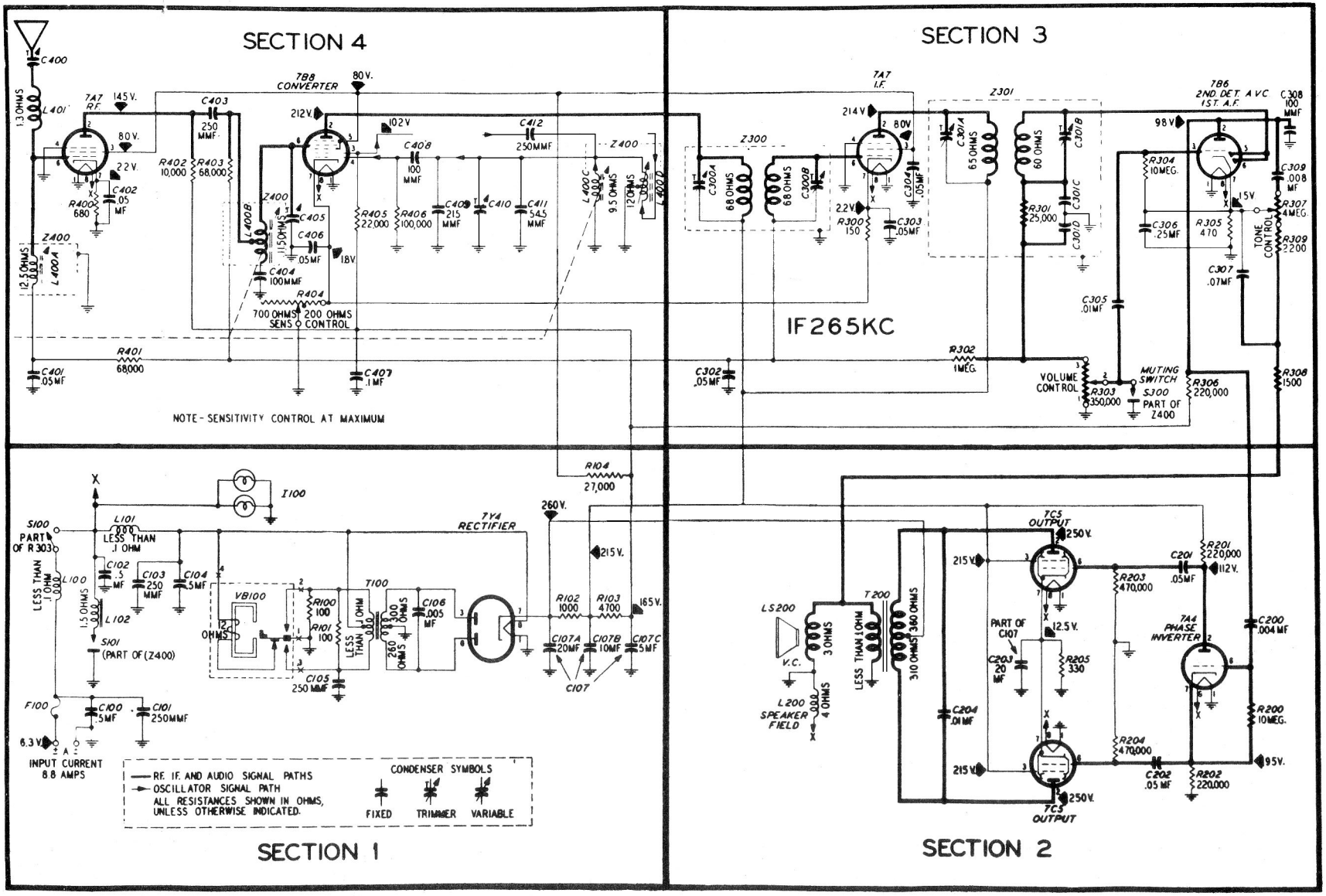

Figure 10. Complete schematic.

