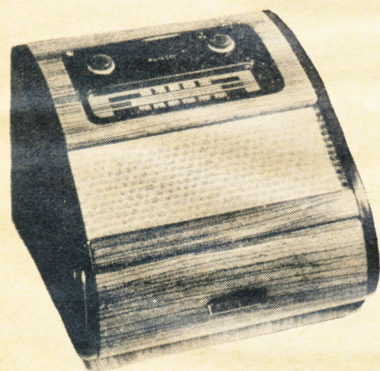


PHILCO SERVICE



Model 706

PHILCO RADIO

SPECIFICATIONS

CABINET	Model 706 (Wood, Philcote finish)
CIRCUIT	Five-tube superheterodyne
FREQUENCY RANGE	540 to 1600 kc.
PHONOGRAPH	Philco automatic record player, Model M-7
POWER INPUT	105 to 120 volts—A.C. only
POWER CONSUMPTION	32 watts (exclusive of phono motor)
ANTENNA	Built-in loop or external
INTERMEDIATE FREQUENCY	460 kc.
PHILCO TUBES USED	7A8, 7B7, 7C6, 50L6GT/G, 50Y6GT/G
PILOT LAMP	110-volt, screw base, Part No. 34-2540

NOTE: The parts list and service procedure for adjusting the M-7 automatic record player on model 706 will be found in Philco Service Manual PR-1154.

PHILCO TROUBLE-SHOOTING PROCEDURE

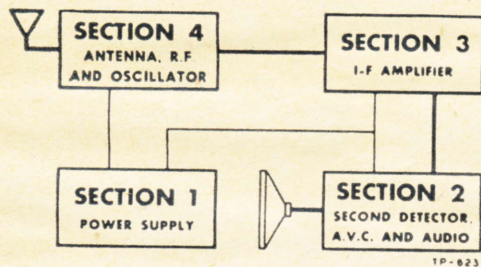


Figure 1. Block diagram (Heavy lines indicate signal path).

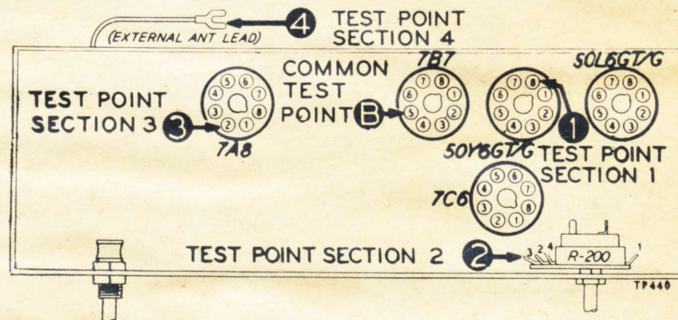


Figure 2. Bottom view, showing test points.

In this manual, the receiver circuit is divided into four sections, as shown in figure 1. One test point is designated for each section, as shown in figure 2. Normal indications, secured when checking at these test points, eliminate the section under test as a source of trouble. Isolation of the faulty part is accomplished by testing in the order shown in the sectional test charts. A high-quality signal generator and volt-ohmmeter are required. Voltage readings shown were taken with a 20,000-ohms-per-volt d-c meter.

To localize trouble, connect the receiver to the power line; turn the receiver volume control to maximum; see that all tube filaments are lighted; then proceed in the order given in the following chart. When applying a signal, connect the signal-generator output lead through a condenser (.01 to .25 mf.) to the indicated test points; connect the generator ground lead through a .5 mf. condenser to B-. Remedy any defect encountered before proceeding to the next check.

NOTE: To open the cabinet, release the catch, which is accessible through the circular opening near the rear of the bottom cover. While holding the catch up, slide the top section of the cabinet 3/4" toward the rear. The top section can then be lifted away from the base board. When reassembling the cabinet, make sure that all leads are clear of the phono turntable and pickup.

TESTS TO LOCALIZE TROUBLE TO ONE SECTION

SECTION	TEST	NORMAL RESULTS
1	Measure voltage between point 1 and B-.	120v*
2	Apply audio signal through a condenser (.01 to .25 mf.) between point 2 and B-.	Loud, clear signal
3	Apply weak, modulated signal (460 kc.) through a condenser (.01 to .25 mf.) between point 3 and B-.	Loud, clear signal
4	Apply weak, modulated signal (1000 kc.) through a condenser (.01 to .25 mf.) between point 4 and B-. Rotate tuning condenser until signal is heard in speaker.	Loud, clear signal

* For 117-volt, a-c input

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TESTS TO ISOLATE TROUBLE WITHIN SECTION 1

Make all tests for this section with a volt-ohmmeter, using the applicable d-c range. See figures 3 and 4 for location of test points. If the 50Y6GT/G is found to be defective, check C101, C102, and C104 for shorts before inserting a new tube.

Test Points	Normal Reading	Possible Cause of Abnormal Indication
A to C	190v	Defective 50Y6, shorted or leaky C101, C102, C104, or C204 (see Section 2 for location).
A to B-	120v	Open L100.
D to B-	-7v	High voltage indicates open R102. No voltage indicates open R101.

