

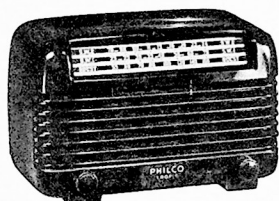
# PHILCO



# SERVICE

## HOME RADIO

### PHILCO TROPIC RADIO



**MODEL 46-806**

#### SPECIFICATIONS

CABINET	Model 46-806 (Plastic, walnut finish)
CIRCUIT	Five-tube superheterodyne
FREQUENCY	540 kc. to 24 mc. in 3 bands: BDCST, 540 to 1600 kc.; S-W 1, 2.3 to 7.0 mc.; S-W 2, 7.0 to 24 mc.
POWER INPUT	115 or 230 volts A.C. or D.C.
POWER CONSUMPTION	25 watts at 115 volts, 52 watts at 230 volts
ANTENNA	External "L" type
INTERMEDIATE FREQUENCY	455 kc.
PHILCO TUBES USED	14J7E, 7B7E, 7C6, 35A5E, 35Z3
PILOT LAMP	6 to 8 volts, brown bead, bayonet base, Philco Part No. 34-2068E

#### PHILCO TROUBLE-SHOOTING PROCEDURE

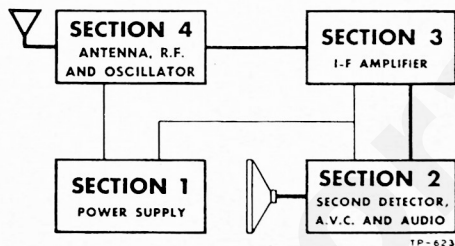


Figure 1. Block diagram.  
(Heavy lines indicate signal path)

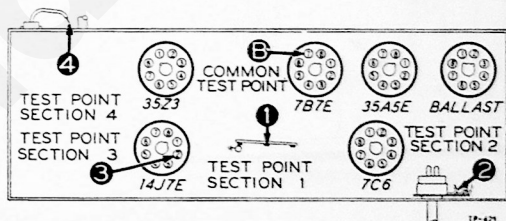


Figure 2. Bottom view, showing test points.

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 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; connect the ground lead through a .5-mf condenser to B-. Remedy any defect encountered before proceeding to the next check.

**NOTE:** Make sure that the ballast tube is plugged in properly for the supply voltage being used before applying power to the set.

#### TESTS TO LOCALIZE TROUBLE TO ONE SECTION

SECTION	TEST	NORMAL RESULTS
1	Measure voltage between test point 1 and B-.	95v.*
2	Apply audio signal through a condenser (.01 to .25 mf.) between point 2 and B-.	Loud, clear signal
3	Apply weak, modulated r-f signal (455 kc.) through a condenser (.01 to .25 mf.) between point 3 and B-.	Loud, clear signal
4	Set dial pointer to center of scale. Apply weak, modulated r-f signal between point 4 and B-. Starting with band switch in BDCST position, tune signal generator until the signal is heard in the speaker. Repeat this procedure for each of the short-wave bands.	Loud, clear signal

\* 117-volt a-c input. When operating on d-c line and no voltage can be measured, reverse power plug.

# PHILCO SERVICE

RADIO MODEL 46-806

## TESTS TO ISOLATE TROUBLE WITHIN SECTION 1

Make all tests for this section with a volt-ohmmeter, using the applicable d-c range. The voltages given were taken with the set operating and the volume control at minimum. See figures 3 and 4 for location of test points.

TEST POINTS	NORMAL READING	POSSIBLE CAUSE OF ABNORMAL READING
A to B-	115v.	Defective 35Z3, Z100, or S100, shorted or open C100A, or shorted C100B.
C to B-	95v.	Shorted or leaky C100B, open L100, or shorted C203 (see Section 2 for location).