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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MODEL
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CIRCUIT DESCRIPTION

The circuit of the P4635 consists of a 7A7 r-f amplifier, a 7B8 converter, a 7A7 i-f amplifier, a 7B6 second detector-first audio, and an audio power amplifier using two 7C5's in push-pull, driven by a 7A4 phase inverter. The power supply is of the six-volt non-synchronous vibrator type, using a 7Y4 rectifier.

The antenna input circuit is designed for maximum interference elimination, without sacrifice of signal strength. Permeability tuning, controlled by a pantograph tuning unit, is used for both the r-f and oscillator stages. This method of tuning assures maximum sensitivity, selectivity, and stability for this type of receiver. A sensitivity control is provided (identified in figure 9, , which consists of a variable resistor in the cathode of the r-f amplifier stage. This should be adjusted for lower sensitivity in areas where most reception is from local stations, in order to minimize noise pickup.

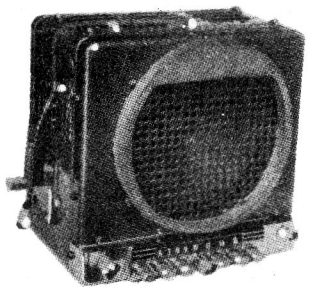
The P4635 uses an intermediate frequency of 265 kc., instead of the conventional 455 kc. This advantage is made possible by a tuned image-rejection circuit in the r-f amplifier stage, which keeps image interference at a minimum.

Two features of the audio system are the tone control, which is an inverse feed-back circuit built around the first audio amplifier, and the push-pull output stage, which delivers a full five watts of audio power to the dynamic speaker.

PHILCO TROUBLE-SHOOTING PROCEDURE

This service manual provides a complete trouble-shooting procedure for the P4635, 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. Tests indicated by a large asterisk (*) provide sectional master checks, making it possible to eliminate each section as a source of trouble without going through its entire test chart.

Wherever trouble is found (indicated by failure to get a "Normal Indication" on any test) it should be isolated by voltage and resistance checks of the parts associated with the point under test, and remedied before testing further.



MODEL P4635

SPECIFICATIONS

CIRCUIT	Eight-tube, superheterodyne
FREQUENCY RANGE	540 to 1600 kc.
INTERMEDIATE FREQUENCY	265 kc.
POWER INPUT	6.3 volts, 8.8 amperes, d.c.
PHILCO TUBES	7A7(2), 7B8, 7B6, 7A4, 7C5(2), 7Y4

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 connector.

For the r-f alignment (all steps after the first), inject the signal through a 20-mmf. condenser in series with an antenna lead (Part No. 95-0181) plugged in to the antenna receptacle. If an antenna lead is not available, connect a 30-mmf. condenser from the antenna receptacle to ground, and inject the signal through the 20-mmf. condenser alone. **The foregoing instruction must be carefully followed if the receiver is to give its best performance after being reinstalled in the car.**

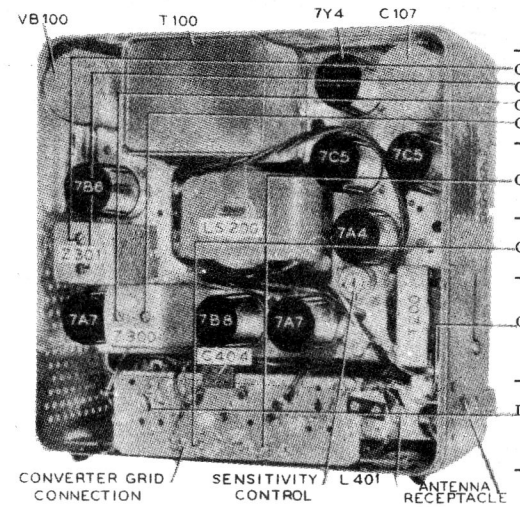
CONNECT THE OUTPUT METER between the voice-coil lug on the speaker and the receiver chassis.

