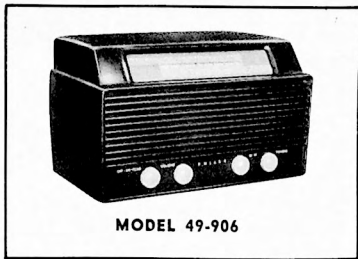


# PHILCO RADIO MODEL 49-906



## SPECIFICATIONS

CABINET ..... Plastic  
 CIRCUIT ..... Eight-tube superheterodyne

### FREQUENCY RANGES

Broadcast ..... 540—1620 kc.  
 FM ..... 88—108 mc.

AUDIO OUTPUT ..... 1 watt

OPERATING VOLTAGES . 105—120 volts, a.c. or d.c.

POWER CONSUMPTION. . 40 watts

AERIALS ..... Built-in loop and FM line cord; provisions for connection of external aerial

### INTERMEDIATE FREQUENCIES

AM ..... 455 kc.  
 FM ..... 9.1 mc.

PHILCO TUBES (8) ..... 12AU6, 12AU7, 14F8, 6BJ6 (2), 19T8, 50A5, 117Z3

TP-5863

## 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
J — socket	S — switch	Z — electrical assembly
L — choke or coil	T — transformer	
LA — loop aerial	TB — terminal panel	

## 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 1. Hold a ruler against the dial backplate, with the start

of the ruler at the reference line shown, and mark pencil dots at the proper points for the required frequency settings.

After installation of the chassis in the cabinet, the dial pointer should be moved to coincide with the index mark on the dial. Coincidence of the pointer and index mark should occur with the tuning condenser fully meshed.

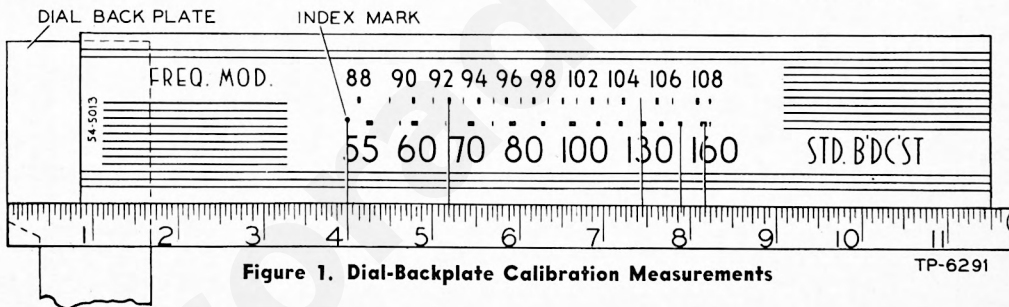


Figure 1. Dial-Backplate Calibration Measurements

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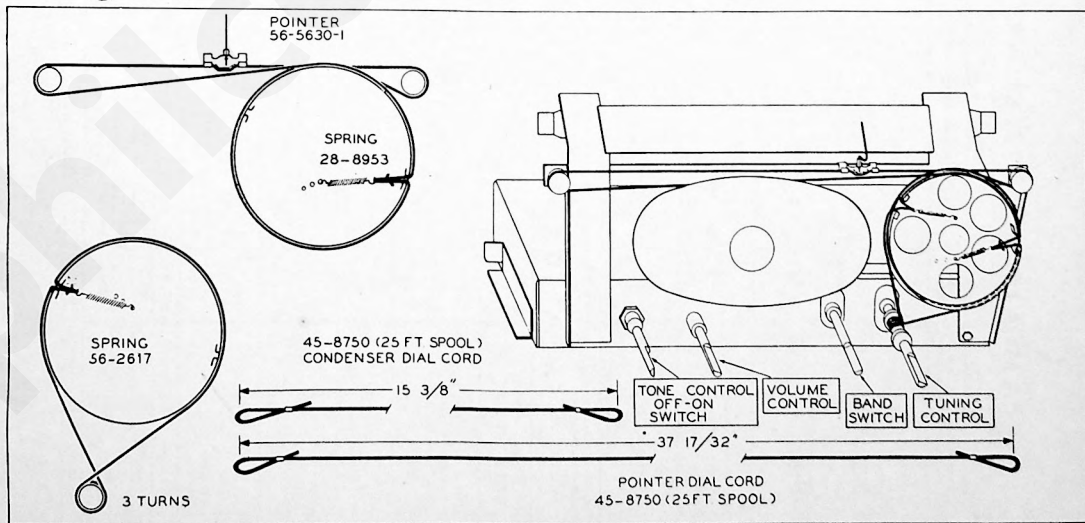


