TROUBLE SHOOTING

Section 1

POWER SUPPLY

Make the tests in this section with a d-c voltmeter connecting the leads between B–, test point B, and 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 power-cord plug connected to a source of power (a.c. or d.c.), turn on the power, and set the volume control to minimum (clockwise).

Follow the steps in the order given. 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.

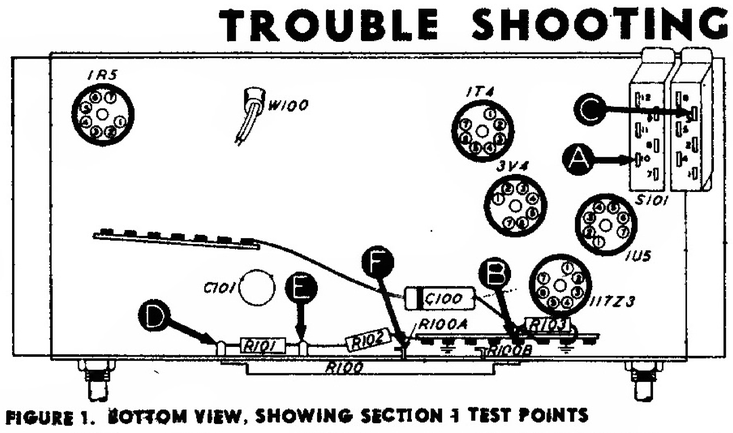


FIGURE 1. BOTTOM VIEW, SHOWING SECTION 1 TEST POINTS

STEP	TEST POINT	NORMAL INDICATION	ABNORMAL INDICATION	POSSIBLE CAUSE OF ABNORMAL INDICATION
1	A C	7.5v 00v		Trouble in this section. Isolate by the following tests.
2	D	107v	Low voltage No voltage	Defective: 117Z3. Open C101A. Defective: 117Z3. Open: S100, S101.
3	E	103v	Low voltage No voltage	Changed Resistance: R101. Leaky: C101A. Open: R101. Shorted: C101A.
4	F	55v	Low voltage No voltage	Changed Resistance: R100A. Leaky: C101B. Open: R100A. Shorted: C101B.
5	A	7.5v	Low voltage High voltage No voltage	Changed Resistance: R100A. Open: filament of one or more tubes. Open: R100A.
6	C	00v	Low voltage High voltage No voltage	Changed Resistance: R102. Leaky: C101C. Open: R207*, T200*. Open: R102. Shorted: C101C.
Listening Test: Hum may be caused by open C101B, C101C, C100, or R103.				

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

BATTERY VOLTAGE: Replace battery when (with radio turned on) "B" voltage falls below 60 volts, or "A" voltage falls below 6 volts.

TROUBLE SHOOTING

Section 2

AUDIO CIRCUITS

For the tests in this section, use an audio-frequency signal generator. 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.

With the power-cord plug connected to a source of power (a.c. or d.c.), set the volume control to maximum (counterclockwise). Adjust the signal-generator output as required for each step.

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 ont, isolate and correct the trouble in this section.

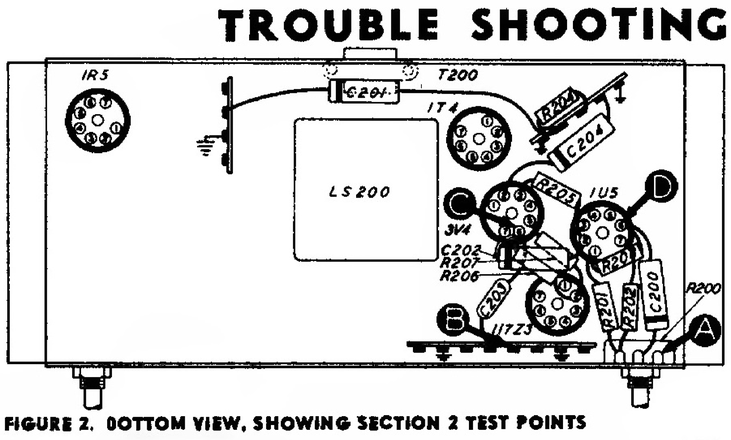


FIGURE 2. BOTTOM VIEW, SHOWING SECTION 2 TEST POINTS

STEP	TEST POINT	NORMAL INDICATION	POSSIBLE CAUSE OF ABNORMAL INDICATION
1	A	Load, clear signal with weak signal input.	Trouble in this section. Isolate by the following tests.
2	C	Clear signal with strong signal input.	Defective: 3V4, LS300. Open: R205, R207, T200. Shorted or leaky: C202, C203, C204, T200.
3	D	Same as step 1.	Defective: 1U5. Open: R204, R305. Shorted or leaky: C201, C203.
4	A	Same as step 1.	Open: R200 (rotate through range), R201, R203, C300, R203, C304*.
Listening Test: If speech or music is distorted (with section 1 operating normally), check R203, R201, and R202 for opens, and C200 for leakage.			

