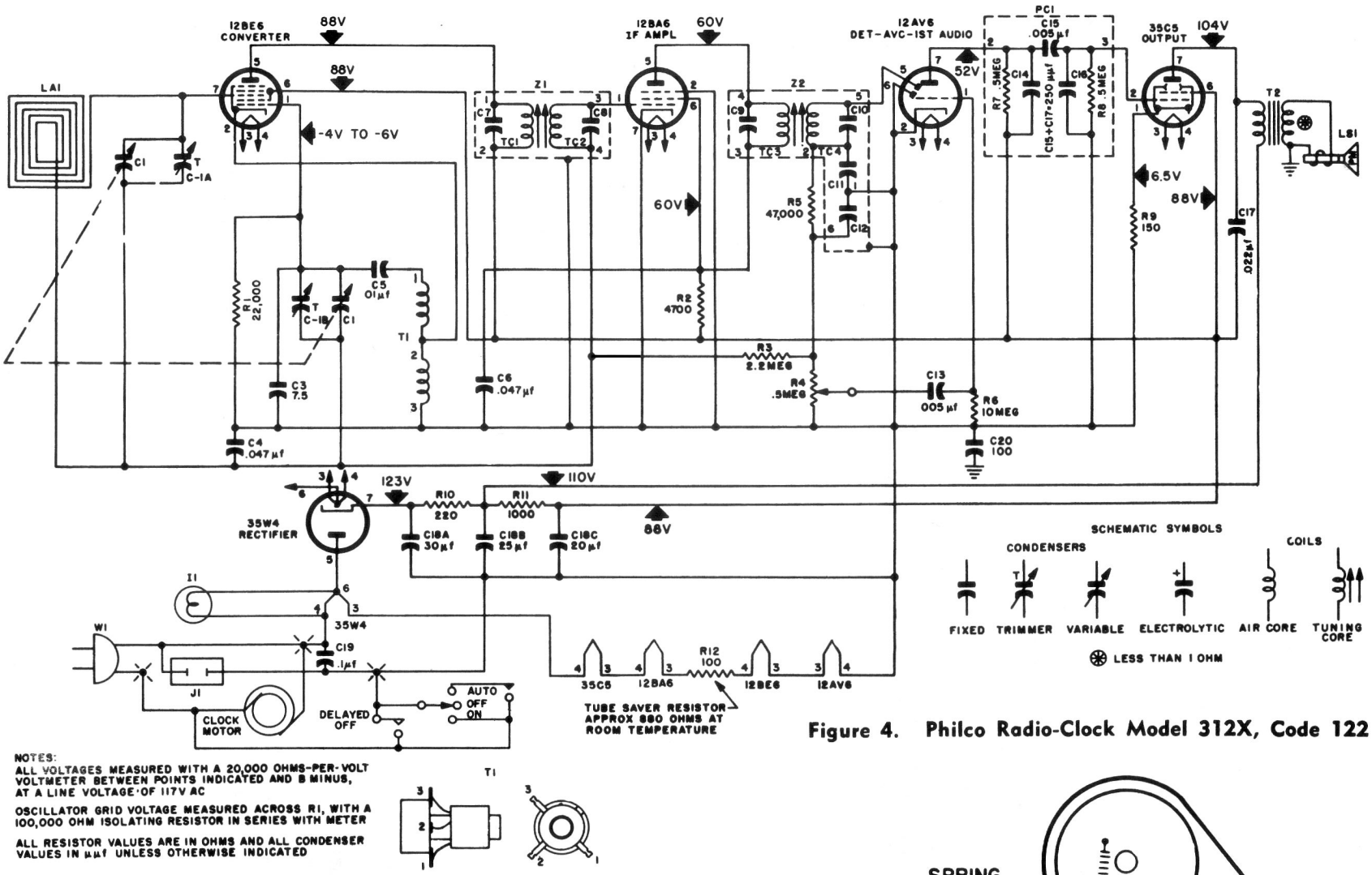
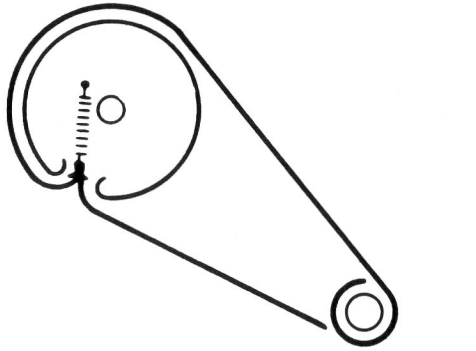


