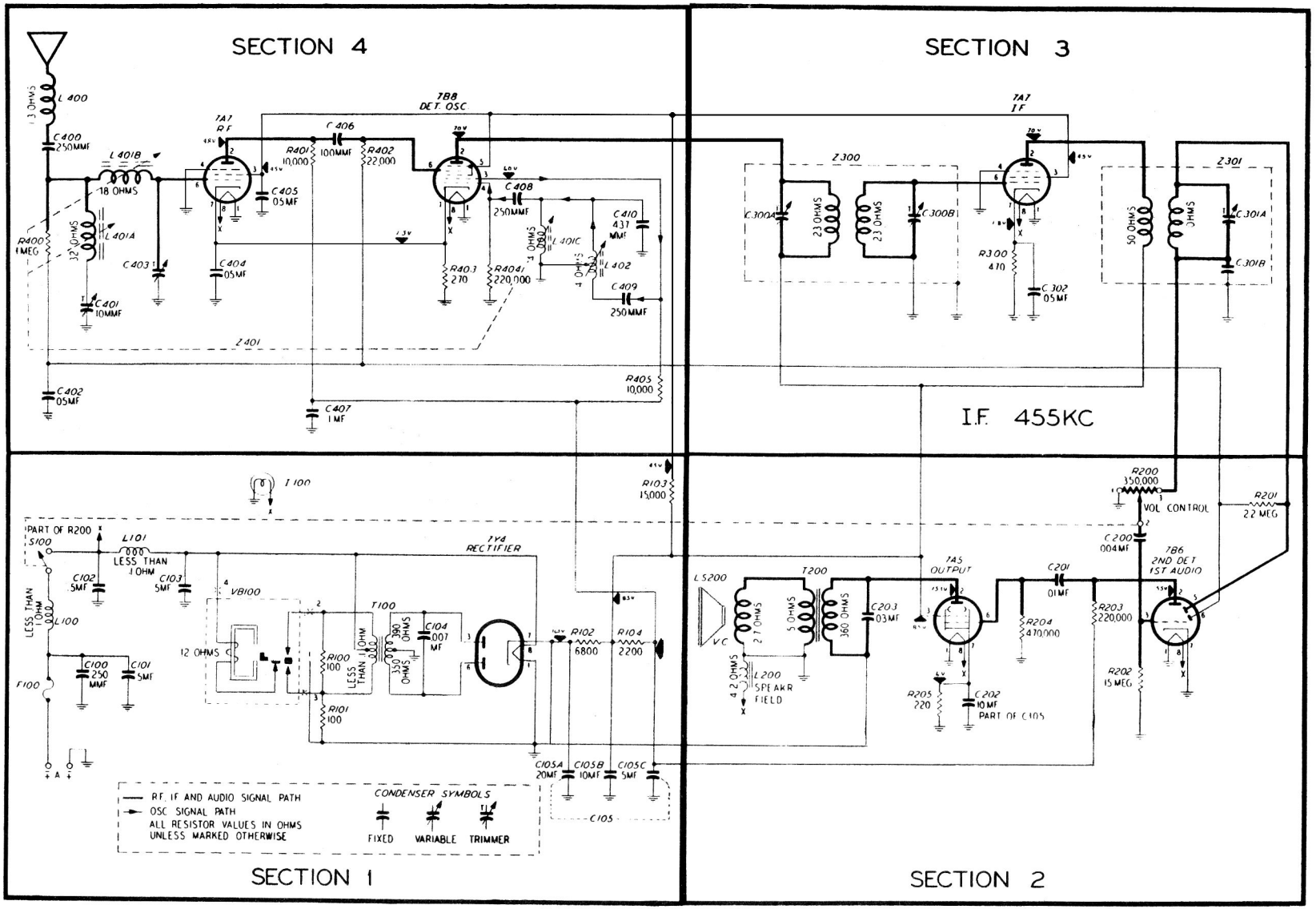

Figure 10. Complete schematic.

