Philco Radio & Television Corp.

Model: 49-506	Chassis:	Year: Pre 1950
Power:	Circuit:	IF:
Tubes:		
Bands:		

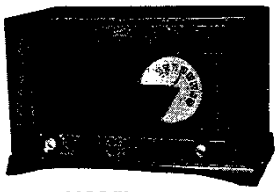
Resources
Riders Volume 19 - PHILCO 19-146
Riders Volume 19 - PHILCO 19-147
Riders Volume 19 - PHILCO 19-148
Riders Volume 19 - PHILCO 19-149
Riders Volume 19 - PHILCO 19-150
Riders Volume 19 - PHILCO 19-151
Riders Volume 19 - PHILCO 19-152
Riders Volume 19 - PHILCO 19-153

MODELS 49-500, 49-500-I, 49-506

PHILCO CORP.

GENERAL INFORMATION

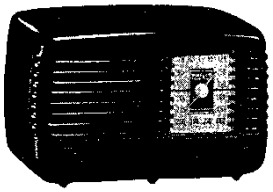
Philco Model 49-506 is a 5-tube superheterodyne. This set employs the same chassis as that used in Models 49-500 and 49-500-I, but is housed in a new-style cabinet which is supplied in either of two finishes, walnut or mahogany.



MODEL 49-506

SPECIFICATIONS

CABINET	Wood, with plastic grille; walnut or mahogany finish



MODEL 49-500 (Walnut)

MODEL 49-500-I (Ivory)

SPECIFICATIONS

CABINET	Bakelite
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, 50A5, 35Z5GT

TP-2667

Circuit Description

The Philco Models 49-500 and 49-500-I are 5-tube, table-model superheterodyne radios, providing reception in the standard broadcast band.

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 50A5 output tube. The output tube is transformer coupled to a permanent-magnet dynamic speaker.

D-c operating voltages are obtained from a 35Z5GT half-wave rectifier, the output of which is filtered by a two-section resistor-condenser filter.

Condenser C304 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. 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.

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

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

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, burned resistors, or other obvious sources of trouble.
2. Measure the resistance between B+ and B- (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. This resistance value, which is much lower than normal, does not represent a quality check of these condensers; it is the lowest value which will permit the rectifier to operate safely while the voltage tests of Section 1 (power supply) are performed.

PHILCO CORP.

MODELS 49-500, 49-500-I, 49-506

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.

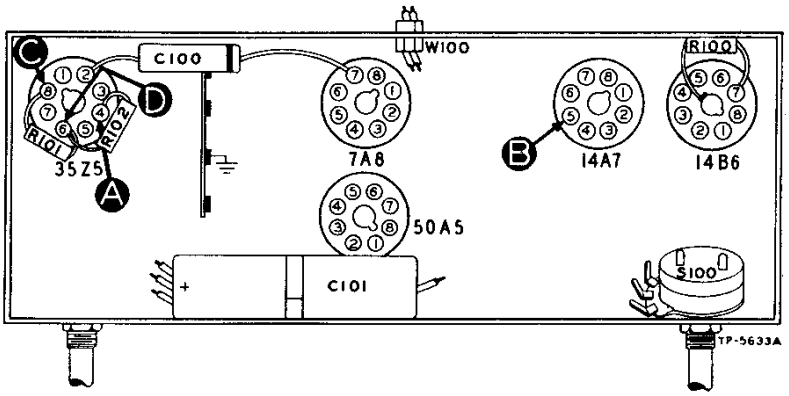


FIGURE 1. BOTTOM VIEW, SHOWING SECTION 1 TEST POINTS

STEP	TEST POINT	NORMAL INDICATION	ABNORMAL INDICATION	POSSIBLE CAUSE OF ABNORMAL INDICATION
1	A to B	90v		Trouble within this section; isolate by the following tests.
2	C to B	115v	No voltage Low voltage High voltage	Defective 35Z5GT. Shorted: C101A. Defective: 35Z5GT. Open: C101A or I100. Leaky: C101A. Open: R101.
3	D to B	105v	No voltage Low voltage High voltage	Shorted: C101B. Open: C101B. Leaky: C101B or C203. Open: R102, T200, or R204.
4	A to B	90v	No voltage Low voltage High voltage	Shorted: C101C. Leaky: C101C. Open: R204.