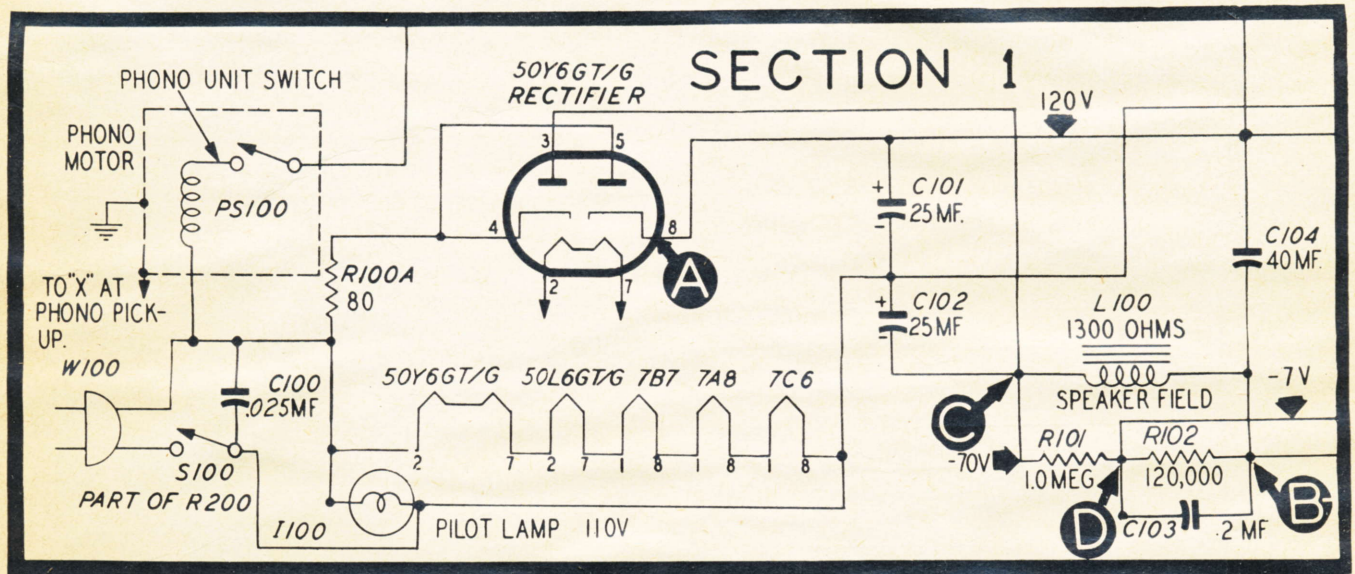


Figure 3. Section 1 schematic.

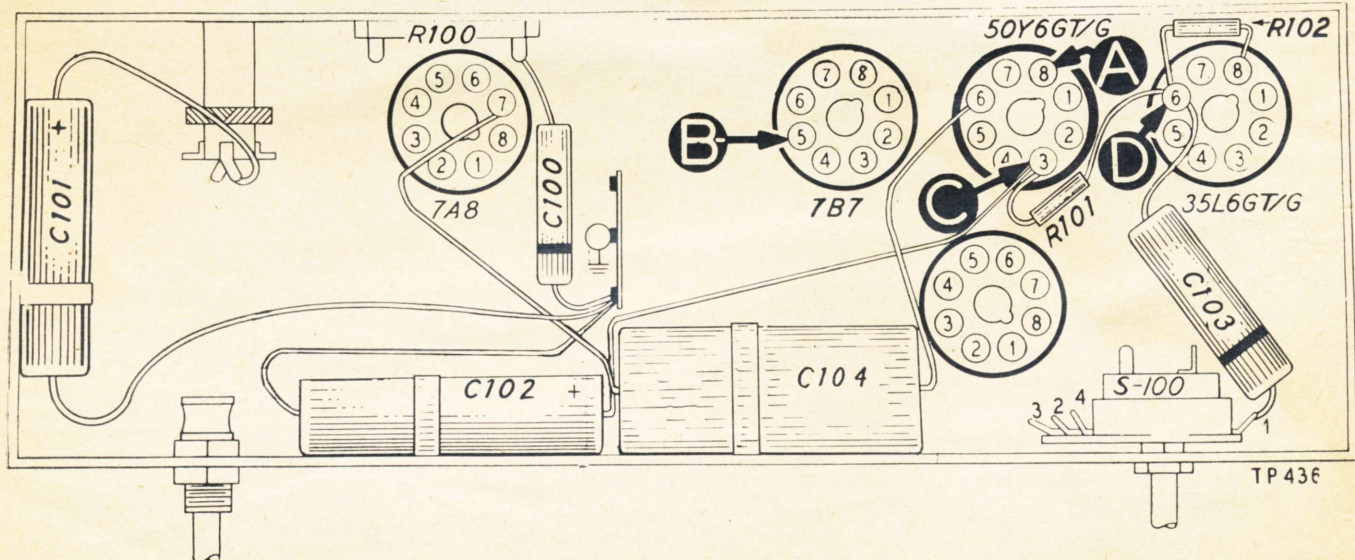


Figure 4. Bottom view, showing Section 1 test points.