NOTE: All voltage, capacity, and resistance values shown are average. The voltages were measured between the points indicated and the receiver chassis (B-), using a 20,000-ohms-per-volt meter, with 6.3 volts d-c input to the receiver power supply; the volume control was set at minimum, and the tuning control at 540 kc.

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ALIGNMENT DATA ON SHEET 192

TROUBLE SHOOTING DATA ON SHEETS 193 to 196

C—condenser
I—pilot lamp
L—choke or coil
LS—loud speaker
R—resistor
S—switch
T—transformer
VB—vibrator
Z—electrical assembly.

100-series—Section 1—the power supply.
200-series—Section 2—the second detector and audio system.
300-series—Section 3—the i-f amplifier.
400-series—Section 4—the r-f and converter.

AUTO RADIO MODELS 54624, 54625

DATA SHEET 191

PHILCO

CIRCUIT DESCRIPTION

The circuit of the Model S4624 custom-built auto radio consists of a 7A7 r-f stage, a 7B8 converter, a 7A7 i-f stage, a 7B6 second detector and first audio, and a 7A5 beam-power audio amplifier. The power supply is of the 6-volt non-synchronous vibrator type, using a 7Y4 full-wave rectifier.

A high degree of selectivity, sensitivity, and stability is achieved by the use of permeability tuning in both the r-f and oscillator circuits.

An intermediate frequency of 460 kc. is generated in the converter stage, and is applied via a tuned transformer to the i-f amplifier. A second tuned transformer passes the amplified 460-kc. signal on to the second detector, (the diode section of the 7B6) where it is rectified and the audio-frequency modulation separated from it. Automatic volume control is provided by smoothing and filtering the rectified 460-kc. voltage, and applying it to the grids of the r-f amplifier and converter tubes.

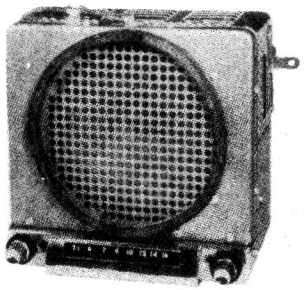
The audio signal from the second detector is applied through the volume control to the first audio amplifier (the triode section of the 7B6). From the plate of the first audio, the signal is applied to the grid of the output power amplifier. The output transformer, which constitutes the plate load of the power amplifier, transmits the signal to the voice coil of the electro-dynamic speaker.

IMPORTANT

The aerial and aerial lead-in form part of the r-f tuning circuit. When testing or aligning this receiver on the bench it is important that an aerial dummy load of equal capacity be used.

PHILCO TROUBLE-SHOOTING PROCEDURE

This service manual provides a logical trouble-shooting procedure for the S4624, which will facilitate the isolation of most of the faults that may be encountered. The circuit is divided into four sections, with a schematic and chassis layout, showing test points, for each section. The trouble-shooting procedure for each section is outlined in a chart. The first test in each chart is a sectional master check, making it possible to eliminate the section under test as a source of trouble without going through its entire chart procedure. The sections should be tested in their numerical order, as they are arranged in the manual.



MODEL S4624

SPECIFICATIONS

CIRCUIT	Six-tube, superheterodyne
FREQUENCY RANGE	540 to 1600 kc.
INTERMEDIATE FREQUENCY	460 kc.
PHILCO TUBES	7A7(2), 7B8, 7B6, 7A5, 7Y4
POWER INPUT	6.3 volts, 6 amps, d.c.
AERIAL	Retractable-tip, Philco Part No. 91-0230

ALIGNMENT PROCEDURE

CONNECT THE SIGNAL-GENERATOR output lead as follows:

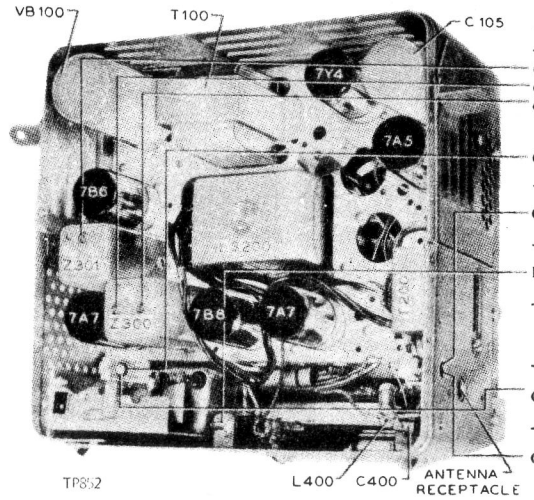
For the i-f alignment (the first step in the chart), connect through a .05-mf. condenser to the antenna receptacle.