ADJUST THE RECEIVER CONTROLS as follows:

Set the volume and sensitivity controls at maximum. Set the tone control for maximum signal output (approximately the center of its range).

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, make the following adjustments: Set the antenna trimmer for maximum signal strength on a weak station near 1400 kc. Set the sensitivity control for low sensitivity, if the receiver is to be used mainly for local-station reception, or higher sensitivity depending on the degree of distant-station reception desired. The lower the sensitivity can be set, the less will be the noise and interference pickup.



ADJUST IN ORDER	SPECIAL INSTRUCTIONS	DIAL SETTINGS SIG. GEN.	DIAL SETTINGS RECEIVER
C301A C301B C300A C300B	Ground pin 4 of the 7B8. Adjust for maximum and then repeat procedure.	265 kc.	1600 kc.
C410	Remove the ground from pin 4 of the 7B8. Adjust for maximum.	1600 kc.	1600 kc.
C405	Adjust for maximum.	1400 kc.	1400 kc.
C400	Adjust for maximum. Final adjustment to be made after installation in car, with antenna connected.	1400 kc.	1400 kc.
L400D	Adjust for maximum while rocking tuning control back and forth across signal.	580 kc.	580 kc.
	Repeat all steps after the first.		

Figure 9. Chassis view, showing trimmer locations.

All components in the receiver circuit are symbolized and located as follows.

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

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

PRELIMINARY CHECKS

The following preliminary checks are recommended:

1. Carefully inspect both sides of the chassis. Make sure that all the 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, overheated 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 C107 for shorts before inserting a new tube. If the vibrator is defective, check C106 for a short before inserting a new vibrator.

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TESTS TO ISOLATE TROUBLE WITHIN SECTION 1

MAKE TEST ★ FIRST

If the "NORMAL INDICATION" is obtained, proceed to the next section. If not, isolate and remedy the trouble in this section.

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 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, C107, for shorts before inserting a new tube. If the vibrator is found to be defective, check C106 for a short before inserting a new vibrator.

TEST POINTS	NORMAL INDICATION	POSSIBLE CAUSE OF ABNORMAL INDICATION
★ D to B—	165 volts	Trouble within Section 1. Isolate by following tests.
A to B—	260 volts	Defective 7Y4, VB100, T100, C105, C106, C107A, or C107B.
C to B—	215 volts	Defective R102, C107B or C107C.
D to B—	165 volts	Defective R103, C107C or C407 (see Section 4 for location).

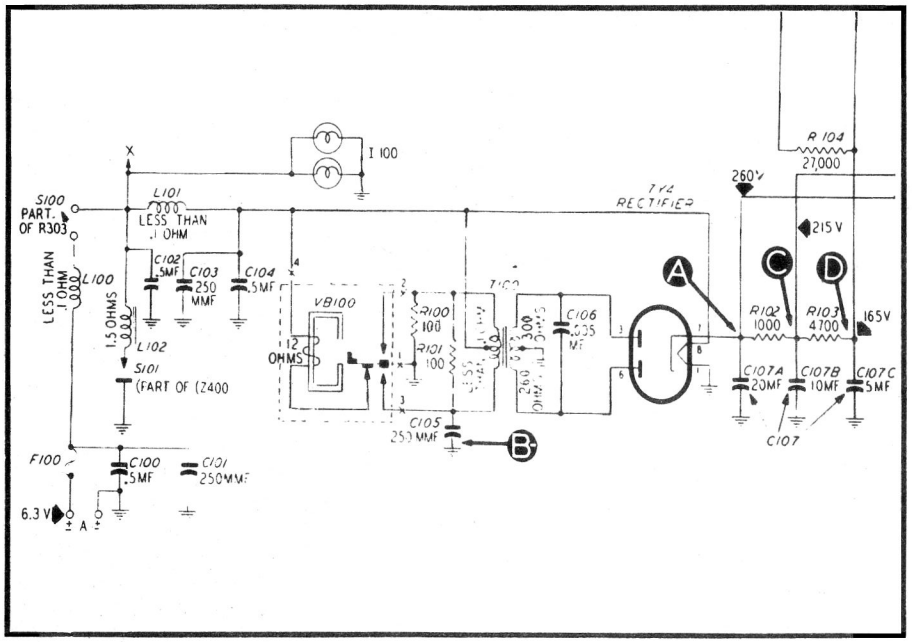

Figure 1. Section 1 schematic.

