

PHILCO SERVICE

RADIO MODEL 46-131

TESTS TO ISOLATE TROUBLE WITHIN SECTION 1

Make all tests for this section with a volt-ohmmeter, using the 0-250v. d-c range. Voltages given were taken with the set operating and drawing normal current from battery. See figures 3 and 4 for location of test points.

Test Points	Normal Reading	Possible Cause of Abnormal Reading
B to C (chassis)	79 volts	No voltage indicates open battery cable, defective switch S100, open resistor R100, shorted condenser C100. Low voltage indicates nearly dead battery, defective resistor R100, leaky condenser C100, or excessive plate or screen current by one or more tubes.
A to C	1.4 volts	No voltage indicates open battery cable or defective switch S100.
D to C	6 volts	Deviation in this voltage indicates change in value of resistor R100, or abnormal current flow because of defective parts in sections 2, 3, or 4.

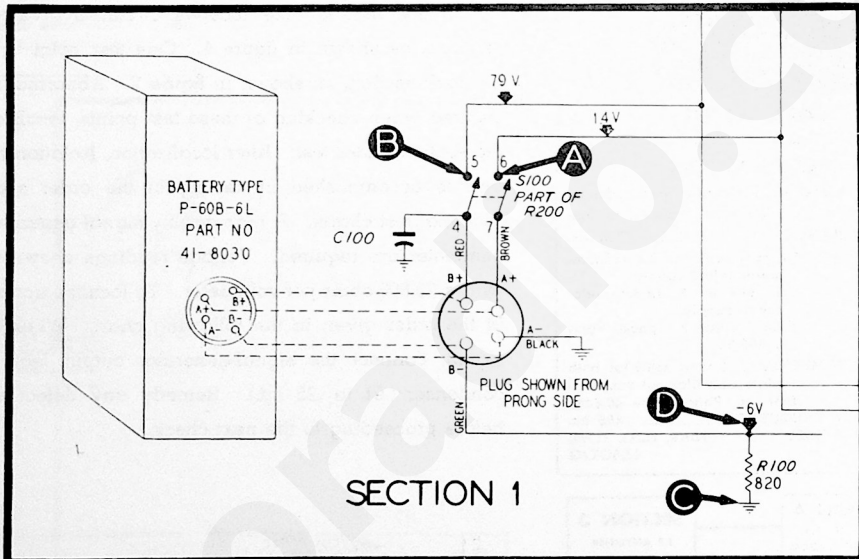


Figure 3. Section 1 schematic.

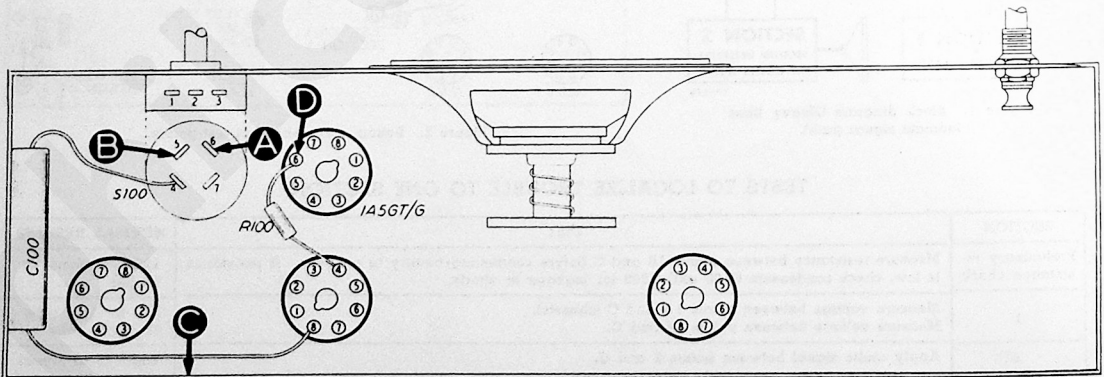


Figure 4. Bottom view, showing section 1 test points.

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TESTS TO ISOLATE TROUBLE WITHIN SECTION 2

For all tests in this section use the audio range of the signal generator. Connect the generator output lead through a condenser (.01 to .25 mf.) to points indicated; connect the ground lead to receiver chassis. Adjust signal generator output for clear, audible signal.