For the r-f alignment (all steps after the first), connect through a dummy aerial consisting of a 20-mmf. condenser in series with an aerial lead (Part No. 95-0211) plugged into the antenna receptacle. If the aerial lead is not available, connect a 30-mmf. condenser from the aerial terminal to the receiver chassis, and inject the signal through the 20-mmf. condenser alone.

CONNECT THE OUTPUT METER across the speaker voice coil. Do not disconnect the speaker during alignment.

SET THE RECEIVER VOLUME CONTROL at maximum. Adjust the signal-generator output as alignment progresses to keep the meter needle near center scale, using the lowest range on the output meter.

AFTER REINSTALLING THE RECEIVER in the car, and connecting the antenna, adjust the antenna trimmer (C403) for maximum signal strength on a weak station near 1400 kc.



ADJUST IN ORDER	SPECIAL INSTRUCTIONS	DIAL SETTINGS SIG. GEN.	DIAL SETTINGS RECEIVER
C301A C300B C300A	1. Ground pin 4 of the 7B8 converter. Adjust the i-f trimmers for maximum in the order given, and then repeat the procedure.	460 kc.	1600 kc.
C401	2. Preset C401 to ½ turn from fully tight. Remove the ground from pin 4 of the 7B8.		
C103	3. Adjust for maximum.	1400 kc.	1400 kc.
L402	4. Adjust for maximum while rocking the tuning control.	580 kc.	580 kc.
	5. Tune in the 550-kc. signal with the receiver tuning control.	550 kc.	550 kc. (approx.)
C401	6. Ajust for minimum output.	1460 kc.	Do not alter from setting made in step 5.
C103	7. Adjust for maximum. Final adjustment to be made after the set has been reinstalled in the car, with the antenna connected.	1400 kc.	1400 kc.

Figure 9. Chassis view, showing trimmer location.

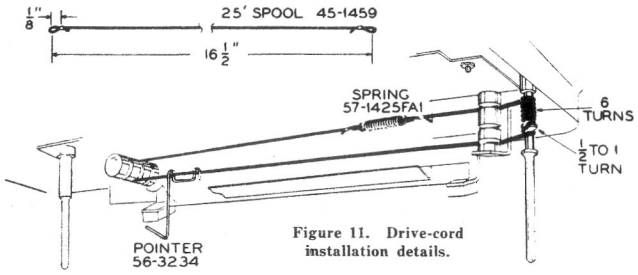


Figure 11. Drive-cord installation details.

PRELIMINARY CHECKS

Before starting the trouble-shooting procedure, the following steps are recommended:

1. Carefully inspect both sides of the chassis. Make sure that all tubes are secure, and look for bad connections, burned resistors, or other mechanical faults.

2. Check the fuse, and connect the receiver to a source of power (6.3 volts, d.c.). Look for unlighted tube filaments, over-heated resistors (smoke, sweating, etc.), and listen for the hum of the vibrator.

3. Check the tubes and the vibrator. WARNING: If the 7Y4 is defective, check C105 for shorts before inserting a new tube. If the vibrator is defective, check C104 for a short before inserting a new vibrator.

NOTE: Further information on the S4624, covering installation and operation of the receiver, will be found in the Owner's manual for this model—Philco Part No. 39-7915.

AUTO RADIO MODEL S4624, S4625

CIRCUIT DATA ON SHEET 191
FURTHER DATA ON SHEETS 193 to 196

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PHILCO DATA SHEET 192

MAKE TEST NO. 1 FIRST!

