

# PHILCO RADIO-PHONOGRAPH MODEL 50-1725

## SPECIFICATIONS

CABINET .....	Wood console, mahogany finish
CIRCUIT .....	Seven-tube superheterodyne plus rectifiers
FREQUENCY RANGES	
Broadcast .....	540—1620 kc.
FM .....	88—108 mc.
AUDIO OUTPUT .....	.5 watts
OPERATING VOLTAGE .....	105—125 volts, 60 cycles, a.c.
POWER CONSUMPTION	
Radio .....	.65 watts
Phonograph .....	.85 watts
AERIALS .....	Built-in, semi-high-impedance loop for broadcast; line-cord aerial for FM
INTERMEDIATE FREQUENCY	
AM .....	455 kc.
FM .....	9.1 mc.
PHILCO TUBES (7) .....	12AU6, 12AU7, 14F8, 6BJ6(2), 19T8, 50C6G, selenium rectifier (2)
PHONOGRAPH .....	Philco Automatic Record Changer and Record Player Combination Model M-9C. (For service information refer to PR-1599.)



MODEL 50-1725

TP-7804

## Circuit Description

Philco Model 50-1725 is a console-model radio-phonograph, which provides reception on the standard-broadcast and FM bands. The radio is a seven-tube superheterodyne, with two selenium rectifiers incorporated in the power supply.

A built-in, high-impedance loop aerial for the broadcast band and a line-cord aerial for the FM band normally provide adequate signal pickup; if additional pickup is required, Philco Dipole Aerial, Part No. 45-1462, may be used. When connecting the dipole aerial, disconnect the black lead from terminal 2 of TB400, and attach this lead to pin 1 of the dipole-aerial plug, which fits into J400. No additional coupler is required.

To eliminate complicated switching and to provide better stability and greater gain on both bands, separate converter tubes are used for broadcast and FM reception. A 12AU6 high-gain pentode is used in a tuned r-f amplifier on the FM band. The output of this tube is fed to the 14F8 dual triode, which functions as the converter for the FM signal. A 12AU7 dual triode is used as the converter for the broadcast signal. Band switching is accomplished by means of a single-wafer switch, which connects the B+ voltage to the proper mixer plate.

A 6BJ6 tube is used in each of the two i-f amplifier

stages. Two sets of i-f transformers are used—one set is tuned to 455 kc. for broadcast, and the other set is tuned to 9.1 mc. for FM. The use of two sets of i-f transformers makes better shielding possible, so that undesirable beat signals and interaction between transformers are eliminated.

Two diode sections of a 19T8 triple-diode are used in a ratio-detector circuit, for detection of FM signals. The other diode section is used in a half-wave rectifier circuit, for detection of AM (broadcast) signals and to provide a-v-c action.

The triode section of the 19T8 functions as the first audio amplifier. The output of this stage is resistance-coupled to a 50C6G output tube, which is transformer-coupled to the permanent-magnet speaker.

Two selenium rectifiers are used in a half-wave voltage-doubler circuit, to supply the B+ voltage.

## Philco TROUBLE-SHOOTING Procedure

For rapid trouble shooting, the radio circuit is divided into four sections with test points specified for each section; these sections and test points are indicated in the schematic diagram. The trouble-shooting procedure given for each section includes a simplified test chart and a bottom view of the chassis showing the locations of the test points and the components of that section.

In each chart, the first step is a master check for determining whether trouble exists in that section without going through the entire test procedure.

Failure to obtain the "NORMAL INDICATION" in any given step indicates trouble within the circuit under test.

After isolating the trouble to a single stage, the defect is located by: first, testing the tube; second, measuring tube electrode voltages; third, measuring circuit resistances; fourth, substituting condensers. The trouble revealed should be corrected before testing further.

**Preliminary Checks**

To avoid possible damage to the radio, the following preliminary checks should be made before it is turned on:

1. Inspect both the top and the bottom of the chassis. Make sure that all tubes are secure in the proper sockets, and look for any broken or shorted connections, burned resistors, or other obvious sources of trouble.

2. Measure the resistance between B+, test point C, and B-, test point B. When the ohmmeter test leads are connected in the proper polarity, the highest resistance reading will be obtained. If the reading is lower than 2500 ohms, check condensers C103A, C103B, and C316 for leakage or shorts. The resistance value given is much lower than normal, and is not intended as a quality check of these condensers; the value given is the lowest at which the rectifier will operate safely while the voltage checks of Section 1 (power supply) are performed.

**Important!**

To avoid altering FM operation, special care should be used in replacing any part. Replacement parts should be placed in the same physical positions as the original parts; connections should be of the same length, and should be soldered to the same points. The placement or length of leads should not be altered.

**Section 1 TROUBLE SHOOTING POWER SUPPLY**

For the tests in this section, use a d-c voltmeter. Connect the negative lead to B-, test point B; connect the positive lead to the test points indicated in the chart. The voltage readings given were taken with a 20,000-ohms-per-volt meter at a line voltage of 117 volts, a.c.

Turn on the power, and set the volume control to minimum. Turn the tone control fully clockwise, and set the band switch to the broadcast position.

If the "NORMAL INDICATION" is obtained in step 1, proceed with the tests for Section 2 (audio circuits); if not, isolate and correct the trouble in this section.

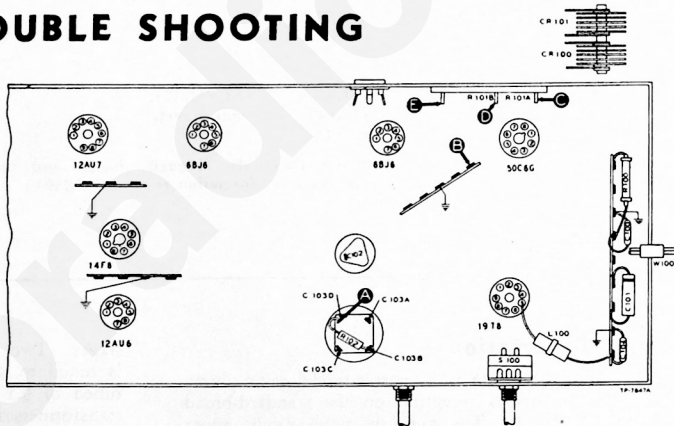


Figure 1. Bottom View, Showing Section 1 Test Points

STEP	TEST POINT	NORMAL INDICATION	ABNORMAL INDICATION	POSSIBLE CAUSE OF ABNORMAL INDICATION
1	A	145v		Trouble in this section. Isolate by the following tests.
2	C	230v	No voltage. Low voltage. High voltage.	Defective: CR100, CR101. Open: C102, W100, R100, S100. Shorted: C103A, C101, C104, C100, C313*, C330*. Defective: CR100, CR101. Open: C103A. Shorted or leaky: C103B. Open: R101A, R101B, R102.
3	D	205v	No voltage. Low voltage. High voltage.	Open: R101A. Shorted: C103B. Leaky: C103B. Shorted: C103C, C316*. Open: R101B, R102, R206*, T200*.
4	E	160v	No voltage. Low voltage. High voltage.	Open: R101B. Shorted: C103C. Leaky: C103C. Shorted: C103D, C310*, C315*. Open: R102, R315*.
5	A	145v	No voltage. Low voltage.	Open: R102. Shorted: C103D. Leaky: C103C.

