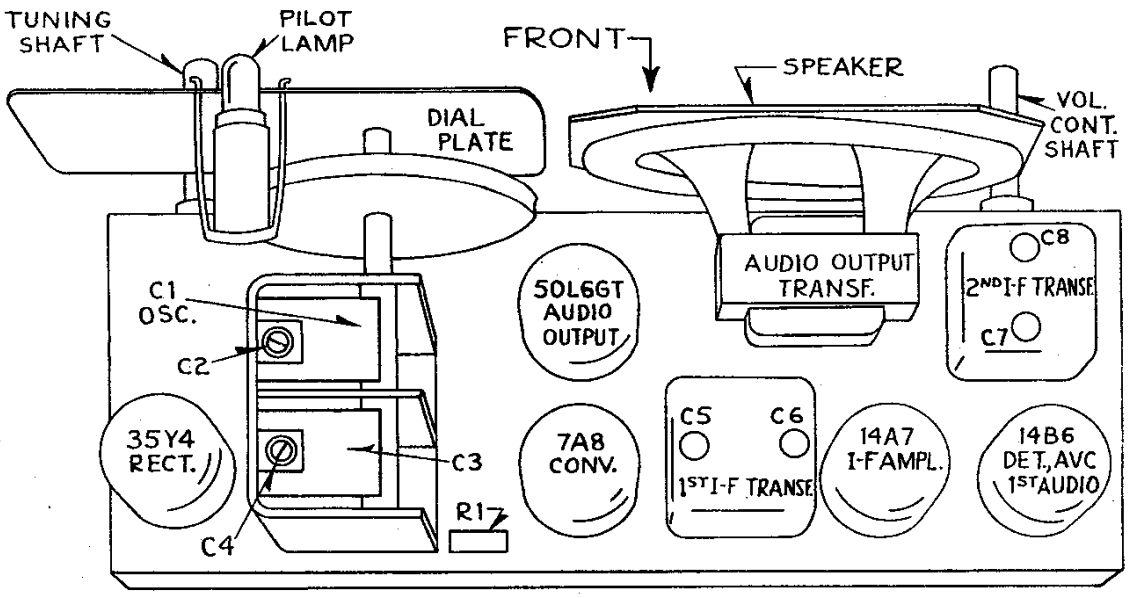
Philco Radio & Television Corp.

Model: 48-214	Chassis:	Year: Pre 1950
Power:	Circuit:	IF:
Tubes:		
Bands:		

Resources
Riders Volume 17 - PHILCO 17-10
Riders Volume 17 - PHILCO 17-11
Riders Volume 17 - PHILCO 17-12
Riders Volume 17 - PHILCO 17-13
Riders Volume 18 - PHILCO 18-40
Riders Volume 18 - PHILCO 18-41
Riders Volume 18 - PHILCO 18-42
Riders Volume 18 - PHILCO 18-43
Riders Volume 18 - PHILCO 18-44
Riders Volume 18 - PHILCO 18-45
Riders Volume 18 - PHILCO 18-46
Riders Volume 18 - PHILCO 18-47

MODEL 48-214
CODE 125

PHILCO CORP.



TOP VIEW

I.F. ALIGNMENT

CONNECT THE OUTPUT METER TO THE CENTER TERMINAL (LOW) AND THE LEFT TERMINAL (HIGH) OF THE THREE LUG TERMINAL STRIP MOUNTED ON THE REAR OF THE CHASSIS.

CONNECT THE SIGNAL GENERATOR TO THE STANDARD HAZELTINE LOOP MODEL 1150 AND COUPLE IT LOOSELY TO THE RECEIVER LOOP.

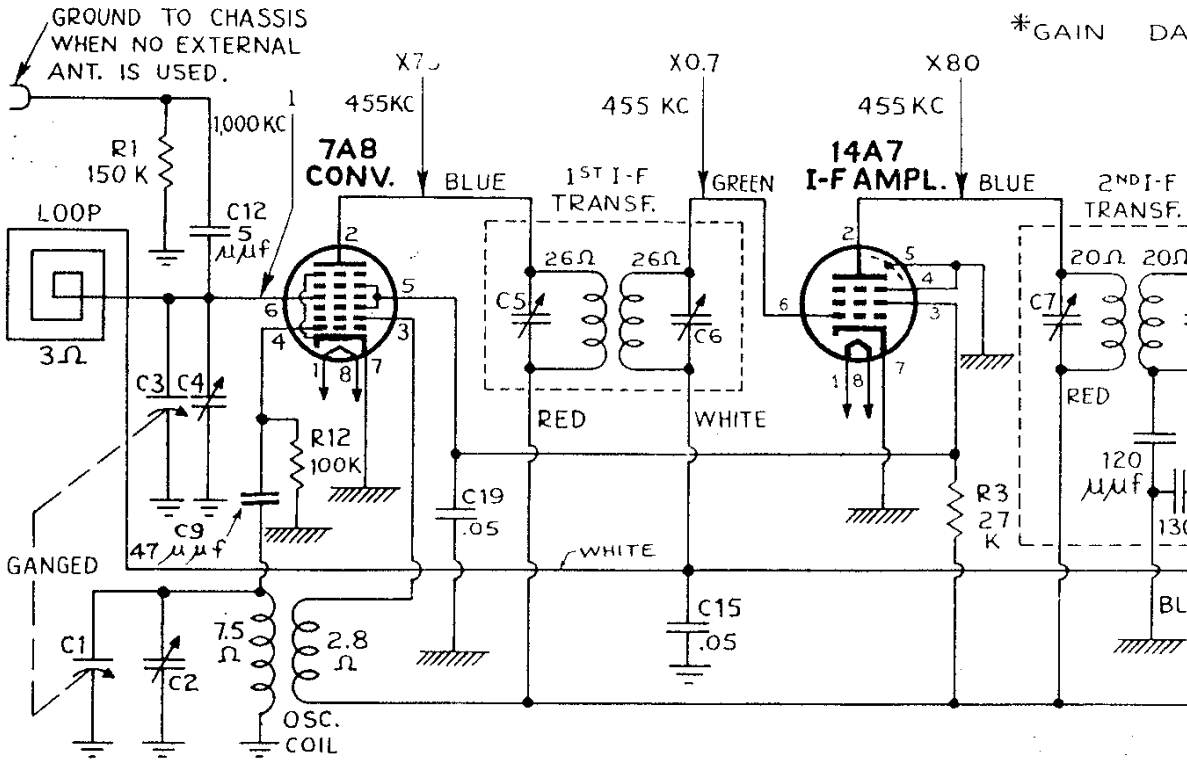
SET THE SIGNAL GENERATOR TO 455 KC AND FULLY MESH THE RECEIVER TUNING CAPACITOR. KEEP THE RECEIVER VOLUME CONTROL AT MAXIMUM AND THE OUTPUT OF THE SIGNAL GENERATOR SUFFICIENT TO GIVE A READABLE DEFLECTION ON THE OUTPUT METER. ADJUST FOR MAXIMUM I.F. TRIMMERS C8, C7, C6 AND C5, IN THAT ORDER.

