring—Spring clip for knobs
77467	Washer—Knob washer—felt
77067	Window—Clear vinylite dial window

APPLY TO YOUR RCA DISTRIBUTOR FOR PRICES OF REPLACEMENT PARTS



Specifications

Tuning Ranges

Standard Broadcast ("A" Band)..520-1605 kc. (576-186 m.)
Medium Wave ("B" Band).....2.3-7 mc. (131-42.8 m.)
Short Wave ("C" Band).....7.0-22 mc. (42.8-13.7 m.)

Intermediate Frequency.....455 kc.

Tube Complement

(1) RCA-12BE6.....Converter
(2) RCA-6BI6.....I. F. Amplifier
(3) RCA-12AV6.....Det.-A.V.C.-A.F. Amp.
(4) RCA-50L6GT.....Output
(5) RCA-35W4.....Rectifier

Power Supply

1. 105-125 v. 60 cycles A.C.....50 watts
2. 210-250 v. 60 cycles A.C.....55 watts
3. 105-125 v. 25 cycles A.C.....55 watts

Note: Instruments having power supply #1 or #2 may be converted to 50 cycle operation by the addition of a conversion spring sleeve to the record changer motor shaft.

Instruments having power supply #2 employ a step-down transformer but the power cord which extends from the chassis may be connected direct to a 117 v. A.C. power supply.

Record Changer

930409-6.....for 60 or 50 cycle operation
930409-4.....for 25 cycle operation
Turntable speed.....33⅓, 45 or 78 r.p.m.
Record capacity.....Up to fourteen 7 inch RCA type or twelve 10 inch, or ten 12 inch, or ten 10 in. and 12 in. intermixed.
Pickup (Stock No. 162A001)..Ceramic with replaceable styli

Tuning Drive Ratio.....14:1 (7 turns of knob)

Cabinet Dimensions (overall)

Height.....10⅝" (27 cm.)
Width.....16⅝" (42 cm.)
Depth.....22½" (57 cm.)

Weight.....29 lbs. (13.2 kg.)

Loudspeaker

Size and Type.....6½" (16 cm.) P.M.
V.C. Impedance.....3.2 ohms at 400 cycles

Power Output

Undistorted.....1.0 watt
Maximum.....1.8 watt

Alignment Procedure

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

Note: If the test-oscillator is a-c operated, it may be necessary to an isolation transformer (117v./117v.) for the receiver during alignm and connect the low side of the test-oscillator to common wiring—reve of the plug may reduce hum.

Calibration Scale on Indicator-Drive-Cord Drum—The tuning is fastened in the cabinet and cannot be used for reference during a ment, therefore a calibration scale is attached to the indicator-drive- drum which is mounted on the shaft of the gang condenser. The settin the gang condenser is read on this scale, which is calibrated in deg

As the first step in r-f alignment, check the position of the drum. "180°" mark on the drum scale must be vertical and directly over center of the gang-condenser shaft when the plates are fully meshed

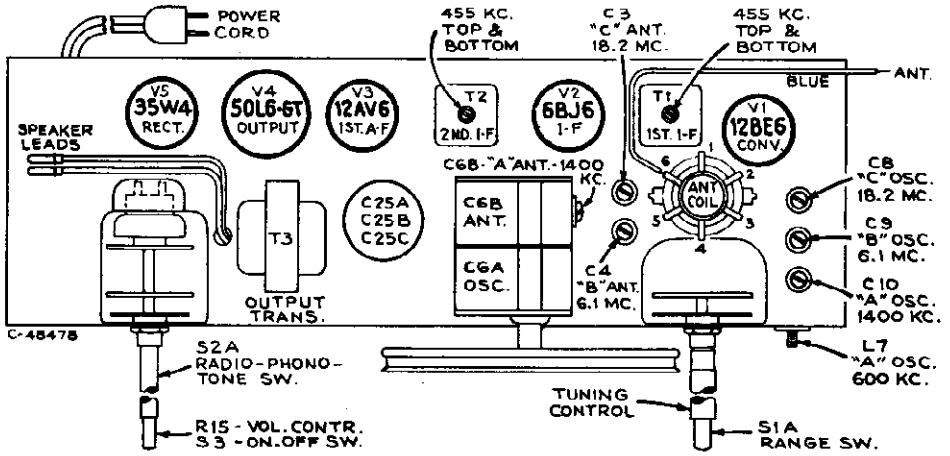
Pointer for Calibration Scale—Improvise a pointer for the cali tion scale by fastening a piece of wire to the gang-condenser frame, bend the wire so that it points to the "180°" mark on the calibration s when the plates are fully meshed. The correct setting of the gang in deg for each alignment frequency, is given in the alignment table.

Dial-Indicator Adjustment—After fastening the chassis in the cab attach the dial indicator to the drive cable with indicator at the end bration mark, and gang condenser fully meshed. The indicator has a for attachment to the cable.

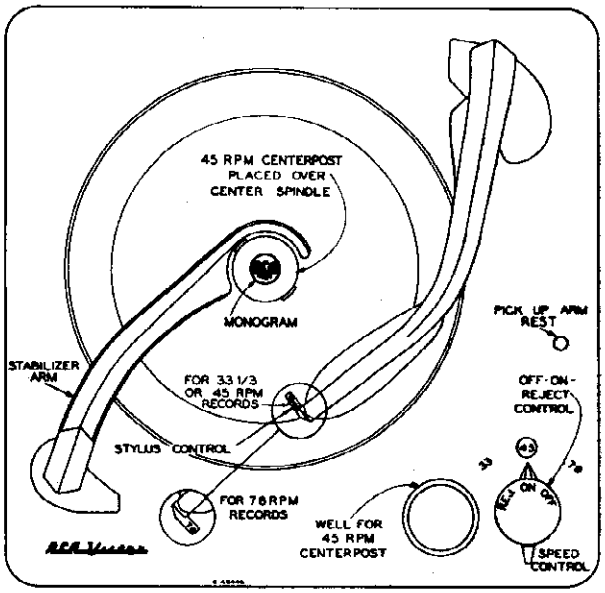
Step	Connect high side of test osc. to—	Tune test osc. to—	Range switch	Turn radio dial to—	Adjust max. out
1	6BJ6 grid (Pin No. 1) in series with .01 mf	455 kc	A	Quiet point near 600 kc	T-2 top ar bottor
2	12BE6 grid (in No. 7) Pin series with .01 mf				T-1* top ar bottor
3	Antenna lead in series with 220 mmf	1400 kc	A	1400 kc 30°	C10 os C6-B a
4		600 kc		600 kc 145°	L7 os (rock ga
5		Repeat steps 3 and 4			
6	Antenna lead in series with 300 ohms	6.1 mc	B	6.1 mc 30.3°	C9 osc C4 ant
7		18.2 mc	C	18.2 mc 36°	C8 osc C3 ant

* Do not readjust T-2.
† If two peaks are found—adjust at minimum capacity peak.
‡ Rock gang while adjusting—use maximum capacity peak.
NOTE: Oscillator tracks above signal on all bands.

MODEL 35QU,
Ch. RC-1054K

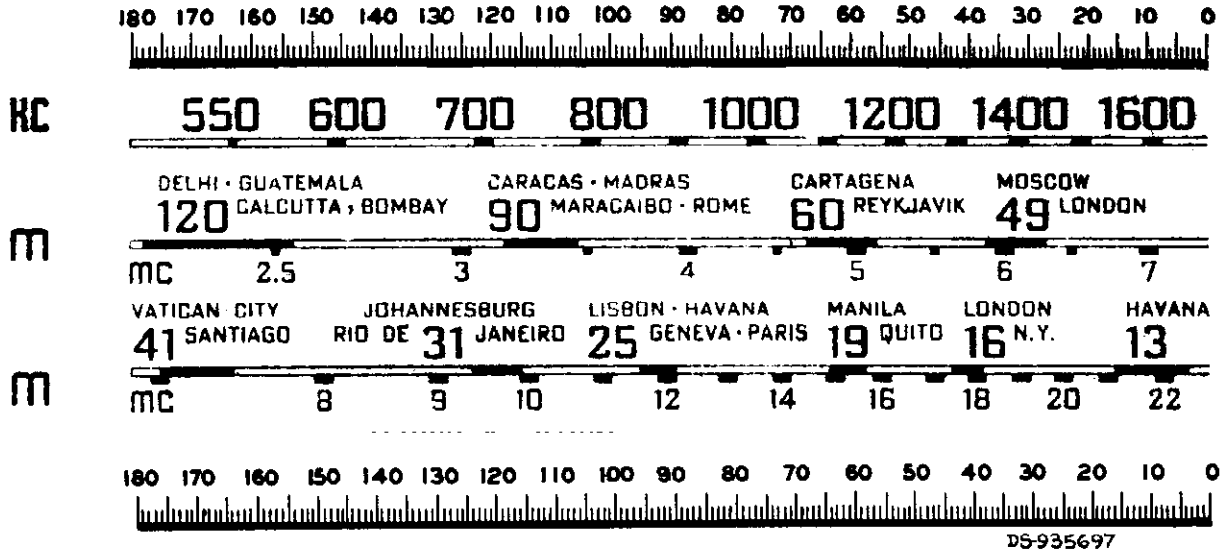


Tube and Trimmer Locations



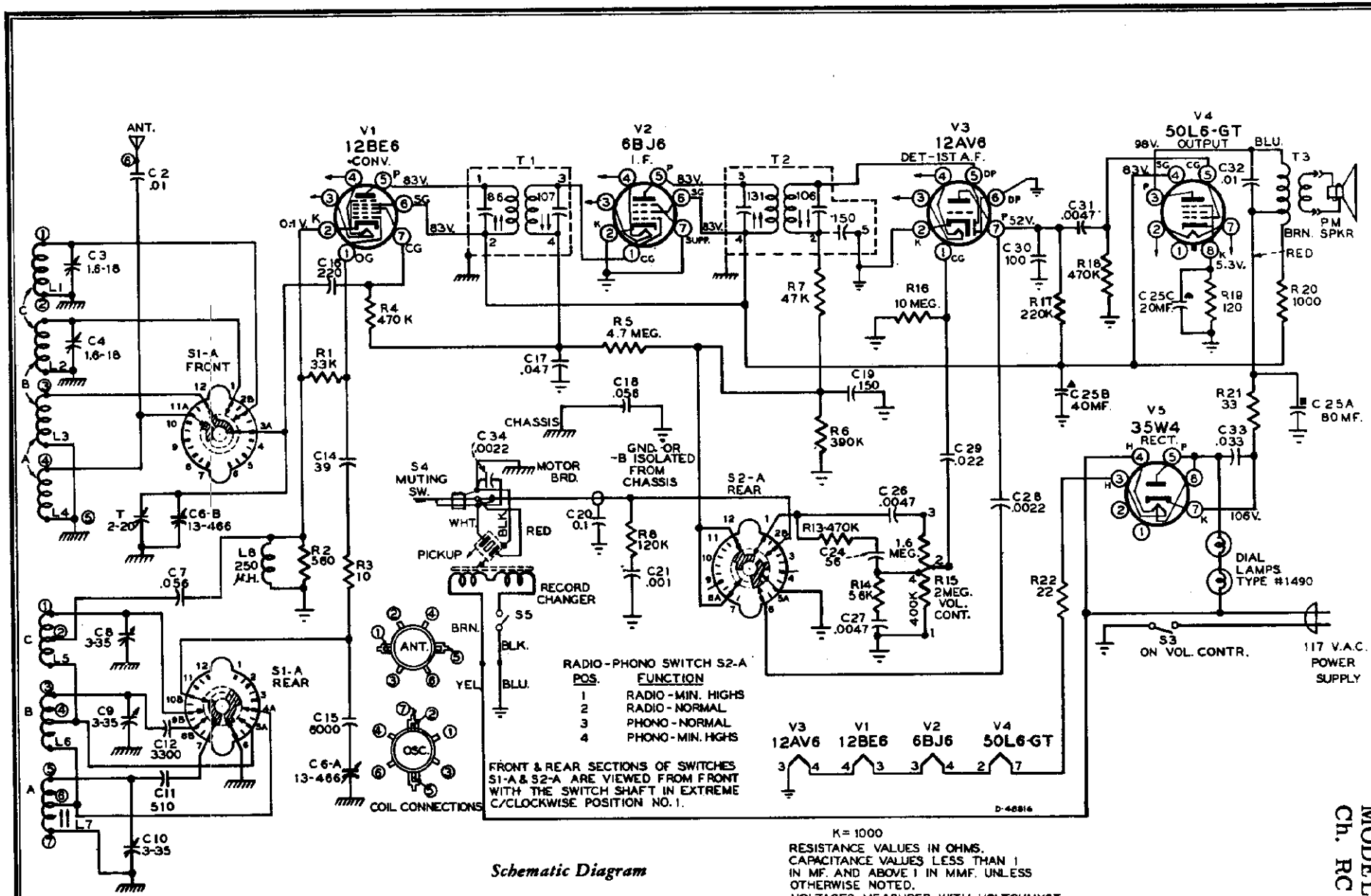
Critical Lead Dress

1. Dress C2 away from antenna coil windings.
2. Keep body of C15 away from chassis base.
3. All wires from the antenna and oscillator coils to the band switch are critical for length and should not be changed.
4. Dress any slack in lead from oscillator coil (C band secondary terminal) toward end of chassis.
5. Dress (C14-R3) away from chassis base.
6. Dress output plate lead next to chassis keeping it under −B and +B leads.
7. Dress phono cable under C29.
8. Dress R20 next to rear chassis apron.



Reduced Reproduction of Receiver Dial Scale and Corresponding 0-180° Calibration Scales

The corresponding position of the dial indicator for any setting of the calibration scale can be determined by drawing a line from this point on the bottom calibration scale to the same point on the top calibration scale. For example: 145° on the calibration scale corresponds to approximately 600 kc on "A" band, etc. Read instructions under "Alignment Procedures."



Schematic Diagram

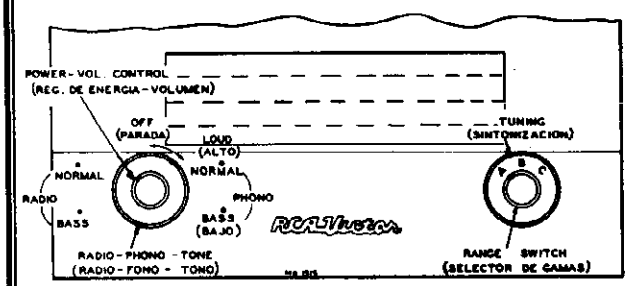
K = 1000
RESISTANCE VALUES IN OHMS.
CAPACITANCE VALUES LESS THAN 1 IN MF. AND ABOVE 1 IN MMF. UNLESS OTHERWISE NOTED.
VOLTAGES MEASURED WITH VOLTOHMYST AND SHOULD HOLD WITHIN ± 20% WITH RATED POWER SUPPLY.

MODEL 35QU, Ch. RC-1054K

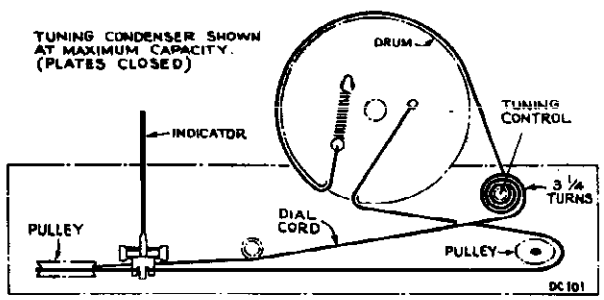
STOCK No.	DESCRIPTION
	CHASSIS ASSEMBLY RC-1054K
S-6032	Bracket—Dial cord pulley bracket complete with one large pulley (left)
S-6033	Bracket—Dial cord pulley bracket complete with one large pulley (right)
	Fixed Capacitors:
S-6634	Ceramic, 56 mmf (C24)
S-6635	Ceramic, 100 mmf (C30)
S-6636	Ceramic, 150 mmf (C19)
S-6637	Ceramic, 220 mmf (C16)
S-6300	Mica, 510 mmf (C11)
S-4441	Mica, 3300 mmf (C12)
S-4442	Mica, 6000 mmf (C15)
S-6638	Molded paper, .001 mf, 600v. (C21)
S-4607	Molded paper, .0022 mf, 600v. (C28)
S-4443	Molded paper, .0047 mf, 600v. (C26, C31)
S-5469	Molded paper, .0047 mf, 600v. (C27)
S-6326	Ceramic, .01 mf. (C2)
S-4609	Molded paper, .01 mf, 600v. (C32)
S-4732	Molded paper, .022 mf, 400v. (C29)
S-6639	Molded paper, .033 mf, 1000v. (C33)
S-4448	Molded paper, .047 mf, 200v. (C17)
S-4449	Molded paper, .056 mf, 400v. (C7, C18)
S-4634	Molded paper, .1 mf, 400v. (C20)
S-4452	Electrolytic, 30 mf and 40 mf at 150v. and 20 mf at 25v. (C25A, C25B, C25C)
S-4450	Capacitor—Trimmer capacitor, two sections of 1.6—18 mmf (C3, C4)
S-4516	Capacitor—Trimmer capacitor, three sections of 3-35 mmf (C8, C9, C10)
S-6640	Capacitor—Variable tuning capacitor (C6-A, C6-B)
S-4453	Capacitor and Resistor—Assembly comprising 39 mmf capacitor and 10 ohm resistor (C14, R3)
S-4454	Clip—Mounting clip for I-F transformers
S-6641	Coil—"A-B-C" bands antenna coil (L1, L2, L3, L4)
S-6642	Coil—"A-B-C" bands oscillator coil (L5, L6, L7)
S-4457	Coil and Resistor—Assembly comprising 250 microhenry coil and 560 ohm resistor (L8, R2)
S-6643	Control—Volume control and tone switch (R15, S2-A)
S-4458	Cord—Tuning drive cord (approx. 49 inches required)
S-5463	Cord—Power line attachment cord
S-6311	Core—Adjustable core for oscillator coil
S-4464	Grommet—Rubber grommet for tuning capacitor mounting (3 req'd)
S-4466	Insulation—Insulating plate for mounting electrolytic capacitor
S-6316	Nut—Speed nut for mounting of oscillator adjustable core.
	Resistors—Fixed, composition:
S-6644	22 ohms, 1 watt (R22)
S-6645	33 ohms, 1 watt (R21)
S-6646	120 ohms, ½ watt (R19)
S-6647	1000 ohms, 1 watt (R20)
S-6648	33,000 ohms, ½ watt (R1)
S-6392	47,000 ohms, ½ watt (R7)
S-6649	56,000 ohms, ½ watt (R14)
S-6396	120,000 ohms, ½ watt (R8)
S-6650	220,000 ohms, ½ watt (R17)

STOCK No.	DESCRIPTION
S-4624	390,000 ohms, ½ watt (R6)
S-4476	470,000 ohms, ½ watt (R4, R18)
S-6479	470,000 ohms, ½ watt (R13)
S-4478	4.7 megohm, ½ watt (R5)
S-5517	10 megohm, ½ watt (R16)
S-6651	Sleeve—Tuning control sleeve
S-4483	Socket—Tube socket—octal—for 50L6GT tube
S-6322	Socket—Tube socket—miniature for 12BE6 tube
S-6652	Socket—Tube socket—miniature for 6BJ6, 12AV6 and 35W4 tubes
S-6037	Socket—Dial lamp socket and lead assembly
S-5710	Spacer—Metal spacer for tuning condenser mounting (3 req'd)
S-4485	Spring—Tension spring for tuning drive cord
S-6653	Switch—Tuning range switch (S1-A, S1-B)
S-4487	Transformer—First I-F transformer (T1)
S-4488	Transformer—Second I-F transformer (T2)
S-6654	Transformer—Output transformer (T3)
S-6179	Washer—"C" washer to retain tuning control sleeve
	SPEAKER ASSEMBLY (STAMPED 970667-7, 8 or 9)
S-6046	Cone—Cone and voice coil assembly
S-6662	Speaker—6½ inch P.M. speaker complete with cone and voice coil.
	MISCELLANEOUS
S-6655	Capacitor—Molded paper, .0022 mf, 1000v. (C34)
S-5734	Decal—"Victrola" decal
S-6656	Decal—Control function decal for front of cabinet (1 set)
S-6657	Dial—Plastic dial scale
S-6665	Emblem—"RCA Victor" emblem
S-5735	Foot—Rubber foot for cabinet (4 req'd)
S-4502	Grommet—Rubber grommet for chassis mounting (4 req'd)
S-6043	Grommet—Rubber grommet for speaker mounting (4 req'd)
S-6658	Hinge—Cabinet lid hinge (2 req'd)
S-6044	Indicator—Station indicating pointer
S-6511	Knob—Radio-Phono switch control knob for walnut finish instruments
S-6512	Knob—Radio-Phono switch control knob for oak finish instruments
74963	Knob—Volume control and on-off switch knob for walnut finish instruments
S-9206	Knob—Volume control and on-off switch knob for oak finish instruments
74959	Knob—Tuning control knob for walnut finish instruments
S-9204	Knob—Tuning control knob for oak finish instruments
S-6513	Knob—Range switch control knob for walnut finish instruments
S-6514	Knob—Range switch control knob for oak finish instruments
S-4506	Lamp—Dial lamp—Mazda type #1490 (2 req'd)
S-6659	Spacer—Metal spacer for chassis mounting (4 req'd)
S-6530	Spacer—Metal spacer for speaker mounting (4 req'd)
S-5744	Stud—Internal thread stud for mounting lid hinge (8 req'd)
S-4659	Support—Cabinet lid support
S-6661	Transformer—234/117v. 50-60 cycle step-down transformer

APPLY TO YOUR RCA DISTRIBUTOR FOR PRICES OF REPLACEMENT PARTS

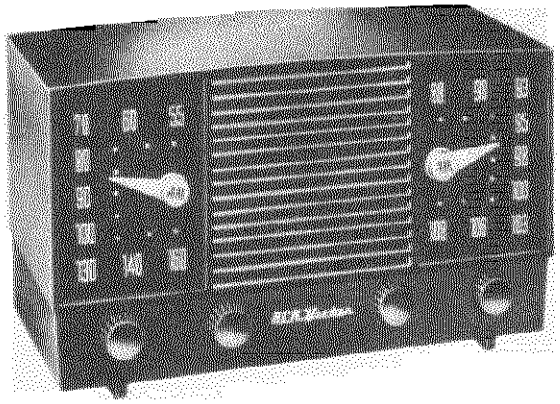


Radio Controls



Dial-Indicator and Drive Mechanism

MODEL 2-XF-91, C
RC1121, Forbes



Model 2-XF-91 "Forbes"
Maroon

SPECIFICATIONS

TUNING RANGE

Standard Broadcast (AM) ..... 540-1600 kc
Frequency Modulation (FM) ..... 88-108 mc
Intermediate Frequency (AM) ..... 455 kc
Intermediate Frequency (FM) ..... 10.7 mc

TUBE COMPLEMENT

(1) RCA 6BJ6 ..... R.F. Amplifier
(2) RCA 19X8 ..... Mixer-Oscillator
(3) RCA 12BA6 ..... I.F. Amplifier
(4) RCA 12AU6 ..... FM I.F. Amplifier
(5) RCA 12AU6 ..... FM I.F. Amplifier
(6) RCA 12AL5 ..... F.M. Detector
(7) RCA 12AV6 ..... AM Det.-AVC-Audio
(8) RCA 35C5 ..... Audio Output
RCA Stock No. 77519 ..... Selenium Rectifier

POWER SUPPLY RATING

115 volts, 50-60 cycles, or 115 volts d.c. ..... 35 w

LOUDSPEAKER

Size and Type ..... 5¼" P
Voice Coil Impedance ..... 3.2 oh

AUDIO POWER OUTPUT

Undistorted ..... 1.0 w
Maximum ..... 1.3 w

TUNING DRIVE RATIO ..... 9:1 (4½ turns of kn

NET WEIGHT 8

DIMENSIONS (Overall)

Height ..... 8⅛" Width ..... 13 9/16" Depth 7

CIRCUIT DESCRIPTION

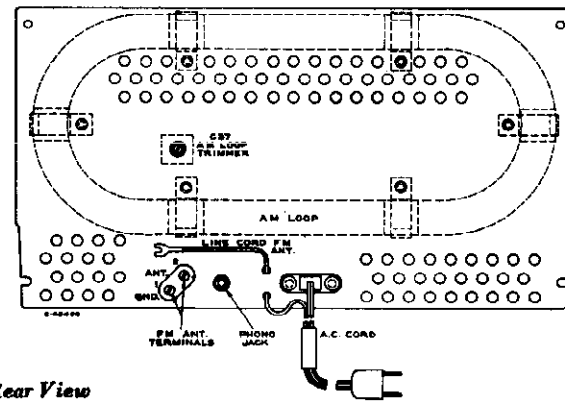
This instrument, an AM-FM table radio, has eight tubes, plus selenium rectifier. Individual dials are provided for AM and FM bands. RF circuits, contained on a two tube sub-chassis, include RF amplification for both bands and a combination mixer-oscillator circuit. The input circuit to the FM RF stage is broad-banded, and is tuned to the approximate FM band center at 100 mc. The mixer is pentode connected for AM operation; triode connected for FM operation. AM IF circuits use an IF amplifier and conventional diode detector with AVC. FM IF circuits include three IF amplifier stages and a discriminator detector. The two tube audio amplifier has an adjustable tone control circuit with combination bass and treble compensation. A hum-bucking circuit uses the tapped-winding output transformer. An inbuilt AM loop antenna, and line cord FM antenna, allow reception without the use of external antennas. A phono jack at the instrument rear permits the use of a record player attachment.

