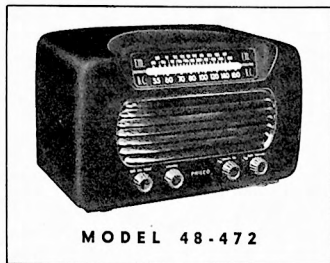


PHILCO RADIO MODEL 48-472, CODE 122



SPECIFICATIONS

CABINETPlastic, walnut finish
 CIRCUITEight-tube superheterodyne

FREQUENCY RANGES
 Broadcast540—1620 kc.
 FM88—108 mc.
 AUDIO OUTPUT1 watt
 OPERATING VOLTAGES...105—120 volts, a.c. or d.c.
 POWER CONSUMPTION...40 watts
 AERIALSBuilt-in loop and FM line
 cord; provisions for connec-
 tion of external aerial
 INTERMEDIATE
 FREQUENCIES
 AM455 kc.
 FM9.1 mc.
 PHILCO TUBES (8)12AU6, 12AU7, 14F8, 6BJ6-
 (2), 19T8, 50A5, 117Z3

TP-4880

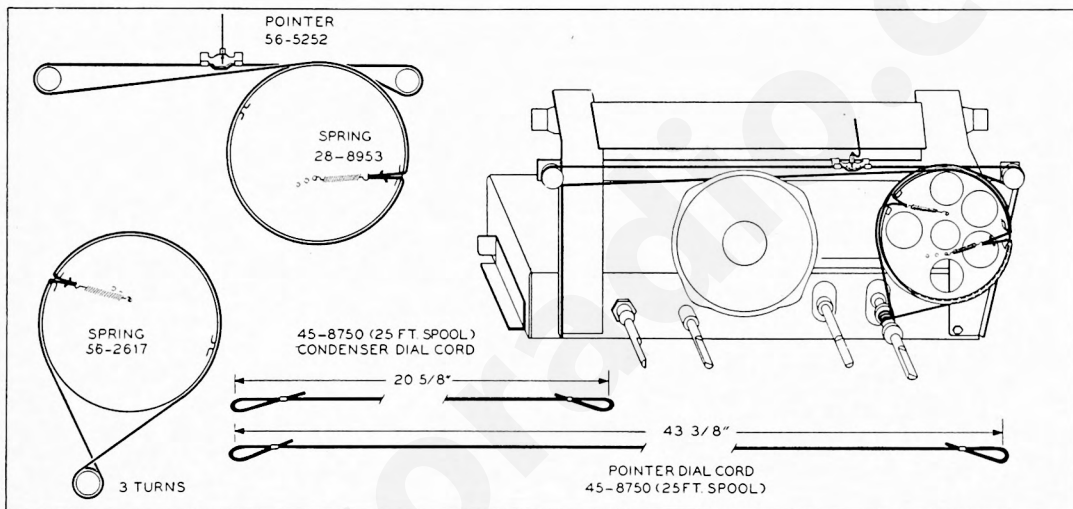


Figure 1. Drive-Cord Installation Details

TP-5398E

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 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.

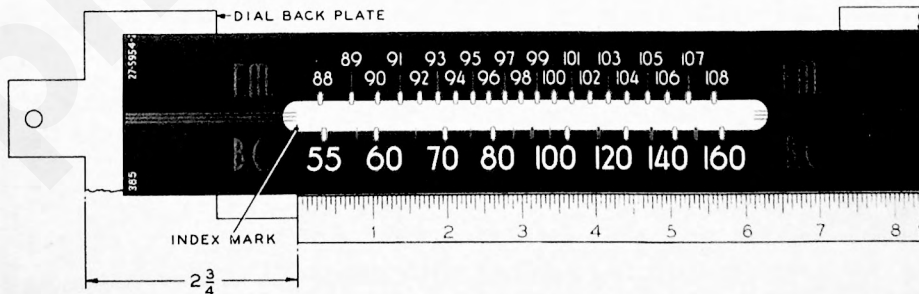


Figure 2. Dial-Backplate Calibration Measurements

TP-5538

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 1 of TB400.	455 kc.	540 kc.	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 loop. See note below.	1600 kc.	1600 kc.	Adjust for maximum output.	C401B—BC osc.
3	Same as step 2.	1500 kc.	1500 kc.	Adjust for maximum output.	C401A—BC aerial

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

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 and 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.