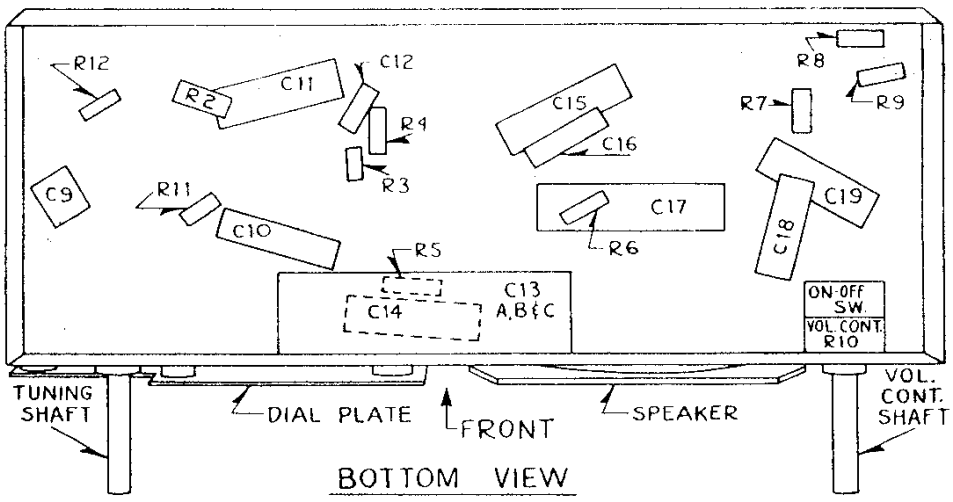
R.F. OSC. ADJUSTMENT

KEEPING THE SAME SETUP AS USED FOR I.F. ALIGNMENT, SET THE SIGNAL GENERATOR AND RECEIVER TO 1600 KC AND ADJUST OSCILLATOR TRIMMER C2 FOR MAXIMUM OUTPUT.

SET THE SIGNAL GENERATOR AND RECEIVER TO 1400 KC AND ADJUST R.F. TRIMMER C4 FOR MAXIMUM OUTPUT.