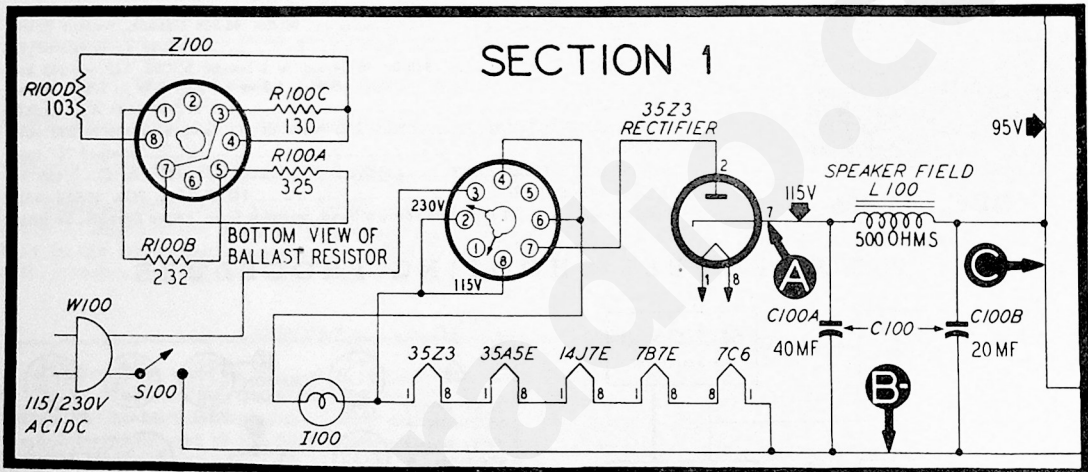


Figure 3. Section 1 schematic.

TP-411A

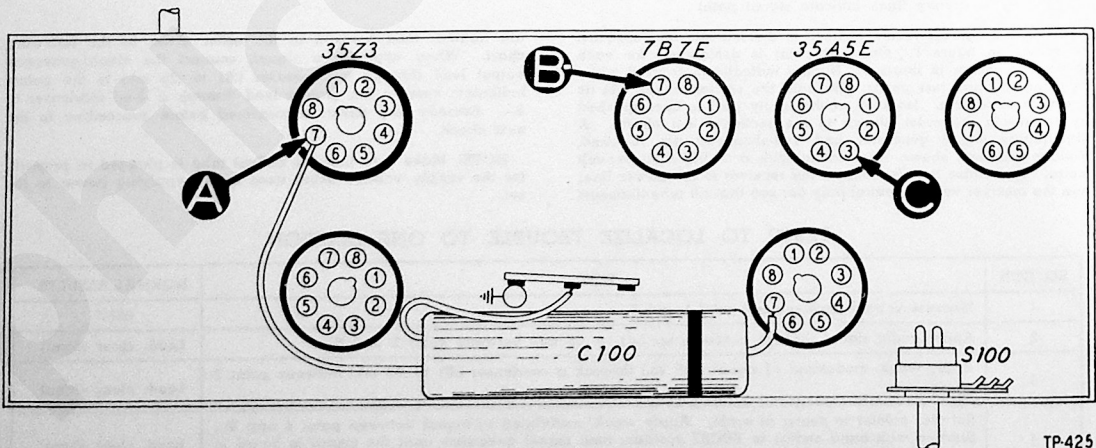


Figure 4. Bottom view, showing Section 1 test points.

TP-425

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, and the ground lead through a .5-mf. condenser to 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
D to B-	Loud, clear signal from speaker	Defective 35A5E, T200, LS200, open R205, or leaky C202.
E to B-	Loud, clear signal, same as preceding test	Open C202.
F to B-	Clear signal, noticeably louder than preceding test	Defective 7C6, or open R203.
G to B-	Loud, clear signal, same as preceding test	Absence of signal indicates open C200 or R200. Hum, noise, or distortion indicates defective R200. (Rotate R200 through entire range for complete check.)

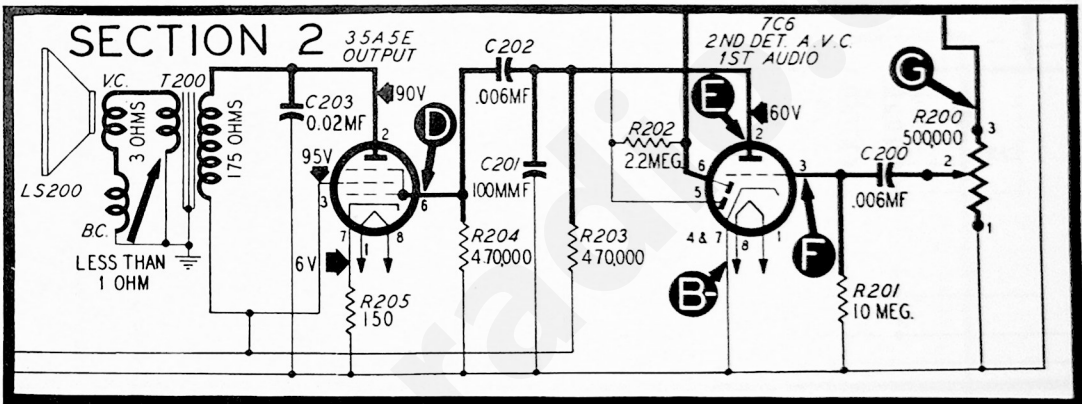


Figure 5. Section 2 schematic.

