Philco Radio & Television Corp.

Model: 48-1201	Chassis:	Year: Pre 1950
Power:	Circuit:	IF:
Tubes:		
Bands:		

Resources
Riders Volume 18 - PHILCO 18-115
Riders Volume 18 - PHILCO 18-116
Riders Volume 18 - PHILCO 18-117
Riders Volume 18 - PHILCO 18-118
Riders Volume 18 - PHILCO 18-119
Riders Volume 18 - PHILCO 18-120
Riders Volume 18 - PHILCO 18-121

TROUBLE SHOOTING

For the tests in this section, use a d-c voltmeter. Connect the negative lead to the B— bus, 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.

With the radio-phono switch set to the radio position, turn the volume control to minimum.

Follow the steps in sequence; if the "NORMAL INDICATION" is obtained in step 1, proceed with the tests for Section 2; if not, isolate and correct the trouble in this section.

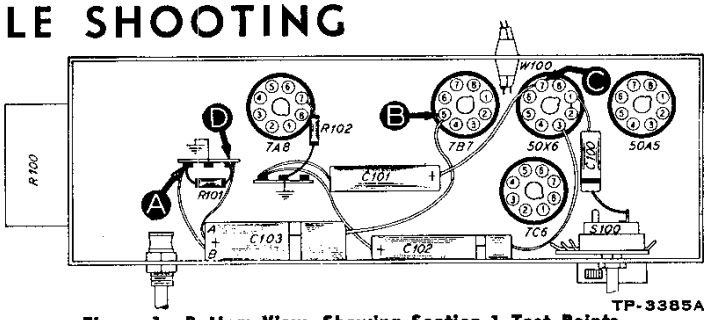


Figure 1. Bottom View, Showing Section 1 Test Points

STEP	TEST POINT	NORMAL INDICATION	ABNORMAL INDICATION	POSSIBLE CAUSE OF ABNORMAL INDICATION
1	A	90v		Trouble within this section. Isolate by the following tests.
2	C	215v	No voltage Low voltage High voltage	Defective: 50X6, S100, W100. Shorted: C101, C102, C100. Defective: 50X6. Open: C101, C102. Leaky: C101, C102, C103A. Open: R100, R204,* T200.*
3	D	185v	No voltage Low voltage High voltage	Open: R100. Shorted: C103A. Shorted: C103B. Leaky: C103A. Open: R101, R204,* T200.*
4	A	90v	No voltage Low voltage	Open: R101. Shorted: C103B. Leaky: C103B.
Listening Test: Abnormal hum or garbled speech may be caused by open C100, C101, C102, C103A, C103B, or R102.				

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

Section 2 TROUBLE SHOOTING

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

In steps 1 and 4, set the volume control to maximum in the radio position when testing at test point A, and to maximum in the phono position when testing at test point E. Adjust the signal-generator output as required for each step.

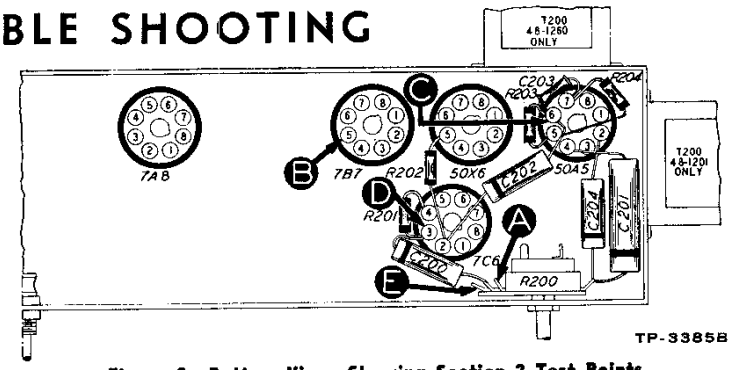


Figure 2. Bottom View, Showing Section 2 Test Points

If the "NORMAL INDICATION" is obtained for both test points A and E in step 1, proceed with the tests for Section 3. If the "NORMAL INDICATION" is obtained at one test point and not at the other, the volume control is defective. If the "NORMAL INDICATION" is not obtained at either test point, isolate and correct the trouble within this section.