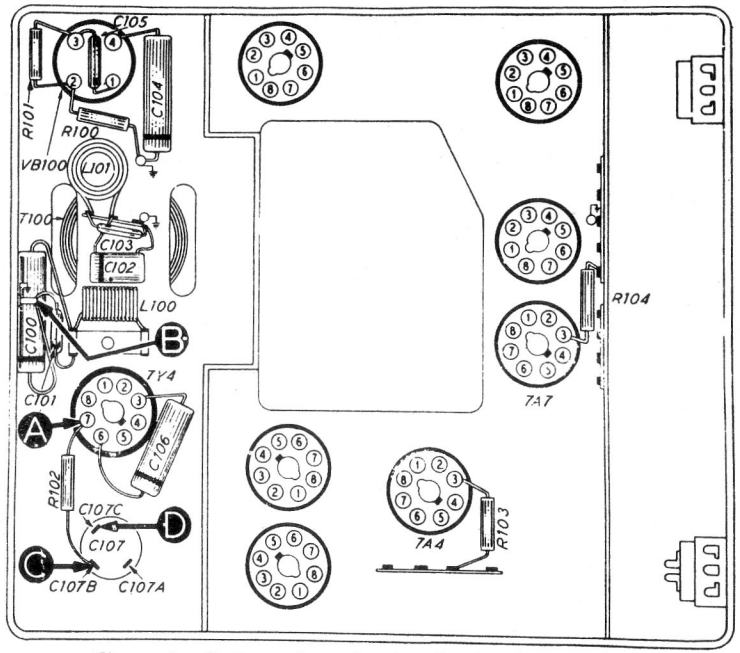

Figure 2. Bottom view, showing Section 1 test points.

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MAKE TEST ★ FIRST

If the "NORMAL INDICATION" is obtained, proceed to the next section. If not, 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 adjust the signal-generator output for a loud, clear signal.

★

TEST POINTS	NORMAL INDICATION	POSSIBLE CAUSE OF ABNORMAL INDICATION
H to B—	Loud, clear signal.	Trouble within Section 2. Isolate by following tests.
E to B— (Remove 7A4)	Loud, clear signal.	Defective 7C5, T200, LS200, R203, R205, C201, C202, C203, or C204.
F to B— (7A4 removed)	Loud, clear signal, same as preceding test.	Defective 7C5, T200, R204, or C202.
G to B— (Replace 7A4)	Clear signal, louder than preceding test.	Defective 7A4, R202, R201, R200, or C200.
H to B—	Loud, clear signal, same as preceding test.	Defective C200 or C308 (see Section 3 for location).