TP-411-8

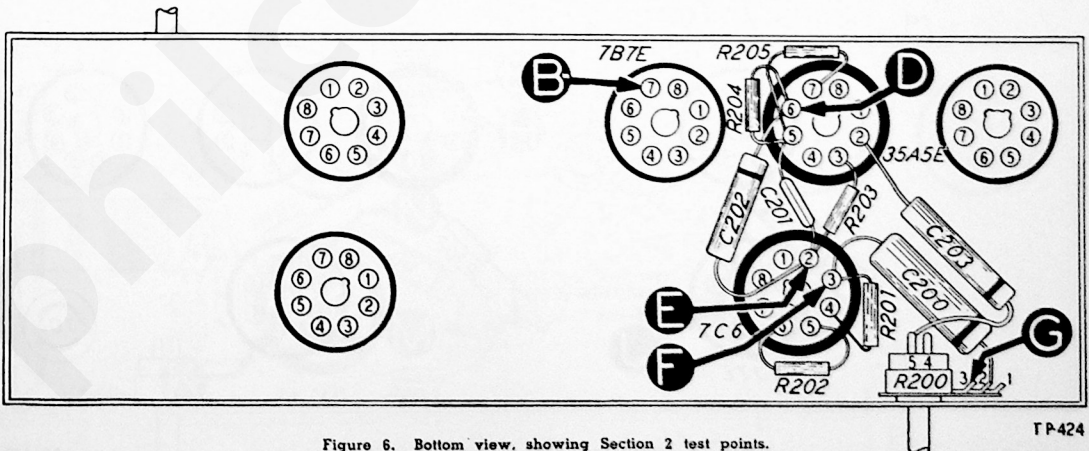


Figure 6. Bottom view, showing Section 2 test points.

TP-424

# PHILCO SERVICE

RADIO MODEL 46-806

## TESTS TO ISOLATE TROUBLE WITHIN SECTION 3

For all tests in this section, set the signal generator at 455 kc., with modulation on. Connect the generator output lead through a condenser (.01 to .25 mf.) to the points indicated, and the ground lead through a .5mf. condenser to 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 from speaker	Defective 7B7E, Z301, shorted C302, or open R302.
J to B-	Loud, clear signal, same as preceding test	Defective or misaligned Z300.

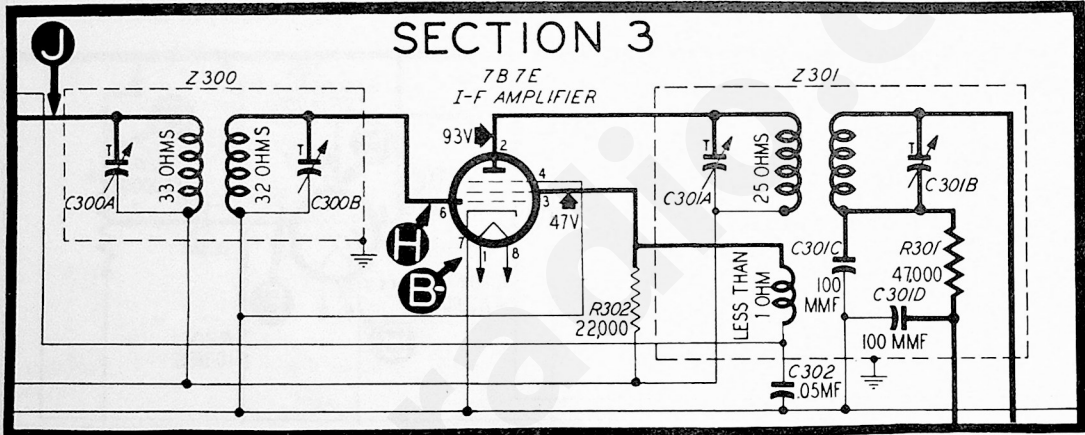


Figure 7. Section 3 schematic.