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 points indicated; connect the generator ground lead through a .5-mf. condenser to B-. Set the receiver volume control at maximum, and adjust the generator output for a loud, clear signal.

Test Points	Normal Indication.	Possible Cause of Abnormal Indication
E to B-	Loud, clear signal from speaker.	Defective 50L6GT/G, T200, LS200, or C203.
F to B-	Loud, clear signal, same as preceding test.	Open C203.
G to B-	Clear signal, noticeably louder than preceding test.	Defective 7C6 or R203.
H to B- (volume control in maximum radio position)	Loud, clear signal, same as preceding test.	Open C201, or defective volume control Rotate R200 through its entire radio range for complete check.
J to B- (volume control in maximum phono position)	Loud, clear signal, same as preceding test.	Defective volume control. Rotate R200 through its entire phono range for complete check.

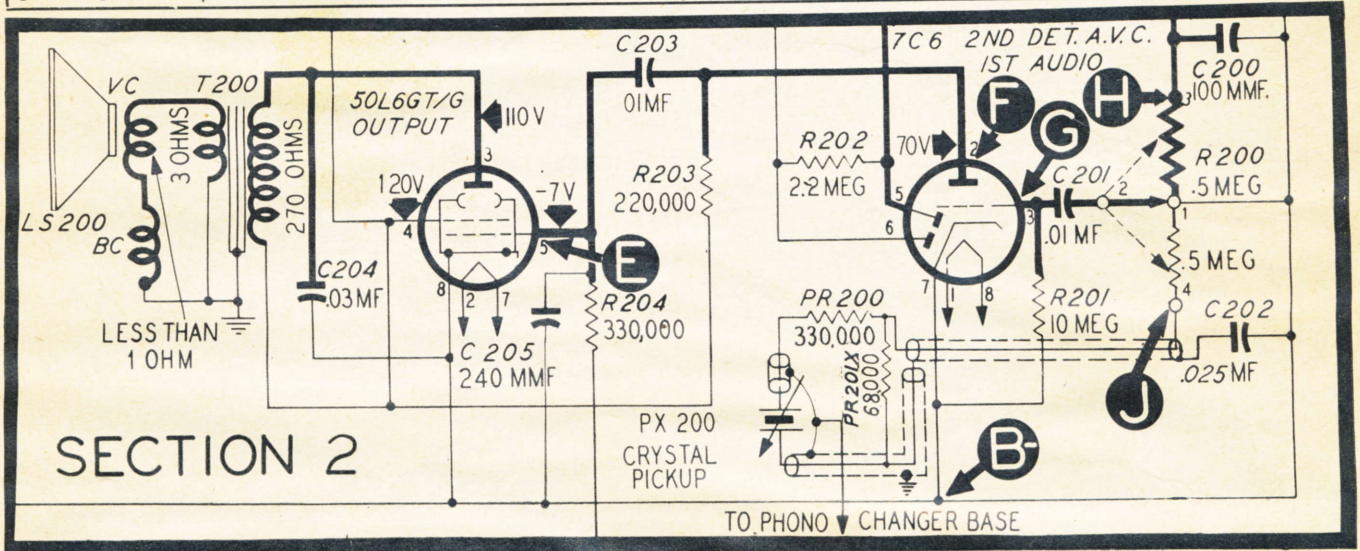


Figure 5. Section 2 schematic.

TP-420

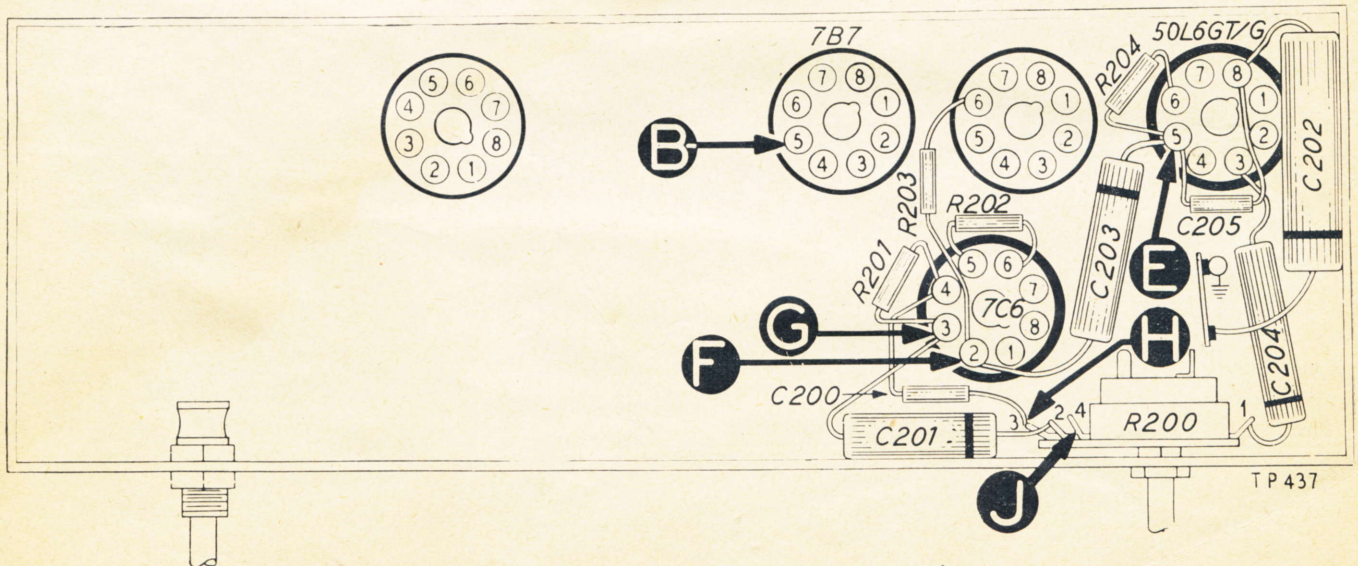


Figure 6. Bottom view, showing Section 2 test points.