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

Section 2 — Audio Circuits

TROUBLE SHOOTING

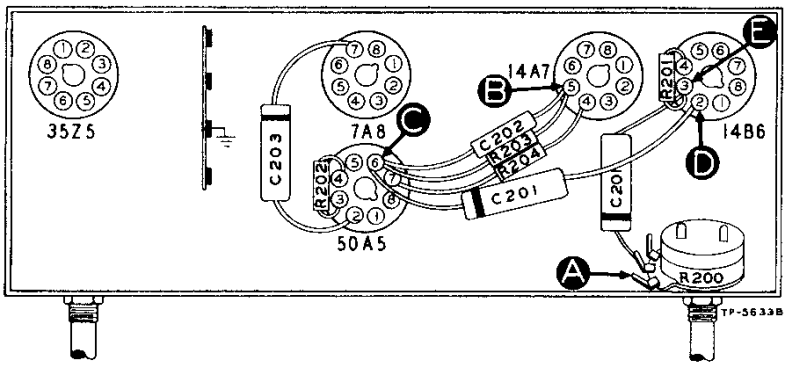


FIGURE 2. BOTTOM VIEW, SHOWING SECTION 2 TEST POINTS

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.

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: LS200 or T200. Shorted: C203. Open: R204. Defective: 50A5. Weak or distorted signal — Defective: 50A5 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. Weak or distorted signal — Shorted: C200. Open: R201. Defective: 14B6.
5	A	Same as step 1.	No signal — Open: C200. Shorted: C300D. Weak or distorted signal — Open: R200 (rotate through range).

MODELS 49-500, 49-500-I, 49-506

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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.

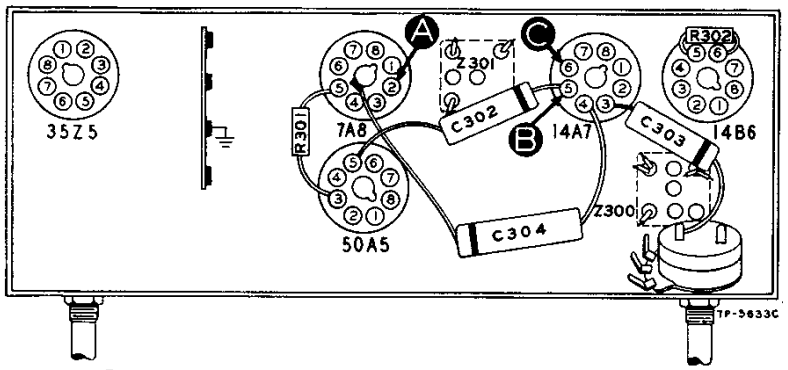


FIGURE 3. BOTTOM VIEW, SHOWING SECTION 3 TEST POINTS

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: Z300. Defective: 14B6 or 14A7. Open: R301. Shorted: C303. Weak or distorted signal — Leaky: C303. Open: C303 or C304. Defective: 14B6 or 14A7. Misaligned: Z300. Leaky or open: C302.
3	A	Same as step 1.	No signal — Open or shorted: Z301. Weak or distorted signal — Misaligned: Z301.

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.