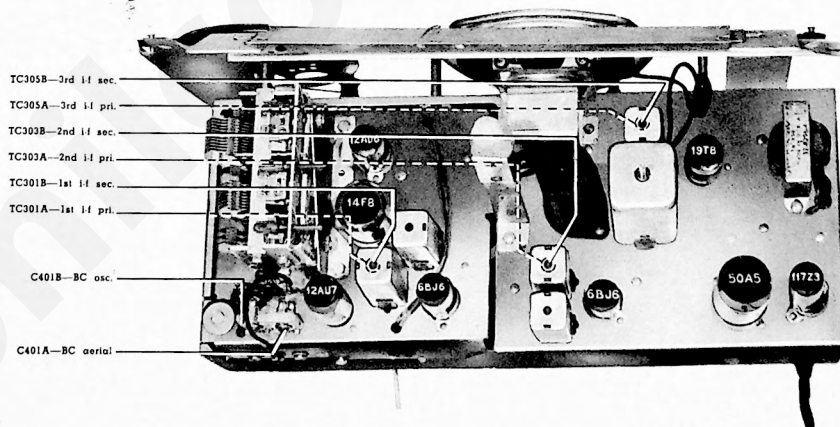


Figure 4. Top View, Showing AM Trimmer Locations

TP-5816

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 6BJ6, 1st i-f amplifier.	9.1 mc.	88 mc.	Adjust for maximum reading on alignment indicator. Attenuate signal generator to maintain reading of approximately 10 volts. Repeat adjustments until no further improvement is noted. After this step, do not disturb any of these trimmers except as directed in step 3.	TC304B—3rd i-f sec. TC304A—3rd i-f pri. TC302B—2nd i-f sec. TC302A—2nd i-f pri.
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 noted. Do not disturb these trimmers after this step.	TC300B—1st i-f sec. TC300A—1st i-f pri.
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.	TC304B—3rd i-f sec.
4	To terminal 2 of J400.	105 mc.	105 mc.	Adjust for maximum reading on alignment indicator.	C400C—FM osc.
5	Same as step 4.	105 mc.	105 mc.	Same as step 4. Rock tuning control.	C400B—FM r-f
6	Same as step 4.	105 mc.	105 mc.	Same as step 4.	C400A—FM aerial
7	Same as step 4.	92 mc.	92 mc.	Same as step 4. See note page 10.	L403—FM osc. (tracking)
8	Same as step 4.	92 mc.	92 mc.	Same as step 7.	L402—FM r-f (tracking)
9	Same as step 4.	92 mc.	92 mc.	Same as step 7.	L401—FM aerial (tracking)
10	Repeat steps 4 through 9 until no further improvement is obtained.				

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.

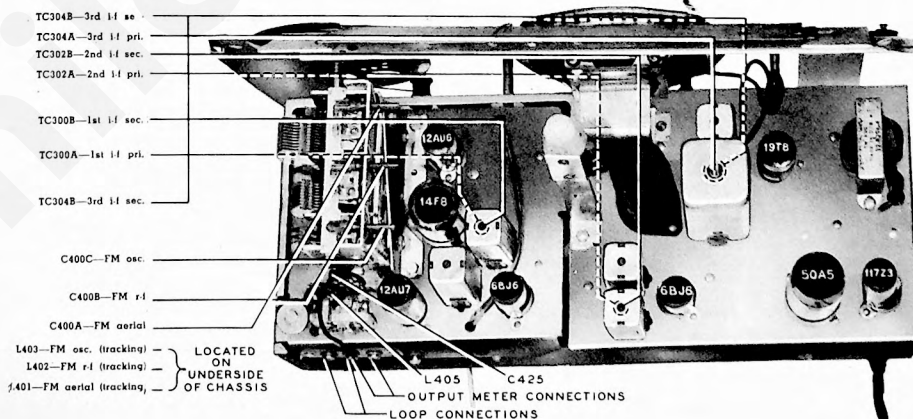


Figure 5. Top View, Showing FM Trimmer Locations

TP-5816

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	

The number of the symbol, except when the number is less than 100, 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

