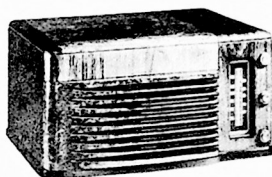




HOME RADIO

PHILCO RADIO



MODEL 46-1203

SPECIFICATIONS

CABINET	Model 46-1203 (wood, walnut finish)
CIRCUIT	Six-tube superheterodyne
FREQUENCY RANGE	540 to 1620 kc.
PHONOGRAPH	Philco record changer, Model D-10
POWER INPUT	105 to 120 volts only
POWER CONSUMPTION	60 watts
ANTENNA	Loop fastened to cabinet; terminal provided for external connection
INTERMEDIATE FREQUENCY	455 kc.
PHILCO TUBES USED	7C7, 7A8, 7B7, 7C6, 35L6GT/G, 50Y6GT/G
PILOT LAMP	110-volt, screw-base, Part No. 34-2477

PHILCO TROUBLE-SHOOTING PROCEDURE

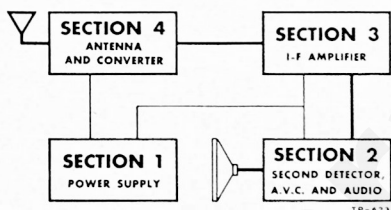


Figure 1. Block diagram.
(Heavy lines indicate signal path.)

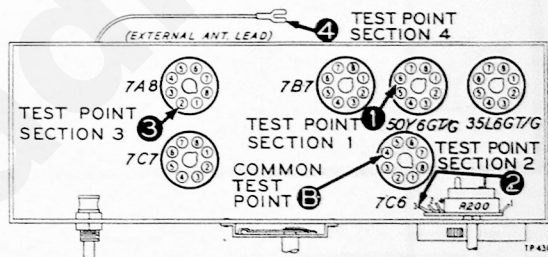


Figure 2. Bottom view, showing test points.

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 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 meter. To localize trouble, connect the receiver to the power line; turn the receiver volume control fully on; 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 points indicated, and the ground lead through a .5 mf. condenser to B-. Remedy any defect encountered before proceeding to the next check.

NOTE: Before attempting to remove the chassis from the cabinet, unsolder the loop connections. After the chassis has been removed, remove the loop, and reconnect it to the chassis.

TESTS TO LOCALIZE TROUBLE TO ONE SECTION

SECTION	TEST	NORMAL RESULTS
1	Measure voltage between test point 1 and B-.	115v.
2	Apply audio signal between point 2 and B-, through a condenser (.01 to .25 mf.).	Loud, clear signal
3	Apply weak, modulated r-f signal (455 kc.) between point 3 and B-, through a condenser (.01 to .25 mf.).	Loud, clear signal
4	Apply weak, modulated r-f signal (1,000 kc.) between point 4 and B-, through a condenser (.01 to .25 mf.). Rotate tuning condenser until signal is heard.	Loud, clear signal

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TESTS TO ISOLATE TROUBLE WITHIN SECTION 1

Make all tests for this section with a volt-ohmmeter, using the 250-volt d-c range. See figures 3 and 4 for location of test points.

TEST POINTS	NORMAL READING	POSSIBLE CAUSE OF ABNORMAL READING
A to B-	180 volts	Defective 50Y6GT/G, shorted, leaky, or open C102 or C103, shorted or leaky C104A, shorted C203 or C204 (See section 2 for location), or open R100A.
C to B-	175 volts	Defective L100.
D to B-	115 volts	Open R102, or shorted or leaky C104B.

