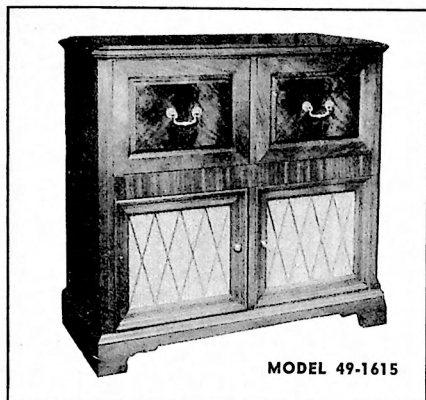


# PHILCO RADIO-PHONOGRAPH MODEL 49-1615



## SPECIFICATIONS

CABINET ..... Wood console, mahogany finish, Georgian style

CIRCUIT ..... 11-tube superheterodyne

### FREQUENCY RANGES

Broadcast ..... 540—1620 kc.

FM ..... .88—108 mc.

AUDIO OUTPUT ..... 10 watts

PUSH BUTTONS ..... Six: Five for broadcast stations, one for power on-off

OPERATING VOLTAGE .. 105—125 volts, 60 cycles, a.c.

### POWER CONSUMPTION

Radio ..... 110 watts

Phonograph ..... 125 watts

AERIALS ..... Low-impedance broadcast loop; FM line-cord aerial; provision for external aerial

### INTERMEDIATE FREQUENCIES

AM ..... 455 kc.

FM ..... 9.1 mc.

PHONOGRAPH ..... Philco Automatic Record Changer and Record Player Combination, Model M-12C (for service information, refer to page 532)

PHILCO TUBES (11) ..... 6AU6, 7F8, 6BA6(2), 6T8, 7A4, 6V6GT(2), 7E7, 7F7, 5U4G

TP-6098

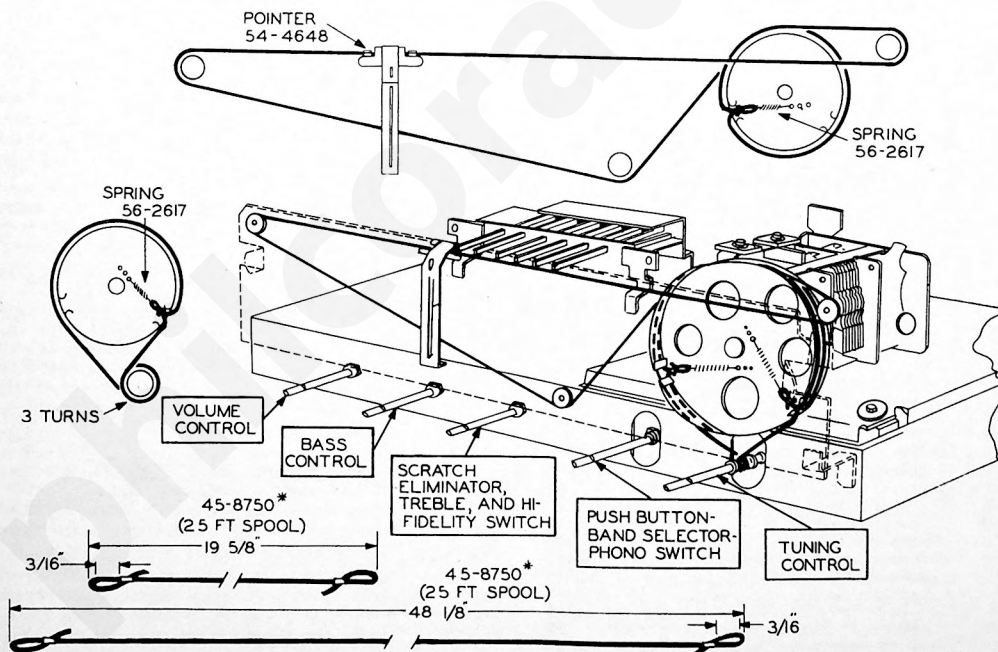


FIGURE 1. DRIVE-CORD INSTALLATION DETAILS

TP-7673F

## MODEL 49-1615

### SETTING THE PUSH BUTTONS

1. Connect the output meter between the No. 3 pin of the aerial input jack, J400, and the chassis. See figure 8.
2. Turn the volume control to maximum, and the bass control fully counterclockwise. Turn the treble selector switch fully clockwise. Set the band switch to the push-button position.
3. Couple the signal generator loosely to the loop aerial (see RADIATING LOOP note under AM ALIGNMENT CHART).
4. Turn on the power, and allow the radio to warm up for 15 minutes before starting the adjustments.
5. Starting with the lowest frequency desired, set the signal generator to the frequency (modulation on), push the station-selector push button, and adjust the associated oscillator tuning core and aerial trimmer condenser (marked on rear of chassis) for maximum indication on the output meter.
6. Reset the signal-generator frequency, and repeat the procedure for each remaining station-selector push button.
7. Turn off the signal generator, and make a final adjustment of all tuning cores and trimmer condensers while listening to the stations for which the adjustments are being made.

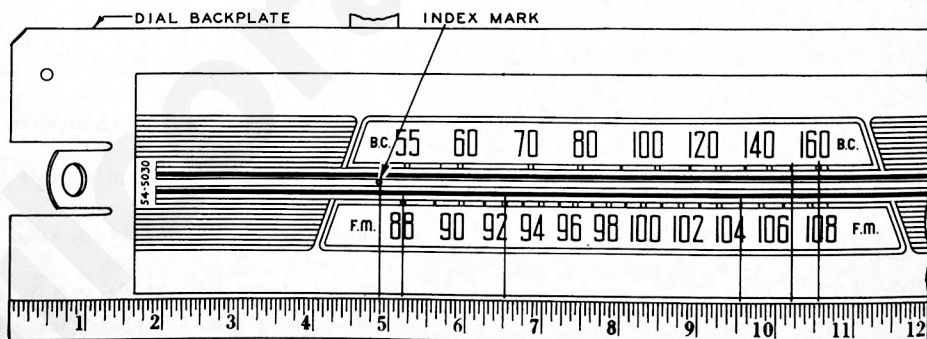


FIGURE 2. DIAL-BACKPLATE CALIBRATION MEASUREMENTS

TP-7088

### CALIBRATING DIAL BACKPLATE

When the radio chassis has been removed from the cabinet, dial calibration and alignment points may be marked on the dial backplate below the pointer.

