Philco Radio & Television Corp.

	Model: 49-505	**Chassis:**	**Year:** Pre 1950
	Power:	**Circuit:**	**IF:**
	Tubes:		
	Bands:		

Resources
Beitmans 1949 88
Riders 19 (XIX) PHILCO 19-178
Riders 19 (XIX) PHILCO 19-179
Riders 19 (XIX) PHILCO 19-180
Riders 19 (XIX) PHILCO 19-181
Riders 19 (XIX) PHILCO 19-182
Riders 19 (XIX) PHILCO 19-183
Riders 19 (XIX) PHILCO 19-184
Riders 19 (XIX) PHILCO 19-185

PHILCO RADIO — MODELS 49-500 AND 49-500-1

Section 1 — Power Supply — TROUBLE SHOOTING

For the tests in this section, use a d-c voltmeter; connect the leads to the test points indicated in the chart. The voltages shown were taken with a 20,000-ohms-per-volt meter at a line voltage of 117 volts, 60 cycles.

Turn the volume control to minimum, and set the dial pointer at 540 kc.

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

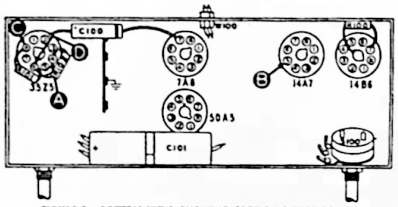


FIGURE 1. BOTTOM VIEW, SHOWING SECTION 1 TEST POINTS

STEP	TEST POINT	NORMAL INDICATION	ABNORMAL INDICATION	POSSIBLE CAUSE OF ABNORMAL INDICATION
1	A to B	80v		Trouble within this section; isolate by the following tests.
2	C to B	115v	No voltage Low voltage High voltage	Detective 35Z5GT. Shorted: C101A. Detective 35Z5GT. Open: C101A or T100. Leaky: C101A. Open: R101.
3	D to B	125v	No voltage Low voltage High voltage	Shorted: C101A. Open: C101A. Leaky: C101B or C102. Open: R101, T100, or R104.
4	A to B	80v	No voltage Low voltage High voltage	Shorted: C101C. Leaky: C101C. Open: R104.

Listening Test Abnormal hum may be caused by open C101A, C101B, or C101C.

Section 2 — Audio Circuits — TROUBLE SHOOTING

For the tests in this section, use an audio-signal generator. Connect the ground lead of the generator to B; connect the output lead through a .1-mf. condenser to the test points indicated in the chart. Set the volume control at maximum. If the "NORMAL INDICATION" is obtained in step 1, proceed with the tests for Section 3 (i-f, detector, and a-v-c circuits); if not, isolate and correct the trouble within this section.

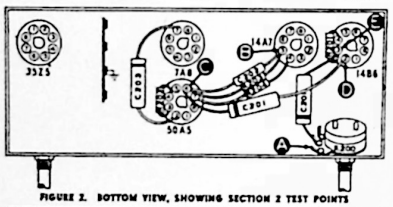


FIGURE 2. BOTTOM VIEW, SHOWING SECTION 2 TEST POINTS

STEP	TEST POINT	NORMAL INDICATION	POSSIBLE CAUSE OF ABNORMAL INDICATION
1	A	Loud, clear signal with weak signal-generator input.	Trouble within this section; isolate by the following tests.
2	C	Clear signal with weak signal-generator input.	No signal — Open or shorted: L8200 or T100. Shorted: C202. Open: R204. Detective 50A5. Weak or distorted signal — Detective: 50A5 or L8200. Leaky: C202 or C201. Open: R203. Shorted: R204.
3	D	Same as step 2.	No signal — Open: C201. Weak or distorted signal — Leaky: C201.
4	E	Same as step 1.	No signal — Open: R202. Detective 14B6. Weak or distorted signal — Shorted: C200. Open: R201. Detective 14B6.
5	A	Same as step 1.	No sig.a. — Open: C202. Shorted: C200D. Weak or distorted signal — Open: R200 (rotate through range).

Section 3 — I-F, Detector, and A-V-C Circuits — TROUBLE SHOOTING

For the tests in this section, use an r-f signal generator, with modulated output, set to 455 kc. Connect the ground lead of the signal generator to B; connect the output lead through a .1-mf. condenser to the test points indicated in the chart. Set the volume control at maximum. If the "NORMAL INDICATION" is obtained in step 1, proceed with the tests for Section 4 (r-f and converter circuits); if not, isolate and correct the trouble within this section.