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TESTS TO ISOLATE TROUBLE WITHIN SECTION 3

For all tests in this section, set the signal generator to 460 kc., with modulation on. Connect the generator output lead through a condenser (.01 to .25 mf.) to the points indicated; connect the ground lead through a .5 mf. condenser to B-. Set the receiver volume control at maximum, and adjust the generator output for a loud, clear signal.

Test Points	Normal Indication	Possible Cause of Abnormal Indication
K to B-	Loud, clear signal from speaker	Defective 7B7 or 7C6, defective or misaligned Z301, shorted C302, or open R401 (see Section 4 for location).
L to B-	Loud, clear signal, same as preceding test.	Defective or misaligned Z300.

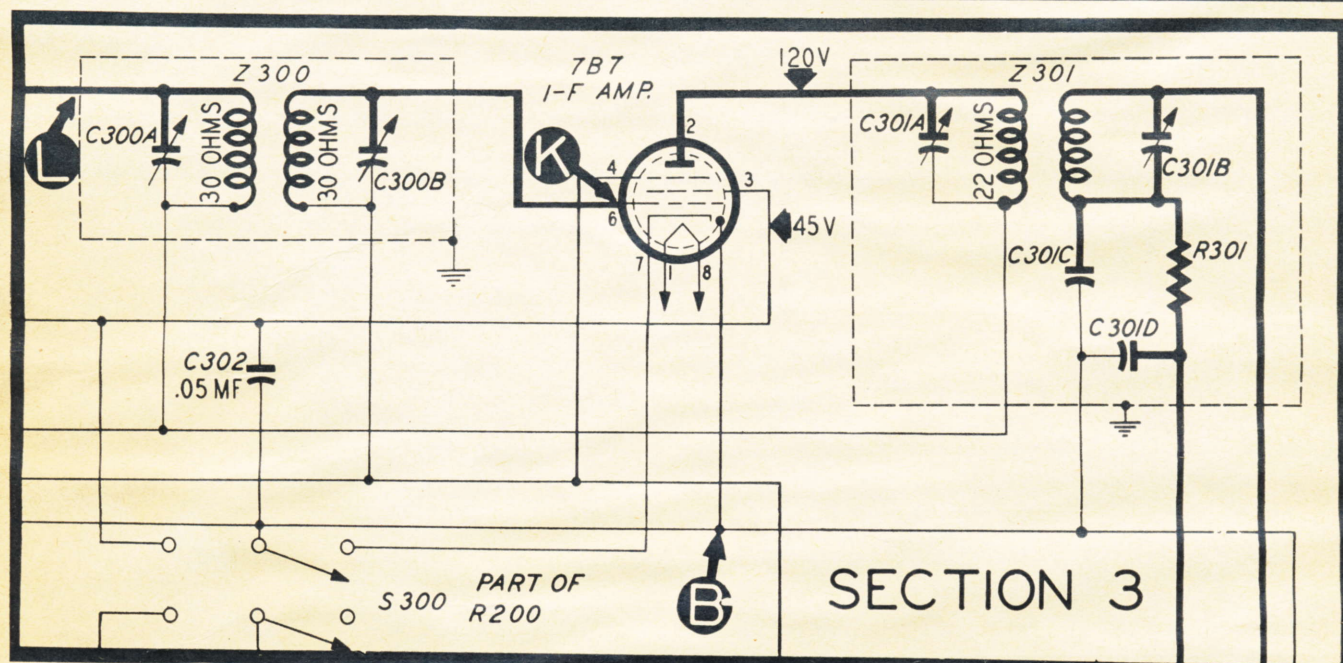


Figure 7. Section schematic.