The method of measuring for these points is illustrated in figure 2. Hold a ruler against the scale backplate, with the start of the ruler at the left-hand edge of the backplate, and mark pencil dots at the proper points for the required frequency settings. When the ruler is correctly placed, the index mark is approxi-

mately 4-7/8" from the reference point indicated in figure 2.

With the tuning gang fully meshed, the pointer should be adjusted on the dial drive cord to coincide with the index mark.

After the chassis is installed in the cabinet, the tuning condenser should be fully meshed, and the dial pointer should be moved to coincide with the index mark on the dial.

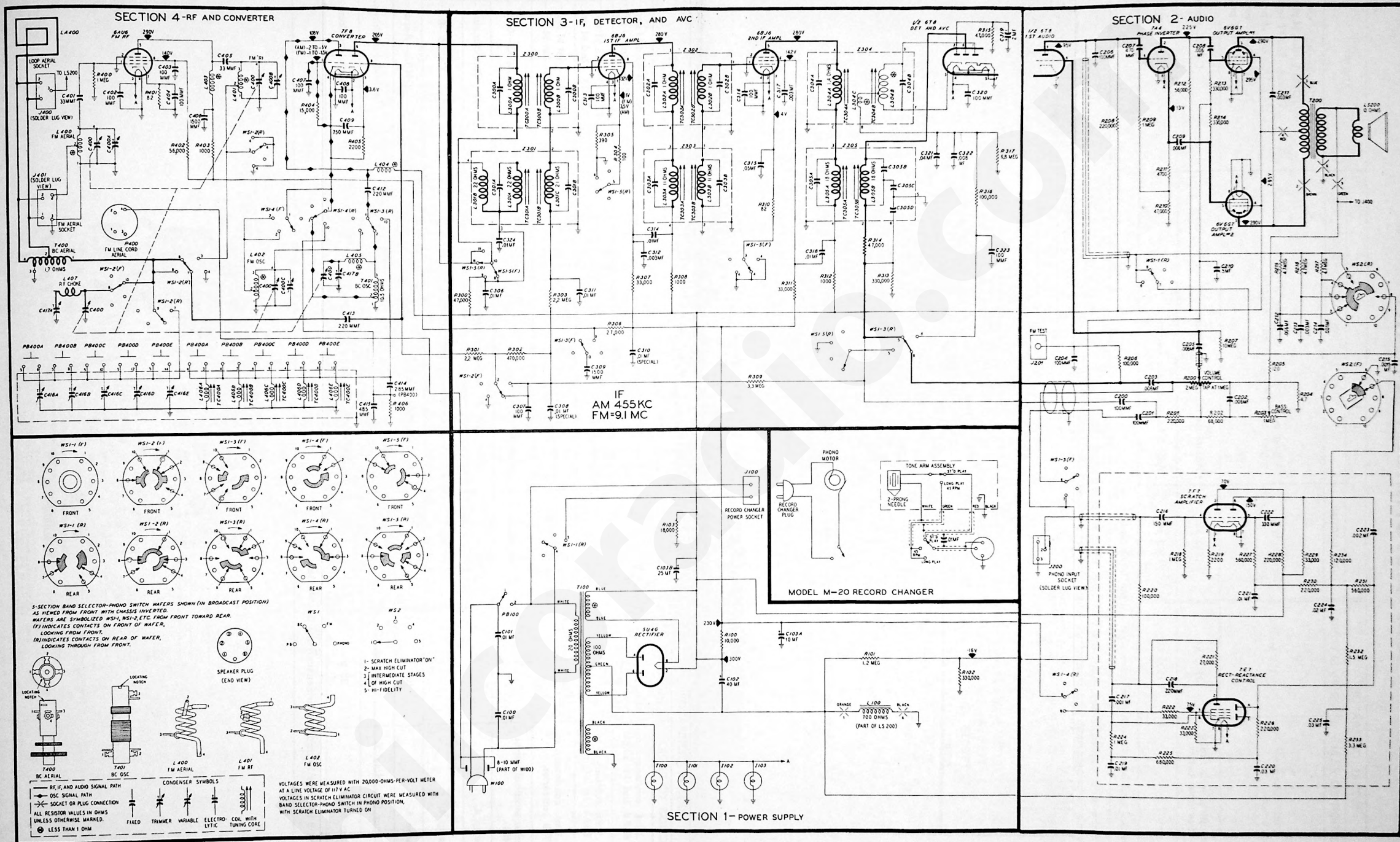


FIGURE 3. PHILCO RADIO-PHONOGRAPH MODEL 49-1615, SECTIONALIZED SCHEMATIC DIAGRAM, SHOWING TEST POINTS

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

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



# AM ALIGNMENT CHART

STEP	SIGNAL GENERATOR		RADIO		ADJUST
	CONNECTION TO RADIO	DIAL SETTING	DIAL SETTING	SPECIAL INSTRUCTIONS	
1	Through .1-mf. condenser to pin 8 of 7F8 tube.	455 kc.	Gang fully closed.	Adjust each trimmer, in order given, for maximum output. Do not repeat adjustments.	TC305B—3rd i-f sec. TC305A—3rd i-f pri. TC303B—2nd i-f sec. TC303A—2nd i-f pri. TC301B—1st i-f sec. TC301A—1st i-f pri.
2	Loosely coupled with radiating loop. See note below.	1600 kc.	1600 kc.	Adjust for maximum output.	C417B—Osc.
3	Same as step 2.	1500 kc.	1500 kc.	Adjust for maximum output.	C417A—Aerial
4	Repeat steps 2 and 3 until no further increase in output is obtained.				