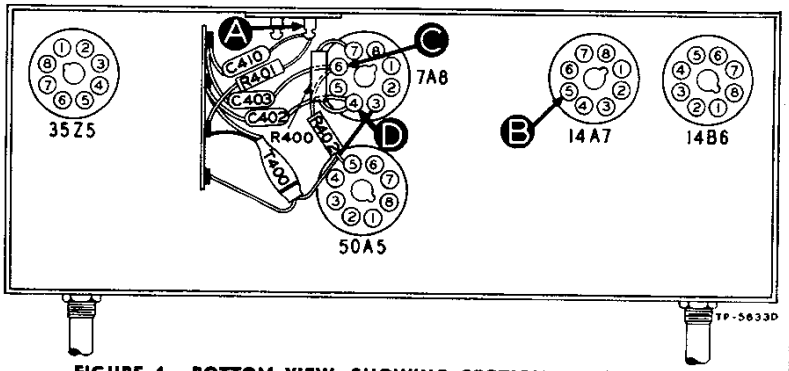
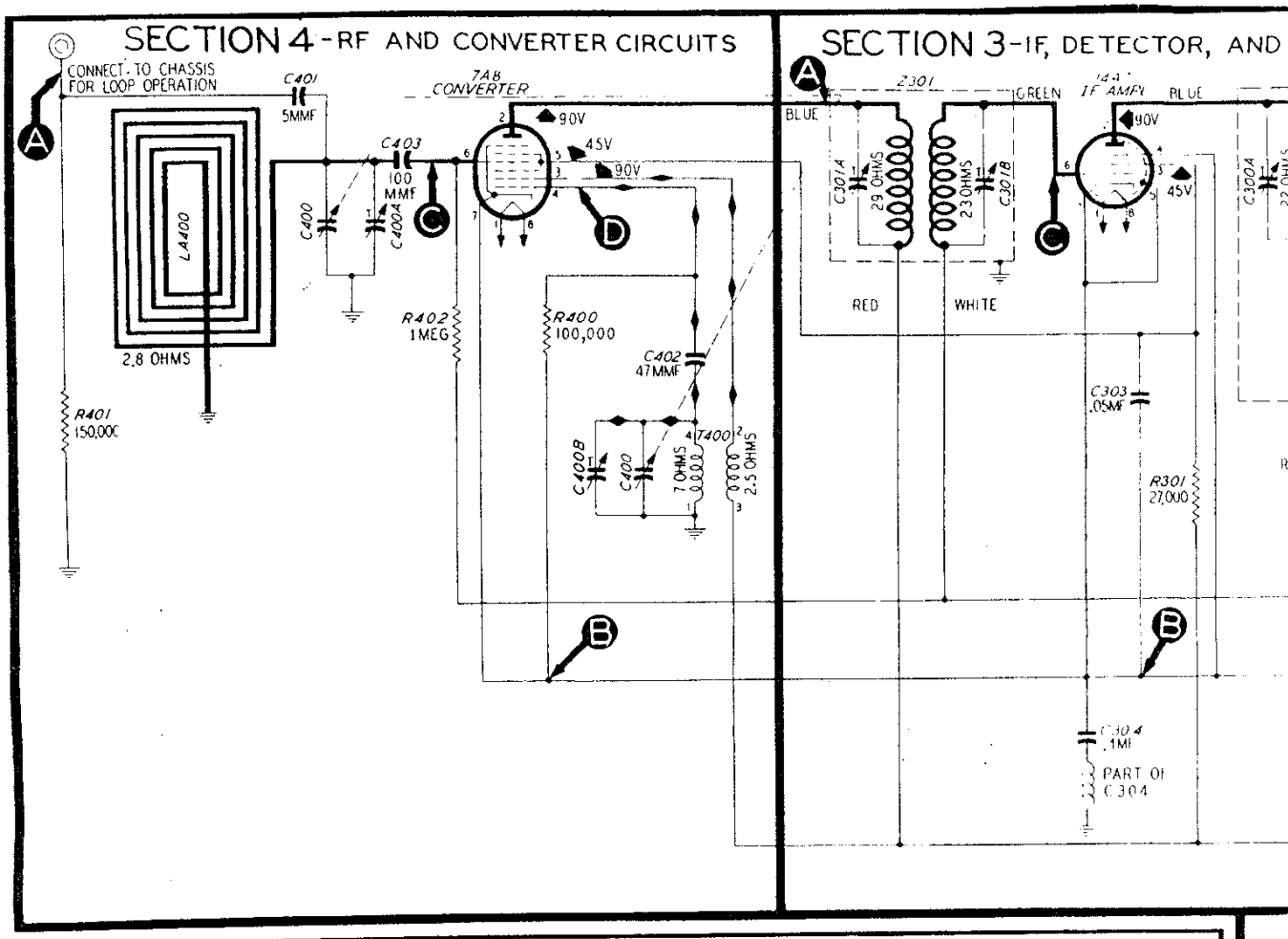
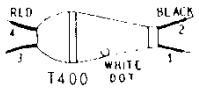