Test Points	Normal Indication	Possible Cause of Abnormal Indication
E to C (chassis)	Clear, audible signal from speaker (receiver volume control at approximately three-fourths maximum).	No signal indicates defective 1A5GT/G, defective output transformer T200 or speaker LS200. Low and greatly distorted signal indicates leakage in condensers C202 or C203.
F to C	Clear, audible signal, same as preceding test.	No signal indicates open condenser C202, or shorted condenser C201; distortion indicates leakage in condenser C202, or open resistor R203.
G to C	Clear, audible signal with noticeable increase over that obtained in previous tests.	No signal indicates defective 1LH4, or open resistor R202. Distortion indicates defective 1LH4.
H to C	Clear, audible signal, same as preceding test.	No signal indicates open condenser C200; noisy or otherwise distorted signal indicates defective volume control R200. Rotate control through entire range for complete check.

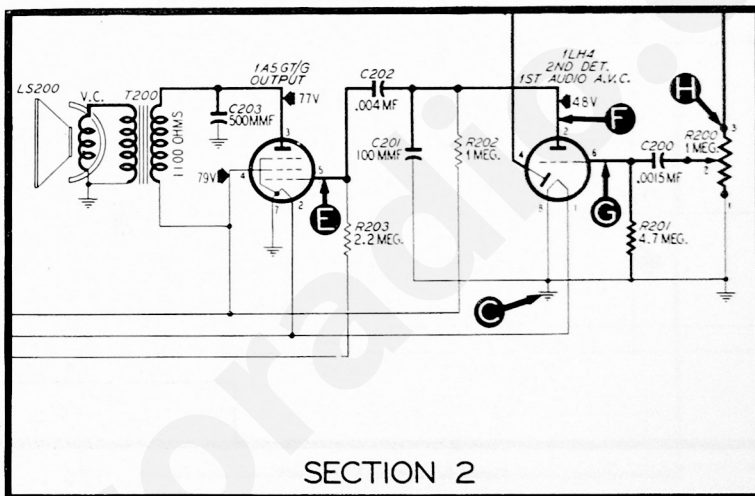


Figure 5. Section 2 schematic.

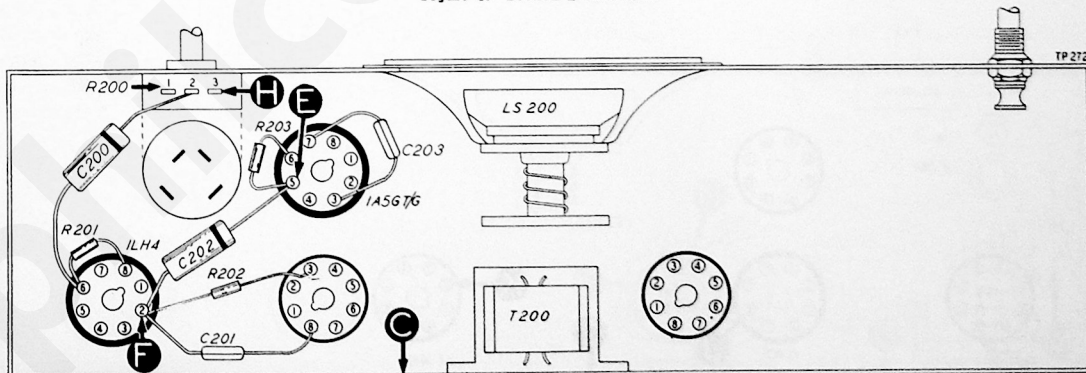


Figure 6. Bottom view, showing section 2 test points.

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TESTS TO ISOLATE TROUBLE WITHIN SECTION 3

For all tests in this section, set the signal generator to 455 kc., modulation on. Connect the generator output lead through a condenser (.01 to .25 mf.) to the points indicated; connect the ground lead to receiver chassis. Adjust signal generator output for clear, audible signal.

Test Points	Normal Indication	Possible Cause of Abnormal Indication
J to C (chassis)	Audible signal from speaker.	No signal, or very weak signal, indicates defective 1LN5 tube, defective or misaligned i-f transformer assembly Z301, or defective diode section of 1LH4 tube.
K to C	Audible signal from speaker.	No signal indicates defective or misaligned i-f transformer assembly Z300.