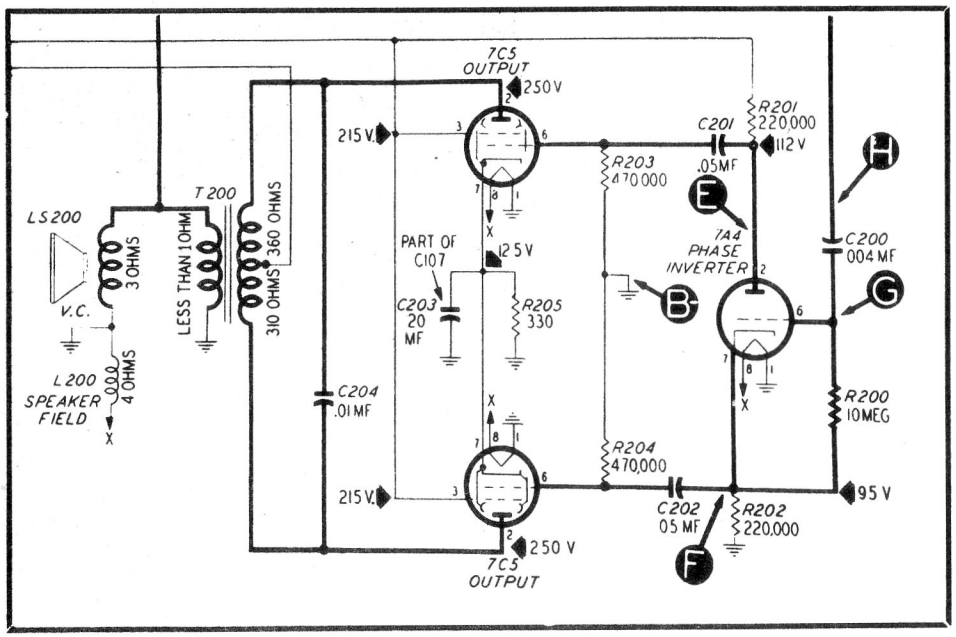

Figure 3. Section 2 schematic.

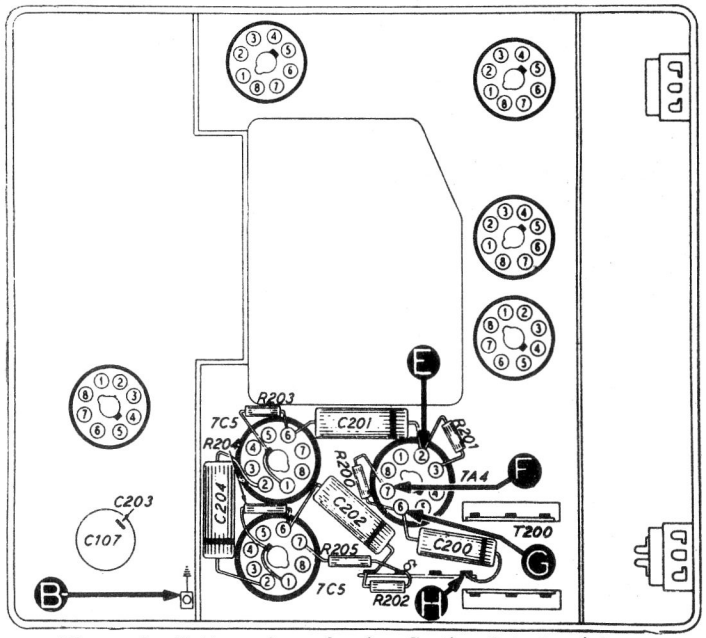

Figure 4. Bottom view, showing Section 2 test points.

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MAKE TEST ★ FIRST

If the "NORMAL INDICATION" is obtained, proceed to the next section. If not, isolate and remedy the trouble in this section.

TESTS TO ISOLATE TROUBLE WITHIN SECTION 3

For the second and third tests in the chart for this section, use an audio signal. For the first, and the last two, use a modulated 265-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
M to B— (265-kc. signal)	Loud, clear signal.	Trouble within Section 3. Isolate by following tests.
J to B— (audio signal)	Loud, clear signal.	Defective 7B6, R306, R305, R304, C306, C308, or C309.
K to B— (audio signal)	Loud, clear signal.	Defective C305, S300, or R303 (rotate R303 through its entire range for complete check).
L to B— (265-kc. signal)	Loud, clear signal.	Defective 7A7, C301C, C301D, C303, C304, R104, R300, R404, or Z301.
M to B— (265-kc. signal)	Loud, clear signal.	Defective R302 or Z300.