STEP	TEST POINT	NORMAL INDICATION	POSSIBLE CAUSE OF ABNORMAL INDICATION
1	A E	Loud, clear signal with weak signal input.	Trouble within this section. Isolate by the following tests.
2	C	Loud, clear signal with strong signal input.	Defective: 50A5, LS200. Shorted: C203, C204, T200. Open: R204, T200.
3	D	Loud, clear signal with weak signal input.	Defective: 7C6. Open: C202, R202, R203. Shorted: C202. Leaky: C202.
4	A E	Loud, clear signal with weak signal input.	Defective: R200. Open: C200. Shorted: C305.* Leaky: C305.*
Listenting Test: Distortion on strong signals may be caused by open-circuited R201 or by short-circuited or leaky C200. Hum modulation on phonograph operation may be caused by open-circuited C201.			

Section 3 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 the B— bus, test point B; connect the generator output lead through a .1-mf. condenser to the test points indicated in the chart.

Turn the volume control to maximum in the radio position.

If the "NORMAL INDICATION" is obtained in step 1, proceed with the tests for Section 4; if not, isolate and correct the trouble in this section.

NOTE: Since the circuit location of test point A for this section is the same as that of test point C for Section 4, the effectiveness of step 1 as a master check is dependent upon the condition of certain parts in Section 4; these parts are listed below under "POSSIBLE CAUSE OF ABNORMAL INDICATION."

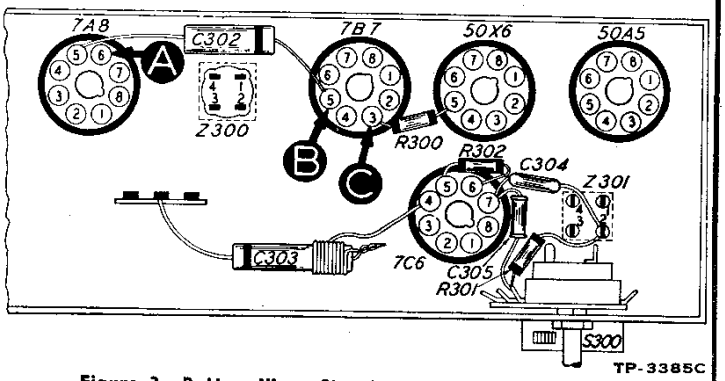


Figure 3. Bottom View, Showing Section 3 Test Points

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	Loud, clear signal with strong signal input.	Defective: 7B7, 7C6, Z301. Open: C302, R300, R301, R302. Shorted: C302, C304, C305.
3	A	Loud, clear signal with weak signal input.	Defective: 7A8,* Z300. Misaligned: Z300.

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

Section 4 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 the B— bus, test point B; connect the generator output lead through a .1-mf. condenser to the test points indicated in the chart.

Turn the volume control to maximum in the radio position.

Except as noted for the oscillator test, set the radio and signal-generator dials to 1000 kc.