Figure 2. Drive-Cord Installation Details

TP-6417

### AM ALIGNMENT CHART

STEP	SIGNAL GENERATOR		RADIO	
	CONNECTION TO RADIO	DIAL SETTING	DIAL SETTING	SPECIAL INSTRUCTIONS
1	Ground lead to B-, test point B; output lead through .1-mf. condenser to terminal 1 of TB400.	435 kc.	540 kc.	ADJUST TC305B—3rd if sec. TC305A—3rd if pri. TC300B—2nd if sec. TC300A—2nd if pri. TC301B—1st if sec. TC301A—1st if pri.  C401B—BC osc. C401A—BC aerial
2	Radiating loop (see note below).	1600 kc.	1600 kc.	Adjust for maximum output.
3	Same as step 2.	1500 kc.	1500 kc.	Adjust for maximum output.

RADIATING LOOP: Make up a six-to-eight-inch, 6-inch-diameter loop, using insulated wire; connect to the signal-generator leads and place near the radio loop.

### FM ALIGNMENT CHART

STEP	SIGNAL GENERATOR		RADIO	
	CONNECTION TO RADIO	DIAL SETTING	DIAL SETTING	SPECIAL INSTRUCTIONS
1	Through .1-mf. condenser to pin 1 of 6B16, 1st if amplifier.	9.1 mc.	88 mc.	Adjust for maximum reading on alignment indicator. Attenuate signal generator to maintain reading of approximately 10 volts, maximum allowed. Do not disturb any of the other trimmers except as directed in step 3.
2	Through .1-mf. condenser to pin 8 of 14F8.	9.1 mc.	88 mc.	Adjust for maximum reading on alignment indicator. Repeat adjustments until no further improvement is obtained. Do not disturb other trimmers after this step.
3	Same as step 2.	9.1 mc.	88 mc.	Adjust for minimum reading on output meter. This adjustment is critical; repeat to make sure it is correct.
4	To terminal 1 of J406.	105 mc.	105 mc.	Adjust for maximum reading on alignment indicator.
5	Same as step 4.	105 mc.	105 mc.	Same as step 4. Rock tuning control.
6	Same as step 4.	105 mc.	105 mc.	Same as step 4.
7	Same as step 4.	92 mc.	92 mc.	Same as step 4. See note on page 10.
8	Same as step 4.	92 mc.	92 mc.	Same as step 4.
9	Same as step 4.	92 mc.	92 mc.	Same as step 4.
10	Repeat steps 4 through 9 until no further improvement is obtained.			