17-11,12

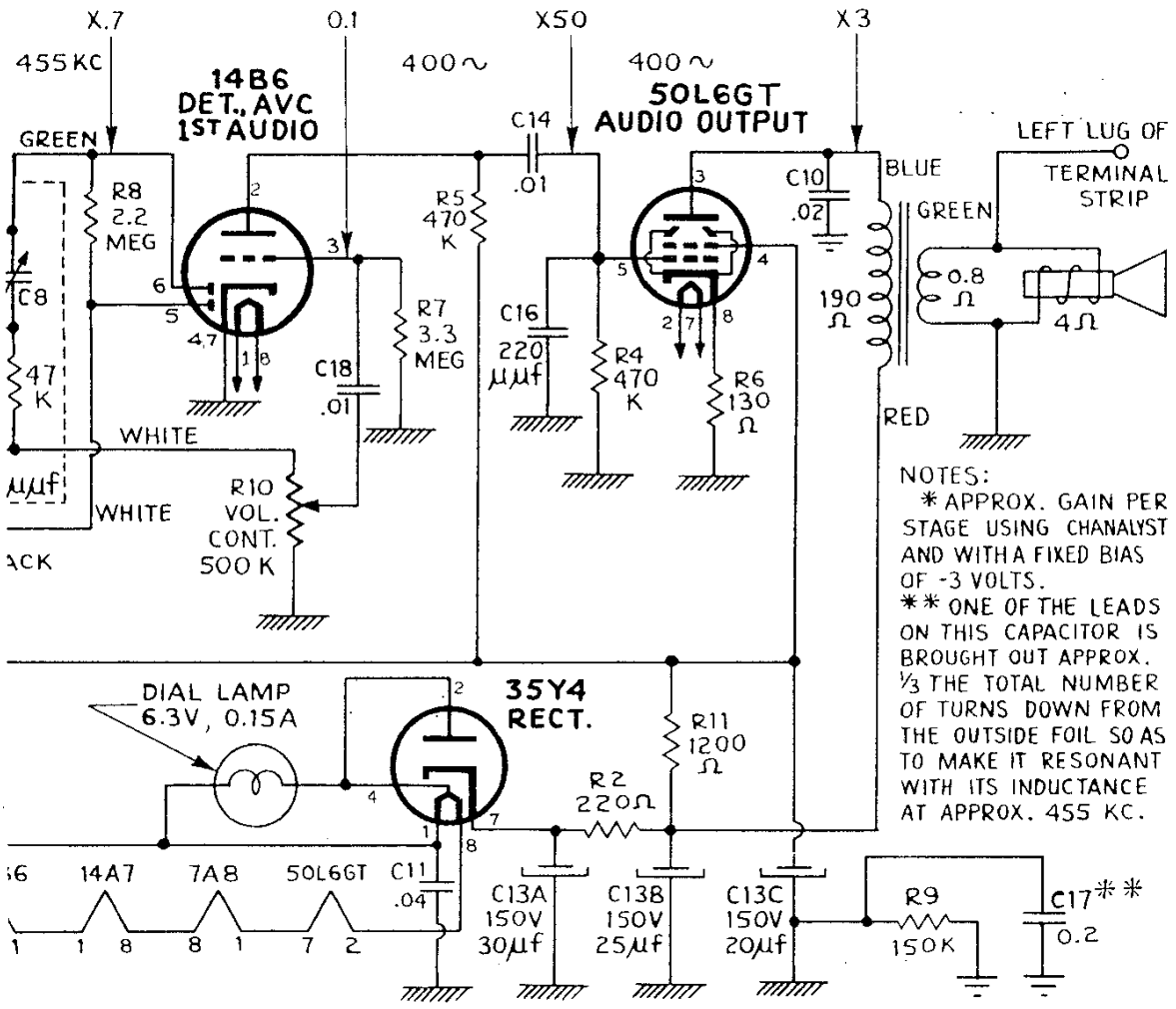




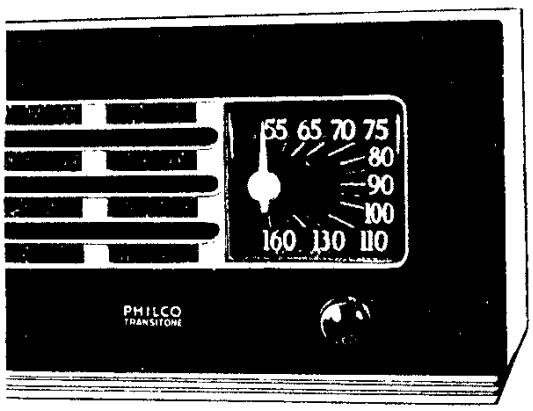
ILCO CORP.

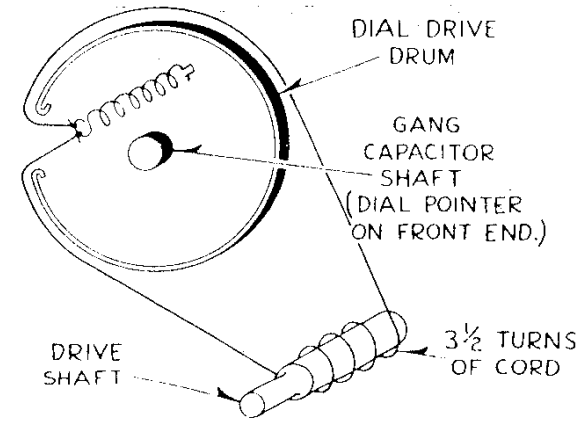
MODEL 48-214
Code 125

TA



NOTES:
* APPROX. GAIN PER STAGE USING CHANALYST AND WITH A FIXED BIAS OF -3 VOLTS.
** ONE OF THE LEADS ON THIS CAPACITOR IS BROUGHT OUT APPROX. 1/3 THE TOTAL NUMBER OF TURNS DOWN FROM THE OUTSIDE FOIL SO AS TO MAKE IT RESONANT WITH ITS INDUCTANCE AT APPROX. 455 KC.





NOTE:
TUNING CAPACITOR IN MAX. CAPACITY POSITION.

PHILCO CORP.

MODEL 48-214
Code 125

TUBE	PIN	VTVM	20,000 OHM PV	1,000 OHM PV	RESISTANCE
7A8 CONV.	1	AC	AC	AC	45 OHM
	2	+92	+92	+92	OVER 5 MEG
	3	+92	+92	+92	OVER 5 MEG
	4	-14	-12	-6	100 K
	5	+42	+42	+42	OVER 5 MEG
	6	-1	-0.8	-0.4	2.4 MEG
	7	0	0	0	0
	8	AC	AC	AC	35 OHM
14A7 I.F. AMPL.	1	AC	AC	AC	20 OHM
	2	+92	+92	+92	OVER 5 MEG
	3	+42	+42	+42	OVER 5 MEG
	4	0	0	0	0
	5	0	0	0	0
	6	-1	-0.8	-0.4	2.4 MEG
	7	0	0	0	0
	8	AC	AC	AC	35 OHM
14B6 DET. AVC. 1st AUDIO	1	AC	AC	AC	20 OHM
	2	+50	+50	+20	OVER 5 MEG
	3	-1	-0.8	-0.4	3 MEG
	4	0	0	0	0
	5	-1	0.8	0.4	2.4 MEG
	6	-0.8	0.6	0.2	450 K
	7	0	0	0	0
	8	0	0	0	0
50L6GT AUDIO OUTPUT	1	+50	+50	+20	OVER 5 MEG
	2	AC	AC	AC	100 OHM
	3	+100	+100	+100	OVER 5 MEG
	4	+92	+92	+92	OVER 5 MEG
	5	0	0	0	0
	6	-1	-0.8	-0.4	2.4 MEG
	7	AC	AC	AC	35 OHM
	8	+6	+6	+6	130 OHM
35Y4 RECT.	1	AC	AC	AC	130 OHM
	2	AC	AC	AC	125 OHM
	3	-14	-12	-6	100 K
	4	AC	AC	AC	125 OHM
	5	+92	+92	+92	OVER 5 MEG
	6	0	0	0	0
	7	+120	+120	+120	OVER 5 MEG
	8	AC	AC	AC	90 OHM

NOTE: ALL VOLTAGE AND RESISTANCE MEASUREMENTS MADE WITH RESPECT TO B- AND WITH A LINE VOLTAGE OF 116 V.A.C.

MODELS 48-200, 48-200-I, 48-214, PHILCO CORP.
Code 125

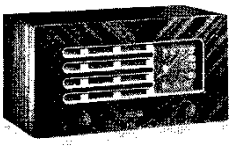
Codes 121 of these models use oscillator transformer part number 32-3880. Codes 122 use oscillator transformer part number 32-4263.

Code 121 of each of these three models is identical to Code 125 of each model, with the following exceptions:

1. The type 35Y4 rectifier tube was replaced by a type 35Z5GT tube.
2. The type 50L6GT output tube was replaced by a type 50A5 tube.

MODEL 48-200 (Walnut)
MODEL 48-200-I (Ivory)

MODEL 48-214



Circuit Description

The Philco Models 48-200, 48-200-I and 48-214 are 5-tube, table-model superheterodyne radios, providing reception in the standard broadcast band. The three models, which started in factory production as Code 125, are identical, except for cabinet and dial parts, as indicated in the parts list.

The high-impedance loop aerial normally provides adequate signal pickup. An external aerial may be connected, if desired, by detaching the aerial lead (shown in figure 6) from the chassis, and connecting the lead to an external aerial lead-in. Do not use a ground.