REVISIONS TO 48-472, CODE 122 SERVICE MANUAL

Reference Symbol	Description	Service Part No.
Parts List Corrections		
I100	Panel lamp, 110v, screw base	34-2605
C203	Condenser, d-c blocking, .002 mf.	61-0062
C318	Condenser, decoupling, 1500 mmf.	62-215001011
C410	Condenser, cathode by-pass, 1500 mmf.	62-215001011
C412	Condenser, r-f by-pass, 1500 mmf.	62-215001011
C427	Condenser, r-f by-pass, 1500 mmf.	62-215001011

REPLACEMENT PARTS LIST

NOTE: Parts marked with 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 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

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*
I100	Panel lamp, 110v, screw base	34-2477
L100	Choke, filament, 100 millihenries	32-4143-4
R100	Resistor, filter, 220 ohms	66-1224340
R101	Resistor, filter, 470 ohms	66-1474340
S100	Switch, power	Part of R201
W100	Line cord and plug (incl. FM line aerial)	L-2183*

SECTION 2

C200	Condenser, d-c blocking, .006 mf.	45-3500-7*
C201	Condenser, d-c blocking, .006 mf.	45-3500-7*
C202	Condenser, plate by-pass, 100 mmf.	62-110009001
C203	Condenser, d-c blocking, .002 mf.	30-4579*
C204	Condenser, tone compensation, .01 mf.	61-0120*
C205	Condenser, r-f by-pass, 100 mmf.	62-110009001
C206	Condenser, 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, permanent magnet	36-1625
R200	Volume control, 2 megohms	33-5539-19
R201	Tone control, 500,000 ohms	33-5538-11
R202	Resistor, plate load, 470,000 ohms	66-4473340*
R203	Resistor, grid return, 470,000 ohms	66-4473340*

SECTION 2 (Continued)

Reference Symbol	Description	Service Part No.
R204	Resistor, cathode bias, 120 ohms	66-1124340*
R205	Resistor, grid return, 10 megohms	66-6103340*
T200	Output transformer	32-8296-4

SECTION 3

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, .01 mf.	61-0120*
C312	Condenser, plate by-pass, .01 mf.	61-0120*
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.	62-215001001

REPLACEMENT PARTS LIST (Continued)

SECTION 3 (Continued)

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

Reference	Symbol	Description	Service Part No.
C319		Condenser, electrolytic, filter, FM detector, 2 mf.	30-2417-7
C320		Condenser-and-choke assy., by-pass, .05 mf.	38-9851-6
C321		Condenser, r-f by-pass, .01 mf.	61-0120*
C322		Condenser, compensating, .01 mf.	61-0120*
L300A		Primary coil, 1st FM i-f transformer	Part of 2300
L300B		Secondary coil, 1st FM i-f transformer	Part of 2300
L301A		Primary coil, 1st AM i-f transformer	Part of 2301
L301B		Secondary coil, 1st AM i-f transformer	Part of 2301
L301C		Tertiary coil, 1st AM i-f transformer	Part of 2301
L302A		Primary coil, 2nd FM i-f transformer	Part of 2302
L302B		Secondary coil, 2nd FM i-f transformer	Part of 2302
L303A		Primary coil, 2nd AM i-f transformer	Part of 2303
L303B		Secondary coil, 2nd AM i-f transformer	Part of 2303
L304A		Primary coil, 3rd FM i-f transformer	Part of 2304
L304B		Secondary coil, 3rd FM i-f transformer	Part of 2304
L304C		Tertiary coil, 3rd FM i-f transformer	Part of 2304
L305A		Primary coil, 3rd AM i-f transformer	Part of 2305
L305B		Secondary coil, 3rd AM i-f transformer	Part of 2305
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, screen dropping, 1000 ohms	66-2103340*
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, 47 ohms	66-0473340*
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*
R314		Resistor, FM-detector load, 47,000 ohms	66-3473340*
TC300A		Primary tuning core, 1st FM i-f trans.	Part of 2300
TC300B		Secondary tuning core, 1st FM i-f trans.	Part of 2300
TC301A		Primary tuning core, 1st AM i-f trans.	Part of 2301
TC301B		Secondary tuning core, 1st AM i-f trans.	Part of 2301
TC302A		Primary tuning core, 2nd FM i-f trans.	Part of 2302
TC302B		Secondary tuning core, 2nd FM i-f trans.	Part of 2302
TC303A		Primary tuning core, 2nd AM i-f trans.	Part of 2303
TC303B		Secondary tuning core, 2nd AM i-f trans.	Part of 2303
TC304A		Primary tuning core, 3rd FM i-f trans.	Part of 2304
TC304B		Secondary tuning core, 3rd FM i-f trans.	Part of 2304
TC305A		Primary tuning core, 3rd AM i-f trans.	Part of 2305
TC305B		Secondary tuning core, 3rd AM i-f trans.	Part of 2305
WS-B		Switch-wafer section	Part of 42-1834†
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
Z305		Transformer, 3rd AM i-f	32-4240-2