Radio Controls

OPERATING INSTRUCTIONS

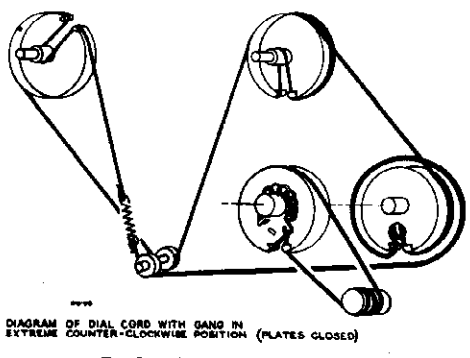
RADIO — Turn OFF-VOLUME control about half-way in clockwise direction to turn receiver ON and provide for med VOLUME. Allow a short warm-up period. Set FUNCTION trol at desired service — AM or FM. Rotate TUNING contro move the pointers to the desired AM or FM frequency. Do touch the pointers themselves. Adjust VOLUME and TO controls as desired.

PHONOGRAPH — Connect attachment to PHONO jack at strument rear. Switch the FUNCTION control to "PH" posit Turn on receiver and adjust VOLUME and TONE controls desired.

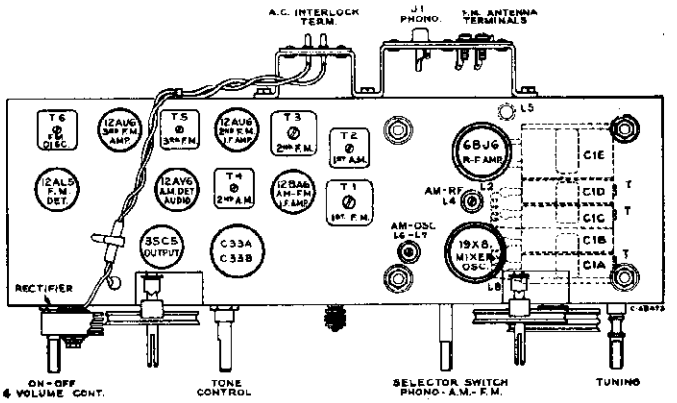


Rear View

MODEL 2-XF-91, Ch. RC1121



Dial and Drive Cord Drive



Tube and Trimmer Locations

ALIGNMENT PROCEDURE

ALIGNMENT INDICATORS:

An RCA VoltOhmyst or equivalent meter is necessary for measuring developed d-c voltage during FM alignment. Connections are specified in the aligament tabulation. An output meter is also necessary to indicate maximum audio output during AM 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 AVC voltage. When audio output is being measured, the volume control should be turned to maximum. Adjust tone control to mid-position.

SIGNAL GENERATOR:

For all alignment operations, connect the low side of the signal generator to the receiver chassis. If output measurement is used for AM alignment, the output of the signal generator should be kept as low as possible to avoid AVC action.

If an FM sweep generator is used for FM alignment, adjust for 10.7 mc, 0.4 mc sweep. Connect oscilloscope across C26, adjusting discriminator T6 top core for 10.7 mc crossover, and T6 bottom core for balanced peaks. Peak separation should be approximately 330 kc. When aligning the other FM tuned circuits, connect oscilloscope lead through a 220K resistor to pin 1 of V5. Follow alignment table sequence, adjusting for maximum gain and symmetrical curves.

Tube Socket Voltages

Tube Type and Function	Tube Element	Pin No.	AM	FM	Phono
V1 6BJ6	Plate	5	94	92	92
	Screen	6	94	92	92
R.F. Amp.	Cathode	2	0.7	0.9	0.5
	Grid	1	−0.5	0	−0.6
V2 19X8	Plate	9	75	80	80
	Screen	1	75	80	80
Mixer	Cathode	6	0	0	0
	Grid	7	−1.6	−2.3	−2.3
	Plate	3	85	85.6	74
Osc.	Grid	2	−3.3	−3	−0.3
	Cathode	6	—	—	—
V3 12BA6	Plate	5	94	92	90
	Screen	6	94	92.3	90
I.F. Amp.	Cathode	7	0.8	0.9	0.8
	Grid	1	−0.4	−0.2	−0.2
V4 12AU6	Plate	5	95	93.5	92
	Screen	6	95	94.1	92
2nd I.F.	Cathode	7	0.8	0.8	0.8
Amp. (F.M.)	Grid	1	0	0	0
V5 12AU6	Plate	5	74	73	72
	Screen	6	74	73	72
3rd I.F.	Cathode	7	0.3	0.3	0.4
Amp. (F.M.)	Grid	1	−0.2	−0.4	−0.2
V6 12AL5	Plate	2	—	—	—
	Cathode	5	—	—	—
F.M. Det.	Plate	7	—	—	—
	Cathode	1	—	—	—
V7 12AV6	Plate	7	58	57	57
A.M. Det.	Grid	1	−0.8	−0.8	−0.8
Audio Amp.	Plate (Diode)	5	−0.5	−0.3	−0.3
V8 35C5	Plate	7	130	130	130
Audio	Screen	6	96	94.5	94.5
Output	Cathode	1	5.1	5.0	5.0
	Grid	2-5	—	—	—

Rectifier output should be approximately 139 volts, 70 ma.

AM Alignment

FUNCTION SWITCH IN AM POSITION

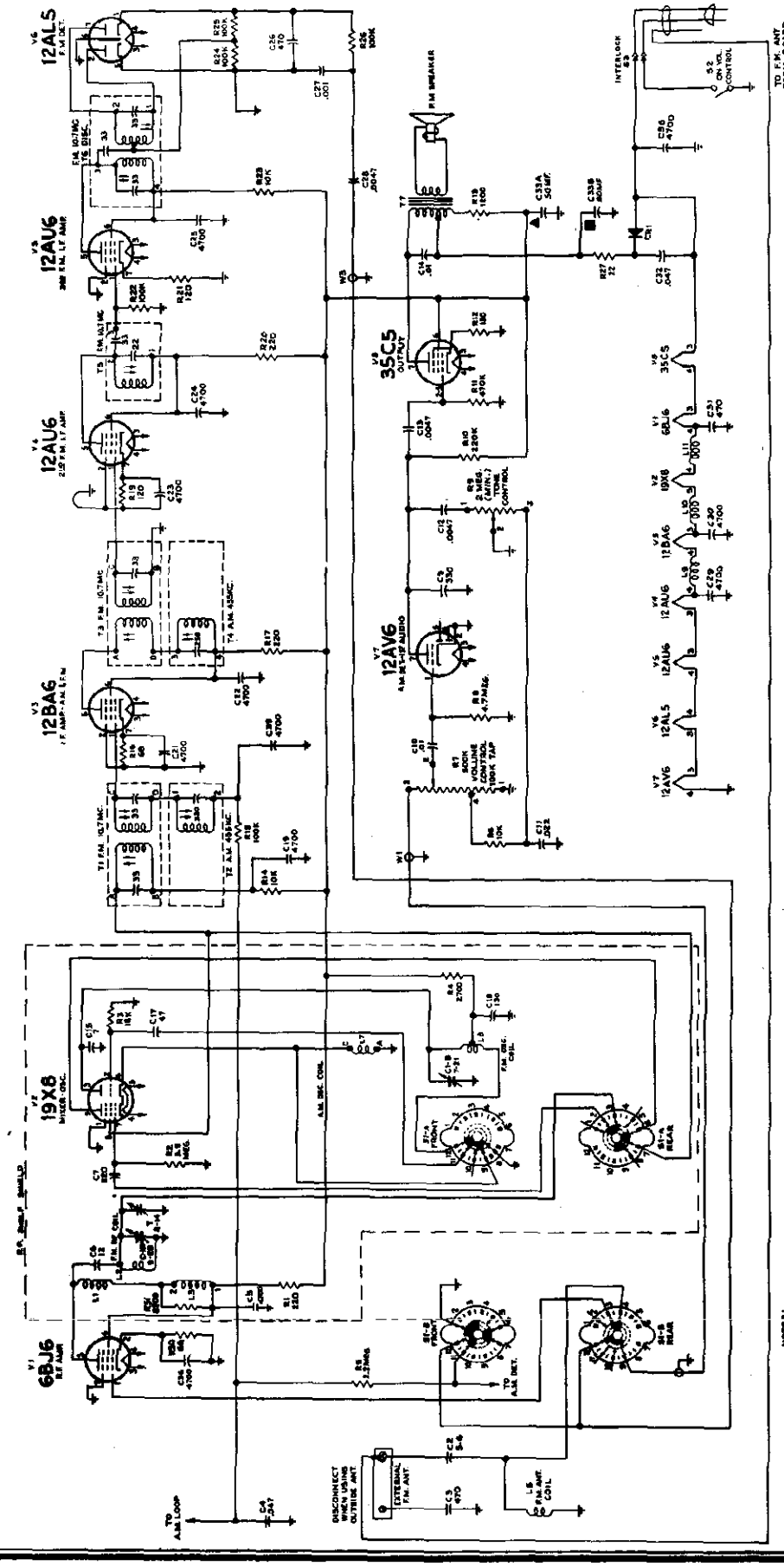
Steps	Connect high side of sig. gen. to—	Sig. gen. output	Turn radio dial to—	Adjust for peak output
1	Pin No. 1 of V3 in series with .01 mfd.	455 kc. (mod.)	Quiet point at high freq. end	T4 bottom core (sec.) T4 top core (pri.)
2	Tap lug 4 on AM RF coil			T2 bottom core (sec.) T2 top core (pri.)
3	Short wire placed near loop for radiated signal	1620 kc. (mod.)	1620 kc.	C1A-T (osc.)
4		1400 kc. (mod.)	1400 kc.	C37 (ant.) C1C-T (rf.)
5		600 kc. (mod.)	600 kc.	L6 (osc.) with 10,000 ohm resistor from C1C RF stator to gnd. (rocking gang)
6				L4 (RF) with the 10,000 ohms removed
7	Repeat steps 4, 5 and 6 until maximum gain is obtained			

FM Alignment

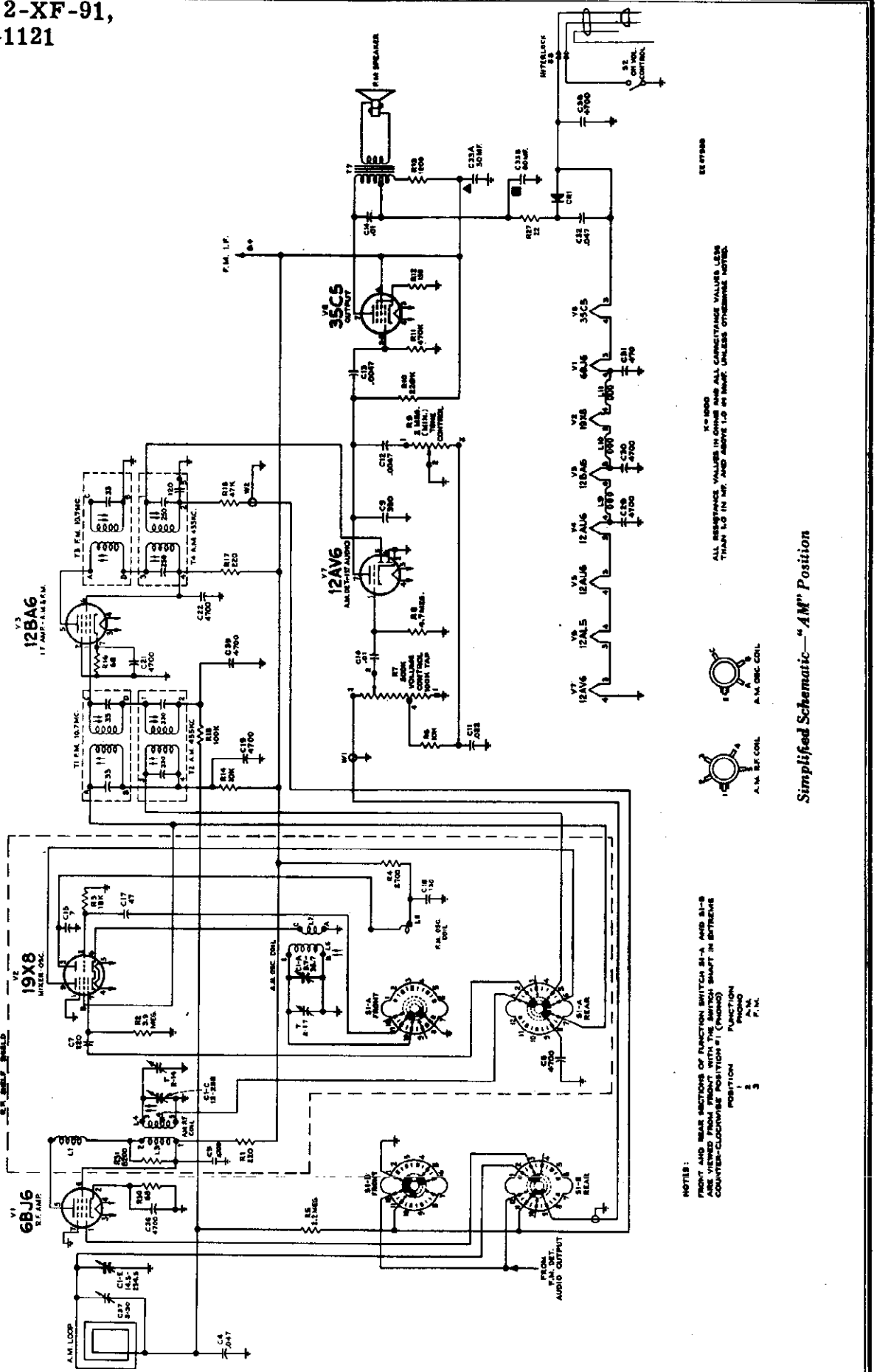
FUNCTION SWITCH IN FM POSITION—VOLUME CONTROL MINIMUM—TONE CONTROL CENTER

Steps	Connect high side of sig. gen. to—	Sig. gen. output	Turn radio dial to—	Adjust for max. output
1	Pin No. 1 of V5-12AU6	10.7 mc.	Quiet point at low frequency end	T6 top core for zero d.c. (across C26) T6 bottom core for maximum d.c. (junction of R24 and R25)
2	Pin No. 1 of V4-12AU6			†T5 top core
3	Pin No. 1 of V3-12BA6			T3 top core †*T3 bottom core
4	C1D Stator			T1 top core †*T1 bottom core
5	FM Ant. terminals thru 270 ohm resistor	90 mc.	90 mc.	†FM osc. L8
6		106 mc.	106 mc.	†FM R.F. C1D-T
7		90 mc.	90 mc.	†FM R.F. L2
8		Repeat steps 6 and 7 until maximum gain is obtained		
9		100 mc.	100 mc.	†FM Ant. coil L5

*If necessary for accurate peaking, the winding in the same transformer not being peaked should be loaded with a 680 ohm resistor.
†Connect VoltOhmyst to pin 1 of V5 through a 220K isolating resistor with ¼ inch maximum exposed lead at grid terminal end. Output adjusted for 1 volt d.c. Dress VoltOhmyst lead away from input circuits.
Oscillator frequency is above signal frequency on both AM and FM


V6 12AL5 F.M. DET.
V5 12AU6 2nd F.M. I.F. AMP.
V4 12AU6 1st F.M. I.F. AMP.
V3 12BA6 I.F. AMP.—A.M. R.F.
V2 19X8 MIXER-OSC.
V1 6BJ6 R.F. AMP.
V8 35C5 OUTPUT
V7 12AV6 A.M. DET.-1st AUDIO
V6 35C5
V1 6BJ6
V2 19X8
V3 12BA6
V4 12AU6
V5 12AU6
V6 12AL5
V7 12AV6
F.M. BREAKER
INTERLOCK
TO F.M. ANT. TERM. BOARD
S2 ON VOL. CONTROL
TO A.M. DET.
TO A.M. LOOP
DISCONNECT WHEN USING OUTSIDE ANT.
EXTERNAL F.M. ANT.
A.M. OSC. COIL
A.M. R.F. COIL
NOTES:
FUNCTION
PHONO
A.M.
F.M.
POSITION
1
2
3
Simplified Schematic—"FM" Position

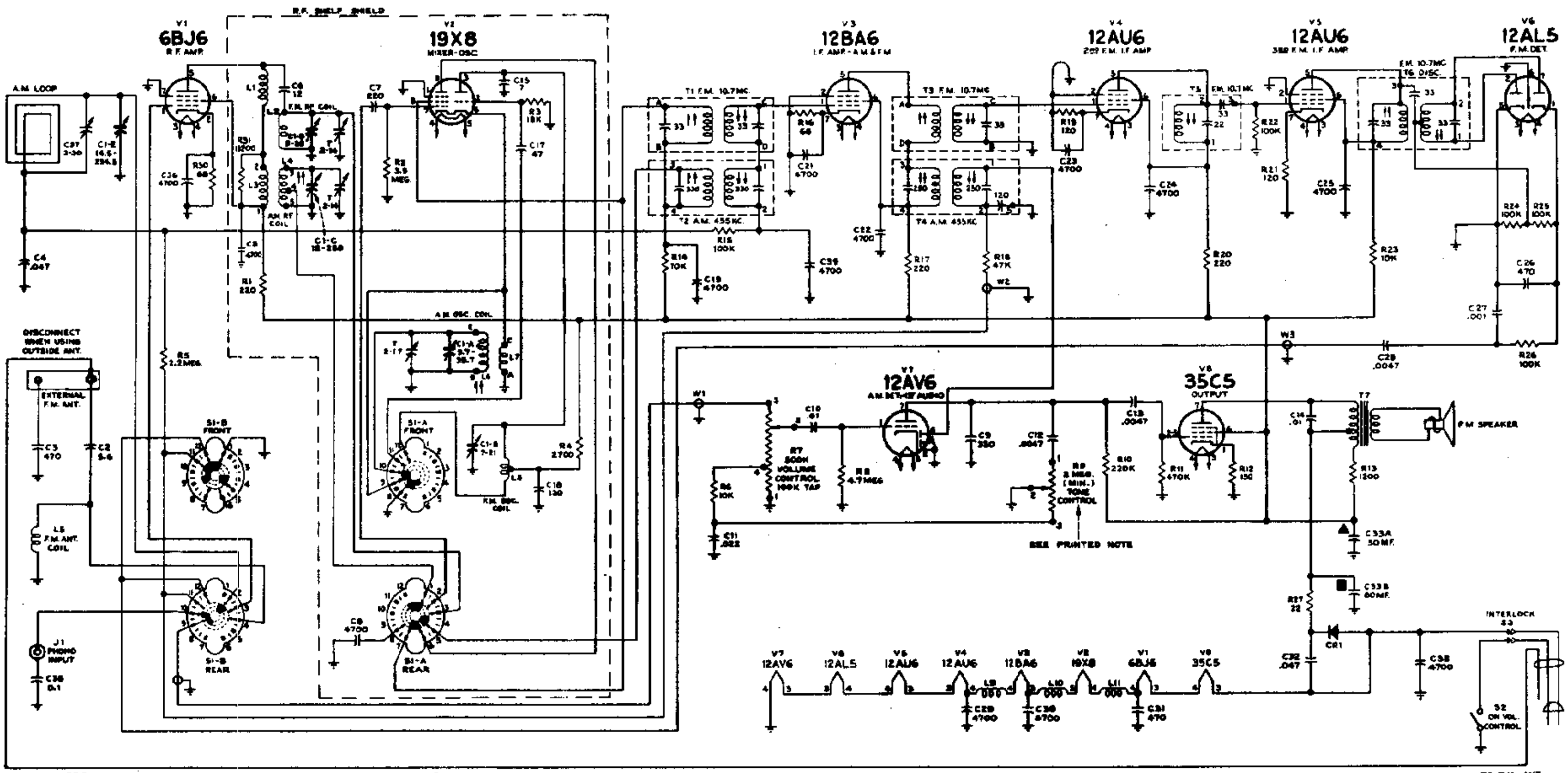
MODEL 2-XF-91,
Ch. RC-1121



MODEL 2-XF-9
Ch. RC1121

CRITICAL LEAD DRESS

1. All FM IF Transformer grid and plate leads should be short and direct as possible and kept low, near chassis.
2. C26 leads should be kept as short as possible.
3. C32 leads should be kept as short as possible.
4. R24 and R25 leads should be kept as short as possible on T6 terminal 6 side.
5. C27 should ground in hole near terminal 5 of V6 with short leads.
6. AM oscillator coil should not be tilted over toward function switch when wrapping short bus leads to switch.
7. Keep leads V5 pin 5, to T6 term 1, as short as possible and low near chassis.
8. Dress C28 down on chassis and against terminal board. Run filament lead between V5 and V6 on side of V6 socket opposite C28.
9. All ceramic button 4700 uuf condensers should have leads as short as possible.
10. Green lead from AM oscillator stator gang terminal to AM oscillator coil should be dressed against front of shield box and up above filament choke.
11. RF plate choke L1, should be dressed at least 1/8" away from AM R.F. coil L4 and at least 1/8" from shield.
12. Mixer grid condenser C7 should be dressed away from FM oscillator gang stator terminal and away from leads connecting to terminals 8 and 9 of V2 socket.
13. Filament chokes L10 and L11 should be raised a minimum of 1/16" above chassis.
14. Use varnished tubing only on choke and coupling cond. leads coming through shield partition slot.
15. Condenser C2 should have lead on antenna terminal end not more than 3/16" long to prevent possible contact of lead or body to "Hot" chassis.
16. Condensers C3 and C35 should use varnished tubing, not vinyl, to prevent breakthrough crossing chassis edge.
17. Oscillator grid condenser C17 should have short leads and be dressed away from filament choke L10.
18. Leads from loop terminal to chassis terminal board should have a minimum of three twists.



NOTES:
FRONT AND REAR SECTIONS OF FUNCTION SWITCH S1-A AND S1-B ARE VIEWED FROM FRONT WITH THE SWITCH SHAFT IN EXTREME COUNTER-CLOCKWISE POSITION #1 (PHONO)

K=1000
ALL RESISTANCE VALUES IN OHMS AND ALL CAPACITANCE VALUES LESS THAN 1.0 IN MF. AND ABOVE 1.0 IN MMF. UNLESS OTHERWISE NOTED.