Listening Test: Abnormal hum may be caused by open C103A, C103B, C103C, or C103D.

\* This part, located in another section, may cause abnormal indication in this section.

## Section 2

## TROUBLE SHOOTING

### AUDIO CIRCUITS

For the tests in this section, use an audio-frequency signal generator. Connect the generator ground lead to B—, test point B; connect the output lead through a .1-mf. condenser to the test points indicated in the chart.

Set the volume control to maximum, and turn the tone control to the midpoint of its range. Set the band switch

to the broadcast position for test points A, C, and D, and to the phono position for test point E.

If the "NORMAL INDICATION" is obtained in step 1, proceed with the tests for Section 3 (i-f, detector, and a-v-c circuits); if not, isolate and correct the trouble in this section.

STEP	TEST POINT	NORMAL INDICATION	POSSIBLE CAUSE OF ABNORMAL INDICATION
1	A E	Loud, clear speaker output with weak generator input.	Trouble in this section. Isolate by the following tests.
2	C	Clear signal with strong input.	Defective: 50C6G, LS200. Open: T200, R205, R206. Shorted: C206, C207, T200, C209.
3	D	Same as step 1.	Defective: 19T8. Open: C204, R202, R203. Shorted: C203, C205 (rotate R204), C204, C208.
4	A	Same as step 1.	Open: R200 (rotate through range), C200, C201, WS-1 (R). Shorted: C200, C201, C305D*.
5	E	Same as step 1.	Open: WS-1 (R).

Listening Test: Distortion may be caused by shorted or leaky C201 or C204. Distortion on strong signals may be caused by leaky or shorted C200.

\* This part, located in another section, may cause abnormal indication in this section.

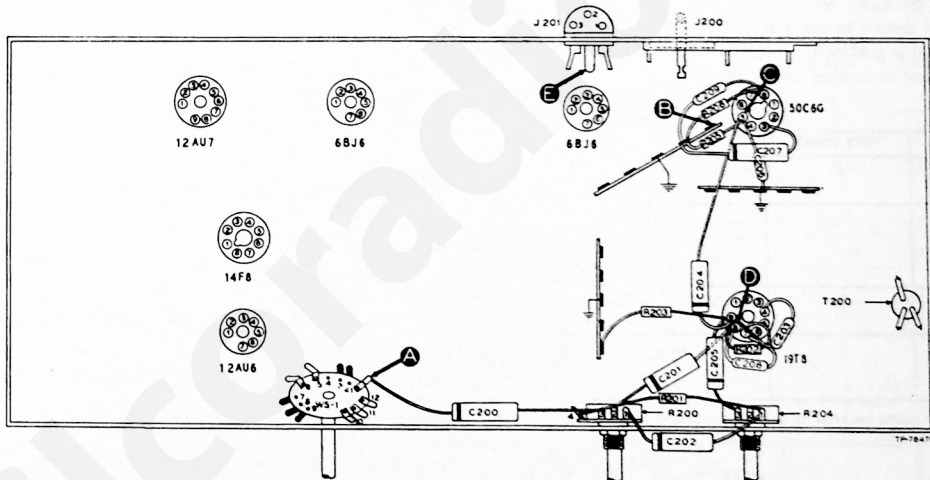


Figure 2. Bottom View, Showing Section 2 Test Points

## Section 3

## TROUBLE SHOOTING

### I-F, DETECTOR, AND A-V-C CIRCUITS

#### AM Circuits

For the following tests, use an r-f signal generator, with modulated output, set at 455 kc. Connect the generator ground lead to B—, test point B; connect the output lead through a .1-mf. condenser to the test points indicated in the chart.

Set the volume control to maximum, and turn the tone control to the midpoint of its range. Set the radio-phonograph switch to the radio position, and rotate the tuning control until the tuning condenser is fully meshed.

If the "NORMAL INDICATION" is obtained in step 1, proceed with the tests for Section 4 (r-f and converter circuits); if not, isolate and correct the trouble in this section.

To provide a complete i-f-amplifier check, test point A for this section is placed at the grid of the mixer in Section 4; therefore, the effectiveness of step 1 as a master check is dependent upon the condition of certain parts in the mixer circuit. These parts are listed below under the "POSSIBLE CAUSE OF ABNORMAL INDICATION."

Section 3 (Cont.)

# TROUBLE SHOOTING

## I-F, DETECTOR, AND A-V-C CIRCUITS

### AM Chart

STEP	TEST POINT	NORMAL INDICATION	POSSIBLE CAUSE OF ABNORMAL INDICATION
1	A	Loud, clear speaker output with weak generator input.	Trouble in AM circuits. Isolate by the following tests.
2	C	Loud, clear output with strong input.	Defective: 6BJ6, (2nd i-f amplifier), 19T8 (diode section). Open: Z302, Z303, Z304, Z305, R307, R308, R309, R310, R311, WS-1 (F). Shorted Z302, Z303, Z304, Z305, C314, C315, C316, C319. Misaligned: Z305.
3	D	Loud, clear output with moderate input.	Defective: 6BJ6 (1st i-f amplifier). Open: R303, R304, R305, R306, Z300, Z301, Z302, Z303. Shorted or leaky: C308, C310, Z300, Z301, Z302, Z303. Misaligned: Z303.
4	A	Same as step 1.	Defective: 12AU7. Open Z301, R301, R302, R408*, R411*, R412*, WS-1 (F). Shorted or leaky: C307, Z301. Misaligned: Z301.

\* This part, located in another section, may cause abnormal indication in this section.

### FM Circuits

The following tests are also made with an AM r-f signal generator, using modulated output.

Observe the instructions preliminary to the tests for the AM circuits, with these exceptions: Set the band switch to the FM position. Set the signal-generator frequency to 9.1 mc., and detune to one side or the other until a satisfactory test signal is obtained.