Figure 4. Philco Radio-Clock Model 312X, Code 122

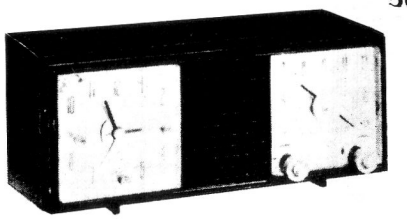
NOTES:
ALL VOLTAGES MEASURED WITH A 20,000 OHMS-PER-VOLT VOLTMETER BETWEEN POINTS INDICATED AND B MINUS, AT A LINE VOLTAGE OF 117V AC

OSCILLATOR GRID VOLTAGE MEASURED ACROSS R1, WITH A 100,000 OHM ISOLATING RESISTOR IN SERIES WITH METER

ALL RESISTOR VALUES ARE IN OHMS AND ALL CONDENSER VALUES IN µµf UNLESS OTHERWISE INDICATED



FREQUENCY RANGE	
Standard Broadcast	540 kc. to 1620 kc.
AUDIO OUTPUT	1 watt
312X OPERATING VOLTAGE	105 to 120 volts, a.c. 60 cycle
312XA POWER CONSUMPTION	30 watts
AERIAL	High-impedance loop
INTERMEDIATE FREQUENCY	455 k.c.
PHILCO TUBES	12BE6. converter, 12BA6 i-f amplifier, 12AV6 det.—a.v.c.-1st audio, 35C5 output, 35W4 rectifier



SERVICE HINTS

REMOVING THE CHASSIS FROM THE CABINET

312X, Code 124

To remove the chassis from the cabinet, first remove the station selector knob and volume control knob, and, at the bottom-center of the dial scale, remove the dial-scale cover retaining screw. Loosen the dial-scale cover by gently rocking it up and down with the finger tips until the cover comes away from the cabinet. Remove the pointer by gently pulling it off the tuning-gang shaft. Remove the chassis mounting screws from beneath the cabinet, and slide the chassis out.

REMOVING THE SUBBASE

After removing the chassis from the cabinet, remove the subbase, using the following procedure.

1. Remove the output transformer and dial light connections by unsoldering the leads from the pins on the subbase.
2. Unsolder the volume control and a-c leads, and unsolder and remove the loop aerial.
3. At the rear of the panel, bend the hold down tabs out flush with the subbase, and remove.

PARTS REPLACEMENT

Whenever possible, replace all components and leads from the top side of the chassis. In cases where this is not possible, the components must be unsoldered when removed from the bottom. Use only a lightweight low-wattage iron of approximately 22.5 to 25 watts, and always use a low-melting-point solder. Extreme caution must be used to prevent solder from dropping or splashing, and to avoid lifting of the printed wiring foil. Use only the tip of the soldering iron at the solder point whenever heat is being applied. Hold the subbase in one hand while applying heat to the solder point and throw the solder off, with a downward thrust, as soon as it starts to melt. When the solder is removed, the part to be repaired or replaced can be lifted from its location. Insert the new part and secure it with just a drop of solder at each point.

REPLACING TUBE SOCKETS AND I-F TRANSFORMERS

To replace tube sockets and i-f transformers, follow the procedure given above for removing solder. Then use a sharp knife to sever the remaining thin bond of solder at the connections. With the solder removed, the part can be backed out of the slots. Before inserting the repaired or new part, clean all connections at the unsoldered lugs. Use caution when reinserting parts through the subbase slots, so that the foil is not lifted. When soldering is complete apply an electrical varnish to all repaired areas.

ALIGNMENT PROCEDURE

RADIO CONTROLS—Set volume control to maximum. Set tuning control as indicated in chart.

OUTPUT METER—Connect across voice-coil terminals.
SIGNAL GENERATOR—Connect generator and set frequency as indicated in chart. Use modulated output.
OUTPUT LEVEL—During alignment, adjust signal-generator output to hold output-meter reading below 1.25 volts.

STEP	SIGNAL GENERATOR		RADIO			ADJUST
	CONNECTION TO RADIO	DIAL SETTING	DIAL SETTING	BAND SWITCH SETTING	SPECIAL INSTRUCTIONS	
1	Ground lead to B—; output lead through a .1-μf. condenser to grid (pin 7) of 12BE6.	455 kc.	Tuning gang fully open	Broadcast	Adjust tuning cores, in order given, for maximum output. TC2 and TC4 are located at top of transformers.	TC4—2nd i-f sec. TC3—2nd i-f pri. TC2—1st i-f sec. TC1—1st i-f pri.
2	Radiating loop (See note below).	1620 kc.	*1620 kc.	Broadcast	Adjust trimmer for maximum output.	C1-A—osc.
3	Same as step 2.	1500 kc.	1500 kc.	Broadcast	Adjust trimmer for maximum output.	C1B—aerial (broadcast)

NOTE: Make up a 6—8 turn, 6-inch-diameter loop from insulated wire, connect to signal-generator leads, and place near radio loop.