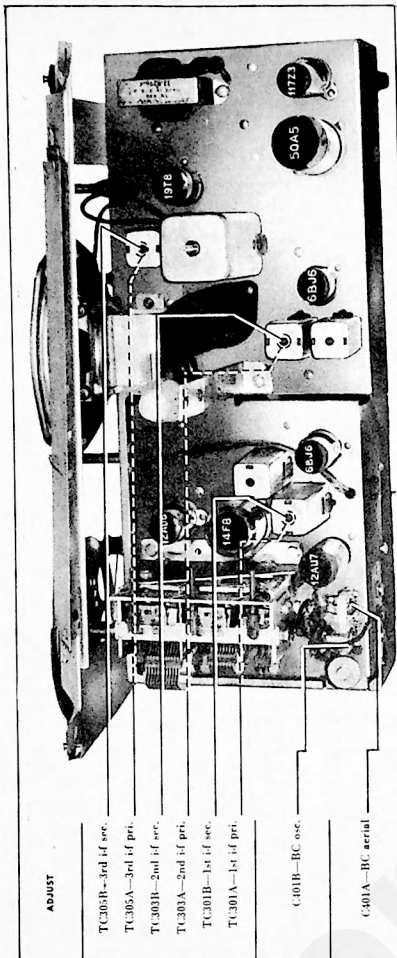
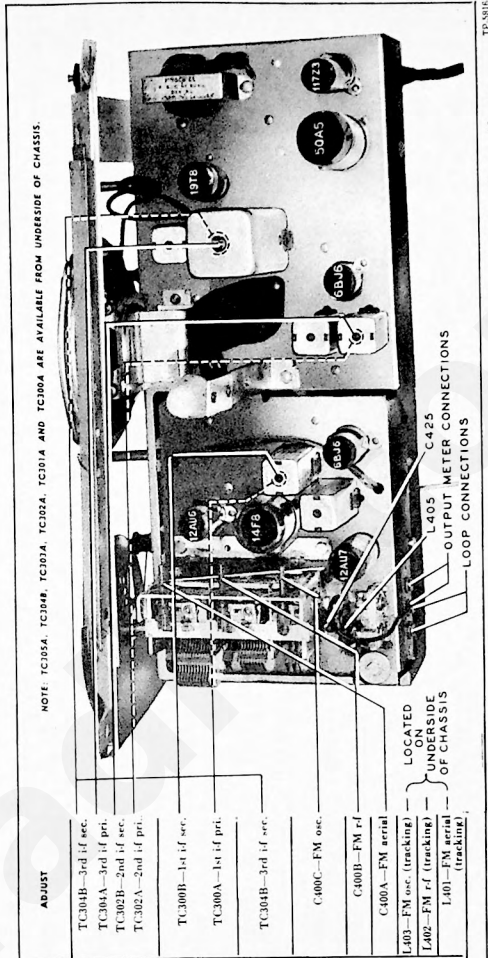


Figure 3. Top View, Showing AM Trimmer Locations

TP-5816-1



NOTE: TC305A, TC304B, TC304A, TC302A, TC302A ARE AVAILABLE FROM UNDERSIDE OF CHASSIS.