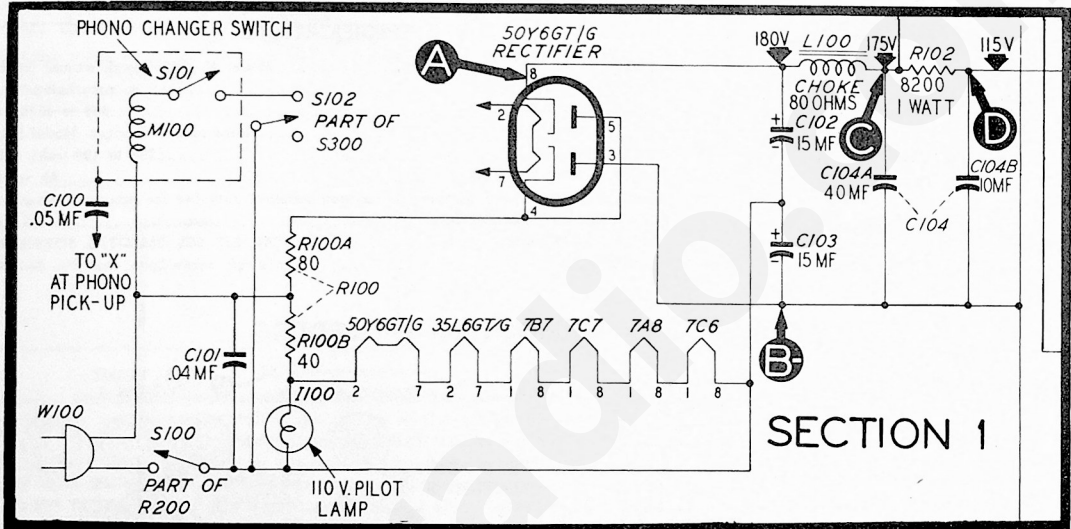


Figure 3. Section 1 schematic.

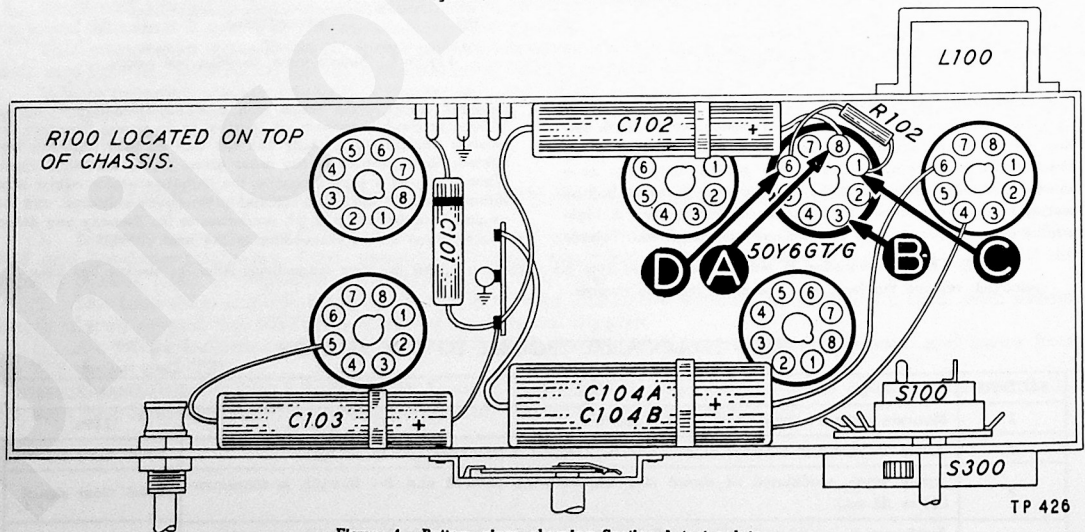


Figure 4. Bottom view, showing Section 1 test points.

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TESTS TO ISOLATE TROUBLE WITHIN SECTION 2

For all tests within this section, use an audio signal. Connect the generator output lead through a condenser (.01 to .25 mf.) to the points indicated; connect the ground lead through .5 mf. to B. Adjust the signal-generator output for a loud, clear signal.

TEST POINTS	NORMAL INDICATION	POSSIBLE CAUSE OF ABNORMAL INDICATION
E to B-	Loud, clear signal.	Defective 35L6GT/G, T200, LS200, or leaky or shorted C202.
F to B-	Loud, clear signal, same as preceding test.	Open C202.
G to B-	Clear signal, noticeably louder than preceding test.	Defective 7C6, or open R203.
H to B- (volume control in radio position)	Loud, clear signal, same as preceding test.	Open C201 or defective R200. (Rotate R200 through its entire radio range.)
J to B- (volume control in phono position)	Loud, clear signal, same as preceding test.	Defective R200. (Rotate R200 through its entire phono range.)

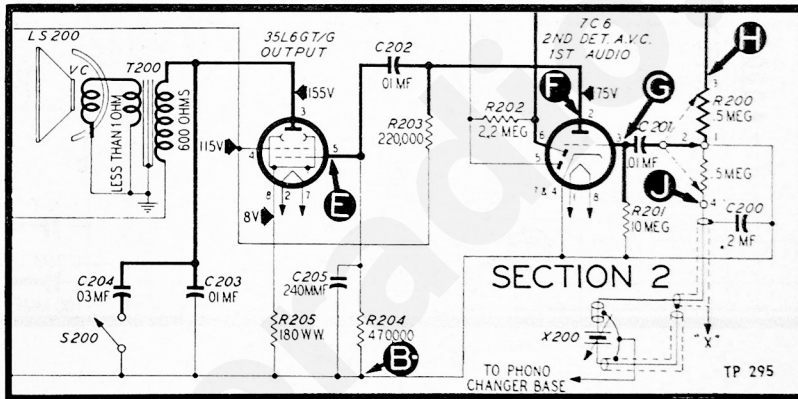


Figure 5. Section 2 schematic.