The best indication of satisfactory FM-detector operation

is the ability of this circuit to take the alignment properly (see page 11).

The parts which were found to be satisfactory for AM operation, with the exception of those indicated in the chart, will usually be satisfactory for FM operation.

If the "NORMAL INDICATION" is obtained in step 1, proceed with the tests for Section 4 (r-f and converter circuits); if not, isolate and correct the trouble in the FM circuits.

### FM Chart

STEP	TEST POINT	NORMAL INDICATION	POSSIBLE CAUSE OF ABNORMAL INDICATION
1	E	Loud, clear speaker output with weak generator input.	Trouble in FM circuits. Isolate by the following tests.
2	C	Loud, clear output with strong input.	Defective: 6BJ6 (2nd i-f amplifier), 19T8 (diode sections). Open Z304, C317, C318, C320, C321, C322, C323, R312, R313, R314, WS-1 (R)*. Shorted: Z304, C317, C318, C320, C321, C322, C323, C332, WS-1 (R)*. Misaligned: Z304.
3	D	Loud, clear output with moderate input.	Defective: 6BJ6 (1st i-f amplifier). Misaligned: Z302. Shorted: Z302.
4	E	Same as step 1.	Defective: 14F8*. Open: Z300, R300, R405*, R410*, L407*, WS-1 (F). Shorted: C306, C420*, C328, Z300, WS-1 (F). Misaligned: Z300.

\* This part, located in another section, may cause abnormal indication in this section.

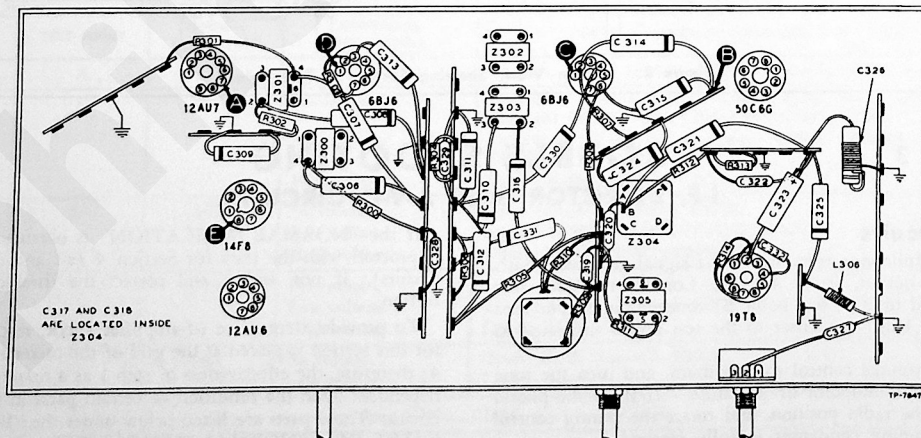


Figure 3. Bottom View, Showing Section 3 Test Points

Section 4

# TROUBLE SHOOTING

## R-F AND CONVERTER CIRCUITS

### AM Circuits

For the tests in this section, with the exception of the oscillator test, use an AM r-f signal generator with modulated output. Connect the generator ground lead to B—, test point B; connect the output lead through a .1-mf. condenser to the test points indicated in the chart.

Set the volume control to maximum, and turn the tone control to the midpoint of its range. Set the band switch to the broadcast position, and set the tuning control and the signal-generator frequency as indicated in the chart.

If the "NORMAL INDICATION" is not obtained in step 1, isolate and correct the trouble in the AM circuits. If the trouble is not revealed by the tests for this section, check the alignment.

### FM Circuits

The following tests are also made with an AM r-f signal generator, using modulated output. Observe the instructions preliminary to the tests for the AM circuits with the following exceptions:

Set the band switch to the FM position.

If the "NORMAL INDICATION" is not obtained in step 1, isolate and correct the trouble in the FM circuits.

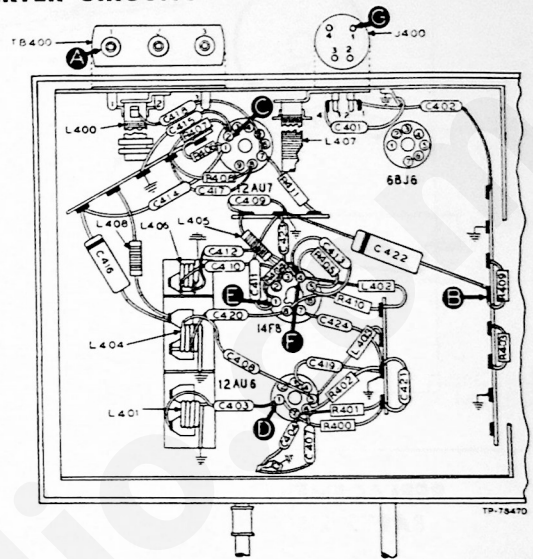


Figure 4. Bottom View, Showing Section 4 Test Points

### AM Chart

STEP	TEST POINT	SIG. GEN. FREQ.	RADIO TUNING	NORMAL INDICATION	POSSIBLE CAUSE OF ABNORMAL INDICATION
1	A	1000 kc.	Tune to signal.	Loud, clear speaker output with weak generator input.	Trouble in AM circuits. Isolate by the following tests.
2	C (Osc. test; see note below.)		Tune through range.	Negative 2 to 2.5 volts.	Defective: 12AU7 (osc. section). Shorted: C414, C415, C400, C405B, C417, L407. Open C414, C416, L408, L407, R412, R407, R406.
3	A	1000 kc.	Tune to signal.	Same as step 1.	Defective: 12AU7 (mixer section). Open: L400, L409, C418, R411, R408. Shorted: C400, C405A, C406, C417.

**OSCILLATOR TEST:** Connect the positive lead of a high-resistance voltmeter to B—, test point B; connect the prod end of the negative lead through a 100,000-ohm isolating resistor to the oscillator grid (pin 2 of 12AU7), test point C. Use a suitable meter range, such as 0–10 volts. Proper operation of the oscillator is indicated by negative voltage of approximately the value given in the chart (measured with 20,000-ohms-per-volt meter) throughout the tuning range.

### FM Chart

STEP	TEST POINT	SIG. GEN. FREQ.	RADIO TUNING	NORMAL INDICATION	POSSIBLE CAUSE OF ABNORMAL INDICATION
1	G	100 mc.	Tune to signal.	Loud, clear speaker output with weak generator input.	Trouble in FM circuits. Isolate by the following tests.
2	E to F (Osc. test; see note below.)		Tune through range.	Negative 1 to 1.5 volts.	Defective: 14F8 (osc. section). Open: R409, L402, L406, L405, C412, R404, C410, R403. Shorted: C400, C400C, L406, C411, C412, C423, C424, C410, C409.
3	D	100 mc.	Tune to signal.	Same as step 1.	Defective: 12AU6. Open: L403, R402, R401, R400, C408, L404, C420, R410, R405, C413. Shorted: C403, C404, C407, C408, L404, C400B, C400, C420.
4	G	100 mc.	Tune to signal.	Same as step 1.	Open: C402, L401, C403. Shorted: L401, C400A, C400, C403.