SECTION 4

R-F AND CONVERTER CIRCUITS

C400		Condenser, tuning gang	31-2724-1
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

SECTION 4 (Continued)

R-F AND CONVERTER CIRCUITS

Reference	Symbol	Description	Service Part No.
C410		Condenser, cathode by-pass, 1500 mmf.	62-215001001
C411		Condenser, d-c blocking, 100 mmf.	62-110009001
C412		Condenser, r-f by-pass, 1500 mmf.	62-215001001
C413		Condenser, d-c blocking, 220 mmf.	62-122001001
C414		Condenser, r-f by-pass, 100 mmf.	62-110009001
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.	62-215001001
J400		Aerial socket	27-6214
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	32-4052-16
PL400		Plug, FM aerial	Part of W100
R400		Resistor, grid return, 1 megohm	66-5106340*
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, 1500 ohms	66-2153340*
R406		Resistor, grid return, 10,000 ohms	66-3103340*
R407		Resistor, plate decoupling, 33,000 ohms	66-3333340*
R408		Resistor, grid return, 15,000 ohms	66-3153340*
R409		Resistor, cathode bias, 2200 ohms	66-2223340*
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, 33,000 ohms	66-3333340*
TB400		Aerial terminal panel	38-9942
WS-A		Switch-wafer section	Part of 42-1834†

MISCELLANEOUS

Description	Service Part No.
Cabinet (less scale)	10666
Baffle-and-cloth assembly	40-6965
Cabinet back	54-7485-1
Clip, baffle mounting	28-4279FA1
Dial scale	27-5954-2
Strap, scale mounting (L.H.)	56-4032
Strap, scale mounting (R.H.)	56-4031
Dial-Backplate Assembly	
Dial cord (25-ft. spool)	45-8750*
Diffusing panel	54-7506
Pointer	56-5252
Spring, pointer	28-8953
Spring, gang	56-2617
Upright assembly	76-3461
Dial drive shaft	76-3479
Knob	54-4376
Rubber mount, r-f chassis	54-4295
Socket, 9-pin miniature	27-6203-5
Socket, 8-pin Loktal	27-6138*
Socket, 7-pin miniature	27-6226

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

**REVISIONS TO 48-472, CODE 122
SERVICE MANUAL**

PRODUCTION CHANGES

Run 2

R307 Resistor, cathode bias, 47 ohms, was changed to 120 ohms 66-1128340*
The above change was made to insure uniform i-f sensitivity, despite differences in tubes.

Run 3

Condensers C419 and C424 were changed to higher voltage rating, Part No. 61-0120 (the part number given in the service manual is correct for the high-voltage type).

Run 4

R100 Resistor, filter, 220 ohms, was changed to 2-watt size 66-1224340
Z304 Transformer, 3rd FM i-f, was changed 32-4261-1
The new type, which is furnished for all replacements of Z304, provides for adjustment at the top.

Run 5

The following changes were made, to remove B+ from the FM r-f tube during broadcast operation:

The red wire from C103C to the junction of L406 and R402 was removed.

The red wire from the junction of L406 and R402 to WS-8 was removed.

A wire was added, from C103C to WS-8.

A wire was added, from the junction of L406 and R402 to the junction of C427 and R403.