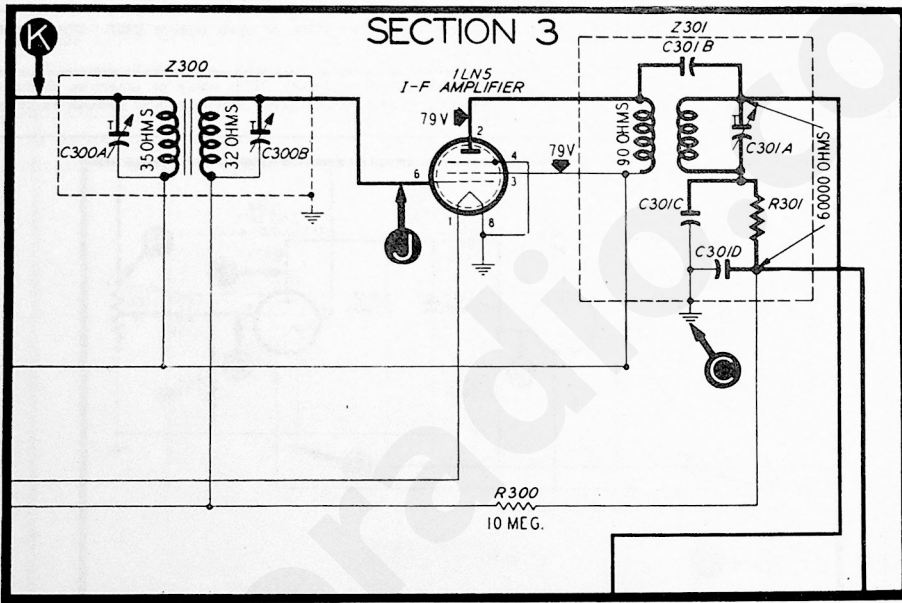


Figure 7. Section 3 schematic.

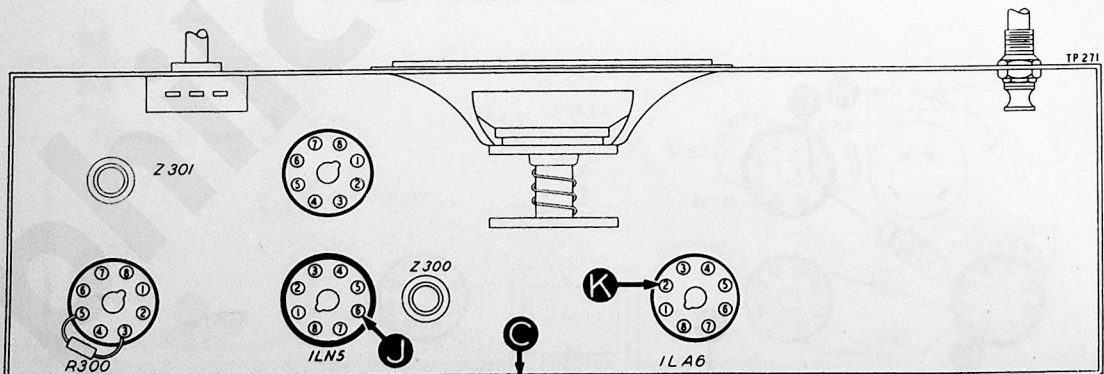


Figure 8. Bottom view, showing section 3 test points.

TESTS TO ISOLATE TROUBLE WITHIN SECTION 4

IMPORTANT: Before applying a test signal to this section, make a preliminary check by rotating the tuning control through its entire range. Any scraping noise heard in the speaker indicates bent tuning condenser plates, dirty wiper contacts or dirt between the condenser plates. These conditions should be remedied before proceeding with the tests. Then connect the signal-generator output lead through a condenser (.01 to .25 mf.) to indicated test points and the generator ground lead to "C" (receiver chassis). For best results, check operation first at 540 kc. and then at 1700 kc.

Test Points	Normal Indication	Possible Cause of Abnormal Indication
L to C (chassis)	Audible signal from speaker.	No signal indicates defective 1LA6 tube, defective oscillator transformer T401, shorted plates in oscillator section of condenser C401, shorted condenser C405, or defective resistor R401 or R402.
M to C	Audible signal from speaker.	No signal indicates defective antenna transformer T400, or shorted plates in antenna section of condenser C401.

OSCILLATOR GRID BIAS VOLTAGE. Ground test point "L", connect a voltmeter (20,000-ohms-per-volt, 10-volt scale) between "N" (—) and "C" (+), and rotate the tuning control throughout its entire range. The voltage reading should not fall below 1.5 volts throughout. Insufficient voltage indicates malfunctioning, and the components listed in the first test in the above chart should be checked in the order given.

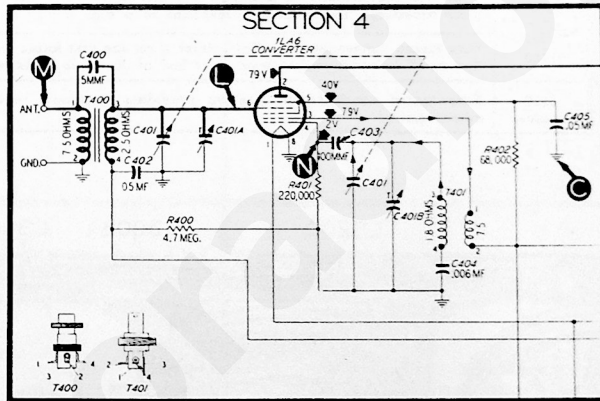


Figure 9. Section 4 schematic.

