PHILCO RADIO-PHONOGRAPH MODELS 50-1721, 50-1723, AND 50-1724

SPECIFICATIONS

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

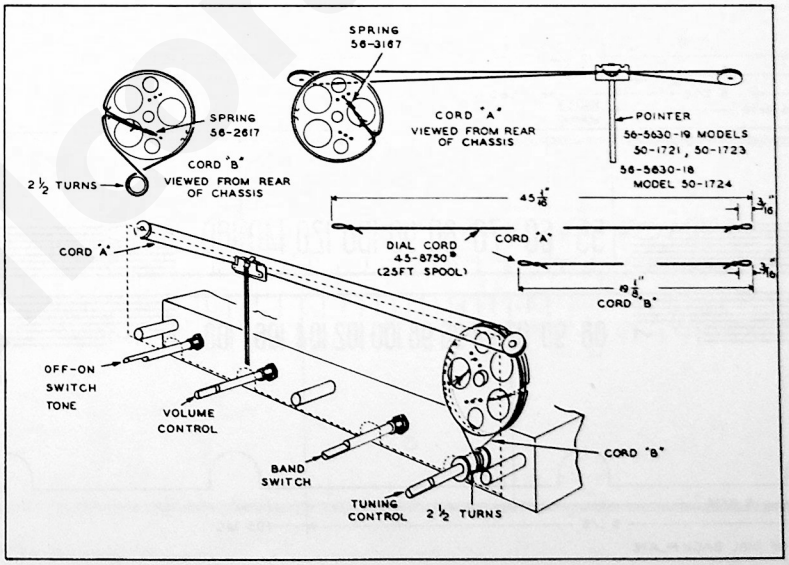

Figure 1. Drive-Cord Installation Details

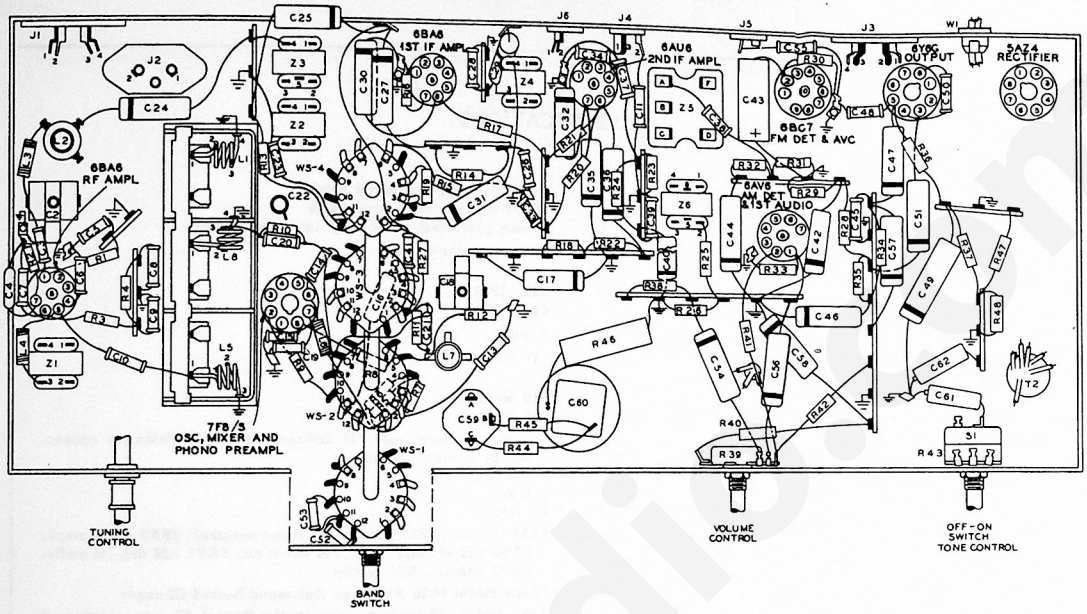

Figure 2. Symbolized Chassis, Showing Parts Placement

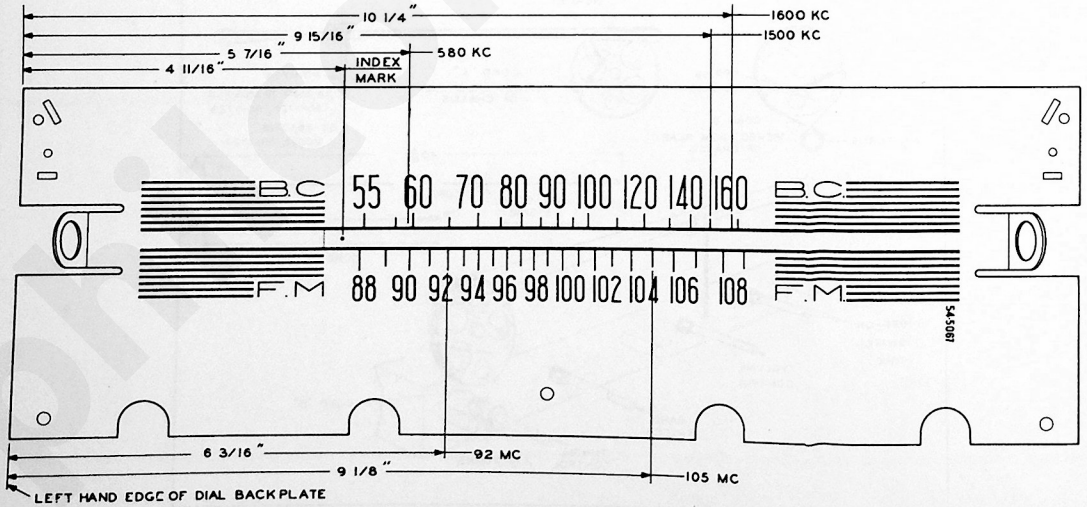

Figure 3. Dial-Backplate Calibration Measurements

REPLACEMENT PARTS LIST

NOTE

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

Reference Symbol	Description	Service Part No.
C1	Condenser, tuning gang, 6 sections	31-2750
C1A	Condenser, trimmer, FM aerial	Part of C1
C1B	Condenser, trimmer, FM r-f	Part of C1
C1C	Condenser, trimmer, AM r-f	Part of C1
C1D	Condenser, trimmer, AM osc.	Part of C1
C2	Condenser, series padder, AM aerial	31-6473-6
C3	Condenser, d-c blocking, 470 μμf.	62-147001001*
C4	Condenser, cathode by-pass, 100 μμf.	60-10105407*
C5	Condenser, a-v-c by-pass, 100 μμf.	62-110009001*
C6	Condenser, filament by-pass, 100 μμf.	62-110009001*
C7	Condenser, screen by-pass, 1500 μμf.	62-215001011*
C8	Condenser, plate decoupling, 1500 μμf.	62-215001011*
C9	Condenser, r-f by-pass, 100 μμf.	62-110009001*
C10	Condenser, d-c blocking, 51 μμf.	62-051009001*
C11	Condenser, tone compensation, phono, 100 μμf.	62-110009001*
C12	Condenser, fixed trimmer, 10 μμf.	62-010009001
C13	Condenser, FM plate by-pass, 100 μμf.	62-110009001*
C14	Condenser, d-c blocking, 220 μμf.	62-122001001
C15	Condenser, oscillator grid, 100 μμf.	62-110009001*
C16	Condenser, d-c blocking, phono coupling, .01 μf.	61-0120*
C17	Condenser, by-pass, .01 μf.	61-0120*
C18	Condenser, series padder, broadcast	31-6473-7
C19	Condenser, filament by-pass, 100 μμf.	62-110009001*
C20	Condenser, d-c blocking, 220 μμf.	62-122001001
C21	Condenser, d-c blocking, .01 μf.	61-0120*
C22	Condenser, FM trimmer	31-6511
C23	Condenser, r-f by-pass, 100 μμf.	62-110009001*
C24	Condenser, plate decoupling, .01 μf.	61-0120*