If the "NORMAL INDICATION" for this test is obtained, proceed to Test No. 1 in the next section. If not, continue through the chart to isolate and remedy the trouble in this section.

TESTS TO ISOLATE TROUBLE WITHIN SECTION 1

Make all measurements for this section with a volt-ohmmeter, using the applicable d-c range. All voltages given in this manual are average, and were taken with a 20,000 ohms-per-volt meter and with 6.3 volts d-c input; the volume control was set at minimum, and the tuning control at 540 kc.

WARNING: If the 7Y4 rectifier is found to be defective, check the main filter condenser, C105, for shorts before inserting a new tube. If the vibrator is found to be defective, check C104 for a short before inserting a new vibrator.

	TEST POINTS	NORMAL INDICATION	POSSIBLE CAUSE OF ABNORMAL INDICATION
1.	D to B-	45 volts	Trouble within Section 1. Isolate by following tests.
2.	A to B-	165 volts	Defective 7Y4, VB100, T100, C104, or C105A.
3.	C to B-	85 volts	Defective R102, C105B, C105C, or C406 (shown in Section 4).
4.	D to B-	45 volts	Defective R103 or C303 (shown in Section 3).
5.	E to B-	73 volts	Defective R104, C105C, or C406 (shown in Section 4).

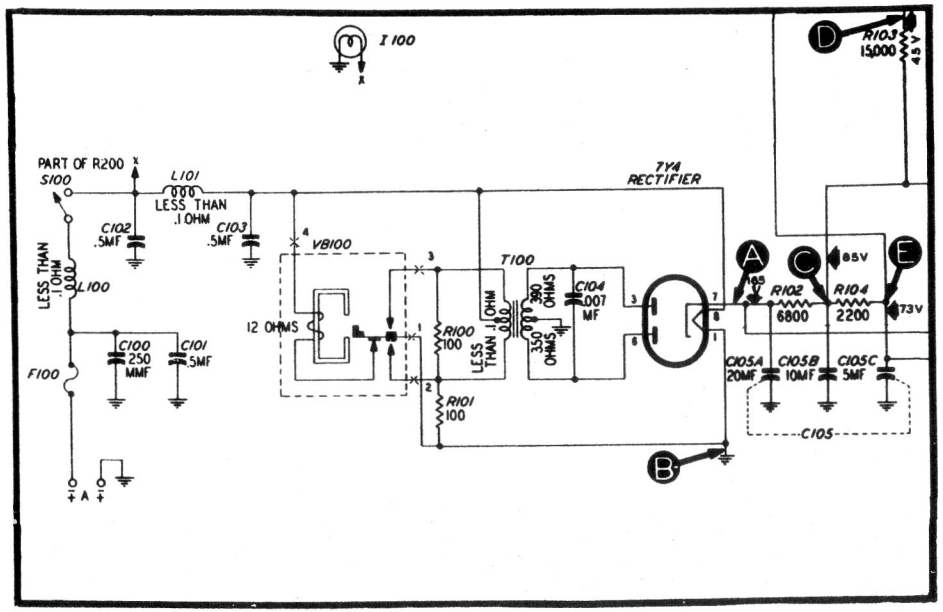

Figure 1. Section 1 schematic. TP461E

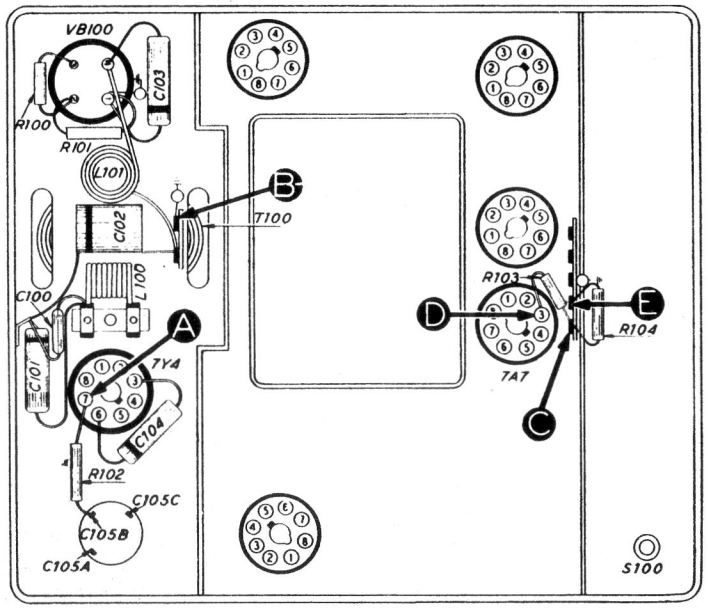

Figure 2. Bottom view, showing Section 1 test points. TP461A