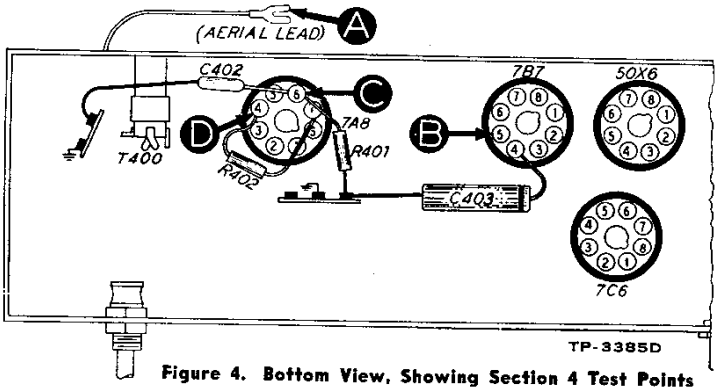
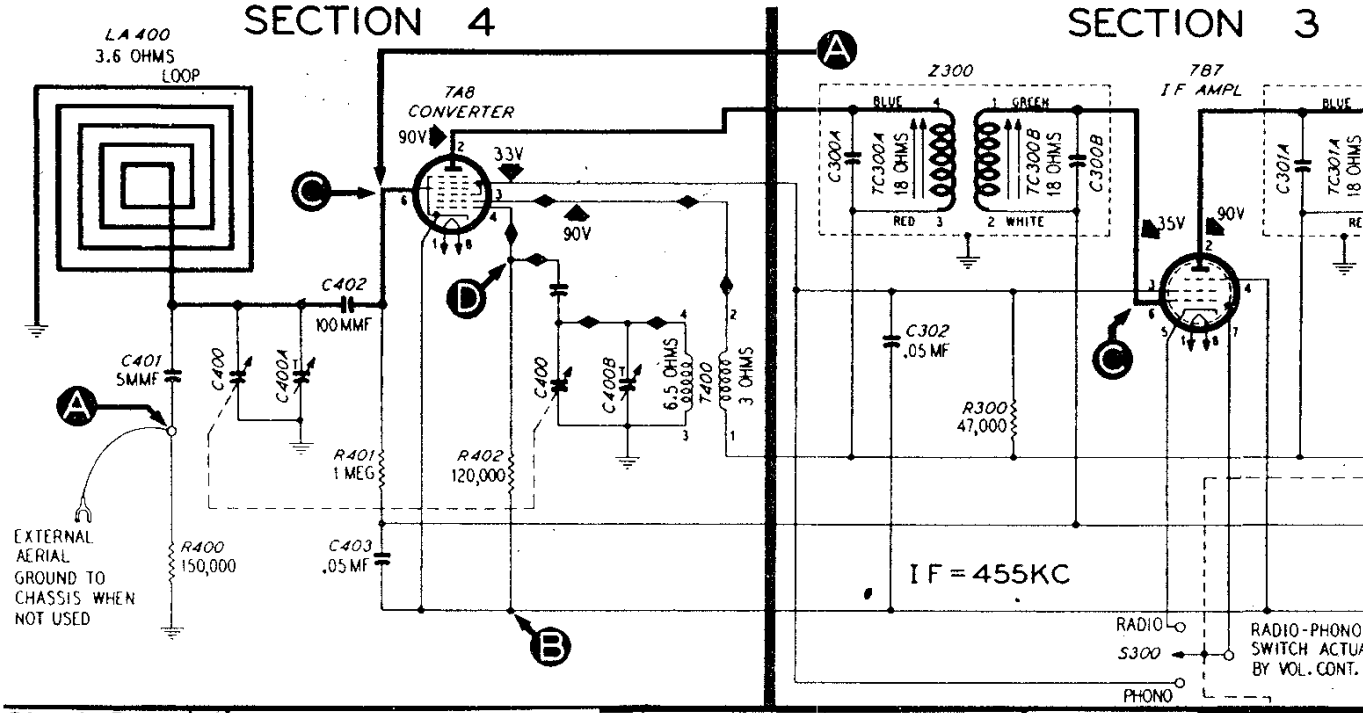


Figure 4. Bottom View, Showing Section 4 Test Points

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	Loud, clear signal with moderate signal input.	Defective: 7A8, osc. circuit. Misaligned: osc. circuit. Open: C403, R401.
3	D (Osc. test; see note below.)	Negative 4—8 volts.	Defective: 7A8, T400. Shorted: C400, C400B. Open: R402.
4	A	Loud, clear signal with weak signal input.	Defective: LA400. Shorted: C400, C400A. Open: C401, C402.

OSCILLATOR-TEST NOTE: Connect positive lead of high-resistance d-c voltmeter to B— bus, test point B; connect prod end of negative lead through 100,000-ohm isolating resistor to oscillator grid, test point D. Use suitable meter range, such as 0—10 volts. Proper operation of oscillator is indicated by negative voltage of 4 to 8 volts (measured with 20,000-ohms-per-volt meter) throughout range of tuning control.



Circuit Description

Philco Radio-Phonographs, Models 48-1201 and 48-1260 are identical electrically. The radio is a five-tube superheterodyne with a built-in loop aerial and provisions for connecting an external aerial.

The loop aerial feeds into the mixer section of a 7A8 pentagrid converter. The aerial and oscillator circuits are tuned by ganged, variable tuning condensers, and the oscillator-section rotor plates are shaped to provide proper tracking without the use of a series padding condenser.