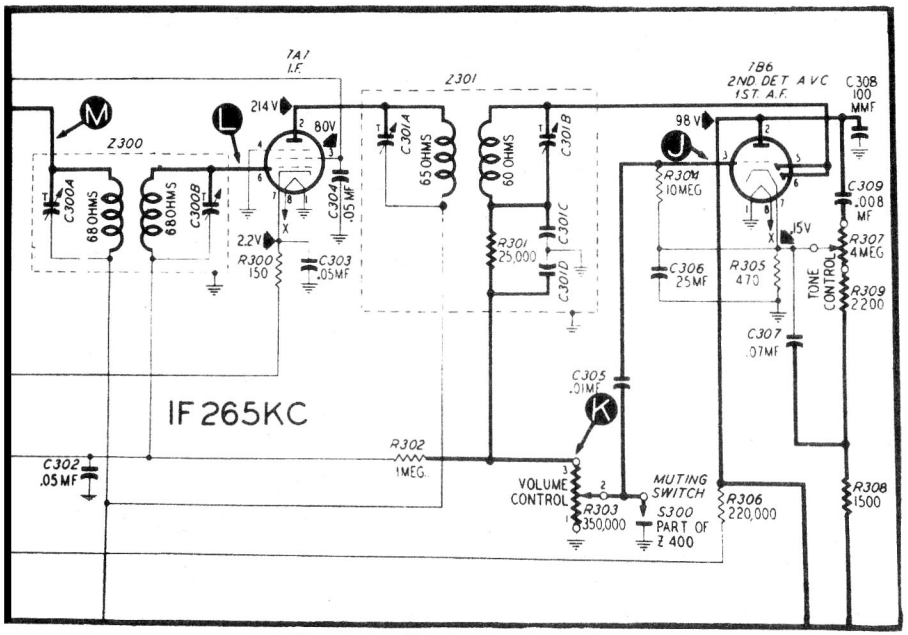

Figure 5. Section 3 schematic.

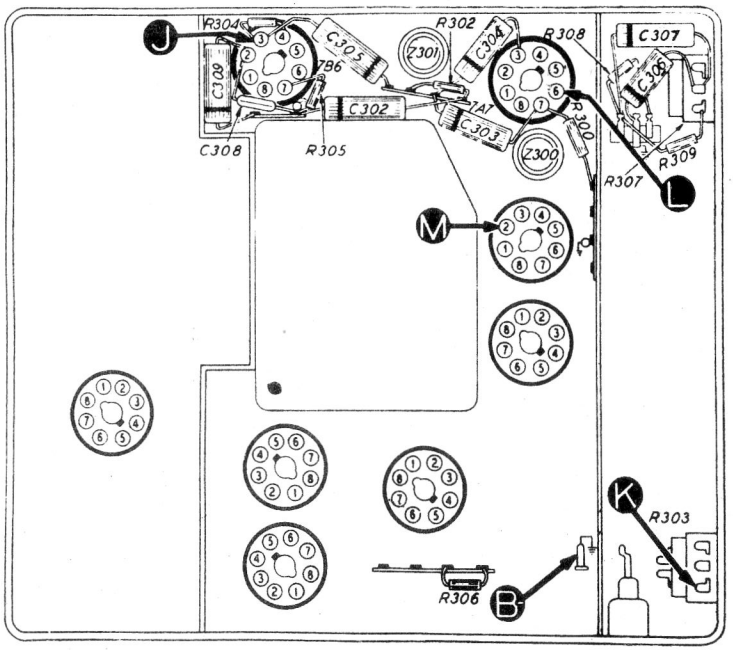

Figure 6. Bottom view, showing Section 3 test points.

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MAKE TEST ★ FIRST

If the "NORMAL INDICATION" is not obtained, isolate and remedy the trouble in this section.

TESTS TO ISOLATE TROUBLE WITHIN SECTION 4

1. 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 S. Rotate the tuning control; absence of voltage indicates that the oscillator is not functioning. If so, check the components listed in the second test below.

2. 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 adjust the generator output for a loud, clear signal.