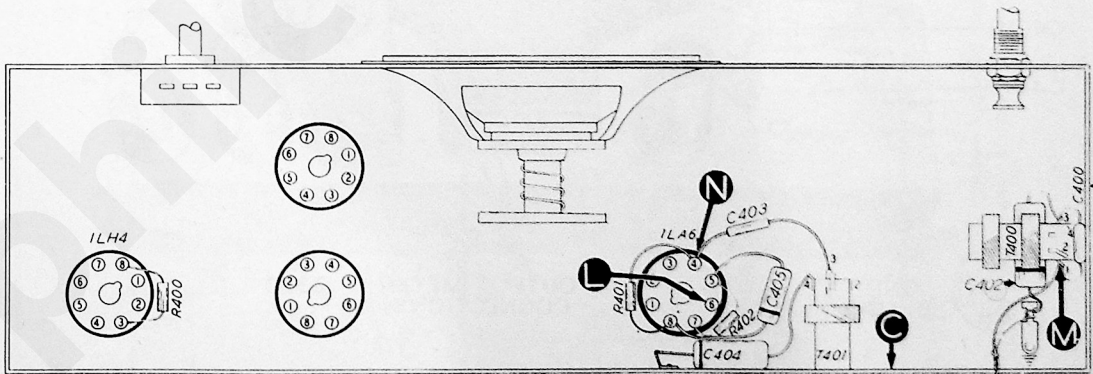


Figure 10. Bottom view, showing section 4 test points.

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CONNECTING ALIGNING EQUIPMENT

OUTPUT METER. Connect to voice coil lugs on rear of speaker, as shown in figure 11.

SIGNAL GENERATOR. Use a 100-mmf. condenser to couple the signal-generator output lead to the receiver. Adjust the output of the signal generator to give a signal strength sufficient to cause a readable deflection of the output meter, using the range on the meter which best indicates small variations in output. Reduce the output of the signal generator if the pointer of the output meter goes off scale as alignment progresses.

PROCEDURE. Turn receiver volume control to three-fourths maximum and adjust all trimmers, in the order listed, for maximum output.

ALIGNMENT CHART

SIGNAL GENERATOR		RECEIVER		
Connections to Receiver	Dial Setting (kc.)	Dial Setting (kc.)	Special Instructions	Adjust Trimmers in Given Order
Stator plate terminal, antenna section of tuning condenser, and chassis.	455	540	Turn C300B fully clockwise. Turn tuning condenser plates to fully meshed position. Make sure that dial pointer is set to the left index mark (the first small hole stamped $3\frac{1}{4}$ inches from left end of scale plate reflector). This setting corresponds to a dial setting of 540 kc.	C301A C300A C300B
Antenna lead and chassis.	1700	1700	Turn tuning condenser until dial pointer is on the first index mark (the first small hole $4\frac{1}{8}$ inches from right end of the scale plate reflector).	C401B
Antenna lead and chassis.	1500	1500 (approx.)	Turn tuning condenser to position providing maximum reading on output meter.	C401A