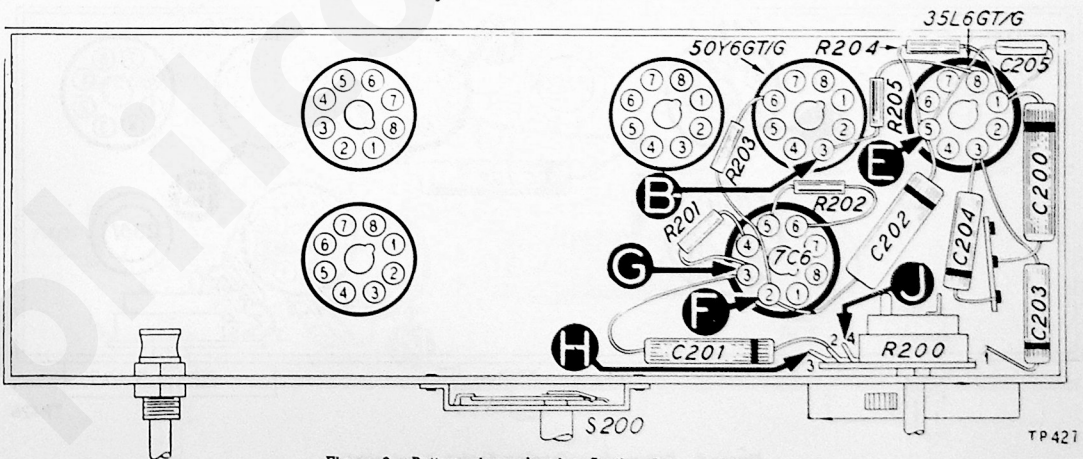


Figure 6. Bottom view, showing Section 2 test points.

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TESTS TO ISOLATE TROUBLE WITHIN SECTION 3

For all tests within this section, set the signal generator to 455 kc., with modulation on. Connect the generator output lead through a condenser (.01 to .25 m.f.) to the points indicated; connect the ground lead through .5 mf. to B-. 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 R300.
L to B-	Loud, clear signal, same as preceding test.	Defective or misaligned Z300.

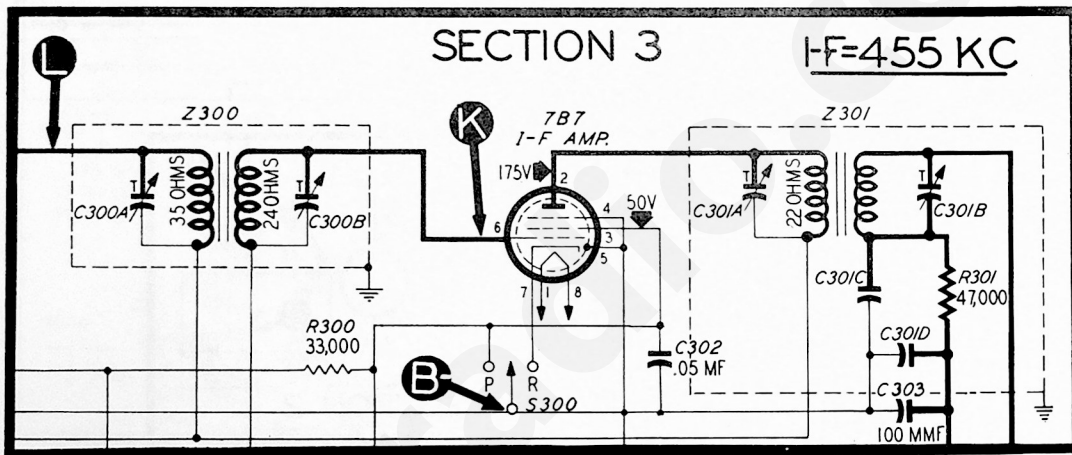


Figure 7. Section 3 schematic.

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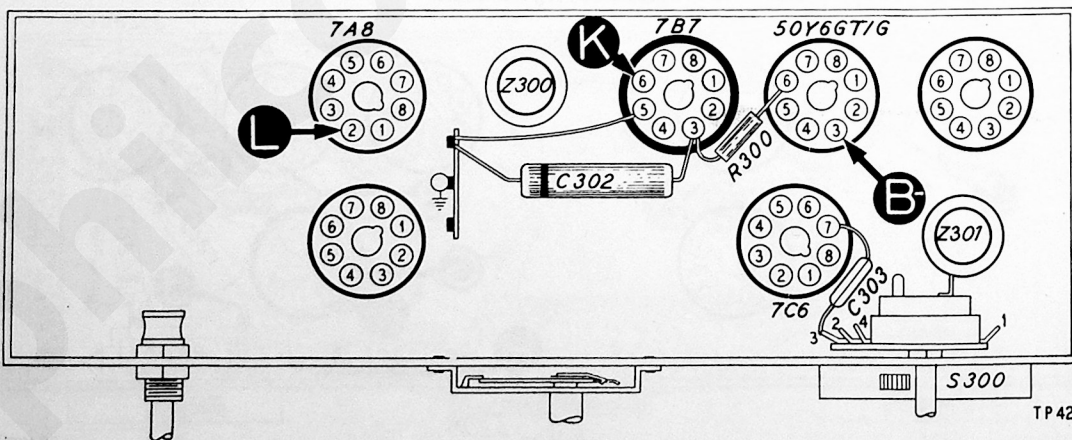