**RADIATING LOOP:** Make up a six-to-eight turn, 6-inch-diameter loop, using insulated wire; connect to signal generator leads and place near radio loop. Radio loop must be connected to set during alignment.

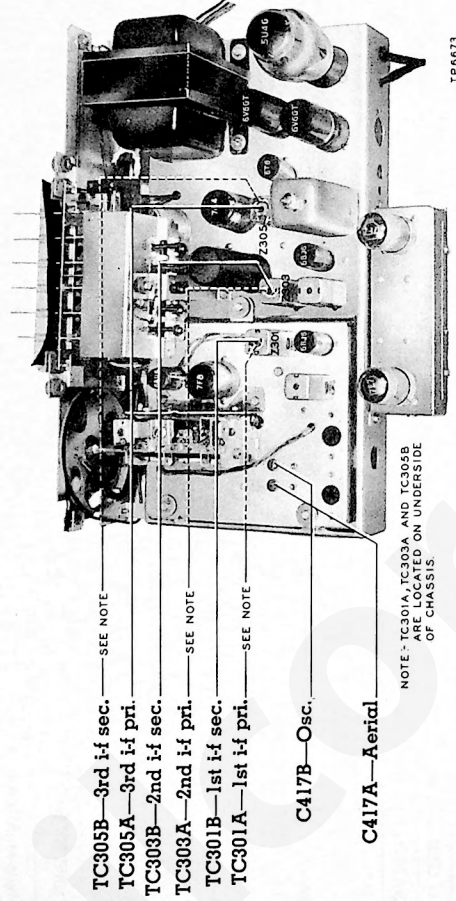


FIGURE 4. TOP VIEW, SHOWING AM TRIMMER LOCATIONS

# FM ALIGNMENT CHART

STEP	SIGNAL GENERATOR		RADIO		ADJUST
	CONNECTION TO RADIO	DIAL SETTING	DIAL SETTING	SPECIAL INSTRUCTIONS	
1	Through .1-mf. condenser to pin 1 of 6BA6 2nd i-f ampl.	9.1 mc.	88 mc.	Adjust trimmers, in order given, for maximum output.	TC304B—3rd i-f sec. TC304A—3rd i-f pri.
2	Through .1-mf. condenser to pin 1 of 6BA6 1st i-f ampl.	9.1 mc.	88 mc.	Same as step 1.	TC302B—2nd i-f sec. TC302A—2nd i-f pri.
3	Through .1-mf. condenser to pin 8 of 7F8 converter.	9.1 mc.	88 mc.	Same as step 1.	TC300B—1st i-f sec. TC300A—1st i-f pri.
4	To FM aerial terminal (terminal 4 of J401).	105 mc.	105 mc.	Adjust for maximum.	C400C—Osc.
5	Same as step 4.	92 mc.	92 mc.	Adjust L402 for maximum (see Note 1).	L402—Osc. tracking
6	Same as step 4.	105 mc.	105 mc.	Adjust for maximum while rocking tuning control.	C400B—R.f.
7	Same as step 4.	105 mc.	105 mc.	Adjust for maximum.	C400A—Aerial
8	Dipole radiator (see Note 3).	92 mc.	92 mc.	Adjust L401 for maximum while rocking tuning control (see Note 1).	L401—R-f tracking
9	Same as step 8.	92 mc.	92 mc.	Adjust L400 for maximum (see Note 1).	L400—Aerial tracking
10	Repeat steps 5 through 10 until no further increase in output is obtained.				

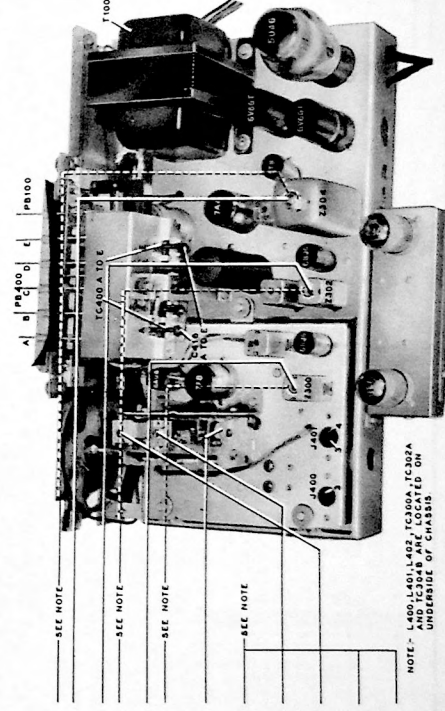


FIGURE 5. TOP VIEW, SHOWING FM TRIMMER LOCATIONS

## **ALIGNMENT PROCEDURE**

**CAUTION:** Do not turn on the power with the speaker disconnected, or the radio may be damaged.

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### **ALIGNMENT OF AM CIRCUITS**

When the complete AM and FM alignment is to be made, the AM alignment should be made first; however, if AM alignment is not required, the FM alignment alone may be made.

**DIAL POINTER:** With the tuning condensers fully meshed, the dial pointer must coincide with the index mark at the low-frequency end of the dial. See "CALIBRATING DIAL BACKPLATE" for the method of measuring the backplate for index and calibration points.

**CONTROLS:** Set the volume control to maximum, and the bass control fully counterclockwise. Set the treble selector switch fully clockwise. Set the band switch to the broadcast position. Set the signal-generator dial and radio dial as indicated in the chart.