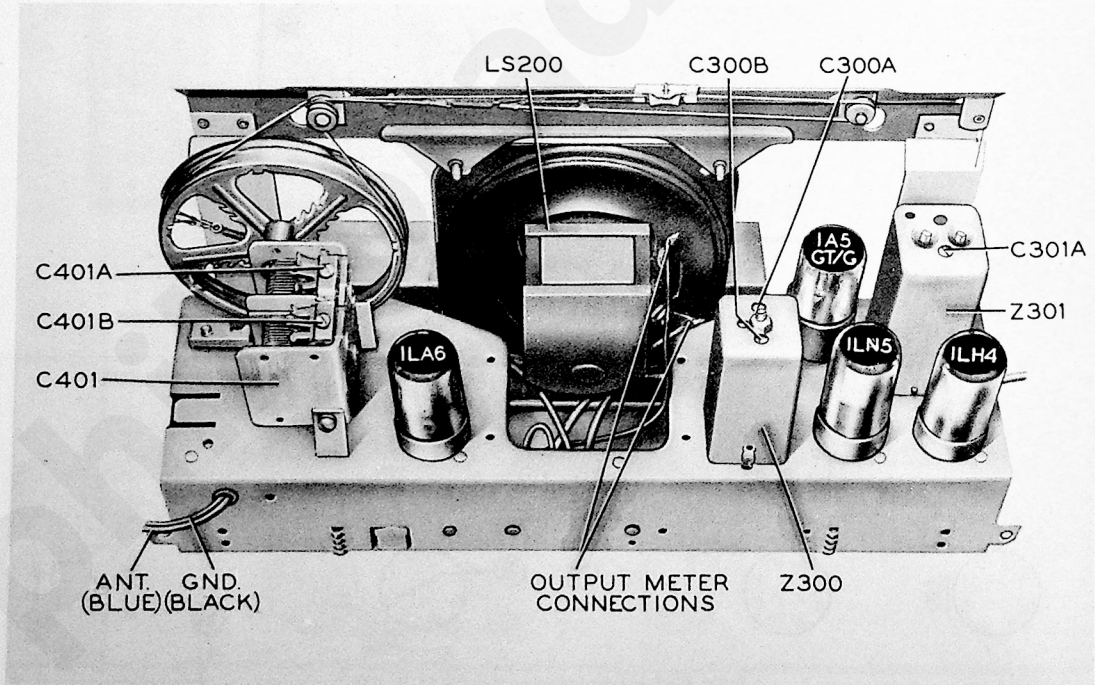


Figure 11. Top view, showing trimmer-condenser locations.

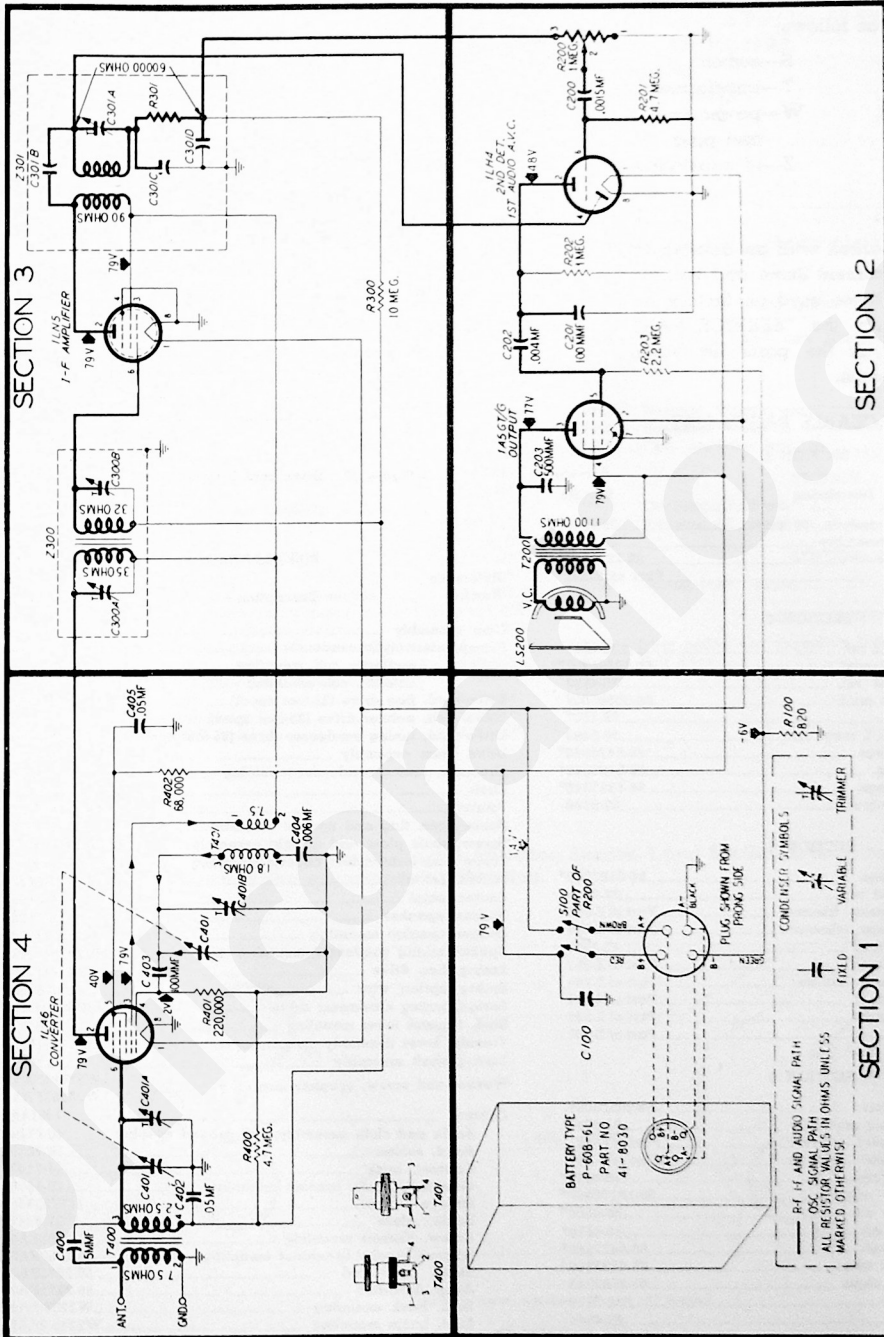


Figure 12. Complete schematic.