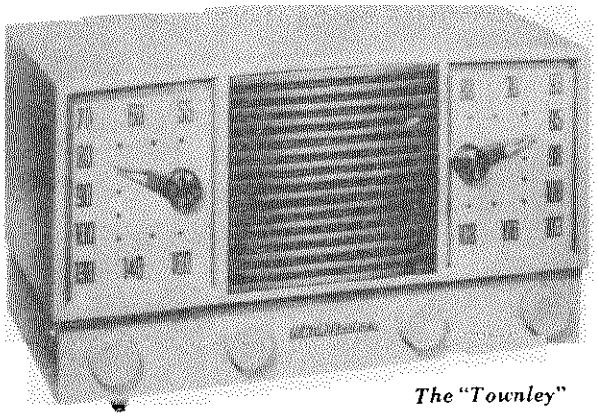
Acceptable value of R9 may be 2 to 50 megohms

MODEL 2-XF-91, Ch. RC1121

STOCK No.	PART DESCRIPTION
	CHASSIS ASSEMBLIES
	RC1121
77520	Bushing—Laminated bushing (⅝" long with shoulder) for station selector pointer pulley and shaft assembly.
77522	Capacitor—Variable tuning capacitor (C1A, C1B, C1C, C1D, C1E, C1A-T, C1C-T, C1D-T)
70997	Capacitor—Fixed, ceramic, non-insulated, 5.6 mmf., ±1 mmf., 500 volts D.C. Temp. coef. = 0 (C2)
77530	Capacitor—Fixed, ceramic, non-insulated, 7 mmf., ±.5 mmf., 500 volts D.C. Temp. coef. = 80 (C15)
33380	Capacitor—Fixed, ceramic, non-insulated, 12 mmf., ±5%, 500 volts D.C. Temp. coef. = 0 (C6)
77531	Capacitor—Fixed, ceramic, non-insulated, 47 mmf., ±10%, 500 volts D.C. Temp. coef. = 0 (C17)
77532	Capacitor—Fixed, ceramic, non-insulated, 130 mmf., ±2½%, 500 volts D.C. Temp. coef. = −750 (C18)
39636	Capacitor—Fixed, mica, 220 mmf., 500 volts D.C. (C7)
75792	Capacitor—Fixed, ceramic, insulated, 330 mmf., ±20%, 500 volts D.C. High K (C9)
76992	Capacitor—Fixed, mica, 470 mmf., 300 volts D.C. (C26, C31)
39644	Capacitor—Fixed, mica, 470 mmf., 500 volts D.C. (C3)
73473	Capacitor—Fixed, ceramic, 4700 mmf., +100%, −0%, 500 volts D.C. High K disc (C5, C8, C19, C21, C22, C23, C24, C25, C29, C30, C36, C38, C39)
73520	Capacitor—Electrolytic comprising 1 section of 80 mfd., 150 volts and 1 section of 50 mfd., 150 volts (C33A, C33B)
77533	Capacitor—Fixed, miniature, tubular, paper, .001 mfd., 200 volts D.C. (C27)
73920	Capacitor—Fixed, tubular, paper, .0047 mfd., 600 volts (C12, C13, C28)
73561	Capacitor—Fixed, tubular, paper, .01 mfd., 400 volts (C10)
73594	Capacitor—Fixed, tubular, paper, .01 mfd., 600 volts (C14)
73562	Capacitor—Fixed, tubular, paper, .022 mfd., 400 volts (C11)
73558	Capacitor—Fixed, tubular, paper, .047 mfd., 200 volts (C4)
75071	Capacitor—Fixed, tubular, moulded, .047 mfd., 400 volts (C32)
73551	Capacitor—Fixed, tubular, paper, 0.1 mfd., 400 volts (C35)
73935	Clip—Mounting clip for I.F. transformers
77538	Coil—Antenna coil—F.M. (L5)
77534	Coil—Choke coil (L1)
77535	Coil—Choke coil (L9, L10, L11)
77526	Coil—Oscillator coil—A.M.—complete with adjustable core (L6, L7)
77537	Coil—Oscillator coil—F.M. (L8)
77525	Coil—RF coil—A.M.—complete with adjustable core (L3, L4)
77536	Coil—RF coil—F.M. (L2)
77528	Connector—Combination phono input connector and antenna terminal board (J1)
75474	Connector—Single contact male connector for speaker lead
77529	Connector—Two (2) contact male connector for power cord
77516	Control—Tone control (R9)
77515	Control—Volume control and power switch (R7, S2)
72953	250' Dial Cord Reel—Dial cord (approx. 49" overall required)
	Drive cord (approx. 11" overall required)
77523	Drum—Variable tuning capacitor drive drum and hub
16058	Grommet—Rubber grommet for mounting RF shelf (4 required)
77521	Nut—Speednut for station selector pointer pulley and shaft bushing
72602	Pulley—Idler pulley for indicator cord (2 required)
77510	Pulley—Pulley and shaft (split) for station selector pointers
77519	Rectifier—Selenium rectifier, 100 MA (CR1)
76346	Resistor—Wire wound, 1200 ohms, 4 watts (R13)
	Resistor—Fixed, composition:
503022	22 ohms, ±10%, ½ watt (R27)
503068	68 ohms, ±10%, ½ watt (R16, R30)
503112	120 ohms, ±10%, ½ watt (R19, R21)
503115	150 ohms, ±10%, ½ watt (R12)
503122	220 ohms, ±10%, ½ watt (R1, R17, R20)
503227	2700 ohms, ±10%, ½ watt (R4)
503282	8200 ohms, ±10%, ½ watt (R31)
503310	10,000 ohms, ±10%, ½ watt (R6, R14, R23)
503318	18,000 ohms, ±10%, ½ watt (R3)
503347	47,000 ohms, ±10%, ½ watt (R18)
502410	100,000 ohms, ±5%, ½ watt (R24, R25)
503410	100,000 ohms, ±10%, ½ watt (R15, R22, R26)
503422	220,000 ohms, ±10%, ½ watt (R10)
503447	470,000 ohms, ±10%, ½ watt (R11)
503522	2.2 megohm, ±10%, ½ watt (R5)
503539	3.9 megohm, ±10%, ½ watt (R2)
503547	4.7 megohm, ±10%, ½ watt (R8)
77527	Shaft—Tuning knob shaft
75192	Shield—Tube shield for V1
76331	Shield—Tube shield for V2
77087	Socket—Tube socket, 7 pin, miniature, moulded, saddle mounted for V1
76336	Socket—Tube socket, 9 pin, miniature, moulded, saddle mounted for V2
73117	Socket—Tube socket, 7 pin, miniature, wafer for V3, V4, V5, V6, V7, V8
31970	Spring—Dial cord spring
31418	Spring—Drive cord spring
77524	Switch—Function switch (S1)
77517	Transformer—Output transformer (T7)
77511	Transformer—Ratio detector transformer — complete with adjustable cores (T6)
76335	Transformer—First I.F. transformer—A.M.—complete with adjustable cores (T2)
77514	Transformer—First I.F. transformer—F.M.—complete with adjustable cores (T1)
76328	Transformer—Second I.F. transformer—A.M.—complete with adjustable cores (T4)
77513	Transformer—Second I.F. transformer—F.M.—complete with adjustable cores (T3)
77512	Transformer—Third I.F. transformer—F.M.—complete with adjustable cores (T5)
33726	Washer—"C" washer for station selector pointer pulley and shaft or tuning knob shaft
34373	Washer—"C" washer to fasten idler pulleys
	SPEAKER ASSEMBLIES
	971933-1
77539	Speaker—5¼" P.M. speaker complete with cone and voice coil (3.2 ohms)
	MISCELLANEOUS
77543	Antenna—Antenna loop and back assembly complete with power cord (includes C37)
77543	Back—Cabinet back complete with loop, capacitor and power cord (includes C37)
Y2467	Cabinet—Maroon plastic cabinet less "RCA Victor" emblem and function decal
77544	Capacitor—Adjustable, mica trimmer, 3-30 mmf. (C37)
77545	Cord—Power cord and plugs
77542	Decal—Control function decal
77033	Emblem—"RCA Victor" emblem
77548	Knob—Function switch knob
77547	Knob—Tuning control, tone control or volume control and power switch knob
73203	Nut—Speednut to fasten "RCA Victor" emblem to cabinet.
77541	Pointer—Station selector pointer—A.M.
77540	Pointer—Station selector pointer—F.M.
73992	Retainer—Knob retainer (knob to cabinet)
76837	Spring—Retaining spring for knobs (knob to shaft)

APPLY TO YOUR RCA DISTRIBUTOR FOR PRICES OF REPLACEMENT PARTS

MODELS 2-XF-931, -932, -933, -934, -935, Ch. RC1121A, Townle



The "Townley"

2-XF-931 ***Maroon*** | *2-XF-932* ***Ivory*** | *2-XF-933* ***Green*** | *2-XF-934* ***Red*** | *2-XF-935* ***Beige***

SPECIFICATIONS

TUNING RANGE

Standard Broadcast (AM)..... 540-1600 kc
Frequency Modulation (FM)..... 88-108 mc
Intermediate Frequency (AM)..... 455 kc
Intermediate Frequency (FM)..... 10.7 mc

TUBE COMPLEMENT

(1) RCA 6BJ6 .....R.F. Amplifier
(2) RCA 19X8 ..... Mixer-Oscillator
(3) RCA 12BA6 .....I.F. Amplifier
(4) RCA 12AU6 .....FM I.F. Amplifier
(5) RCA 12AU6 .....FM I.F. Amplifier
(6) RCA 12AL5 .....F.M. Detector
(7) RCA 12AV6 ..... AM Det.-AVC-Audio
(8) RCA 35C5 ..... Audio Output
RCA Stock No. 77519.....Selenium Rectifier

POWER SUPPLY RATING

115 volts, 50-60 cycles.....35 wa

CAUTION: DO NOT OPERATE ON D.C.

DIAL LAMPS..... 2 No. 47, 6-8 volts, 0.15 am

LOUDSPEAKER

Size and Type.....5¼" P.
Voice Coil Impedance.....3.2 ohr

AUDIO POWER OUTPUT

Undistorted .....1.0 wa
Maximum .....1.3 wa

TUNING DRIVE RATIO.....9:1 (4½ turns of kno

NET WEIGHT.....8 lb

DIMENSIONS (Overall)

Height..... 8⅛" Width..... 13⁹⁄₁₆" Depth..... 7¾

CIRCUIT DESCRIPTION

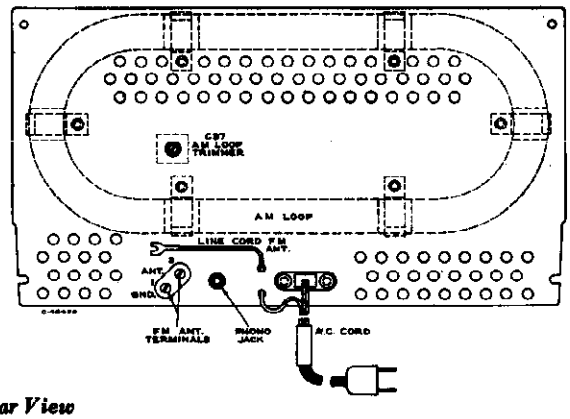
This instrument, an AM-FM table radio, has eight tubes, plus selenium rectifier. Individual dials are provided for AM and FM bands. RF circuits, contained on a two tube sub-chassis, include RF amplification for both bands and a combination mixer-oscillator circuit. The input circuit to the FM RF stage is broad-banded, and is tuned to the approximate FM band center at 100 mc. The mixer is pentode connected for AM operation; triode connected for FM operation. AM IF circuits use an IF amplifier and conventional diode detector with AVC. FM IF circuits include three IF amplifier stages and a discriminator detector. The two tube audio amplifier has an adjustable tone control circuit with combination bass and treble compensation. A hum-bucking circuit uses the tapped-winding output transformer. An inbuilt AM loop antenna, and line cord FM antenna, allow reception without the use of external antennas. A phono jack at the instrument rear permits the use of a record player attachment.

Radio Controls

OPERATING INSTRUCTIONS

RADIO — Turn OFF-VOLUME control about half-way in clockwise direction to turn receiver ON and provide for mediu VOLUME. Allow a short warm-up period. Set FUNCTION co trol at desired service — AM or FM. Rotate TUNING control move the pointers to the desired AM or FM frequency. Adju VOLUME and TONE controls as desired.

PHONOGRAPH — Connect attachment to PHONO jack at i strument rear. Switch the FUNCTION control to "PH" positio Turn on receiver and adjust VOLUME and TONE controls desired.



Rear View

MODELS 2-XF-931 Series, Ch. RC1121A

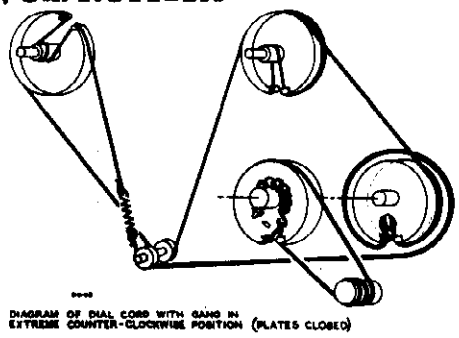
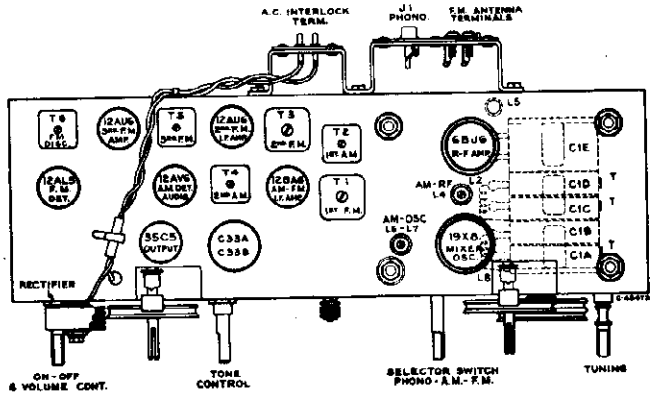


DIAGRAM OF DIAL CORD WITH GANG IN EXTREME COUNTER-CLOCKWISE POSITION (PLATES CLOSED)

Dial and Drive Cord Drive



Tube and Trimmer Locations

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SIGNAL GENERATOR:

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If an FM sweep generator is used for FM alignment, adjust for 10.7 mc, 0.4 mc sweep. Connect oscilloscope across C26, adjusting discriminator T6 top core for 10.7 mc crossover, and T6 bottom core for balanced peaks. Peak separation should be approximately 330 kc. When aligning the other FM tuned circuits, connect oscilloscope lead through a 220K resistor to pin 1 of V5. Follow alignment table sequence, adjusting for maximum gain and symmetrical curves.

Tube Socket Voltages

Tube Type and Function	Tube Element	Pin No.	AM	FM	Phono
V1 6BJ6	Plate	5	94	92	92
	Screen	6	94	92	92
R.F. Amp.	Cathode	2	0.7	0.9	0.5
	Grid	1	−0.5	0	−0.6
V2 19X8	Plate	9	75	80	80
	Screen	1	75	80	80
Mixer	Cathode	6	0	0	0
	Grid	7	−1.6	−2.3	−2.3
	Plate	3	85	85.6	74
Osc.	Grid	2	−3.3	−3	−0.3
	Cathode	6	—	—	—
V3 12BA6	Plate	5	94	92	90
	Screen	6	94	92.3	90
I.F. Amp.	Cathode	7	0.8	0.9	0.8
	Grid	1	−0.4	−0.2	−0.2
V4 12AU6	Plate	5	95	93.5	92
	Screen	6	95	94.1	82
2nd I.F.	Cathode	7	0.8	0.8	0.8
Amp. (F.M.)	Grid	1	0	0	0
V5 12AU6	Plate	5	74	73	72
	Screen	6	74	73	72
3rd I.F.	Cathode	7	0.3	0.3	0.4
Amp. (F.M.)	Grid	1	−0.2	−0.4	−0.2
V6 12AL5	Plate	2	—	—	—
	Cathode	5	—	—	—
F.M. Det.	Plate	7	—	—	—
	Cathode	1	—	—	—
V7 12AV6	Plate	7	58	57	57
A.M. Det.	Grid	1	−0.8	−0.8	−0.8
Audio Amp.	Plate	5	−0.5	−0.3	−0.3
	(Diode)				
V8 35C5	Plate	7	130	130	130
Audio	Screen	6	96	94.5	94.5
Output	Cathode	1	5.1	5.0	5.0
	Grid	2-5	—	—	—

Rectifier output should be approximately 139 volts, 70 ma.

AM Alignment

FUNCTION SWITCH IN AM POSITION

Steps	Connect high side of sig. gen. to—	Sig. gen. output	Turn radio dial to—	Adjust for peak output
1	Pin No. 1 of V3 in series with .01 mfd.	455 kc. (mod.)	Quiet point at high freq. end	T4 bottom core (sec.) T4 top core (pri.)
2	Tap lug 4 on AM RF coil			T2 bottom core (sec.) T2 top core (pri.)
3	Short wire placed near loop for radiated signal	1620 kc. (mod.)	1620 kc.	C1A-T (osc.)
4		1400 kc. (mod.)	1400 kc.	C37 (ant.) C1C-T (rf.)
5		600 kc. (mod.)	600 kc.	L6 (osc.) with 10,000 ohm resistor from C1C RF stator to gnd. (rocking gang)
6				L4 (RF) with the 10,000 ohms removed
7	Repeat steps 4, 5 and 6 until maximum gain is obtained			

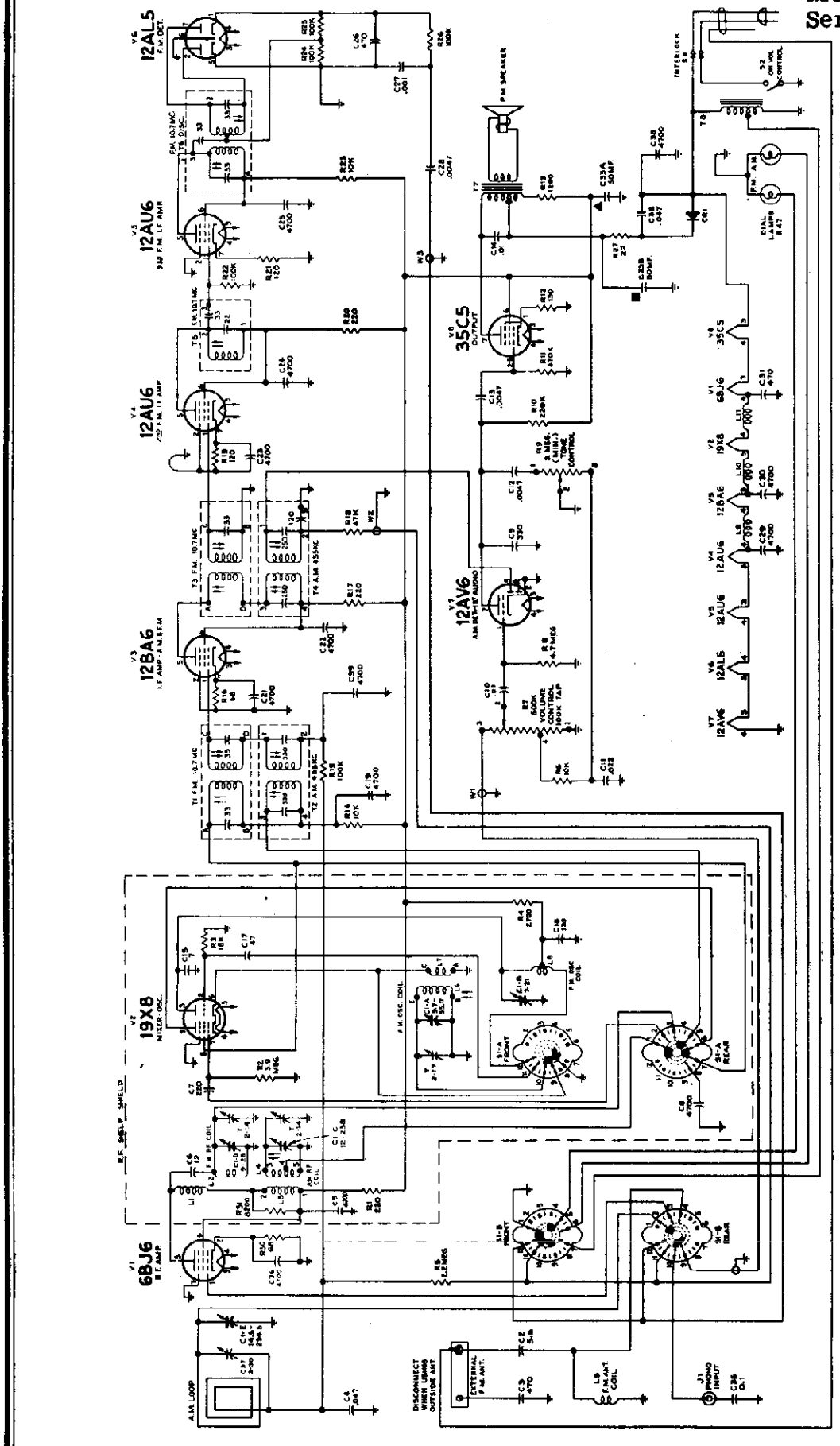
FM Alignment

FUNCTION SWITCH IN FM POSITION—VOLUME CONTROL MINIMUM—TONE CONTROL CENTER

Steps	Connect high side of sig. gen. to—	Sig. gen. output	Turn radio dial to—	Adjust for max. output
1	Pin No. 1 of V5-12AU6	10.7 mc.	Quiet point at low frequency end	T6 top core for zero d.c. (across C26) T6 bottom core for maximum d.c. (junction of R24 and R25)
2	Pin No. 1 of V4-12AU6			†T5 top core
3	Pin No. 1 of V3-12BA6			T3 top core †*T3 bottom core
4	C1D Stator			T1 top core †*T1 bottom core
5	FM Ant. terminals thru 270 ohm resistor	90 mc.	90 mc.	†FM osc. L8
6		106 mc.	106 mc.	†FM R.F. C1D-T
7		90 mc.	90 mc.	†FM R.F. L2
8		Repeat steps 6 and 7 until maximum gain is obtained		
9		100 mc.	100 mc.	†FM Ant. coil L5

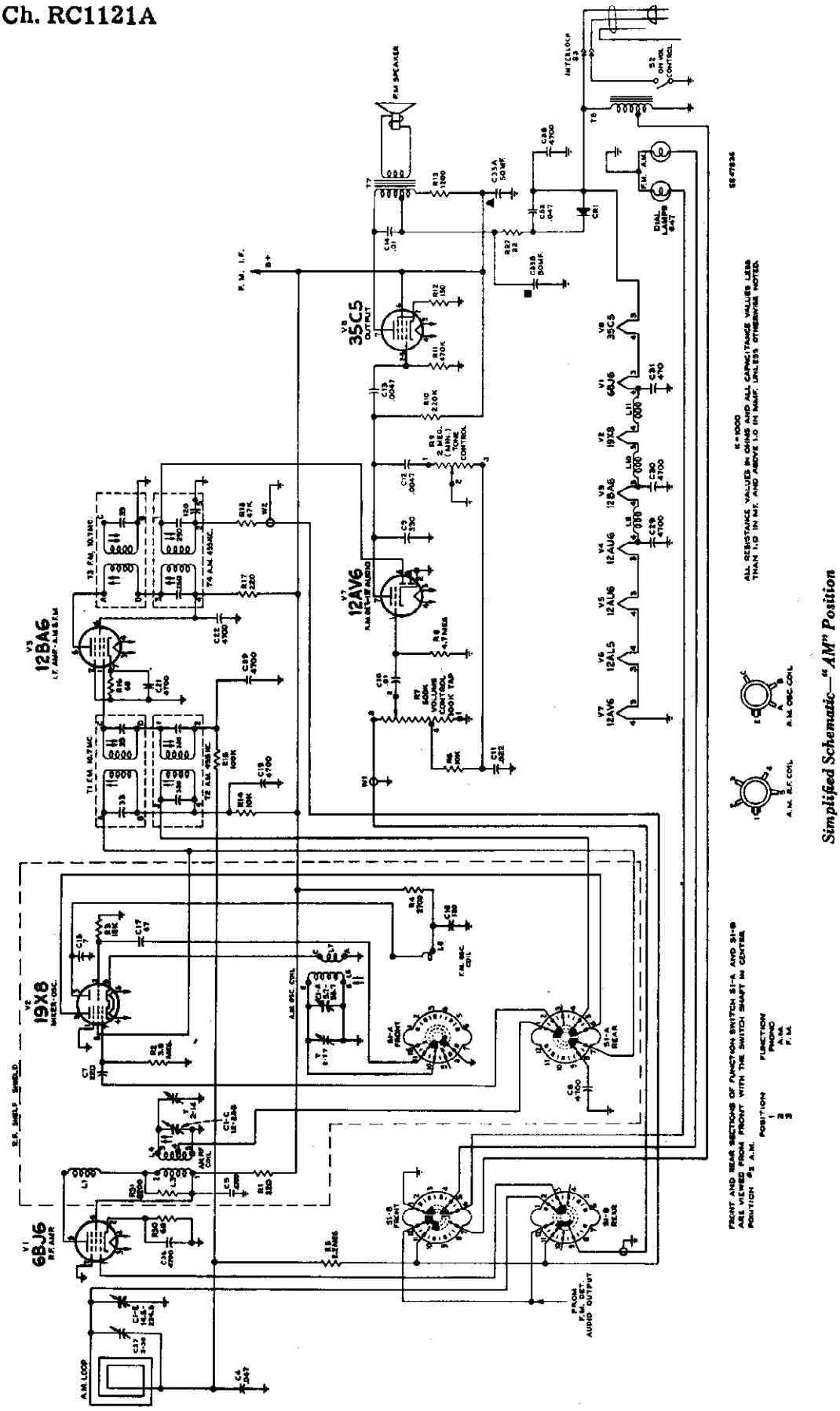
*If necessary for accurate peaking, the winding in the same transformer not being peaked should be loaded with a 680 ohm resistor.
†Connect VoltOhmyst to pin 1 of V5 through a 220K isolating resistor with ¼ inch maximum exposed lead at grid terminal end. Output adjusted for 1 volt d.c. Dress VoltOhmyst lead away from input circuits.
Oscillator frequency is above signal frequency on both AM and FM

