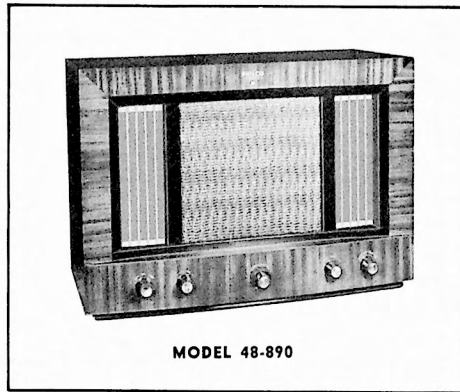


PHILCO-TROPIC RADIO MODEL 48-890



MODEL 48-890

SPECIFICATIONS

CABINET Wood, light maple or mahogany

CIRCUIT 11-tube superheterodyne (provision for external record player)

FREQUENCY RANGES

Standard Broadcast (BC)540—1700 kc.
 Short Wave 1 (SW1)1.5—2.6 mc.
 Short Wave 2 (SW2)2.5—5.1 mc.
 Short Wave 3 (SW3)5.0—7.4 mc.
 Short Wave 4 (SW4)7.3—22.0 mc.
 Band Spread 1 (31M)9.3—9.9 mc.

Band Spread 2 (25M)11.3—12.0 mc.
 Band Spread 3 (19M)14.7—15.6 mc.
 Band Spread 4 (16M)17.3—18.2 mc.
 Band Spread 5 (13M)20.8—21.9 mc.

AUDIO OUTPUT7.5 watts

OPERATING VOLTAGES95—125 volts, or 190—250 volts, 50/60 cycles, a.c.

POWER CONSUMPTION90 watts

AERIALPhilco Aerial, Part No. 45-1469

INTERMEDIATE

FREQUENCY455 kc.

PHILCO TUBES (11)7C7, 7J7, 7B7 (2), 7A6, 7A4 (3), 7CS (2), 5A2A.

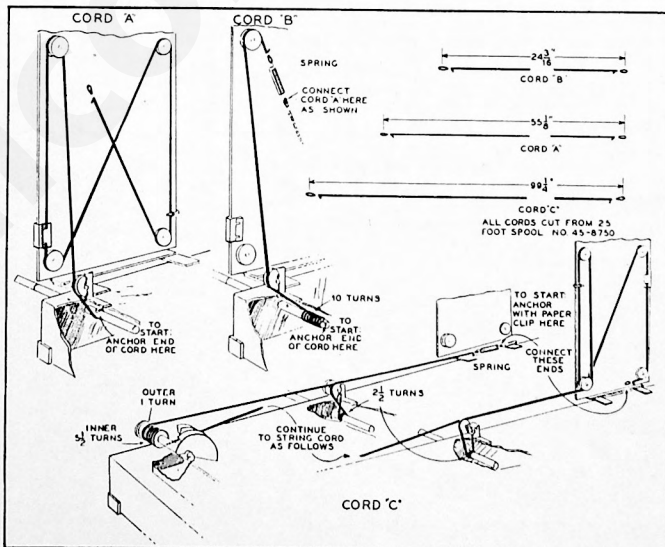


Figure 1 Drive-Cord Installation Details

REPLACEMENT PARTS LIST

NOTE: Part numbers identified by an asterisk (*) are general replacement items. These numbers may not be identical with those on factory parts; 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.	61-0120*
C101	Condenser, line filter, .01 mf.	61-0120*
C102	Condenser, electrolytic, input filter, 40 mf., 450v	30-2570-15
C103	Condenser, electrolytic, 3-section	Part of C103
C103A	Condenser, 20 mf., 450v	Part of C103
C103B	Condenser, 10 mf., 450v	Part of C103
C103C	Condenser, 10 mf., 450v	Part of C103
I100 to I110	110 lamp	Part of C103
R100	Resistor, filter, 820 ohms	66-1825340*
R101	Resistor, filter, 820 ohms	66-1825340*
R102	Resistor, filter, 2200 ohms	66-2225340*
R103	Resistor, filter, 47,000 ohms	66-3474340*
R107	Resistor, voltage divider, 1 megohm	66-5103340*
R105	Resistor, voltage divider, 56,000 ohms	66-3563340*
S100	Switch, off-on	Part of R201
T100	Transformer, power	32-8246-1
W100	A-c cord and plug	
WS1-8 (R)	Switch-water section	Part of 42-1825†
WS2-1 (F)	Switch-water section	Part of 42-1817‡
WS2-1 (R)	Switch-water section	Part of 42-1817‡