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

MODEL 48-300

Section 3

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

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.

With the power-cord plug connected to a source of power (a.c. or d.c.), set the volume control to maximum (counterclockwise).

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.

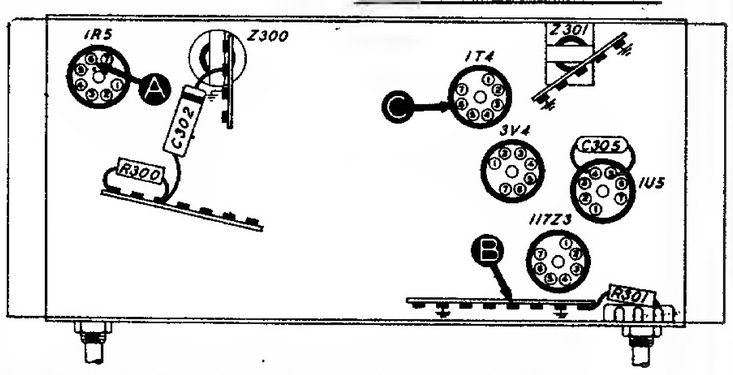


FIGURE 3. BOTTOM VIEW, SHOWING SECTION 3 TEST POINTS

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."

STEP	TEST POINT	NORMAL INDICATION	POSSIBLE CAUSE OF ABNORMAL INDICATION
1	A	Load, clear signal with weak signal input.	Trouble in this section. Isolate by the following tests.
2	C	Loud, clear signal with moderate signal input.	Defective: 1T4. Open: R300, Z301 pri. or sec., R302. Shorted: C300B, C301A, C303, C302.
3	A	Same as step 1.	Defective: 1R5*. Shorted: C400*, C400A*, C300A, C300E Open: Z300* pri. or sec., T400*
Listening Test: Oscillation or instability may be caused by open C305.			

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

TROUBLE SHOOTING

Section 4

R-F AND CONVERTER CIRCUITS

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 volume control to maximum (counterclockwise).

Set the tuning control and signal-generator frequency as indicated in the chart.

If the "NORMAL INDICATION" is not obtained in step 1, isolate the trouble by following the remaining steps.