The loop is coupled to the 7A8 converter tube. Variable-condenser tuning is employed, the oscillator rotor-section plates being 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 50L6GT output tube. The output tube is transformer coupled to a permanent-magnet dynamic speaker.

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

Condenser C304 in Section 3, figures 3 and 5, 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. Since the tuning gang is connected to the chassis, by-passing at broadcast and short-wave frequencies is adequate. The inductive effect is negligible at audio frequencies.

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

SPECIFICATIONS

CABINET:	
Models 48-200 and 48-200-I	Bakelite
Model 48-214	Wood
CIRCUIT	Five-tube superheterodyne
FREQUENCY RANGE	540 to 1620 kc.
OPERATING VOLTAGE	105 to 120 volts, a.c. or d.c.
POWER CONSUMPTION	30 watts
AERIAL	Loop fastened to cabinet; terminal also provided for outside aerial
INTERMEDIATE FREQUENCY	455 kc
PHILCO TUBES (5),	7A8, 14A7, 14B6, 50L6GT, 35Y4
PANEL LAMP,	6—8-volt, bayonet base, Part No. 34-2068

Philco TROUBLE-SHOOTING Procedure

In this manual, the schematic diagram is divided into four sections, with a chassis layout for each section, showing components and test points for each section. The test points are also indicated on the schematic diagram in the corresponding section. A simplified trouble-shooting procedure is given in a chart for each section. The first step in each chart is a master check, indicating whether trouble exists in that section. Failure to obtain the "NORMAL INDICATION" in a given step indicates trouble, which should be located by voltage, resistance, or capacitance checks of parts indicated in the step, and remedied before testing further.

Preliminary Checks

The following preliminary checks are recommended before turning on the radio:

1. Carefully inspect both top and bottom of the chassis. Make sure that all tubes are secure in the proper sockets (see figure 6), and look for bad connections, burnt resistors, or other obvious sources of trouble.

2. Measure the resistance between B plus and B minus (test points C and B— in figure 1), using the ohmmeter polarity giving the highest resistance reading; if the reading is lower than 50,000 ohms, check C101A, C101B, and C101C, for leakage or shorts.

PHILCO CORP. MODELS 48-200, 48-200-I, 48-214, Code 125

TROUBLE SHOOTING *Section 1*

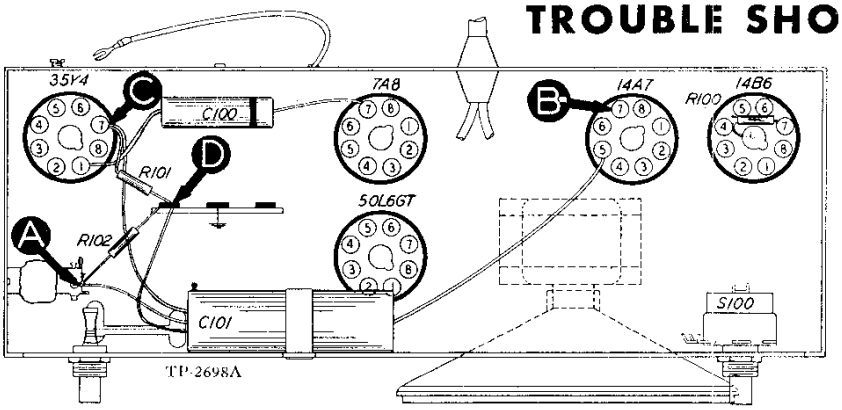


Figure 1. Bottom View, Showing Section 1 Test Points

Make the tests for this section with a d-c voltmeter, connecting 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.

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

STEP	TEST POINTS	NORMAL INDICATION	ABNORMAL INDICATION	POSSIBLE CAUSE OF ABNORMAL INDICATION
1	A to B—	90v		Trouble within this section; isolate by the following tests.
2	C to B—	115v	No voltage	Defective 35Y4 tube. Shorted C101A.
			Low voltage	Defective 35Y4 tube. Open C101A or I100. Leaky C101A.
			High voltage	Open R101.
3	D to B—	105v	No voltage	Shorted C101B.
			Low voltage	Open C101B. Leaky C101B or C203.
			High voltage	Open R102, T200, or R204.
4	A to B—	90v	No voltage	Shorted C101C.
			Low voltage	Leaky C101C.
			High voltage	Open R204.

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

TROUBLE SHOOTING *Section 2*

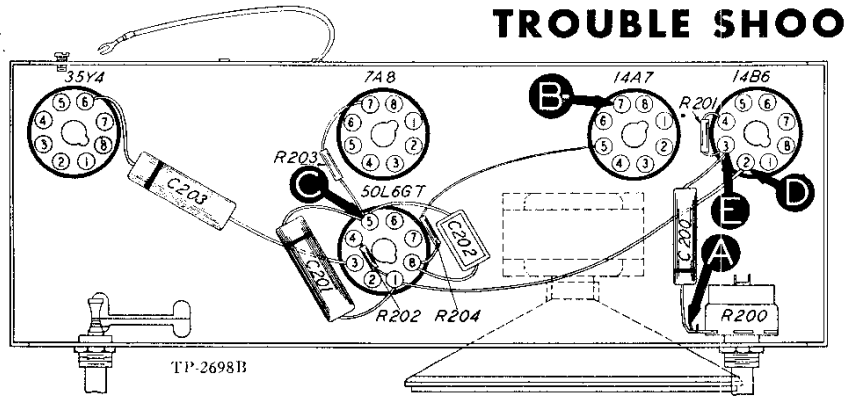


Figure 2. Bottom View, Showing Section 2 Test Points

Make tests for this section by using an audio signal. Connect ground lead of signal generator to B—; connect output lead through a .1-mf condenser to the test points indicated in the chart. Set the volume control at maximum. If "NORMAL INDICATION" is obtained in step 1, proceed with tests for Section 3; if not, isolate and correct the trouble within this section.

