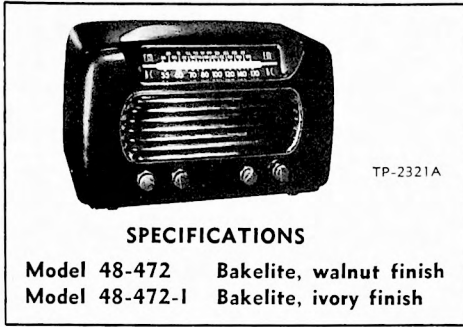


PHILCO RADIO MODELS 48-472 AND 48-472-1



CIRCUIT	Seven-tube superheterodyne
FREQUENCY RANGES	
Broadcast	540—1720 kc.
FM	88—108 mc.
AUDIO OUTPUT	1.25 watts
OPERATING VOLTAGE	105—120 volts, a.c. or d.c.
POWER CONSUMPTION	45 watts
AERIALS	Built-in cabinet loop, line cord (FM), or external aerial
INTERMEDIATE FREQUENCIES	
AM	455 kc.
FM	9.1 mc.
PHILCO TUBES (7)	12AW6, 14F8, 14H7 (2), 14X7, 50A5, 117Z3
PANEL LAMP	110-volt, screw-base, Part No. 34-2477

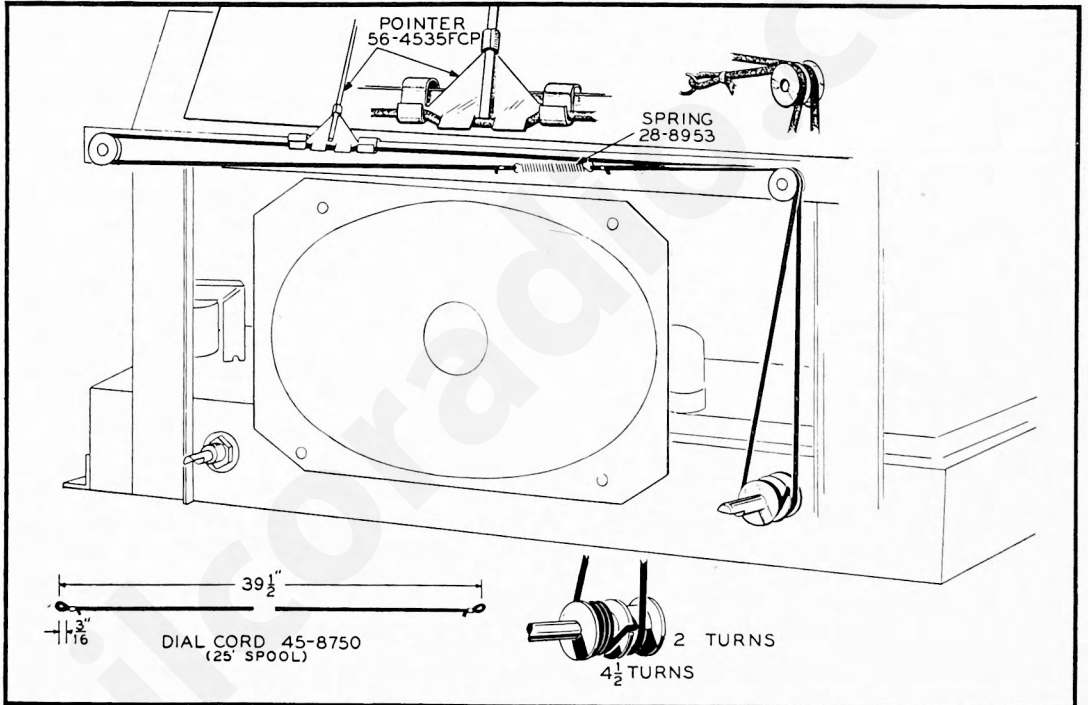


Figure 1. Drive-Cord Installation Details

TP-3386

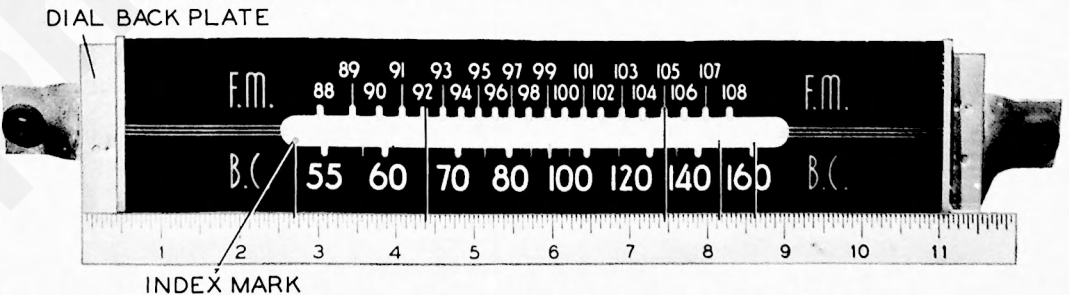


Figure 2. Composite Dial-and-Backplate Photo, Showing Calibration Measurements

TP-3408

AM ALIGNMENT CHART

STEP	SIGNAL GENERATOR		RADIO		ADJUST
	CONNECTIONS TO RADIO	DIAL SETTING	DIAL SETTING	SPECIAL INSTRUCTIONS	
1	Ground lead to B-; output lead through .1-mf. condenser to terminal 1 of TB401.	455 kc.	540 kc.	Adjust trimmers ONCE ONLY, in the order given, for maximum output.	C302A C301D C300C TC300
2	Radiating loop (see note *).	1600 kc.	1600 kc.	Adjust for maximum.	C413A
3	Same as step 2.	1500 kc.	1500 kc.	Adjust for maximum.	C413B

AM ALIGNMENT PROCEDURE

Make alignment with loop connected to radio. AM alignment should be completed before making FM alignment.

DIAL—Calibration and pointer-index measurements are shown in the composite dial-and-backplate photo, figure 7. With tuning condensers fully meshed, set dial pointer to index mark.

OUTPUT METER—Connect between terminal 3 (voice-coil connection) of aerial terminal board, TB400, and chassis.

SIGNAL GENERATOR (AM)—Connect as indicated in chart.

CONTROLS—Set volume control to maximum, turn on radio power, and set tone control to counter-clockwise (treble) position. Set wafer switch to broadcast position.

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

***RADIATING LOOP** (steps 2 and 3): Make up a six-to-eight-turn, 6-inch-diameter loop, using insulated wire; connect to signal-generator leads and place near radio loop.