TROUBLE SHOOTING DATA

CIRCUIT ON SHEET 191
TROUBLE SHOOTING DATA 193 to 196
ALIGNMENT DATA ON SHEET 192

1948-49

AUTO RADIO MODELS S4624, S4625

PHILCO DATA SHEET 193

MAKE TEST NO. 1 FIRST!

If the "NORMAL INDICATION" for this test is obtained, proceed to Test No. 1 in the next section. If not, continue through the chart to isolate and remedy the trouble in this section.

TESTS TO ISOLATE TROUBLE WITHIN SECTION 2

For all tests in this section, use an audio signal. Connect the generator output lead through a condenser (.01 to .25 mf.) to the test points indicated; connect the ground lead to the receiver chassis (B-). Set the receiver volume control at maximum, and start with the signal generator adjusted for low output.

	TEST POINTS	NORMAL INDICATION	POSSIBLE CAUSE OF ABNORMAL INDICATION
1.	J to B-	Loud, clear signal.	Trouble within Section 2. Isolate by following tests.
2.	F to B-	Clear signal, using moderate generator output.	Defective 7A5, T200, LS200, R204, R205, C201, C202, or C203.
3.	G to B-	Same as above.	Open C201.
4.	H to B-	Clear signal, much louder than step 3.	Defective 7B6, R202, R203, C105C, or R104 (shown in Section 1).
5.	J to B-	Same as step 4.	Defective C200 or R 200 (rotate R200 through its entire range for complete check).

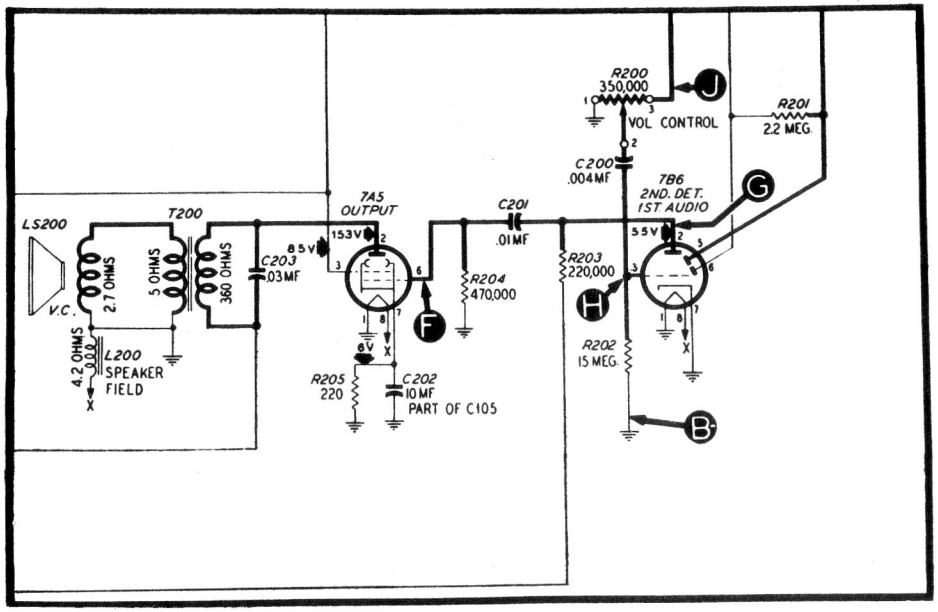

Figure 3. Section 2 schematic.