MODELS 2-XF-93
Series, Ch. RC1121



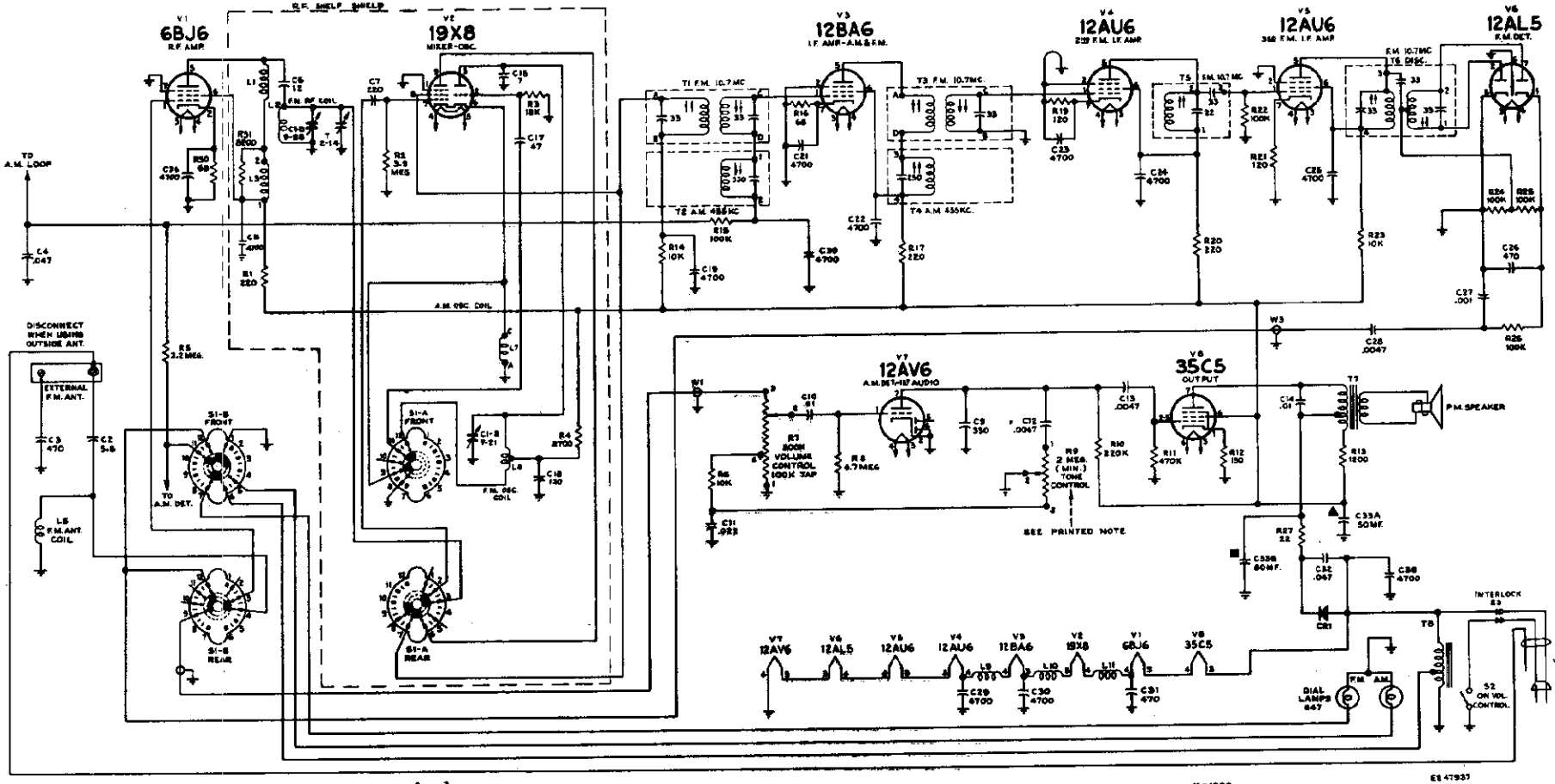
Simplified Schematic—"FM" Position

MODELS 2-XF-931
Series, Ch. RC1121A



CRITICAL LEAD DRESS

1. All FM IF Transformer grid and plate leads should be short and direct as possible and kept low, near chassis.
2. C26 leads should be kept as short as possible.
3. C32 leads should be kept as short as possible.
4. R24 and R25 leads should be kept as short as possible on T6 terminal 6 side.
5. C27 should ground in hole near terminal 5 of V6 with short leads.
6. AM oscillator coil should not be tilted over toward function switch when wrapping short bus leads to switch.
7. Keep leads V5 pin 5, to T6 term 1, as short as possible and low near chassis.
8. Dress C28 down on chassis and against terminal board. Run filament lead between V5 and V6 on side of V6 socket opposite C28.
9. All ceramic button 4700 uuf condensers should have leads as short as possible.
10. Green lead from AM oscillator stator gang terminal to AM oscillator coil should be dressed against front of shield box and up above filament choke.
11. RF plate choke L1, should be dressed at least ⅛" away from AM R.F. coil L4 and at least ⅛" from shield.
12. Mixer grid condenser C7 should be dressed away from FM oscillator gang stator terminal and away from leads connecting to terminals 8 and 9 of V2 socket.
13. Filament chokes L10 and L11 should be raised a minimum of 1/16" above chassis.
14. Use varnished tubing only on choke and coupling cond. leads coming through shield partition slot.
15. Condenser C2 should have lead on antenna terminal end not more than 3/16" long to prevent possible contact of lead or body to "Hot" chassis.
16. Condensers C3 and C35 should use varnished tubing, not vinyl, to prevent breakthrough crossing chassis edge.
17. Oscillator grid condenser C17 should have short leads and be dressed away from filament choke L10.
18. Leads from loop terminal to chassis terminal board should have a minimum of three twists.



FRONT AND REAR SECTIONS OF FUNCTION SWITCH S1-A AND S1-B ARE VIEWED FROM FRONT WITH THE SWITCH SHAFT IN EXTREME COUNTER-CLOCKWISE POSITION #1 (PHONO)

K = 1000
ALL RESISTANCE VALUES IN OHMS AND ALL CAPACITANCE VALUES LESS THAN 1.0 IN MF. AND ABOVE 1.0 IN MMF. UNLESS OTHERWISE NOTED.

E8 47937

MODELS 2-XF-931 Series, Ch. RC1121A

STOCK No.	PART DESCRIPTION
	CHASSIS ASSEMBLIES RC-1121A
77520	Bushing—Laminated bushing (⅝" long with shoulder) for station selector pointer pulley and shaft assembly.
77522	Capacitor—Variable tuning capacitor (C1A, C1B, C1C, C1D, C1E, C1A-T, C1C-T, C1D-T)
70997	Capacitor—Fixed, ceramic, non-insulated, 5.6 mmf., ±1 mmf., 500 volts D.C. Temp. coef. = 0 (C2)
77530	Capacitor—Fixed, ceramic, non-insulated, 7 mmf., ±.5 mmf., 500 volts D.C. Temp. coef. = 80 (C15)
33380	Capacitor—Fixed, ceramic, non-insulated, 12 mmf., ±5%, 500 volts D.C. Temp. coef. = 0 (C6)
77531	Capacitor—Fixed, ceramic, non-insulated, 47 mmf., ±10%, 500 volts D.C. Temp. coef. = 0 (C17)
77532	Capacitor—Fixed, ceramic, non-insulated, 130 mmf., ±2½%, 500 volts D.C. Temp. coef. = -750 (C18)
39836	Capacitor—Fixed, mica, 220 mmf., 500 volts D.C. (C7)
75792	Capacitor—Fixed, ceramic, insulated, 330 mmf., ±20%, 500 volts D.C. High K (C9)
76992	Capacitor—Fixed, mica, 470 mmf., 300 volts D.C. (C26, C31)
39644	Capacitor—Fixed, mica, 470 mmf., 500 volts D.C. (C3)
73473	Capacitor—Fixed, ceramic, 4700 mmf., +100%, -0%, 500 volts D.C. High K disc (C5, C8, C19, C21, C22, C23, C24, C25, C29, C30, C36, C38, C39)
73520	Capacitor—Electrolytic comprising 1 section of 80 mfd., 150 volts and 1 section of 50 mfd., 150 volts (C33A, C33B)
77533	Capacitor—Fixed, miniature, tubular, paper, .001 mfd., 200 volts D.C. (C27)
73920	Capacitor—Fixed, tubular, paper, .0047 mfd., 600 volts (C12, C13, C28)
73561	Capacitor—Fixed, tubular, paper, .01 mfd., 400 volts (C10)
73594	Capacitor—Fixed, tubular, paper, .01 mfd., 600 volts (C14)
73562	Capacitor—Fixed, tubular, paper, .022 mfd., 400 volts (C11)
73558	Capacitor—Fixed, tubular, paper, .047 mfd., 200 volts (C4)
75071	Capacitor—Fixed, tubular, moulded, .047 mfd., 400 volts (C32)
73551	Capacitor—Fixed, tubular, paper, 0.1 mfd., 400 volts (C35)
73935	Clip—Mounting clip for I.F. transformers
77538	Coil—Antenna coil—F.M. (L5)
77534	Coil—Choke coil (L1)
77535	Coil—Choke coil (L9, L10, L11)
77526	Coil—Oscillator coil—A.M.—complete with adjustable core (L6, L7)
77537	Coil—Oscillator coil—F.M. (L8)
77525	Coil—RF coil—A.M.—complete with adjustable core (L3, L4)
77536	Coil—RF coil—F.M. (L2)
77528	Connector—Combination phono input connector and antenna terminal board (J1)
75474	Connector—Single contact male connector for speaker lead
77529	Connector—Two (2) contact male connector for power cord
77516	Control—Tone control (R9)
77515	Control—Volume control and power switch (R7, S2)
72953	250' Dial Cord Reel—Dial cord (approx. 49" overall required)
	Drive cord (approx. 11" overall required)
77523	Drum—Variable tuning capacitor drive drum and hub
16058	Grommet—Rubber grommet for mounting RF shell (4 required)
31480	Lamp—Dial lamp (Mazda 47)
77521	Nut—Speednut for station selector pointers pulley and shaft bushing
72602	Pulley—Idler pulley for indicator cord (2 required)
77510	Pulley—Pulley and shaft (split) for station selector pointers
77519	Rectifier—Selenium rectifier, 100 MA (CR1)
76346	Resistor—Wire wound, 1200 ohms, 4 watts (R13)
	Resistor—Fixed, composition:
503022	22 ohms, ±10%, ½ watt (R27)
503068	68 ohms, ±10%, ½ watt (R16, R30)
503112	120 ohms, ±10%, ½ watt (R19, R21)
503115	150 ohms, ±10%, ½ watt (R12)
503122	220 ohms, ±10%, ½ watt (R1, R17, R20)
503227	2700 ohms, ±10%, ½ watt (R4)
503282	8200 ohms, ±10%, ½ watt (R31)
503310	10,000 ohms, ±10%, ½ watt (R6, R14, R23)
503318	18,000 ohms, ±10%, ½ watt (R3)
503347	47,000 ohms, ±10%, ½ watt (R18)
502410	100,000 ohms, ±5%, ½ watt (R24, R25)
503410	100,000 ohms, ±10%, ½ watt (R15, R22, R26)
503422	220,000 ohms, ±10%, ½ watt (R10)
503447	470,000 ohms, ±10%, ½ watt (R11)
503522	2.2 megohm, ±10%, ½ watt (R5)
503539	3.9 megohm, ±10%, ½ watt (R2)
503547	4.7 megohm, ±10%, ½ watt (R8)

STOCK No.	PART DESCRIPTION
77527	Shaft—Tuning knob shaft
75192	Shield—Tube shield for V1
76331	Shield—Tube shield for V2
77566	Socket—Dial lamp socket
77087	Socket—Tube socket, 7 pin, miniature, moulded, saddle mounted for V1
76336	Socket—Tube socket, 9 pin, miniature, moulded, saddle mounted for V2
73117	Socket—Tube socket, 7 pin, miniature, wafer for V3, V4, V5, V6, V7, V8
31970	Spring—Dial cord spring
31418	Spring—Drive cord spring
77524	Switch—Function switch (S1)
77666	Transformer—Filament transformer, 117 volt A.C. input
77517	Transformer—Output transformer (T7)
77511	Transformer—Ratio detector transformer—complete with adjustable cores (T6)
76335	Transformer—First I.F. transformer—A.M.—complete with adjustable cores (T2)
77514	Transformer—First I.F. transformer—F.M.—complete with adjustable cores (T1)
76328	Transformer—Second I.F. transformer—A.M.—complete with adjustable cores (T4)
77513	Transformer—Second I.F. transformer—F.M.—complete with adjustable cores (T3)
77512	Transformer—Third I.F. transformer—F.M.—complete with adjustable cores (T5)
33726	Washer—"C" washer for station selector pointer pulley and shaft or tuning knob shaft
34373	Washer—"C" washer to fasten idler pulleys
	SPEAKER ASSEMBLIES 971933-1
77539	Speaker—5¼" P.M. speaker complete with cone and voice coil (3.2 ohms)
	MISCELLANEOUS
77543	Antenna—Antenna loop and back cover complete with power cord (includes C37)
77543	Back—Cabinet back complete with loop, capacitor and power cord (includes C37)
Y2468	Cabinet—Maroon plastic cabinet less "RCA Victor" emblem and function decal for Model 2-XF-931
Y2469	Cabinet—Ivory plastic cabinet less "RCA Victor" emblem and function decal for Model 2-XF-932
Y2470	Cabinet—Green plastic cabinet less "RCA Victor" emblem and function decal for Model 2-XF-933
Y2471	Cabinet—Red plastic cabinet less "RCA Victor" emblem and function decal for Model 2-XF-934
Y2472	Cabinet—Beige plastic cabinet less "RCA Victor" emblem and function decal for Model 2-XF-935
77559	Cap—Station selector pointer cap—A.M.
77558	Cap—Station selector pointer cap—F.M.
77544	Capacitor—Adjustable, mica trimmer, 3-30 mmf. (C37)
77545	Cord—Power cord and plugs
77542	Decal—Control function decal
77033	Emblem—"RCA Victor" emblem
77560	Grille—Metal grille
77548	Knob—Function switch knob—maroon—for Model 2-XF-931
77550	Knob—Function switch knob—ivory—for Model 2-XF-932
77552	Knob—Function switch knob—green—for Model 2-XF-933
77556	Knob—Function switch knob—red—for Model 2-XF-934
77554	Knob—Function control knob—beige—for Model 2-XF-935
77547	Knob—Tuning control, tone control or volume control and power switch knob—maroon—for Model 2-XF-931
77549	Knob—Tuning control, tone control or volume control and power switch knob—ivory—for Model 2-XF-932
77551	Knob—Tuning control, tone control or volume control and power switch knob—green—for Model 2-XF-933
77555	Knob—Tuning control, tone control or volume control and power switch knob—red—for Model 2-XF-934
77553	Knob—Tuning control, tone control or volume control and power switch knob—beige—for Model 2-XF-935
73203	Nut—Speed nut to fasten "RCA Victor" emblem to cabinet
77563	Pad—Cork and rubber pad (1/32" x 3/16" x 3/16") for mounting metal grille to cabinet
77557	Pointer—Station selector pointer
73992	Retainer—Knob retainer (knob to cabinet)
76837	Spring—Retaining spring for knobs (knob to shaft)
77561	Window—Polystyrene window for L.H. side of cabinet
77562	Window—Polystyrene window for R.H. side of cabinet

APPLY TO YOUR RCA DISTRIBUTOR FOR PRICES OF REPLACEMENT PARTS

Specifications

Tuning Range

Standard Broadcast (AM).....540-1600 kc.
Frequency Modulation (FM).....88-108 mc.
Intermediate Frequency (AM).....455 kc.
Intermediate Frequency (FM).....10.7 mc.

Tube Complement

Tube Used	Function
Radio Chassis RC1111	
(1) RCA 6CB6	R-F Amplifier
(2) RCA 6J6	Mixer and Oscillator
(3) RCA 6BA6	I-F Amplifier
(4) RCA 6AU6	F-M Driver
(5) RCA 6AL5	Ratio Detector
(6) RCA 6AV6	AM Det.-AVC-A-F Amplifier
Audio Chassis RS141	
(1) RCA 6C4	Phase Inverter
(2) RCA 6V6GT	Audio Output
(3) RCA 6V6GT	Audio Output
(4) RCA 5Y3GT	Rectifier

Lamps

Dial (2).....#51, 6-8 volts, 0.2 amp.
Jewel (1).....#51, 6-8 volts, 0.2 amp.

Power Supply Rating.....115 volts, 60 cycles, 100 w

Audio Power Output Rating

Radio.....undistorted 8 watts, maximum 9 w
Phonograph.....undistorted 10 watts, maximum 12 w

Loudspeaker (92569-12W)

Size and Type.....12 inch P.
Voice Coil Impedance.....3.2 ohms at 400 cyc

Tuning Drive Ratio.....9:1 (4½ turns of kn

Net Weight.....96 l

Dimensions (overall)

Height....35½ in. Width....35 in. Depth....23

Record Changer (930409-8, or -10)

Turntable Speed.....33⅓, 45 or 78 r.p.m.
Record Capacity.....Up to fourteen 7 inch RCA type
or twelve 10 inch
or ten 12 inch
or ten 10 inch and 12 inch intermi
Pickup (Stock No. 75475)....Crystal with replaceable s

General Description

This instrument is a Victrola combination having nine tubes, plus one rectifier. It has a modern style cabinet in either walnut, mahogany, or limed oak finish. The entire receiver (with the exception of the power supply and speaker) is built as a unit with the automatic record changer for "pull-out" operation. The three speed record changer is nested over the radio chassis on a plastic case. Record storage space is provided for both large and small diameter records.

For standard broadcast reception, a loop antenna is mounted on the roll-out unit back. A folded dipole is mounted inside the cabinet for use on the FM band. Provision is made for connecting an external antenna for either the broadcast or FM bands.

By rotating the function switch, the 2S10 can be operated as:

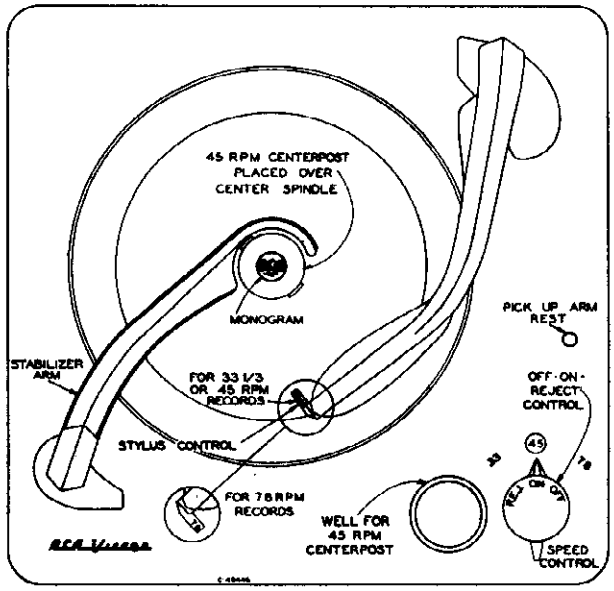
1. Phonograph sound channel for the three speed record changer.
2. Standard broadcast "A" band receiver (540-1600 k
3. Broadcast "FM" band receiver (88-108 mc).

The function switch controls the internal connections for:

A. RF-IF stage AVC voltages from AM or FM detector.
B. Audio amplifier input from any one of three chann
C. B+ voltage application to RF-IF circuits.
D. Audio output tube bias voltage. In phonograph ope tion, R2 is disconnected from R107, increasing av able power output for phonograph operation.
E. Selection of tuned circuits for AM or FM operation.

A horizontal tilted slide rule type dial is located along the front face of the plastic roll-out case. The dial is edge-lighted both ends by dial lamps. An amber jewel lamp, visible at bottom front, glows whenever the set is in operation.

MODEL 2-S-10, Ch. RC1111 Record Changer



Controls

Record Changer Controls

The record changer has a dual control on the motorboard and a stylus selector control on the pickup arm. The inner control (circular knob) is the OFF-ON-REJECT control. Turning this knob to the center position energizes the motor and starts the turntable, when turned to the right (clockwise) it starts the mechanism into complete automatic operation. The mechanism will shut off automatically after the last record has been played but can be shut off manually by turning this knob to the left (counter-clockwise).

The outer control (double ended lever) is the speed control. It has three normal positions, "33", "45", "78" to select the turntable speed desired and a neutral position (midway between "45" and "78"). The control should be turned to this neutral position if the changer is not expected to be in use for an extended period of time.

The stylus control has two normal positions (right and left) and one shipping position (lever pointing up). When playing 33⅓ or 45 r.p.m. records the lever is turned so that "33-45" is visible on the TOP of the lever; likewise for 78 r.p.m. records "78" should be visible on the TOP.

The removable centerpost is for use with 45 r.p.m. records having the large centerhole. It must be placed over the center spindle with the "RCA" trademark monogram FACING to the FRONT. When not in use it is placed in a well at the front of the motorboard.

To load or remove records, the record stabilizer is lifted and turned off-side. After loading it is turned to the center where it rests on top of the stack of records.

Record Changer Adjustments

Landing Adjustment

Only one landing adjustment is necessary. The landing position of the stylus is adjusted by means of the eccentric stud (20A), mounted on the pickup arm support bracket. When adjusted for correct landing on one side of record, the landing position for other sizes of records is automatically corrected.

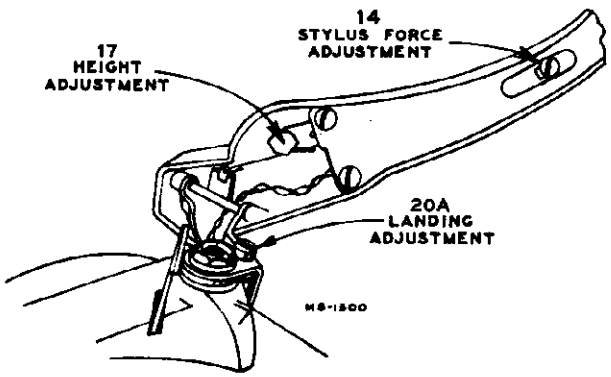
Pickup Arm Height Adjustment

The pickup arm height during cycle is adjusted by means of the hex head screw (17), located in the pickup arm.

Turn control knob to "REJ" and rotate turntable by hand until arm has risen to its maximum height. Adjust screw so that stylus is 1⅜" above turntable.

Stylus Force Adjustment

Stylus force should be 7½ to 9½ grams. Loosen screw (14), and move slide until the correct force is obtained.



Adjustments

Tripping

The tripping method used in this mechanism is a velocity method. Velocity tripping is effective between 4¾" and 3¼" diameters, when the stylus moves inward ⅛" or more per revolution of the turntable. No adjustment is required.

Radio

Operating Instructions

RADIO—Turn extreme right hand FUNCTION knob to "AM" or "FM" radio position as desired. Turn OFF-VOLUME Knob "ON" and advance to mid-position for medium volume. Allow approximately 20 seconds for tube warm-up. With TUNING knob, select desired station indicated by dial pointer. Set tone controls for most pleasing reception. Turn BASS control counter-clockwise and TREBLE control clockwise for full tone. Adjust volume level as desired.

PHONOGRAPH—Turn extreme right hand FUNCTION knob to "PH" position. Turn OFF-VOLUME knob "ON" and advance to mid-position for medium volume. Set tone controls as indicated above for best tone. Refer to RECORD CHANGER section for operational information.

Radio Controls

Roll-Out Mechanism

Record Changer Mounting

The record-changer is mounted in a roll-out carriage. The changer mechanism is mounted on springs and should be free floating.

Roll-out Carriage Removal

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 carriage has a normal movement limitation of approximately 10 inches. If it 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.

Alignment Procedure

CORRECT ALIGNMENT OF THE AM R.F. STAGES REQUIRES THAT THE FM R.F. STAGES 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. Adjust tone controls for maximum highs and lows during alignment.

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

Ⓐ 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	Pin No. 1 of V3 in series with .01 mfd.	455 kc. (mod.)	Quiet point at low freq. end	T4 bottom† core (sec.). T4 top core (pri.).
2	To stator of C1-F			T2 top† core (sec.). T2 bottom core (pri.).
Ⓒ	PERFORM FM ALIGNMENT BEFORE PROCEEDING			
3	Short wire placed near loop for radiated signal	1620 kc. (mod.)	1620 kc.	C1B-T (osc.).
4		1400 kc. (mod.)	1400 kc.	C1D-T (ant.). C1E-T (rf.).
5		600 kc. (mod.)	600 kc.	L5 (osc.) with 10,000 ohm resistor from RF stator to gnd. (rocking gang)
6				L7 (RF) with the 10,000 ohms removed.
7	Repeat steps 4, 5 and 6 until no improvement in sensitivity is obtained.			