**OUTPUT METER:** Connect between the No. 3 terminal (voice-coil connection) of the loop aerial socket, J400, and the chassis. See figure 5.

**AM SIGNAL GENERATOR:** Connect the ground lead to the chassis, and the output lead as indicated in the chart. Use modulated output.

**OUTPUT LEVEL:** During alignment, the signal-generator output must be attenuated to hold the radio output below 1.5 volts, as read on the output meter.

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### **ALIGNMENT OF FM CIRCUITS**

**BEFORE STARTING ALIGNMENT, ALLOW THE RADIO AND SIGNAL GENERATOR TO WARM UP FOR 15 MINUTES.**

**CONTROLS:** Set the volume control to maximum, and the bass control fully counterclockwise. Set the treble selector switch fully clockwise. Set the band switch to the FM position. Set the signal-generator dial and radio dial as indicated in the chart.

**OUTPUT METER:** Connect between the No. 3 terminal (voice-coil connection) of the loop aerial socket, J400, and the chassis. See figure 5.

**AM SIGNAL GENERATOR:** Connect the ground lead to the chassis; connect the output lead through a .1-mf. condenser to the points specified in the chart. Use modulated output.

**OUTPUT LEVEL:** During alignment, the signal-generator output must be attenuated to hold the radio output below 1.5 volts, as read on the output meter.

**LOCATIONS OF COILS:** For the locations of coils L400, L401, and L402 (steps 8, 9, and 10), refer to figure 1

Note 1. Check the tracking of oscillator and r-f circuits with a tuning wand. If placing the brass end in or near the coil increases the output-meter reading, spread the turns; if the powdered-iron end increases the output reading, compress the turns. If both ends cause a decrease in the output, the coil is correctly tuned. Do not change the coils excessively, since only a small adjustment is required at these frequencies.

Note 2. Make two simple dipole aerials to feed the signals from the signal generator to the radio. Each dipole aerial may consist of two 30-inch lengths of rubber-covered wire. Connect one dipole aerial to terminals 3 and 4 on the FM aerial socket, J401, of the radio. See figure 5. Connect the other dipole aerial to the output leads of the signal generator. Place the two dipoles several feet apart.

Note 3. The use of a signal generator for steps 5 through 11 is recommended only if the available generator is sufficiently accurate to insure correct frequency settings. Otherwise, an alternative procedure employing FM broadcast-station signals is recommended. For the adjustments at the high-frequency end of the band, use the station nearest 105 mc.; for the adjustments at the low-frequency end of the band, use the station nearest 88 mc. or 92 mc., as indicated. If the radio is greatly misaligned, it may be necessary to adjust the trimmers and coils for maximum noise at each end of the band before station signals can be heard.

# REPLACEMENT PARTS LIST

NOTE: Part numbers identified by an asterisk (\*) are general replacement items. These numbers may not be identical with those on factory assemblies; also, the electrical values of some replacement items may differ from the values indicated in the schematic diagram and parts list. The values substituted in any case are so chosen that the operation of the radio will be either unchanged or improved. When ordering replacements, use only the "Service Part No."

## SECTION 1 POWER SUPPLY

Reference Symbol	Description	Service Part No.
C100	Condenser, line filter, .01 mf.	60-0120*
C101	Condenser, line filter, .01 mf.	60-0120*
C102	Condenser, electrolytic, filter, 40 mf., 450v	30-2568-20
C103	Condenser, electrolytic, 2-section	30-2556
C103A	Condenser, filter, 10 mf., 450v	Part of C103
C103B	Condenser, filter, 25 mf., 450v	Part of C103
C104	Condenser, filter, .01 mf.	61-0120*
L100	Field coil, filter choke	Part of LS200
I100	Lamp, bin light, 6.3-volt	34-2040
I101	Lamp, jewel light, 6.3-volt	34-2040
I102	Lamp, pilot light, 6.3-volt	34-2040
I103	Lamp, pilot light, 6.3-volt	34-2040
J100	Socket, phono power	27-6200
PB100	Switch, power off-on	Part of 42-1881†
R100	Resistor, filter, 18,000 ohms, 10w	33-1335-85
R101	Resistor, bias divider, 1.2 megohms	66-5123340*
R102	Resistor, bias divider, 330,000 ohms	66-4333340*
R103	Resistor, bleeder, 18,000 ohms, 10 watts	33-1335-85
T100	Transformer, power	32-8378
W100	Line cord and plug	L-2183*
WS1-1(R)	Switch-wafer section	Part of 42-1877‡

## SECTION 2 AUDIO CIRCUITS

C200	Condenser, AM tone compensation, 100 mmf.	62-110009001
C201	Condenser, AM tone compensation, 100 mmf.	62-110009001
C202	Condenser, bass tone compensation, .003 mf.	61-0117*
C203	Condenser, d-c blocking, .006 mf.	45-3500-7*
C204	Condenser, r-f by-pass, 100 mmf.	62-110009001
C205	Condenser, d-c blocking, .006 mf.	45-3500-7*
C206	Condenser, r-f by-pass, 100 mmf.	62-110009001
C207	Condenser, d-c blocking, 470 mmf.	60-10515307*
C208	Condenser, d-c blocking, .006 mf.	45-3500-7*
C209	Condenser, d-c blocking, .006 mf.	45-3500-7*
C210	Condenser, bias filter, .5 mf.	45-3500-10*
C211	Condenser, tone compensation, .003 mf.	61-0117*
C212	Condenser, tone compensation, .006 mf.	45-3500-7*
C213	Condenser, tone compensation, .033 mf.	61-0117*
C214	Condenser, tone compensation, .001 mf.	45-3500-5*
C215	Condenser, tone compensation, .0015 mf.	45-3500-6*
C216	Condenser, high-pass filter, 150 mmf.	60-10155407*
C217	Condenser, d-c blocking, .001 mf.	45-3500-5*
C218	Condenser, reactance feedback, 100 mmf.	60-10105407*
C219	Condenser, bias filter, .01 mf.	61-0120*