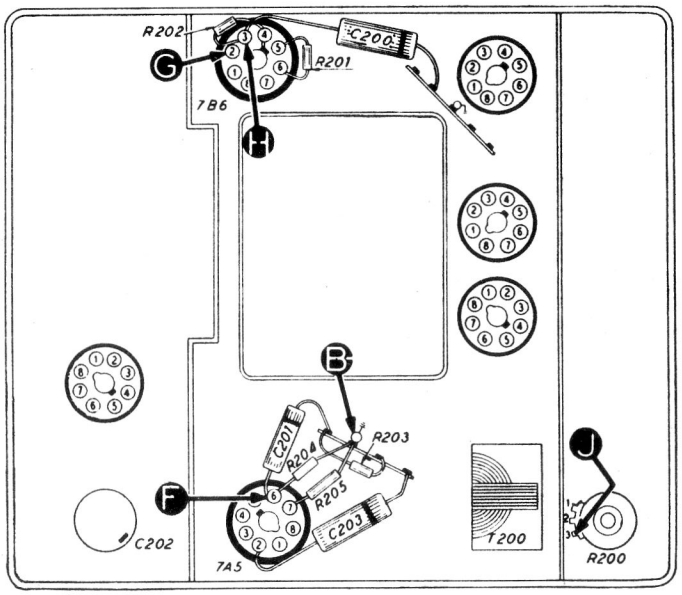

Figure 4. Bottom view, showing Section 2 test points.

TROUBLE SHOOTING DATA

CIRCUIT ON SHEET 191
TROUBE SHOOTING DATA 193 to 196
ALIGNMENT DATA ON SHEET 192

1948.49

AUTO RADIO MODELS S4624 . S4625

PHILCO DATA SHEET 194

MAKE TEST NO. 1 FIRST!

If the "NORMAL INDICATION" for this test is obtained, proceed to Test No. 1 in the next section. If not, continue through the chart to isolate and remedy the trouble in this section.

TESTS TO ISOLATE TROUBLE WITHIN SECTION 3

For all tests in this section, use a modulated 460-kc. signal. Connect the signal-generator output lead through a condenser (.01 to .25 mf.) to the test points indicated; connect the ground lead to the receiver chassis (B-). Set the receiver volume control at maximum, and adjust the signal-generator output for a loud, clear signal.

	TEST POINTS	NORMAL INDICATION	POSSIBLE CAUSE OF ABNORMAL INDICATION
1.	L to B-	Loud, clear signal	Trouble within Section 3. Isolate by following tests.
2.	K to B-	Loud, clear signal	Defective 7A7, Z301, R300, C302, or C303.
3.	L to B-	Loud, clear signal	Defective Z300.