The output of the 7A8 converter is transformer-coupled to the 7B7 i-f amplifier which, in turn, is transformer-coupled to the diode section of the 7C6 diode-triode. Each of the i-f coupling transformers has permeability-tuned primary and secondary windings.

One diode functions as the 2nd detector; the other diode develops the a-v-c voltage, which is applied to the mixer section of the converter and to the i-f amplifier. The output of the 2nd detector is resistance-coupled to the triode section of the 7C6 which, in turn, is resistance-coupled to the 50A5 beam-power output tube. The output tube is transformer-coupled to the permanent-magnet dynamic loud-speaker, to which it supplies approximately 1.8 watts of audio power.

D-c operating voltages are supplied from a voltage-doubler power supply employing a 50X6 full-wave rectifier and a resistor-condenser filter network.

A 120,000-ohm resistor, R102, is connected between B— and the chassis to prevent hum under conditions of high humidity. A series-tuned circuit consisting of a condenser, C303, and a choke is also connected between B— and the chassis. This combination is resonant at 455 kc. and, therefore, offers a lower impedance at the i.f. than the condenser alone would offer. The more effective grounding of the i-f circuits improves the stability of the high-gain i-f stages.

Preliminary Checks

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

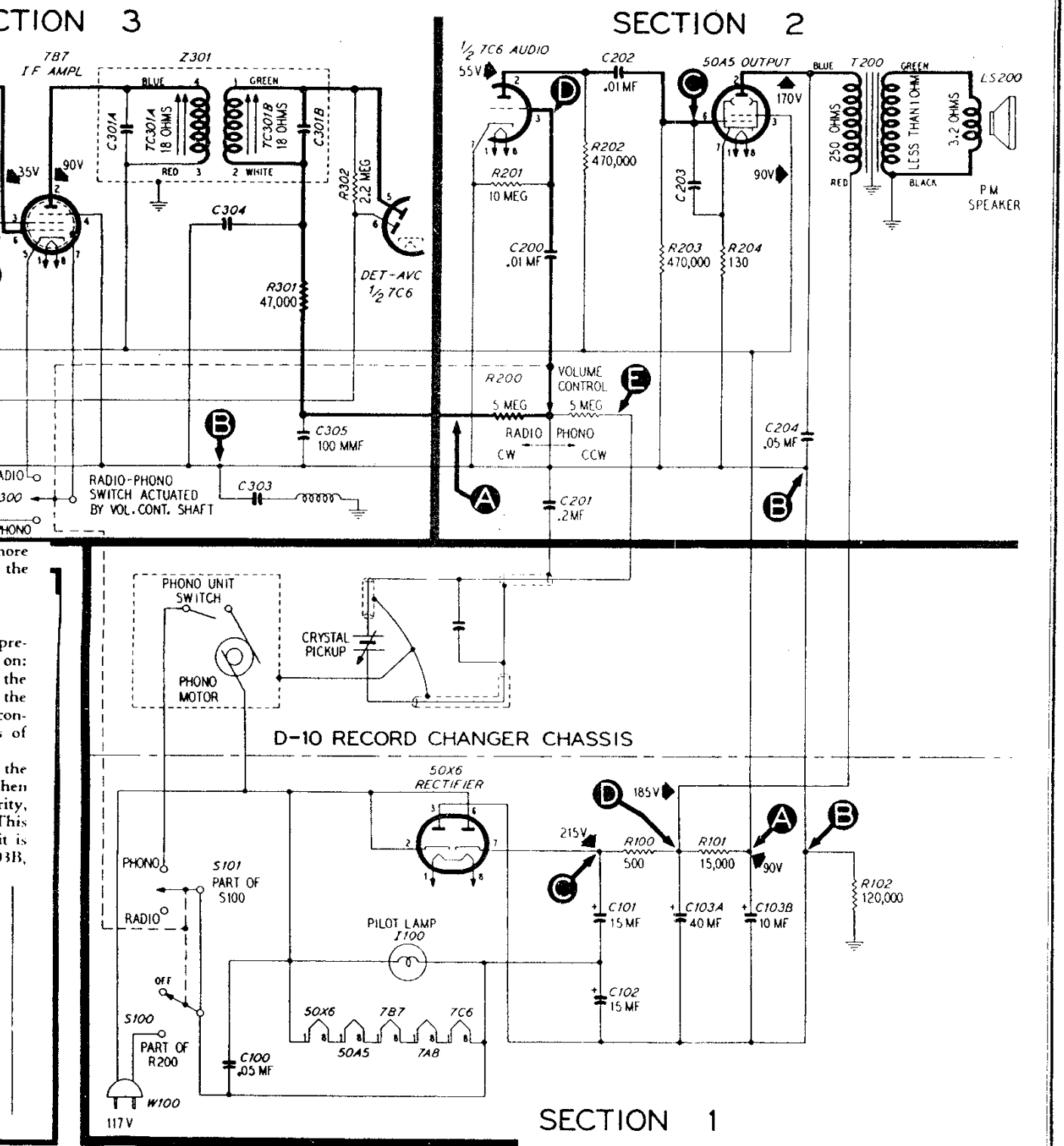
1. Carefully inspect both top and bottom of the chassis. Make sure that all tubes are secure in the proper sockets, and look for broken or shorted connections, burned resistors, or other obvious sources of trouble.