* For proper adjustment of the oscillator trimmer, fully open the tuning gang and insert a .006-inch non-metallic shim between the heel of the rotor and the top of the stator plates. Close the tuning gang sufficiently to hold the shim in place, and then remove the shim without disturbing the gang setting.

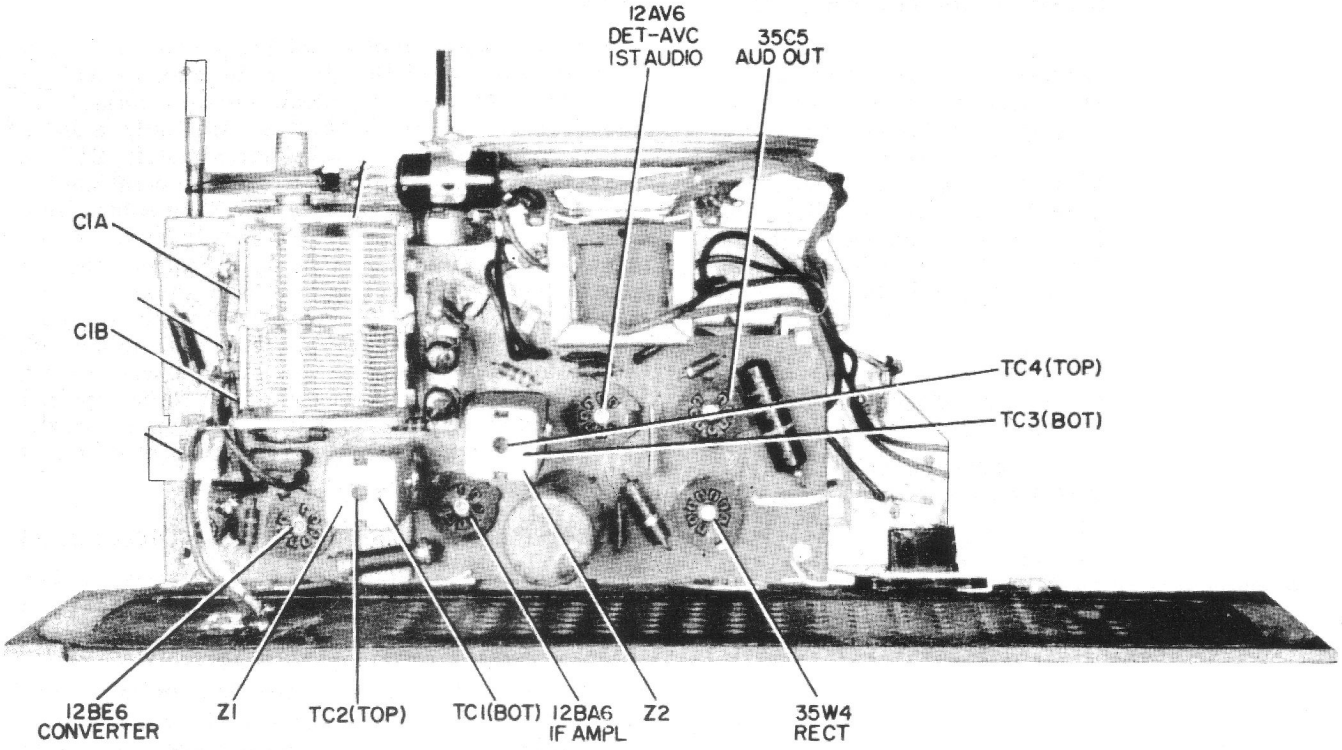


Figure 2. Top View, Showing Trimmer Locations

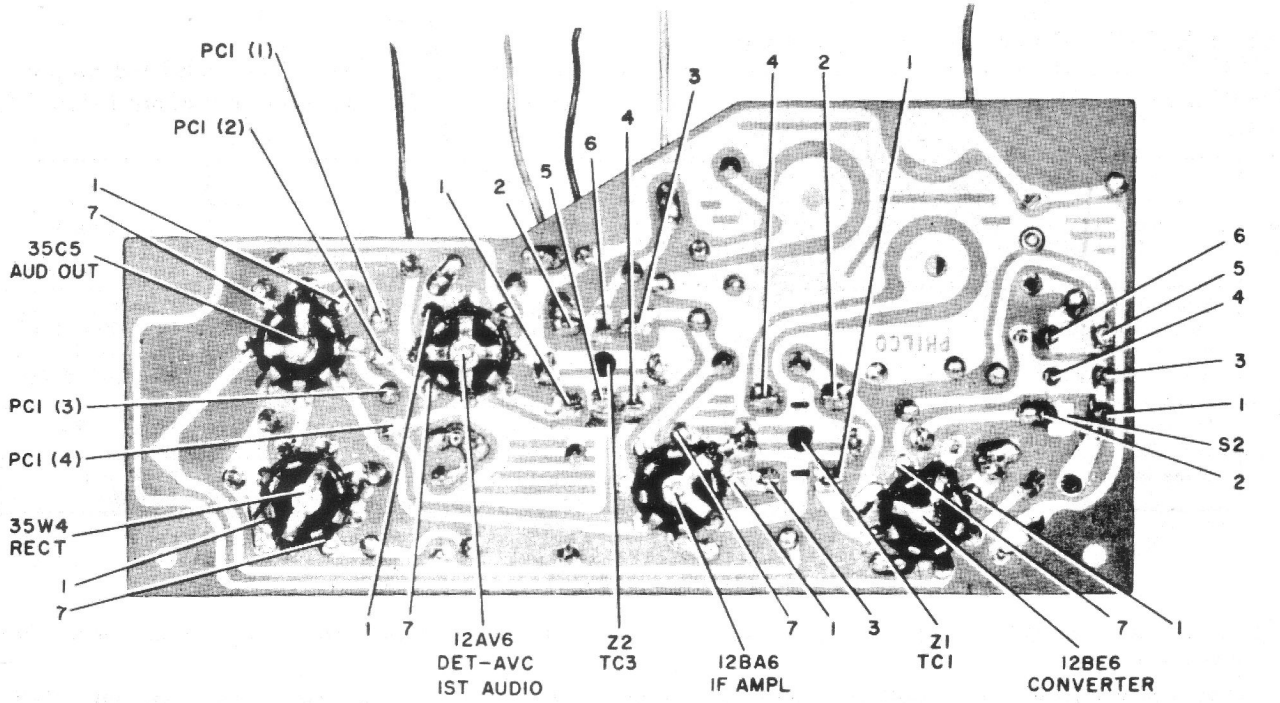