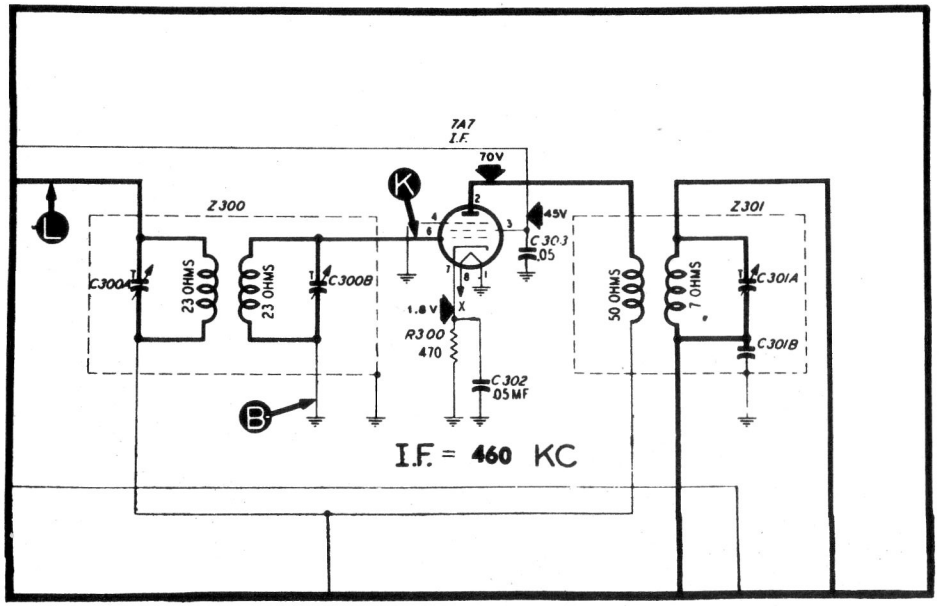

Figure 5. Section 3 schematic.

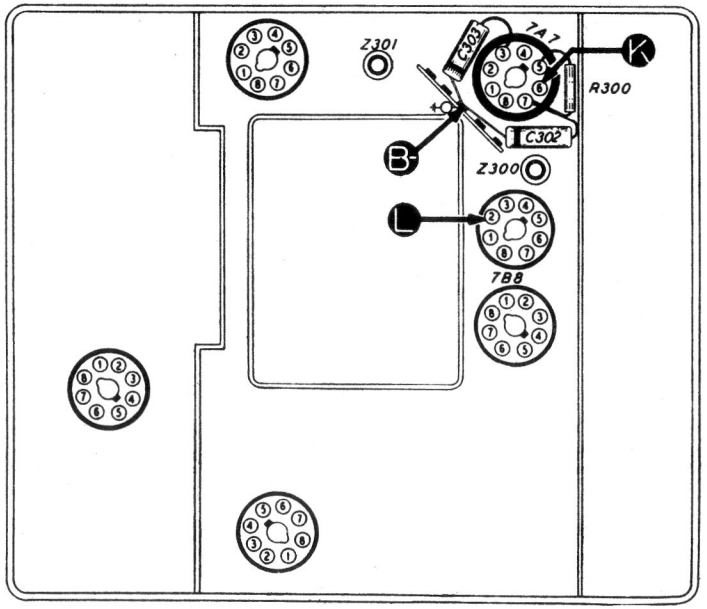

Figure 6. Bottom view, showing Section 3 test points.

TROUBLE SHOOTING DATA

CIRCUIT DATA ON SHEET 191
TROUBLE SHOOTING DATA 193 to 196
ALIGNMENT DATA ON SHEET 192

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AUTO RADIO MODELS S4624, S4625

PHILCO DATA SHEET 195

MAKE TEST NO. 1 FIRST!

If the "NORMAL INDICATION" for this test is not obtained, continue through the chart to isolate and remedy the trouble in this section.

TESTS TO ISOLATE TROUBLE WITHIN SECTION 4

PRELIMINARY OSCILLATOR CHECK:

Attach the positive lead of a 20,000-ohms-per-volt meter (10-volt range) to the receiver chassis, and the prod end of the negative lead through 50,000 ohms to point R. Rotate the tuning control through its entire range; absence of voltage indicates that the oscillator is not functioning. If this is the case, check the components listed in the second test below.

FOR CHART TESTS 1 - 5:

Connect the signal-generator output lead through a condenser (.01 to .25 mf.) to the test points indicated; connect the ground lead to the receiver chassis. Set the receiver volume control at maximum, tune the signal generator and receiver to 1000 kc., and start with the generator adjusted for low output.

	TEST POINTS	NORMAL INDICATION	POSSIBLE CAUSE OF ABNORMAL INDICATION
1.	Q to B-	Loud, clear signal.	Trouble within Section 4. Isolate by following tests.
2.	M to B-	Clear signal, with moderate generator output.	Defective 7B8, C404, C405, C406, C408, C409, R402, R403, R404, R405, L401C, or L402.
3.	N to B-	Same as above.	Open C405.
4.	P to B-	Clear signal, louder than step 3.	Defective 7A7, R400, R401, C401, C402, or C403.
5.	Q to B-	Same as step 4.	Defective L400, C400, L401A, or L401B.