TP-420-C

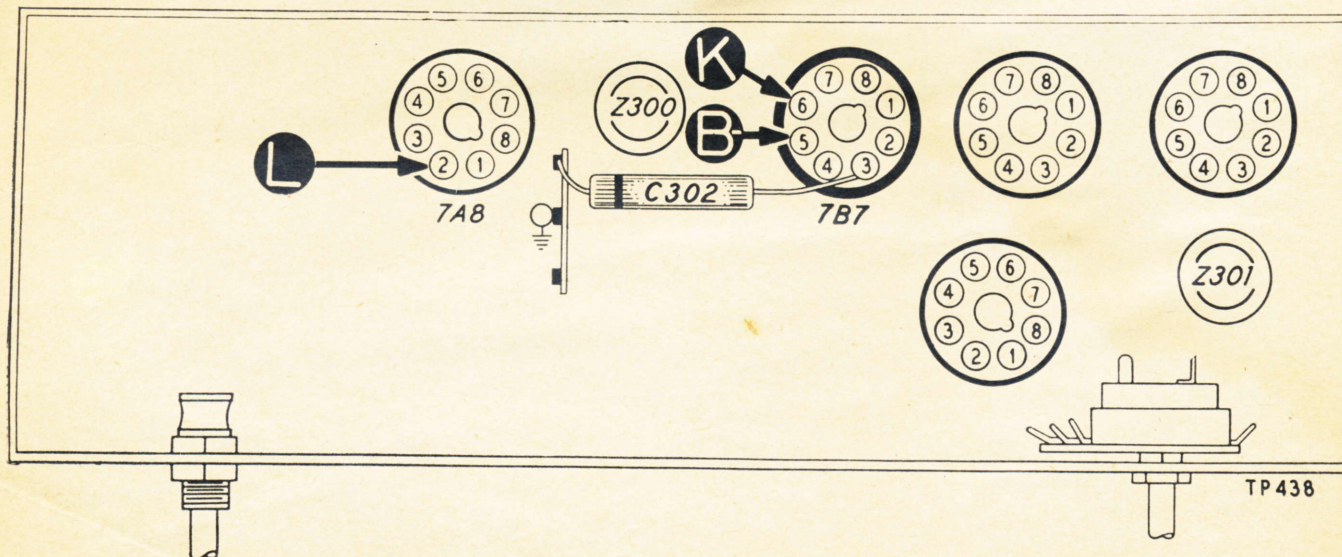


Figure 8. Bottom view, showing Section 3 test points.

TESTS TO ISOLATE TROUBLE WITHIN SECTION 4

1. Set the volume control at maximum. Rotate the tuning condenser through its entire range. Any scraping noise from the speaker indicates bent plates, or dirt between plates or on wiper contacts. Remedy such conditions before proceeding further.
2. Attach the positive lead of a 20,000-ohms-per-volt meter to B- and the prod end of the negative lead through

- a 50,000-ohm resistor to point P. Set the meter on a 10-volt or similar range, and rotate the tuning condenser through its entire range. Absence of voltage at any point indicates that the oscillator is not functioning. If so, check the components listed in the first test below.
3. Connect the signal generator as for previous tests, tune the generator to 1000 kc., and proceed as below.

Test Points	Normal Indication	Possible Cause of Abnormal Indication
M to B- (Rotate tuning condenser until signal is heard).	Loud, clear signal from speaker.	Defective 7A8, T401, R400, or C401B.
N to B-.	Clear signal, louder than preceding test.	Defective T400 or open C400.

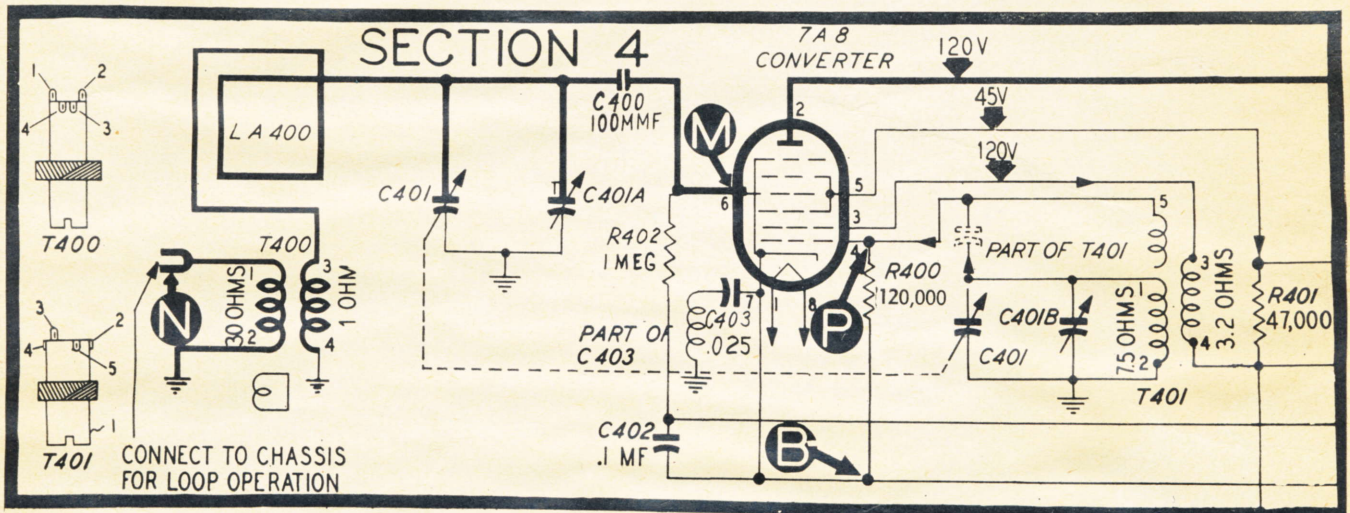


Figure 9. Section 4 schematic.