SECTION 2 — AUDIO CIRCUITS

C200	Condenser, d-c blocking, .02 mf.	61-0108*
C201	Condenser, tone compensation, 100 mmf.	60-1010540*
C202	Condenser, tone compensation, .006 mf.	45-3500-7*
C203	Condenser, d-c blocking, .05 mf.	61-0122*
C204	Condenser, tone control, .04 mf.	45-3500-7*
C205	Condenser, d-c blocking, .006 mf.	45-3500-7*
C206	Condenser, r-f by-pass, 470 mmf.	62-147001001†
C207	Condenser, electrolytic, cathode by-pass,	
C208	Condenser, d-c blocking, .006 mf.	45-3500-7*
C209	Condenser, r-f by-pass, 245 mmf.	62-122001001†
C210	Condenser, d-c blocking, .006 mf.	45-3500-7*
C211	Condenser, tone compensation, .003 mf.	61-0115*
L5200	Speaker	36-1810-1
PL200	Speaker cable and plug	41-3714-2
R200	Volume control, 2 megohms (tap at 1 megohm)	33-5535-14
R201	Tone control (with a-c switch), 5 megohms	33-5538-24
R202	Resistor, diode load, 330,000 ohms	66-4333340*
R203	Resistor, tone compensation, 50,000 ohms	66-3683340*
R204	Resistor, feed-back voltage divider, 680 ohms	66-1683340*
R205	Resistor, feed-back voltage divider, 45 ohms	66-9473340*
R206	Resistor, grid return, 470,000 ohms	66-4473340*
R207	Resistor, plate load, 470,000 ohms	66-4473340*
R208	Resistor, grid return, 470,000 ohms	66-4473340*
R209	Resistor, cathode bias, 1200 ohms	66-2123340*
R210	Resistor, grid return, 33,000 ohms	66-3333340*
R211	Resistor, plate load, 270,000 ohms	66-4273340*
R212	Resistor, plate load, 270,000 ohms	66-4273340*
R213	Resistor, voltage divider, 470,000 ohms	66-4473340*
R214	Resistor, grid return, 470,000 ohms	66-4473340*
R215	Resistor, cathode bias, 220 ohms	66-1225340*
R216	Resistor, parasitic suppressor, 1000 ohms	66-2103340*
R217	Resistor, parasitic suppressor, 1000 ohms	66-2103340*
T200	Transformer, output	32-8300-2
WS1-1 (R)	Switch-water section	Part of 42-1825†

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

C300A	Condenser, shunt	Part of Z300
C300B	Condenser, shunt	Part of Z300
C300C	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, trimmer	Part of Z302
C303	Condenser, r-f by-pass, .05 mf.	61-0112*
C304	Condenser, cathode by-pass (u.s. mf.)	61-0122*
C305	Condenser, filter, 100 mmf. (part of Z302)	60-1010540*
C306	Condenser, filter, 100 mmf. (part of Z302)	60-1010540*
C307	Condenser, bias filter, .1 mf.	61-0113*
C308	Not used	
C309	Condenser, d-c blocking, 100 mmf.	60-1010540*
L300A	Primary winding, 1st i-f	Part of Z300
L300B	Tertiary winding, 1st i-f	Part of Z300
L300C	Secondary winding, 1st i-f	Part of Z300
L301A	Primary winding, 2nd i-f	Part of Z301
L301B	Secondary winding, 2nd i-f	Part of Z301
L302A	Primary winding, 3rd i-f	Part of Z302
L302B	Secondary winding, 3rd i-f	Part of Z302
R300	Sensitivity control, 15,000 ohms	33-5401
R301	Resistor, cathode bias, 1500 ohms	66-2153340*
R302	Resistor, cathode bias, 1800 ohms	66-2183340*
R303	Resistor, filter, 47,000 ohms (part of Z302)	66-3474340*
R304	Resistor, a-v-c decoupling	
R305	Resistor, a-v-c voltage divider,	
R306	Resistor, a-v-c voltage divider, 68,000 ohms	66-4683340*
R307	Resistor, plate decoupling, 10,000 ohms	66-3104340*
TC300A	Tuning core	Part of Z300
TC300B	Tuning core	Part of Z300
TC300C	Tuning core	Part of Z300
TC301A	Tuning core	Part of Z301
TC301B	Tuning core	Part of Z301
Z300	Transformer, 1st i-f	32-3982-1
Z301	Transformer, 2nd i-f	32-3983
Z302	Transformer, 3rd i-f	32-3984
WS1-8 (F)	Switch-water section	Part of 42-1825†