STEP	TEST POINT	NORMAL INDICATION	POSSIBLE CAUSE OF ABNORMAL INDICATION
1	A	Loud, clear signal with low signal-generator output	Trouble within this section; isolate by the following tests.
2	C	Clear signal with high signal-generator output	No signal: Open or shorted LS200 or T200. Shorted C203. Open R204. Defective 50L6GT tube. Weak or distorted signal: Defective 50L6GT tube, or LS200. 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. Defective 14B6 tube. Weak or distorted signal: Shorted C200. Open R201. Defective 14B6 tube.
5	A	Same as step 1 Note: Rotate R200 through range	No signal: Open C200. Shorted C300D. Weak or distorted signal: Defective R200.

TROUBLE SHOOTING *Section 3*

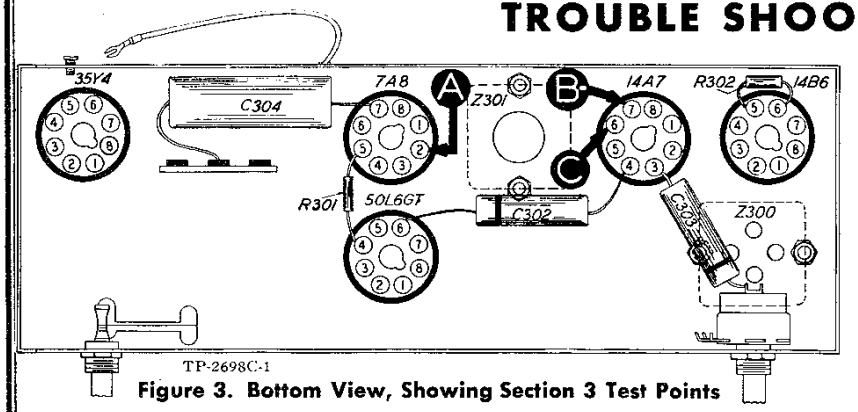


Figure 3. Bottom View, Showing Section 3 Test Points

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

STEP	TEST POINT	NORMAL INDICATION	POSSIBLE CAUSE OF ABNORMAL INDICATION
1	A	Clear signal with low signal-generator output	Trouble within this section; isolate by the following tests.
2	C	Same as step 1	No signal: Open or shorted Z300. Defective 14B6 or 14A7 tube. Open R301. Shorted C303. Weak or distorted signal: Leaky C303. Open C303 or C304. Defective 14B6 or 14A7 tube. Misaligned Z300. Leaky or open C302.
3	A	Same as step 1	No signal: Open or shorted Z301. Weak or distorted signal: Misaligned Z301.

TROUBLE SHOOTING *Section 4*

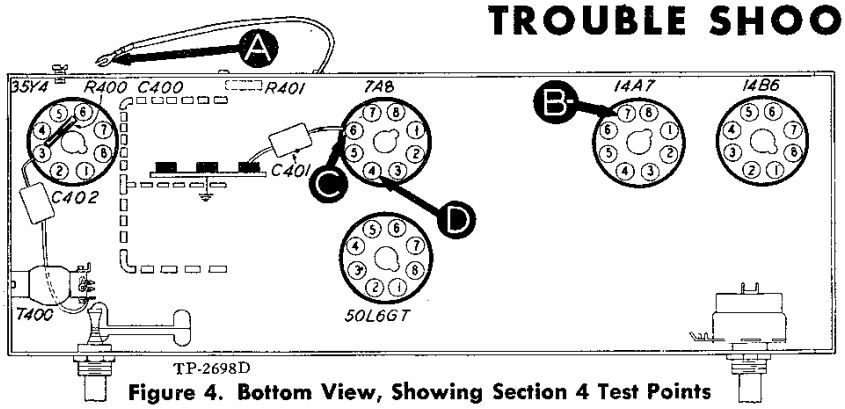


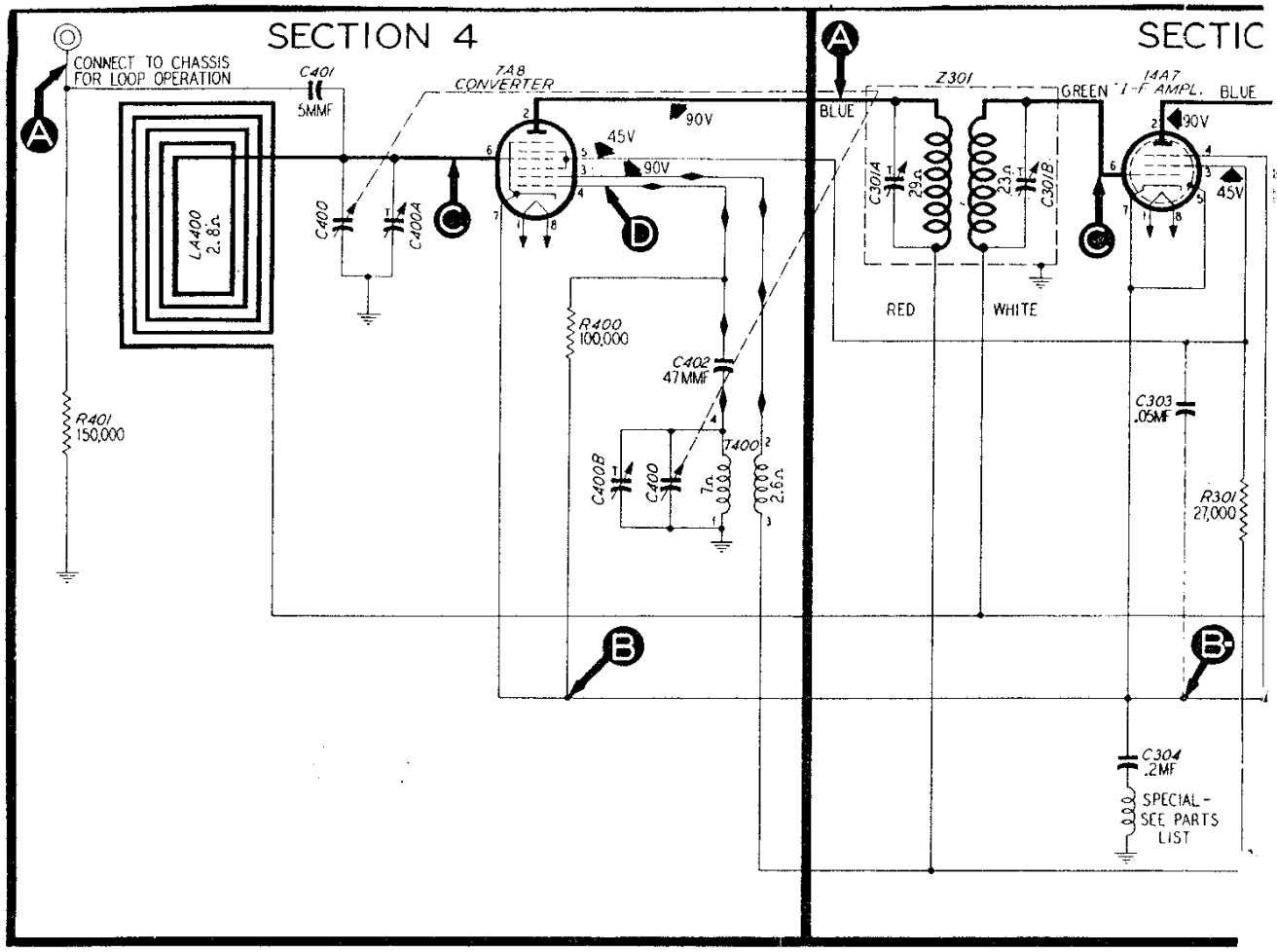
Figure 4. Bottom View, Showing Section 4 Test Points

