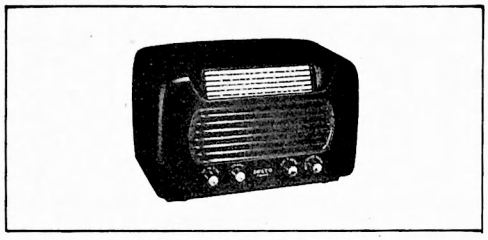
PHILCO-TROPIC RADIO MODEL 48-821



MODEL 48-821

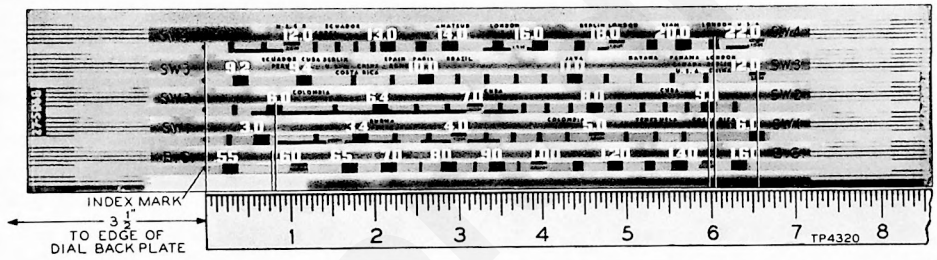
SPECIFICATIONS

CABINET	Bakelite
CIRCUIT	Five-tube superheterodyne
FREQUENCY RANGES	
Standard Broadcast	540—1600 kc.
Short Wave 1	2.9—6.0 mc.
Short Wave 2	5.9—9.3 mc.
Short Wave 3	9.2—12.0 mc.
Short Wave 4	11.6—22.0 mc.
OPERATING VOLTAGES	105-125 volts or 220-240 volts, a.c. or d.c.
POWER CONSUMPTION	31 watts at 115 volts; 63 watts at 230 volts
AUDIO OUTPUT	1.7 watts at 115 volts; 2.2 watts at 230 volts
AERIAL	Philco Outdoor Aerial, Part No. 45-1494
INTERMEDIATE FREQUENCY	455 kc.
PHILCO TUBES (5)	14J7, 7B7, 14B6, 50A5, 35Y4

TP-3699

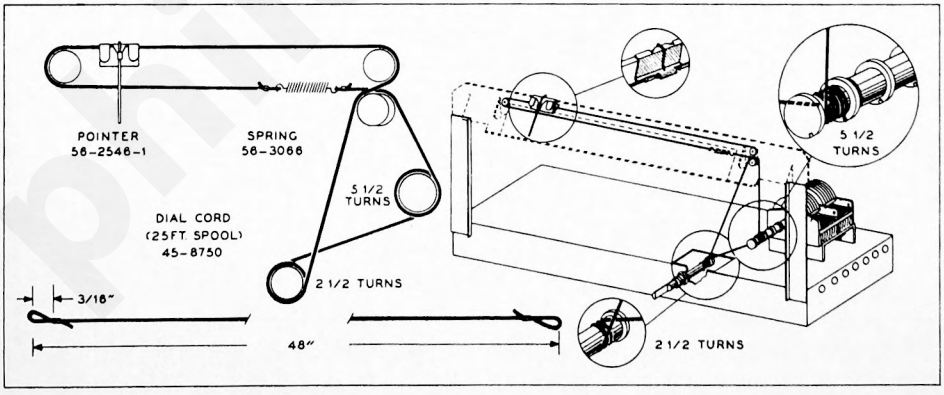
CALIBRATING DIAL BACKPLATE

When the chassis has been removed from the cabinet, dial calibration and alignment points should be marked on the backplate below the pointer. First, make a mark $3\frac{1}{2}$" from the reference point, indicated in figure 7 by the line at the left-hand edge of the backplate; this mark locates the index point. Second, place the left-hand edge of the ruler at the index point, and make pencil marks on the backplate for the alignment points.