SECTION 4 — R-F AND CONVERTER CIRCUITS

C400	Condenser, tuning gang	31-2725-1
C400A	Condenser, tuning-gang section, aerial	Part of C400
C400B	Condenser, tuning-gang section, r.f.	Part of C400
C400C	Condenser, tuning-gang section, oscillator	Part of C400
C401	Condenser, shunt, .33 mmf.	30-1224*
C402	Condenser assembly, trimmer, 3-section	Part of 31-6507-35
C402A	Condenser, trimmer, SW3 aerial	Part of C402
C402B	Condenser, trimmer, SW2 aerial	Part of C402
C402C	Condenser, trimmer, SW4 aerial	Part of C402

SECTION 4 (Continued) R-F AND CONVERTER CIRCUITS

Reference Symbol	Description	Service Part No.
C403	Condenser, series, SW3 aerial, 110 mmf.	30-1220-26*
C404	Condenser, shunt, BS1 aerial, 177 mmf.	30-1220-30*
C405	Condenser, shunt, BS2 aerial, 110 mmf.	30-1220-26*
C406	3-section Condenser assembly, trimmer,	Part of 31-6507-35 Part of C406
†42-1825	Band switch, 8-section (includes WS1-1, WS1-2, WS1-3, WS1-4, WS1-5, WS1-6, WS1-7, and WS1-8).	
†42-1817	Voltage change-over switch, 1 section (WS2-1).	
C406B	Condenser, trimmer, BS4 aerial	Part of C406
C406C	Condenser, trimmer, BS3 aerial	Part of C406
C407	Condenser, d-c blocking, 100 mmf.	60-1010540*
C408	a-v-c filter, .05 mf.	61-0122*
C409	Condenser, shunt, 10 mmf.	30-1224-26*
C410	Condenser assembly, trimmer, 3-section	Part of 31-6507-25†
C410A	Condenser, trimmer, SW3 r.f.	Part of C410
C410B	Condenser, trimmer, SW2 r.f.	Part of C410
C410C	Condenser, trimmer, SW4 r.f.	Part of C410
C411	Condenser, series, SW3 r.f., 138 mmf.	30-1220-28*
C412	Condenser, shunt, BS1 r.f., 177 mmf.	30-1220-30*
C413	Condenser, shunt, BS2 r.f., 107 mmf.	30-1220*
C414	Condenser, d-c blocking, 100 mmf.	60-1010540*
C415	Condenser, a-v-c filter, .05 mf.	61-0122*
C416	Condenser, screen by-pass, .05 mf.	61-0122*
C417	Condenser assembly, trimmer, 3-section	Part of 31-6507-25†
C417A	Condenser, trimmer, BS5 r.f.	Part of C417
C417B	Condenser, trimmer, BS4 r.f.	Part of C417
C417C	Condenser, trimmer, BS3 r.f.	Part of C417
C418	Condenser assembly, trimmer, 4-section	31-6414-3
C418A	Condenser, trimmer, SW4 osc.	Part of C418
C418B	Condenser, trimmer, SW3 osc.	Part of C418
C418C	Condenser, trimmer (1600 kc.), BC osc.	Part of C418
C418D	Condenser, padder (580 kc.), BC osc.	Part of C418
C419	Condenser, d-c blocking, 250 mmf.	60-10255237*
C421	Condenser, d-c blocking, 100 mmf.	60-1010540*
C421	Condenser assembly, trimmer, 2-section	Part of 31-6507-25†
C421A	Condenser, trimmer, BS1 osc.	Part of C421
C421B	Condenser, trimmer, SW2 osc.	Part of C421
C422	Condenser assembly, trimmer, 2-section	Part of 31-6507-25†
C422A	Condenser, trimmer, BS3 osc.	Part of C422
C422B	Condenser, trimmer, BS2 osc.	Part of C422
C423	Condenser, trimmer, BS5 osc.	31-6489
C424	Condenser, shunt, SW2 r.f., 245 mmf.	30-1220-34
C425	Condenser, shunt, SW2 aerial, 300 mmf.	30-1220-10
C426	Condenser, d-c blocking, 100 mmf.	60-1010540*
C427	Condenser, trimmer, BS4 osc.	31-6489
C428	Condenser, series, SW3 osc., 129 mmf.	60-10135237*
L400	Coil, SW2, 3 aerial	32-4206-4
L401	Coil, SW4 aerial	32-4208-5
L402	Coil, BS aerial	32-3670
L403	BC, SW1 r.f.	32-3678
L404	Coil, SW2, 3 r.f.	32-4208-6
L405	Coil, SW4 r.f.	32-4208-6
L406	Coil, BS r.f.	32-3671
L407	Coil, SW1 osc.	32-4083
L408	Coil, SW2, 3 osc.	32-4206-4
L409	Coil, SW4 osc.	32-4206-4
R400	Resistor, grid return, 1 megohm	66-5103340*
R401	Resistor, plate load, 10,000 ohms	66-3103340*
R402	Resistor, grid return, 1 megohm	66-5103340*
R403	Resistor, plate load, 22,000 ohms	66-324340*
R404	Resistor, grid return, 68,000 ohms	66-3683340*
R405	Resistor, parasitic suppressor, 68 ohms	66-0683340*
T400	Transformer, BC SW1 aerial	32-4242
T401	Transformer, BS osc.	32-4212-1
TC400	Tuning-core assembly, band-spread, 3-gang	76-1281-2
TC400A	Tuning core, BS aerial	Part of TC400
TC400B	Tuning core, BS r.f.	Part of TC400
TC400C	Tuning core, BS osc.	Part of TC400
TC401	Tuning core, SW4 aerial (tracking)	Part of L401
TC405	Tuning core, SW4 r.f. (tracking)	Part of L405
TC406	Tuning core, SW3 osc. (tracking)	Part of L408
TC409	Tuning core, SW4 osc. (tracking)	Part of L409
WS1-2 (R)	Switch-water section	Part of 42-1825†
WS1-2 (F)	Switch-water section	Part of 42-1825†
WS1-3 (F)	Switch-water section	Part of 42-1825†
WS1-3 (R)	Switch-water section	Part of 42-1825†
WS1-4 (F)	Switch-water section	Part of 42-1825†
WS1-4 (R)	Switch-water section	Part of 42-1825†
WS1-5 (F)	Switch-water section	Part of 42-1825†
WS1-5 (R)	Switch-water section	Part of 42-1825†
WS1-6 (F)	Switch-water section	Part of 42-1825†
WS1-6 (R)	Switch-water section	Part of 42-1825†
WS1-7 (F)	Switch-water section	Part of 42-1825†
WS1-7 (R)	Switch-water section	Part of 42-1825†