**OSCILLATOR TEST:** Connect the positive lead of a high-resistance voltmeter to test point F; connect the prod end of the negative lead through a 100,000-ohm isolating resistor to the oscillator grid (pin 2 of 14F8), test point E. Use a suitable meter range, such as 0–10 volts. Proper operation of the oscillator is indicated by negative voltage of approximately the value given in the chart (measured with 20,000-ohms-per-volt meter) throughout the tuning range.

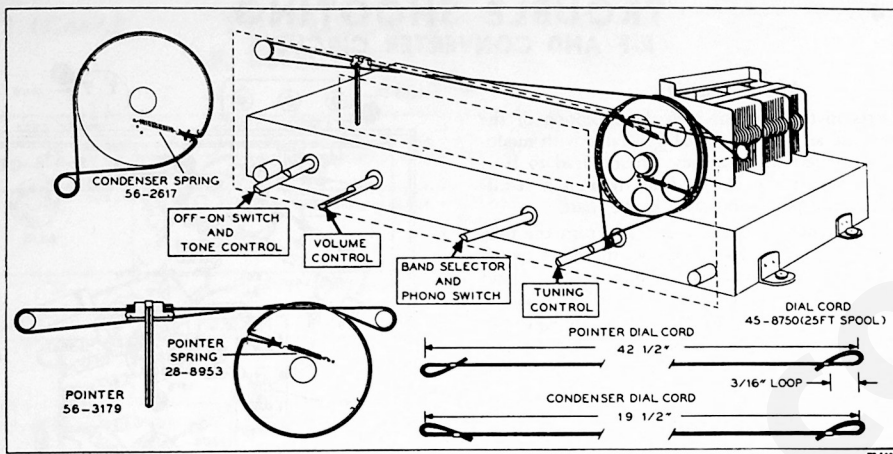


Figure 5. Drive-Cord Installation Details

## REPLACEMENT PARTS LIST

### SECTION 1 POWER SUPPLY

Reference Symbol	Description	Service Part No.
C100	Condenser, line by-pass, 100 mmf.	62-110009001*
C101	Condenser, line by-pass, .04 mf.	
C102	Condenser, electrolytic, filter, 40 mf., 200 v.	30-2568-28
C103	Condenser, electrolytic, 4-section	30-2568-24
C103A	Condenser, filter, 40 mf., 250 v.	
C103B	Condenser, filter, 40 mf., 250 v.	
C103C	Condenser, filter, 20 mf., 250 v.	
C103D	Condenser, filter, 10 mf., 250 v.	
C104	Condenser, r-f by-pass, 100 mmf.	62-110009001*
CR100	Rectifier, selenium, dry disc	34-8003-1
CR101	Rectifier, selenium, dry disc	34-8003-1
I100	Lamp, pilot	34-2605*
L100	Choke, filament, 100 microhenries	32-4143-4
R100	Resistor, current limiting, 50 ohms	33-1334
R101	Resistor, 2-section filter	33-3435-17
R101A	Resistor, filter, 180 ohms	Part of R101
R101B	Resistor, filter, 2500 ohms	Part of R101
R102	Resistor, filter, 2200 ohms	66-2224340
S100	Switch, on-off	Part of R204
W100	Line cord and plug	L2183*
WS-1 (R)	Switch-wafer section	Part of 42-1874†

### SECTION 2 AUDIO CIRCUITS

C200	Condenser, d-c blocking, .02 mf.	61-0108*
C201	Condenser, d-c blocking, .006 mf.	45-3500-7*
C202	Condenser, bass compensation, .006 mf.	45-3500-7*
C203	Condenser, by-pass, 100 mmf.	62-110009001*
C204	Condenser, d-c blocking, .006 mf.	45-3500-7*
C205	Condenser, tone compensation, .006 mf.	45-3500-7*
C206	Condenser, by-pass, 100 mmf.	62-110009001*
C207	Condenser, tone compensation, .006 mf.	45-3500-7*
C208	Condenser, 51 mmf.	30-1224-2*
C209	Condenser, cathode by-pass, 220 mmf.	62-122001001*
J200	Socket, FM test	27-6180
J201	Socket, phono input	27-6126
LS200	Speaker	36-1610-2
R200	Volume control, 2 megohms (tap at 1 megohm)	
R201	Resistor, bass compensation, 47,000 ohms	66-3473340*

### SECTION 2 (Continued) AUDIO CIRCUITS

Reference Symbol	Description	Service Part No.
R202	Resistor, grid return, 10 megohms	66-6103340*
R203	Resistor, plate load, 270,000 ohms	66-4273340*
R204	Tone control (with on-off switch), 4 megohms	33-5538-34
R205	Resistor, grid return, 470,000 ohms	66-4473340*
R206	Resistor, cathode bias, 220 ohms	66-1225340*
T200	Transformer, audio output	
WS-1 (R)	Switch-wafer section	Part of 42-1874†

### SECTION 3 I-F, DETECTOR, AND A-V-C CIRCUITS

C300A	Condenser, shunt	Part of Z300
C300B	Condenser, shunt	Part of Z300
C301A	Condenser, shunt	Part of Z301
C301B	Condenser, shunt	Part of Z301
C302A	Condenser, shunt	Part of Z302
C302B	Condenser, shunt	Part of Z302
C303A	Condenser, shunt	Part of Z303
C303B	Condenser, shunt	Part of Z303
C305A	Condenser, shunt	Part of Z305
C305B	Condenser, shunt	Part of Z305
C305C	Condenser, i-f filter	Part of Z305
C305D	Condenser, i-f filter	Part of Z305
C306	Condenser, plate decoupling (FM), .01 mf.	61-0120*
C307	Condenser, plate decoupling (AM), .01 mf.	61-0120*
C308	Condenser, a-v-c by-pass, .01 mf.	61-0120*
C309	Condenser, r-f by-pass, 100 mmf.	62-110009001*
C310	Condenser, plate decoupling, .004 mf.	61-0179*
C311	Condenser, r-f by-pass, .05 mf.	61-0122*
C312	Condenser, a-v-c filter, .01 mf.	61-0120*
C313	Condenser, r-f by-pass, .01 mf.	61-0120*
C314	Condenser, cathode by-pass, .01 mf.	61-0120*
C315	Condenser, screen by-pass, .01 mf.	61-0120*
C316	Condenser, plate decoupling, .01 mf.	61-0120*
C317	Condenser, i-f trimmer, fixed, 5 mmf.	Part of Z304
C318	Condenser, i-f trimmer, fixed, 68 mmf.	Part of Z304
C319	Condenser, plate decoupling, 100 mmf.	62-110009001*
C320	Condenser, r-f by-pass, 100 mmf.	62-110009001*
C321	Condenser, compensating, .01 mf.	61-0120*
C322	Condenser, decoupling, 2700 mmf.	60-20275404*
C323	Condenser, electrolytic, FM-detector filter, 2 mf., 50 v.	30-2417-7

