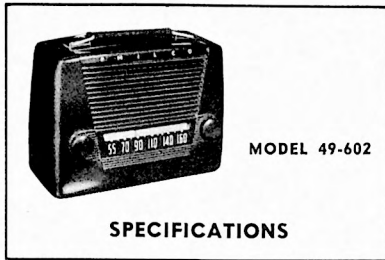


# PHILCO RADIO MODEL 49-602



CABINET	Molded Polystyrene (maroon, tan, ivory or green)
CIRCUIT	Four-tube superheterodyne
FREQUENCY RANGE	540-1600 kc.
AUDIO OUTPUT	160 milliwatts
OPERATING VOLTAGES	Battery: "B", 90 volts; "A", 7.5 volts. A.c./d.c.: 105-120 vclts
POWER CONSUMPTION	Battery: "B", 13 ma. at 90 volts; "A", 50 ma. at 7.5 volts. A.c./d.c.: 25 watts
AERIAL	Built-in high-impedance loop; terminal also provided for external aerial
INTERMEDIATE FREQUENCY	455 kc.
PHILCO TUBES (4)	1R5, 1T4, 1U5, 3V4
BATTERY TYPE	Philco P-361

TP-4523

## CALIBRATING DIAL BACKPLATE

When the radio chassis has been removed from the cabinet, dial calibration and alignment points may be marked on the dial (chassis) backplate at the end of the pointer with a pencil. The method of measuring for these points is illustrated in figure 1.

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

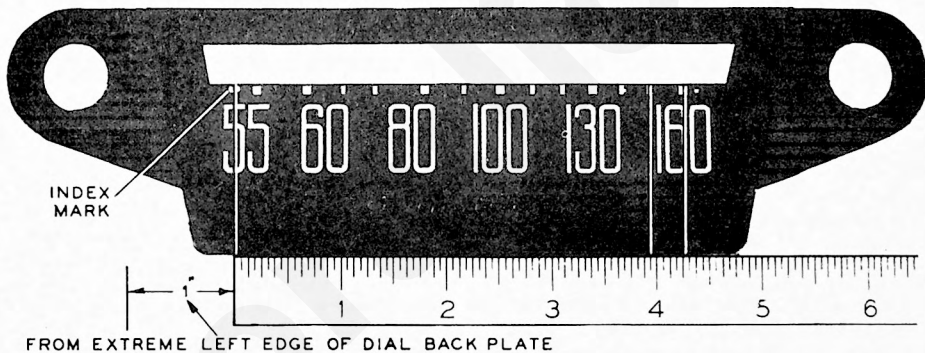


Figure 1. Dial-Backplate Calibration Measurements

TP-5776

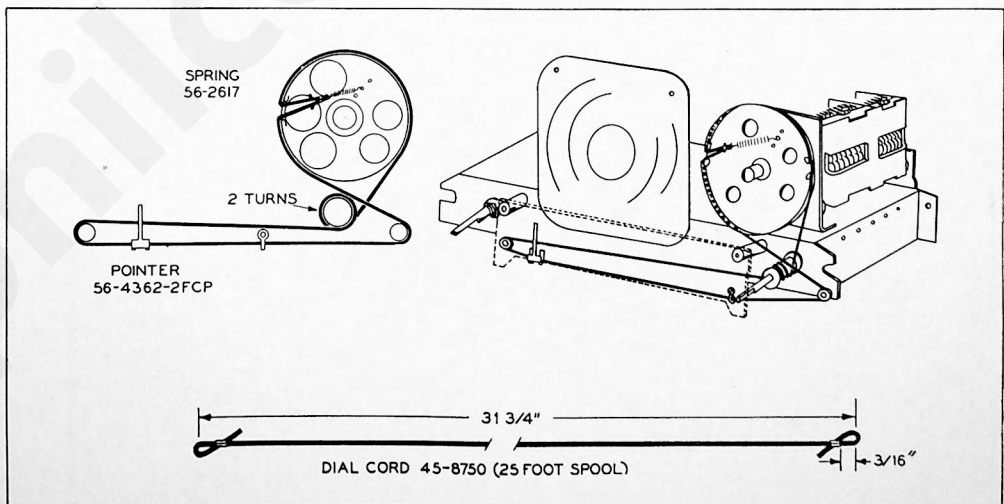
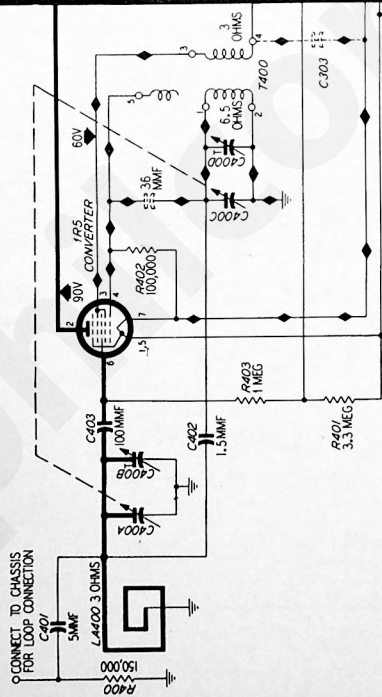