TP-411-C

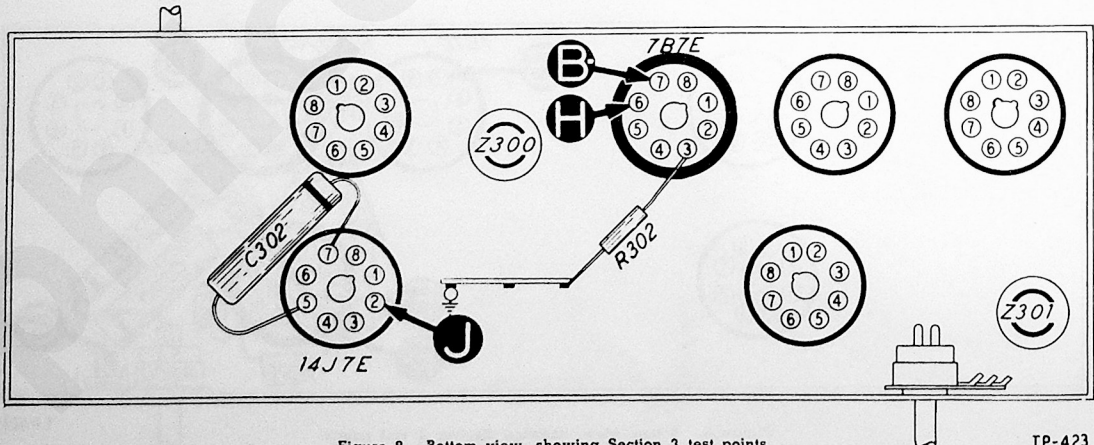


Figure 8. Bottom view, showing Section 3 test points.

TP-423

### 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 the plates or on the 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 M. Set the meter on a 10-volt or similar range

and rotate the tuning condenser through its entire range on each position of the band switch. 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. Repeat the tests at 5 mc. and 15 mc. on S-W 1 and S-W 2, respectively.

TEST POINTS	NORMAL INDICATION	POSSIBLE CAUSE OF ABNORMAL INDICATION
K to B- (Tune set until signal is heard)	Loud, clear signal from speaker	Defective 14J7E or Z402, open R403, R402, R401, or C412, or defective S400.
L to B-	Loud, clear signal	Defective T400, T401, or S400, or open C403.

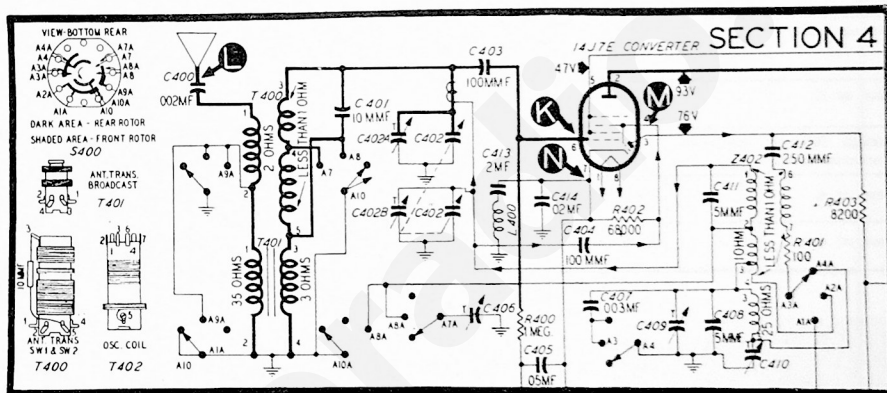


Figure 9. Section 4 schematic.