Figure 4. Top View, Showing FM Trimmer Locations

TP-5816-1

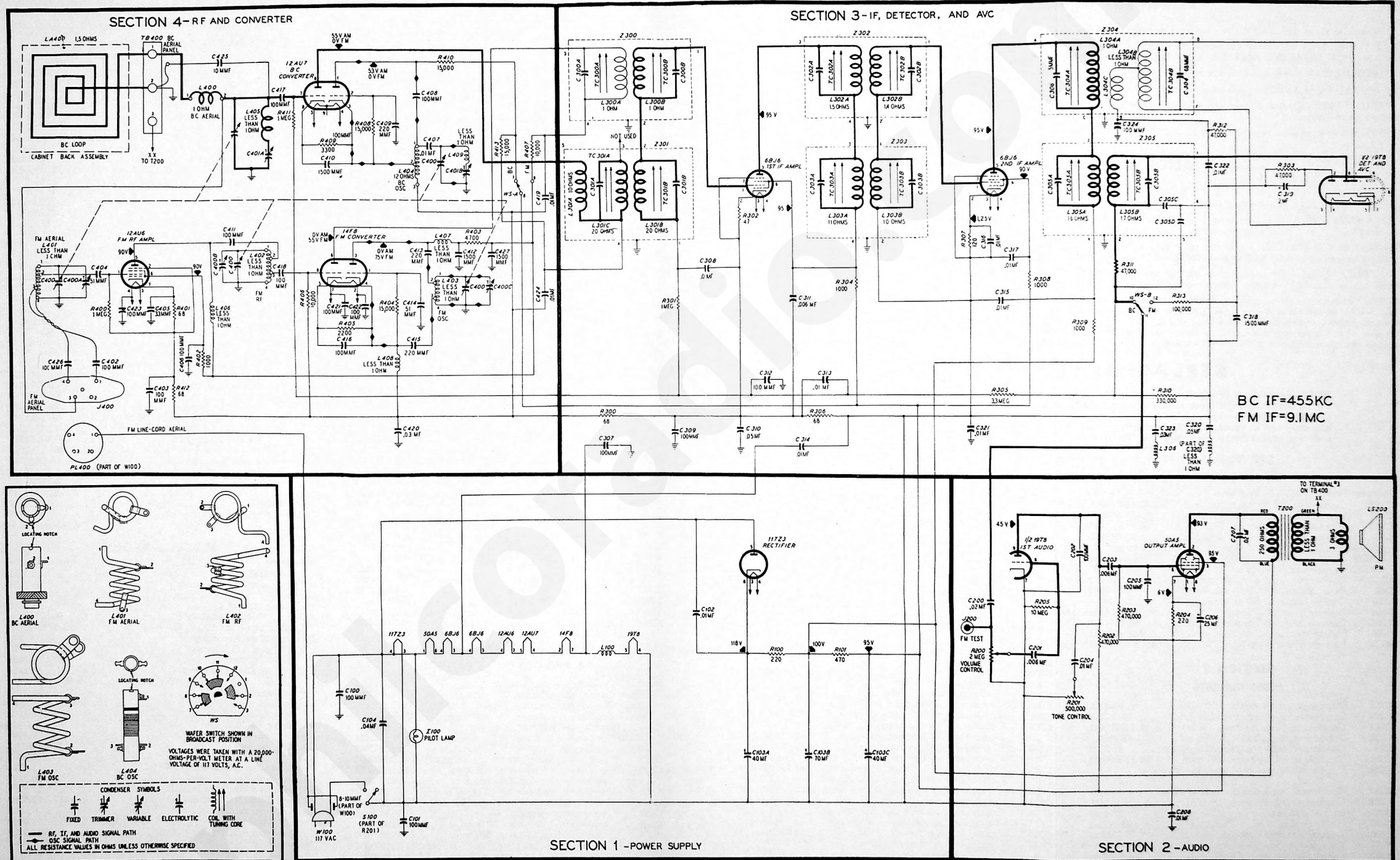


Figure 5. Philco Radio Model 49-906, Sectionalized Schematic Diagram.

ALIGNMENT OF AM CIRCUITS

Make alignment with loop aerial connected to radio. The AM alignment should be completed before the FM alignment is made. DIAL POINTER—With tuning condenser fully meshed, adjust dial pointer to coincide with index mark at low-frequency end of dial. See "CALIBRATING DIAL BACKPLATE" for method of measuring backplate for index and calibration marks. OUTPUT METER—Connect between terminal 3 (voice-coil connection) of aerial terminal panel TB400 and chassis. AM SIGNAL GENERATOR—Connect as indicated in chart. Use modulated output. OUTPUT LEVEL—During alignment, signal-generator output must be attenuated to maintain radio output below 1.25 volts, as read on output meter. CONTROLS—Set volume control to maximum, turn tone control fully counterclockwise, and set band switch to broadcast position.

ALIGNMENT OF FM CIRCUITS

Align the AM Circuits first

OUTPUT METER—Connect between terminal 3 (voice-coil connection) of aerial terminal panel TB400 and chassis. ALIGNMENT INDICATOR—Connect negative lead of a 20,000-ohms-per-volt, d-c voltmeter to pin 2 of 19T8 tube; connect positive lead to B-, test point B in Section 2. Use 10-volt range. AM SIGNAL GENERATOR—Generator must have sufficient output to give a reading of at least 8.5 volts on alignment indicator. Connect generator ground lead to B-, test point B; connect output lead as indicated in chart. Use modulated output. CONTROLS—Same as for alignment of AM circuits, except set band switch to FM position. Allow radio and signal generator to warm up for at least 15 minutes before making alignment. NOTE: Check resonance of coils L401, L402, and L403 by inserting each end of a powdered-iron tuning core, such as Philco Part No. 56-6100, in the coils. If the signal strength increases when the iron end is inserted, compress the turns slightly. If the signal strength increases when the threaded 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.