FIGURE 4. BOTTOM VIEW, SHOWING SECTION 4 TEST POINTS

STEP	TEST POINT	DIAL SETTINGS		NORMAL INDICATION	POSSIBLE CAUSE OF ABNORMAL INDICATION
		SIG. GEN.	RADIO		
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 1620 kc.	Negative 9 to 12 volts.	Open or shorted: T400, C402, or R400. Shorted: C400 or C400B. Defective: 7A8.
3	C	540 kc.	540 kc.	Same as step 1.	No signal — Open or shorted: Z301. Shorted: C400 or C400A. Defective 7A8. Weak or distorted signal — Shorted or open: LA400. Defective: 7A8.
4	A	540 kc.	540 kc.	Same as step 1.	Weak signal — Open: C401.

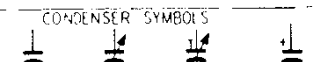
OSCILLATOR-TEST NOTE: Connect positive lead of a 20,000-ohms-per-volt meter to B; connect prod end of negative lead through a 100,000-ohm isolating resistor to test point D. Proper operation of oscillator is indicated by a negative voltage of 9 to 12 volts throughout range of tuning condenser.





RF IF AND AUDIO SIGNAL PATH
OSC SIGNAL PATH
ALL RESISTOR VALUES IN OHMS UNLESS MARKED OTHERWISE.

CONDENSER SYMBOLS



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.