**SECTION 3 (Continued)**  
**I-F, DETECTOR, AND A-V-C CIRCUITS**

Reference Symbol	Description	Service Part No.
C324	Condenser, r-f by-pass, 01 mfd.	61-0120*
C325	Condenser, tuned i-f by-pass, 03 mfd.	45-9500-1*
C326	Condenser, tuned i-f by-pass, 05 mfd.	61-0170*
C327	Condenser, r-f by-pass, 100 mmfd.	62-110009001*
C328	Condenser, r-f by-pass, 1500 mmfd.	62-215001011
C329	Condenser, r-f by-pass, 100 mmfd.	62-110009001*
C330	Condenser, filament by-pass, 01 mfd.	61-0120*
C331	Condenser, r-f by-pass, 01 mfd.	61-0120*
C332	Condenser, neutralization, 2.2 mmfd.	30-1221-6
L306	Coil, tuned i-f by-pass	32-4061-2
R300	Resistor, plate decoupling, 10,000 ohms	66-3103340*
R301	Resistor, plate decoupling, 10,000 ohms	66-3103340*
R302	Resistor, grid return, 1 megohm	66-5103340*
R303	Resistor, cathode bias, 47 ohms	66-0473340*
R304	Resistor, plate decoupling, 1000 ohms	66-2103340*
R305	Resistor, a-v-c filter, 3.3 megohms	66-5333340*
R306	Resistor, isolating, 68 ohms	66-0683340*
R307	Resistor, cathode bias, 68 ohms	66-0683340*
R308	Resistor, screen dropping, 10,000 ohms	66-3103340*
R309	Resistor, plate decoupling, 1000 ohms	66-2103340*
R310	Resistor, a-v-c return, 330,000 ohms	66-4333340*
R311	Resistor, diode load, 47,000 ohms	66-3473340*
R312	Resistor, isolating, 47,000 ohms	66-3473340*
R313	Resistor, isolating, 100,000 ohms	66-4103340*
R314	Resistor, FM-detector load, 47,000 ohms	66-3473340*
TC300A	Tuning core	Part of Z300
TC300B	Tuning core	Part of Z300
TC301A	Tuning core	Part of Z301
TC301B	Tuning core	Part of Z301
TC302A	Tuning core	Part of Z302
TC302B	Tuning core	Part of Z302
TC303A	Tuning core	Part of Z303
TC303B	Tuning core	Part of Z303
TC304A	Tuning core	Part of Z304
TC304B	Tuning core	Part of Z304
TC305A	Tuning core	Part of Z305
TC305B	Tuning core	Part of Z305
WS-1 (F)	Switch-water section	Part of 42-1874†
Z300	Transformer, FM 1st i-f	
Z301	Transformer, AM 1st i-f	
Z302	Transformer, FM 2nd i-f	
Z303	Transformer, AM 2nd i-f	
Z304	Transformer, FM 3rd i-f	32-4261-1
Z305	Transformer, AM 3rd i-f	

**SECTION 4**  
**R-F AND CONVERTER CIRCUITS**

C400	Condenser, tuning gang (3-section FM, 2-section AM)	
C400A	Condenser, trimmer, FM aerial	Part of C400
C400B	Condenser, trimmer, FM r-f	Part of C400
C400C	Condenser, trimmer, FM osc.	Part of C400
C401	Condenser, aerial coupling (FM), 100 mmfd.	62-110009001*
C402	Condenser, aerial coupling (FM), 100 mmfd.	62-110009001*
C403	Condenser, grid blocking, 51 mmfd.	30-1224-2*
C404	Condenser, cathode by-pass, 100 mmfd.	62-110009001*
C405	Condenser, trimmer assembly, 2-section	31-6476-18
C405A	Condenser, trimmer, AM aerial	Part of C405
C405B	Condenser, trimmer, AM osc.	Part of C405
C406	Condenser, isolating, 10 mmfd.	62-010009001
C407	Condenser, screen by-pass, 100 mmfd.	62-110009001*
C408	Condenser, blocking, 51 mmfd.	30-1224-2*
C409	Condenser, by-pass, 1500 mmfd.	62-215001011
C410	Condenser, blocking, 220 mmfd.	62-122001001*
C411	Condenser, by-pass, 51 mmfd.	30-1224-2*
C412	Condenser, blocking, 220 mmfd.	62-122001001*
C413	Condenser, cathode by-pass, 100 mmfd.	62-110009001*
C414	Condenser, blocking, 100 mmfd.	62-110009001*
C415	Condenser, by-pass, 220 mmfd.	66-122001001*
C416	Condenser, isolating, 01 mfd.	61-0120*
C417	Condenser, cathode by-pass, 1500 mmfd.	
C418	Condenser, d-c blocking, 100 mmfd.	62-110009001*
C419	Condenser, FM r-f by-pass, 100 mmfd.	62-110009001*
C420	Condenser, d-c blocking, 220 mmfd.	62-122001001*