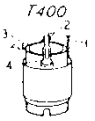
Make tests for this section by using an r-f signal generator with modulated output. Set frequency as noted in chart. Connect generator ground lead to B−; connect output lead through a .1-mf condenser to the test points indicated in the chart.

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

STEP	TEST POINT	DIAL SETTINGS		NORMAL INDICATION	POSSIBLE CAUSE OF ABNORMAL INDICATION
		SIG. GEN.	RADIO		
1	A	540 kc	540 kc	Clear signal with low signal-generator output	Trouble within this section; isolate by the following tests.
2	Osc. Test (see Note below)		540 to 1620 kc	Negative voltage	Open or shorted T400, C402, or R400. Shorted C400 or C400B. Defective 7A8 tube.
3	C	540 kc	540 kc	Same as step 1	No signal: Open or shorted Z301. Shorted C400 or C400A. Defective 7A8 tube. Weak or distorted signal: Shorted or open LA400. Defective 7A8 tube.
4	A	540 kc	540 kc	Same as step 1	Weak signal: Open C401.

NOTE: Oscillator test.—Connect positive lead of a 20,000-ohms-per-volt meter to B−; 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 12 volts throughout range of tuning condenser.





R-F, I-F AND AUDIO SIGNAL PATH
OSC. SIGNAL PATH
ALL RESISTOR VALUES IN OHMS UNLESS MARKED OTHERWISE

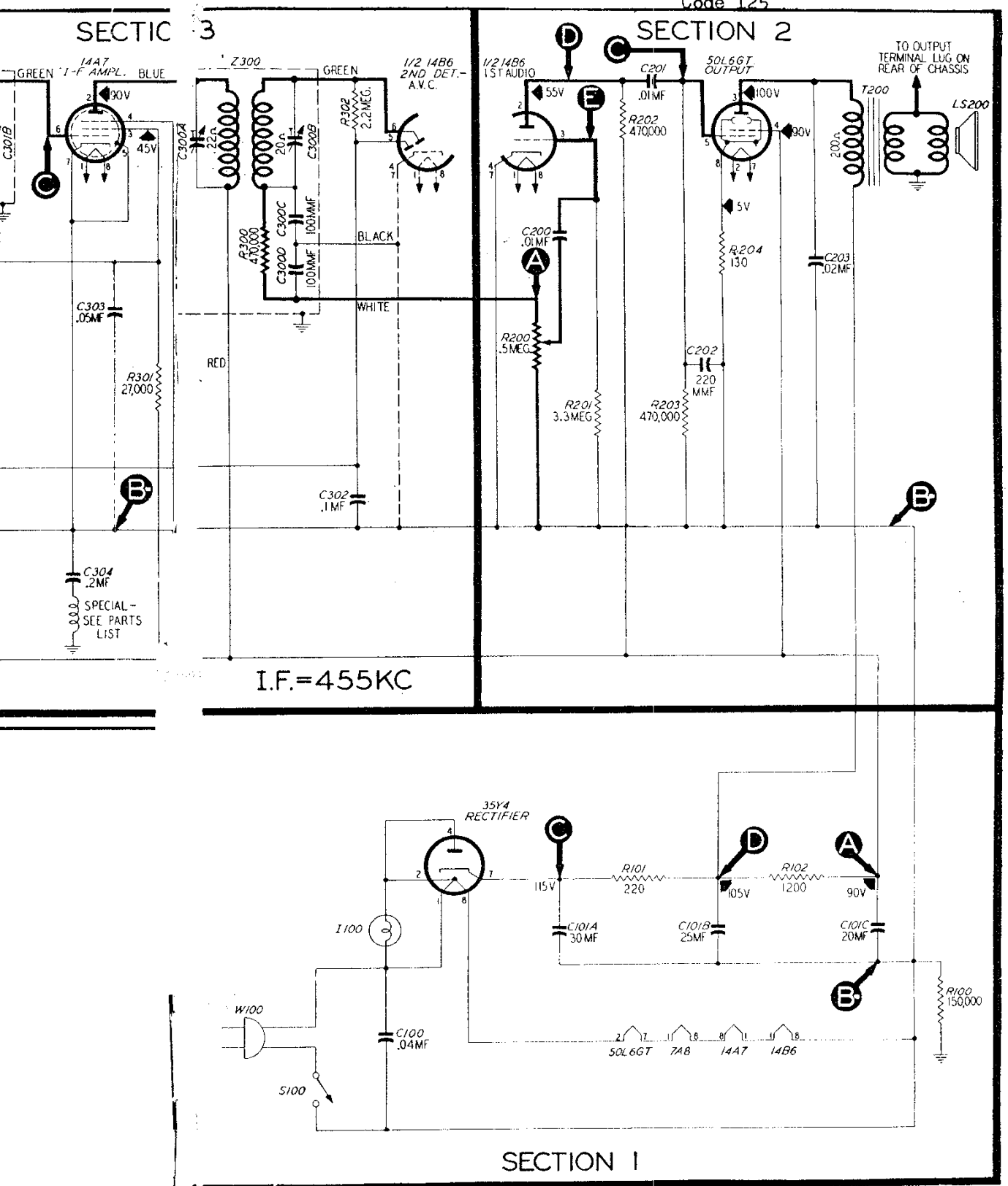
CONDENSER SYMBOLS
FIXED VARIABLE TRIMMER

NOTE: ALL VOLTAGES AND CAPACITY AND RESISTANCE VALUES SHOWN ARE AVERAGE. THE VOLTAGES BETWEEN TEST POINT B- AND OTHER POINTS INDICATED WERE MEASURED WITH A 20,000-OHMS-PER-VOLT METER; VOLUME CONTROL AT MINIMUM AND TUNING CONDENSER PLATES FULLY MESHED.