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MODELS 49-500,
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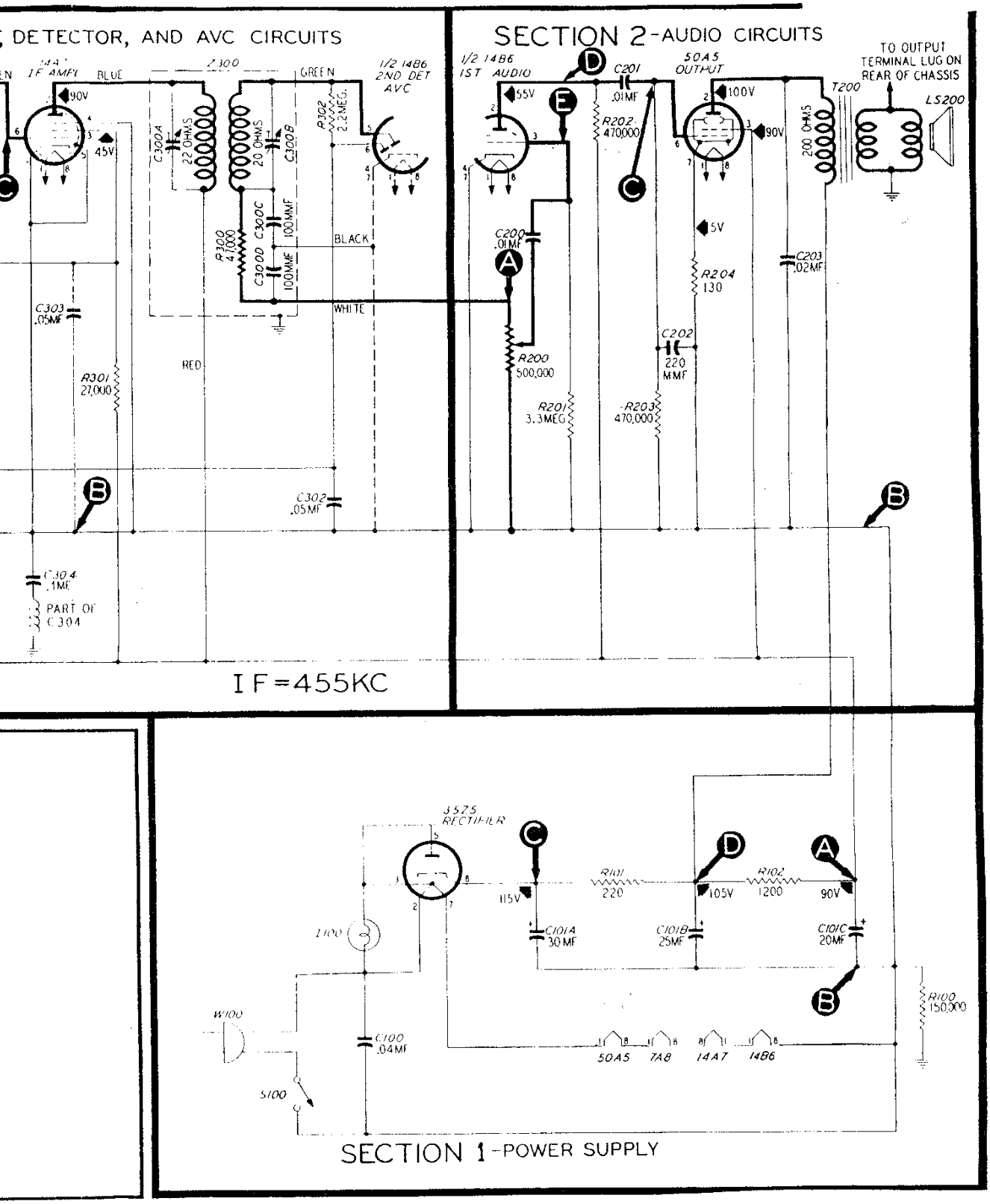

49-500-I, SECTIONALIZED SCHEMATIC DIAGRAM, SHOWING TEST POINTS

MODELS 49-500,
49-500-I, 49-506

ALIGNMENT

TURN ON THE RADIO, AND SET T

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) lug and center (chassis) lug of terminal panel, shown in figure 6.

STEP	SIGNAL GENERATOR		RADIO		ADJU
	CONNECTIONS TO RADIO	DIAL SETTING	DIAL SETTING	SPECIAL INSTRUCTIONS	
1				Turn C301B (copper screw) down tight.	
2	Through .1-mf. condenser to pin 6 of 7A8 converter.	455 kc.	540 kc.	Adjust trimmers, in order given, for maximum output.	C3 C C3 C
3	Through 100-mmf. condenser to external aerial connector.	1600 kc.	1600 kc.	Disconnect external aerial lug from chassis. Adjust trimmer for maximum output.	C
4	Same as step 3.	1500 kc.	1500 kc.	Adjust for maximum output.	C4

MISCELLANEOUS

Description	Service Part No.
Cabinet	
Walnut	10728
Mahogany	10728A
Cabinet Hardware	
Back	54-7682
Baffle-and-cloth assembly	
Walnut	40-6945
Mahogany	40-6945-1
Fastener, acetate window (4)	56-6161FE7
Knob	
Walnut	54-4527-11
Mahogany	54-4527-10
Window, acetate	54-4504

Description	Service Part No.
Dial-Scale Hardware	
Cord, drive (25-ft. spool)	45-8750*
Pointer	54-4505
Scale, dial	27-5978-2
Spring, (drive cord)	56-2617
Pilot-lamp assembly	76-1280
Shaft assembly, drive	31-2718
Socket, Loktal	27-6138*
Socket, octal	27-6174*

REPLACEMENT

Replacement parts are the sa
49-500-I, with the exceptions list

SECTI

Reference Symbol	Descripti
C100	Condenser, line filt

SECTI

LA400	Loop aerial

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NT PROCEDURE

SET THE VOLUME CONTROL TO MAXIMUM.