**SECTION 4 (Continued)**  
**R-F AND CONVERTER CIRCUITS**

Reference Symbol	Description	Service Part No.
C421	Condenser, r-f by-pass, 100 mmfd.	62-110009001*
C422	Condenser, r-f by-pass, 02 mfd.	61-0108*
C423	Condenser, FM r-f by-pass, 100 mmfd.	62-110009001*
C424	Condenser, FM r-f by-pass, 100 mmfd.	62-110009001*
J400	Socket, FM aerial	27-6214-1
L400	Coil, AM aerial	32-4033-11
L401	Coil, FM aerial	32-4159-1
L402	Coil, r-f isolating (FM)	32-4061-2
L403	Coil, FM r-f plate load	32-4061-2
L404	Coil, FM r-f	32-4159-1
L405	Coil, FM osc. plate load	32-4061-2
L406	Coil, FM osc.	32-4018-5
L407	Coil, AM osc.	32-4221-1
L408	Coil, r-f isolating	32-4061-2
L409	Coil, r-f isolating	32-4061-2
LA400	Loop aerial	76-3583-12
PL400	Plug, wire and lug assembly, FM line-cord aerial	41-3791-1
R400	Resistor, grid return, 1 megohm	66-5103340*
R401	Resistor, cathode bias, 100 ohms	66-1103340*
R402	Resistor, screen dropping, 15,000 ohms	66-3153340*
R403	Resistor, plate decoupling, 10,000 ohms	66-3103340*
R404	Resistor, grid return, 15,000 ohms	66-3153340*
R405	Resistor, cathode bias, 1500 ohms	66-2153340*
R406	Resistor, plate load, 33,000 ohms	66-3333340*
R407	Resistor, grid return, 15,000 ohms	66-3153340*
R408	Resistor, cathode bias, 1500 ohms	66-2153340*
R409	Resistor, isolating, 68 ohms	66-0683340*
R410	Resistor, grid return, 10,000 ohms	66-3103340*
R411	Resistor, grid return, 1 megohm	66-5103340*
TB400	Terminal board, aerial	38-9942

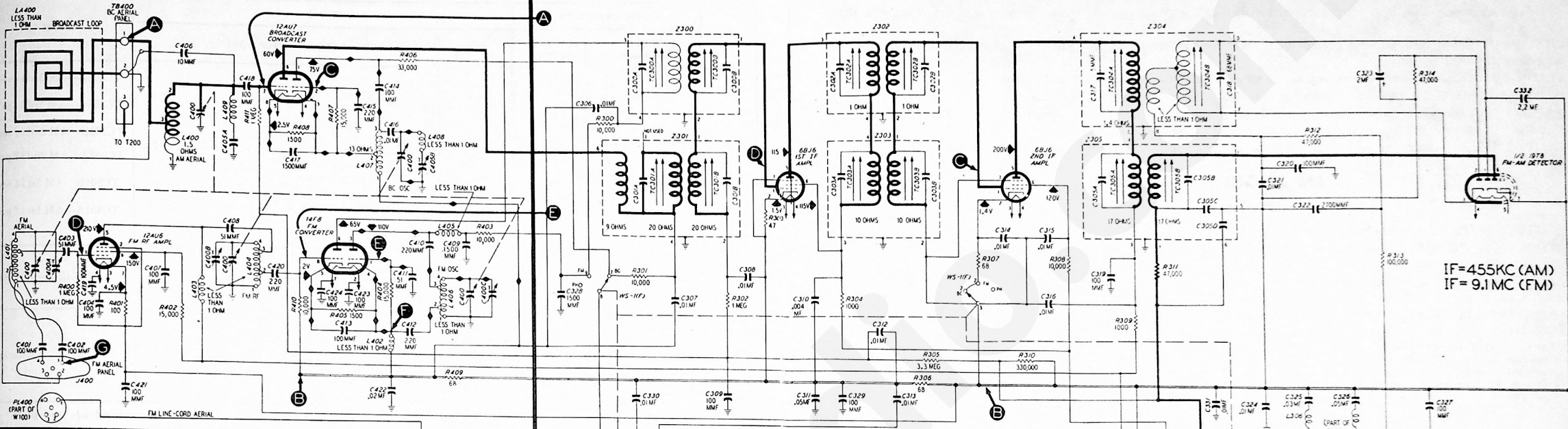
**MISCELLANEOUS**

Description	Service Part No.
Bracket-and-clip assembly, pilot lamp	76-3919
Cabinet (less scale)	10751
Back	54-7814
Baffle, speaker	219-166
Baffle-and-cloth assembly	40-7674
Bezel	56-5855FCP
Bin mechanism (L.H.)	76-3223-5
Bin mechanism (R.H.)	76-3223-6
Dome (4 required)	45-6190
Door pull	56-6493
Frame, changer mounting	76-4104
Grommet, changer mounting	54-4313
Hinge (pair)	
Knob (4 required)	54-4376
Scale	54-5024
Scale strap (2 required)	56-2234-2
Scale strap, short	56-4756
Spring, bin mechanism (2 required)	56-4978
Spring, changer mounting (6 required)	56-3043FA15
Dial-backplate assembly	76-3918
Drive cord (25-ft. spool)	45-8750*
Fastener, snap (diffusing panel)	28-4342FA3
Panel, diffusing	54-7593
Pointer	56-5630-2
Spring, diffusing panel (2 required)	56-3841
Spring, gang	56-2617
Spring, pointer	28-8953
Phono parts	
Condenser, blocking, 01 mfd.	61-0120*
Condenser, blocking, 05 mfd.	61-0122*
Crystal-pickup-cartridge-and-needle assembly, Philco special	45-1609
Crystal-pickup cartridge, P-30	35-2234-1
Needle, for P-30 crystal	45-1597
Shaft, drive (radio)	76-3479-1
Bushing (2 required)	54-7512
Socket assembly, pilot lamp	27-6233
Socket, miniature (6B16)	27-6226
Socket, miniature (19T8)	
Socket, octal (50C6G)	27-6174-4
Washer, fiber, speaker mounting (4 required)	27-7467

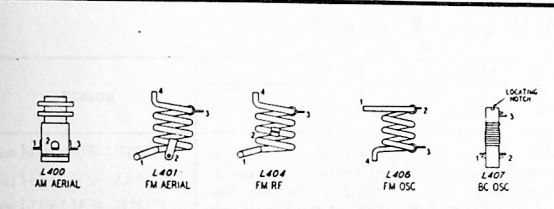
†42-1874 is a single-section water switch (band switch).

SECTION 4-RF AND CONVERTER

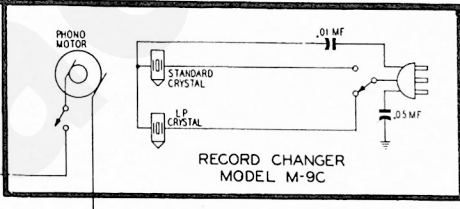
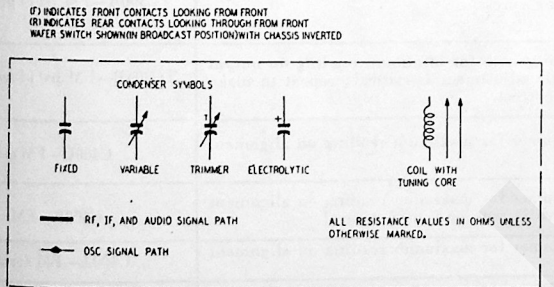
SECTION 3-IF, DETECTOR, AND AVC



IF = 455 KC (AM)  
IF = 9.1 MC (FM)



- NOTES
1. ALL VOLTAGES MEASURED FROM AUDIO B-.
  2. THE RESISTANCE OF ALL COILS IS LESS THAN 1 OHM UNLESS OTHERWISE SPECIFIED.
  3. ALL VOLTAGES MEASURED WITH LINE VOLTAGE OF 117V.