FIGURE 5. PHILCO MODELS 48-200, CODE 125, 48-200-I, CODE 125, AND 48-214, C

PHILCO COR PI

MODELS 48-200, 48-200-I, 48-214,
Code 125



TP-2698-1

25, AND 48-214, C

25; COMPLETE SECTIONALIZED SCHEMATIC, SHOWING ALL TEST POINTS

...LCO CORP.

ALIGNMEI... PROCE...

TURN ON THE RADIO POWER, ... SET THE VOLUM...

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

OUTPUT METER—Connect to left (output) l... and center (chassis) lug of terminal pan... shown in figure 6.

SIGNAL G... B—; conn... chart.

STEP	SIGNAL GENERATOR		RADIO		...JUST
	CONNECTIONS TO RADIO	DIAL SETTING	DIAL SETTING	SPECIAL INSTRUCTIONS	
1				Turn C301B (copper screw) down tight.	
2	Through .1-mf. condenser to test-point C of Section 4.	455 kc.	540 kc.	Adjust trimmers, in the order given, for maximum output.	C300A C300B C301A C301B
3	Through 100-mmf. condenser to external aerial connector.	1600 kc.	1600 kc.	Disconnect external aerial lug from chassis. Adjust trimmer for maximum output.	C400B
4	Same.	1500 kc.	1500 kc.	Adjust for maximum output.	...00A

SYMBOLIZATION AND TERMINOLOGY

All components in the radio circuits are symbolized and located as follows:

C—condenser	LA—loop aerial	S—switch
I—pilot lamp	LS—loudspeaker	T—transformer
L—choke or coil	R—resistor	Z—electrical assembly

100-series components are in Section 1—the power supply.

200-series components are in Section 2—the second detector, a-v-c, and audio circuits.

300-series components are in Section 3—the i-f amplifier.

100-series components are in Section 4—the aerial, r-f, and oscillator circuits.