TP-4320

Figure 1. Dial-Backplate Calibration Measurements



TP-4731E

Figure 2. Drive-Cord Installation Details

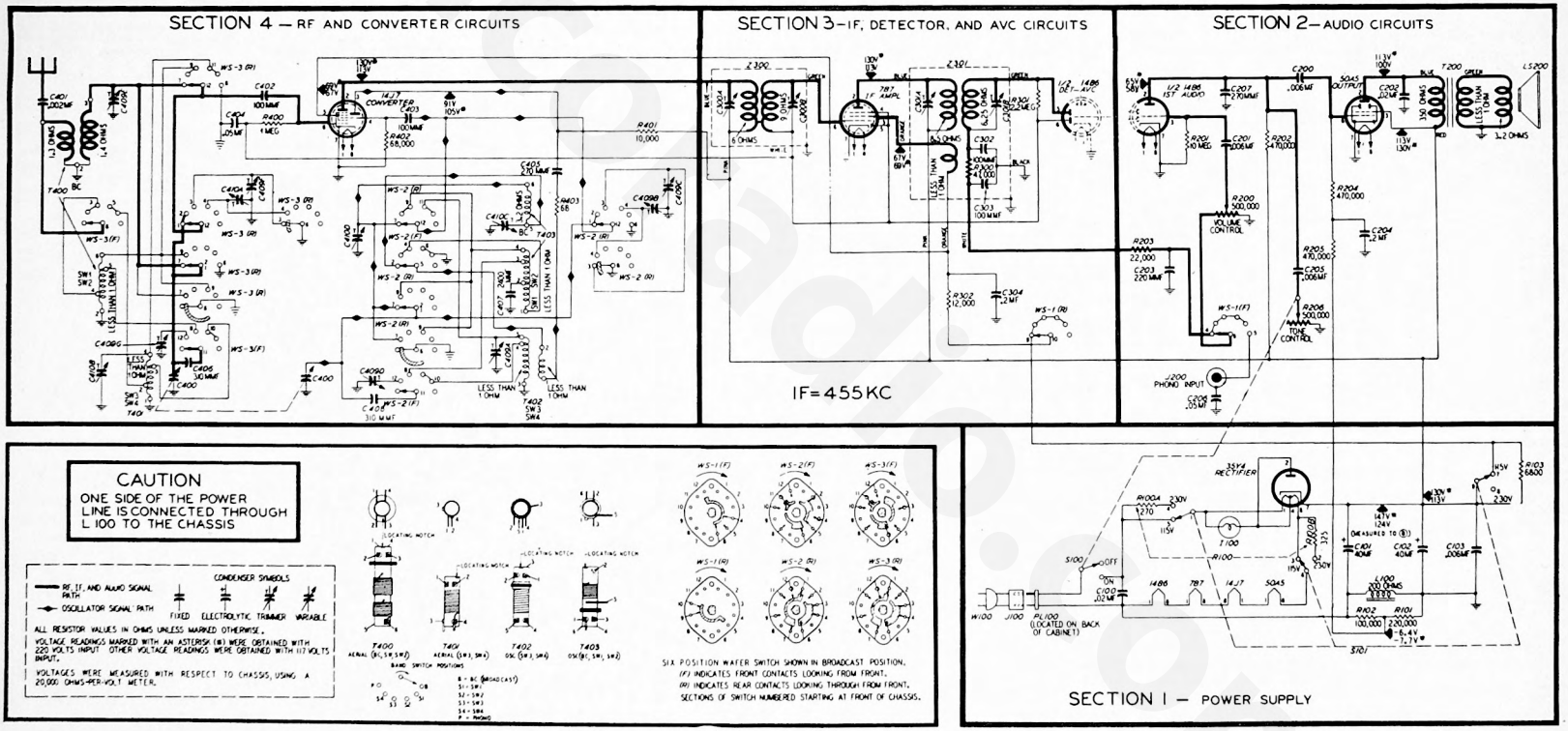


Figure 3. Philco-Tropic Radio Model 48-821, Sectionalized Schematic Diagram, Showing Test Points

TP-4071

ALIGNMENT PROCEDURE

CAUTION: Before turning on the radio, make certain that the voltage-change switch, located on the rear of the chassis, is set to the correct line voltage.

ONE SIDE OF THE POWER LINE IS CONNECTED TO THE RADIO CHASSIS THROUGH THE SPEAKER FIELD.

OUTPUT METER: Connect between speaker voice-coil terminals.

SIGNAL GENERATOR: Connect ground lead to chassis, test point C; connect output lead as indicated in chart. Use modulated output.