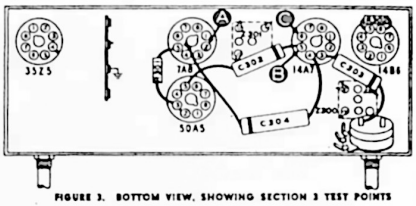


FIGURE 3. BOTTOM VIEW, SHOWING SECTION 3 TEST POINTS

STEP	TEST POINT	NORMAL INDICATION	POSSIBLE CAUSE OF ABNORMAL INDICATION
1	A	Clear signal with weak signal-generator input.	Trouble within this section; isolate by the following tests.
2	C	Same as step 1.	No signal — Open or shorted: T300. Detectives 14B6 or 14A7. Open: R301. Shorted: C303. Weak or distorted signal — Leaky: C303. Open: C303 or C304. Detectives 14B6 or 14A7. Misaligned: T300. Leaky or open: C303.
3	A	Same as step 1.	No signal — Open or shorted: T301. Weak or distorted signal — Misaligned: T301.

Section 4 — R-F and Converter Circuits — TROUBLE SHOOTING

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

Inspect the tuning condensers for bent plates, dirt, or poor wiper contacts; any or all of these will cause noise. If the "NORMAL INDICATION" is not obtained in step 1, isolate the trouble by following the remaining steps.

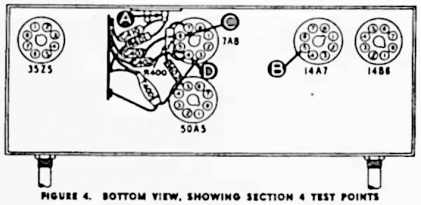
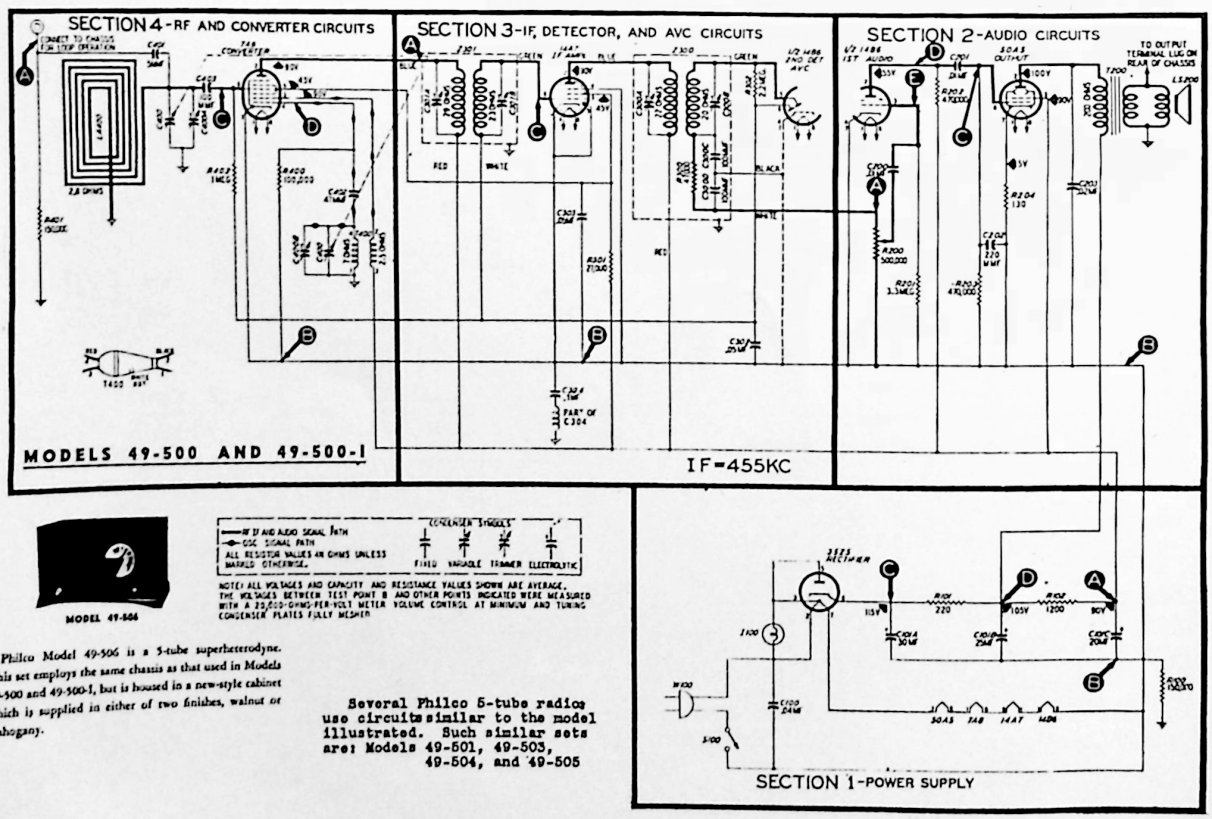