†42-1881 Push-button switch assembly

## SECTION 2 (Continued) AUDIO CIRCUITS

Reference Symbol	Description	Service Part No.
C220	Condenser, bias filter, .03 mf.	45-3500-1*
C221	Condenser, bias filter, .01 mf.	61-0120*
C222	Condenser, d-c blocking, 330 mmf.	60-10335407*
C223	Condenser, d-c blocking, .002 mf.	61-0062*
C224	Condenser, bias filter, .02 mf.	61-0108*
C225	Condenser, bias filter, .03 mf.	45-3500-1*
J200	Socket, phono input	27-6126
J201	Socket, FM test	27-6180
LS200	Speaker, electrodynamic, 12" (including L100)	36-1630
R200	Volume control, 2 megohms, tap at 1 megohm	45-5009
R201	Resistor, bass boost, 220,000 ohms	66-4223340*
R202	Resistor, tone compensation, 68,000 ohms	66-3683340*
R203	Tone control, bass, 1 megohm	45-5012
R204	Resistor, voltage divider, inverse feedback, 4.7 ohms	66-9473340*
R205	Resistor, voltage divider, inverse feedback, 100 ohms	66-1103340*
R206	Resistor, isolating, 100,000 ohms	66-4103340*
R207	Resistor, grid return, 10 megohms	66-6103340*
R208	Resistor, plate load, 220,000 ohms	66-4223340*
R209	Resistor, grid return, 1 megohm	66-5103340*
R210	Resistor, cathode bias, 47,000 ohms	66-3473340*
R211	Resistor, cathode load, 4700 ohms	66-2473340*
R212	Resistor, plate load, 56,000 ohms	66-3563340*
R213	Resistor, grid return, 330,000 ohms	66-4333340*
R214	Resistor, grid return, 330,000 ohms	66-4333340*
R215	Resistor, tone compensation, 4.7 megohms	66-5473340*
R216	Resistor, tone compensation, 4.7 megohms	66-5473340*
R217	Resistor, tone compensation, 4.7 megohms	66-5473340*
R218	Resistor, grid return, 1 megohm	66-5103340*
R219	Resistor, cathode bias, 2200 ohms	66-2223340*
R220	Resistor, low-pass filter, 100,000 ohms	66-4103340*
R221	Resistor, plate load, 27,000 ohms	66-3273340*
R222	Resistor, screen voltage divider, 33,000 ohms	66-3333340*
R223	Resistor, screen voltage divider, 33,000 ohms	66-3333340*
R224	Resistor, grid return, 1 megohm	66-5103340*
R225	Resistor, bias filter, 680,000 ohms	66-4683340*
R226	Resistor, bias filter, 220,000 ohms	66-4223340*
R227	Resistor, grid return, 560,000 ohms	66-4563340*
R228	Resistor, plate load, 220,000 ohms	66-4223340*
R229	Resistor, plate load, 100,000 ohms	66-4103340*
R230	Resistor, bias filter, 220,000 ohms	66-4223340*
R231	Resistor, diode load, 560,000 ohms	66-4563340*

‡42-1877 Band switch, S-section



# REPLACEMENT PARTS LIST

## SECTION 2 (Continued) AUDIO CIRCUITS

Reference Symbol	Description	Service Part No.
R232	Resistor, bias filter, 1.5 megohms	66-5153340*
R233	Resistor, bias filter, 3.3 megohms	66-5333340*
R234	Resistor, diode load, 120,000 ohms	66-4123340*
T200	Transformer, output	32-8379
WS1-1(R)	Switch-wafer section	Part of 42-1877‡
WS1-3(F)	Switch-wafer section	Part of 42-1877‡
WS1-4(R)	Switch-wafer section	Part of 42-1877‡
WS2	Switch, wafer, scratch eliminator off-on and fidelity (treble selector) switch	42-1876

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

C300A	Condenser, fixed trimmer, pri., 1st FM i-f	Part of Z300
C300B	Condenser, fixed trimmer, sec., 1st FM i-f	Part of Z300
C301A	Condenser, fixed trimmer, pri., 1st AM i-f	Part of Z301
C301B	Condenser, fixed trimmer, sec., 1st AM i-f	Part of Z301
C302A	Condenser, fixed trimmer, pri., 2nd FM i-f	Part of Z302
C302B	Condenser, fixed trimmer, sec., 2nd FM i-f	Part of Z302
C303A	Condenser, fixed trimmer, pri., 2nd AM i-f	Part of Z303
C303B	Condenser, fixed trimmer, sec., 2nd AM i-f	Part of Z303
C304A	Condenser, fixed trimmer, pri., 3rd FM i-f	Part of Z304
C304B	Condenser, fixed trimmer, sec., 3rd FM i-f	Part of Z304
C305A	Condenser, fixed trimmer, pri., 3rd AM i-f	Part of Z305
C305B	Condenser, fixed trimmer, sec., 3rd AM i-f	Part of Z305
C305C	Condenser, r-f by-pass	Part of Z305
C305D	Condenser, r-f by-pass	Part of Z305
C306	Condenser, plate decoupling, .01 mf.	61-0120*
C307	Condenser, r-f by-pass, 100 mmf.	62-110009001
C308	Condenser (special), a-v-c filter, .01 mf.	30-4641
C309	Condenser, r-f by-pass, 1500 mmf.	62-215001011
C310	Condenser, (special), r-f by-pass, .01 mf.	30-4641
C311	Condenser, r-f by-pass, .01 mf.	61-0120*
C312	Condenser, screen by-pass, .01 mf.	61-0120*
C313	Condenser, filament by-pass, 100 mmf.	62-110009001
C314	Condenser, plate by-pass, .01 mf.	61-0120*
C315	Condenser, cathode by-pass, .01 mf.	61-0120*
C316	Condenser, filament by-pass, 100 mmf.	62-110009001
C317	Condenser, screen by-pass, .01 mf.	61-0120*
C318	Condenser, plate by-pass, .01 mf.	61-0120*
C319	Condenser, electrolytic, diode-load filter, 2 mf., 50v	30-2417-7
C320	Condenser, filament by-pass, 100 mmf.	62-110009001
C321	Condenser, de-emphasis, .04 mf.	45-3500-2
C322	Condenser, de-emphasis, .008 mf.	30-4112*
C323	Condenser, r-f by-pass, 100 mmf.	62-110009001
L300A	Coil, primary winding, 1st FM i-f	Part of Z300