RADIO CONTROLS: Set volume control to maximum, and turn tone control fully clockwise.

OUTPUT LEVEL: During alignment, adjust signal-generator output to maintain output-meter indication below 1.5 volts.

STEP	SIGNAL GENERATOR		RADIO			ADJUST
	CONNECTIONS TO RADIO	FREQUENCY	BAND SWITCH	TUNING	SPECIAL INSTRUCTIONS	
1	Through .05-mf. condenser to pin 6 of 14J7.	455 kc.	BC	580 kc.	Adjust, in order given, for maximum output, then repeat.	C301B—2nd i-f sec. C301A—2nd i-f pri. C300B—1st i-f sec. C300A—1st i-f pri.
2	Through 400-ohm resistor to aerial lead.	21 mc.	SW4	21 mc.	Adjust for maximum output. Image should be heard when radio is tuned to 20.1 mc.	C409A—SW4 osc.
3	Same as step 2.	20.8 mc.	SW4	20.8 mc.	Adjust for maximum output.	C410B*—SW4 aerial
4	Same as step 2.	12 mc.	SW3	12 mc.	Adjust for maximum output. Image should be heard when radio is tuned to 11.1 mc.	C409B—SW3 osc.
5	Same as step 2.	12 mc.	SW3	12 mc.	Adjust for maximum output.	C410A*—SW3 aerial
6	Same as step 2.	9 mc.	SW2	9 mc.	Adjust for maximum output. Image should be heard when radio is tuned to 8.1 mc.	C409C—SW2 osc.
7	Same as step 2.	9 mc.	SW2	9 mc.	Adjust for maximum output.	C409F*—SW2 aerial
8	Same as step 2.	6 mc.	SW1	6 mc.	Adjust for maximum output. Image should be heard when radio is tuned to 5.1 mc.	C409D—SW1 osc.
9	Same as step 2.	6 mc.	SW1	6 mc.	Adjust for maximum output.	C409G*—SW1 aerial
10					Loosen trimmer ½ turn from tight position.	C410C—BC osc. (series)
11	Through 200-mmf. condenser to aerial lead.	1520 kc.	BC	1520 kc.	Adjust for maximum output.	C410D—BC osc. (shunt)
12	Same as step 11.	1520 kc.	BC	1520 kc.	Adjust for maximum output.	C409E*—BC aerial
13	Same as step 11.	580 kc.	BC	580 kc.	Adjust for maximum output.	C410C*—BC osc. (series)
14	Repeat steps 11, 12, 13, and 12.					

* Rock tuning gang while adjusting this trimmer.

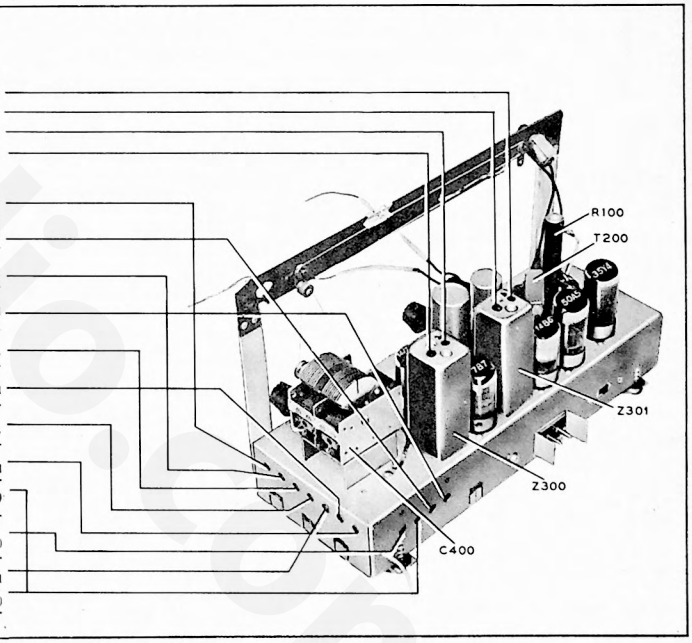


Figure 4. Chassis View, Showing Trimmer Locations

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
I—pilot lamp
L—choke or coil
LS—loud-speaker
R—resistor
S—switch
T—transformer
WS—wafer switch
Z—electrical assembly

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 amplifier, detector, and a-v-c circuits.
400-series components are in Section 4, the r-f and converter circuits.