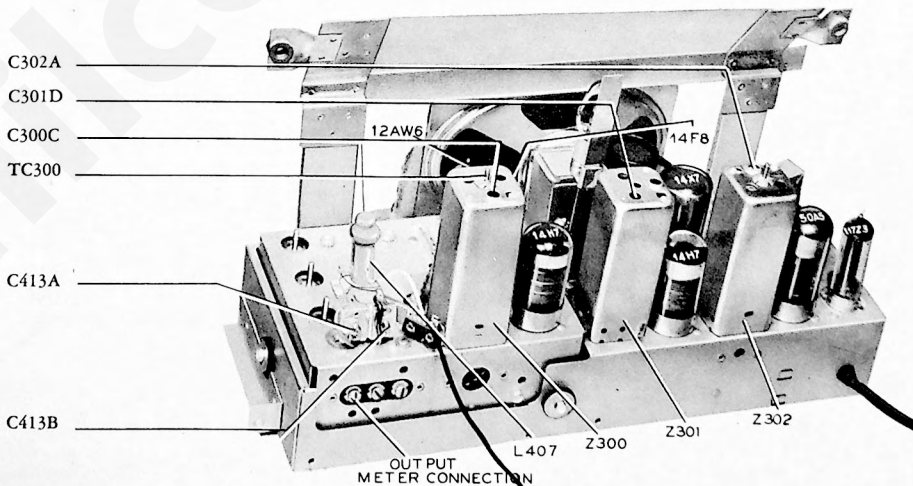


Figure 4. Top View, Showing AM Trimmer Locations

FM ALIGNMENT CHART

STEP	SIGNAL GENERATOR		RADIO		ADJUST
	CONNECTIONS TO RADIO	DIAL SETTING	DIAL SETTING	SPECIAL INSTRUCTIONS	
1	Through .1-mf. condenser to pin 1 of 12AW6 tube	9.1 mc.	88 mc.	Adjust for maximum d-c meter reading; attenuate signal to maintain approximately 10-volt reading. Repeat until no further improvement is noted. After this step, do not touch any of these trimmers except C302C (in step 3).	C302C TC302 C301C C301A
2	Through .1-mf. condenser to pin 8 of 14F8 tube	9.1 mc.	88 mc.	Adjust for maximum d-c meter reading; attenuate signal to maintain approximately 10-volt reading. Repeat until no further improvement is noted. After this step, do not touch these trimmers.	C300B C300A
3	Same as step 2.	9.1 mc.	88 mc.	Double-check adjustment of C302C to make certain that minimum audio output is obtained. This is a critical adjustment; turn trimmer very slowly.	C302C
4	To pin 3 of J400.	105 mc.	105 mc.	Maximum d-c meter reading. This is the oscillator high-frequency trimmer adjustment.	C400C
5	Same as step 4.	105 mc.	105 mc.	Adjust for maximum while rocking tuning control.	C400B
6	Same as step 4.	105 mc.	105 mc.	Adjust for maximum.	C400A
7	Same as step 4.	92 mc.	92 mc.	Adjust L403 (see ADJUSTING R-F COILS).	
8	Same as step 4.	92 mc.	92 mc.	Adjust L402 (see ADJUSTING R-F COILS).	
9	Same as step 4.	92 mc.	92 mc.	Adjust L400 (see ADJUSTING R-F COILS).	
10	Repeat steps 4 through 9 until no further increase is obtained.				

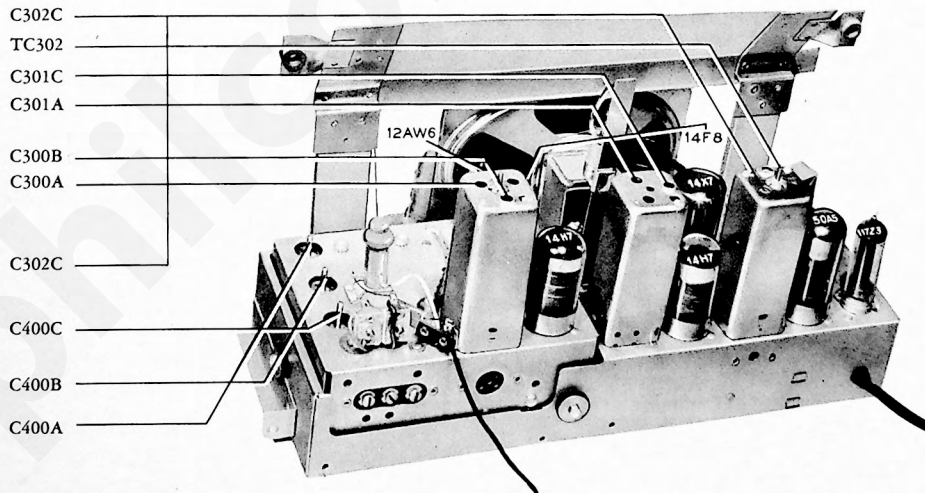


Figure 5. Top View, Showing FM Trimmer Locations

FM ALIGNMENT PROCEDURE

Make AM Alignment First.

OUTPUT METER (used only in step 3)—Same connections as for AM alignment.

D-C ALIGNMENT INDICATOR—Connect 20,000-ohms-per-volt meter across 5-mf. condenser, C319, in FM detector circuit—negative lead to pin 6 of 14X7 tube and positive lead to B-. Use 10-volt range.

SIGNAL GENERATOR (AM)—Use MODULATED output for entire alignment. Generator must have sufficient output to give d-c meter reading greater than 8.5 volts. Connect generator ground to lead B-; connect output lead as indicated in chart.

CONTROLS—Same settings as for AM alignment, except wafer switch, which should be set to FM position. Allow radio and generator to warm up for 15 minutes before starting alignment.