C25	Condenser, by-pass, .01 μf.	61-0120*
C26	Condenser, a-v-c by-pass, 100 μμf.	62-110009001*
C27	Condenser, a-v-c decoupling, .01 μf.	61-0120*
C28	Condenser, filament by-pass, 100 μμf.	62-110009001*
C29	Condenser, filament by-pass, .01 μf.	61-0120*
C30	Condenser, screen by-pass, .002 μf.	61-0062*
C31	Condenser, plate decoupling, .01 μf.	61-0120*
C32	Condenser, cathode by-pass, .01 μf.	61-0120*
C33	Condenser, r-f by-pass, 100 μμf.	62-110009001*
C34	Condenser, filament by-pass, 100 μμf.	62-110009001*
C35	Condenser, screen by-pass, .002 μf.	61-0062*
C36	Condenser, neutralizing, .01 μf.	61-0120*
C37	Condenser, i-f by-pass, 220 μμf.	62-122001001*
C38	Condenser, d-c blocking, a-v-c rectifier coupling, 15 μμf.	62-015009001
C39	Condenser, i-f by-pass, 100 μμf.	62-110009001*
C40	Condenser, de-emphasis, .002 μf.	61-0062*
C41	Condenser, i-f by-pass, 100 μμf.	62-110009001*
C42	Condenser, by-pass, .01 μf.	61-0120*
C43	Condenser, electrolytic diode load filter, 2 μf.	30-2417-7
C44	Condenser, a-v-c filter, .01 μf.	61-0120*
C45	Condenser, plate by-pass, 100 μμf.	62-110009001*
C46	Condenser, plate by-pass, .1 μf.	61-0113*
C47	Condenser, d-c blocking, .006 μf.	45-3500-7*
C48	Condenser, grid by-pass, 220 μμf.	62-122001001
C49	Condenser, bias filter, .2 μf.	45-3500-3*
C50	Condenser, screen by-pass, 100 μμf.	62-110009001*
C51	Condenser, tone compensation, .006 μf.	45-3500-7*
C52	Condenser, phono tone compensation, 51 μμf.	62-051009001
C53	Condenser, AM tone compensation, 100 μμf.	
C54	Condenser, d-c blocking, .02 μf.	61-0108*
C55	Condenser, i-f by-pass, 100 μμf.	
C56	Condenser, d-c blocking, .006 μf.	45-3500-7*
C57	Condenser, hi-cut, .006 μf.	45-3500-7*
C58	Condenser, bass boost, .01 μf.	61-0120*
C59	Condenser, electrolytic, 3 sections	30-2570-45
C59A	Condenser, filter, 60 μf., 400v	Part of C59
C58B	Condenser, filter, 10 μf., 400v	Part of C59
C59C	Condenser, filter, 10 μf., 400v	Part of C59
C60	Condenser, electrolytic, filter, 80 μf., 400v	