Oscillator frequency is above signal frequency on both AM and FM.
Ⓐ Ⓑ Ⓒ encircled letters indicate recommended alignment sequence.

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 C39 and the common lead to chassis. Adjust sig. gen. output to provide approx. −4 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-F. 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 T1
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-F trimmer (ant.) and C1-C 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 R33 and C35 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 −4 volts indication.

L8, L1 and L2 are adjustable by increasing or decreasing the spacing between turns. Oscillator signal tracks above signal frequency.

The proper adjustment of the I.F. cores can be determined by starting the core all the way out. The first peak obtained is the correct one.

Tube Socket Voltages

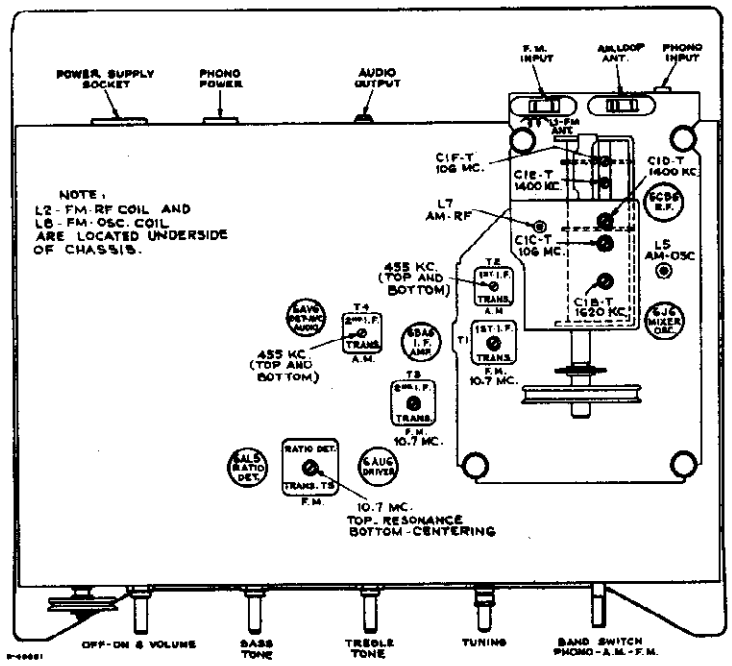
Tube Type and Function	Tube Element	Pin No.	AM	FM	Phono
V1 6CB6 R-F Amp.	Plate	5	215	180	—
	Screen	6	74	62	—
	Cathode	2	0.4	0.4	—
	Grid	1	−0.8	0.4	—
V2 6J6 Osc. and Mixer	Plate	2	55	58	—
	Grid	5	−1.2	−1.3	—
	Plate	1	43	46	—
	Grid	6	−2.0	−1.2	—
V3 6BA6 I-F Amp.	Plate	5	210	210	—
	Screen	6	126	115	—
	Cathode	7	0.9	0.7	—
	Grid	1	−0.8	−0.2	—
V4 6AU6 Driver	Plate	5	216	216	—
	Screen	6	150	150	—
	Cathode	7	1.5	1.5	—
	Grid	1	0	0	—
V5 6AL5 Ratio Det.	—	—	—	—	—
	—	—	—	—	—
V6 6AV6 Audio Amp.	Plate	7	88	88	104
	Grid	1	−0.7	−0.7	−0.8
V7 6C4 Phase Inverter	Plate	5	87.5	88	120
	Cathode	7	−11	−11	−13
	Grid	6	−16	−16	−19
V8 6V6GT V9 6V6GT Audio Power Output	Plate	3	300	300	298
	Screen	4	224	224	292
	Cathode	8	0	0	0
	Grid	5	−17	−17	−21
V10 5Y3GT Rectifier	Fil.	8	305	305	307

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

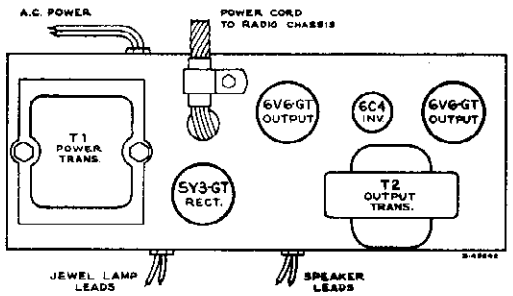
Critical Lead Dress

1. The 1st F.M. I.F. plate lead should be dressed away from the R.F. plate.
2. Dress the 1st A.M. I.F. plate lead to S-2 wafer away from the A.M. R.F. coil.
3. The ground strap between the R.F. Shelf and the main chassis should be well soldered and kept as short as practicable but yet allow some flexibility for the R.F. Shelf.
4. Dress A.C. power switch wires away from all audio components.
5. Dress C-26 down toward base between terminal board and side apron.
6. C-18 bypass should ground as close to the R.F. Shelf ground strap as practicable.
7. Dress C-25 away from arm of volume control.
8. All leads, from the R.F. shelf, leaving through the shields must be kept as short as possible so as to minimize F.M. oscillator radiation.
9. Dress A.C. leads in the RS141 chassis away from audio input leads and components.
10. Dress all leads away from R1 in the RS141 chassis.
11. All leads for F.M. should be kept short especially on the R.F. shelf.

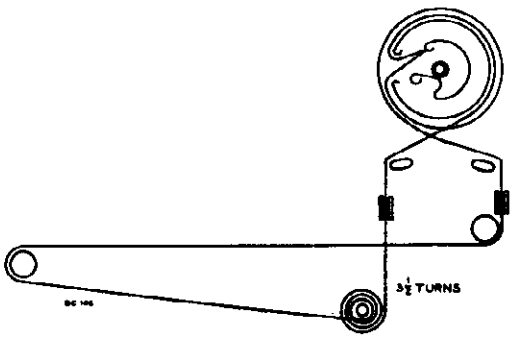
MODEL 2-S-10, Ch. RC1111



RC1111 Chassis—Tube and Trimmer Locations



RS141—Audio Amplifier Chassis



Dial Cord Drive

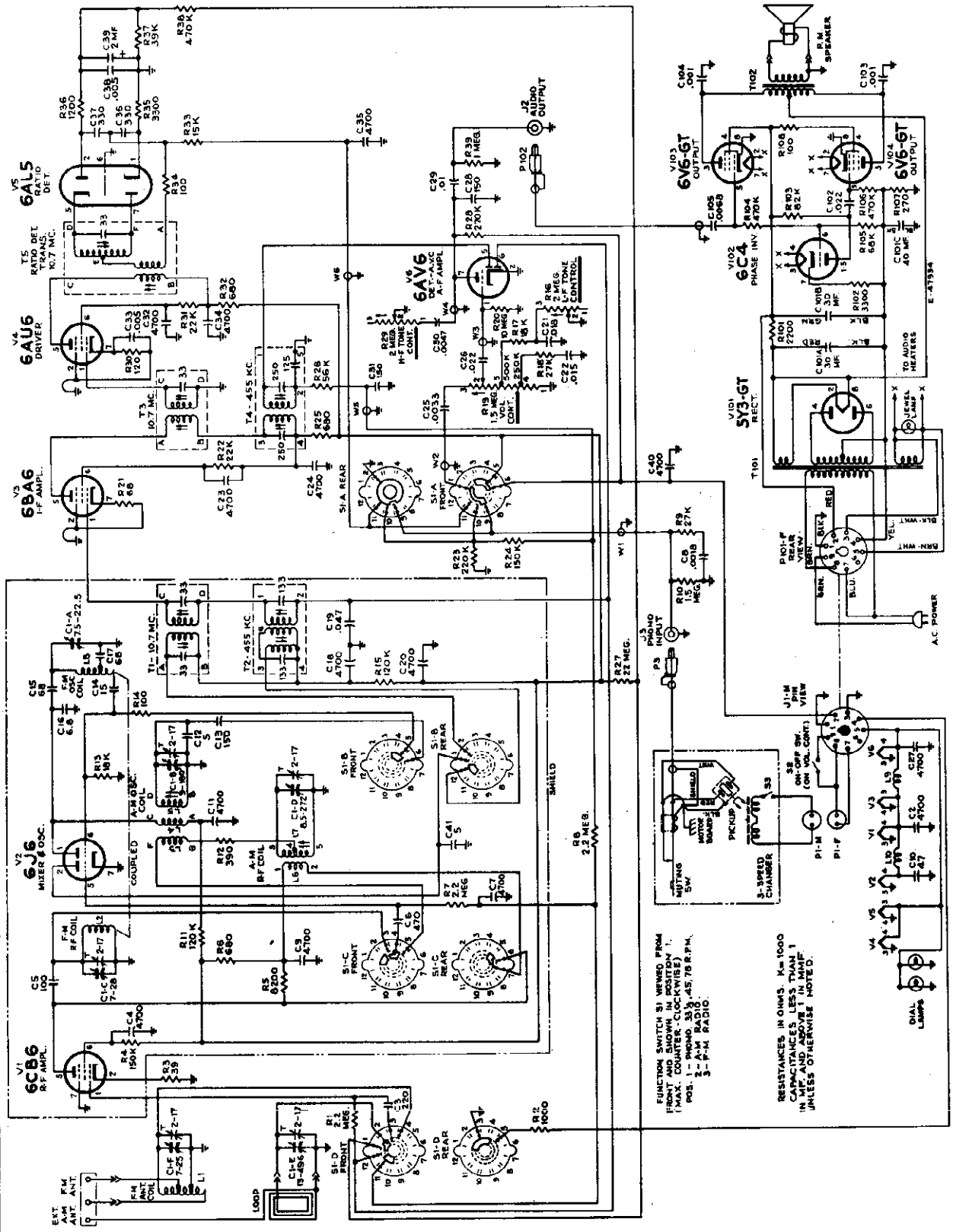
STOCK NO.	PART DESCRIPTION
	CHASSIS ASSEMBLIES RC 1111
77308	Capacitor—Variable tuning capacitor (C1-A, C1-B, C1-C, C1-D, C1-E, C1-F)
75613	Capacitor—Ceramic, 5 mmf. (C12, C41)
77352	Capacitor—Ceramic, 6.8 mmf. (C16)
39044	Capacitor—Ceramic, 15 mmf. (C14)
76348	Capacitor—Ceramic, 47 mmf. (C10)
75612	Capacitor—Ceramic, 68 mmf. (C15, C17)
39396	Capacitor—Ceramic, 100 mmf. (C5)
75614	Capacitor—Ceramic, 150 mmf. (C13, C28, C31)
75611	Capacitor—Ceramic, 220 mmf. (C3)
39640	Capacitor—Mica, 330 mmf. (C36, C37)
39644	Capacitor—Mica, 470 mmf. (C6)
73473	Capacitor—Ceramic, 4700 mmf. (C2, C4, C7, C9, C11, C18, C20, C23, C24, C27, C32, C34, C35, C40)
73747	Capacitor—Electrolytic 2 mfd., 50 volts (C39)
77468	Capacitor—Tubular, paper, .0018 mfd., 600 volts (C8)
73795	Capacitor—Tubular, paper, .0038 mfd., 600 volts (C25)
73920	Capacitor—Tubular, paper, .0047 mfd., 600 volts (C30)
72490	Capacitor—Tubular, paper, .005 mfd., 200 volts (C33, C38)
73561	Capacitor—Tubular, paper, .01 mfd., 400 volts (C29)
73797	Capacitor—Tubular, paper, .015 mfd., 600 volts (C22)
77469	Capacitor—Tubular, paper, .018 mfd., 200 volts (C21)
73562	Capacitor—Tubular, paper, .022 mfd., 400 volts (C26)
73558	Capacitor—Tubular, paper, .047 mfd., 200 volts (C19)
73935	Clip—Mounting clip for I.F. transformer for 75558 & 76328
77313	Coil—Antenna coil—FM (L1)
71942	Coil—Filament choke coil (L9, L10)
75569	Coil—Oscillator coil—AM—complete with adjustable core (L3, L4, L5)
77315	Coil—Oscillator coil—FM (L8)
77305	Coil—R.F. coil—AM—complete with adjustable core (L6, L7)
77314	Coil—R.F. coil—FM (L2)
75543	Connector—2 contact female connector for phono power cable (P1)
74879	Connector—2 contact female connector for antenna leads
75062	Connector—9 contact male connector for power input (J1)
35787	Connector—Single contact female connector for audio cable (J2)
33742	Connector—Single contact female connector for phono cable (J3)
75562	Control—Tone control—H.F. (R29)
75561	Control—Tone control—L.H. (R16)
75537	Control—Volume control and power switch (R19, S2)
72953	Cord—250′ Drive Cord Reel (approx. 57″ overall req'd)
75564	Coupling—Spring coupling for function switch extension shaft
74839	Fastener—Push fastener to fasten RF shelf (4 req'd)
16058	Grommet—Rubber grommet for mounting RF shelf (4 req'd)
75548	Grommet—Rubber grommet for mounting slides (4 req'd)
11765	Lamp—Dial lamp—Mazda 51
77311	Latch—Bottom cover latch
77486	Nut—Speed nut for latch adjustment screw
76421	Pin—Slide mechanism stop pin
72602	Pulley—Drive cord pulley
35641	Pulley—Drive cord pulley—1⅜″ dia.
	Resistor—Fixed, composition:—
503039	39 ohms, ±10%, ½ watt (R3)
503068	68 ohms, ±10%, ½ watt (R21)
503110	100 ohms, ±10%, ½ watt (R14, R34)
503112	120 ohms, ±10%, ½ watt (R30)
503139	390 ohms, ±10%, ½ watt (R12)
503168	680 ohms, ±10%, ½ watt (R6, R25, R32)
503210	1000 ohms, ±10%, ½ watt (R2)
502212	1200 ohms, ±5%, ½ watt (R36)
502233	3300 ohms, ±5%, ½ watt (R35)

Parts (Continued)

STOCK NO.	PART DESCRIPTION
503282	8200 ohms, ±10%, ½ watt (R5)
503315	15,000 ohms, ±10%, ½ watt (R33)
503318	18,000 ohms, ±10%, ½ watt (R13, R17)
503322	22,000 ohms, ±10%, ½ watt (R22, R31)
503327	27,000 ohms, ±10%, ½ watt (R9, R18)
503339	39,000 ohms, ±10%, ½ watt (R37)
503356	56,000 ohms, ±10%, ½ watt (R26)
503412	120,000 ohms, ±10%, ½ watt (R11, R15)
503415	150,000 ohms, ±10%, ½ watt (R4, R24)
503422	220,000 ohms, ±10%, ½ watt (R23)
503427	270,000 ohms, ±10%, ½ watt (R28)
503447	470,000 ohms, ±10%, ½ watt (R38)
503510	1 megohm, ±10%, ½ watt (R39)
503515	1.5 megohm, ±10%, ½ watt (R10)
503522	2.2 megohm, ±10%, ½ watt (R1, R7, R8)
503610	10 megohm, ±10%, ½ watt (R20)
504622	22 megohm, ±20%, ½ watt (R27)
77303	Shaft—Extension shaft for function switch
75540	Shaft—Tuning knob shaft
73584	Shield—Tube shield for V1, V6
75192	Shield—Tube shield for V2
77310	Slide—Slide mechanism (2 req'd)
31364	Socket—Dial lamp socket
74179	Socket—Tube socket, 7 contact, miniature, wafer for V1, V3, V4, V5
73117	Socket—Tube socket, 7 contact, miniature, wafer for V6
77306	Socket—Tube socket, 7 pin, moulded, saddle-mounted for V2
77312	Spring—Actuating spring for bottom cover latch
76332	Spring—Drive cord spring
75563	Spring—Retaining spring for function switch extension shaft
76422	Spring—Retaining spring for slide mechanism stop pin
77304	Support—Polystyrene support for FM oscillator coil complete with mounting bracket
77307	Switch—Function switch (S1)
75559	Transformer—1st. I.F. transformer—FM—complete with adjustable cores (T1)
75558	Transformer—1st. I.F. transformer—AM—complete with adjustable cores (T2)
76328	Transformer—2nd. I.F. transformer—AM—complete with adjustable cores (T4)
75560	Transformer—2nd. I.F. transformer—FM—complete with adjustable cores (T3)
73743	Transformer—Ratio detector transformer complete with adjustable core (T5)
33726	Washer—"C" washer for tuning knob shaft or drive cord pulley
	ROLLOUT MECHANISM ASSEMBLIES
77319	Bracket—Dial lamp socket bracket—L.H.
77318	Bracket—Dial lamp socket bracket—R.H.
77320	Dial—Polystyrene dial scale
77321	Escutcheon—Dial scale escutcheon less dial
77317	Frame—Plastic mounting frame—light brown—for chassis and record changer for blonde mahogany instruments
77316	Frame—Plastic mounting frame—maroon—for chassis and record changer for mahogany or walnut instruments
77322	Pointer—Station selector pointer
	AMPLIFIER ASSEMBLIES RS 141
77324	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 (C101A, C101B, C101C)
75643	Capacitor—Tubular, paper, oil impregnated, .001 mfd., 1000 volts (C103, C104)
73789	Capacitor—Tubular, paper, .0068 mfd., 400 volts (C105)
73562	Capacitor—Tubular, paper, .022 mfd., 400 volts (C102)
72583	Cable—Shielded audio cable complete with pin plug (Includes P102)
75064	Connector—9 contact female connector for power input cable (P101)

STOCK NO.	PART DESCRIPTION
73690	Cord—Power cord and plug
74838	Grommet—Power cord strain relief (1 set)
72776	Pin—Contact pin for speaker lead (2 req'd)
73637	Resistor—Wire wound, 2200 ohms, 5 watts (R101)
	Resistor—Fixed, composition:—
503110	100 ohms, ±10%, ½ watt (R108)
522127	270 ohms, ±5%, 2 watts (R107)
502233	3300 ohms, ±5%, ½ watt (R102)
503368	68,000 ohms, ±10%, ½ watt (R105)
503382	82,000 ohms, ±10%, ½ watt (R103)
503447	470,000 ohms, ±10%, ½ watt (R104, R106)
31364	Socket—Pilot lamp socket
31251	Socket—Tube socket, octal, wafer
73117	Socket—Tube socket, 7 pin, miniature, wafer
77323	Transformer—Output transformer (T102)
75566	Transformer—Power transformer, 117 volt, 60 cycle (T101)
	SPEAKER ASSEMBLIES 92569-12W RMA—274
75682	Cone—Cone and voice coil (3.2 ohms)
76093	Speaker—12" P.M. speaker complete with cone and voice coil (3.2 ohms) 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
77332	Antenna—Antenna loop—less cable
74649	Antenna—F.M. antenna
77327	Back—Back—light brown—for chassis and changer rollout assembly for blonde mahogany instruments
77326	Back—Back—maroon—for chassis and changer rollout assembly for mahogany or walnut instruments
77325	Back—Cabinet back
75707	Board—Antenna terminal board
71599	Bracket—Pilot lamp bracket
72437	Cable—Shielded pickup cable complete with pin plug
13103	Cap—Pilot lamp cap (Jewel)
71892	Catch—Bullet catch and strike for cabinet doors
X3222	Cloth—Grille cloth for blonde mahogany instruments
X3130	Cloth—Grille cloth for mahogany or walnut instruments
30870	Connector—2 contact male connector for record changer power cable
74882	Connector—2 contact male connector for antenna loop cable
74752	Connector—2 contact male connector for antenna lead
71984	Decal—"RCA Victor" decal
74273	Decal—"Victrola" decal
37396	Grommet—Rubber grommet for speaker mounting
74308	Hinge—Cabinet door hinge (1 set)
77330	Knob—Function switch knob—maroon
77331	Knob—Function switch knob—tan
77328	Knob—Tuning control, tone control or volume control and power switch knob—maroon
77329	Knob—Tuning control, tone control or volume control and power switch knob—tan
11765	Lamp—Pilot lamp—Mazda 51
73634	Nut—Speed nut for speaker mounting screws
77335	Plate—Back plate for lower door pull (2 req'd)
77334	Pull—Cabinet door pull—lower (2 req'd)
77333	Pull—Cabinet door pull—upper—(4 req'd)
75623	Screw—#8-32 x ⅝" trimit head screw for upper door pull
74113	Screw—#8-32 x 1" trimit head screw for lower door pull
74734	Spring—Spring clip for knobs
75902	Spring—Suspension spring for main cable
72936	Stop—Cabinet door stop

MODEL 2-S-10,
Ch. RC1111

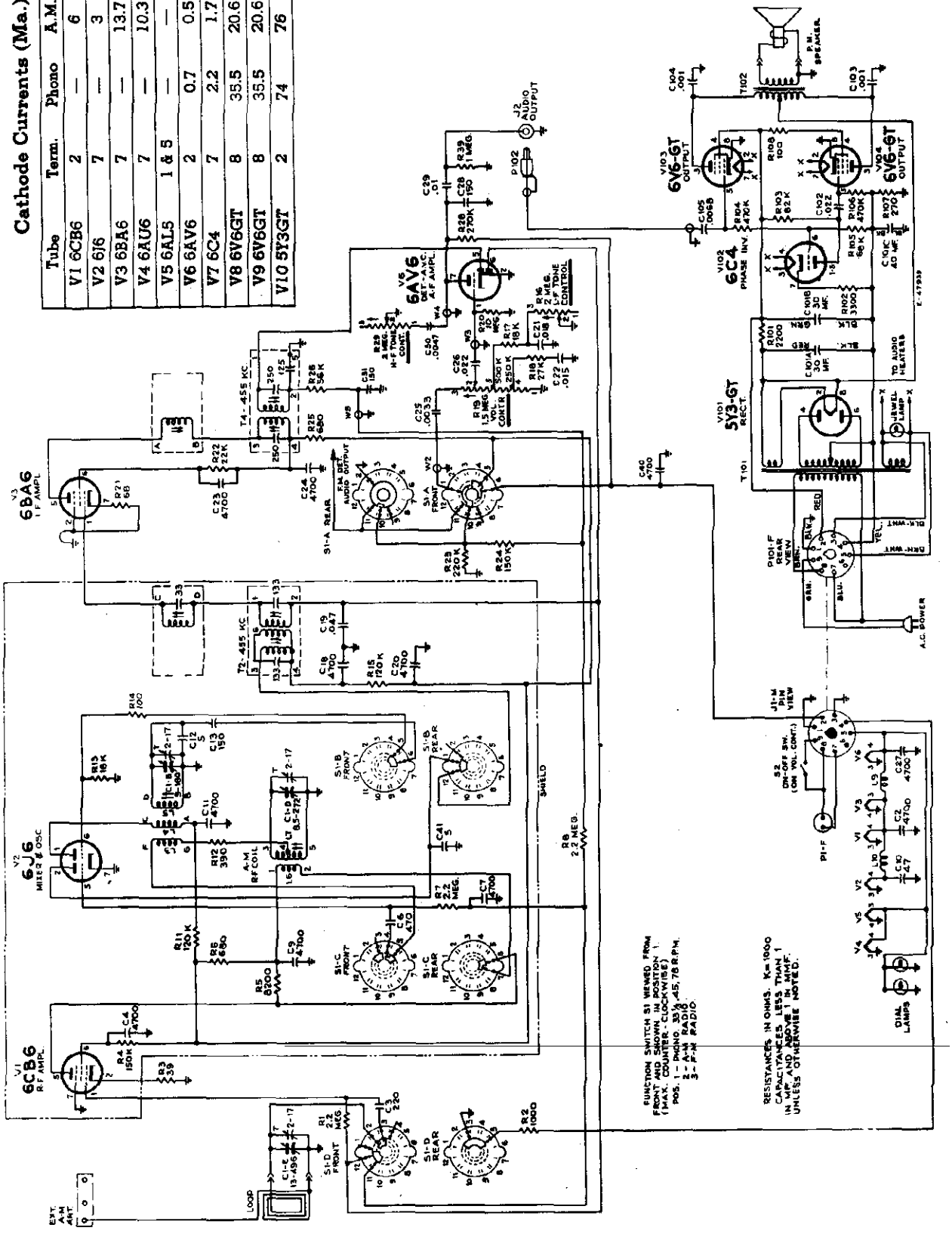


Complete Schematic Diagram—Chassis RC1111 and RS141

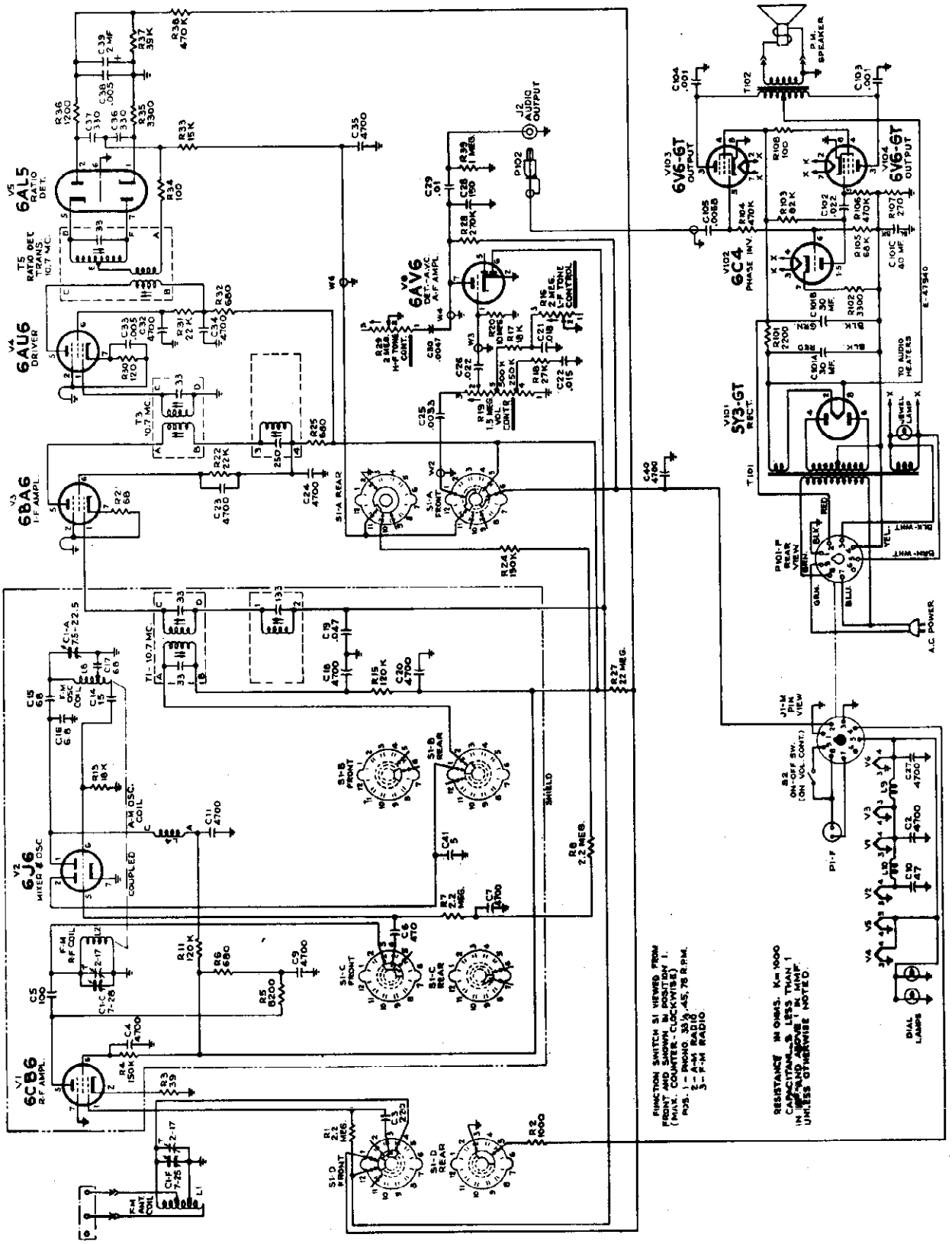
MODEL 2-S-1
Ch. RC1111

Cathode Currents (Ma.)