2. Measure the resistance between B+ (pin 7 of the 50X6 rectifier) and the B— bus, test point B. When the ohmmeter leads are connected in proper polarity, the highest resistance reading will be obtained. This reading should be not lower than 4000 ohms. If it is lower, check condensers C101, C102, C103A, C103B, and C204 for leakage or shorts.

SPECIFICATIONS

CABINET	Model 48-1201; wood, mahogany finish, harvest (L) Model 48-1260; wood, Philcote finish
CIRCUIT	Five-tube superheterodyne
FREQUENCY RANGE	540 to 1600 kc.
AUDIO OUTPUT	1.8 watts
OPERATING VOLTAGE	105—120 volts, 60 cycles, a.c.
POWER CONSUMPTION	Radio, 45 watts; Phonograph, 60 watts
AERIAL	Built-in loop; terminal also provided for external aerial
INTERMEDIATE FREQUENCY	455 kc.
PHILCO TUBES (5)	7A8, 7B7, 7C6, 50A5, 50X6
PHONOGRAPH	

Figure 5. Philco Radio-Phonograph Models 48-1201 and 48-1260, Section



201 and 48-1260. Sectionalized Schematic Diagram, Showing Test Points

ALIGNMENT PRO

TURN VOLUME CONTROL TO MAXIMUM

NOTE: Make alignment with loop connected to radio.

OUTPUT METER—Connect to terminals indicated in figure 7.

DIAL—Calibration and pointer-index measurements are shown in figure 8. With tuning gang fully meshed, set pointer to index mark.

SIG
bus;
mod

STEP	SIGNAL GENERATOR		RADIO		ADJUST
	CONNECTIONS TO RADIO	DIAL SETTING	DIAL SETTING	SPECIAL INSTRUCTIONS	
1	Through .1-mf. condenser to ext. aerial lead.	455 kc.	Gang fully meshed.	Adjust trimmers for maximum output in order given.	TC301B TC301A TC300B TC300A
2	Through 100-mmf. condenser to ext. aerial lead.	1600 kc.	1600 kc.	Adjust trimmer for maximum output.	C400B
3	Same as step 1.	1500 kc.	1500 kc.	Adjust trimmer for maximum output.	C400A
4	Repeat steps 2 and 3.				