MEI PROCEDURE

OWER, SET THE VOLUME CONTROL FULL ON

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

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

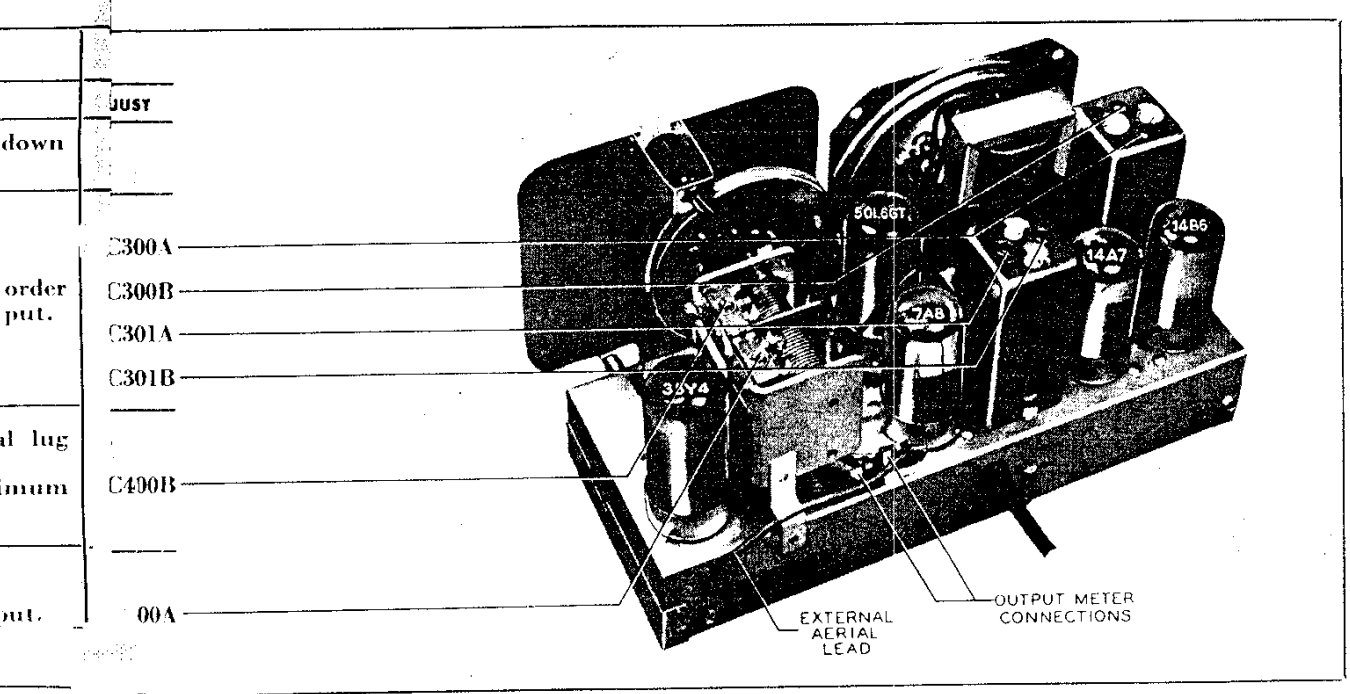


Figure 6. Chassis View, Showing Trimmer Locations

TP-3126

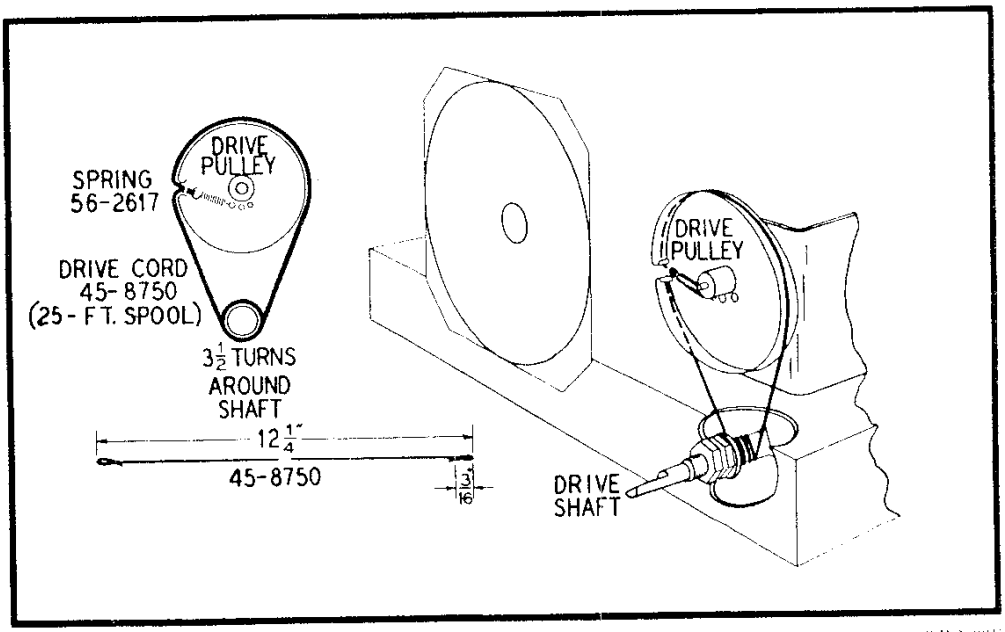


Figure 7. Drive-Cord Installation Details

TP-2698E

PHILCO CORP. MODELS 48-200, 48-200-I, 48-214, Code 125

REPLACEMENT PARTS LIST

NOTE: Parts marked with an asterisk (*) are general replacement items, and the numbers listed may not be identical with those on factory assemblies; also, the electrical values of some replacement items furnished may differ from the values indicated in the schematic 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." in this parts list.

SECTION 1

Symbol	Description	Service Part No.
C100	Condenser, line filter, .04 mf	45-3500-2*
C101	Condenser, electrolytic, 3-section filter	30-2573
C101A:	Condenser, electrolytic, 30 mf	Part of C101
C101B:	Condenser, electrolytic, 25 mf	Part of C101
C101C:	Condenser, electrolytic, 20 mf	Part of C101
R100	Resistor, leakage, 150,000 ohms	66-4153340*
R101	Resistor, filter, 220 ohms	66-1224340*
R102	Resistor, filter, 1200 ohms	66-2123340*
S100	Switch, power	Part of R200
W100	Power cord and plug	L3363
I100	Panel lamp	34-2068

SECTION 2

C200	Condenser, coupling, .01 mf	61-0120*
C201	Condenser, coupling, .01 mf	61-0120*
C202	Condenser, by-pass, 220 mmf	60-10205307*
C203	Condenser, by-pass, .02 mf	61-0108*
R200	Volume control (with power switch), 500,000 ohms	33-5429
R201	Resistor, grid load, 3.3 megohms	66-5333340*
R202	Resistor, plate load, 470,000 ohms	66-4473340*
R203	Resistor, grid load, 470,000 ohms	66-4473340*
R204	Resistor, bias, 130 ohms	66-1123340*
LS200	Speaker	36-1614
T200	Output transformer	Part of LS200

SECTION 3

C302	Condenser, a-v-c by-pass, .1 mf	61-0113*
C303	Condenser, screen by-pass, .05 mf	61-0122*
C304	Condenser, special i-f by-pass, .2 mf	30-4644
R300	Resistor, diode load, 47,000 ohms	Part of Z300
R301	Resistor, screen, 27,000 ohms	66-3273340*
R302	Resistor, a-v-c, 2.2 megohms	66-5223340*
Z300	Transformer, 2nd i-f	32-3952
C300A:	Condenser, trimmer	Part of Z300
C300B:	Condenser, trimmer	Part of Z300
C300C:	Condenser, by-pass, 100 mmf	Part of Z300
C300D:	Condenser, by-pass, 100 mmf	Part of Z300
Z301	Transformer, 1st i-f	32-3967
C301A:	Condenser, trimmer	Part of Z301
C301B:	Condenser, trimmer	Part of Z301

SECTION 4

Symbol	Description	Service Part No.
C400	Condenser, tuning, 2-section	31-2527-2
C400A:	Condenser, trimmer	Part of C400
C400B:	Condenser, trimmer	Part of C400
C401	Condenser, coupling, 5 mmf	60-90505007*
C402	Condenser, isolating, 47 mmf	60-00515307*
R400	Resistor, osc., grid, 100,000 ohms	66-4103340*
R401	Resistor, aerial discharge, 150,000 ohms	66-4153340*
T400	Transformer, oscillator	32-3880
LA400	Loop aerial:	
	Models 48-200, 200-I	32-4052-5
	Model 48-214	32-4052-6

MISCELLANEOUS

Description	Service Part No.
Cabinet	
Model 48-200	10542D
Model 48-200-I	10542E
Model 48-214	10621
Cabinet Hardware	
Back	
Model 48-200	27-9879
Model 48-200-I	27-9922
Model 48-214	54-7080
Foot, felt	W2190
Knob	
Model 48-200	27-4820
Model 48-200-I	54-4118
Model 48-214	54-4154
Window, acetate	
Models 48-200, 200-I	54-4088
Model 48-214	54-4212
Clip, coil mounting	28-5002FA1
Dial-Scale Hardware	
Cord, drive (25-ft. spool)	45-8750
Pointer	
Models 48-200, 200-I	27-4891-1
Model 48-214	54-4148-2
Scale, dial	
Model 48-200	27-5965
Model 48-200-I	27-5965-1
Model 48-214	27-5839
Screw, scale mounting	1W19674FA3
Spring, drive cord	56-2617
Washer, scale mounting	2W54094
Panel, terminal, loop aerial	76-2148
Panel, lamp assembly	76-1472
Shaft, drive assembly	31-2718
Socket, Loktal	27-6138*
Socket, octal	27-6174*