Tube	Term.	Phono	A.M.	F.M.
V1 6CB6	2	—	6	6
V2 6J6	7	—	3	3
V3 6BA6	7	—	13.7	13.5
V4 6AU6	7	—	10.3	10.6
V5 6AL5	1 & 5	—	—	—
V6 6AV6	2	0.7	0.5	0.5
V7 6C4	7	2.2	1.7	17.1
V8 6V6GT	8	35.5	20.6	21.1
V9 6V6GT	8	35.5	20.6	21.1
V10 5Y3GT	2	74	76	77.5



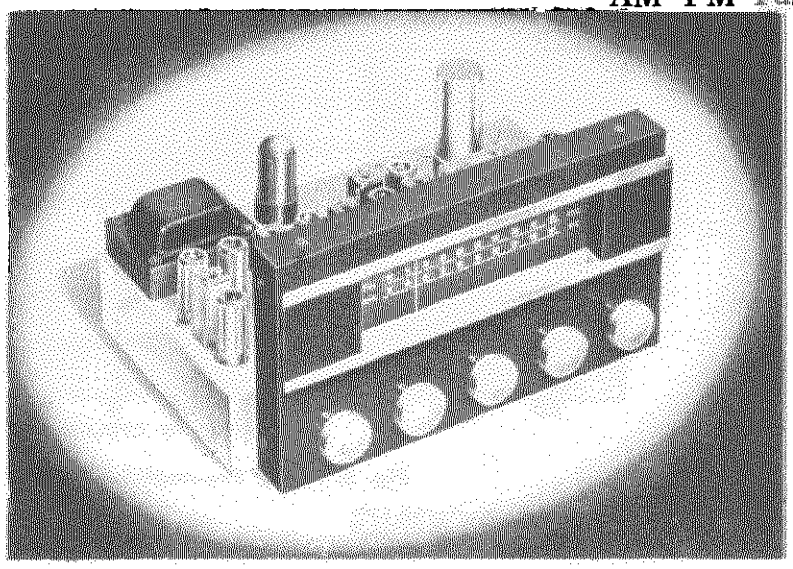
MODEL 2-S-10,
Ch. RC1111



Simplified Schematic Diagram—"FM" Position

MODEL 10,
AM-FM Tun

ELECTRICAL SPECIFICATIONS



TUBE COMPLEMENT: 11 tubes plus rectifier—6CB6 RF amp., 12AT7 mixer, 12AT7 osc, and AFC., (2) 6CB6 IF amp., (2) 6AU6 limiters, 6AL5 FM det., 6AV6 AM det. and audio amp., 12AX7 audio amp., 12AX7 phono pre-amp., 6X5GT rectifier.

CONTROLS: Bass, Off-On-Volume, FM-AM-PH-TV selector, Tuning, Treble.

ANTENNA: FM-300 ohm or 72 ohm input. AM-high or low impedance transformer input. Low-noise loop also provided for AM and FM.

SENSITIVITY: FM-5 microvolts for 30 db. quieting. AM-5 microvolts for 0.5 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 2 volts at less than ½% distortion from cathode follower. For use with either high or low gain amplifiers with input impedance of 10,000 ohms or higher. Cathode follower connection direct from detector also provided.

AM INTERSTATION WHISTLE FILTER: 25 db. rejection at 10 kc., 1 db. at 7 kc.

POWER CONSUMPTION: 105-125 volts, 60 cps., 50 watts.

SHIPPING WEIGHT: 16 lbs.

DIMENSIONS: 13½" x 9½" x 7" high.

BANDWIDTH: FM—190 kc.; AM—8.5 kc.

TONE COMPENSATION: Bass variable up to 16 db. boost or 14 db. cut at 60 cps. Treble variable up to 15 db. boost or 15 db. cut at 10,000 cps.

PHONO PRE-AMPLIFIER: 31 db. gain plus 22 db. bass compensation.

INTERMEDIATE FREQUENCIES: FM—10.7 mc.; AM—455 kc.

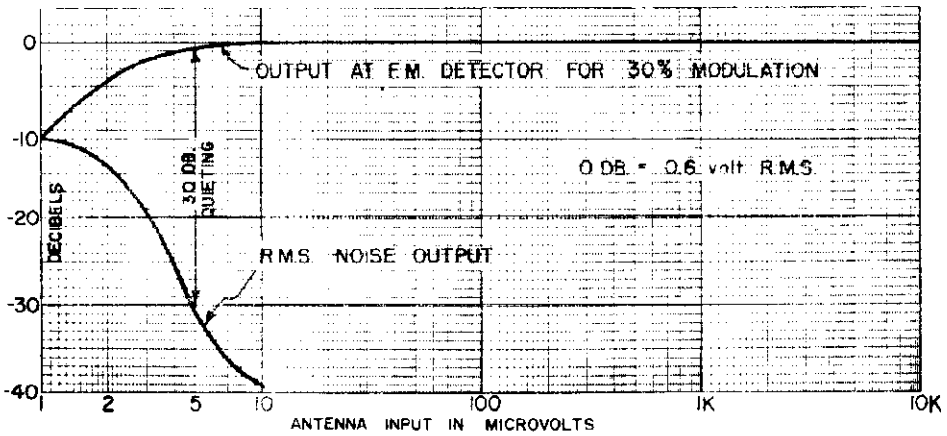


Fig. 1. FM Limiting Characteristic

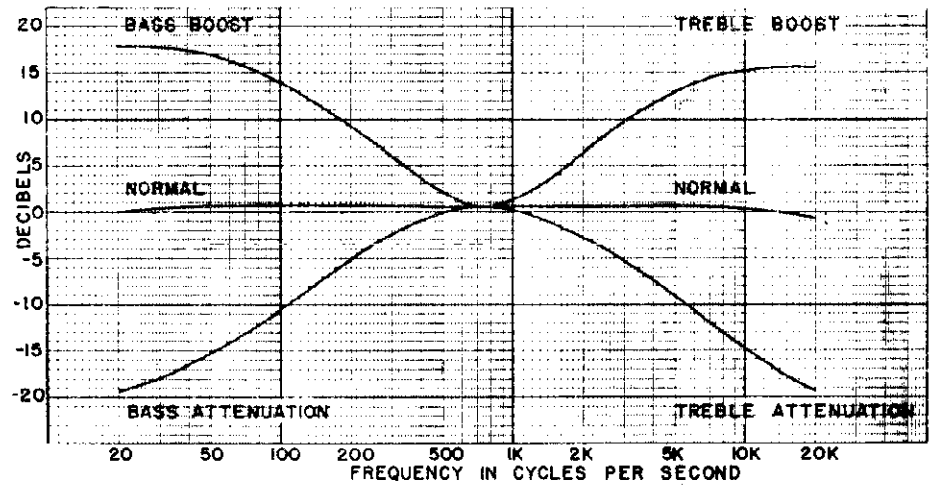


Fig. 2. Audio Characteristic

MODEL 10, AM-FM Tuner

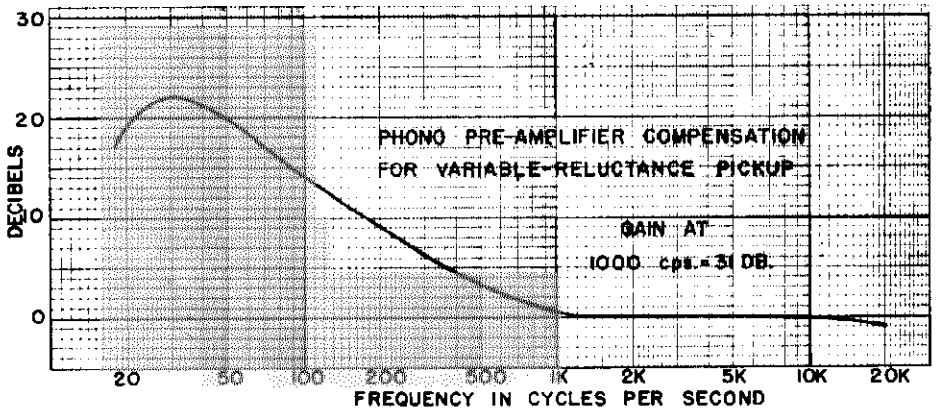


Fig. 3. Phono Pre-amplifier Characteristic

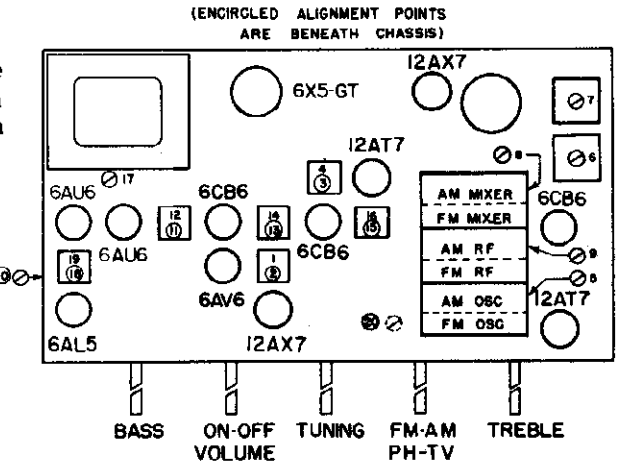
UNPACKING

These instructions cover the operation and installation of the Craftsmen 10 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 C10 tuner chassis should be the following:

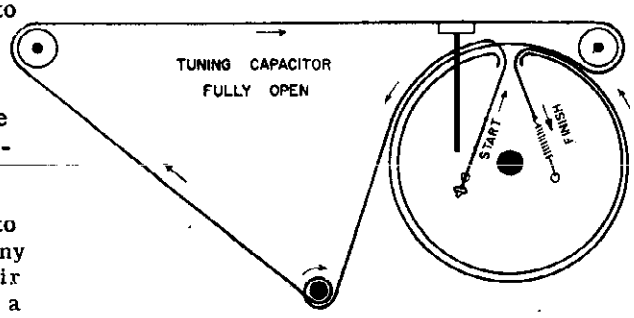
1 3B023 Brass escutcheon
1 7X403 AM low-impedance antenna
1 7A604A Shielded audio cable



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.

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.



Dial Cord Drive.

MODEL 10, AM
FM Tuner

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 signal generator and indicating meter should be connected d ectly to chassis at all times. Use an insulated screwdriver w 1/8" thick blade for adjusting IF transformers.

TUBE	FUNCTION	PIN 1	PIN 2	PIN 3	PIN 4	PIN 5	PIN 6	PIN 7	PIN 8	PIN 9
6CB6	RF AMP.	0	2.4	0	6.3*	145	145	2.4	--	--
12AT7	MIXER	154	0	2.1	0	0	-0.9	-0.9	0	6.3*
12AT7	OSC-AFC	150	1.8	0	0	0	182	-0.7	1.8	6.3*
6CB6	1st IF	-0.3	1.7	6.3*	0	150	150	0	--	--
6CB6	2nd IF	0	2.1	6.3*	0	150	150	0	--	--
6AU6	1st LIMITER	-0.3	0	6.3*	0	39	39	0	--	--
6AU6	2nd LIMITER	-0.8	0	6.3*	0	48	48	0	--	--
6AL5	FM DET.	0	-5.8	6.3*	0	-0.8	0	-4	--	--
6AV6	AM DET. & AUDIO AMP.	0	0.9	57	57	0.6	-0.6	106	--	--
12AX7	CATHODE-FOLLOWER	200	19	35	57	57	200	19	35	57
12AX7	PHONO PRE-AMP	81	0	1	57	57	59	0	0.9	57
6X5-GT	RECTIFIER	--	58	196*	--	196*	--	58	228	--

*AC Voltages measured at 1,000 ohms per volt.

DC Voltages measured with vacuum-tube voltmeter.

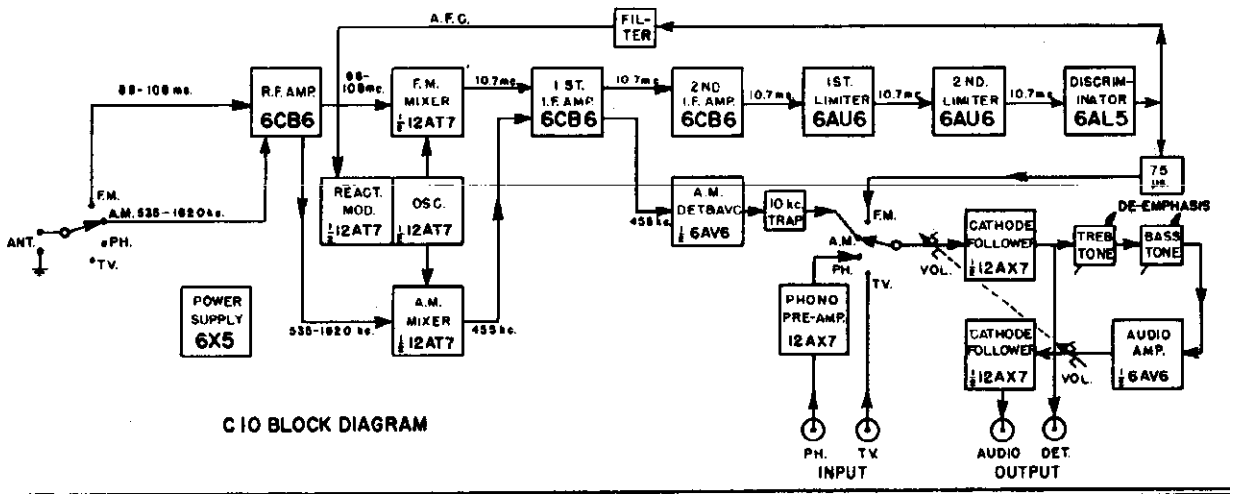
Socket connections are shown as bottom views.

Measurements are with no signal applied and bandswitch in FM position.

Measured values are from socket pin to common negative.

Line voltage maintained at 115 volts for voltage readings.

		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 positiv 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	90 mc	Same as above	Tune for maximum response	Same as above	Contract or extend coil spring L2, L4	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" sh



C 10 BLOCK DIAGRAM

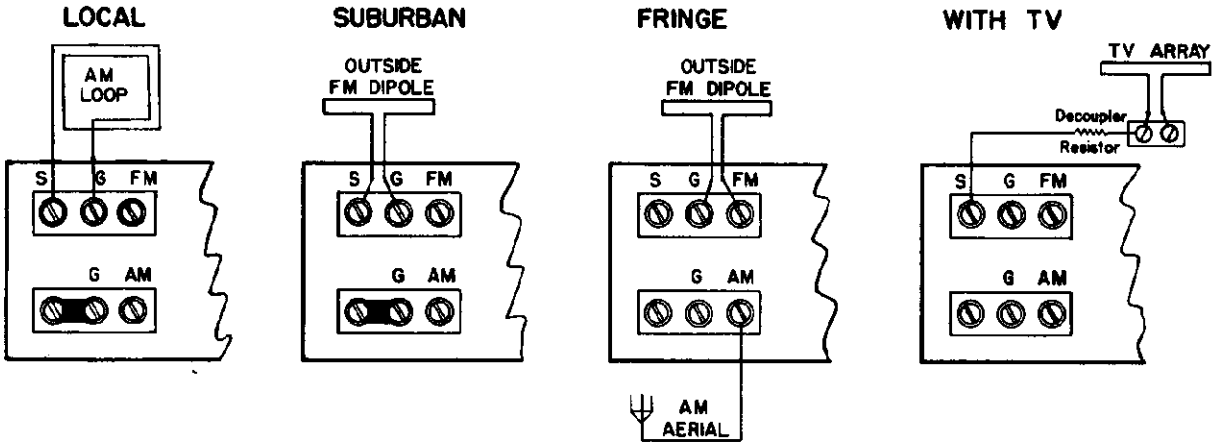


Fig. 6. Antenna Arrangements

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.

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 and AM signals as well. This can be done by coupling lightly (through a 1000-ohm resister) 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.

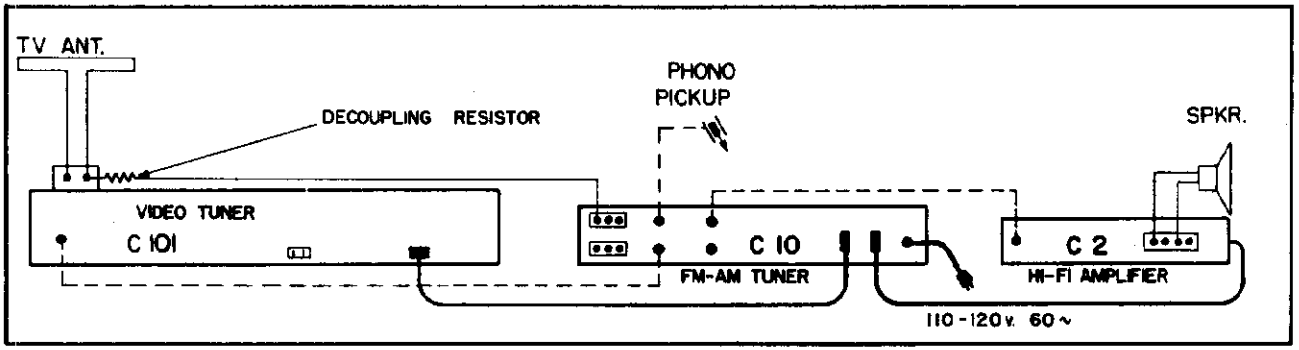


Fig. 7. Typical Installation Interconnections

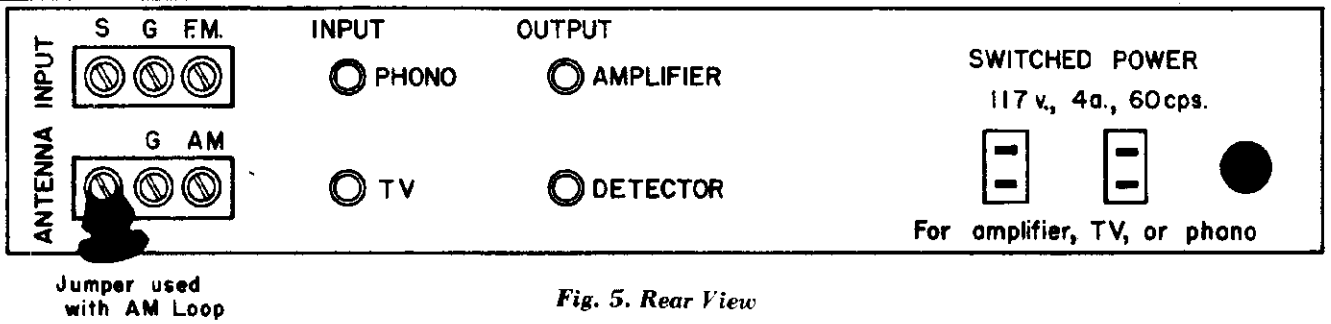


Fig. 5. Rear View

A cathode-follower connection directly following the FM and AM detectors is available at the receptacle labeled Detector Output. This output bypasses the entire C10 audio system including the bass and treble 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 might also be fed from the Detector Output.

From either the Audio Output or Detector Output cathode-follower, as much as 50 feet of shielded cable can be used for inter-connection without undue loss of high-frequency response.

PHONO - The Phono Input jack feeds a pre-amplifier compensated (see Figure 3) for use with variable-reluctance type cartridges. The input resistors, R151 and R152, shunting this jack are recommended for use with a GE cartridge; recommendations for other cartridges and microphone usage are as follows.

For a crystal-type phonograph cartridge, either use the TV input or remove 12AX7 pre-amplifier, R151, R152 and C154. Add jumper from Phono Input jack to previous connection from C154.

PHONO PRE-AMPLIFIER ADAPTATIONS

Cartridge Type	Input Resistance	Wiring
GE	13.5KΩ	Use as found.
Pickering	27KΩ	Remove one 27KΩ resistor.
Audak	54KΩ	Cut top of one 27KΩ, cut bottom of other 27KΩ, twist & solder free resistor pigtails.
Microphone	1MΩ	Add jumper across 3300$\mu\mu$f capacitor, C153. Replace two 27KΩ input resistors with 1MΩ.

ANTENNA ARRANGEMENTS

ANTENNA - Several antenna arrangements are possible for use with the C10 as shown in Figure 6 and the best arrangements 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 input and an input marked "S" connected internally through a switch to either the FM or AM input.