Figure 8. Bottom view, showing Section 3 test points.

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TESTS TO ISOLATE TROUBLE WITHIN SECTION 4

1. Set volume control at maximum; rotate tuning condenser through its entire range. Any scraping noise from 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 point S, and the prod end of the negative lead through a 50,000-

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

TEST POINTS	NORMAL INDICATION	POSSIBLE CAUSE OF ABNORMAL INDICATION
M to Chassis (Rotate tuning cond. until signal is heard.)	Loud, clear signal from speaker.	Defective 7A8, T401, or open R403.
N to B-	Loud, clear signal, same as preceding test.	Defective Z400.
P to B-	Clear signal, noticeably louder than preceding test.	Defective 7C7, open R402.
Q to B-	Clear signal, slightly louder than preceding test.	Defective T400, LA400, or open C402 or C400.

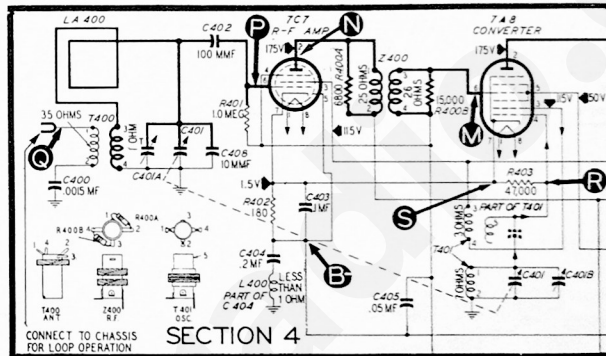


Figure 9. Section 4 schematic.

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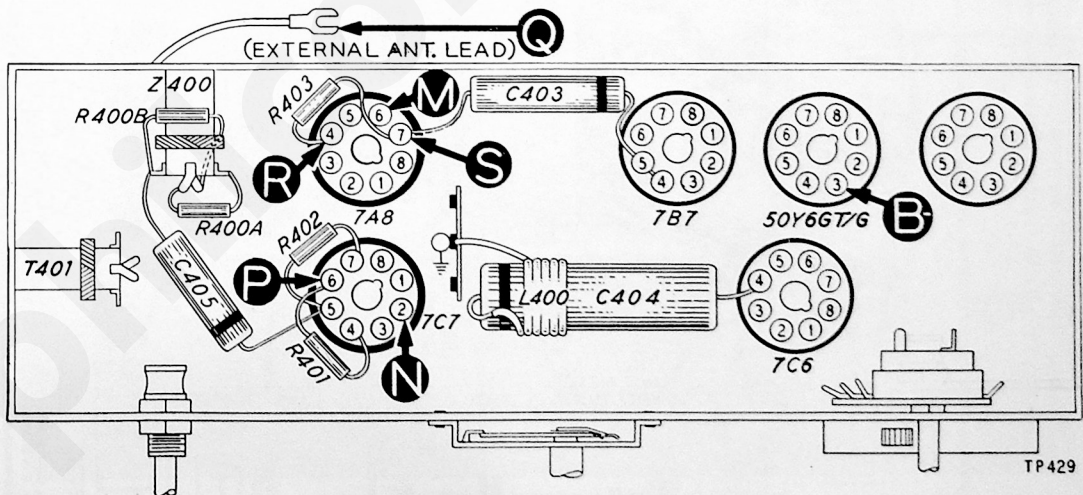


Figure 10. Bottom view, showing Section 4 test points.

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PHILCO SERVICE

RADIO MODEL 46-1203

ALIGNMENT PROCEDURE

This receiver should be aligned with the chassis installed in the cabinet.

With the tuning condenser plates fully meshed, make sure that the pointer coincides with the index mark at the extreme low end of the scale.

OUTPUT METER: Connect between the points indicated in figure 11 below.

SIGNAL GENERATOR: Connect the output lead as indicated in

the chart below, and the ground lead through a condenser (.05 mf.) to B-.