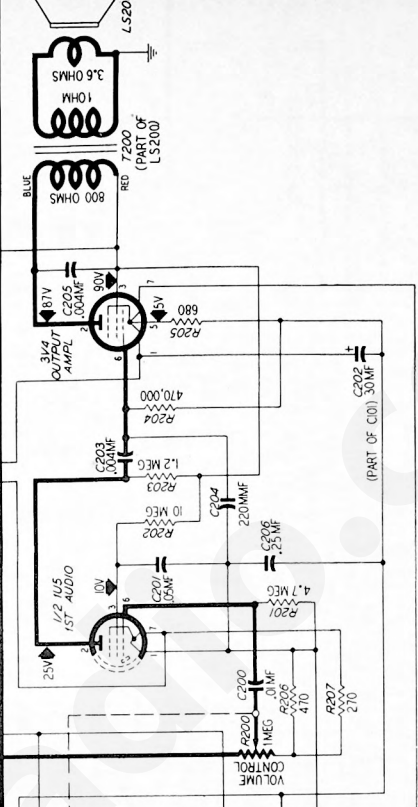
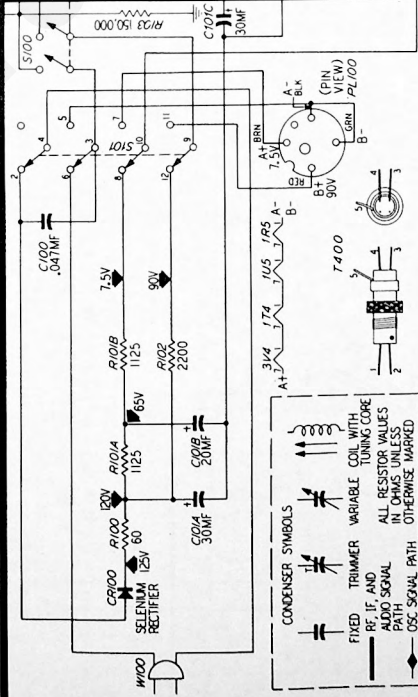
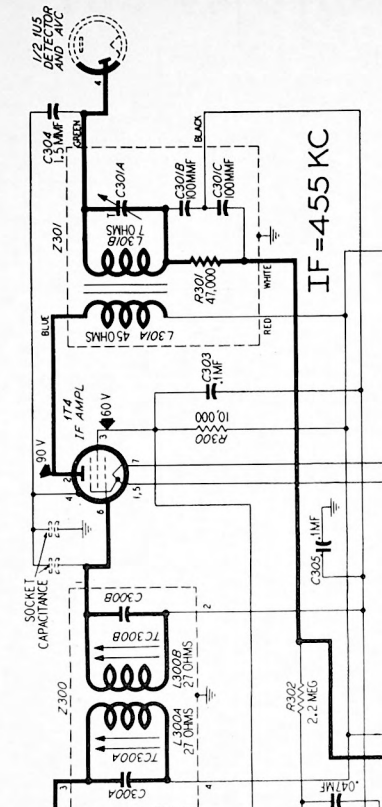
Figure 2. Drive-Cord Installation Details

TP-5354E

SECTION 4 - RF AND CONVERTER CIRCUITS



SECTION 3 - IF, DETECTOR AND AVC CIRCUITS



SECTION 1 - POWER SUPPLY

SECTION 2 - AUDIO CIRCUITS

Figure 3. Philco Model 49-602, Sectionalized Schematic Diagram.

OSCILLATOR TEST: Connect the positive lead of a high-resistance voltmeter to test point D, connect the prod end of the negative lead through a 100-ohm resistor to the oscillator coil (pin 4 of the 19S), test point C. Use a suitable meter range, such as 0-10 volts. Proper operation of the oscillator is indicated by negative voltage within the range given in the chart (measured with a 20,000-ohm-per-volt meter) throughout the tuning range.

TP 6335

# ALIGNMENT PROCEDURE

DIAL—Calibration and pointer-index measurements are shown in figure 1. With tuning condenser fully meshed, set pointer to index mark.

RADIO CONTROLS—Set volume control to maximum.

OUTPUT METER—Connect across voice-coil terminals.

SIGNAL GENERATOR—Use modulated output.