FIGURE 4. BOTTOM VIEW, SHOWING SECTION 4 TEST POINTS

STEP	TEST POINT	DIAL SETTINGS: SIG. GEN.	DIAL SETTINGS: RADIO	NORMAL INDICATION	POSSIBLE CAUSE OF ABNORMAL INDICATION
1	A	540 kc.	540 kc.	Clear signal with weak signal-generator input.	Trouble within this section; isolate by the following tests.
2	D (Osc. test; see note below.)		540 to 1650 kc.	Negative 9 to 13 volts.	Open or shorted: T400, C402, or R400. Shorted: C400 or C400B. Detective: 7A8.
3	C	540 kc.	540 kc.	Same as step 1.	No signal — Open or shorted: Z301. Shorted: C400 or C400A. Detective 7A8. Weak or distorted signal — Shorted or open: LA400. Detective: 7A8.
4	A	540 kc.	540 kc.	Same as step 1.	Weak signal — Open: C401.

OSCILLATOR-TEST NOTE: Connect positive lead of a 20,000-ohms-per-volt meter to B; connect prod end of negative lead through a 100,000-ohm isolating resistor to test point D. Proper operation of oscillator is indicated by a negative voltage of 9 to 13 volts throughout range of tuning condenser.



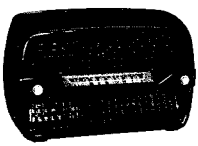
MODEL 49-506

Philco Model 49-506 is a 5-tube superheterodyne. This set employs the same chassis as that used in Models 49-500 and 49-500-1, but is housed in a new-style cabinet which is supplied in either of two finishes, walnut or mahogany.

Several Philco 5-tube radios use circuits similar to the model illustrated. Such similar sets are: Models 49-501, 49-503, 49-504, and 49-505

PHILCO RADIO MODELS 49-500 AND 49-500-1, SECTIONALIZED SCHEMATIC DIAGRAM, SHOWING TEST POINTS

MODEL 49-505 PHILCO CORP.



MODEL 49-505

Circuit Description

The Philco Radio, Model 49-505, is a five-tube, table-model superheterodyne, providing reception in the standard-broadcast band.

The high-impedance loop aerial normally provides adequate signal pickup. Provisions are made for the connection of an external aerial.

The loop is coupled to the 7A8 converter. Variable-condenser tuning is employed; the oscillator rotor-section plates are properly shaped to obtain tracking, thus eliminating the necessity for a series padding condenser.

The 7A8 is transformer-coupled to the 14A7 i-f amplifier, which is also transformer-coupled to the diodes of the 14B6 second detector—first audio-frequency amplifier. A-v-c voltage is applied to the control grids of both the i-f and converter tubes.

The triode section of the 14B6 is the first audio stage, and is resistance-coupled to the 50A5 output stage. The output tube works into a permanent-magnet dynamic speaker.

D-c operating voltages are obtained from the 35Y4 half-wave rectifier, the output of which is filtered by a two-section resistor-condenser filter.

Condenser C302 in Section 3 is a special condenser, inductively wound to form a series-tuned circuit, resonant at the intermediate frequency. This special condenser offers less impedance at this frequency than a conventional condenser, thus permitting higher i-f gain, with no tendency toward instability. The inductive effect at audio frequencies is negligible. Since the tuning gang is connected to the chassis, by-passing at broadcast frequencies is adequate.

Resistor R100, the 150,000-ohm resistor in Section 1, prevents hum which might otherwise occur under conditions of high humidity.

SPECIFICATIONS

CABINET	Plastic (walnut)
CIRCUIT	Five-tube superheterodyne
FREQUENCY RANGE	540—1620 kc.
OPERATING VOLTAGE	105—120 volts, a.c. or d.c.
POWER CONSUMPTION	30 watts
AERIAL	Loop fastened to cabinet; connection also provided for outside aerial
INTERMEDIATE FREQUENCY	455 kc.
PHILCO TUBES (5)	7A8, 14A7, 14B6, 50A5, 35Y4

Philco TROUBLE-SHOOTING Procedure

For rapid trouble shooting, the radio circuit is divided into four sections, with test points specified for each section; these sections and test points are indicated in the schematic diagram. The trouble-shooting procedure given for each section includes a simplified test chart and a bottom view of the chassis showing the locations of the test points and the components of that section.