Turn the receiver volume control to maximum; adjust the generator output to give a readable deflection on the output meter, using a meter range that best indicates small changes in output. Reduce the generator output as alignment progresses, to prevent the meter needle from going off scale. Adjust all trimmers, in the order listed, for maximum output.

SIGNAL GENERATOR			RECEIVER		
	CONNECTIONS TO RECEIVER	DIAL SETTING	DIAL SETTING	SPECIAL INSTRUCTIONS	ADJUST TRIMMERS
1	Through .05 mf. to stator of antenna section of tuning condenser.	455 kc.	Plates fully meshed	Pre-set C300B fully clockwise. Adjust for maximum in order given.	C300B C301A C301B C300A C300B
2	Through 100 mmf. to stator of antenna section of tuning condenser.	1600 kc.	1600 kc.	Adjust for maximum.	C401B
3	Connect output lead to a wire approx. 6" long, and lay this near the loop.	1500 kc.	1500 kc.	Adjust for maximum.	C401A

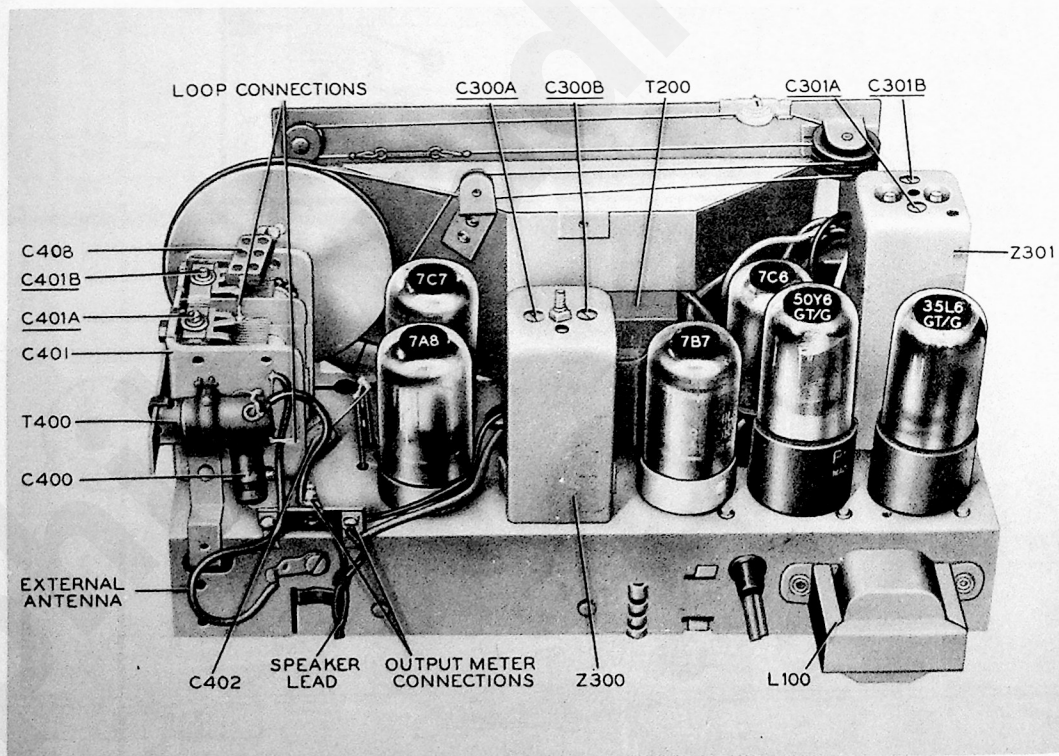
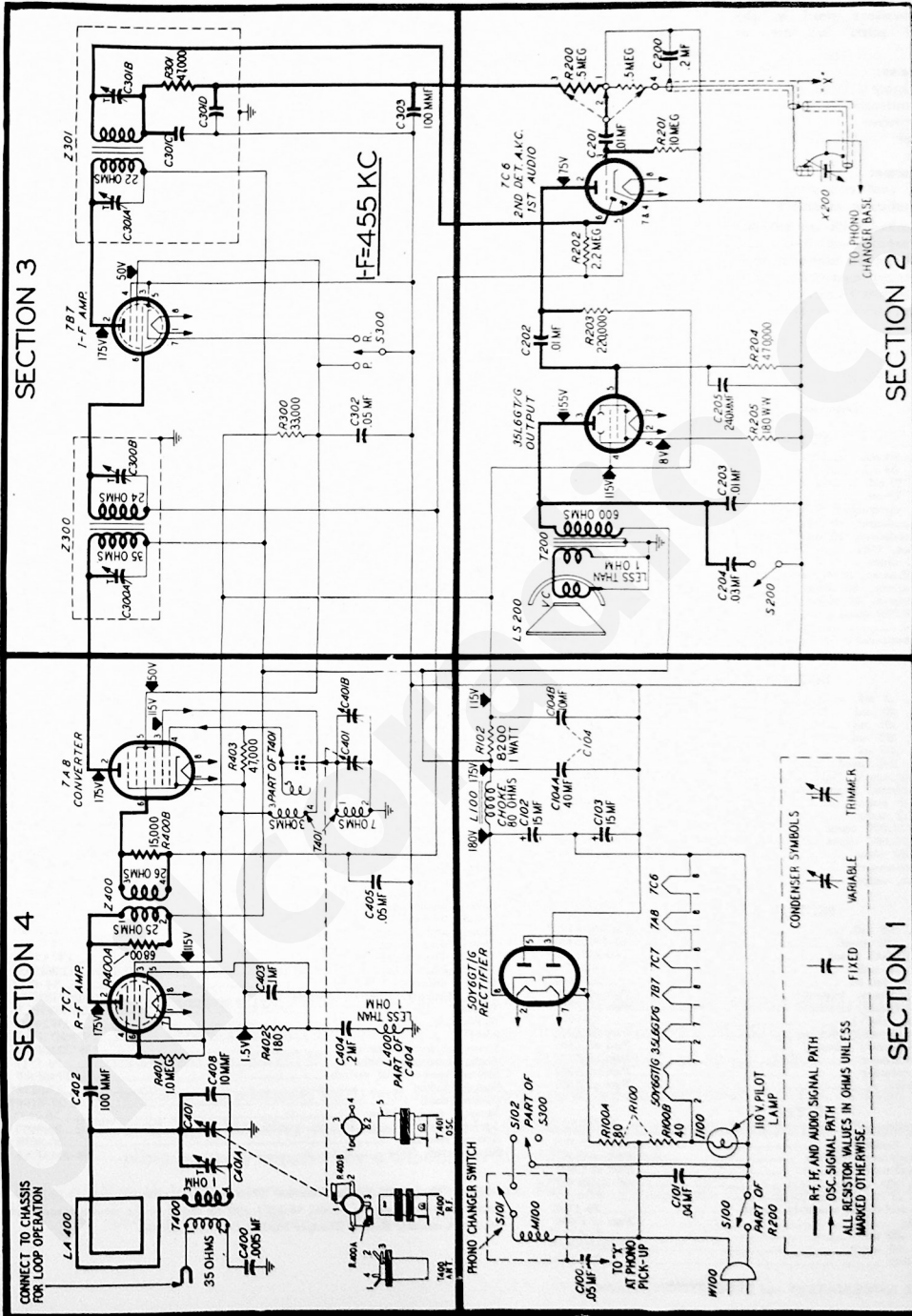