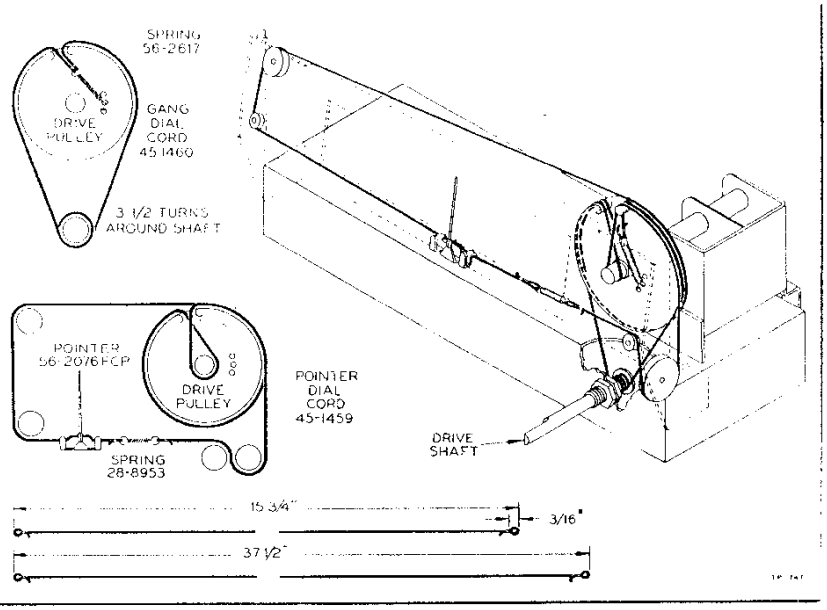
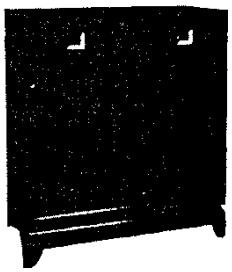


Figure 6. Drive-Cord Installation Details

MODEL 48-1201



MODEL 48-1260

NOTE: Par
factory ass
and parts
When orde

Reference Symbol
C100
C101

PHILCO CORP.