ADJUSTING R-F COILS: In steps 7, 8, and 9, the resonance of the circuits using coils L400, L402, and L403 may be checked by the use of a powdered-iron tuning core, such as Part No. 56-6100. If the signal strength (meter reading) increases when the iron end is inserted in the coil, compress the turns slightly. If the signal strength increases when the brass end is inserted, spread the turns. If the signal strength decreases when either the brass or iron end is inserted, no adjustment of the coil is necessary. Do not spread or compress turns excessively, since only a small change is required at these frequencies.

Oscillator coil, L403: Adjust coil for maximum meter reading.

R-f coil, L402: Adjust coil for maximum meter reading while rocking tuning control.

Aerial coil, L400: Adjust coil for maximum meter reading.

REPLACEMENT PARTS LIST

NOTE

Part numbers 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 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			SECTION 2 (Continued)		
Reference Symbol	Description	Service Part No.	Reference Symbol	Description	Service Part No.
C100	Condenser,		C207	Condenser, cathode by-pass, 25 mf.	
C101	Condenser, r-f by-pass, 100 mmf.	30-1225-2*	C208	Condenser, tone compensating, .02 mf.	61-0108*
C102	Condenser, r-f by-pass, 100 mmf.	30-1225-2*	LS200	Loud-speaker	36-1604-1
C103	Condenser, r-f by-pass, .01 mf.	61-0120*	R200	Volume control, 2 megohms	33-5539-19
C104	Condenser, electrolytic, 3-section	30-2568-10	R201	Tone control, 500,000 ohms	33-5538-11
C104A	Condenser, filter, 40 mf.	Part of C104	R202	Resistor, grid return, 10 megohms	66-6103340*
C104B	Condenser, filter, 70 mf.	Part of C104	R203	Resistor, plate load, 470,000 ohms	66-4473340*
C104C	Condenser, filter, 40 mf.	Part of C104	R204	Resistor, grid return, 470,000 ohms	66-4473340*
I100	Panel lamp, 110v, screw base	34-2477	R205	Resistor, cathode bias, 120 ohms	66-1123340*
R100	Resistor, filter, 220 ohms	66-1224340*	T200	Output transformer	32-8296-4
R101	Resistor, filter, 470 ohms	66-1474340			
S100	Switch, a-c.power	Part of R200			
W100	Line cord and plug (including FM line aerial)				
L100	Choke, filament, 100 microhenries	32-4143-4			
SECTION 2			SECTION 3		
C200	Condenser, coupling, .01 mf.	61-0120*	C300A	Condenser, trimmer	Part of Z300
C201	Condenser, by-pass, .01 mf.	61-0120*	C300B	Condenser, trimmer	Part of Z300
C202	Condenser-and-choke assembly, i-f by-pass, .05 mf.	38-9851-6	C300C	Condenser, trimmer	Part of Z300
C203	Condenser, by-pass, 100 mmf.	30-1225-2*	C301A	Condenser, trimmer	Part of Z301
C204	Condenser, tone compensating, .006 mf.	45-3500-7	C301B	Condenser, trimmer	Part of Z301
C205	Condenser, by-pass, .05 mf.	61-0122*	C301C	Condenser, trimmer	Part of Z301
C206	Condenser, blocking, .002 mf.	61-0052	C301D	Condenser, trimmer	Part of Z301
			C302A	Condenser, trimmer	Part of Z302
			C302B	Condenser, mica	Part of Z302
			C302C	Condenser, trimmer	Part of Z302
			C302D	Condenser, trimmer	Part of Z302
			C303	Condenser, a-v-c by-pass, .01 mf.	61-0120*
			C304	Condenser, i-f by-pass, .002 mf.	61-0062

REPLACEMENT PARTS LIST (Continued)

SECTION 3 (Continued)

