PHILCO . . . . RADIO SERVICE BULLETIN No. 326

RADIO MANUFACTURERS SERVICE — Your Guarantee of Best Radio Service — A PHILCO SERVICE PLAN

Model 40-165

SPECIFICATIONS

TYPE OF CIRCUIT: Model 165 is a six tube Push-Button and dial tuned set incorporating the new Philco Built-in Super Aerial system which eliminates an outside aerial and reduces local static interference to a minimum. The model is also designed to receive the sound of a television program tuned in by special type Philco Television sets.

In addition, other features of design are: Tone control, three tuning ranges covering the frequencies listed below; and a pentode audio output circuit. Outside aerial connections are also provided for remote localities where station signal strength is very weak.

The receiver is equipped with six electric tuning push buttons for automatically selecting stations. Five of the push buttons are used for broadcast stations and one for selecting dial tuning. One of the station push buttons (low frequency push button preferably) may be set up for use with a Philco Wireless Record Player or the sound programs of Philco Television models.

PHILCO BUILT-IN SUPER AERIAL SYSTEM:

Included in the built-in super aerial system is a statically shielded loop for broadcast band reception and a short wave receiving loop. The feature of the built-in broadcast band statically shielded loop is that it may be turned to the position in which it picks up a minimum amount of interference, or if interference is not present the loop may be set in the position where best reception is obtained.

POWER SUPPLY: 115 Volts, 25 and 60 Cycle A. C.

POWER CONSUMPTION: 45 watts.

FREQUENCY TUNING RANGES: (Three)

540 to 1550 K. C. 1.5 to 3.5 M. C. 6.0 to 18.0 M. C.

INTERMEDIATE FREQUENCY: 455 K. C.

AUDIO OUTPUT: 2 watts.

PHILCO TUBES USED: 1232, R. F.; 6J8G, Converter; 7B7, I. F.; 7C6, Second Detector A. V. C. and First Audio; 41, Audio Power Output; 84, Rectifier.

CABINET DIMENSIONS: Type F; Height, 37"; Width, 23¾"; Depth, 9¾".

ADJUSTING ELECTRIC PUSH-BUTTON TUNING:

The procedure for adjusting the electric tuning push-buttons in this model is covered in Service Bulletin No. 325.

ALIGNING OF COMPENSATING CONDENSERS

EQUIPMENT REQUIRED

(1) **Signal Generator.** In order to properly adjust this receiver a calibrated signal generator such as Philco Model 077 is required. This signal generator covers a frequency range of 540 to 36,000 K. C.

(2) **Aligning Indicator.** To obtain maximum signal strength and accurate adjustment of the padders a vacuum tube voltmeter and circuit tester such as Philco Models 027 and 028 is recommended. These testers also contain an audio output meter which may also be used as an indicating device.

(3) **Aligning Tools.** Fiber handle screw driver Philco Part No. 45-2610. When using the vacuum tube voltmeter for adjusting the set, an aligning adaptor Part No. 45-2767 is required.

CONNECTING ALIGNING INSTRUMENTS

Vacuum Tube Voltmeter: To use the vacuum tube voltmeter as an alignment indicator make the following connections:

1. **Adjusting I. F. Circuit:** Remove the 1232 R. F. tube from its socket and insert the aligning adaptor in the socket, then replace the tube in the adaptor. Connect the negative terminal of the vacuum tube voltmeter to the light colored wire which protrudes from the side of the adaptor. Attach the positive terminal of the voltmeter to the black wire.

2. **Adjusting R. F. Circuit:** To adjust the R. F. padders, insert the aligning adaptor in the 7C6 socket and place the tube in the adaptor. The vacuum voltmeter remains connected to the adaptor as given when adjusting I. F. With the voltmeter connected in this manner a very sensitive indication of the A. V. C. voltage is obtained when the padders are adjusted.

Audio Output Meter: If an audio output meter is used, connect it to the plate and screen terminals of the 41 type tube and adjust the output meter for the 0 to 30 A. C. scale.

After connecting the aligning meter, adjust the compensators in the order as shown in the tabulation below. Locations of the compensators are shown on the schematic diagram page No. 2. If the output meter pointer goes off scale when adjusting the compensators, reduce the strength of the signal from the generator.

Signal Generator: When adjusting the I. F. padders, the high side of the signal generator is connected through a .1 mfd. condenser to terminal No. 1 of the loop terminal panel at the rear of the chassis. The ground or low side of the signal generator is connected to the chassis of the receiver.