MENT PROCEDURE

OL TO MAXIMUM IN THE RADIO POSITION

ients are meshed,

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

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

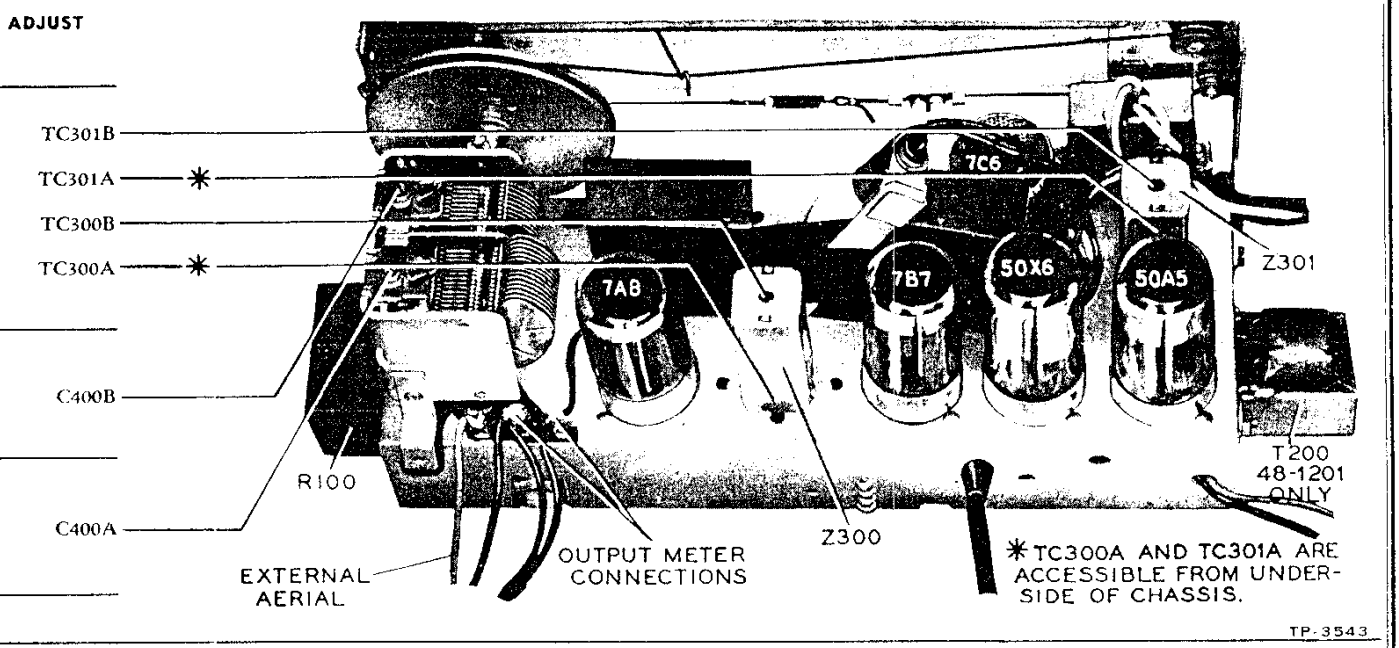


Figure 7. Top View, Showing Trimmer Locations

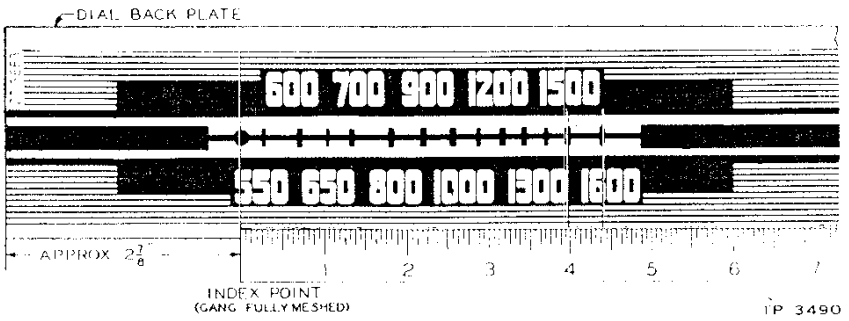


Figure 8. Calibration Measurements for Dial Backplate

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

Section 1

Reference Symbol	*Description*	*Service Part No.*
C100	Condenser, line filter, .05 mf.	61-0122*
C101	Condenser, electrolytic, filter, 15 mf.	45-3015-18*

Section 1 *(Continued)*

Reference Symbol	*Description*	*Service Part No.*
C102	Condenser, electrolytic, filter, 15 mf.	45-3018-18*
C103	Condenser, dual electrolytic	30-2575-12*

REPLACEMENT PARTS LIST (Continued)

Section 1 (Continued)

Reference Symbol	Description	Service Part No.
C103A	Condenser, electrolytic, filter 40 mf.	Part of C103
C103B	Condenser, electrolytic, filter, 10 mf.	Part of C103
I100	Panel lamp	34-2477
R100	Resistor, filter, 500 ohms	33-3435-3
R101	Resistor, filter, 15,000 ohms	66-3154340
R102	Resistor, leakage, 150,000 ohms	66-4123340*
S100	Switch, off-on, power	Part of R200
S101	Switch, radio-phono	42-1736
W100	A-c power cord	L-3199

Section 2

C200	Condenser, blocking, .01 mf.	61-0120*
C201	Condenser, audio by-pass, .2 mf.	45-3500-3*
C202	Condenser, blocking, .01 mf.	61-0120*
C203	Condenser, by-pass, 240 mmf.	60-10245307*
C204	Condenser, tone compensation, .05 mf.	61-0122*
R200	Volume control, center-tapped, 1 megohm	33-5519
R201	Resistor, grid leak, 10 megohms	66-6103340*
R202	Resistor, plate load, 470,000 ohms	66-4473340*
R203	Resistor, grid leak, 470,000 ohms	66-4473340*
R204	Resistor, cathode bias, 130 ohms	66-1133340*
LS200	Loud-speaker	
	Model 48-1201	36-1617-Z
	Model 48-1260	36-1626
T200	Output transformer	
	Model 48-1201	32-8310
	Model 48-1260	32-8310-1

Section 3

C300A	Condenser, fixed, primary	Part of Z300
C300B	Condenser, fixed, secondary	Part of Z300
C301A	Condenser, fixed, primary	Part of Z301
C301B	Condenser, fixed, secondary	Part of Z301
C302	Condenser, screen by-pass, .05 mf.	61-0122*
C303	Condenser-and-choke assembly, by-pass, .2 mf.	76-1161
C304	Condenser, i-f by-pass, 100 mmf.	60-10105407*
C305	Condenser, i-f by-pass, 100 mmf.	60-10105407*
R300	Resistor, screen dropping, 47,000 ohms	66-3473340*
R301	Resistor, filter, 47,000 ohms	66-3473340*
R302	Resistor, a-v-c filter, 2.2 megohms	66-5223340*
S300	Switch, phono-radio	Part of S101
Z300	Transformer, 1st i.f., 455 kc., includes C300A and C300B	32-4160
Z301	Transformer, 2nd i.f., 455 kc., includes C301A and C301B	32-4161