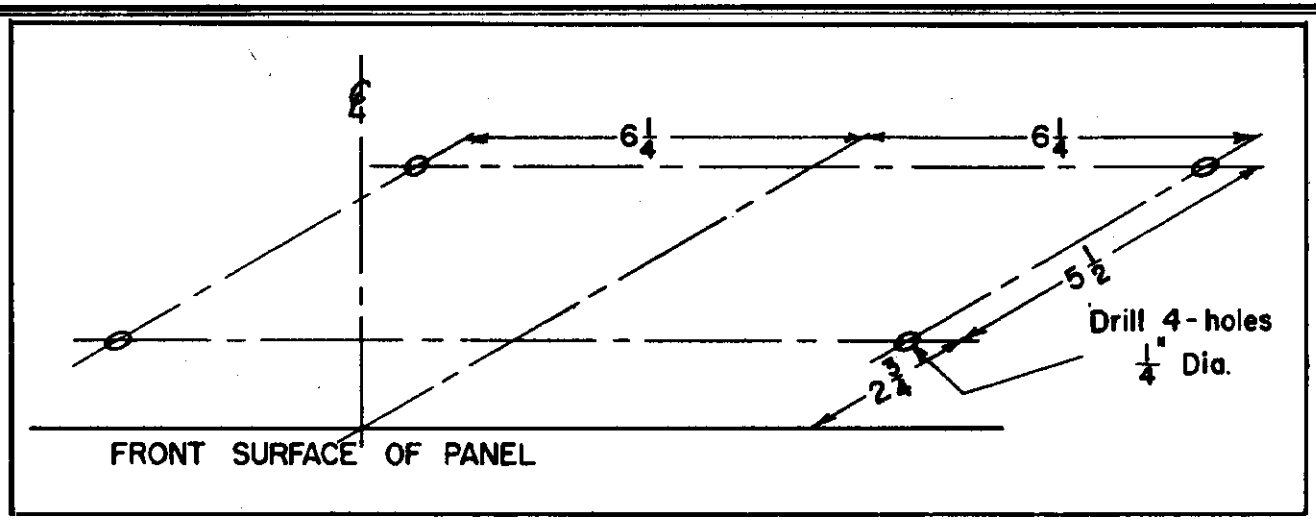


Fig. 4. Mounting Hole Layout

VENTILATION - Considerable ventilation must be provided to carry off the heat dissipated by the receiver. A 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 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.

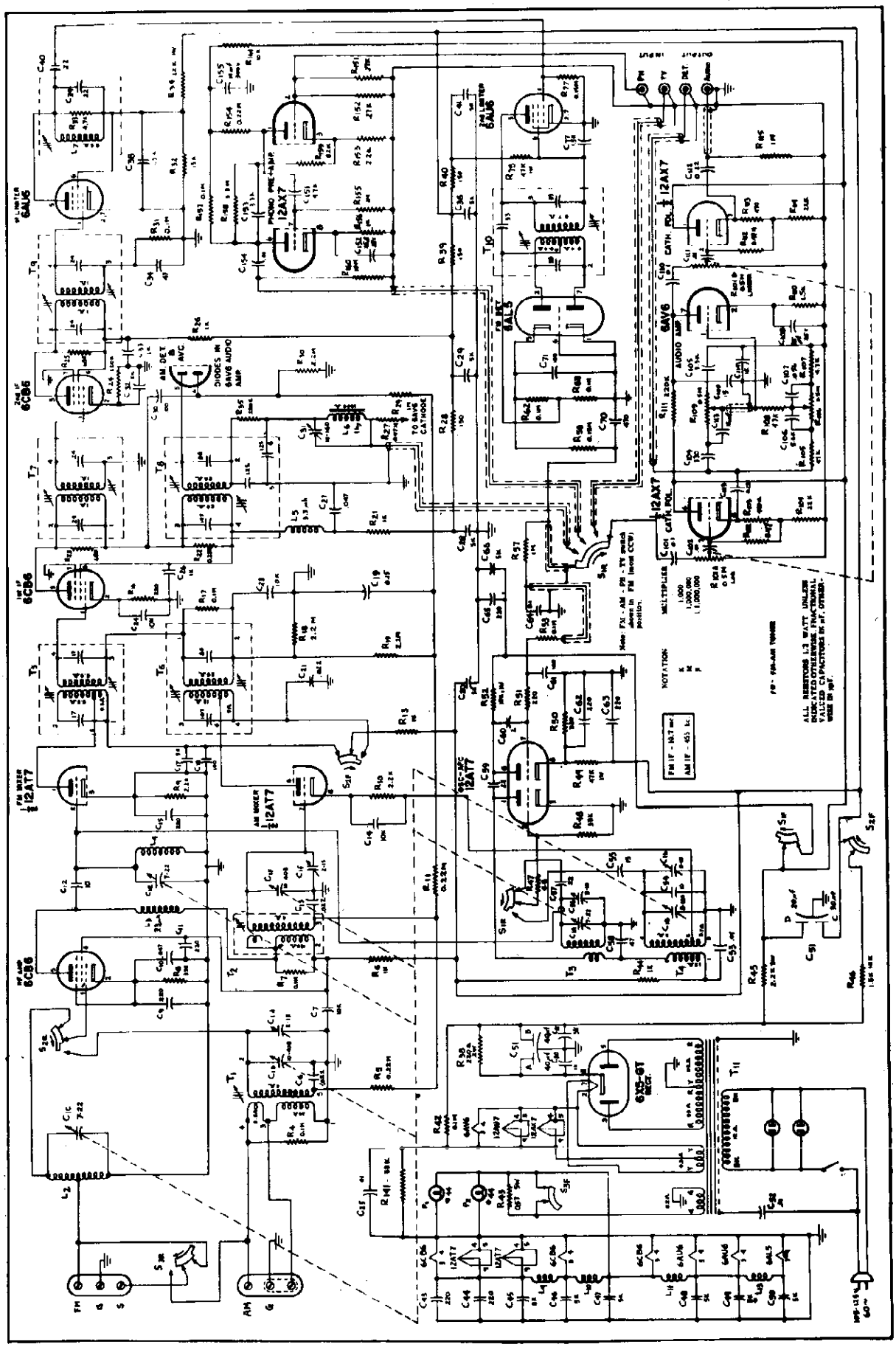
Remove the five press-fit knobs (use a steady outward pull on the knob) and the four mounting screws and washers found in the chassis mounts. Locate the chassis so that a 1/16-in. clearance exists between the inward flange of the escutcheon and the dial glass. Replace the four washers and screws and 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 cathode-follower Amplifier Output jack, furnishing up to 2 volts at less than 1/2 % distortion from 20 to 20,000 cps., (refer to Figure 2) and the associated shielded audio cable have been provided to connect the C10 into new or existing audio systems. Any audio amplifier, such as the Craftsmen 2 or 500 Amplifier, with an input impedance of 10,000 ohms or greater can be operated from this output.

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.

MODEL 10, AM-FM Tune

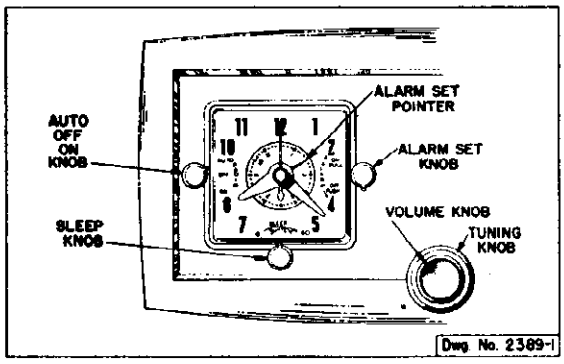


MODEL 10, AM-FM Tuner

PARTS LIST

Part No.	Ref. No.	Description
CAPACITOR, Ganged Tuning		
17S007	C1A	7-22 μμf, FM Osc. Tuning
	C1B	8-108 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
	C1F	10-408 μμf, AM 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		
17X402	C56	1-6 μμf, 500v, Trimmer
CC20CK2R0D	C60	2 μμf, 500v, Tubular
CC20SL100M	C54, C12	10 μμf, 500v, Tubular
CC20SL150M	C55, C109, C113	15 μμf, 500v, Tubular
CC20SL220M	C40	22 μμf, 500v, Tubular
CC20CK220M	C39, C57, C59	22 μμf, 500v, NPO
CC20UK470M	C34, C58	47 μμf, 500v, Tubular
CC20SL101M	C18, C30, C61, C71	100 μμf, 500v, Tubular
CC20SL221M	C8, C9, C11, C15, C43, C44, C62, C63, C65	220 μμf, 500v, Tubular
CC25SL471K	C70	470 μμf, 500v, Tubular
CC20ZZ102X	C26, C33, C80, C114	1000 μμf, 500v, Tubular
18X701	C17, C20, C81, C66, C28, C29, C32, C36, C41, C45, C46, C47, C48, C49, C50	5000 μμf, 500v, Disc
18X704	C7, C14, C102, C111, C23, C53	10,000 μμf, 500v, Disc
18X705	C38, C77	1500 μμf, 500v, Disc
CAPACITORS, Mica		
17X205	C31	10-160 μμf, 300v, Trimmer
CM20A331K	C104	330 μμf, 500v, Molded
CAPACITORS, Paper		
CP10M4222K	C151	.0022 μf, 400v, Tubular
CP10M4332K	C105, C153	.0033 μf, 400v, Tubular
CP10M4562K	C106	.0056 μf, 400v, Tubular
CP10M4103M	C25, C154	.01 μf, 400v, Tubular
CP10M6103M	C52	.01 μf, 600v, Tubular
CP10M4223M	C21, C6, C13	.022 μf, 400v, Tubular
CP10M4473M	C10, C27	.047 μf, 400v, Tubular
CP10M4563K	C107	.056 μf, 400v, Tubular
CP10M4104M	C64, C101, C110	.1 μf, 400v, Tubular
CP10M2224M	C103, C112	0.22 μf, 200v, Tubular
CP10M4154M	C19	0.15 μf, 400v, Tubular
CAPACITORS, Electrolytic		
CE8H2501P	C155	10 μf, 250v, Tubular
CE8H0202P	C108, C152	25 μf, 25v, Tubular
18S022	C51A	40 μf, 300v, Twist Mount
	C51B	40 μf, 300v,
	C51C	30 μf, 300v,
	C51D	20 μf, 300v,
PILOT LIGHTS		
15X003	P1, P2	No. 44 Pilot Light

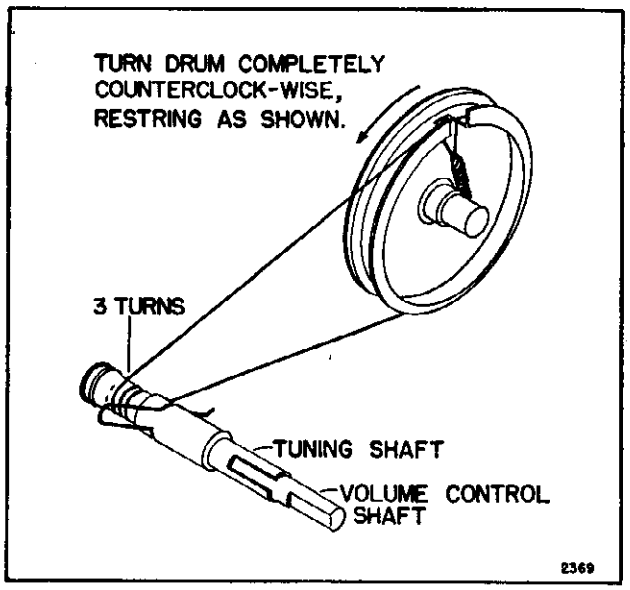
Part No.	Ref. No.	Description
RESISTORS		
RC20AE6R8K	R47	6.8 Ω, 1/2w, Carbon
RC20AE151K	R28, R39, R40	150 Ω, 1/2w, Carbon
RC20AE221K	R16, R24, R51	220 Ω, 1/2w, Carbon
RC20AE331K	R8, R50	330 Ω, 1/2w, Carbon
RC20AE152K	R110	1.5K Ω, 1/2w, Carbon
RC20AE102K	R6, R13, R21, R26, R44, R156	1000 Ω, 1/2w, Carbon
RC20AE222K	R9, R10, R153	2.2K Ω, 1/2w, Carbon
RC20AE472K	R33, R107	4.7K Ω, 1/2w, Carbon
RC20AE103K	R161	10K Ω, 1/2w, Carbon
RC20AE153K	R32	15K Ω, 1/2w, Carbon
RC20AE223K	R104, R114	22K Ω, 1/2w, Carbon
RC20AE273K	R151, R152	27K Ω, 1/2w, Carbon
RC20AE333K	R41, R48	33K Ω, 1/2w, Carbon
RC20AE473K	R105, R108	47K Ω, 1/2w, Carbon
RC20AE683K	R23, R25	68K Ω, 1/2w, Carbon
RC20AE823K	R159	82K Ω, 1/2w, Carbon
RC20AE104K	R4, R7, R17, R31, R42, R53, R62, R63, R157	100K Ω, 1/2w, Carbon
RC20AE154K	R58, R77	150K Ω, 1/2w, Carbon
RC20AE224K	R5, R11, R22, R35, R111, R154	220K Ω, 1/2w, Carbon
RC20AE474K	R27, R102, R112	470K Ω, 1/2w, Carbon
RC20AE105K	R29, R57, R115, R155	1M Ω, 1/2w, Carbon
RC20AE225K	R18, R19, R30	2.2M Ω, 1/2w, Carbon
RC20AE335K	R158	3.3M Ω, 1/2w, Carbon
RC20AE106K	R160	10M Ω, 1/2w, Carbon
RC30AF222K	R54	2.2K Ω, 1w, Carbon
RC30AE103K	R52	10K Ω, 1w, Carbon
RC30AE223K	R34	22K Ω, 1w, Carbon
RC30AE473K	R49, R75	47K Ω, 1w, Carbon
RC40AE222K	R45	2.2K Ω, 2w, Carbon
RW0471K	R103, R113	470 Ω, 1/2w, Wire Wound
RW2221K	R38	220 Ω, 2w, Wire Wound
RW5R47K	R43	0.47 Ω, 5w, Wire Wound
RWX152K	R46	1.5K Ω, 10w, Wire Wound
23S715	R106, R109	0.5M Ω, 1/4w, Carbon Potentiometer
23S727	R101	0.5M Ω, 1/4w, Carbon Potentiometer and Switch
		0.5M Ω, 1/4w,
COILS & CHOKES		
5A209	L4	FM Conv. Coil
5A210	L2	FM RF Coil
5S402	L3, L5	3.3 μh Choke
5A017	L7	FM Limiter Coil
5X406	L9, L10, L11, L13	1.0 μh Choke
19S406	L6	1 h, 10 kc Filter
SWITCHES		
4S006A	S1, S2, S3	4 Pos., 3 section Band 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
5A220A	T1	AM Ant.
19S208A	T11	Power Transformer



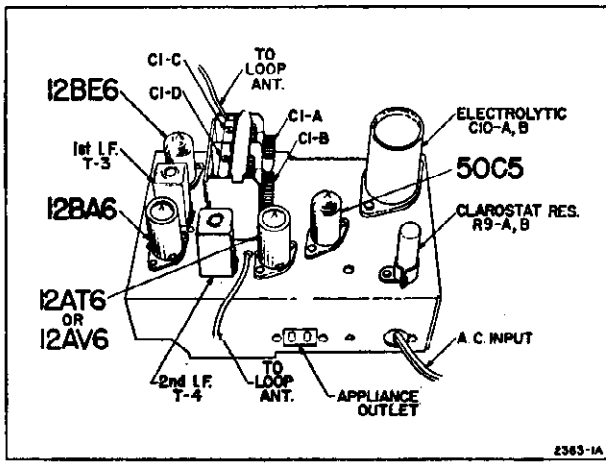
Front Cabinet View

SERVICE DATA

Power Supply	115 volts, 60 cycles AC only, 24 watts.
Frequency Range	540 to 1600 Kc.
Intermediate Freq.	455 Kc.
Selectivity	At 1000 Kc., 60 Kc. at 1000 x signal.
Sensitivity	150 u. v. per meter.
Power Output	1.0 watts undistorted, 1.25 watt maximum.
Loud Speaker	4" PM., v.c. impedance, 3.2 ohms
Tube Complement	
12BE6, Converter, 12BA6, IF Amplifier 50C5, Audio output	12AV6, or 12AT6, Detector AVC Audio



Dial Stringing Diagram



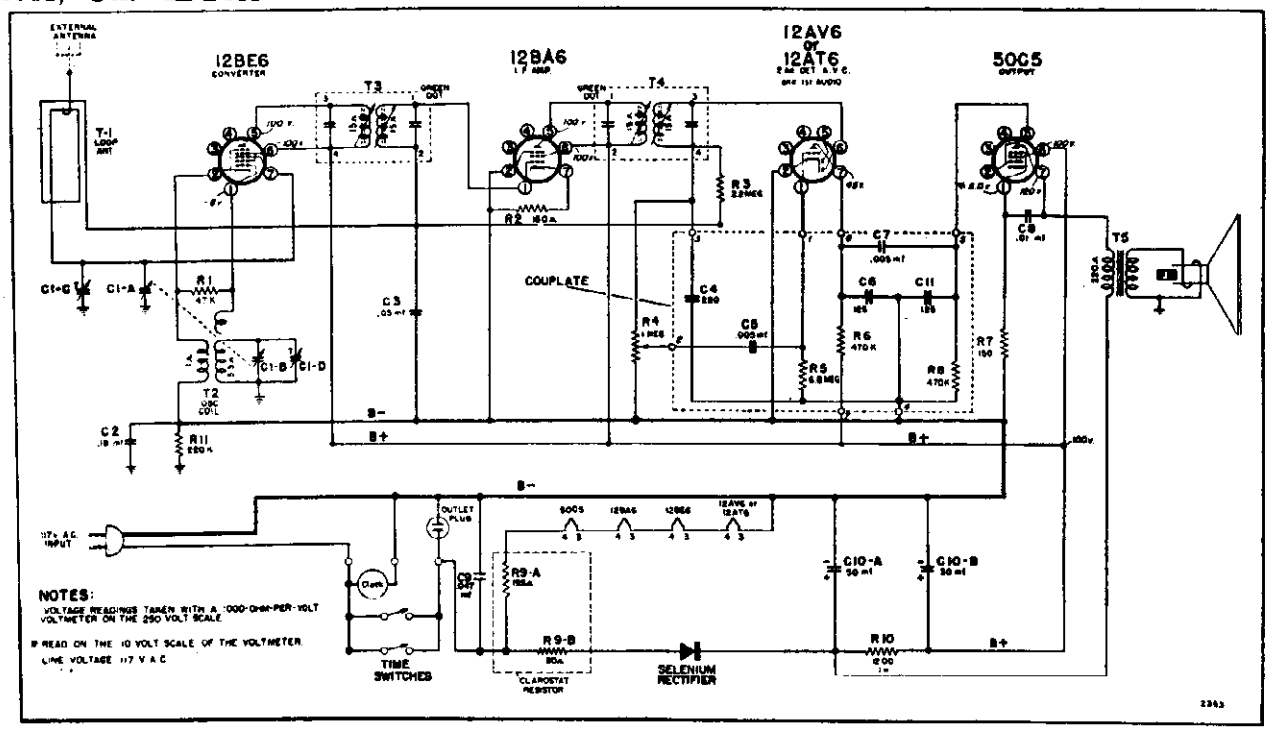
Chassis View

ALIGNMENT PROCEDURE

• Loop must be connected and volume set to maximum.

SIGNAL GENERATOR				TUNER SETTING	ADJUST FOR MAXIMUM OUTPUT
Frequency	Coupling Capacitor	Connection to Radio	Ground Connection		
455 kc.	.1 mf.	12BE6, Pin 7	HEAVY BUSS LEAD ACROSS CENTER OF CHASSIS	(Capacitor fully open) (plates out of mesh)	Top and bottom Cores in output and input I.F. cans
1620 kc.	.1 mf.	12BE6, Pin 7		(Capacitor fully open) (plates out of mesh)	Oscillator trimmer C1-D on gang
535 kc.	.1 mf.	12BE6, Pin 7		Capacitor fully closed	Check for adequate range
1400 kc.	———	Lay Generator lead near back of cabinet		Tune in 1400 kc. signal	Antenna trimmer C1-C on gang

MODELS CR-41A, -42A, -43A, Ch. 4D16A

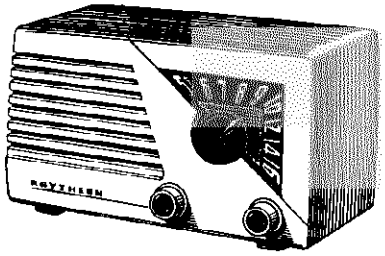


SCHEMATIC DIAGRAM

PARTS LIST

Please specify part number and chassis model number when ordering replacements.
Use only Genuine Factory Replacement Parts

Ref. No.	Part No.	Description	Selling Price
		CAPACITORS	
C1A, B	8A-19740	2-gang condenser	$3.00
C1C, D		Trimmers on gang	
C2	8D-11111	.18 mfd. x 400 volts, paper	.35
C3	8D-14460	.05 mfd. x 200 volts, paper	.35
C4	(incl. in couplate)	220 mmf.	
C5		.005 mfd.	
C6, 11		125 mmf.	
C7		.005 mfd.	
C8	8D-17258	.01mfd. x 200 volts, paper	.25
C9	8J-16081	.047 mfd. x 400 volts, paper	.30
C10A, B	8C-15262	Electrolytic condenser	1.80
C4, 5, 6, 7, 11 R5, 6, 8	201-19303	Couplate	.90
		RESISTORS	
R1	9B1-82	47K ohms, 1/2 watt, 10%	.25
R2, 7	9B1-62	150 ohms, 1/2 watt, 10%	.25
R3	9B1-33	2.2 megohms, 1/2 watt, 20%	.25
R4	10B-19797	1. megohm volume control	.80
R5	(incl. in couplate)	6.8 megohms, 1/2 watt,	
R6		470K ohms, 1/2 watt	
R8		470K ohms 1/2 watt	
R9A, B	9M-19778	195 ohms, 5 watts and 50 ohms, 5 watt, clarostat	.95
R10	9B4-63	1200 ohms, 2 watts, 10%	.35
R11	9B1-27	220K ohms, 1/2 watt, 20%	.25
		TRANSFORMERS AND COILS	
T1	13E-20995	Loop antenna assembly	1.40
T2	13D-19064	Oscillator coil	60
T3, 4	13B-17731	I. F. transformers	1.45
T5	12C-17595-1	Audio output transformer	1.00
		MISCELLANEOUS	
	3A-19798	Tuning shaft	.45
	49A-18851	Spring clip	.02
	2G-20329	Dial pointer	.30
	49A-11324	Tension spring	.05
	21J-19594	Selenium rectifier	2.20
	R5C-19734-87	Cabinet (ivory)	5.65
	R5C-19734-86	Cabinet (mahogany)	4.05
	5C-19734-89	Cabinet (red)	5.75
	6A-20309	Dial glass	.75
	5B-20711-74	Clock knob (CR-41)	.05
	5B-20711-88	Clock knob (CR-42)	.05
	5B-19794-74	Volume knob (mahogany)	.10
	5B-19795-74	Tuning knob (mahogany)	.30
	5B-19794-88	Volume knob (ivory)	.10
	5B-19795-88	Tuning knob (ivory)	.30
	85B-19794-90	Knob-Volume (red)	.10
	85B-19795-90	Knob-Tuning (red)	.30
	5B-20711-91	Knob (clock) (CR-43)	.05
	23A-16328	Line cord lock	.05
	14M-20212	A.C. line cord and plug	1.40
	15C-16007	Tube socket, 7-prong miniature	.15
	2M-17589 or	Tube shield base	.05
	2M-19187	Tube shield base	.05
	2M-17588 or	Tube shield	.10
	2M-19188	Tube shield	.10
	19B-19802	A.C. receptacle	.30
	15B-10076	Lytic mounting base	.05
	18A-19739	4" P.M. speaker	4.65
	43D-20510	Tinnerman clip	.02
	29J-16690	Rubber washer	.02
	42A8-20210	Chassis mounting bolt	.03
	2M-10096	Cinch button (loop back)	.05
	3M-20268	Time set knob	.05
	2F-20616	Bezel	3.40
	2F-21022	Bezel	3.40
	21M-20996	Clock assembly (CR-41)	11.31
	21M-20997	Clock assembly (CR-43)	11.31
	23J-20343	Cardboard baffle	.05
	25E-19234	Rubber channel	.05
	38A-20854	Fibre barrier (UL)	.05
	9M-19778	Clarostat resistor	.95
	2C-21001	Dial scale (CR-41 & CR-42)	.35
	2C-21002	Dial scale (CR-43)	.45

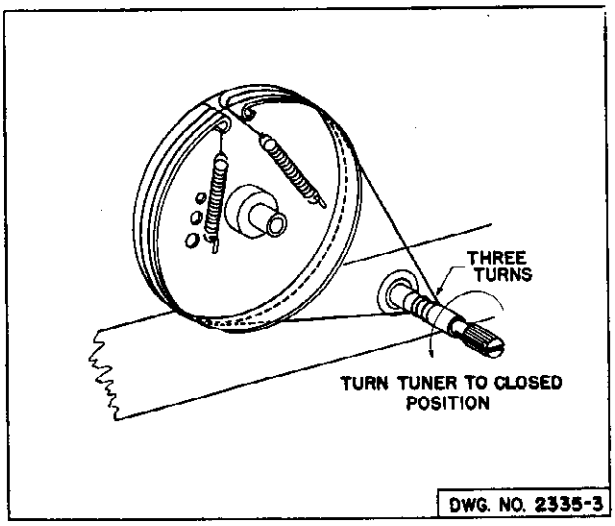


Front Cabinet View

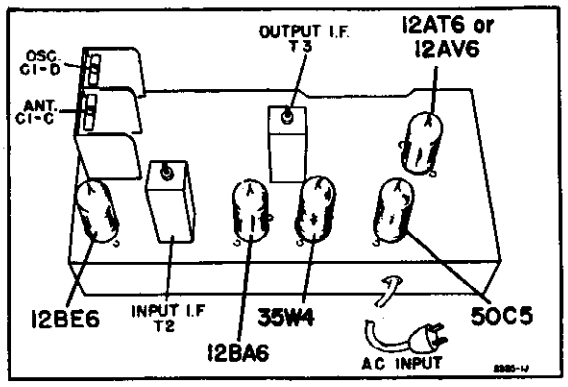
SERVICE DATA

Power Supply.....115 volts, DC or 50-60 cycle, AC
24 watts.
Frequency Range.....540 to 1600 Kc.
Intermediate Freq...455 Kc.
Selectivity.....At 1000 Kc., 60 Kc. ,at 1000 x signal
Sensitivity.....150 u. v. per meter
Power Output.....0.8 watts undistorted, 1.0 watt maximum
Loud Speaker.....4" PM., v.c. impedance, 3.2-ohm
Tube Complement....