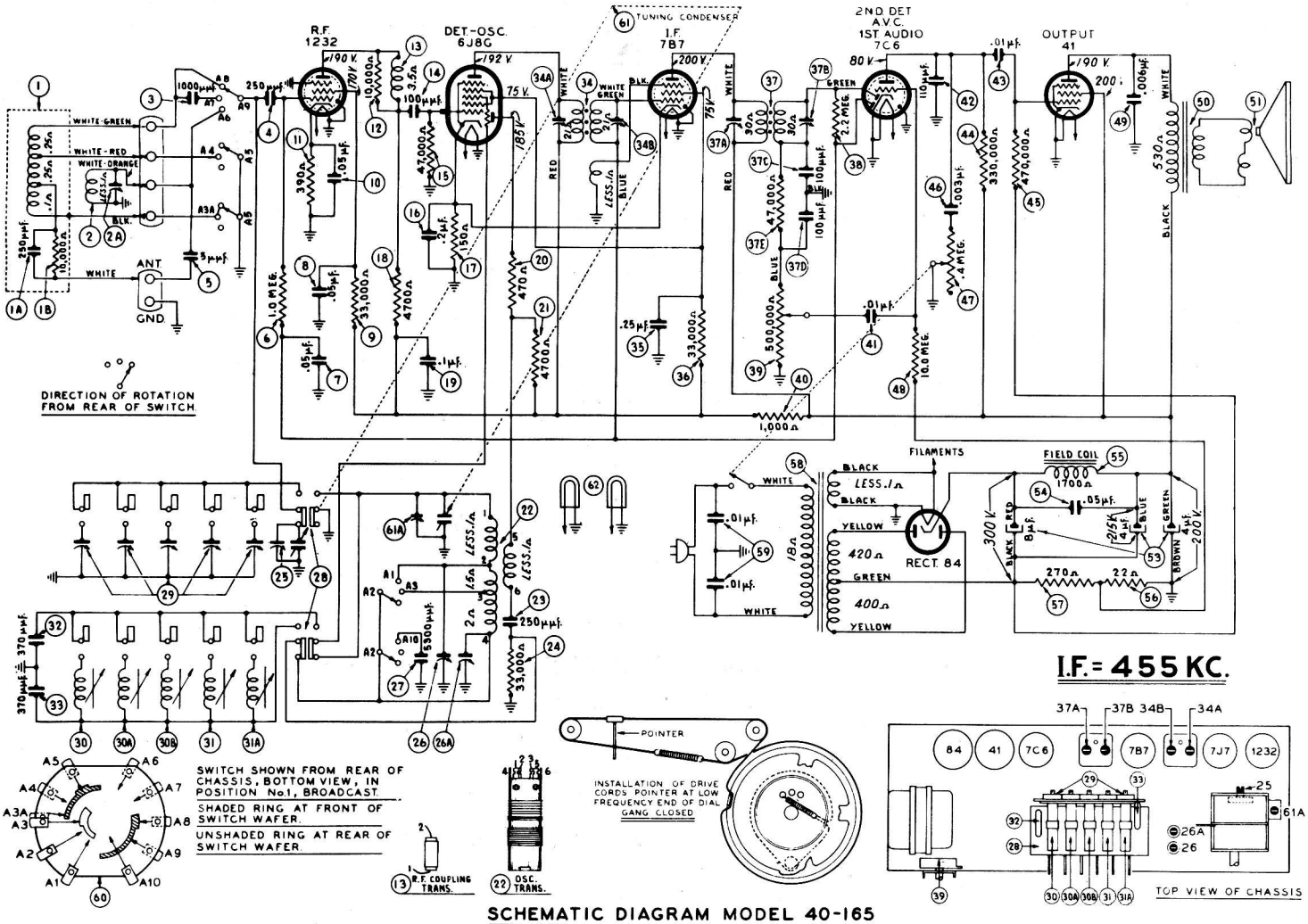
When aligning the R. F. padders a loop antenna is made from a few turns of wire and connected to the signal generator output terminals; the generator is then placed two or three feet from the loop in the cabinet. Do not remove the receiver loop from the cabinet. It is necessary when adjusting the padders, that the receiver be left in the cabinet.