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

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

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

Preliminary Checks

To avoid possible damage to the radio, the following preliminary checks should be made before turning on the power.

1. Inspect the top and bottom of the chassis. Make sure that all tubes are secure in the proper sockets, and look for any broken or shorted connections, burned resistors, or other obvious sources of trouble.
2. Measure the resistance between B+ (pin 7 of the 35Y4 rectifier) and B— (test point B). When the ohmmeter test leads are connected in the proper polarity, the highest resistance reading will be obtained. If the reading is lower than 1500 ohms, check condensers C101A, C101B, and C101C for leakage or shorts.

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

Section 1—Power Supply

TROUBLE SHOOTING

For the tests in this section, use a d-c voltmeter. Connect the negative lead to B–, test point B; connect the positive lead to the test points indicated in the chart. The voltage readings given were taken with a 20,000-ohms-per-volt meter, at a line voltage of 117 volts, a.c.

Turn on the power, and set the volume control to minimum.

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

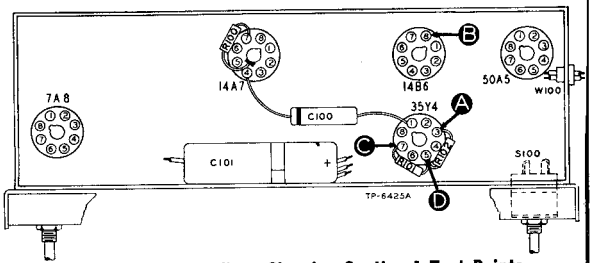


Figure 1. Bottom View, Showing Section 1 Test Points

STEP	TEST POINT	NORMAL INDICATION	ABNORMAL INDICATION	POSSIBLE CAUSE OF ABNORMAL INDICATION
1	A	107 volts		Trouble within this section. Isolate by the following tests.
2	C	130 volts	No voltage Low voltage High voltage	Defective: 35Y4, S100, W100. Shorted: C101A. Defective: 35Y4. Open: C101A, I100. Leaky: C101A. Open: R101, R102, R203*, T200*.
3	D	120 volts	No voltage Low voltage High voltage	Shorted: C101B. Open: R101. Shorted: C203*. Leaky: C101B, C203*. Open: R102, R203*, T200*.
4	A	107 volts	No voltage Low voltage High voltage	Shorted: C101C. Leaky: C101C. Open: R203*.
Listening Test: Abnormal hum may be caused by open C101B, C101C, or R100.				

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

Section 2—Audio Circuits

TROUBLE SHOOTING

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

Set the radio volume control to maximum.

If the "NORMAL INDICATION" is obtained in step 1, proceed with the tests for Section 3 (i-f, detector, and a-v-c circuits). If not, isolate and correct the trouble in this section.

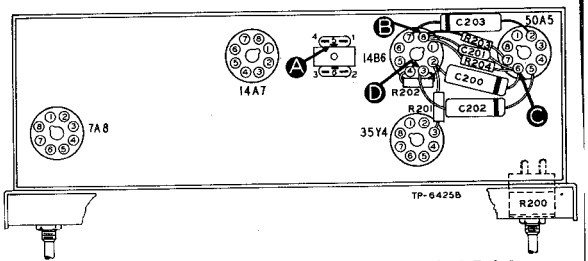


Figure 2. Bottom View, Showing Section 2 Test Points

STEP	TEST POINT	NORMAL INDICATION	POSSIBLE CAUSE OF ABNORMAL INDICATION
1	A	Loud, clear signal with weak signal input.	Trouble within this section. Isolate by the following tests.
2	C	Clear signal with strong signal input.	Open or shorted: LS200, T200. Shorted: C201, C203. Open: R203. Defective: 50A5.
3	D	Same as step 1.	Open: R201, R202, R204. Open, shorted, or leaky: C200. Defective: 14B6.
4	A	Same as step 1.	Defective: R200 (rotate through entire range). Open, shorted, or leaky: C202. Shorted: C301D*.

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

Section 3—I-F, Detector, and A-v-c Circuits — TROUBLE SHOOTING

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

Set the radio volume control to maximum.