TP-411-D

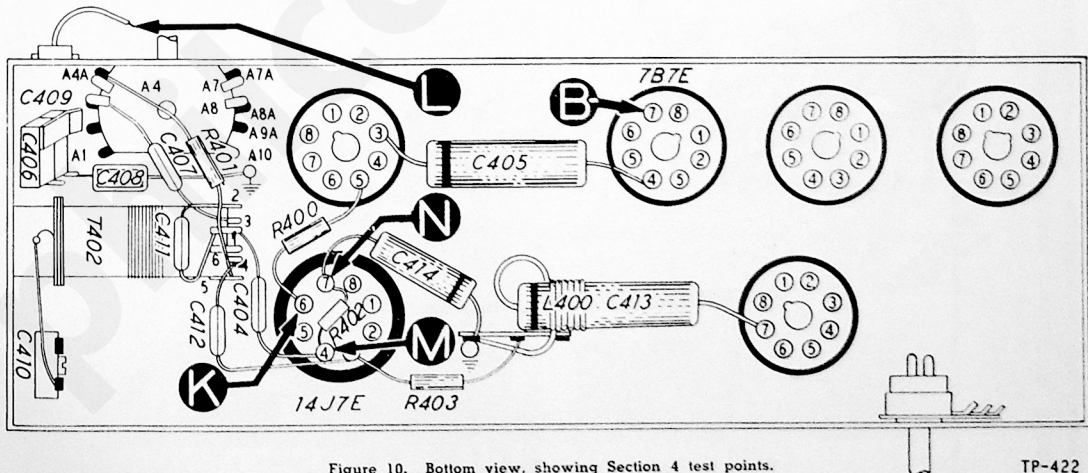


Figure 10. Bottom view, showing Section 4 test points.

TP-422

# PHILCO SERVICE

RADIO MODEL 46-806

## ALIGNMENT PROCEDURE

### OUTPUT METER:

Connect between the voice-coil lug (the rear terminal on the antenna terminal strip) and chassis.

### SIGNAL GENERATOR:

Connect the output lead as indicated in the chart below; connect the ground lead through a .5-mf. condenser to B-.

NOTE: Turn the receiver volume control to maximum. Then adjust the signal-generator output to give a readable deflection on the output meter, using the meter range that best indicates small changes in output. Reduce the

signal-generator output as alignment progresses, to prevent the meter needle from going off scale. Adjust all trimmers listed for maximum output.

### DIAL CALIBRATION:

Make a dummy scale by holding a piece of transparent paper against the scale on the cabinet and marking the following points: index mark, 580 kc., 1500 kc., 6 mc., 20.1 mc., and 21.0 mc. With the tuning condenser in fully meshed position, the pointer should be made to coincide with the index mark at the extreme left end of the scale.

### ALIGNMENT CHART

SIGNAL GENERATOR			RECEIVER			
	Connections to Receiver	Dial Setting	Band Switch Position	Dial Setting	Special Instructions	Adjust Trimmers
1	Through .05-mf. condenser to stator of antenna section of tuning gang.	455 kc.	BDCST	Gang fully meshed	Adjust trimmers for max. in given order.	C301B C301A C300B C300A
2	Through 400-ohm resistor to antenna lead.	21 mc.	S-W 2	21 mc.	Adjust C402B for max. Then tune set to 20.1 mc. and find weaker signal (image). Retune set to 21.0 mc.; adjust C402A for max. while rolling tuning gang.	C402B C402A
3	Same as 2.	6 mc.	S-W 1	6 mc.	Adjust C406 for max. while rolling tuning gang.	C406
4	Through 200-ohm. condenser to antenna lead.	1500 kc.	BDCST	1500 kc.	Turn C410 to 1/2 turn from fully tight. Adjust C409 for max. while rolling tuning gang.	C409
5	Same as 4.	580 kc.	BDCST	580 kc.	Adjust C410 for max. while rolling tuning gang.	C410
6	Same as 4.	1500 kc.	BDCST	1500 kc.	Adjust C409 for max. while rolling tuning gang.	C409