MISCELLANEOUS

Description	Service Part No.
Cabinet and Cabinet Parts	
Baffle and cloth (L)	40-6951
Baffle and cloth (M)	40-6951-1
Cabinet, less scale (L)	1069-1A
Cabinet, less scale (M)	1069-1A
Cabinet back	54-7486
Dial and Backplate Parts	
Bracket (dial mtg.), i.h.	76-1540-1
Bracket (dial mtg.), h.h.	76-1539
Clamp, dial (dial mtg.)	56-1795FA15
Dial assembly, r.h.	76-3282
Dial assembly, i.h.	76-3282-1
Pointer	56-2546
Pilot-lamp assembly	27-6233-14
Cord, drive (99-1/4"), 25-ft. spool	45-8750*
Cord, drive (24-3/16"), 25-ft. spool	45-8750*
Cord, drive (55-1/8"), 25-ft. spool	45-8750*
Knob (L), 5 req.	54-4248-2
Knob (M), 5 req.	54-4323
Socket, Loktal, 11 req.	27-6138*
Spring, drive cord	28-8751
†31-6507-3 Trimmer-condenser assembly 6-section (includes C402A, B, C, and C406A, B, C)	
†31-6507-2 Trimmer-condenser assembly 10-section (includes C410A, B, C, C417A, B, C, C421A, B, and C422A, B)	

ALIGNMENT PROCEDURE

MODEL 48-890

CAUTION: Before connecting the radio to the power source, make certain that the voltage change-over switch is correctly set for the line voltage.
DIAL POINTERS: With the tuning-condenser gang fully meshed, and the band-spread tuning-core gang completely in, set the pointers to coincide with the index mark at the low-frequency end of each dial.
BAND-SPREAD TUNING-CORE GANG: With the pointer at the bottom of the scale, adjust the iron core assembly to bring the end of the oscillator core flush with the end of the coil. **CAUTION:** When tightening the setscrew, to hold the brass rod, do not turn this screw too tight.