C61	Condenser, line filter, .01 μf.	45-3505-41
C62	Condenser, line filter, .01 μf.	45-3505-41
I1	Lamp, pilot, 6.3v	34-2064
I2	Lamp, pilot, 6.3v	34-2064
I3	Lamp, bin light, 6.3v	34-2064
J1	Socket, FM aerial	27-6214-1
J2	Socket, AM aerial	27-6214-14
J3	Socket, phono power	27-6182
J4	Socket, phono input	27-6126
J5	Socket, audio test	27-6180
J6	Socket, speaker	27-6214-12
L1	Coil, FM aerial	32-4415
L2	Coil, bc. aerial	32-4413
L3	Coil, r-f isolating	32-4061-2
L4	Coil, r-f isolating	32-4061-2
L5	Coil, FM r-f	32-4416
L6	Coil, r-f isolating	32-4061-2
L7	Coil, bc. oscillator	32-4153-6
L8	Coil, FM oscillator	32-4414
LA1	Loop aerial, bc., 50-1721	76-4337-7
LA1	Loop aerial, bc., 50-1723	76-4337-5
LA1	Loop aerial, bc., 50-1724	76-4337-6
LA2	Aerial wire and plug assembly, FM	41-3791-1
LS1	Speaker, 10", p.m.	36-1610-6
R1	Resistor, grid return, 2.2 megohms	66-5228340*
R2	Resistor, cathode bias, 47 ohms	66-0478340*
R3	Resistor, screen dropping, 27,000 ohms, 1 watt	66-3274340*
R4	Resistor, plate decoupling, 1000 ohms	66-2108340*
R5	Resistor, plate load, bc., 22,000 ohms	66-3228340*
R6	Resistor, plate load, FM, 1000 ohms	66-2108340*
R7	Resistor, plate load, phono, 10,000 ohms	66-3108340*
R8	Resistor, grid return, 15,000 ohms	66-3158340*
R9	Resistor, cathode bias, phono, 4700 ohms	66-2478340*
R10	Resistor, parasitic suppressor, 470 ohms	66-1478340*
R11	Resistor, parasitic suppressor, 1000 ohms	66-2108340*
R12	Resistor, crystal load, 1 megohm	66-5108340*
R13	Resistor, plate dropping, 22,000 ohms	66-3228340*
R14	Resistor, grid return, 1 megohm	66-5108340*
R15	Resistor, grid return, FM, 1 megohm	66-5108340*
R16	Resistor, cathode bias, 47 ohms	66-0478340*
R17	Resistor, screen decoupling, 1000 ohms	66-2108340*
R18	Resistor, plate decoupling, 1000 ohms	66-2108340*
R19	Resistor, grid return, 3300 ohms	66-2338340*
R20	Resistor, cathode bias, 120 ohms	66-1128340*
R21	Resistor, screen decoupling, 1000 ohms	66-2108340*
R22	Resistor, plate decoupling, 1000 ohms	66-2108340*