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

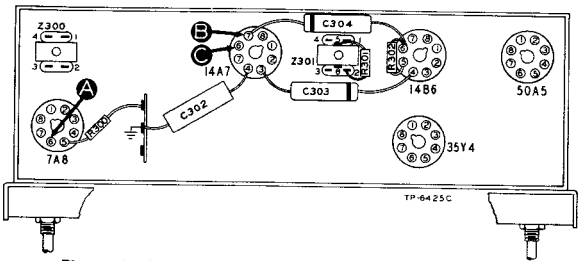


Figure 3. Bottom View, Showing Section 3 Test Points

STEP	TEST POINT	NORMAL INDICATION	POSSIBLE CAUSE OF ABNORMAL INDICATION
1	A	Clear signal with weak signal input.	Trouble within this section. Isolate by the following tests.
2	C	Clear signal with moderate signal input.	Misaligned: Z301. Defective: 14B6 (diode section), 14A7. Open: R300, C302. Shorted, leaky, or open: C303, Z301.
3	A	Same as step 1.	Defective or misaligned: Z300. Defective: 7A8*. Open: C302, LA400*, Z300. Shorted: Z300.

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

Section 4—R-F and Converter Circuits — TROUBLE SHOOTING

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

Set the radio volume control to maximum.

Set the radio and signal-generator dials as indicated in the chart.

If the "NORMAL INDICATION" is not obtained in step 1, isolate and correct the trouble in this section.

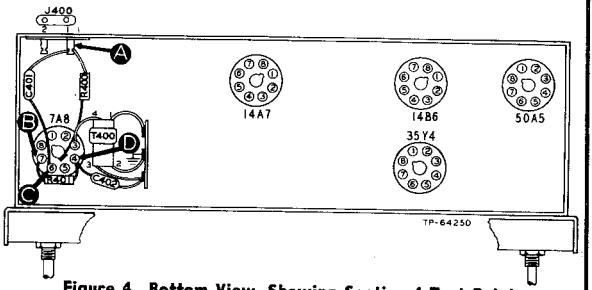
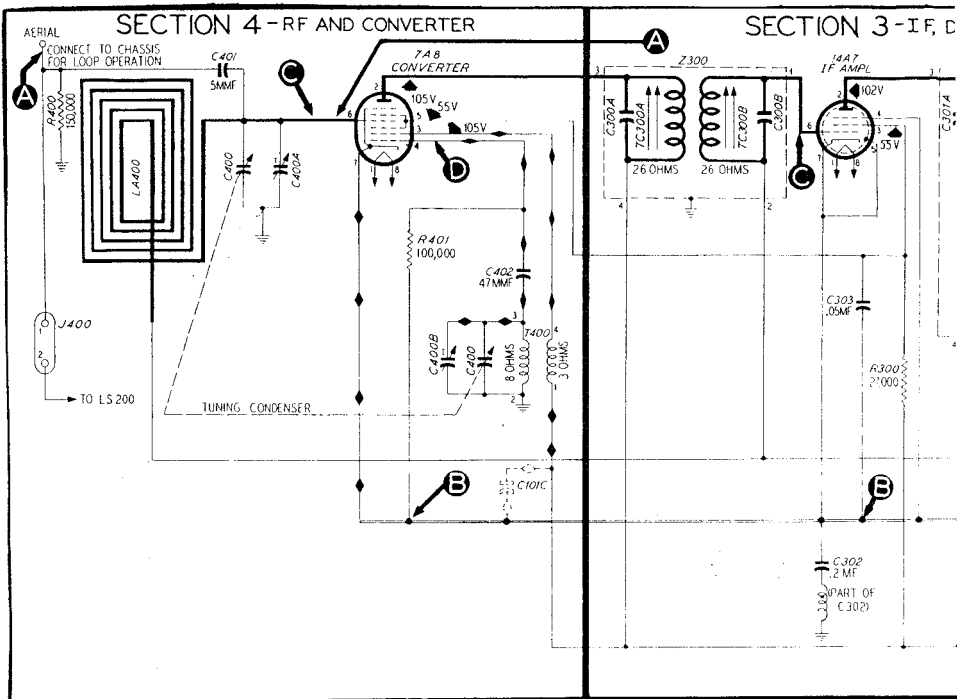
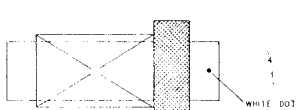


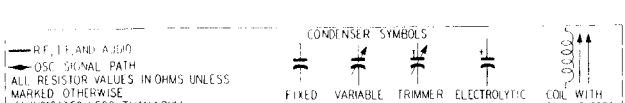
Figure 4. Bottom View, Showing Section 4 Test Points

STEP	TEST POINT	DIAL SETTINGS SIG. GEN.	DIAL SETTINGS RADIO	NORMAL INDICATION	POSSIBLE CAUSE OF ABNORMAL INDICATION
1	A	540 kc.	540 kc.	Clear signal with weak signal input.	Trouble within this section. Isolate by the following tests.
2	C	540 kc.	540 kc.	Same as step 1.	Shorted: C400, C400A. Defective: 7A8. Trouble in oscillator section.
3	Oscillator Test (see Note below)		540 to 1620 kc.	Negative 7 to 11 volts.	Defective: 7A8. Open or shorted: C402, T400. Shorted: C400, C400B.
4	A	540 kc.	540 kc.	Same as step 1.	Defective: LA400. Open: C401.