TP-420-D

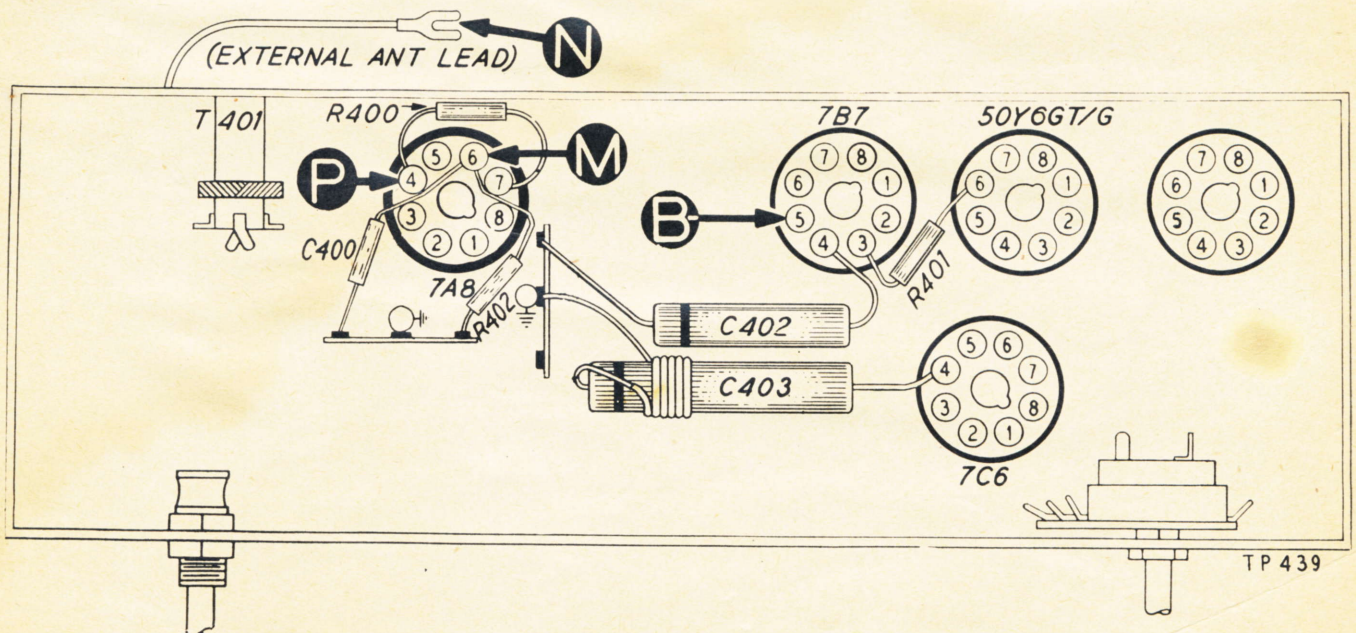


Figure 10. Bottom view, showing Section 4 test points.

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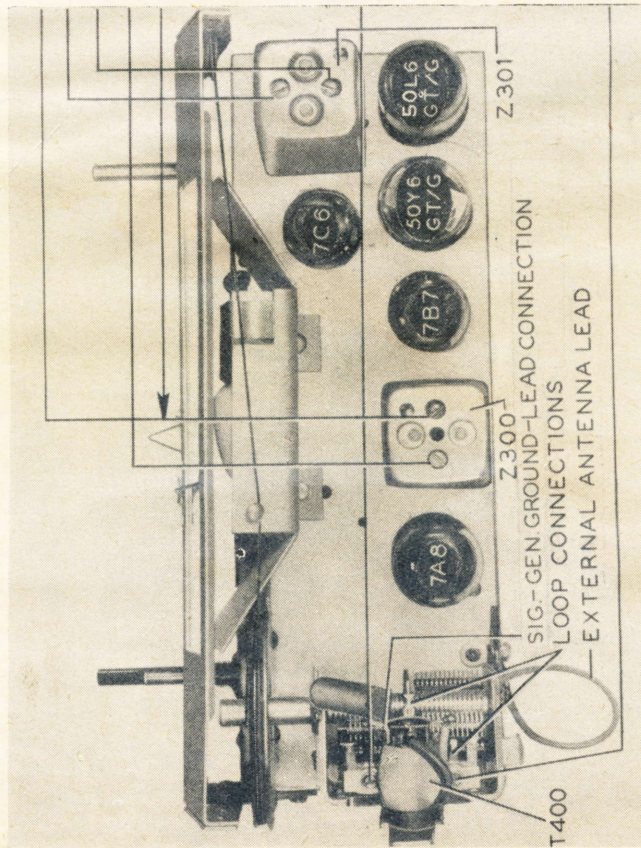
ALIGNMENT PROCEDURE

THIS RECEIVER SHOULD BE ALIGNED with the chassis installed in the cabinet. If the chassis has been removed for servicing, re-install it and connect the loop before starting the alignment procedure.

CONNECT THE OUTPUT METER between the voice coil lug on the speaker and ground.

CONNECT THE SIGNAL-GENERATOR output lead as indicated in the chart below. Connect the generator ground lead as indicated in figure 11.