12BE6, Converter
12BA6, IF Amplifier
12AV6, or 12AT6, Detector, AVC, Audio
50C5, Audio output
35W4, Rectifier



Dial Stringing Diagram



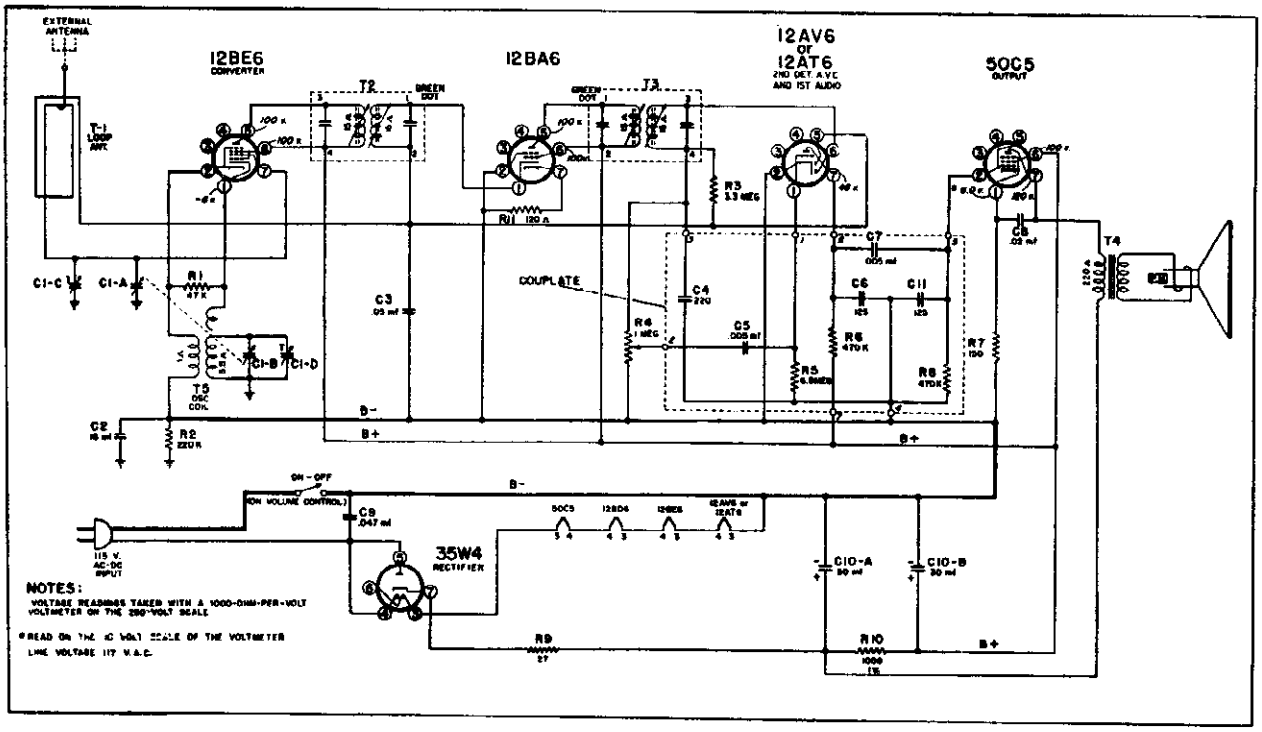
Top Chassis View

ALIGNMENT PROCEDURE

- Loop must be connected and set volume to maximum.

SIGNAL GENERATOR				TUNER SETTING	ADJUST FOR MAXIMUM OUTPUT	INPUT FOR 50-MILLIWATT OUTPUT
Frequency	Coupling Capacitor	Connection to Radio	Ground Connection			
455 kc.	.1 mf	12BE6, Pin 7	HEAVY BUSS LEAD ACROSS CENTER OF CHASSIS	Capacitor fully open (plates out of mesh)	Top and bottom Cores in output and input I.F. cans	65 microvolts
1620 kc.	.1 mf	12BE6, Pin 7		Capacitor fully open (plates out of mesh)	Oscillator trimmer C1-D on gang	70 microvolts
535 kc.	.1 mf.	12BE6, Pin 7		Capacitor fully closed	Check for adequate range	70 microvolts
1400 kc.		Lay generator lead near back of cabinet		Tune in 1400 Kc. signal	Antenna trimmer C-1C on gang	200 to 400 microvolts
400 cycles	.1 mf.	12AT6, Pin 1		———	———	.06 volts

MODELS R-51A,
-52A, Ch. 5D157-A



SCHEMATIC DIAGRAM

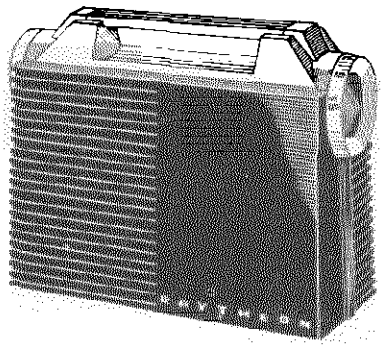
LIST OF PARTS

Please specify part number and chassis model number when ordering replacements.

Use only Genuine Factory Replacement Parts

Ref. No.	Part No.	Description	Price
		Capacitors	
C1A-B	8A-20992	2-gang condenser	$2.85
C1C-D		Trimmers on gang	—
C2	8D-11111	.18 mfd x 400 volts	.35
C3	8D-10770	.05 mfd x 200 volts	.25
C4-5-6-7-11- and R5-6-8	201-19303	Couplate	.90
C8	8D-10774	.02 mfd x 400 volts	.25
C9	8J-16081	.047 mfd x 400 volts	.30
C10-A-B	8C-17391	Electrolytic condenser	1.25
		Resistors	
R1	9B1-82	47K ohms, 1/2 watt, 10%	.25
R2	9B1-27	220K ohms, 1/2 watt, 20%	.25
R3	9B1-34	3.3 megohms, 1/2 watt, 20%	.25
R4	10A-18126	Volume control and switch	1.05
R5-6-8		See Couplate	
R7	9B1-52	150 ohms, 1/2 watt, 10%	.25
R9	9B1-43	27 ohms, 1/2 watt, 10%	.25
R10	9B2-62	1000 ohms 1 watt, 10%	.30
R11	9B1-51	120 ohms, 1/2 watt, 20%	.25
		Transformers and Coils	
T1	13E-21028	Loop antenna assembly	1.40
T2-3	13B-17731	I.F. transformer	1.45
T4	12C-17595	Output transformer	1.00
	OR 12C-19302		
T5	13D-17583	Oscillator coil	.70

Ref. No.	Part No.	Description	Price
		Dial Parts	
	3A-18166	Tuning shaft	$ .20
	40A-17591	Bushing	.05
	29E-17592	Spring washer	.05
	43D-17609	Tinnerman clip	.05
	29C-10630	"C" washer	.05
	53A-18547	Dial string (approx 20")	.05
	49A-11324	Take up spring	.05
	2D-20217	Pointer bracket	.05
	2G-20329	Pointer	30
	200-20227	Shaft and pulley assembly	.20
	49A-11324	Coil spring	.05
	6D-20984	Dial scale	1.20
		Miscellaneous	
	5C-20990-65	Cabinet (mahogany)	4.60
	5C-20990-87	Cabinet (white)	5.95
	5B-18164-74	Knob (mahogany)	.30
	5B-18164-88	Knob (white)	.30
	18A-17579	Speaker, 4" P.M.	2.64
	2H-17588 or	Tube shield	.10
	2H-19188	Tube shield	.10
	2M-17589 or	Tube shield base	.05
	2M-19187	Tube shield base	.05
	2M-17580	I.F. locking clip	.05
	15C-16007	7-prong, socket	.15
	15B-10440	Octal socket	.15
	14M-10088-4	AC line cord and plug	1.00
	2D-15432-2	Loop mounting bracket	.35
	23A-10344	Line cord lock	.05



GENERAL DESCRIPTION

This model is a 3-way portable radio with 4 tubes plus a selenium rectifier and uses a built-in antenna. The receiver will operate on 115 volts, 50 to 60 cycles AC, or 115 volts DC, or on the self-contained batteries. When using the radio on AC, reversing the plug may reduce hum. If the radio does not operate in one minute on direct current (DC), reverse the plug. When battery operation is desired, the line cord plug is insert into a socket switch on the chassis (see bottom cabi view), the insertion automatically moves the switch c tacts for battery operation. When the line cord plug out of the chassis switch, the batteries are automatica disconnected.

SPECIFICATIONS

Power Supply.....115 volts, DC or 50-60 cycles AC, 25 watts.
A Battery—7.5 volts, 50 milliamperes.
B Battery—90 volts, 14 milliamperes

Frequency Range....540 to 1600 kc.

Intermediate Freq...455 kc.

Selectivity.....At 1000 kc., 60 kc. at 1000 x signal

Sensitivity.....500 microvolts per meter

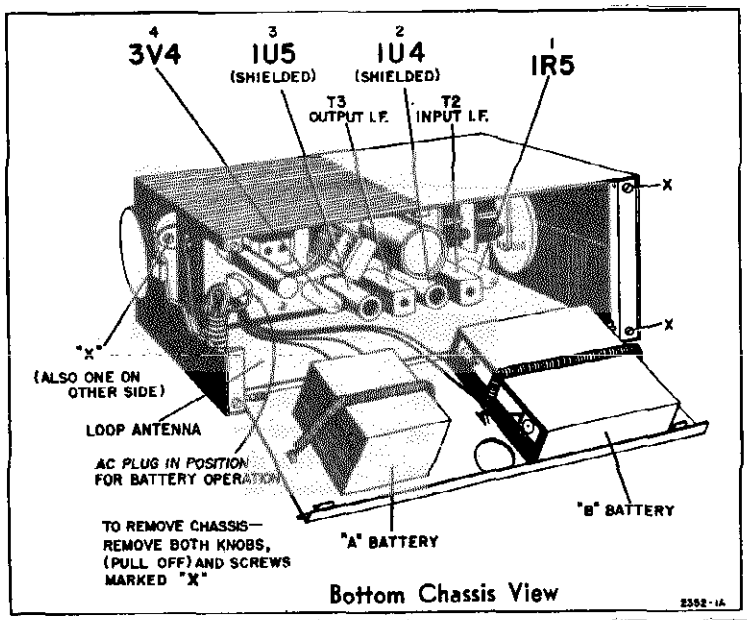
Power Output.....150 milliwatts, undistorted
250 milliwatts, maximum

Loud Speaker.....5" PM, v.c. impedance 3.2 oh

Tube Complement....

1R5, Converter, 1U5, detector, AVC, audio
1U4, I.F. amplifier, 3V4, output amplifier,

Rectifier.....Selenium type.



Bottom Chassis View

MODEL PR-51A,
Ch. 4P12A

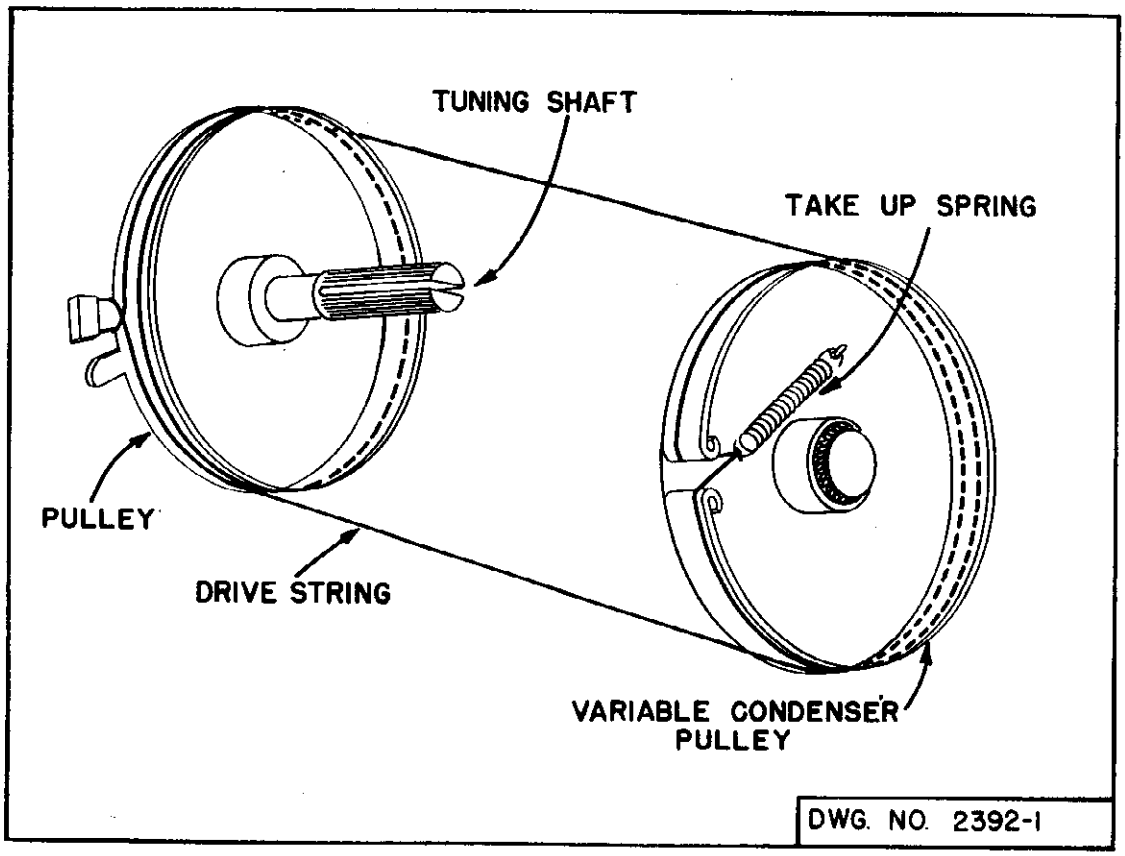
Mfgr.	A	B
RCA	VS-065	VS-090
General	31	132
Ray-O-Vac	P-751	4390
Eveready	717	490
Burgess	C5	N60

BATTERY REPLACEMENT

Since the receiver is small and compact, not every A or B Battery will fit in the space provided. Listed to the left are the five most common manufactured types to be used for replacements.

CAUTION:

When battery operation is desired, the excess line cord length must be rolled up and placed in the position shown in the bottom chassis view above.



Dial Cord Stringing

ALIGNMENT PROCEDURE

The Alignment Procedure below includes the sensitivities at the input of various stage. All measurements are based on an output of 50 milliwatts. This may be measured by disconecting the speaker voice coil and substituting a 3.2 ohm, 5 watt resistor across the secondary winding of the output transformer. A reading of .4 volts AC across this resistor will be equivalent to a 50 milliwatt output with speaker connected. The volume control must be set to maximum.

The signal source must be an accurately calibrated signal generator capable of supplying the frequencies designated, modulated 30% with a 400-cycle audio signal. A 400-cycle audio signal is required for the audio measurement. Variations in sensitivities of plus or minus 25% are usually permissible.

FREQUENCY	COUPLING CAPACITOR	DIAL SETTING	CONNECTION TO RADIO	GROUND CONNECTION	ADJUST	INPUT FOR 50 MILLIWATTS OUT
455 kc.	.1 mfd.	1000 kc.	Pin No. 6 of 1R5	B— (shell of lytic)	I.F. slugs	100 microvolts
1620 kc.	.1 mfd.	1600 kc.	Pin No. 6 of 1R5	B— (shell of lytic)	C1-B Osc. Trim. on gang	———
1400 kc.	Radiation Loop	1400 kc.	Radiation loop	None	C-2 Antenna Trim. on gang	250 microvolts
400 cycles	.05 mfd.	———	Pin No. 6 of 1U5	B— (shell of lytic)	———	.040 volts
400 cycles	.05 mfd.	———	Pin No. 6 of 3V4	B— (shell of lytic)	———	3 volts

PARTS LIST

When ordering parts, specify part number and complete model number

Ref. No.	Part No.	Description	Price
		Capacitors	
C1A-C	8A-21093	2 gang condenser	2.70
C1-B		Trimmer on gang	—
C2		Trimmer on gang	—
C3	8G-14459	220 mmf, ceramic	.25
C4, 5	8D-17268	.02 mfd x 200 volts	.25
C6	8D-18042	.25 mfd x 100 volts	.35
C7	8D-17785	.005 mfd x 200 volts	.25
C8	8G-13962	.005 mfd x 450 volts	.25
C9	8J-16081	.047 mfd x 400 volts	.30
C10A, B, C, D	8C-16068	40-200-40-50 mfd, lytic	2.95
C11	8D-11251	.09 mfd x 400 volts	.25
C12	8D-14460	.05 mfd x 200 volts	.35
		Resistors	
R1, 4, 15	9B1-104	3.3 megohms, 1/2 watt, 10%	.25
R2	9B1-86	100K ohms, 1/2 watt, 10%	.25
R3	9B1-78	22K ohms, 1/2 watt, 10%	.25
R5	9B1-108	6.8 megohms, 1/2 watt, 10%	.25
R6	10A-19596-1 or 10A-19596	Volume control and switch, 1 megohm	1.20
R7, 8	9B1-155	680 ohms, 1/2 watt, 5%	.30
R9	9B1-37	10 megohms, 1/2 watt, 20%	.25
R10	9B1-159	1K ohms, 1/2 watt, 5%	.30
R11	9C-19770	30 ohms, 2 watts, 10%	.20
R12	9B2-169	2700 ohms, 1 watt, 5%	.35
R13	9M-19833	2650 ohms, 10 watts, clarostat	.95
R14	C9B1-90	220K ohms, 1/2 watt, ±10%	.25
R16	C-9B1-95	560K ohms, 1/2 watt, ±10%	.25
		Coils, Transformers and Chokes	
T1	13E-19844	Loop antenna assembly	1.30
T2	13B-17397	Input I.F. transformer	1.45
T3	13B-17397	Output I.F. transformer	1.45
T4	12C-19591	Audio output transformer	1.85
T5	13D-19595	Oscillator coil	.80

Ref. No.	Part No.	Description
		Miscellaneous
	20A-19588	A.C. - D.C. battery switch
	18A-19586	5", PM speaker
	21J-19615	Selenium rectifier
	201-19996	Audio couplate
	201-15005	Filpec
	15C-16007	7 prong, miniature socket
	2H-17008	Tube shield base
	2H-19188	Tube shield
	14M-15724	A.C. line cord
	5M-19963	Line cord lock
	14A-16919	"B" Battery cable
	14A-19846	"A" battery cable
		Cabinet Parts
	2M-19585	Clip, cabinet side channel
	2M-19609	Bottom cover
	49A-19612	Spring, battery
	2M-19614	Stud
	27C-6030	Rivet
	2D-19610	Bracket
	2M-17580	I.F. clip
	62D-19893	Antenna clip
	6M-20077	Clamp, battery cable
	5C-21144-94	Cabinet (red)
	5C-21045-95	Escutcheon
	2D-21016	Handle bracket
	5M-20993-95	Handle
	2M-21017	Handle strap
	38A-21173	Shield (fibre)
	2C-21104	Chassis shield
	3M-20246	Shoulder stud
	41M-20124	Fibre spacer
	29E-20247	Spring washer
	5B-21009-95	Volume knob
	5B-21154-95	Tuning knob
	200-21102	Tuning shaft assembly
	2C-21103	Speaker shield (UL)

MODEL PR-51A,
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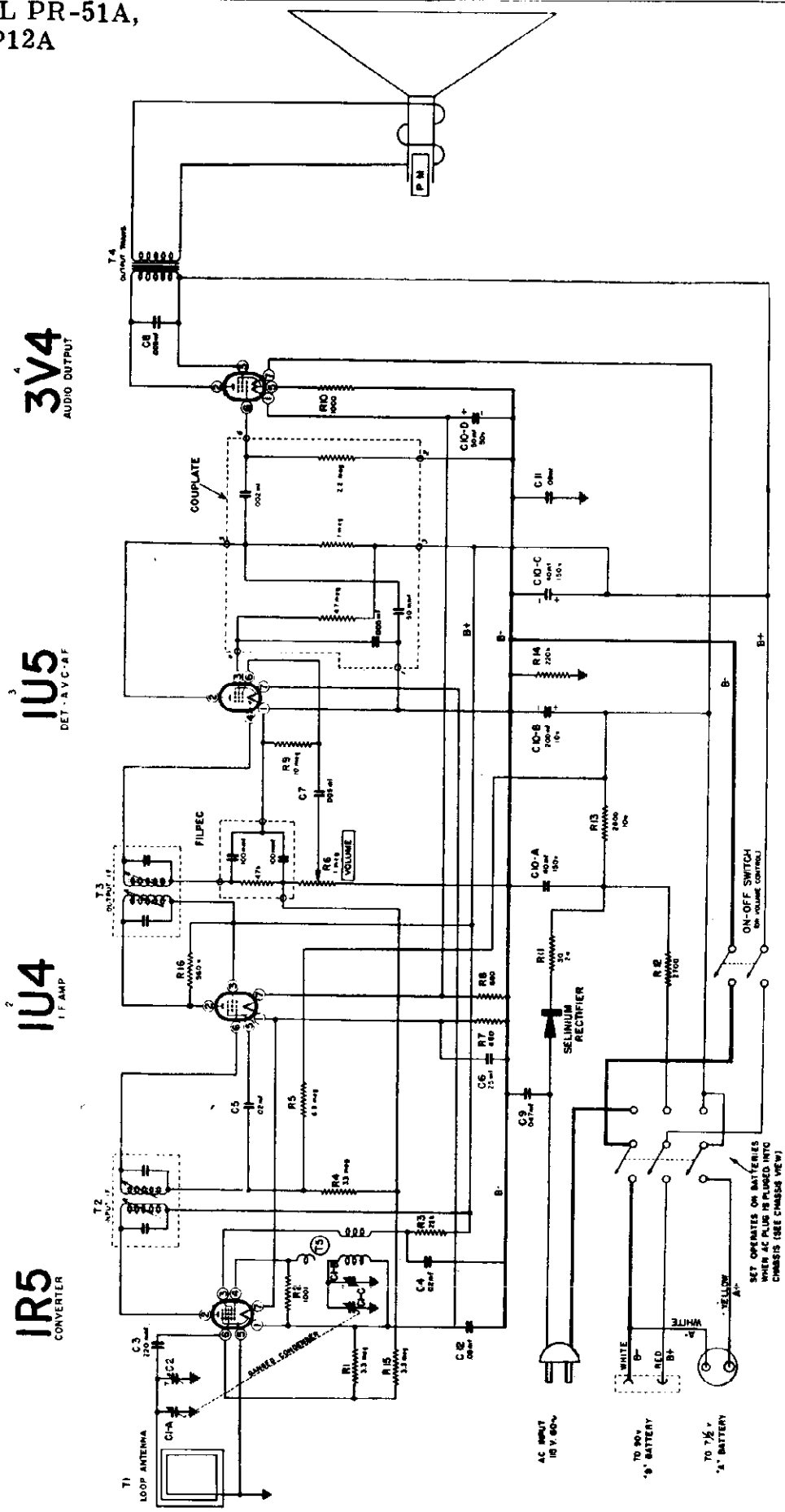

NOTE: R-13 is now 2650 ohms.
R-16 removed to increase sensitivity.
R-7 should be from pin 7 of tube 3 (1U5) to B—.