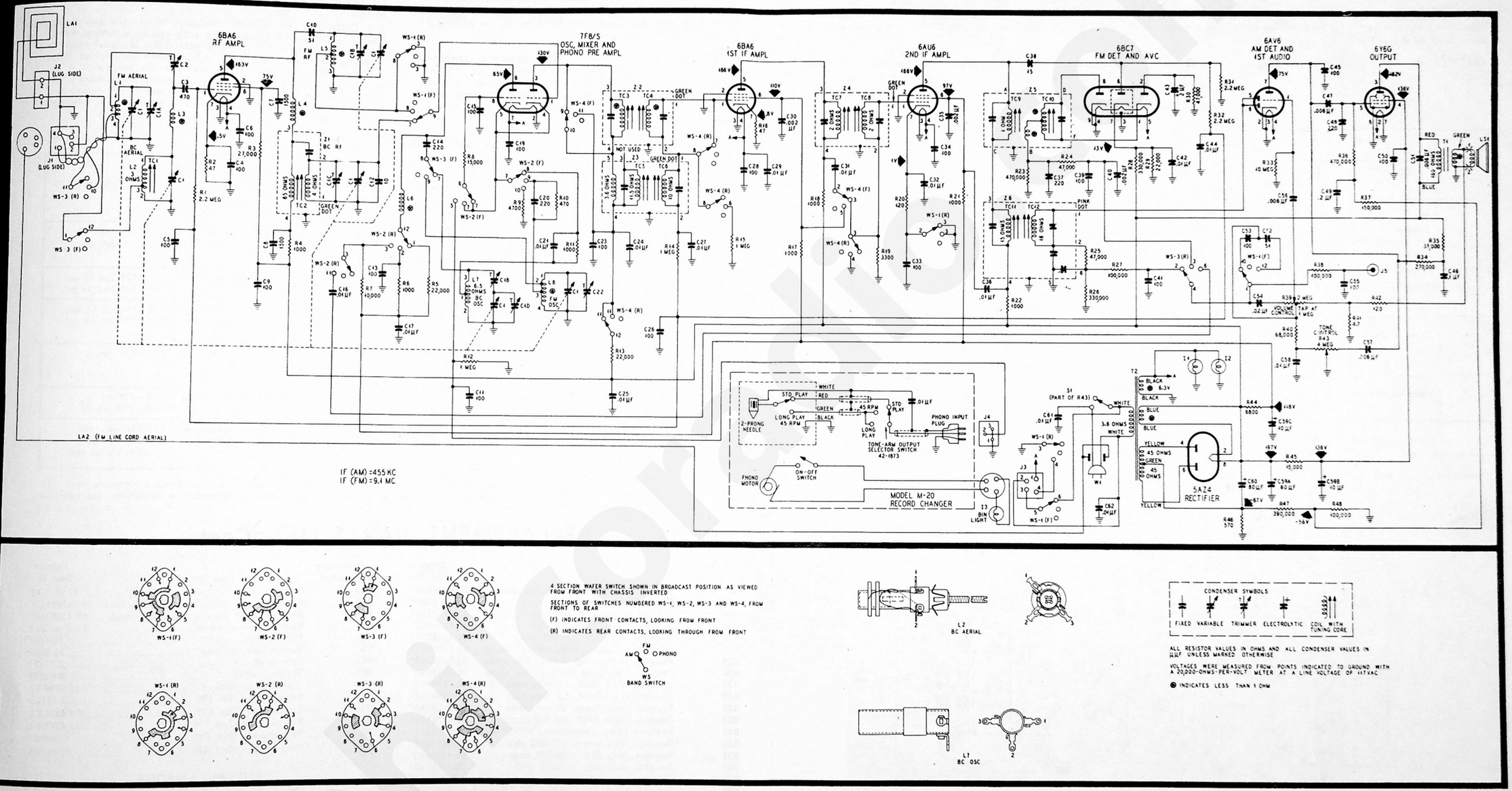

Figure 4. Philco Radio-Phonograph Models 50-1721, 50-1723, and 50-1724, Schematic Diagram

AM ALIGNMENT PROCEDURE

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

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

OUTPUT METER: Connect across speaker voice-coil terminals.

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