REPLACEMENT PARTS LIST

NOTE: An asterisk (\*) indicates a general replacement item. The part numbers of these items may not be identical with those on factory parts; also, the electrical values of some replacement items may differ from the values given 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, r-f by-pass, 100 mmf.	62-110009001
C101	Condenser, r-f by-pass, 100 mmf.	62-110009001
C102	Condenser, r-f by-pass, .01 mf.	61-0120*
C103	Condenser, electrolytic, 3-section	30-2568-10
C103A	Condenser, filter, 40 mf.	Part of C103
C103B	Condenser, filter, 70 mf.	Part of C103
C103C	Condenser, filter, 40 mf.	Part of C103
C104	Condenser, line filter, .04 mf.	45-3500-2
I100	Panel lamp, 110v, screw base	34-2605*
L100	Choke, filament, 100 millihenries	32-4143-4
R100	Resistor, filter, 220 ohms	66-1225340*
R101	Resistor, filter, 470 ohms	66-1474340
S100	Switch, power	Part of R201
W100	Line cord and plug (incl. FM line aerial)	41-3755-19*

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, plate by-pass, 100 mmf.	62-110009001
C203	Condenser, d-c blocking, .006 mf.	45-3500-7*
C204	Condenser, tone compensation, .01 mf.	61-0120*
C205	Condenser, r-f by-pass, 100 mmf.	62-110009001
C206	Condenser, electrolytic, cathode by-pass, 25 mf.	45-3001*
C207	Condenser, tone compensation, .02 mf.	61-0108*
C208	Condenser, r-f by-pass, .01 mf.	61-0120*
J200	Socket, FM test	27-6180
LS200	Loud-speaker, PM	36-1615-2
R200	Volume control, 2 megohms	33-5538-36
R201	Tone control (with a-c switch), 500,000 ohms	33-5539-48
R202	Resistor, plate load, 470,000 ohms	66-4473340*
R203	Resistor, grid return, 470,000 ohms	66-4473340*
R204	Resistor, cathode bias, 220 ohms	66-1224340*

SECTION 2 (Continued)  
AUDIO CIRCUITS

Reference Symbol	Description	Service Part No.
R205	Resistor, grid return, 10 megohms	66-6103340*
T200	Output transformer	32-8296-4

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
C304	Condenser, shunt, 68 mmf.	Part of Z304
C305A	Condenser, shunt	Part of Z305
C305B	Condenser, shunt	Part of Z305
C305C	Condenser, a-v-c filter	Part of Z305
C305D	Condenser, a-v-c filter	Part of Z305
C306	Condenser, shunt (part of Z304), 5 mmf.	30-1224-5
C307	Condenser, r-f by-pass, 100 mmf.	62-110009001
C308	Condenser, a-v-c by-pass, .01 mf.	61-0120*
C309	Condenser, r-f by-pass, 100 mmf.	62-110009001
C310	Condenser, r-f by-pass, .05 mf.	61-0122*
C311	Condenser, screen by-pass, .006 mf.	45-3500-7*
C312	Condenser, r-f by-pass, 100 mmf.	62-110009001*
C313	Condenser, a-v-c by-pass, .01 mf.	61-0120*
C314	Condenser, r-f by-pass, .01 mf.	61-0120*
C315	Condenser, plate by-pass, .01 mf.	61-0120*
C316	Condenser, cathode by-pass, .01 mf.	61-0120*
C317	Condenser, screen by-pass, .01 mf.	61-0120*
C318	Condenser, decoupling, 1500 mmf.	62-215001011*
C319	Condenser, electrolytic, filter	
C320	Condenser-and-choke assy., by-pass, .05 mf.	30-2417-7

REPLACEMENT PARTS LIST (Continued)

SECTION 3 (Continued)