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

Reference Symbol	Description	Service Part No.
L300B	Coil, secondary winding, 1st FM i-f	Part of Z300
L301A	Coil, primary winding, 1st AM i-f	Part of Z301
L301B	Coil, tertiary winding, 1st AM i-f	Part of Z301
L301C	Coil, secondary winding, 1st AM i-f	Part of Z301
L302A	Coil, primary winding, 2nd FM i-f	Part of Z302
L302B	Coil, secondary winding, 2nd FM i-f	Part of Z302
L303A	Coil, primary winding, 2nd AM i-f	Part of Z303
L303B	Coil, secondary winding, 2nd AM i-f	Part of Z303
L304A	Coil, primary winding, 3rd FM i-f	Part of Z304
L304B	Coil, secondary winding, 3rd FM i-f	Part of Z304
L304C	Coil, tertiary winding, 3rd FM i-f	Part of Z304
L305A	Coil, primary winding, 3rd AM i-f	Part of Z305
L305B	Coil, secondary winding, 3rd AM i-f	Part of Z305
R300	Resistor, plate dropping, 47,000 ohms	66-3473340*
R301	Resistor, grid return, 2.2 megohms	66-5223340*
R302	Resistor, a-v-c voltage divider, 470,000 ohms	66-4473340*
R303	Resistor, grid return, 2.2 megohms	66-5223340*
R304	Resistor, cathode bias (FM), 82 ohms	66-0823340*
R305	Resistor, cathode bias, 390 ohms	66-1393340*
R306	Resistor, plate dropping, 27,000 ohms	66-3273340*
R307	Resistor, screen dropping, 33,000 ohms	66-3333340*
R308	Resistor, plate decoupling, 1000 ohms	66-2103340*
R309	Resistor, a-v-c filter, 3.3 megohms	66-5333340*
R310	Resistor, cathode bias, 330 ohms	66-1333340*
R311	Resistor, screen dropping, 20,000 ohms	66-3203340*
R312	Resistor, plate decoupling, 1000 ohms	66-2103340*
R313	Resistor, diode load, 330,000 ohms	66-4333340*
R314	Resistor, i-f filter, 47,000 ohms	66-3473340*
R315	Resistor, FM diode load, 47,000 ohms	66-3473340*
R316	Resistor, isolating, 100,000 ohms	66-4103340*
R317	Resistor, FM detector load, 6.8 megohms	66-5683340*
TC300A	Tuning core, pri., 1st FM i-f	Part of Z300
TC300B	Tuning core, sec., 1st FM i-f	Part of Z300
TC301A	Tuning core, pri., 1st AM i-f	Part of Z301
TC301B	Tuning core, sec., 1st AM i-f	Part of Z301
TC302A	Tuning core, pri., 2nd FM i-f	Part of Z302
TC302B	Tuning core, sec., 2nd FM i-f	Part of Z302
TC303A	Tuning core, pri., 2nd AM i-f	Part of Z303
TC303B	Tuning core, sec., 2nd AM i-f	Part of Z303
TC304A	Tuning core, pri., 3rd FM i-f	Part of Z304
TC304B	Tuning core, sec., 3rd FM i-f	Part of Z304
TC305A	Tuning core, pri., 3rd AM i-f	Part of Z305
TC305B	Tuning core, sec., 3rd AM i-f	Part of Z305
WS1-2(F)	Switch-wafer section	Part of 42-1877‡
WS1-3(F)	Switch-wafer section	Part of 42-1877‡
WS1-3(R)	Switch-wafer section	Part of 42-1877‡
WS1-5(F)	Switch-wafer section	Part of 42-1877‡
WS1-5(R)	Switch-wafer section	Part of 42-1877‡
Z300	Transformer, 1st FM i-f	32-4257
Z301	Transformer, 1st AM i-f	32-4258
Z302	Transformer, 2nd FM i-f	32-4257-1
Z303	Transformer, 2nd AM i-f	32-4160-3
Z304	Transformer, 3rd FM i-f	32-4261-1
Z305	Transformer, 3rd AM i-f	32-4240-2