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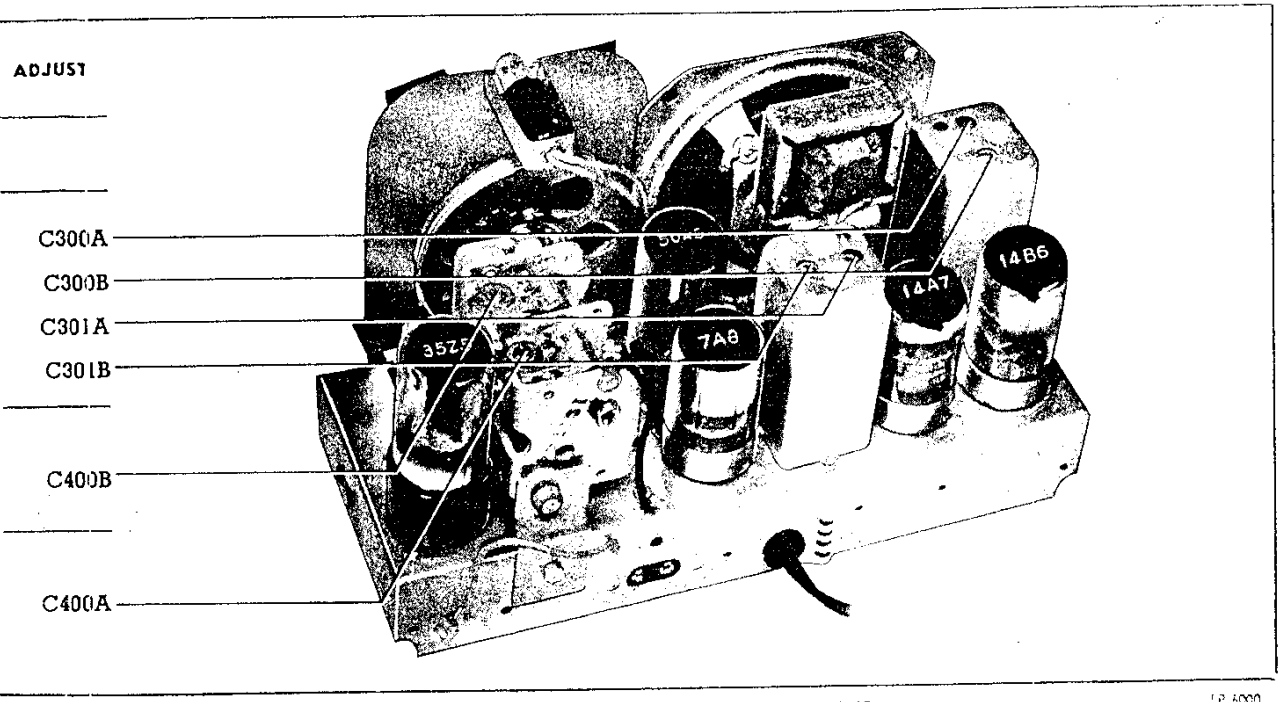
ınel,

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

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



TP 6000

FIGURE 6. TOP VIEW, SHOWING TRIMMER LOCATIONS

ıENT PARTS LIST

the same as those in Models 49-500 and ıons listed below.