NOTE: All voltage, capacity and resistance values shown are average. The voltages shown were measured with a 20,000-ohms-per-volt meter between the indicated test points and C (chassis).

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

- | | |
|-----------------|-----------------------|
| C—condenser | S—switch |
| I—pilot lamp | T—transformer |
| LA—loop antenna | W—power cord and plug |
| LS—loud speaker | Z—i-f transformer |
| R—resistor | |

NOTE: Parts marked with an asterisk (*) are general replacement items and will not be identical with those used on factory assemblies. Use only the "SERVICE PART NUMBER" shown in the parts list when ordering replacements.

REPLACEABLE PARTS LIST

Reference Number	Description	Service Part No.
SECTION 1		
C-100	Condenser, electrolytic, 10 mf.	30-2540*
PL-100	Battery cable assembly	41-3709
R-100	Resistor, 820 ohms	66-1823340*
S-100:	switch	Part of R-200

SECTION 2		
C-200	Condenser, .0015 mf.	30-4621
C-201	Condenser, 100 mf.	60-10105407*
C-202	Condenser, .004 mf.	30-4623
C-203	Condenser, 500 mf.	60-90505007
LS-200	Speaker	36-1507
R-200	Volume control, 1 meg.	33-5493
R-201	Resistor, 4.7 megs.	66-5473340*
R-202	Resistor, 1 meg.	66-5103340*
R-203	Resistor, 2.2 megs.	66-5223340*
T-200	Transformer, output	32-8240

SECTION 3		
R-300	Resistor, 10 megs.	66-6101330*
Z-300	Transformer, 1st i-f	32-3966
C-300-A:	condenser, trimmer	Part of Z-300
C-300-B:	condenser, trimmer	Part of Z-300
Z-301	Transformer, 2nd i-f	32-3897
C-301-A:	condenser	Part of Z-301
C-301-B:	condenser, trimmer	Part of Z-301
C-301-C:	condenser	Part of Z-301
C-301-D:	condenser	Part of Z-301
R-301:	resistor	Part of Z-301

SECTION 4		
C-400	Condenser, 5 mf.	60-90505007
C-401	Condenser, tuning assembly	31-2641
C-401-A:	condenser, trimmer	Part of C-401
C-401-B:	condenser, trimmer	Part of C-401
C-402	Condenser, .05 mf.	30-4518*
C-403	Condenser, 100 mf.	60-10105407*
C-404	Condenser, .006 mf.	30-4504*
C-405	Condenser, .05 mf.	30-4518*
R-400	Resistor, 4.7 megs.	66-5473340*
R-401	Resistor, 220,000 ohms	66-4223340*
R-402	Resistor, 68,000 ohms	66-3683340
T-400	Coil, antenna	32-3919
T-401	Coil, oscillator	32-4044

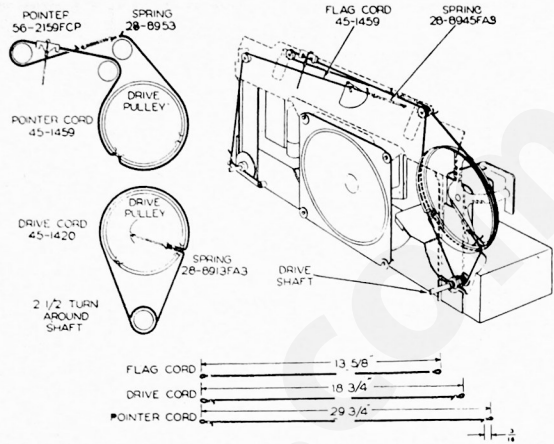


Figure 13. Drive cord installation details.