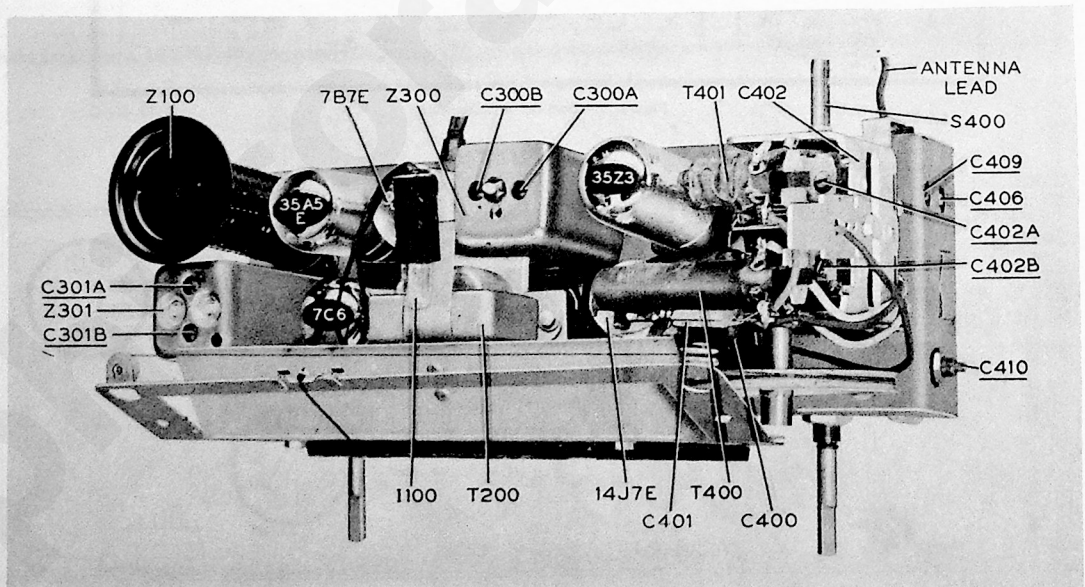


Figure 11. Top view, showing trimmer-condenser locations.



# PHILCO SERVICE

RADIO MODEL 46-806

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

- C—condenser
- I—pilot lamp
- L—choke or coil
- 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 part numbers will not be identical with those used on factory assemblies. Use only the "Service Part No." shown in this parts list when ordering replacements.

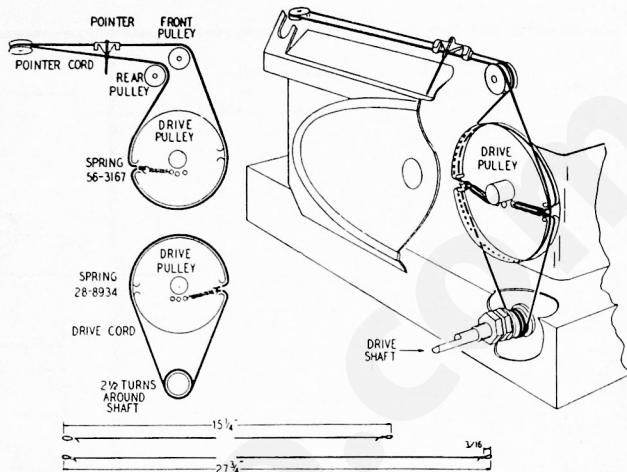


Figure 13. Drive-cord installation details.

## REPLACEMENT PARTS LIST

Reference	Description	Service Part No.
C100	Condenser, electrolytic	30-2510
C100A:	condenser	Part of C100
C100B:	condenser	Part of C100
L100	Lamp, pilot	34-2068E
L100	Field, speaker	Part of LS200
P100	Plug, a-c	L-3275
S100	Switch, volume-control	Part of R200
W100	Cord, a-c	L-3246
Z100	Resistor assembly, ballast	33-3433
R100A:	resistor, 325 ohms	Part of Z100
R100B:	resistor, 232 ohms	Part of Z100
R100C:	resistor, 130 ohms	Part of Z100
R100D:	resistor, 103 ohms	Part of Z100

### SECTION 2

C200	Condenser, .006 mf.	45-3500-7*
C201	Condenser, 100 mmf.	60-10105407*
C202	Condenser, .006 mf.	45-3500-7*
C203	Condenser, .02 mf.	61-0108*
LS200	Speaker	36-1591*
T200:	transformer, output	Part of LS200
R200	Control, volume, 500,000 ohms	45-5007*
R201	Resistor, 10 mega.	66-6103340*
R202	Resistor, 2.2 mega.	66-5223340*
R203	Resistor, 470,000 ohms	66-4473340*
R204	Resistor, 470,000 ohms	66-4473340*
R205	Resistor, 150 ohms	66-1154360*