‡42-1877 Band switch, 5-section

# REPLACEMENT PARTS LIST

## SECTION 4 R-F AND CONVERTER CIRCUITS

Reference Symbol	Description	Service Part No.
C400	Condenser, tuning gang (AM, 2-section; FM, 3-section)	31-2724-6
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, d-c blocking, 33 mmf.	30-1224
C402	Condenser, filament by-pass, 100 mmf.	62-110009001
C403	Condenser, screen by-pass, 100 mmf.	62-110009001
C404	Condenser, cathode by-pass, 100 mmf.	62-110009001
C405	Condenser, d-c blocking, 33 mmf.	30-1224
C406	Condenser, r-f by-pass, 1500 mmf.	62-215001011
C407	Condenser, oscillator grid, 100 mmf.	62-110009001
C408	Condenser, filament by-pass, 100 mmf.	62-110009001
C409	Condenser, d-c blocking, 750 mmf.	60-10755301
C410	Condenser, plate by-pass, 3 mmf.	30-1221
C411	Condenser, r-f by-pass, .01 mf.	61-0120*
C412	Condenser, d-c blocking, 220 mmf.	62-122001001
C413	Condenser, d-c blocking, 220 mmf.	62-122001001
C414	Condenser, ceramic, r-f voltage divider, 285 mmf.	30-1224-14
C415	Condenser, ceramic, r-f voltage divider, 485 mmf.	30-1224-15
C416	Condenser, aerial trimmer assembly, push-button (including C416A to C416E)	31-6479-3
C417	Condenser, trimmer assembly, 2-section	31-6476-8
C417A	Condenser, trimmer, Bc. aerial	Part of C417
C417B	Condenser, trimmer, Bc. oscillator	Part of C417
J400	Socket, loop aerial	27-6214-6
J401	Socket, FM dipole	27-6214-1
LA400	Loop aerial, Bc.	76-4337-1
L400	Coil, FM aerial	32-4158-1
L401	Coil, FM r-f	32-4159-1
L402	Coil, FM oscillator	32-4018-5
L403	Coil, r-f choke, FM plate load	32-4061-2
L404	Coil, r-f choke	32-4061-2
L405	Coil, r-f choke	32-4061-2
L406	Coil, oscillator assembly, push-button	
L406A	Coil, oscillator, 900—1600 kc.	32-3779
L406B	Coil, oscillator, 850—1500 kc.	32-3779
L406C	Coil, oscillator, 650—1300 kc.	32-4059-3
L406D	Coil, oscillator, 600—1200 kc.	32-4059-3
L406E	Coil, oscillator, 540—1000 kc.	32-4059-3
P400	Plug, wire, and lug assembly, FM aerial	41-3791-1
PB400A to PB400E	Push-button switch assembly	42-1881
R400	Resistor, grid return, 1 megohm	66-5103340*
R401	Resistor, cathode bias, 82 ohms	66-0823340*
R402	Resistor, screen dropping, 56,000 ohms	66-3563340*
R403	Resistor, plate decoupling, 1000 ohms	66-2103340*
R404	Resistor, grid return, 15,000 ohms	66-3153340*
R405	Resistor, cathode bias, 1500 ohms	66-2153340*
R406	Resistor, cathode bias, 6800 ohms	66-2683340*
T400	Transformer, Bc. aerial	32-4049-3
T401	Transformer, Bc. oscillator	32-4221-3
TC400A to TC400E	Tuning cores, push-button oscillator	Part of Z400

†42-1877 Band switch, 5-section

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

Reference Symbol	Description	Service Part No.
WS1-2(F)	Switch-wafer section	Part of 42-1877†
WS1-2(R)	Switch-wafer section	Part of 42-1877†
WS1-3(R)	Switch-wafer section	Part of 42-1877†
WS1-4(F)	Switch-wafer section	Part of 42-1877†
WS1-4(R)	Switch-wafer section	Part of 42-1877†

## MISCELLANEOUS

Description	Service Part No.
<b>Cabinet and Cabinet Hardware</b>	
Back assembly, wood	76-4344
Back, cabinet, masonite	54-7702
Baffle (cardboard) and cloth assembly	40-7575-1
Baffle, speaker	219138
Bezel	56-6375FCP
Bin mechanism, R.H.	76-3223-6
Bin mechanism, L.H.	76-3223-5
Spring (2) bin mechanism, phono mtg.	56-4978
Bullet catch (2)	45-6002
Strike plate (2), bullet catch	45-6003
Cabinet	10731
Door, record album	45-6473
Doors, matched set	45-6472
Door pull (2)	56-5398-1
Frame assembly, changer mounting	76-4104
Grommet (3) changer mtg.	54-4313
Spring (6) changer mtg.	56-3045FA15
Hinge, phono door	56-5713-3
Hinge, phono door	56-5713-4
Hinge, knife (stop), top, radio door	56-5713
Hinge, knife (stop), bottom, radio door	56-5713-2
Hinge, knife, R.H., top, record door	45-6449
Hinge, knife, L.H., bottom, record door	45-6449-1
Instrument panel	45-6474
Metal grille (2)	56-6370
Cable-and-plug assembly, speaker	41-3734-11
<b>Dial Scale Parts and Hardware</b>	
Cord, drive (25-ft. spool)	45-8750*
Dial backplate-and-pulley assembly	76-4309
Knob (5)	54-4486
Pointer	54-4648
Carriage, pointer	56-6408
Spring (2), gang and pointer	56-2617
Push-button knob (6)	54-4292
Cap, plastic (6), push-button knob	54-4294
Tab kit	40-7583
Scale-and-backplate assembly	76-4298
Scale strap (2), end, scale mounting	56-2234-2
Scale strap, middle, scale mtg.	56-4756FE11
Jewel-and-bin-lamp assembly	41-3896
Pilot-lamp-socket assembly, L.H.	27-6233-22
Pilot-lamp-socket assembly, R.H.	27-6233-25
Shaft assembly, tuning	76-4245
Socket, Loktal, 7A4	27-6177
Socket, Loktal, 7F8 (r-f section, mica-filled bakelite)	27-6213
Socket, Loktal, 7E7, 7F7	27-6138
Socket, miniature, 6BA6 (2)	27-6226
Socket, miniature, 6AU6 (r-f section, mica-filled bakelite)	27-6203-1
Socket, miniature 6T8	27-6203-5
Socket, octal (3)	27-6174



# Production Change Supplement to SERVICE MANUAL (PR-1653)

## FOR PHILCO RADIO-PHONOGRAPH Model 49-1615

### PRE-PRODUCTION CHANGES

The following parts were deleted:

Reference Symbol	Description	Service Part No.
C104	Condenser, filter, .01 mf. ....	61-0120*
C410	Condenser, plate by-pass, 3 mmf. ....	30-1221
C411	Condenser, r-f by-pass, .01 mf. ....	61-0120*

The following parts were changed:

Reference Symbol	New Description	New Service Part No.
C202	Condenser, bass compensation, .006 mf. ....	45-3500-7*
C312	Condenser, screen by-pass, .003 mf. ....	61-0109*
C315	Condenser, cathode by-pass, .05 mf. ....	61-0122*
C317	Condenser, screen by-pass, .003 mf. ....	61-0109*
R100	Resistor, filter, 10,000 ohms, 2 watts ....	66-3105340*
R304	Resistor, cathode bias (FM), 100 ohms ....	66-1108340*
R310	Resistor, cathode bias, 82 ohms ....	66-0828340*
R311	Resistor, screen dropping, 33,000 ohms ....	66-3338340*
R405	Resistor, cathode bias, 2200 ohms .... (R405 was disconnected from ground and connected to the oscillator cathode, pin 4 of the 7F8.)	66-2228340*
R406	Resistor, cathode bias, 1000 ohms .... The 1st and 2nd i-f amplifier tubes were changed to type 6BJ6.	66-2108340*

The following parts were added:

Reference Symbol	Description	Service Part No.
C324	Condenser, plate by-pass, .01 mf. .... (Connected from lug 3 of Z301 to ground, as shown in figure 1.)	61-0120*
L407	Coil, r-f choke .... (Connected in the lead from C417A to the BC aerial section of C400.)	32-4081-2

The following circuit changes were made:

C314 was disconnected from ground, and connected to the 1st i-f amplifier screen, pin 6 of the first 6BJ6. In its new connection, C314 provides screen neutralization. C318 was disconnected from ground, and connected to the 2nd i-f amplifier screen, pin 6 of the second 6BJ6. In its new connection, C318 provides screen neutralization. The switching of the primaries of Z300 and Z301 was revised as shown in figure 1.

### RUN 2 CHANGES (MAIN CHASSIS)

To eliminate inverse-feedback oscillation, the following part was changed:

Reference Symbol	New Description	New Service Part No.
R205	Resistor, voltage divider, inverse feedback, 120 ohms	66-1128340*

### RUN 2 CHANGES (SCRATCH-ELIMINATOR CHASSIS)

To improve phono-noise suppression, the following parts were changed:

Reference Symbol	New Description	New Service Part No.
C218	Condenser, d-c blocking, reactance feedback, 220 mmf.	62-122001001*
R229	Resistor, plate load, 33,000 ohms	66-3338340*

### RUN 3 CHANGES

To prevent AM noise-pulse interference on FM, the following circuit changes were made:

The switching was removed from the secondary of Z301. C311 is now connected directly to lug 1 of Z301. The removed switch section is now used to ground the AM audio lead when in the FM position. Lug 2 of WS1-5(R) is tied to lug 5 of WS1-3(R), and lug 1 of WS1-5(R) is grounded. See figure 2.

## CORRECTIONS AND ADDITIONS TO PR-1653 MANUAL

The following corrections in part numbers should be made in the Replacement Parts List:

Reference Symbol	Description	Correct Service Part No.
C322	Condenser, de-emphasis, .008 mf.	61-0174*
L406C	Coil, oscillator, 650—1300 kc.	32-4059-2
L406D	Coil, oscillator, 600—1200 kc.	32-4059-2
L406E	Coil, oscillator, 540—1000 kc.	32-4059-2
R200	Volume control, 2 megohms, tap at 1 megohm	33-5535-19
R203	Tone control, bass, 1 megohm	33-5539-52
	Spring (6), changer mtg.	56-3043FA15

The following part should be added to the Replacement Parts List:

Description	Service Part No.
Jewel, telltale	54-4304

The following information should be added to the schematic diagram:

The d-c resistance of the voice coil of LS200 is 10 ohms.

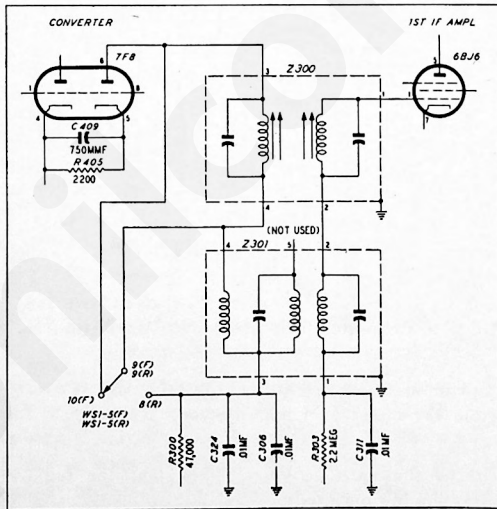


Figure 1.

TP-8462

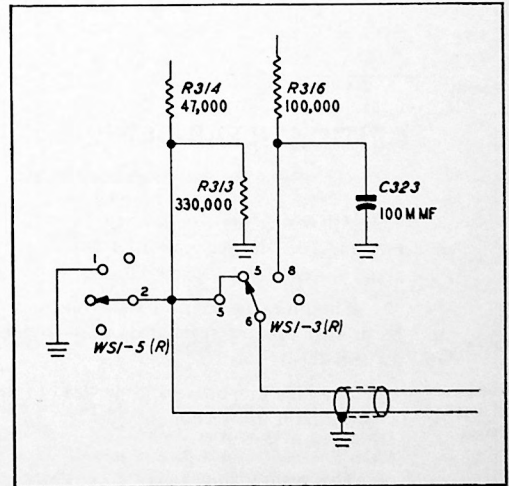


Figure 2.

TP-8463