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

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

AM ALIGNMENT CHART

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

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

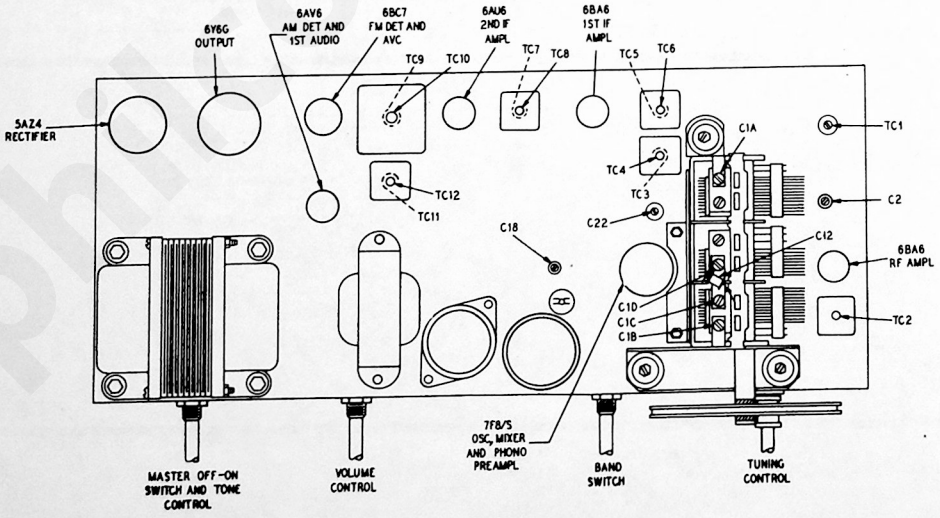

Figure 5. Top View, Showing Trimmer Locations

FM ALIGNMENT PROCEDURE

Make the AM alignment first.