Figure 11. Top view, showing trimmer locations.

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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 B-.

PHILCO SERVICE

RADIO MODEL 46-1203

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

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

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

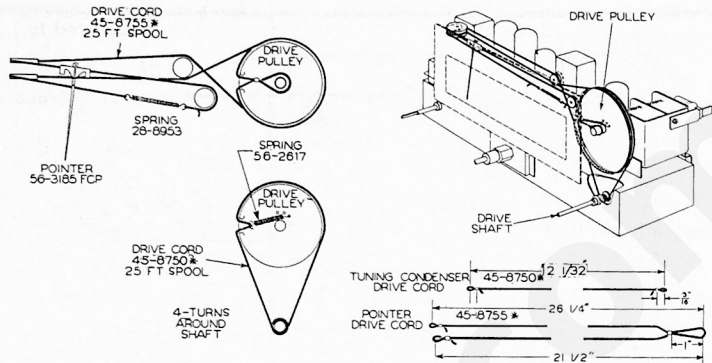


Figure 13. Drive cord installation details.

REPLACEMENT PARTS LIST

Reference Number	Description	Service Part No.	Reference Number	Description	Service Part No.
SECTION 1					
C100	Condenser, .05 mf.	61-0122*	R401	Resistor, 1 meg.	66-5103340*
C101	Condenser, .04 mf.	45-3500-2*	R402	Resistor, 180 ohms	66-1184360*
†C102	Condenser, 15 mf.	30-2559*	R403	Resistor, 47,000 ohms	66-3473340*
†C103	Condenser, 15 mf.	30-2559*	†T400	Transformer, antenna	32-3394
†C104	Condenser, electrolytic, 40-10 mf.	30-2510*	†T401	Transformer, oscillator	32-4190
			Z400	Transformer, r-f	32-3595
	C104A: condenser, 40 mf.	Part of C104	R400A: resistor, 6,800 ohms	Part of Z400	
	C104B: condenser, 10 mf.	Part of C104	R400B: resistor, 15,000 ohms	Part of Z400	
I100	Lamp, pilot, 110v.	34-2477			
L100	Choke, 80 ohms	32-8252			
†R100	Resistor, filament, 80-40 ohms	53-3450			
	R100A: resistor, 80 ohms	Part of R100			
	R100B: resistor, 40 ohms	66-282340*			
R102	Resistor, 8,200 ohms	Part of R200			
S100	Switch, a-c	Part of S300			
S102	Switch, phono-radio	Part of S300			
W100	Cord, a-c	L3199			
SECTION 2					
C200	Condenser, .2 mf.	45-3500-3*			
C201	Condenser, .01 mf.	61-0120*			
C202	Condenser, .01 mf.	61-0120*			
C203	Condenser, .01 mf.	61-0120*			
C204	Condenser, .03 mf.	45-3500-1*			
C205	Condenser, 240 mmf.	60-1024530*			
LS200	Speaker	36-1593			
R200	Control, volume, .5 meg. each side of center tap.	33-5503			
R201	Resistor, 10 mega.	66-6103340*			
R202	Resistor, 2.2 mega.	66-5223340*			
R203	Resistor, 220,000 ohms	66-4473340*			
R204	Resistor, 470,000 ohms	66-4473340*			
R205	Resistor, 180 ohms	66-1184360*			
S200	Switch, tone-control	42-1770			
T200	Transformer, output	32-8242			
SECTION 3					
C302	Condenser, .05 mf.	61-0122*			
C303	Condenser, 100 mmf.	60-1010540*			
R300	Resistor, 33,000 ohms	66-3333340*			
S300	Switch, phono-radio	42-1756*			
Z300	Transformer, 1st i-f	32-3962			
	C300A: condenser, trimmer	Part of Z300			
	C300B: condenser, trimmer	Part of Z300			
Z301	Transformer, 2nd i-f	32-3674*			
	C301A: condenser, trimmer	Part of Z301			
	C301B: condenser, trimmer	Part of Z301			
	C301C: condenser	Part of Z301			
	C301D: condenser	Part of Z301			
	R301: resistor	Part of Z301			
SECTION 4					
C400	Condenser, .0015 mf.	45-3500-6*			
C401	Condenser, tuning	31-2527-1			
	C401A: condenser, trimmer	Part of C401			
	C401B: condenser, trimmer	Part of C401			
C402	Condenser, 100 mmf.	60-1010540*			
C403	Condenser, .1 mf.	61-0113*			
C404	Condenser, and-choke assembly, .2 mf.	76-1198			
	L400: choke	Part of C404			
C405	Condenser, .05 mf.	61-0122*			
†C408	Condenser, 10 mmf.	60-0010540*			
†LA400	Loop assembly	76-1640			
MISCELLANEOUS					
	Back-plate and lamp-bracket assembly	76-2338			
	Bracket, antenna-coil	56-2965			
	Cabinet	10641			
	Band, rubber, scale-mounting	54-4168			
	Baffle-and-cloth assembly	40-6776			
	Bolt, speaker-mounting	W2123			
	Butt. cabinet	45-6067			
	Feet, felt	W2190			
	Knob	54-4115			
	Plate, corner	56-3103			
	Scale, dial	27-5890			
	Strap, scale	56-2068			
	Support, lid	45-6305			
	Washer, speaker-mounting, fibre	27-7467			
	Cable, pick-up	41-3673			
	Cable, speaker	41-3683			
	Cable-and-plug assembly (Phono power)	41-3681			
	Cam assembly	76-1638			
	Clamp, electrolytic-mounting	56-1466FA3			
	Clip, coil-mounting (antenna, oscillator, r-f)	28-5002FF7			
	Cord, tuning-condenser-drive (25-foot spool)	45-8750*			
	Cord, pointer-drive (25-foot spool)	45-8755*			
	Grommet, tuning-mounting	27-4610			
	Lever, switch-assembly	76-1642			
	Panel, terminal	2W45661			
	Panel, wire, 2-lug	2W45647			
	Panel, wire, 3-lug	76-2148			
	Panel, wire, 3-lug	2W45655			
	Panel, wire, 3-lug	12W45657			
	Panel, diffusing	54-4237			
	Plate, backing, tuning-condenser	56-2105FA3			
	Pointer	56-3185FCP			
	Pulley	11W29740			
	Rivet	1W36671FA5			
	Screw, chassis mounting	1W13210FA3			
	Shaft, tuning-assembly	76-1717			
	Sleeve, tone-control switch	56-3240FA3			
	Socket, Loktal	27-6130*			
	Socket, octal	27-6199*			
	Spring, tuning-drive	56-2617			
	Spring, pointer-cord	28-8953			
	Spring, retaining	28-8658			
	Stud, switch lever	56-2945FA3			

NOTE: The parts list and service procedure for adjusting the D-10 automatic record changer on Model 46-1203 will be found in the service manual for Philco Automatic Record Changer Models D-10 and D-10A

† Refer to GENERAL INFORMATION and PRODUCTION CHANGES.