Reference Number	Description	Service Part No.
MISCELLANEOUS		
	Cam assembly	76-1650
	Clamp, electrolytic condenser	56-1346
	Coil clip, } oscillator coil mounting	28-5002FE7
	Coil clip, } antenna coil mounting	
	Drive cord, flag drive (25-foot spool)	45-1459
	Drive cord, pointer drive (25-foot spool)	45-1459
	Drive cord, tuning condenser drive (25-foot spool)	45-1420
	Drive drum assembly	76-2485
	Grommet, tuning condenser mounting	27-4596
	Knob	54-4101
	Pointer	56-2159FCP
	Scale plate, flag and upright assembly	76-1652
	Screw, scale plate and upright assembly	1W19670FA3
	Screw and lockwasher, chassis mounting	1W12518FA3
	Socket, Loktal	27-6138*
	Socket, octal	27-6199*
	Spacer, speaker	26-2709
	Spacer, speaker mounting	1W29184
	Spacer, tuning condenser mounting	1W29184FA3
	Spring, flag drive	28-8945FA3
	Spring, spring wire	28-8953
	Spring, tuning condenser drive	28-8913FA3
	Stud, transfer lever mounting	1W29793
	Transfer lever assembly	76-1655
	Tuning shaft assembly	31-2640
	Washer and screw, speaker mounting	1W37634FA3
		1W36553FA3
	Cabinet	10618A
	Baffle and cloth assembly, 1/8" around speaker	40-6746
	Band, rubber	56-4025
	Cabinet, back	54-7100
	Grommet, scale bracket mounting	27-4596
	Pulleys	11W29740
	Scale, glass	27-5842
	Screw, chassis mounting	W2508FA3
	Spacer, bracket-to-cabinet mounting	56-1307FA3
	Strap, right-hand	56-2672FA3
	Strap, left-hand	56-2671FA3
	Stud, back mounting	W2235FA9
	Stud, baffle mounting	W2235-2FA9
	Washer, spring	56-1866

PRODUCTION CHANGES FOR MODEL 46-131

CODE 121

RUN 2

- a. R200, volume control, 1 megohm, Part No. 33-5493, was changed to Part No. 33-5554.
- b. Cam assembly, Part No. 76-1650, was changed to Part No. 56-2700-1FA3.
- c. Pointer, Part No. 56-2159FCP, was changed to Part No. 56-2896.
- d. Transfer lever assembly, Part No. 76-1655, was changed to 76-1655-1.

CODE 122

The condenser tuning system, used in Code 121, was changed to permeability tuning.

- a. Refer to the accompanying revised schematic diagram.
- b. The parts which are different from those used in Run 1 of Code 121 are given in the following list.

NOTE: The remainder of the parts in the REPLACEABLE PARTS LIST are the same as for Run 1 of Code 121 except for the changes listed above for Run 2 of Code 121.

SECTION 4		
Reference Number	Description	Service Part No.
C400	Condenser, .05 mf.	61-0122*
C401	Condenser, 100 mmf.	60-10105407*
C402	Condenser, silver mica, oscillator shunt, 390 mmf.	30-1220-14*
C403	Condenser, 10 mmf.	60-00105407*
C404	Condenser, 150 mmf.	60-10155407*
C405	Condenser, 100 mmf.	60-10105407*
C406	Condenser assembly, trimmer, 2-section	31-6391
C406A	Condenser, antenna trimmer	Part of C406
C406B	Condenser, oscillator trimmer	Part of C406
L400	Coil, antenna tuning (part of permeability tuning unit)	65-0380-1
L401	Coil, oscillator tuning (part of permeability tuning unit)	65-0381-1
R400	Resistor, 68,000 ohms	66-3683340*
R401	Resistor, 220,000 ohms	66-4223340*

R402	Resistor, 150,000 ohms	66-4153340*
R403	Resistor, 1 megohm	66-5103340*
T400	Coil, oscillator tracking	32-4092

SECTION 3

C302	Condenser, .05 mf.	60-0122*
R302	Resistor, 4.7 megohms	66-5473340*

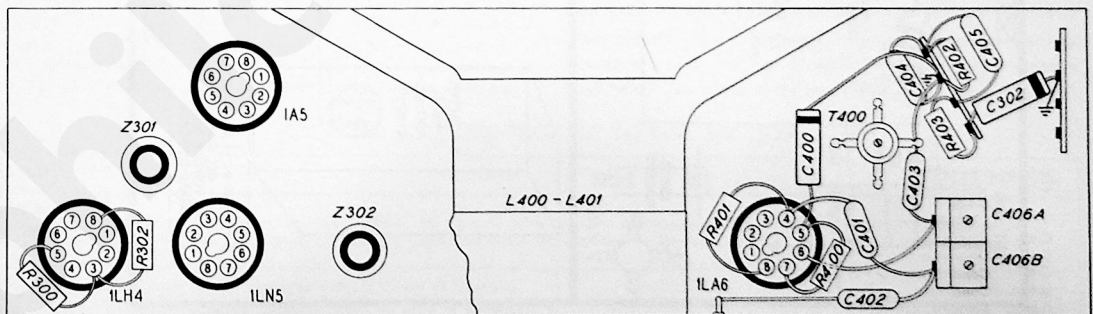
SECTION 2

T200	Transformer, output	32-8297
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MISCELLANEOUS

