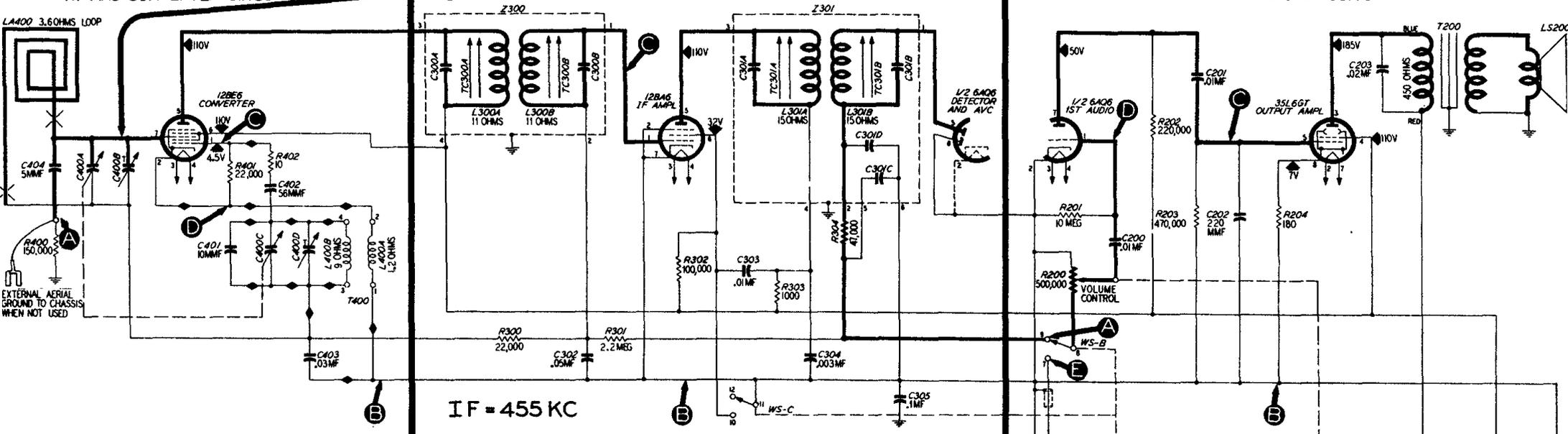


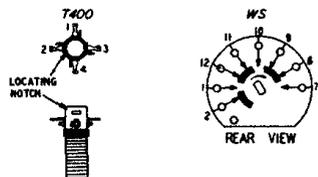
**SECTION 4**  
RF AND CONVERTER CIRCUITS