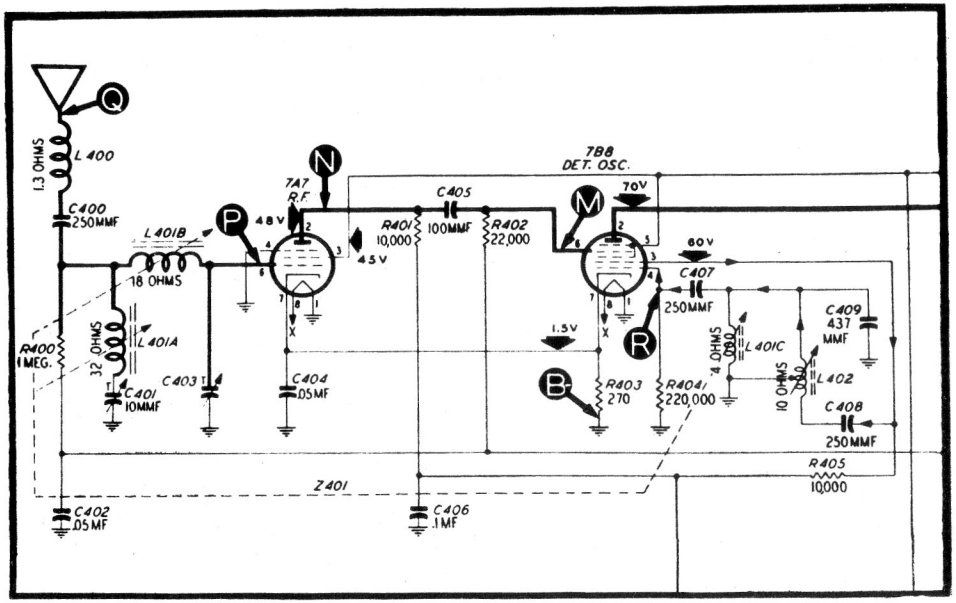

Figure 7. Section 4 schematic.

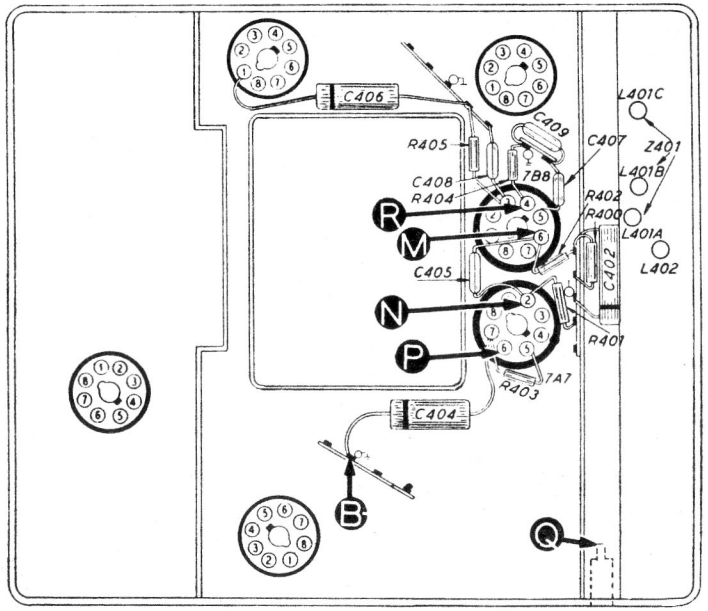

Figure 8. Bottom view, showing Section 4 test points.

TROUBLE SHOOTING DATA

CIRCUIT DATA ON SHEET 191
TROUBLE-SHOOTING DATA 193 to 196
ALIGNMENT DATA ON SHEET 192

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AUTO RADIO MODELS S4624, S4625

PHILCO DATA SHEET 196