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

Reference Symbol	Description	Service Part No.
C321	Condenser, r-f by-pass, .01 mf.	61-0120*
C322	Condenser, compensating, .01 mf.	61-0120*
C323	Condenser, i-f by-pass, .03 mf.	45-3500-1*
C324	Condenser, r-f by-pass, 100 mmf.	62-110009001*
L300A	Primary coil, 1st FM i-f trans.	Part of Z300
L300B	Secondary coil, 1st FM i-f trans.	Part of Z300
L301A	Primary coil, 1st AM i-f trans.	Part of Z301
L301B	Secondary coil, 1st AM i-f trans.	Part of Z301
L301C	Tertiary coil, 1st AM i-f trans.	Part of Z301
L302A	Primary coil, 2nd FM i-f trans.	Part of Z302
L302B	Secondary coil, 2nd FM i-f trans.	Part of Z302
L303A	Primary coil, 2nd AM i-f trans.	Part of Z303
L303B	Secondary coil, 2nd AM i-f trans.	Part of Z303
L304A	Primary coil, 3rd FM i-f trans.	Part of Z304
L304B	Secondary coil, 3rd FM i-f trans.	Part of Z304
L304C	Tertiary coil, 3rd FM i-f trans.	Part of Z304
L305A	Primary coil, 3rd AM i-f trans.	Part of Z305
L305B	Secondary coil, 3rd AM i-f trans.	Part of Z305
L306	Coil, r-f choke	32-4061-2
R300	Resistor, decoupling, 68 ohms	66-0683340*
R301	Resistor, grid return, 1 megohm	66-5103340*
R302	Resistor, cathode bias, 47 ohms	66-0473340*
R303	Resistor, FM-detector load, 47,000 ohms	66-3473340*
R304	Resistor, plate decoupling, 1000 ohms	66-2103340*
R305	Resistor, a-v-c filter, 3.3 megohms	66-5333340*
R306	Resistor, r-f decoupling, 68 ohms	66-0683340*
R307	Resistor, cathode bias, 120 ohms	66-1123340*
R308	Resistor, screen dropping, 1000 ohms	66-2103340*
R309	Resistor, plate decoupling, 1000 ohms	66-2103340*
R310	Resistor, diode load, 330,000 ohms	66-4333340*
R311	Resistor, diode load, 47,000 ohms	66-3473340*
R312	Resistor, decoupling, 47,000 ohms	66-3473340*
R313	Resistor, decoupling, 100,000 ohms	66-4103340*
TC300A	Primary tuning core, 1st FM i-f trans.	Part of Z300
TC300B	Secondary tuning core, 1st FM i-f trans.	Part of Z300
TC301A	Primary tuning core, 1st AM i-f trans.	Part of Z301
TC301B	Secondary tuning core, 1st AM i-f trans.	Part of Z301
TC302A	Primary tuning core, 2nd FM i-f trans.	Part of Z302
TC302B	Secondary tuning core, 2nd FM i-f trans.	Part of Z302
TC303A	Primary tuning core, 2nd AM i-f trans.	Part of Z303
TC303B	Secondary tuning core, 2nd AM i-f trans.	Part of Z303
TC304A	Primary tuning core, 3rd FM i-f trans.	Part of Z304
TC304B	Secondary tuning core, 3rd FM i-f trans.	Part of Z304
TC305A	Primary tuning core, 3rd AM i-f trans.	Part of Z305
TC305B	Secondary tuning core, 3rd AM i-f trans.	Part of Z305
WS-B	Switch-wafer section	Part of 42-1834-1†
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

SECTION 4

R-F AND CONVERTER CIRCUITS

C400	Condenser, tuning gang	31-2724-2
C400A	Condenser, trimmer, FM aerial	Part of C400
C400B	Condenser, trimmer, FM r-f	Part of C400
C400C	Condenser, trimmer, FM oscillator	Part of C400
C401	Condenser, trimmer, 2-section	31-6476-13
C401A	Condenser, trimmer, BC aerial	Part of C401
C401B	Condenser, trimmer, BC oscillator	Part of C401
C402	Condenser, aerial coupling, 100 mmf.	62-110009001
C403	Condenser, r-f by-pass, 100 mmf.	62-110009001
C404	Condenser, blocking, 51 mmf.	30-1224-2*
C405	Condenser, cathode by-pass, 33 mmf.	30-1224*
C406	Condenser, screen by-pass, 100 mmf.	62-110009001
C407	Condenser, isolating, .01 mf.	61-0120*
C408	Condenser, blocking, 100 mmf.	62-110009001
C409	Condenser, r-f by-pass, 220 mmf.	62-122001001
C410	Condenser, cathode by-pass, 1500 mmf.	62-215001011*
C411	Condenser, d-c blocking, 100 mmf.	62-110009001
C412	Condenser, r-f by-pass, 1500 mmf.	62-215001011*
C413	Condenser, d-c blocking, 220 mmf.	62-122001001

SECTION 4 (Continued)