### SECTION 3

C302	Condenser, .05 mf.	61-0122*
R302	Resistor, 22,000 ohms	66-3223340
Z300	Transformer: 1st i-f	32-3976
C300A:	condenser, trimmer	Part of Z300
C300B:	condenser, trimmer	Part of Z300
Z301	Transformer, 2nd i-f	32-4032
C301A:	condenser, trimmer	Part of Z301
C301B:	condenser, trimmer	Part of Z301
C301C:	condenser, 100 mmf.	Part of Z301
C301D:	condenser, 100 mmf.	Part of Z301
R301:	resistor, 47,000 ohms	Part of Z301

### SECTION 4

C400	Condenser, .002 mf.	61-0062*
C401	Condenser, 10 mmf.	60-00105407
C402	Condenser, tuning	31-2707
C402A:	condenser, trimmer	Part of C402
C402B:	condenser, trimmer	Part of C402
C403	Condenser, 100 mmf.	60-10105407*
C404	Condenser, 100 mmf.	60-10105407*
C405	Condenser, .05 mf.	61-0122*

Reference	Description	Service Part No.
C406	Condenser, trimmer	31-6435
C407	Condenser, .003 mf.	60-20305304
C408	Condenser, 5 mmf.	60-90505007
C409	Condenser, padder, bc. and police	31-6436
C410:	condenser, padder, bc. tracker	Part of C409
C411	Condenser, 5 mmf.	60-90505007
C412	Condenser, 250 mmf.	60-10245307*
C413:	Condenser and choke assembly, .2 mf.	76-1161
L400:	choke	Part of C413
C414	Condenser, .02 mf.	61-0108*
R400	Resistor, 1 meg.	66-5103340*
R401	Resistor, 100 ohms	66-1103340*
R402	Resistor, 68,000 ohms	66-3683340*
R403	Resistor, 8,200 ohms	66-2823340
S400	Switch, band	42-1773
T400	Transformer, antenna, s-w	32-3753
T401	Transformer, antenna, bc.	32-3166
Z402	Transformer, oscillator, bc. and s-w	32-3882

### MISCELLANEOUS

Bracket assembly, coil	76-129:FA33
Cabinet	10524T
Back	54-7088
Bolts, speaker	W-2123
Glass, dial	27-5692
Knob assembly, wave-switch	54-4489
Knob assembly	54-4052
Ring, felt	27-9439
Stud, back-mounting	W-2235FA9
Clamp, electrolytic-condenser	56-1466FA3
Clip, spring, s-w and bc. coil mounting	28-5002FA3
Clip, spring, oscillator coil mounting	28-5003FA3
Cord, pointer drive, 25-foot spool	45-8755*
Cord, tuning-condenser drive, 25-foot spool	45-8750*
Grommet, rubber	27-4610
Palnut	1W2908FA3
Panel, wire	76-2173
Panel, wire, 5-lug	12W45673
Plate assembly, scale	76-1374FCP
Pointer, back, tuning-condenser	56-2105FA5
Rivet, socket-mounting	56-2076-2
Shaft, drive	1W36671FA5
Socket assembly, pilot-lamp	76-1290
Socket, octal, ballast-tube	76-1177
Socket, Loktal	27-6143
Spring, tuning-drive	27-6138*
Spring, pointer-drive	28-8954
Strip, scale-mounting	56-3167
Strip, fibrated, scale-mounting	56-2059FA3
Washer, chassis-mounting	54-7018
	1W55950FA9



## PRODUCTION CHANGES FOR MODEL 46-806

### CODE 121

#### RUN 3

a. C413, condenser-and-choke assembly, .2 mf., Part No. 76-1161, was changed to Part No. 76-1198.

b. A filter section was added, as follows:

A 1500-ohm resistor, Part No. 66-2153340\*, was added; the 8200-ohm resistor, R403, was disconnected from the B+ 95v line and connected to the new resistor; the other end of the new resistor was connected to pin 7 of the 35Z3 rectifier tube. The 40-20 mf. electrolytic condenser, C100, Part No. 30-2510, was changed to 40-10-10 mf., Part No. 30-2575-2; the 40-mf. section was connected as before (C100A); one of the 10-mf. sections was connected as before (C100B); the remaining 10-mf. section was connected to the junction of C403 and the new 1500-ohm resistor.

c. A 120,000-ohm resistor, Part No. 66-4123340\*, was added, between the B- bus and the chassis (located physically across C413).

#### RUN 4

C201, 100 mmf., was disconnected from the plate of the 7C6 1st audio tube, and connected to the grid (pin 6) of the 35A5E output tube.