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

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

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

OUTPUT METER: Connect across speaker voice-coil terminals.

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

FM ALIGNMENT CHART

STEP	SIGNAL GENERATOR		RADIO		ADJUST
	CONNECTION TO RADIO	DIAL SETTING	DIAL SETTING	SPECIAL INSTRUCTIONS	
1	Through a .01-μf. condenser to pin 1 of 6AU6*.	9.1 mc. ±80 kc. deviation.	Gang fully meshed.	Adjust TC10 for correct crossover. Adjust TC9 for maximum and equal peaks. Repeat.	TC10—FM det. sec. TC9—FM det. pri.
2	1-μf. condenser to pin 1 of 6BA6*.	9.1 mc. ±80 kc. deviation.	Gang fully meshed.	Adjust, in order given, for maximum and equal peaks. Repeat.	TC8—FM 2nd i-f sec. TC7—FM 2nd i-f pri.
3	Through a .01-μf. condenser to pin 1 of 7F8/S*.	9.1 mc. ±80 kc. deviation.	Gang fully meshed.	Adjust, in order given, for maximum and equal peaks. Repeat.	TC4—FM 1st i-f sec. TC3—FM 1st i-f pri.
4	Through a 300-ohm dummy aerial to FM aerial socket.	108 mc.	108 mc.	Adjust trimmer for maximum reading on output meter.	C22—FM osc.
5	Same as step 4.	105 mc.	105 mc.	Adjust for maximum while rocking gang.	C1B—FM r-f C1A—FM aerial
6	Same as step 4.	92 mc.	92 mc.	Adjust coils, in order given, for proper resonance (see R-F COIL NOTE).	L8—FM osc. coil L5—FM r-f coil L1—FM aerial coil

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

REPLACEMENT PARTS LIST (Cont.)

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

MISCELLANEOUS

(Parts common to all models)

Description	Service Part No.
Bin mechanism, l.h.	76-3223-5
Bin mechanism, r.h.	76-3223-6
Frame assembly	76-4104
Sleeve, changer mounting (3 required)	54-7798

REPLACEMENT PARTS LIST (Cont.)

MISCELLANEOUS (Cont.)

(Parts common to all models)

Description	Service Part No.
Spring, changer mounting, upper, heavier (3 required)	56-7059FA9
Spring, changer mounting, lower, lighter (3 required)	56-7059-1FJ47
Spring, bin mechanism	56-4978
Bullet catch	45-6002
Cable, bin light and phono power	41-3944-3
Cable, speaker	41-3943-4
Clip, bin-light mounting	56-3545-6FA3
Clip, pilot-lamp mounting (2 required)	56-3545FA3
Dial backplate assembly	76-5161
Drive cord (25-ft. spool)	45-8750*
Spring, gang drive	56-2617
Spring, pointer drive	56-3167
Dome (4 required)	45-6190
Drive shaft	76-5139
Bushing, front, brown bakelite	54-7872
Bushing, rear, black bakelite	27-9437
Spring, hairpin, small, bushing to shaft (2 required)	57-1468FA1
Spring, hairpin, large, bushing to chassis	57-0985FA1
Fish paper	27-9111
Gang Mounting	
Mount, rubber	54-4651-1
Knob (4 required)	
Light shield, bin light	56-6307-7FA3
Pilot-lamp assembly, l.h., 14¼" lead length	27-6233-22
Pilot-lamp assembly, r.h., 25" lead length	27-6233-33
Scale strap (2 required)	56-2234-2
Scale strap	56-4756FE11
Screw, back mounting (15 required)	1W25345FE11
Socket, Loktal, 5AZ4	27-6207
Socket, Loktal, 7F8/S	27-6207-1
Socket, 7-pin miniature	27-6203
Socket, 7-pin miniature, 6BA6 r-f ampl.	27-6203-1
Socket, 9-pin miniature	27-6203-5
Socket, octal	27-6174
Strike plate (4 required)	45-6003