SECTION 1  
POWER SUPPLY

SECTION 2-AUDIO

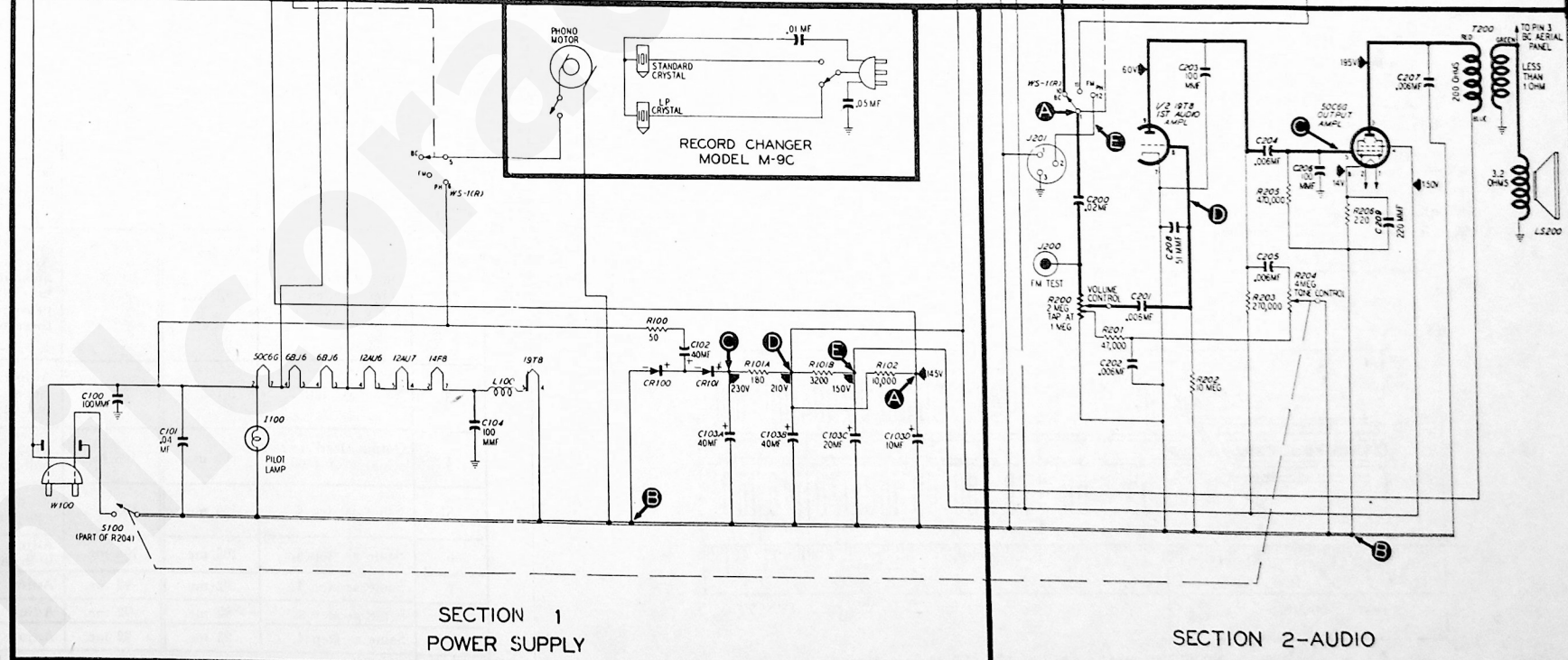


Figure 6. Philco Radio-Phonograph Model 50-1725, Sectionalized Schematic Diagram, Showing Test Points



### AM ALIGNMENT PROCEDURE

Make alignment with loop aerial connected to radio. The AM alignment should be completed before the FM alignment is made.

**DIAL POINTER**—Calibration and pointer-index measurements are shown in figure 7. With tuning gang fully meshed, set pointer to index marker.

**OUTPUT METER**—Connect between terminal 3 of aerial terminal board TB400 and chassis.

**AM R-F SIGNAL GENERATOR**—Connect as indicated in chart. Use modulated output.

**RADIO CONTROLS**—Set volume control to maximum, turn tone control fully counterclockwise, and set band switch to broadcast position.

**OUTPUT LEVEL**—During alignment, adjust signal-generator output to maintain output-meter indication below 1.25 volts.

### FM ALIGNMENT PROCEDURE

#### Make AM Alignment First

**OUTPUT METER**—Connect between terminal 3 of aerial terminal board TB400 and chassis.

**ALIGNMENT INDICATOR**—Connect negative lead of 20,000-ohms-per-volt meter to pin 2 of 19T8 tube; connect positive lead to B—. Use 10-volt range.

**AM R-F SIGNAL GENERATOR**—Generator must have sufficient output to give a reading of 8.5 volts on alignment indicator. Connect ground lead to B—; connect output lead as indicated in chart. Use modulated output.

**RADIO CONTROLS**—Set volume control to maximum, turn tone control fully counterclockwise, and set band switch to FM position. Allow radio and signal generator to operate for at least 15 minutes before making alignment.

**R-F-COIL**—NOTE: Check resonance of coils L401, L404, and L406 by inserting each end of a powdered-iron tuning core such as Philco Part No. 56-6100, into the coils. If the signal strength increases when the iron end is inserted, compress the turns slightly. If the signal strength increases when the brass end is inserted, spread the turns slightly. If the signal strength decreases when either the iron or the brass end is inserted, no further adjustment is necessary. Do not spread or compress turns of coil excessively; only a small change is required at these high frequencies.

### SYMBOLIZATION

The components in the radio circuit are symbolized according to the types of parts and the sections of the radio in which the parts are located. The prefix letter of the symbol designates the type of part as follows:

C—condenser	LS—loud-speaker	W—line cord
I—pilot lamp	R—resistor	WS—wafer switch
L—choke or coil	S—switch	Z—electrical assembly
LA—loop aerial	T—transformer	

The number of the symbol designates the section in which the part is located, as follows:

100-series components are in Section 1—the power supply.

200-series components are in Section 2—the audio circuits.