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



Adjust in Order	Signal Generator to Receiver	Dial Settings Sig. Gen. Receiver
C300B . C301B . C301A . C300A . C300B .	Through .05 mf. to external antenna lead, after disconnecting same from grounded point on chassis.	460 K.C. Gang fully meshed
C401B .	Through .05 mf. to external antenna lead.	1600 K.C. 1600 K.C
C401A .	Through .05 mf. to external antenna lead.	1500 K.C. 1500 K.C

Figure 11. Chassis view, showing trimmer locations.

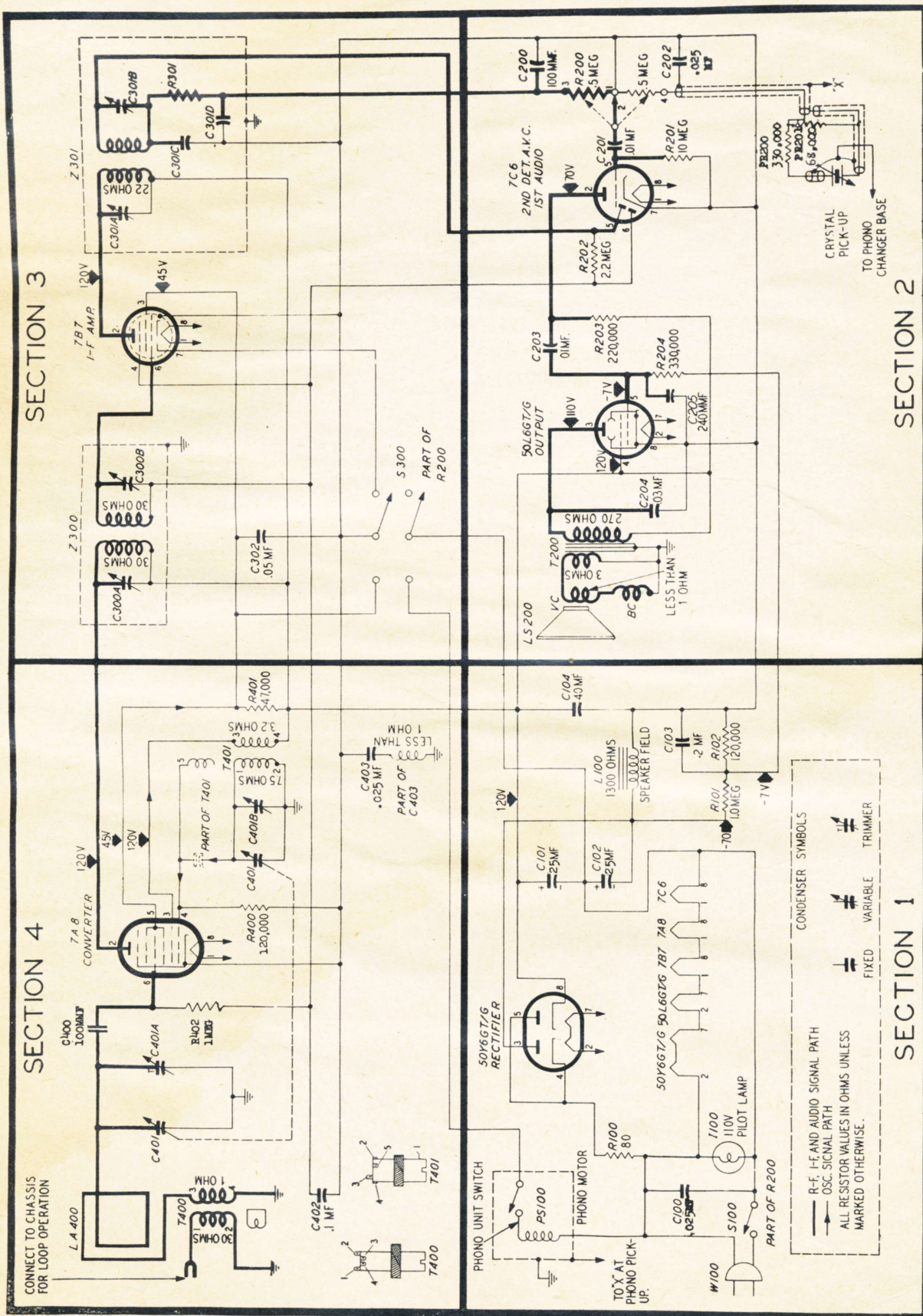


Figure 12. Complete schematic.

NOTE: All voltage, capacity, and resistance values shown are average. The voltages between B- and other points indicated were measured with a 20,000-ohms-per-volt meter, with the volume control at minimum and the tuning condenser plates fully meshed.

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Symbol designations used in the schematics and parts list are as follows:

C—condenser	R—resistor
I—Pilot lamp	S—switch
LA—loop antenna	T—transformer
LS—Loudspeaker	W—power cord and plug
L—Choke or coil	Z—i-f transformer assembly

NOTE: Parts marked with an asterisk (*) are general replacement items, and the part numbers will not be identical with those used on factory assemblies. Use only the "Service Part No." shown below when ordering replacements.