A suffix letter identifies the part as a component of the assembly which bears an identical number without a suffix letter, and with perhaps a different prefix letter.

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
POWER SUPPLY

Reference Symbol	Description	Service Part No.
C100	Condenser, line by-pass, .02 mf., 600v	61-0108*
C101	Condenser, electrolytic, filter, 40 mf., 200v.	30-2568-11
C102	Condenser, electrolytic, filter, 40 mf., 200v	30-2466
C103	Condenser, r-f by-pass, .006 mf.	30-1226-2
I100	Lamp, pilot	34-2068
J100	Socket, power input	47-6217
L100	Choke	32-8312-1
PL100	Plug, power input	54-4426
R100	Resistor, line dropping, 7.5 watts, 2-section	33-3440
R100A	Resistor, 270 ohms	Part of R100
R100B	Resistor, 325 ohms	Part of R100
R101	Resistor, bias voltage divider, 220,000 ohms	66-4223340
R102	Resistor, bias voltage divider, 100,000 ohms	66-4103340
R103	Resistor, dropping, 6800 ohms	66-2683340
S100	Switch, on-off	Part of 33-5538-23
S101	Switch, voltage change	42-1553-3
W100	Line cord	L2183

SECTION 2
AUDIO CIRCUITS

C200	Condenser, d-c blocking, .006 mf.	30-1226-2
C201	Condenser, d-c blocking, .006 mf.	30-1226-2
C202	Condenser, tone compensation, .02 mf.	61-0108*
C203	Condenser, r-f filter, 220 mmf.	60-10205307*
C204	Condenser, bias filter, .2 mf.	45-3500-3*
C205	Condenser, tone compensation, .006 mf.	30-1226-2
C206	Condenser, phono isolation, .05 mf.	61-0122*
C207	Condenser, mica, by-pass, 270 mmf.	60-10245307*
J200	Socket, phono input	27-6149
LS200	Speaker	36-1615-2
R200	Volume control, 500,000 ohms	33-5539-26
R201	Resistor, grid return, 10 megohms	66-6103340*
R202	Resistor, plate load, 470,000 ohms	66-4473340*
R203	Resistor, r-f filter, 22,000 ohms	66-3223340*
R204	Resistor, grid return, 470,000 ohms	66-4473340*
R205	Resistor, bias filter, 470,000 ohms	66-4473340*
R206	Tone control	Part of 33-5538-23
T200	Transformer, output	32-8321
WS-1(F)	Wafer-switch section	Part of 42-1809

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

C300A	Condenser, trimmer	Part of Z300
C300B	Condenser, trimmer	Part of Z300
C301A	Condenser, trimmer	Part of Z301
C301B	Condenser, trimmer	Part of Z301
C302	Condenser, filter, 100 mmf. (part of Z301)	60-10105407*
C303	Condenser, filter, 100 mmf. (part of Z301)	60-10105407*
C304	Condenser, screen by-pass, .2 mf.	45-3500-3*
R300	Resistor, filter, 47,000 ohms (part of Z301)	66-3473340*
R301	Resistor, a-v-c filter, 2.2 megohms	66-5223340*
R302	Resistor, screen dropping, 12,000 ohms	66-3123340
WS-1(R)	Wafer-switch section	Part of 42-1809
Z300	Transformer, 1st i-f, including C300A and C300B	32-3895-1
Z301	Transformer, 2nd i-f, including C301A, C301B, C302, C303, and R300	32-3908-1