STEP	SIGNAL GENERATOR		RADIO		ADJUST
	CONNECTION TO RADIO	DIAL SETTING	DIAL SETTING	SPECIAL INSTRUCTIONS	
1	Ground lead to B— Positive lead through .05-mf. condenser to external-aerial lead. Make sure that radio loop aerial is connected to radio.	455 kc.	Tuning condenser fully meshed.	Adjust, in order given, for maximum output.	C301A—2nd i-f sec. TC300B—1st i-f sec. TC300A—1st i-f pri.
2	Radiating loop (see note below).	1600 kc.	1600 kc.	Adjust for maximum output.	C400D—osc.
3	Same as step 2.	1500 kc.	1500 kc.	Adjust for maximum output while rocking tuning condenser.	C400B—aerial

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

**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 is critical for correct tracking. During alignment, with the cabinet back (containing the loop) laid down on the bench, the chassis should be laid on its back, in approximately its normal relation to the loop.

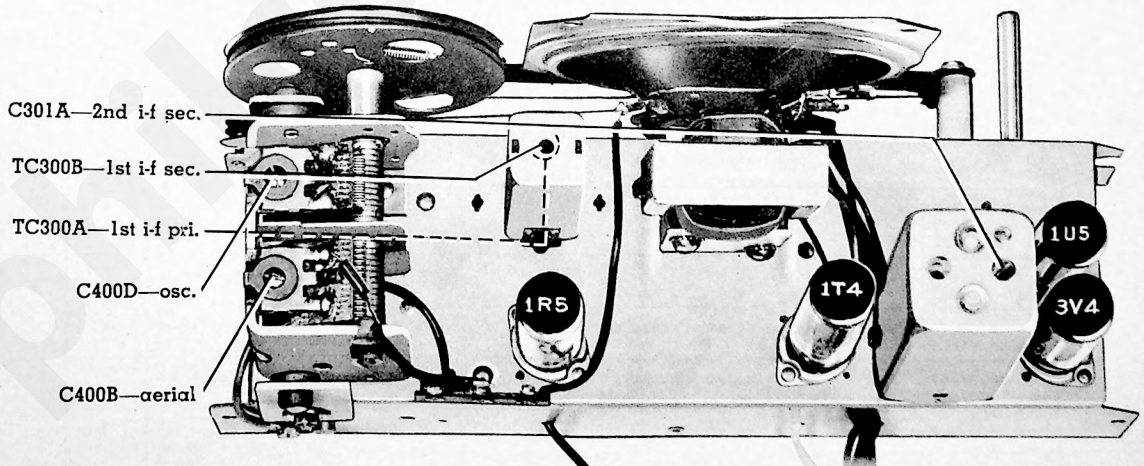


Figure 4. Top View, Showing Trimmer Locations

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The components in the radio circuit are symbolized according to the types of parts and the sections of the radio in which the parts are located. The prefix letter of the symbol designates the type of part, as follows:

C—condenser  
 I—pilot lamp  
 L—choke or coil  
 LA—loop aerial

LS—loud-speaker  
 R—resistor  
 S—switch

T—transformer  
 W—line cord  
 Z—electrical assembly

The number of the symbol designates the section in which the part is located, as follows:

- 100-series components are in Section 1—the power supply
- 200-series components are in Section 2—the audio circuits
- 300-series components are in Section 3—the i-f, detector, and a-v-c circuits
- 400-series components are in Section 4—the r-f and converter circuits

A suffix letter identifies the part as a component of the assembly which bears an identical number without a suffix letter, and with perhaps a different prefix letter.

**REPLACEMENT PARTS LIST**

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

**SECTION 1  
 POWER SUPPLY**

Reference Symbol	Description	Service Part No.
C100	Condenser, line filter, .047 mf.	61-0122*
C101	Condenser, electrolytic, 4-section	30-2568-21
C101A	Condenser, filter, 30 mf., 150v	Part of C101
C101B	Condenser, filter, 20 mf., 150v	Part of C101
C101C	Condenser, filter, 30 mf., 150v	Part of C101
CR100	Rectifier, selenium	34-8003-1
PL100	Battery-cable-and-plug assembly	41-3712-3
R100	Resistor, current limiting, 80 ohms, 1 watt	33-1334
R101	Resistor, 2-section	33-3431-5
R101A	Resistor, filament-dropping, 1125 ohms, 3 watts	Part of R101
R101B	Resistor, filament-dropping, 1125 ohms, 3 watts	Part of R101
R102	Resistor, filter, 2200 ohms	66-2223340*
R103	Resistor, leakage 150,000 ohms	66-4153340*
S100	Switch, on-off	Part of 33-5538-28
S101	Switch, change-over	42-1821
W100	Line-cord-and-plug assembly	L2183*