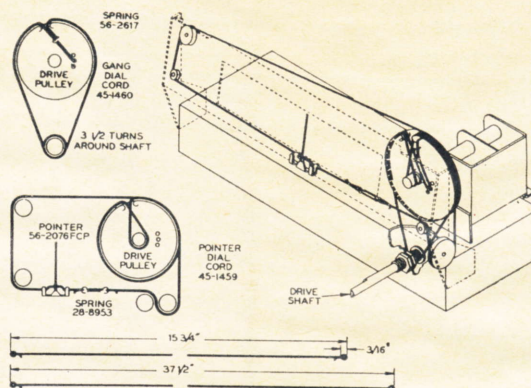


Figure 13. Drive cord installation details.

REPLACEMENT PARTS LIST

SECTION 1

Reference	Description	Service Part No.
C100	Condenser, .025 mf.	30-4598
C101	Condenser, electrolytic, 25 mf.	45-6265
C102	Condenser, electrolytic, 25 mf.	45-6265
C103	Condenser, .2 mf.	45-3500-3*
C104	Condenser, electrolytic, 40 mf.	30-2548
I100	Lamp, pilot	34-2540
L100	Coil, field	Part of LS200
R100	Resistor, 80 ohms	66-0825340
R101	Resistor, 1 meg.	66-5103340*
R102	Resistor, 120,000 ohms	66-4123340*
S100	Switch, off-on	Part of R200
W100	Cord, a-c	L399

SECTION 2

C200	Condenser, 100 mmf.	60-10105407*
C201	Condenser, .01 mf.	61-0120*
C202	Condenser, .025 mf.	30-4599*
C203	Condenser, .01 mf.	61-0120*
C204	Condenser, .03 mf.	45-3500-1*
C205	Condenser, 240 mmf.	60-10245307*
LS200	Speaker	36-1587*
T200	Transformer, output	32-8172
R200	Control, volume, .5 meg. each side of center tap	33-5519
R201	Resistor, 10 megs.	66-6103340*
R202	Resistor, 2.2 megs.	66-5223340*
R203	Resistor, 220,000 ohms	66-4223340*
R204	Resistor, 330,000 ohms	66-4333340*
PR200	Resistor, 330,000 ohms	66-4333340*
PR201	Resistor, 68,000 ohms	66-3683340*

SECTION 3

C302	Condenser, .05 mf.	61-0122*
S300	Switch, phono-changer	42-1736
Z300	Transformer, first i-f	32-3968
C300A	Condenser	Part of Z300
C300B	Condenser	Part of Z300
Z301	Transformer, second i-f	32-4005
C301A	Condenser	Part of Z301
C301B	Condenser	Part of Z301
C301C	Condenser	Part of Z301
C301D	Condenser	Part of Z301
R301	Resistor	Part of Z301

SECTION 4

C400	Condenser, 100 mmf.	60-10105407
C401	Condenser, tuning	31-2659
C401A	Condenser, trimmer	Part of C401
C401B	Condenser, trimmer	Part of C401
C402	Condenser, .1 mf.	61-0113*
C403	Condenser-and-choke assembly, .025 mf.	76-2388

SECTION 4 (Continued)

Reference	Description	Service Part No.
LA400	Loop assembly	76-2127
R400	Resistor, 120,000 ohms	66-4123340
R401	Resistor, 47,000 ohms	66-3473340*
R402	Resistor, 1 meg.	66-5103340*
T400	Coil, antenna	32-3394
7401	Coil, oscillator	32-3562

MISCELLANEOUS

Backing plate, dial	76-1940
Backing plate, dial-and-bracket assembly	76-2057
Panel, diffusing	54-4256
Backing plate, tuning-condenser	56-2105FA3
Bracket, antenna-coil-mounting	56-2105FA3
Bracket, resistor-mounting assembly	56-3596
Cabinet	10639
Baffle, wood	219036
Band, rubber, for scale mounting	54-4168
Bolt, speaker-mounting	W2123
Catch and keeper, for cabinet	45-6297
Clip, bar, assembly	76-2111
Cloth, grille, assembly	40-6769
Hinge, left-hand	45-6298
Hinge, right-hand	45-6296
Strap, scale-mounting	56-2068
Cable, pick-up	41-3708
Cable, speaker	41-3728
Cam assembly	76-1638FA3
Clamp, electrolytic-condenser-mounting	56-1466FA3
Clip, coil-mounting	28-5002FE7
Cover, cabinet-bottom	54-7135
Cover, resistor-mounting assembly	56-3597
Cord, gang-drive, 25-foot spool	45-1460*
Cord, pointer-drive, 25-foot spool	45-1459*
Feet, rubber	27-4817
Grommet, gang-mounting	27-4610
Knob assembly	54-4255
Lamp, pilot, assembly	41-3742-4
Panel, wiring, 2-lug	12W45649
Panel, wiring, 3-lug	76-2148
Plug, speaker	27-4412
Pointer, dial	56-2076FCP
Rivet	1W36671FCP
Shaft assembly	31-2680
Socket, Loktal	27-6138*
Socket, octal	27-6199*
Socket, speaker-cable	27-4461
Spring, gang-drive-cord	56-2617
Spring, pointer-drive-cord	28-8953
Spring, retailer	28-8658FA1
Stud, switch-lever	56-2945FA3
Switch-lever assembly	76-1642