**SECTION 3**  
IF, DETECTOR, AND AVC CIRCUITS

**SECTION 2**  
AUDIO CIRCUITS

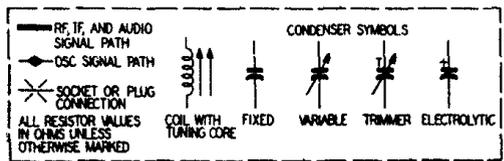


IF = 455 KC

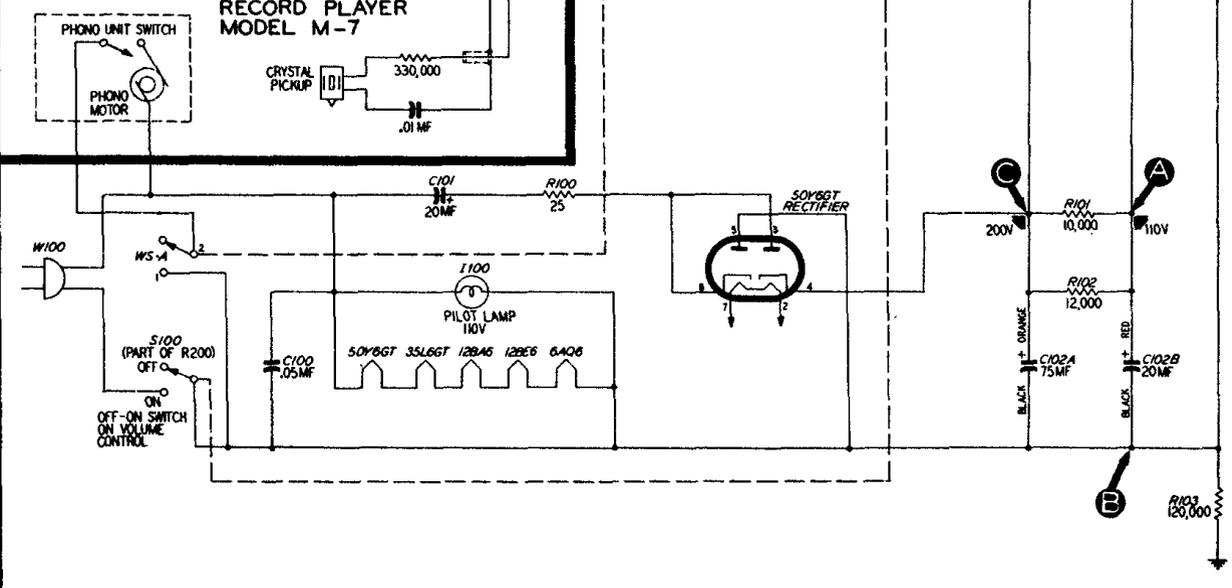


RADIO-PHONO SWITCH (WS) SHOWN IN RADIO POSITION

**MODEL 49-1401**



**RECORD PLAYER MODEL M-7**



**SECTION 1 - POWER SUPPLY**

Philco Model 49-1401, Sectionalized Schematic Diagram, Showing Test Points

Section 1 - Power Supply

Make the tests for this section with 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.

TRUBLE SHOOTING

Set the volume control to minimum, and the radio-phono switch to the radio position. 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.

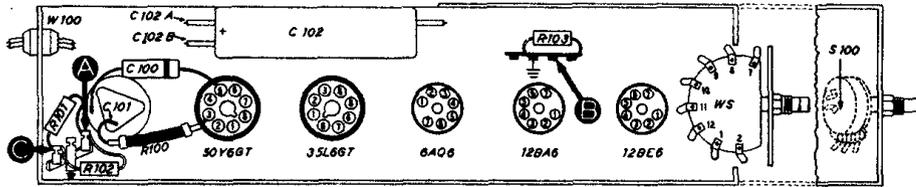


Figure 1. Bottom View, Showing Section 1 Test Points

STEP	TEST POINT	NORMAL INDICATION	ABNORMAL INDICATION	POSSIBLE CAUSE OF ABNORMAL INDICATION
1	A	110v		Trouble in this section. Isolate by the following tests.
2	C	200v	No voltage Low voltage High voltage	Defective: 50Y8GT. Open: W100, S100, R100, C101. Shorted: C100. Defective: 50Y8GT. Open: C102A. Leaky: C102A, C101. Shorted: C101. Open: R101, R102, C102B, R204*, T200*.
3	A	110v	No voltage Low voltage	Shorted: C102B. Open: R101 and R102. Leaky: C102B. Shorted: C304. Open: R101, R102.

Listening Test: Abnormal hum may be caused by open or leaky C102A or C102B.

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

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.

TRUBLE SHOOTING

Set the radio volume control to maximum, and the radio-phono switch as indicated in the chart. 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.

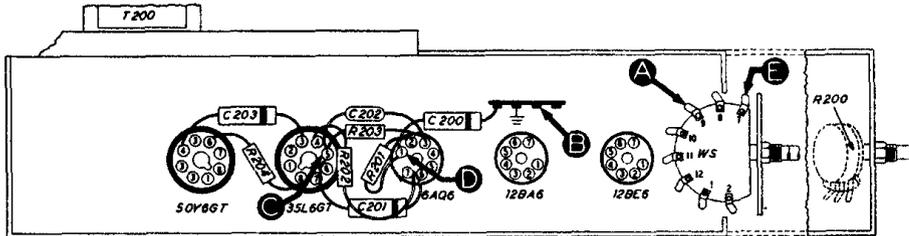


Figure 2. Bottom View, Showing Section 2 Test Points

STEP	TEST POINT	RADIO-PHONO SWITCH	NORMAL INDICATION	POSSIBLE CAUSE OF ABNORMAL INDICATION
1 (a)	A	Radio	Loud, clear speaker output with moderate generator input.	Trouble in this section. Isolate by the following tests.
1 (b)	E	Phono		
2	C	Radio	Clear output with strong input.	Defective: 1S200, 35L6GT. Shorted: T200, C203, C201, C202. Open: T200, R204, R203. Leaky: C203.
3	D	Radio	Loud, clear output with moderate input.	Defective: 6A06. Shorted: C200. Open: C201, R202, R201. Leaky: C201.
4	A	Radio	Loud, clear output with moderate input.	Open: R200 (rotate). C200, WS. Shorted: WS.
5	E	Phono	Same as step 4.	Open or shorted: WS.