OSCILLATOR-TEST NOTE: Connect positive lead of high-resistance voltmeter to B–, test point B; connect prod end of negative lead through a 100,000-ohm isolating resistor to the 7A8 oscillator grid, test point D. Use suitable meter range, such as 0—50 volts. Proper operation of oscillator is indicated by negative voltage of 7 to 11 volts (measured with a 20,000-ohms-per-volt meter) throughout range of tuning control.



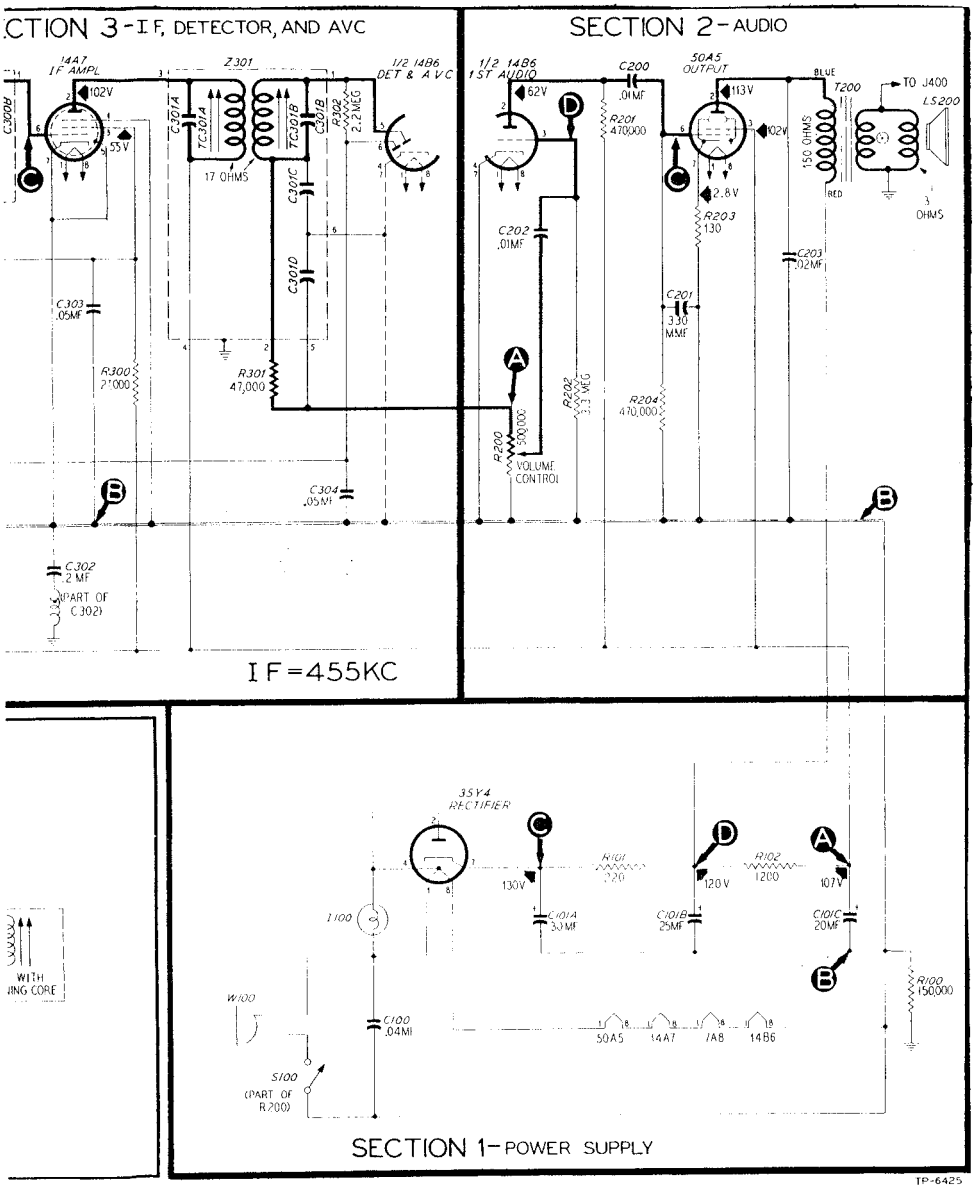




ALL VOLTAGES MEASURED FROM B- WITH 20,000-OHMS-PER-VOLT METER AT A LINE VOLTAGE OF 117 V A.C

Figure 5. Philco Radio Model 49-505, Sectionalized Sche

PHILCO CORP. MODEL 49-505



05, Sectionalized Schematic Diagram, Showing Test Points

ALIGNMENT PR

TURN ON THE RADIO, AND SET THE VOL

DIAL—Turn tuning condensers to full-mesh position. Set dial pointer to coincide with index mark; see figure 7.