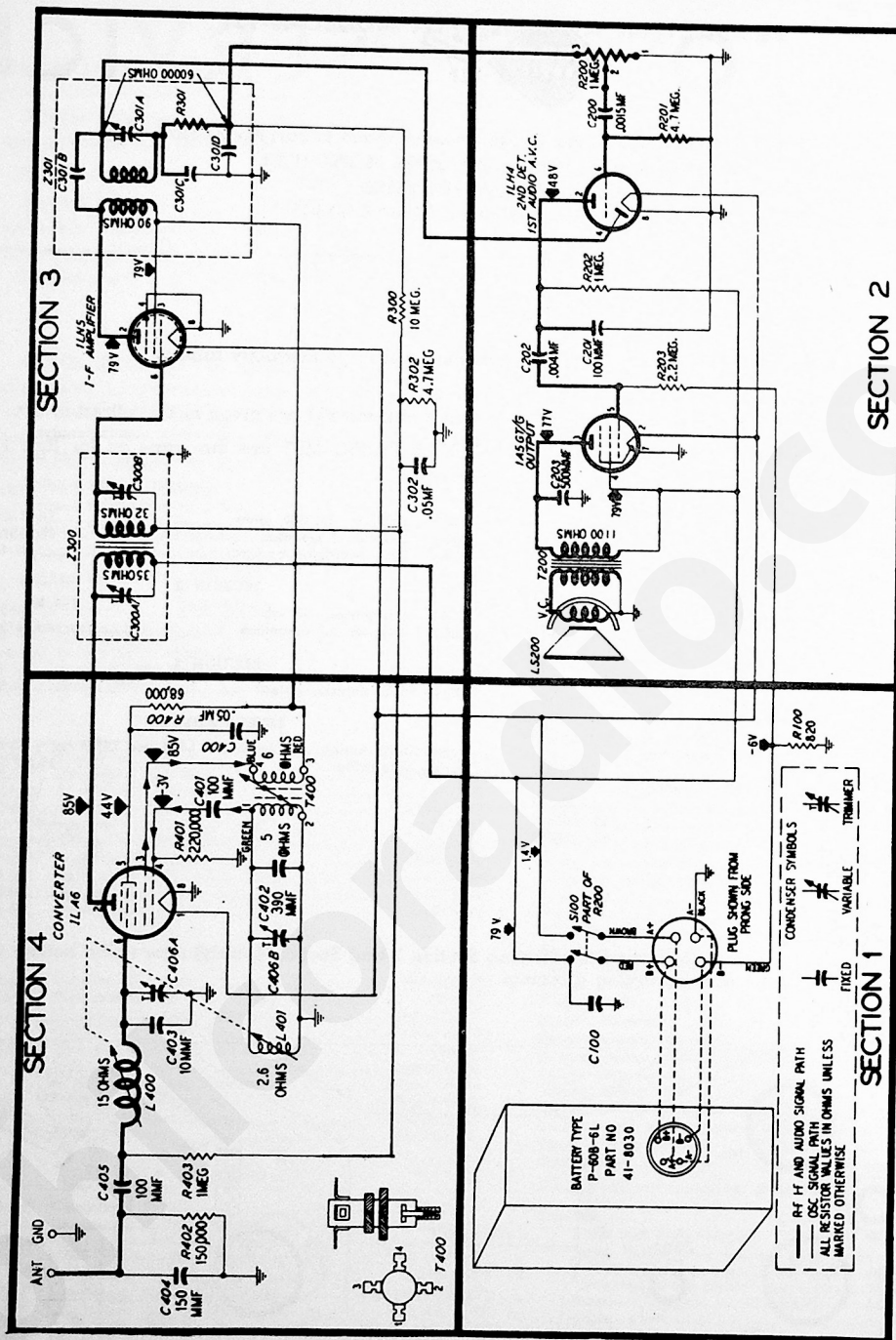
Permeability tuning unit (including L400 and L401)	76-2481
Spring, flag drive	28-9011FA3

- c. For the new physical locations of parts (affecting Section 3 and Section 4, only) refer to the bottom view of the chassis, shown in the accompanying drawing.



Bottom view, sections 3 and 4, model

46-131, code 122



Schematic diagram for model 46-131 code 122

Schematic diagram for model 46-131 code 122