Figure 3. Base View, Showing Printed Wiring Circuit

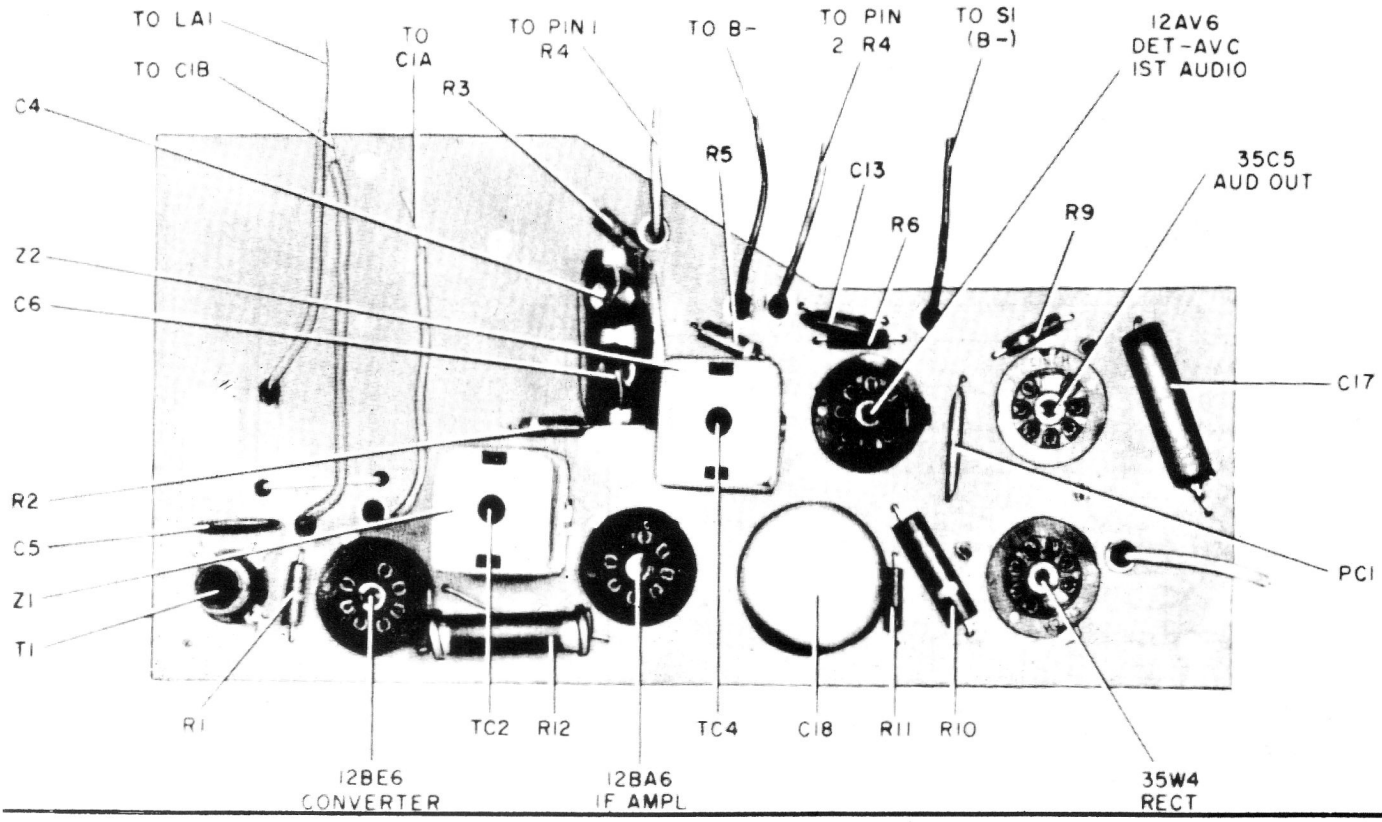


Figure 5. Top View, Showing Parts Placement

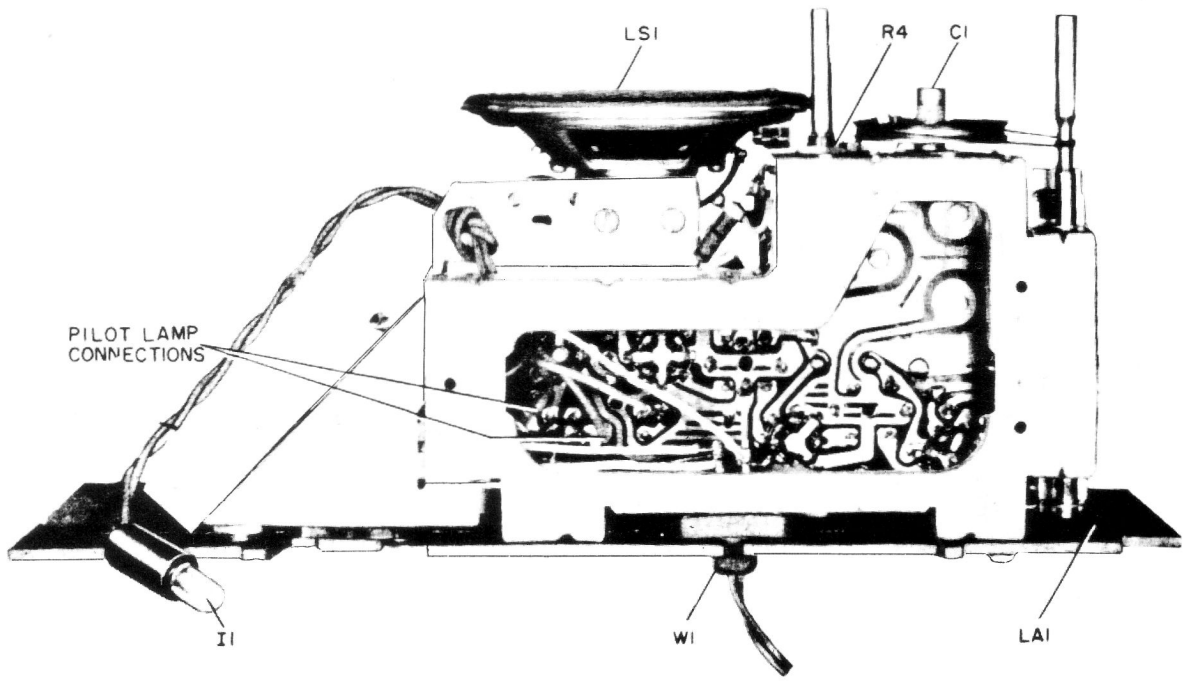


Figure 6: Bottom View, Showing Parts Placement