(Parts not common to all models)

Cabinet, Model 50-1721	10751-3
Back	54-7814
Baffle, wood	219-166
Bezel and scale	54-4751-1
Door pull	56-6493
Drop door	45-6507
Hinge (2 required)	
Pointer	56-5630-19
Cabinet, Model 50-1723	10724-3
Back	54-7668
Baffle, wood	219-129
Baffle-and-cloth assembly	40-7548-1
Bezel and scale	54-4751-1
Doors, matched set of 2	45-1664
Door pull (2 required)	56-7128
Hinge, butt, phono drop door (2 required)	56-7127
Hinge, knife, bottom of record storage door	56-5713-3
Hinge, knife, top of record storage door	56-5713-1
Instrument panel	45-6569
Pointer	56-5630-19
Cabinet, Model 50-1724	10781
Back	54-7998
Baffle, wood	219-202
Baffle-and-cloth assembly	40-7831
Bezel	56-5855
Dial scale	54-5067
Doors, matched set of 2	45-6567
Door pull (2 required)	56-7748
Instrument panel	45-6568
Hinge, knife (2 pairs required)	56-7015
Pointer	56-5630-18

CORRECTIONS TO PARTS LIST

Reference Symbol	Description	Service Part No.
C53	Condenser, AM tone compensation, 100 μμf.	62-110009001
C55	Condenser, i-f by-pass, 100 μμf.	62-110009001
	Coil mount, AM osc.	Delete
	Bracket, copper, ground	Delete
	Plate, ground bracket (to chassis)	Delete
	Shield, ground bracket (against gang)	Delete
	Dial scale, 50-1721 (part of bezel and scale)	Delete
	Instrument panel	Delete
	Dial backplate assembly, 50-1721, Code 122, 50-1724, late production	76-5643
	Hinge (2 required)	56-5765
	Knob (3 required), 50-1721, Codes 121 and 122, 50-1723, Codes 121 and 122	54-4718-6
	Knob (1 required), band switch, 50-1721, Codes 121 and 122, 50-1723, Codes 121 and 122	54-4718-12
	Knob (4 required) 50-1724	54-4718-6
	Pointer, 50-1721, Code 122 (same as 50-1724)	56-5630-18

PRODUCTION CHANGES

Run 2

To provide longer pilot-lamp life, a 1-ohm ½-watt, wire-wound resistor was added, in series with the two pilot lamps. This dropping resistor, Part No. 66-9108340, was wired between pin 1 of the 6Y6G socket and pin 1 of J3, the changer power socket. Also, the strap wire connecting pins 1 and 2 of the 6Y6G socket was removed.

Run 3

To reduce parasitic oscillations in the 6Y6G stage, the following changes were made:

A 10-ohm resistor, Part No. 66-0104340, was added, in the 6Y6G plate lead, and was wired between pin 3 and pin 1 of the 6Y6G socket. Also, the red lead from T1 was removed from pin 3 and wired to pin 1; the two brown leads and the 1-ohm resistor added in Run 2 were removed from pin 1 and wired to pin 6; the ground point of C50 was changed from pin 8 of the 6Y6G socket to the center lug (ground) of the 3-lug wiring panel that lies in front of the rectifier and output-tube sockets.

Run 4

To reduce phono distortion when high-modulation records are played, the following changes were made:

R9 was changed to 6800 ohms, Part No. 66-2688340*.

R7 was changed to 18,000 ohms, Part No. 66-3188340*.

C11 was changed to .001 μμf., Part No. 45-3500-5*.

A 100-μμf. condenser, Part No. 62-110009001*, was added, in parallel with R9, as a cathode by-pass for phono operation.

A 330,000-ohm resistor was added, as a grid return for phono operation. The added resistor wires from lug 5 to lug 10 of WS-2(F).

Run 5

Condenser C60 was changed to Part No. 30-2568-41.