Section 4

C400	Condenser, tuning gang	31-2527-2
C400A	Condenser, aerial trimmer	Part of C400
C400B	Condenser, oscillator trimmer	Part of C400
C401	Condenser, coupling, 5 mmf.	60-90505007*
C402	Condenser, coupling, 100 mmf.	60-10105407*
C403	Condenser, a-v-c filter, .05 mf.	61-0122*
LA400	Loop aerial	
	Model 48-1201	76-2127-3
	Model 48-1260	76-2127-4
R400	Resistor, ext. aerial loading, 150,000 ohms	66-4153340*
R401	Resistor, grid leak, 1 megohm	66-6103340*
R402	Resistor, grid leak, 120,000 ohms	66-4123340*
T400	Oscillator transformer	32-4095-2

Miscellaneous — Model 48-1201

Description	Service Part No.
Aerial-lead assembly	76-1472
Cabinet (less scale)	10664B
Baffle and cloth	40-6827
Bar-and-clip assembly	76-2111
Bottom cover	54-7243
Button (2 required)	56-3920
Button, springs (2 required)	56-3919
Door	21-9058
Frame and base	76-2499
Hinge (2 required)	56-3910

Miscellaneous — Model 48-1201 (Continued)

Description	Service Part No.
Knob (2 required)	54-4255
Rubber foot (4 required)	54-4377
Rubber mount	27-4610
Snap fastener (4 required)	28-4279FA1
Scale	27-5883-1
Scale strap	56-2261
Wooden baffle	21-9055
Dial backplate	76-1940
Cam assembly	76-1638
Drive cord, gang drive (25-foot spool)	45-8740
Drive cord, pointer (25-foot spool)	45-8755
Pointer	56-2076-2
Shaft assembly	31-2680
Spring, gang drive	56-2617
Spring, pointer	28-8953
Hardware	
Bolt, speaker mounting (4 required)	W-2123
Clamp, electrolytic mounting	56-1466
Clip, coil mounting	28-5002FA1
Retainer (2 required)	56-3918
Screw, backplate mtg.	1W19670FA3
Screw (4 required)	1W22285FA9
Spring retainer	28-8658
Pickup cable	41-3708
Socket, Loktal (5 required)	27-6138
Socket, pilot lamp	27-6233
Speaker cable	41-3759
Switch-lever assembly	76-1642

Miscellaneous — Models 48-1260M (Mahogany) and 48-1260L (Light)

Cabinet (L)	10677A
(M)	10677B
Bar and clip assembly	76-2111
Baffle and cloth (L)	40-6927
(M)	40-6927-1
Bezel	56-4954
Bullet catch (L)	45-6002-1
(M)	45-6002
Door	56-4921FJ31
Door spring	56-5027FA38
Door pull (2 required) (L)	56-4796
(M)	56-4796-1
Dome (4 required)	45-6190
Knife hinge (2 required)	56-4056
Knob (2 required) (L)	54-4214-1
(M)	54-4214
Rail (2 required)	56-4797FA1
Scale	27-5883
Scale strap (2 required)	56-2261
Washer, scale strap (2 required)	1W51931
Snap fastener (4 required)	28-4279FA1
Strike plate (L)	45-6003-1
(M)	45-6003
Wood baffle	21-9087
Wood screw (12 required)	1W25223
Dial backplate assembly	76-3176
Bracket (4 required)	56-4991
Cam assembly	76-1638
Drive cord, pointer and gang drive (25-foot spool)	45-8750
Frame and bracket	76-2468-1FJ31
Pointer	56-2076-2
Shaft assembly	31-2860
Spring, pointer	28-8953
Spring, gang drive	56-2617
Screw, backplate mtg. (4 required)	1W19670FA3
Hardware	
Bolt, speaker mtg. (4 required)	W-1695
Clamp, electrolytic mtg.	56-1456
Clip, coil mtg.	28-5002FA1
Eye screw	56-4991
Nut (4 required)	1W19988FA3
Rubber mount, gang mtg.	27-4610
Screw, R. H. (4 required)	1W24984
Speed nut (4 required)	1W60108
Spring retainer	28-8658
Pickup cable	41-3735-10
Socket, Loktal (5 required)	27-6138
Socket, pilot lamp	27-6233
Switch-lever assembly	76-1642