PRODUCTION CHANGES FOR 46-1203

CODE 121

RUN 2

- a. Resistor R403, 47,000 ohms, Part No. 66-3473340*, was changed to 120,000 ohms, Part No. 66-4123340*.
- b. Choke L100, 80 ohms, Part No. 32-8252, was replaced by a 500-ohm resistor, Part No. 33-3435-3.
- c. A 120,000-ohm resistor, Part No. 66-4123340*, was added, between the B- bus and the chassis.

CODE 122

RUNS 1 and 2

- a. Cabinet, Part No. 10641, was changed to Part No. 10641A.
- b. Cabinet lid support, Part No. 45-6299, was changed to 46-6305.
- c. Cabinet butt, Part No. 45-6067, was changed to Part No. 4856306.

RUN 3

- a. Condenser C202, .01 mf., Part No. 61-0120*, was changed to .003 mf., Part No. 61-0109*.
- b. The tuning-condenser gang (C401) was mounted on rubber supports, using backing plate Part No. 56-2105FA3.

RUN 4

Physical wiring changes were made.

RUN 5

Choke L100, Part No. 32-8252, was replaced by a 500-ohm resistor, Part No. 33-3435-3.

CODE 125

RUN 1

The 50Y6GT/G rectifier tube was replaced by a 50X6 tube.

RUN 2

The 500-ohm filter resistor, used in run 5 of Code 122, was replaced by the choke, L100, Part No. 32-8252.

CODE 126

RUN 1

This run is the same as Code 125, with the following exceptions:

- a. The type 7B7 i-f amplifier tube was replaced by a type 14A7 tube.
- b. The line dropping resistor, R100, was removed.
- c. Filter condensers C102, C103, and C104 were replaced by condensers having higher working voltages: C102 and C103, Part No. 30-2559*, were replaced by Part No. 30-2575-11, 15 mf., 200v. C104, Part No. 30-2510*, was replaced by Part No. 30-2575-12, 40-10 mf., 250v.
- d. The oscillator transformer, T401, was replaced by a new-type transformer, Part No. 32-419Q.
- e. A 47-mmfd. grid blocking condenser, Part No. 60-00515307*, was added, to furnish the capacitive coupling formerly supplied by a winding of the old transformer.
- f. A 10-mmfd. temperature compensating condenser, Part No. 30-1224-26, was added, across the oscillator section of the tuning-condenser gang.

- g. The aerial transformer (T400) was removed. The loop aerial (LA400) was replaced by a new-type loop, Part No. 76-3020, having a few turns of wire to provide coupling when used with an external aerial.

RUN 2

C408, 10 mmf., Part No. 60-00105407*, was changed to 5 mmf., Part No. 60-90505007*.

GENERAL INFORMATION ON MODEL 46-1203

HUM MODULATION

Hum modulation may be caused by leakage between the line dropping resistor R100 (Part No. 33-3436) and the case. Such leakage may occur because the resistor and case are mounted on the chassis; this applies to the Code 125 only.

CORRECTING DRIFT

To reduce oscillator frequency drift (noticeable at the high-frequency end of the tuning range), the following changes are recommended:

1. Install new-type oscillator coil, Part No. 32-4190.
2. Install a 47-mm.f. grid blocking condenser, Part No. 60-00515307, to supply the capacitive coupling, formerly obtained through one of the windings on the old transformer.
3. Connect a 10-mm.f. temperature compensating condenser, Part No. 30-1224-26, across the oscillator section of the tuning-condenser gang.
4. If the tuning-condenser gang is equipped with trimmers having round plates, remove the oscillator trimmer, and replace it with a separate ceramic-type trimmer, Part No. 63-0069.
5. In sets of Code 125, remove the line dropping resistor from the chassis and mount it on the cabinet.

CABINET AND LID PART NUMBERS

CODE	FINISH	CABINET PART NO.	LID PART NO.
121	Walnut	10641**	45-6311**
121	Mahogany	10641C	45-6363
122	Walnut-mahogany veneer	10641A	45-6309
122	Walnut	10641G	45-6369
122	Walnut	10641F	45-6369
125	Walnut, with mahogany veneer	10641D	45-6309
125	Walnut	10641G	45-6369
126	Mahogany	10641C	45-6363
126	Walnut	10641A	45-6309
126	Walnut	10641F	45-6369

** Cabinet and lid not available; damaged cabinets or lids of this type may be sent to the Philco factory for repairs.