SECTION 1

scription	Service Part No.
line filter, .04 mf.	30-1226-17

SECTION 4

	32-4052-28

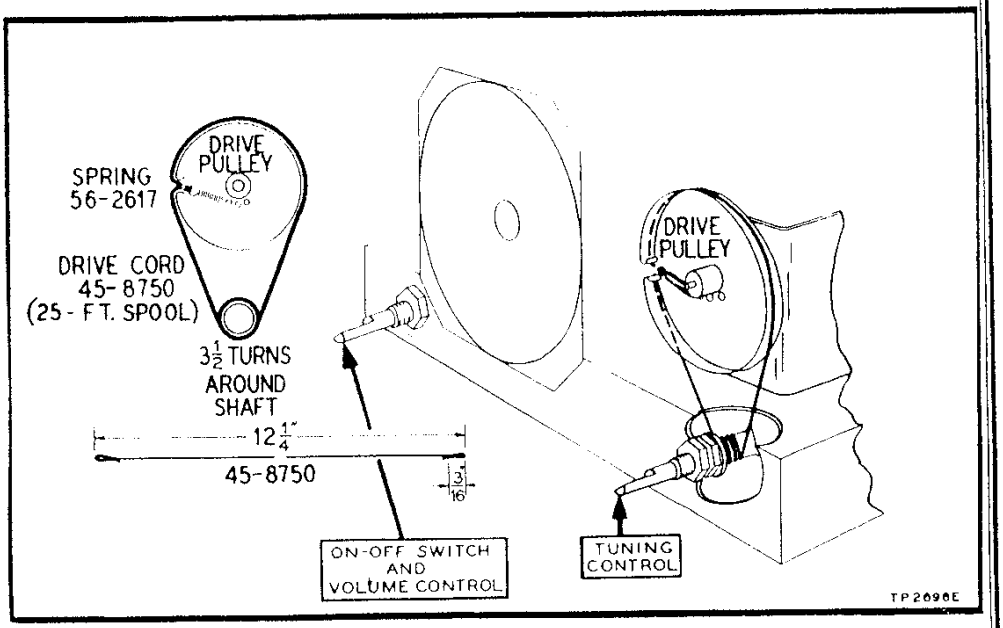


FIGURE 7. DRIVE-CORD INSTALLATION DETAILS

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MODELS 49-500, 49-500-I, 49-506

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 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 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
I100	Panel lamp	34-2068
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	L2183*

SECTION 2

AUDIO CIRCUITS

C200	Condenser, coupling, .01 mf.	61-0120*
C201	Condenser, coupling, .01 mf.	61-0120*
C202	Condenser, by-pass, 220 mmf.	62-122001001
C203	Condenser, by-pass, .02 mf.	61-0108*
LS200	Speaker	36-1614
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*
T200	Output transformer	Part of LS200

SECTION 3

I-F, DETECTOR, AND A-V-C CIRCUITS

C302	Condenser, a-v-c by-pass, .05 mf.	61-0122
C303	Condenser, screen by-pass, .05 mf.	61-0122*
C304	Condenser, special i-f by-pass, .1 mf.	30-4644-1
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	45-6365*
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	45-6365
C301A	Condenser, trimmer	Part of Z301
C301B	Condenser, trimmer	Part of Z301

SECTION 4

R-F AND CONVERTER CIRCUITS

Reference Symbol	Description	Service Part No.
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.	60-90505007*
C402	Condenser, isolating, 47 mmf.	60-00515307*
C403	Condenser, blocking, 100 mmf.	60-10105407*
LA400	Loop aerial	32-4052-5
R400	Resistor, osc., grid, 100,000 ohms	66-4103340*
R401	Resistor, aerial discharge, 150,000 ohms	66-4153340*
R402	Resistor, grid return, 1 megohm	66-5103340*
T400	Transformer, oscillator	32-4263

MISCELLANEOUS

Description	Service Part No.
Cabinet	
Model 49-500	10542D
Model 49-500-I	10542E
Cabinet Hardware	
Back	
Model 49-500	27-9879
Model 49-500-I	27-9922
Fastener, acetate window (6)	28-4279FA1
Foot, felt	W2190
Knob	
Model 49-500	27-4820
Model 49-500-I	54-4118
Window, acetate	54-4088
Dial-Scale Hardware	
Cord, drive (25-ft. spool)	45-8750
Pointer	27-4891-1
Scale, dial	
Model 49-500	27-5985
Model 49-500-I	27-5985-1
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*