TEST POINTS	NORMAL INDICATION	POSSIBLE CAUSE OF ABNORMAL INDICATION
R to B—	Loud, clear signal.	Trouble within Secton 4. Isolate by following tests.
N to B—	Loud, clear signal.	Defective 7B8, L400C, L400D, R404, R405, R406, C408, C409, C410, C411, or C412.
P to B—	Loud, clear signal.	Defective C403, C404, C405, R403, or L400B.
Q to B—	Loud, clear signal.	Defective 7A7, L400A, R400, R402, or C402.
R to B—	Loud, clear signal.	Defective L401, C400, or C401.

★

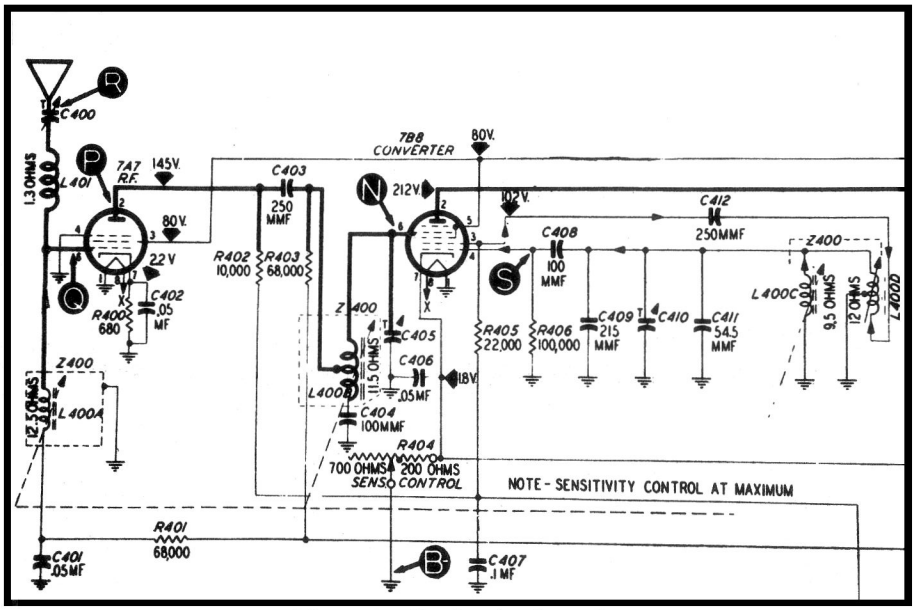

Figure 7. Section 4 schematic.

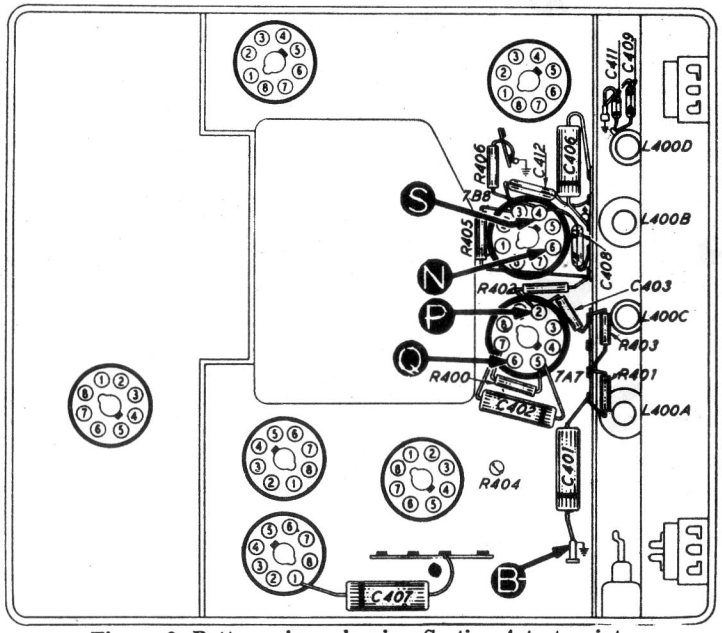

Figure 8. Bottom view, showing Section 4 test points.

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