SECTION 4
R-F AND CONVERTER CIRCUITS

Reference Symbol	Description	Service Part No.
C400	Condenser, tuning gang	31-2723
C401	Condenser, aerial coupling, .002 mf.	61-0062*
C402	Condenser, mica, d-c blocking, 100 mmf.	60-10105407*
C403	Condenser, mica, d-c blocking, 100 mmf.	60-10105407*
C404	Condenser, a-v-c by-pass, .05 mf.	30-1226
C405	Condenser, d-c blocking, 270 mmf.	60-10245307*
C406	Condenser, silvered mica, fixed padder, 310 mmf.	30-1220-11
C407	Condenser, fixed padder, 2400 mmf.	60-20245304*
C408	Condenser, silvered mica, fixed padder, 310 mmf.	30-1220-11
C409	Condenser, trimmer, 7-section	31-6414-1
C409A	Condenser, oscillator trimmer (SW4)	Part of C409
C409B	Condenser, oscillator trimmer (SW3)	Part of C409
C409C	Condenser, oscillator trimmer (SW2)	Part of C409
C409D	Condenser, oscillator trimmer (SW1)	Part of C409
C409E	Condenser, aerial trimmer (BC)	Part of C409
C409F	Condenser, aerial trimmer (SW2)	Part of C409
C409G	Condenser, aerial trimmer (SW1)	Part of C409
C410	Condenser, trimmer, 4-section	31-6414-2
C410A	Condenser, aerial trimmer (SW3)	Part of C410
C410B	Condenser, aerial trimmer (SW4)	Part of C410
C410C	Condenser, oscillator padder (BC)	Part of C410
C410D	Condenser, oscillator trimmer (BC)	Part of C410
R400	Resistor, grid return, 1 megohm	66-5103340*
R401	Resistor, plate load, 10,000 ohms	66-3103340
R402	Resistor, grid return, 68,000 ohms	66-3683340*
R403	Resistor, oscillator stabilizing, 68 ohms	66-0683340*
T400	Transformer, aerial (BC, SW1, SW2)	32-4197
T401	Transformer, aerial (SW3, SW4)	32-4195
T402	Transformer, oscillator (SW3, SW4)	32-4194
T403	Transformer, oscillator (BC, SW1, SW2)	32-4196
WS-2(F)	Wafer-switch section	Part of 42-1809
WS-2(R)	Wafer-switch section	Part of 42-1809
WS-3(F)	Wafer-switch section	Part of 42-1809
WS-3(R)	Wafer-switch section	Part of 42-1809

MISCELLANEOUS

Description	Service Part No.
Adapter, a-c	L3275
Backplate assembly	76-3026
Cabinet and Hardware	
Baffle	40-9161
Cabinet	10666
Scale	27-5968
Scale strap (R. H.)	56-4032FCP
Scale strap (L. H.)	56-4031FCP
Cord, dial (25-ft. spool)	45-8750
Knob	54-4227-2
Lamp assembly, pilot	76-4280
Pointer	56-2546-1
Shaft, drive	31-2718-1
Shell (for socket J100)	56-4346
Socket, loktal	27-6207
Spring, gang and pointer	56-3066
Stud	W2235FA9

REVISIONS AND ADDITIONS TO 48-821 SERVICE MANUAL

Reference Symbol	Description	Service Part No.
	Parts List Additions	
I101	Lamp, pilot	34-2068
	Lamp assembly, pilot	76-1179-5
	Parts List Corrections	
C102	Condenser, electrolytic, filter, 40 mf., 200v	45-6252
J100	Socket, power input	27-6217
J200	Socket, phono input	27-6186
R206	Tone control	33-5538-23
	Lamp assembly, pilot	76-1280
	Socket, Loktal	27-6138

PRODUCTION CHANGES

Run 2

The wiring of the 270-mmf. by-pass condenser, C207, was changed to go from the control grid of the 50A5 tube to ground. The connections were made from pin 6 of the 50A5 to pin 7 of the 14B6.

Run 3

To correct an error in production, the wiring of the line dropping resistor, R100, was changed. The correct wiring is as shown in the manual, with the 270-ohm section on the line side of the 35Y4 filament, and the 325-ohm section between the 35Y4 filament and the other filaments. This resistor is used only when the voltage-change switch, S101, is in the 230v position. The 270-ohm section of R100 is the largest section.

CRITICAL LEAD DRESS

1. The yellow lead from the 6-mc. aerial trimmer, C409G, to the band switch should be dressed upward from the chassis, to reduce the minimum circuit capacitance, for correct adjustment of the aerial trimmer.

2. The green lead from the volume control, R200, to the band switch, and the white lead from R203 to the band switch, should be dressed to the front of the chassis, under the dress lug, to reduce i-f coupling to the r-f stage.

3. The white a-c lead from PL100 to T200 should be dressed to the rear of the chassis, under the dress lug, to reduce hum pickup.

4. The blue lead from the plate of the 50A5 to T200 should be dressed down to the chassis, away from the 14B6 grid wiring and the volume-control wiring, to prevent audio regeneration.