**SECTION 2  
 AUDIO CIRCUITS**

C200	Condenser, d-c blocking, .01 mf.	61-0120*
C201	Condenser, screen by-pass, .05 mf.	61-0122*
C202	Condenser, filter, 30 mf., 25v	Part of 30-2568-21
C203	Condenser, d-c blocking, .004 mf.	61-0179*
C204	Condenser, r-f by-pass, 220 mmf.	62-122001001*
C205	Condenser, tone compensation, .004 mf.	61-0179*
C206	Condenser, by-pass, .25 mf.	61-0125*
LS200	Loud-speaker, p-m	36-1627-1
R200	Volume control, 1 megohm	33-5538-28
R201	Resistor, grid return, 4.7 megohms	66-5473340*
R202	Resistor, screen dropping, 10 megohms	66-6103340*
R203	Resistor, plate load, 1.2 megohms	66-5123340*
R204	Resistor, grid return, 470,000 ohms	66-4473340*
R205	Resistor, bias, 680 ohms	66-1683340*
R206	Resistor, diode return, 470 ohms	66-1473340*
R207	Resistor, diode return, 270 ohms	66-1273340*
T200	Transformer, output	Part of LS200

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

C300A	Condenser, shunt	Part of Z300
C300B	Condenser, shunt	Part of Z300
C301A	Condenser, trimmer	Part of Z301
C301B	Condenser, filter	Part of Z301
C301C	Condenser, filter	Part of Z301
C302	Condenser, a-v-c filter, .047 mf.	61-0122
C303	Condenser, screen by-pass, .1 mf.	61-0113*
C304	Condenser, neutralizing, 1.5 mmf.	30-1221-3
C305	Condenser, i-f by-pass, .1 mf.	61-0113
L300A	Transformer primary, 1st i-f	Part of Z300
L300B	Transformer secondary, 1st i-f	Part of Z300
L301A	Transformer primary, 2nd i-f	Part of Z301
L301B	Transformer secondary, 2nd i-f	Part of Z301
R300	Resistor, screen dropping, 10,000 ohms	66-3103340*

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

Reference Symbol	Description	Service Part No.
R301	Resistor, filter, 47,000 ohms (Part of Z301)	66-3473340*
R302	Resistor, a-v-c filter, 2.2 megohms	66-5223340*
Z300	Transformer, 1st i-f	32-4160-4
Z301	Transformer, 2nd i-f	32-3987-3*

**SECTION 4  
 R-F AND CONVERTER CIRCUITS**

C400	Condenser, tuning gang	31-2727-2
C400A	Condenser, tuning, aerial section	Part of C400
C400B	Condenser, trimmer, aerial	Part of C400
C400C	Condenser, tuning, oscillator section	Part of C400
C400D	Condenser, trimmer, oscillator	Part of C400
C401	Condenser, isolating, 5 mmf.	30-1224-5*
C402	Condenser, neutralizing, 1.5 mmf.	30-1221-3
C403	Condenser, d-c blocking, 100 mmf.	30-1225-2*
LA400	Loop aerial	32-4274
R400	Resistor, leakage, 150,000 ohms	66-4153340*
R401	Resistor, grid return, 3.3 megohms	66-5333340*
R402	Resistor, oscillator bias, 100,000 ohms	66-4103340*
R403	Resistor, a-v-c divider, 1 megohm	66-5103340*
T400	Transformer, oscillator	32-4282

**MISCELLANEOUS**

Description	Service Part No.
<b>Cabinet and Cabinet Parts</b>	
Cabinet, brown	10703D
Cabinet (M), maroon	10703
Cabinet (T), tan	10703A
Cabinet (I), ivory	10703B
Cabinet (G), green	10703C
Handle	76-3742
Battle	54-7577
<b>Cabinet Backs</b>	
Maroon	54-4551
Tan	54-4551-1
Ivory	54-4551-2
Green	54-4551-3
Brown	54-4551-4
<b>Handles</b>	
Tan, ivory, green, maroon	76-4089-1
Brown	76-4089-2
Lever assembly, switch	76-3666
Terminal, aerial strip	76-3674
<b>Dial-Scale Hardware</b>	
Dial-backplate assembly	76-3668
Drive cord, 25-foot spool	45-8750*
Pointer	56-4362-3
Shaft and pulley	76-3671-1
Spring, drive-cord	56-2617
Knob (M)	54-4557
Knob (T)	54-4557-1
Knob (I)	54-4557-2
Knob (G)	54-4557-3
Socket, tube, miniature	27-6203
Spring, voltage change-over switch	28-9010FA1—Part of 76-3666