R-F AND CONVERTER CIRCUITS

Reference Symbol	Description	Service Part No.
C414	Condenser, r-f by-pass, 51 mmf.	30-1224-2
C415	Condenser, d-c blocking, 220 mmf.	62-122001001
C416	Condenser, cathode by-pass, 100 mmf.	62-110009001
C417	Condenser, isolating, 100 mmf.	62-110009001
C418	Condenser, isolating, 100 mmf.	62-110009001
C419	Condenser, plate decoupling, .01 mf.	61-0120*
C420	Condenser, r-f by-pass, .03 mf.	45-3500-1*
C421	Condenser, r-f by-pass, 100 mmf.	62-110009001
C422	Condenser, r-f by-pass, 100 mmf.	62-110009001
C423	Condenser, r-f by-pass, 100 mmf.	62-110009001
C424	Condenser, plate decoupling, .01 mf.	61-0120*
C425	Condenser, aerial coupling, 10 mmf.	62-010009001
C426	Condenser, aerial coupling, 100 mmf.	62-110009001
C427	Condenser, r-f by-pass, 1500 mmf.	62-215001011*
J400	Aerial socket	27-6214-1
L400	Coil, BC aerial	32-4217-1
L401	Coil, FM aerial	32-4158-1
L402	Coil, FM r-f	32-4159-1
L403	Coil, FM oscillator	32-4018-5
L404	Coil, BC oscillator	32-4221-1
L405	Coil, r-f choke	32-4061-2
L406	Coil, FM r-f plate load	32-4061-2
L407	Coil, FM oscillator plate load	32-4061-2
L408	Coil, r-f choke	32-4061-2
L409	Coil, r-f choke	32-4061-2
LA400	Loop aerial	32-4052-22
PL400	Plug, FM aerial	Part of W100
R400	Resistor, grid return, 1 megohm	66-5103340*
R401	Resistor, cathode bias, 68 ohms	66-0683340*
R402	Resistor, screen dropping, 1000 ohms	66-2103340*
R403	Resistor, plate decoupling, 4700 ohms	66-2473340*
R404	Resistor, grid return, 15,000 ohms	66-3153340*
R405	Resistor, cathode bias, 2200 ohms	66-2223340*
R406	Resistor, grid return, 10,000 ohms	66-3103340*
R407	Resistor, plate decoupling, 10,000 ohms	66-3103340*
R408	Resistor, grid return, 15,000 ohms	66-3153340*
R409	Resistor, cathode bias, 3300 ohms	66-2333340*
R410	Resistor, plate load, 15,000 ohms	66-3153340*
R411	Resistor, grid return, 1 megohm	66-5103340*
R412	Resistor, r-f decoupling, 68 ohms	66-0683340*
R413	Resistor, plate decoupling, 15,000 ohms	66-3153340*
TB400	Aerial terminal panel	38-9942
WS-A	Switch-wafer section	Part of 42-1834-1†

MISCELLANEOUS

Description	Service Part No.
Cabinet (less scale)	10715
Baffle-and-cloth assembly	40-7539
Cabinet back	318-2977
Dial scale	54-5013
Strap, scale mounting (L. H.)	56-5739FCP
Strap, scale mounting (R. H.)	56-5739-1FCP
Dial-Backplate Assembly	
Dial cord (25-ft spool)	45-8750*
Diffusing panel	54-7612
Diffusing-panel spring	56-3841
Pointer	56-5630-1FCP
Spring, pointer	28-8953
Spring, gang	56-2617
Upright assembly	76-4041
Dial drive shaft	76-3982
Bracket-and-clip assembly	76-4043
Bracket, speaker	56-5435FA3
Knob	54-4557-1
Plug-and-wire assembly (FM)	41-3791
Rubber mount, r-f chassis	54-4295
Socket assembly, pilot lamp	27-6233
Socket, electrolytic condenser mtg.	27-9508
Socket, 9-pin miniature	27-6203-5
Socket, 8-pin Loktal	27-6138*
Socket, 7-pin miniature	27-6226
Wave switch	42-1834-1

† 42-1834-1 is WS, wafer switch, single wafer (includes WS-A and WS-B).