Listening Test: Distortion may be caused by leaky C201. Distortion on strong signals may be caused by shorted or leaky C200.

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.

TRUBLE SHOOTING

Set the radio volume control to maximum, and the radio-phono switch to the radio position. Rotate the tuning control until the tuning condenser is fully meshed.

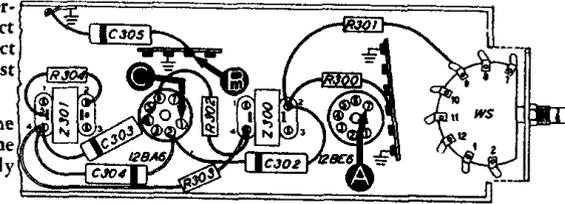


Figure 3. Bottom View, Showing Section 3 Test Points

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.

To provide a complete i-f amplifier check, test point A for this section is placed at the grid of the converter in Section 4; therefore, the effectiveness of step 1 as a master check is dependent upon the condition of certain parts in the converter circuit. These parts are listed below under "POSSIBLE CAUSE OF ABNORMAL INDICATION."

STEP	TEST POINT	NORMAL INDICATION	POSSIBLE CAUSE OF ABNORMAL INDICATION
1	A	Loud, clear speaker output with weak generator input.	Trouble in this section. Isolate by the following tests.
2	C	Loud, clear output with strong input.	Defective: 12BA6, 6A06. Shorted: C300B, C301A, C301B, C301C, C301D, C303, C304, WS, L300B, L301A, L301B. Open: R202, R303, R304, L300B, L301A, L301B, R301, C301A, C301B. Leaky: C303, C304. Misaligned: Z301.
3	A	Loud, clear output with weak input.	Defective: 12BE6*. Shorted: C400A*, C400B*. C300A, L300A, L300B, C302. Open: L300A, R300, C300A, C300B. Misaligned: Z300.

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

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.

TRUBLE SHOOTING

Set the radio volume control to maximum, and the radio-phono switch to the radio position. Set the tuning control and signal-generator frequency as indicated in the chart.

If the "NORMAL INDICATION" is obtained in step 1, further tests should be unnecessary; if not, isolate and correct the trouble in this section. If the trouble is not revealed by the tests for this section, check the alignment.

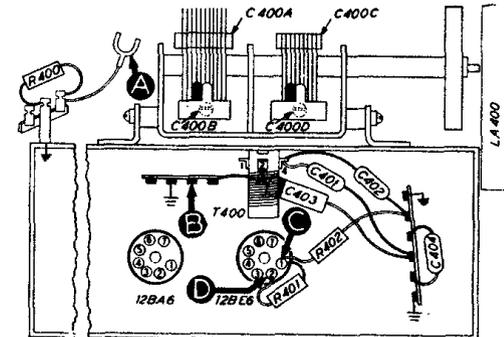


Figure 4. Bottom View, Showing Section 4 Test Points

STEP	TEST POINT	SIG. GEN. FREQ.	RADIO TUNING	NORMAL INDICATION	POSSIBLE CAUSE OF ABNORMAL INDICATION
1	A	1000 kc.	Tune to signal.	Loud, clear speaker output with weak generator input.	Trouble in this section. Isolate by the following tests.
2	C-D (Osc. test: see note below.)		Rotate through range.	Negative 4 to 5 volts.	Defective: 12BE6. Shorted: C400C, C400D, C402, C401, L400A, L400S. Open: C402, L400A, L400B, R401, R402.
3	A	1000 kc.	Tune to signal.	Same as step 1.	Shorted: LA400, C400A, C400B. Open: LA400, C404.

OSCILLATOR TEST: Connect the positive lead of a high-resistance voltmeter to the oscillator cathode (pin 2 of 12BE6), test point D; connect the prod end of the negative lead through a 100,000-ohm isolating resistor to the oscillator grid (pin 1 of 12BE6), test point C. Use a suitable meter range, such as 0-10 volts. Proper operation of the oscillator is indicated by negative voltage within the range given in the chart (measured with a 20,000-ohms-per-volt meter) throughout the tuning range.