Reference Symbol	Description	Service Part No.
C305	Condenser, r-f by-pass, 1500 mmf.	30-1225-1*
C306	Condenser, r-f by-pass (a.v.c.), 100 mmf.	30-1225-2*
C307	Condenser, r-f by-pass, .01 mf.	61-0120*
C308	Condenser, filament by-pass, .01 mf.	61-0120*
C309	Condenser, r-f by-pass (a.v.c.), 220 mmf.	62-122001001
C310	Condenser, a-v-c filter, .01 mf.	61-0120*
C311	Condenser, by-pass, .05 mf.	61-0122*
C312	Condenser, cathode by-pass, .05 mf.	61-0122*
C313	Condenser, screen by-pass, .01 mf.	61-0120*
C314	Condenser, by-pass, 100 mmf.	30-1225-2*
C315	Condenser, by-pass, .01 mf.	61-0120*
C316	Condenser, by-pass, 100 mmf.	30-1225-2*
C317	Condenser, compensating, .006 mf.	45-3500-7
C318	Condenser, compensating, .02 mf.	61-0108
C319	Condenser, filter, FM detector, 5 mf.	30-2417
C320	Condenser, by-pass, 250 mmf.	60-10255237*
C321	Condenser, balance, FM detector, 8 mmf.	30-1224-6
R300	Resistor, a-v-c decoupling, 1 megohm	66-5103340*
R301	Resistor, cathode bias, 68 ohms	66-0683340*
R302	Resistor, plate decoupling, 68 ohms	66-0683340*
R303	Resistor, r-f decoupling (B-), 68 ohms	66-0683340*
R304	Resistor, a-v-c filter, 3.3 megohms	66-5333340*
R305	Resistor, a-v-c decoupling, 1 megohm	66-5103340*
R306	Resistor, a-v-c voltage divider, 1 megohm	66-5103340*
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, compensating, 100,000 ohms	66-4103340*
R311	Resistor, diode load, 100,000 ohms	66-4103340*
R312	Resistor, load, FM detector, 47,000 ohms	66-3473340*
Z300	Transformer, 1st i-f, including C300A, C300B, and C300C	32-4146-1
Z301	Transformer, 2nd i-f, including C301A, C301B, C301C, and C301D	32-4156
Z302	Transformer, 3rd i-f, including C302A, C302B, C302C, and C302D	32-4079

SECTION 4

C400	Condenser, main tuning gang	31-2703
C400A	Condenser, FM aerial trimmer	Part of C400
C400B	Condenser, FM r-f trimmer	Part of C400
C400C	Condenser, FM osc. trimmer	Part of C400
C401	Condenser, coupling, 51 mmf.	30-1224-2*
C402	Condenser, r-f by-pass, 100 mmf.	30-1225-2*
C403	Condenser, screen by-pass, 100 mmf.	30-1225-2*
C404	Condenser, r-f by-pass, 100 mmf.	30-1225-2*
C405	Condenser, FM aerial coupling	Part of W100
C406	Condenser, coupling, 33 mmf.	30-1225-2*
C407	Condenser, blocking, 100 mmf.	30-1225-2*
C408	Condenser, coupling, 51 mmf.	30-1224*
C409	Condenser, grid blocking, 250 mmf.	60-10255237*
C410	Condenser, r-f by-pass, 150 mmf.	60-10155407*
C411	Condenser, mixer coupling, 750 mmf.	30-1225-2
C412	Condenser, isolating, .1 mf.	61-0113*
C413	Condenser, trimmer assembly, 2-section	
C413A	Condenser, trimmer, bc. oscillator	Part of C413
C413B	Condenser, trimmer, bc. aerial	Part of C413
C414	Condenser, coupling,	

SECTION 4 (Continued)