OUTPUT METER—Connect to left (output) terminal of J400 and chassis.

SIGN
Use m

STEP	SIGNAL GENERATOR		RADIO		ADJUST
	CONNECTIONS TO RADIO	DIAL SETTING	DIAL SETTING	SPECIAL INSTRUCTIONS	
1	Ground lead to B–; output lead through .1-mf. condenser to test point C of Section 4.	455 kc.	540 kc.	Adjust tuning cores, in order given, for maximum output.	TC301B—2nd i-f sec. TC301A—2nd i-f pri. TC300B—1st i-f sec. TC300A—1st i-f pri.
2	Radiating loop (see note below).	1600 kc.	1600 kc.	Adjust for maximum.	C400B—osc.
3	Same as step 2.	1500 kc.	1500 kc.	Adjust for maximum.	C400A—aerial

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.

SYMBOLIZATION

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
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.

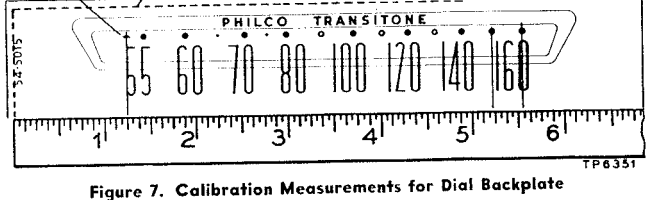


Figure 7. Calibration Measurements for Dial Backplate

LCO CORP.

NT PROCEDURE

T THE VOLUME CONTROL TO MAXIMUM

f **SIGNAL GENERATOR**—Connect as indicated in chart. Use modulated output.