300-series components are in Section 3—the i-f, detector, and a-v-c circuits.

400-series components are in Section 4—the r-f and converter circuits.

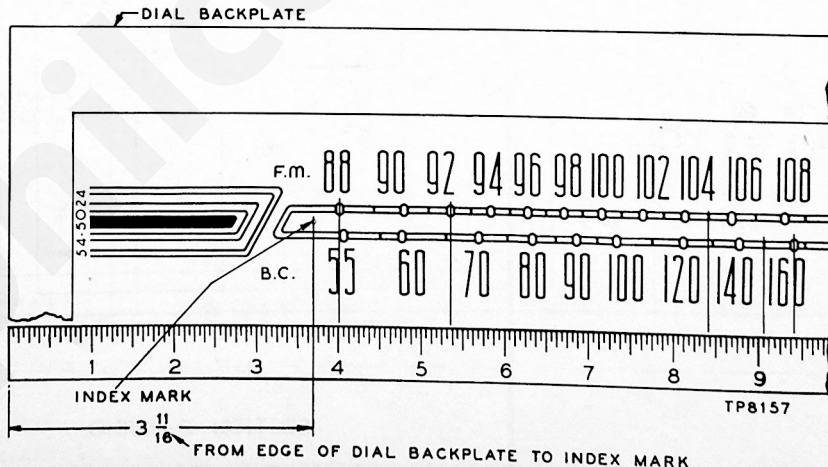


Figure 7. Dial-Backplate Calibration Measurements

## AM ALIGNMENT CHART

STEP	SIGNAL GENERATOR		RADIO		ADJUST
	CONNECTION TO RADIO	DIAL SETTING	DIAL SETTING	SPECIAL INSTRUCTIONS	
1	Ground lead to B-; output lead through .1-mf. condenser to terminal of TB400.	455 kc.	540 kc.	Adjust tuning cores once only, in order given, for Maximum output.	TC305B—AM 3rd i-f sec. TC305A—AM 3rd i-f pri. TC303B—AM 2nd i-f sec. TC303A—AM 2nd i-f pri. TC301B—AM 1st i-f sec. TC301A—AM 1st i-f pri.
2	Radiating loop (see loop below).	1600 kc.	1600 kc.	Adjust trimmer for maximum output.	C405B—AM osc.
3	Same as step 2.	1500 kc.	1500 kc.	Adjust trimmer for maximum output.	C405A—AM aerial

NOTE: TC801A TC803A AND TC805A ARE LOCATED ON UNDERSIDE OF CHASSIS.

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RADIATING LOOP: Make up a 6-to-8 turn, 6-inch-diameter loop from insulated wire; connect to signal-generator leads and place near radio loop aerial.

Figure 8. Top View, Showing AM Trimmer Locations

## FM ALIGNMENT CHART

STEP	SIGNAL GENERATOR		RADIO		ADJUST
	CONNECTION TO RADIO	DIAL SETTING	DIAL SETTING	SPECIAL INSTRUCTIONS	
1	Ground lead to B-; output lead through .1-mf. condenser to pin 1 of 6BJ6 (1st i-f amplifier).	9.1 mc.	88 mc.	Adjust tuning cores for maximum reading on alignment indicator. Attenuate signal generator to maintain 10-volt reading. Repeat until no further improvement is noted. After this step, do not touch any of these tuning cores except as directed in step 3.	TC304B—FM 3rd i-f sec. TC304A—FM 3rd i-f pri. TC302B—FM 2nd i-f sec. TC302A—FM 2nd i-f pri.
2	Output lead through .1-mf. condenser to pin 8 of 14F8.	9.1 mc.	88 mc.	Adjust tuning cores for maximum reading on alignment indicator. Attenuate signal generator to maintain 10-volt reading. Repeat until no further improvement is noted. After this step, do not touch these tuning cores.	TC300B—FM 1st i-f sec. TC300A—FM 1st i-f pri.
3	Same as step 2.	9.1 mc.	88 mc.	Adjust tuning core for minimum reading on output meter. This adjustment is critical; repeat to make sure it is correct.	TC304B—FM 3rd i-f sec.
4	Output lead to terminal 1 of J400.	105 mc.	105 mc.	Adjust trimmer for maximum reading on alignment indicator.	C400C—FM osc.
5	Same as step 4.	105 mc.	105 mc.	Adjust trimmer for maximum reading on alignment indicator while rocking tuning control.	C400B—FM r-f
6	Same as step 4.	105 mc.	105 mc.	Adjust trimmer for maximum reading on alignment indicator.	C400A—FM aerial
7	Same as step 4.	92 mc.	92 mc.	Adjust coil for maximum (see r-f coil note).	L406—FM osc. coil
8	Same as step 4.	92 mc.	92 mc.	Adjust coil for maximum (see r-f coil note).	L404—FM r-f coil
9	Same as step 4.	92 mc.	92 mc.	Adjust coil for maximum (see r-f coil note).	L401—FM aerial coil
10	Repeat steps 4 through 9 until no further increase is obtained.				

NOTE: L901, L904, L906, TC800A, TC802A AND TC804A ARE LOCATED ON UNDERSIDE OF CHASSIS.

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Figure 9. Top View, Showing FM Trimmer Locations

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## CORRECTIONS TO PARTS LIST

Reference Symbol	Description	Service Part No.	Reference Symbol	Description	Service Part No.
C101	Condenser, line by-pass, .04 $\mu$ f. ....	45-3500-2	C417	Condenser, cathode by-pass, 1500 $\mu$ f. ....	62-215001011
C103A	Condenser, filter, 40 $\mu$ f., 250v .....	Part of C103	Z300	Transformer, FM 1st i-f .....	32-4257A
C103B	Condenser, filter, 40 $\mu$ f., 250v .....	Part of C103	Z301	Transformer, AM 1st i-f .....	32-4258A
C103C	Condenser, filter, 20 $\mu$ f., 250v .....	Part of C103	Z302	Transformer, FM 2nd i-f .....	32-4257-1A
C103D	Condenser, filter, 10 $\mu$ f., 250v .....	Part of C103	Z303	Transformer, AM 2nd i-f .....	32-4160-3A
R200	Volume control, 2 megohms (tap at 1 megohm) .....	33-5535-17	Z305	Transformer, AM 3rd i-f .....	32-4240-2A
T200	Transformer, audio output .....	32-8367-1		Hinge (pair) .....	56-5765
C400	Condenser, tuning gang (3 section FM, 2 section AM) .....	31-2724-7		Socket, miniature (19T8) .....	27-6203-5

**1950 TROPIC RADIOS  
AND RADIO-PHONOGRAPHS**