Reference Symbol	Description	Service Part No.
C415	Condenser, blocking, 100 mmf.	30-1225-2*
C416	Condenser, r-f by-pass, .01 mf.	61-0120*
C417	Condenser, r-f by-pass, .01 mf.	61-0120*
C418	Condenser, r-f filament by-pass, 100 mmf.	30-1225-2*
C419	Condenser, aerial coupling, 100 mmf.	30-1225-2*
C420	Condenser, r-f filament by-pass, 100 mmf.	30-1225-2*
J400	Socket, external aerial	27-6214-1
L400	Coil, FM aerial	32-4158
L401	Coil, r-f plate load	32-4061
L402	Coil, FM r-f	32-4159
L403	Coil, FM oscillator	32-4184
L404	Coil, bc. oscillator	32-4019-5
L405	Coil, high-frequency choke	32-4111
L406	Coil, parasitic suppressor, FM osc.	32-4157-1
L407	Coil, aerial loading	32-4217
LA400	Loop aerial	32-4052-16
P400	Plug, external aerial	27-4788
R400	Resistors (2 req., 10 ohms ea.), parasitic suppressor	66-0103340
R401	Resistor, cathode bias, 47 ohms	66-0473340*
R402	Resistor, screen decoupling, 1000 ohms	66-2103340*
R403	Resistor, plate load, 8200 ohms	66-2823340*
R404	Resistor, r-f decoupling, 68 ohms	66-0683340*
R405	Resistor, parasitic suppressor, 1500 ohms	66-2153340*
R406	Resistor, grid leak, 15,000 ohms	66-3153340*
R407	Resistor, cathode bias, 1500 ohms	66-2153340*
R408	Resistor, plate dropping, 33,000 ohms	66-3333340*
R409	Resistor, grid load, 10,000 ohms	66-3103340*
R410	Resistor, parasitic suppressor, 22 ohms	66-0223340*
R411	Resistor, grid return, 10 megohms	66-6103340*
R412	Resistor, r-f decoupling, 68 ohms	66-0683340*
R413	Resistor, grid return, 1 megohm	66-5103340*
TB400	Aerial terminal panel (on chassis)	38-9942
TB401	Aerial terminal panel (on cabinet back)	38-9942
WS	Wafer switch, 3 wafers	42-1800
WS1	Switch wafer	Part of WS
WS2	Switch wafer	Part of WS
WS3	Switch wafer	Part of WS

MISCELLANEOUS

Description	Service Part No.
Cabinet (less scale), Model 48-472	10666
Cabinet (less scale), Model 48-472-I	10666A
Back, cabinet	54-7465
Baffle-and-cloth assembly	40-6853
Clip, back and baffle mounting	W2235FA9
Dial scale, Model 48-472	27-5954
Dial scale, Model 48-472-I	27-5954-1
Screw, scale mounting	1W23138FA3
Strap, scale mounting, left-hand	56-4031FCP
Strap, scale mounting, right-hand	56-4032FCP
Dial backplate assembly	76-2951
Diffusing panel	54-7370
Drive cord (25-ft. spool)	45-8750*
Pointer	56-4535FCP
Spring, diffusing panel	56-3841
Spring, pointer	28-8953
Knob, Model 48-472	54-4376
Knob, Model 48-472-I	54-4375
Panel-lamp-socket assembly	
Screw, speaker mounting	1W48188FA3
Socket, Loktal (14F8)	27-6138
Socket, Loktal (14H7, 14X7, 50A5)	27-6213
Socket, miniature (12AW6)	27-6203-1
Socket, miniature (117Z3)	27-6226

REVISIONS TO 48-472 SERVICE MANUAL

Reference Symbol	Description	Service Part No.
Parts List Corrections		
C100	Condenser, hum eliminating, .04 mf.	30-4119
W100	Line cord and plug	41-3755-19
C207	Condenser, cathode by-pass, 25 mf.	45-3001
R302	Resistor, plate decoupling, 1000 ohms	66-2103340*
C406	Condenser, coupling, 33 mmf.	30-1223-6
C413	Condenser, trimmer assembly, 2-section	31-6476-13
C414	Condenser, coupling, 100 mmf.	62-110009001*
	Panel-lamp-socket assembly	27-6233
	F.M. antenna	41-3791-1

PRODUCTION CHANGES

Main Chassis, Run 2

	Condenser, 100 mmf., was added, between ground and the junction of C306 and R305	62-110009001
	Condenser, 100 mmf., added, from the input side of S100 to ground	62-110009001
C314	Condenser, was repositioned, connecting the previously grounded end to pin four of the 14X7 tube.	

R-F Chassis, Run 2

J400	Socket, external aerial, was changed to a 5-pin socket	27-6214
	Condenser, 100 mmf., was added, between pin 5 and pin 3 of J400,	62-110009011

R-F Chassis, Run 3

	Coil, r-f choke, was added, in series with C413B, from C413B to the junction of L407 and C419	32-4111
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