OUTPUT METER: Connect to speaker voice coil.
SIGNAL GENERATOR: Connect the ground lead to the chassis; connect the output lead as indicated in the chart.
CONTROLS: Set the volume control to maximum, and the tone control near the "off" position. Set the sensitivity control fully clockwise. Set the band switch, radio dial, and signal-generator dial as indicated in the chart.
OUTPUT LEVEL: During alignment, the signal-generator output must be attenuated to hold the output-meter reading below 1.5 volts.

SIGNAL GENERATOR			R A D I O			ADJUST
STEP	CONNECTION TO RADIO	DIAL SETTING	BAND SWITCH	DIAL SETTING	SPECIAL INSTRUCTIONS	
1	Through .05-mi. condenser to mixer grid (connect to section of tuning gang).	455 kc.	BC	Gang fully closed.	Turn TC900B down tight. Adjust meter for maximum. Order given for maximum. Then adjust TC300B alone for maximum.	C900B—2nd i-f sec. TC301B—2nd i-f pri. TC300C—1st i-f sec. TC300A—1st i-f pri. TC300B—1st i-f tertiary
2	Through 400-ohm non-inductive resistor to aerial terminal.	21.5 mc.	B55		Adjust, in order, for maximum.	C423—BS5 osc. C417A—BS5 r.f. C406A—BS5 aerial
3	Same as step 2.	17.8 mc.	B54		Adjust, in order, for maximum.	C427—BS4 osc. C417B—BS4 r.f. C406B—BS4 aerial
4	Same as step 2.	15.2 mc.	B53		Adjust, in order, for maximum.	C422A—BS3 osc. C417C—BS3 r.f. C406C—BS3 aerial
5	Same as step 2.	11.7 mc.	B52		Adjust for maximum.	C422B—BS2 osc.
6	Same as step 2.	9.7 mc.	B51		Adjust for maximum.	C421A—BS1 osc.
7	Same as step 2.	20.0 mc.	SW4		Set screws of iron tuning (tracking) cores TC401, TC405, and TC409 approximately $\frac{1}{4}$ above chassis. Adjust in (image) for maximum. (Image should be heard with radio tuned to 19.1 mc.)	C418A—SW4 osc. C410C—SW4 r.f. C402C—SW4 aerial
8	Same as step 2.	8.0 mc.	SW4		Adjust, in order, for maximum.	TC409—SW4 osc. TC405—SW4 r.f. TC401—SW4 aerial
9	Repeat steps 7 and 8 until no further improvement is obtained.					
10	Same as step 2.	7.0 mc.	SW3		Set tuning (tracking) core TC408 approximately level with chassis. Adjust trimmer, in order, for maximum.	C418B—SW3 osc. C410A—SW3 r.f. C402A—SW3 aerial
11	Same as step 2.	5.1 mc.	SW3		Adjust for maximum.	TC408—SW3 osc.
12	Repeat steps 10 and 11 until no further improvement is obtained.					
13	Same as step 2.	5.0 mc.	SW2		Adjust trimmers, in order, for maximum.	C421B—SW2 osc. C410B—SW2 r.f. C402B—SW2 aerial
14	Through 250-milli-conductor to aerial terminal.	1600 kc.	BC		Adjust for maximum while rocking tuning control.	C418C—BC osc. (shunt)
15	Same as step 13.	580 kc.	BC		Same as step 13.	C418D—BC osc. (series)
16	Same as step 13.	1600 kc.	BC		Same as step 13.	C418C—BC osc. (shunt)
17	Repeat steps 13, 14, and 15.					

Figure 3. Top View, Showing Trimmer Locations

NOTE: SW1 and BC bands are aligned simultaneously by steps 13, 14, and 15.

**REVISIONS AND ADDITIONS TO 48-890
SERVICE MANUAL**

Reference Symbol	Description	Service Part No.
Parts List Additions		
C212	Condenser, plate by-pass, 220 mmf.	62-122001001*
C213	Condenser, electrolytic, cathode by-pass, 50 mf., 25v	30-2417-2
	Jewel	54-4304
Parts List Corrections		
I100 to I110	Pilot lamp	34-2040
W100	A-c cord and plug	L-2183*
C207	Condenser, electrolytic, cathode by-pass, 50 mf., 25v	30-2417-2
C209	Condenser, r-f by-pass, 240 mmf.	60-10245307*
R304	Resistor, a-v-c decoupling, 2.2 megohms	66-5228340*
R305	Resistor, a-v-c voltage divider, 1.5 megohms	66-5158340*

PRODUCTION CHANGES

No production changes were made in this model.