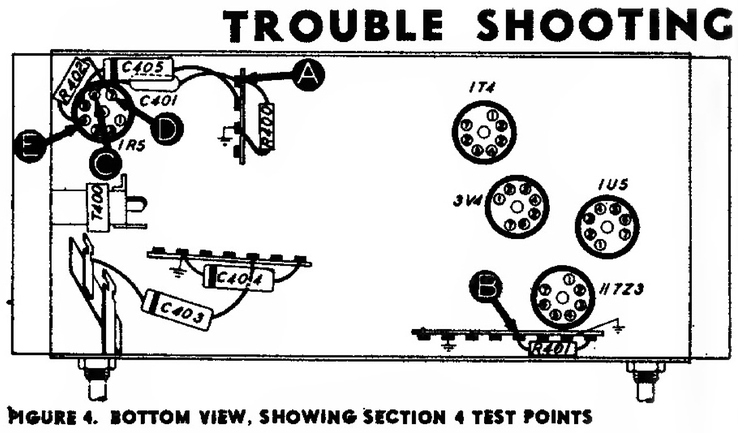
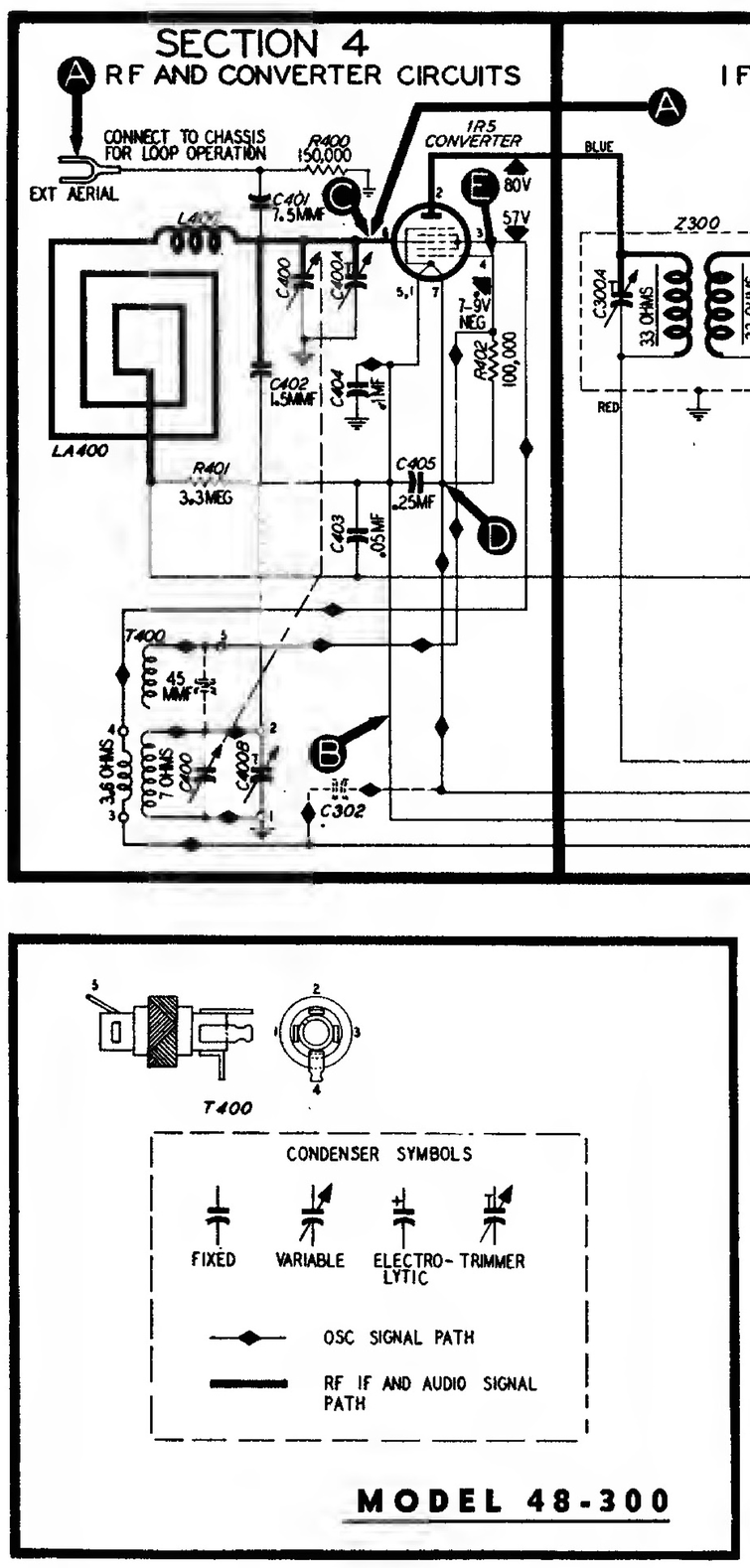


FIGURE 4. BOTTOM VIEW, SHOWING SECTION 4 TEST POINTS

STEP	TEST POINT	SIG. GEN. FREQ.	RADIO TUNING	NORMAL INDICATION	POSSIBLE CAUSE OF ABNORMAL INDICATION
1	A	1000 kc.	Tune to signal.	Loud, clear signal with weak signal input.	Trouble in this section. Isolate by the following tests.
2	C	1000 kc.	Tune to signal.	Same as step 1.	Shorted: C400, C400A, C405, C402. Trouble in oscillator circuit (step 3).
3	E to D (Osc. test: see note below.)		Rotate through range.	Negative 7 to 9 volts.	Defective: 1R5. Open: R402, T400. Shorted: C400, C400B.
4	A	1000 kc.	Tune to signal.	Same as step 1.	Open: C401, L400, LA400, R401.

OSCILLATOR TEST: Connect the positive lead of a high-resistance voltmeter to the 1R5 positive filament terminal, pin 7 (test point D); connect the prod end of the negative lead through a 100,000-ohm isolating resistor to the 1R5 oscillator grid, pin 4 (test point E). Use a suitable meter range, such as 0—10 volts. Absence of negative grid voltage throughout the tuning range indicates that the oscillator is not operating. The normal grid voltage given in the chart was measured with a 20,000-ohms-per-volt meter.



PHILCO RADIO MODEL 48-300, SECTIONALIZED SCHEMATIC DIAGRAM, SHOWING TEST POINTS