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

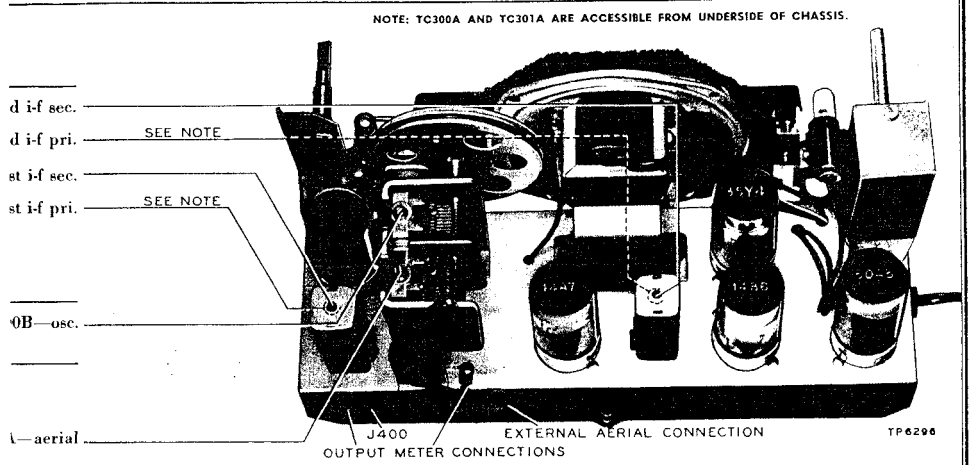


Figure 6. Top View, Showing Trimmer Locations

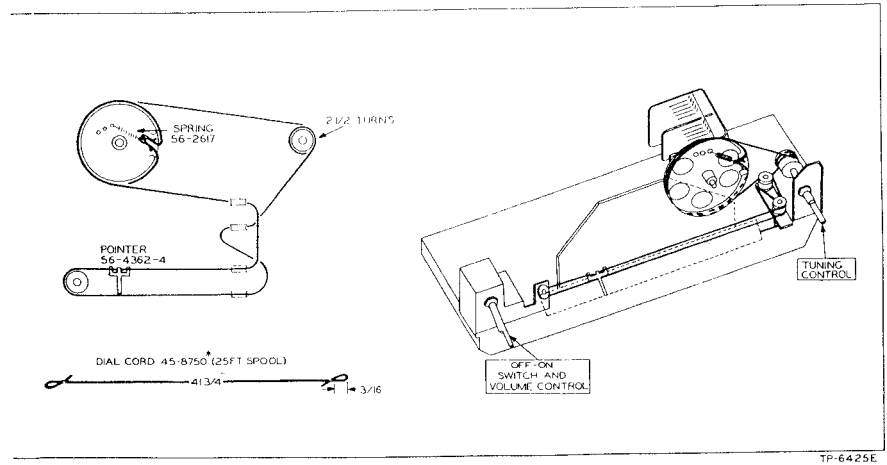


Figure 8. Drive-Cord Installation Details

PHILCO CORP. MODEL 49-505

REPLACEMENT PARTS LIST

NOTE: An asterisk (*) indicates a general replacement item. The part numbers of these items may not be identical with those on factory parts; also, the electrical values of some replacement items may differ from the values given 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, .04 mf	45-3500-2*
C101	Condenser, electrolytic, 3-section	30-2574*
C101A:	Condenser, filter, 30 mf	Part of C101
C101B:	Condenser, filter, 25 mf	Part of C101
C101C:	Condenser, filter, 20 mf	Part of C101
I100	Lamp, pilot	34-2068
R100	Resistor, leakage, 150,000 ohms	66-4153340*
R101	Resistor, filter, 220 ohms	66-1224340
R102	Resistor, filter, 1200 ohms	66-2124340
S100	Switch, power	Part of R200
W100	Power cord and plug	L-2183*

SECTION 2—AUDIO

C200	Condenser, blocking, .01 mf	61-0120*
C201	Condenser, by-pass, 330 mmf	62-133001001*
C202	Condenser, blocking, .01 mf	61-0120*
C203	Condenser, tone compensating, .02 mf	61-0108*
LS200	Speaker	36-1625-6
R200	Volume control, .5 megohm	45-5007*
R201	Resistor, plate load, 470,000 ohms	66-4473340*
R202	Resistor, grid load, 3.3 megohms	66-5333340*
R203	Resistor, bias, 130 ohms	66-1123340*
R204	Resistor, grid load, 470,000 ohms	66-4473340*
T200	Transformer, output	Part of LS200

SECTION 3—I-F, DET., AND A-V-C

C300A	Condenser, fixed trimmer	Part of Z300
C300B	Condenser, fixed trimmer	Part of Z300
C301A	Condenser, fixed trimmer	Part of Z301
C301B	Condenser, fixed trimmer	Part of Z301
C301C	Condenser, by-pass	Part of Z301
C301D	Condenser, by-pass	Part of Z301
C302	Condenser and choke assembly, i-f by-pass, .2 mf	30-4644
C303	Condenser, screen by-pass, .05 mf	61-0122*
C304	Condenser, a-v-c filter, .05 mf	61-0122*
R300	Resistor, screen dropping, 27,000 ohms	66-3273340
R301	Resistor, i-f filter, 47,000 ohms	66-3473340*
R302	Resistor, a-v-c filter, 2.2 megohms	66-5223340*
TC300A	Tuning core	Part of Z300

SECTION 3—I-F, DET., AND A-V-C (Continued)

TC300B	Tuning core	Part of Z300
TC301A	Tuning core	Part of Z301
TC301B	Tuning core	Part of Z301
Z300	Transformer, 1st i-f, including TC300A, TC300B, C300A, and C300B	32-4160-6
Z301	Transformer, 2nd i-f, including TC301A, TC301B, C301A, C301B, C301C, and C301D	32-4240

SECTION 4—R-F AND CONVERTER

C400	Condenser, tuning, 2-section	31-2727-1
C400A:	Condenser, trimmer	Part of C400
C400B:	Condenser, trimmer	Part of C400
C401	Condenser, coupling, 5 mmf	30-1224-5*
C402	Condenser, isolating, 47 mmf	30-1224-2*
LA400	Loop aerial	32-4052-24
R400	Resistor, aerial discharge, 150,000 ohms	66-4153340*
R401	Resistor, oscillator grid, 100,000 ohms	66-4103340*
T400	Transformer, oscillator	32-4263

MISCELLANEOUS

Description	Service Part No.
Baffle-and-cloth assembly	40-7525
Bracket, rear condenser mounting	56-5701FA3
Bracket, scale	56-5698FA3
Cabinet	10717
Cord, drive (25-foot spool)	45-8750*
Cover, bottom	56-5706FA3
Cover, handle	54-4596
Cover, volume control	56-5699FA3
Knob	54-4609
Pilot-lamp-socket assembly	27-6233-12
Plate, guard	54-7709
Pointer	56-4362-4FCP
Rail, pointer	56-5697FCP
Rubber mount	27-4771-1
Scale-and-backplate assembly	76-4167
Shaft assembly, drive	78-4075
Socket, tube	27-6177
Spring	56-2617
Stud, baffle	W2235-1FA9