Operations in Order	SIGNAL GENERATOR		RECEIVER			
	Output Connections to Receiver	Frequency Setting	Dial Setting	Control Settings	Adjust Compensators	Special Instructions
1	High Side to No. 1 Ter. Loop Panel	455 K. C.	580 K. C. No Signal	Range Switch "Brdcst." Vol. Max. Dial Push-Button "In"	37A, 37B, 34A, 34B	See paragraph on signal generator above
2	Use Loop on Generator	18.0 M. C.	18.0 M. C.	Range Switch "SW"	61A	Note A. Image should be 910 K.C. below 18 M.C.
3	Use Loop on Generator	1500 K. C.	1500 K. C.	Range Switch Brdcst.	26, 25	
4	Use Loop on Generator	580 K. C.	580 K. C.	Range Switch Brdcst.	26A	Roll tuning condensor
5	Use Loop on Generator	1500 K. C.	1500 K. C.	Range Switch Brdcst.	26, 25	
6	Use Loop on Generator	18.0 M. C.	18.0 M. C.	Range Switch "SW"	2A	Note B, Note C

NOTE A — DIAL CALIBRATION: In order to adjust the receiver correctly the dial must be aligned to track properly with the tuning condenser. To adjust the dial, proceed as follows: With the tuning condenser closed (maximum capacity), set the dial pointer on the extreme left index line at the low frequency end of the broadcast scale. The arrangement of the drive cable in this position is shown in Schematic Diagram.

NOTE B — Turn loop padder to closed position (maximum capacity), then adjust to the first signal peak from this position; at the same time roll the tuning condenser. See Note C.

NOTE C — When adjusting the low frequency compensator of Range One (Broadcast) or the antenna compensators of the high frequency tuning ranges; the receiver Tuning Condenser must be adjusted (rolled) as follows: First tune the compensator for maximum output, then vary the tuning condenser of the receiver for maximum output. Now turn the compensator slightly to the right or left. Continue turning compensator in the direction that gives greatest signal and again vary the receiver tuning condenser for maximum output. This procedure of first setting the compensator and then varying the tuning condenser is continued until there is no further gain in output reading.



SCHEMATIC DIAGRAM MODEL 40-165

Replacement Parts — Model 40-165

SCHE. No.	DESCRIPTION	PART No.
1	Loop Assy. (Broadcast)	38-9895
1A	Mica Cond. (250 mmfd.)	61-0033
1B	Resistor (10,000 ohms, ½ watt)	33-310339
2	Loop Assy. (Short Wave)	38-9896
2A	Compensator (Part of S. W. Loop)	
3	Mica Cond. (1000 mmfd.)	30-1063
4	Mica Cond. (250 mmfd.)	61-0033
5	Mica Cond. (5 mmfd.)	30-1143
6	Resistor (1.0 meg., ½ watt)	33-510339
7	Tubular Cond. (.05 mfd.)	30-4519
8	Tubular Cond. (.05 mfd.)	30-4123
9	Resistor (33,000 ohms, ½ watt)	33-333339
10	Tubular Cond. (.05 mfd.)	30-4519
11	Resistor (390 ohms, ½ watt)	33-139339
12	Resistor (10,000 ohms, ½ watt)	33-310339
13	R. F. Coupling Trans.	32-3194
14	Mica Cond. (100 mmfd.)	30-1128
15	Resistor (47,000 ohms, ½ watt)	33-347339
16	Tubular Cond. (.2 mfd.)	30-4587
17	Resistor (150 ohms, ½ watt)	33-115339
18	Resistor (4700 ohms, ½ watt)	33-247339
19	Tubular Cond. (.1 mfd.)	30-4527
20	Resistor (470 ohms, ½ watt)	33-147339
21	Resistor (4700 ohms, ½ watt)	33-247339
22	Osc. Trans.	32-3195
23	Mica Cond. (250 mmfd.)	61-0033
24	Resistor (33,000 ohms, ½ watt)	33-333339
25	Compensator (Single)	31-6308
26	Compensator (2 section)	31-6302
27	Mica Cond. (5300 mmfd.)	30-1134
28	Push Button Switch	42-1493
29	Padder Strip and Bracket Assy.	31-6325
30 30A 30B	Coil No. 1 (540-1000 K.C.) Coil No. 2 (650-1100 K.C.) Coil No. 3 (740-1300 K.C.)	32-3042
31 31A	Coil No. 4 (900-1500 K.C.) Coil No. 5 (1100-1600 K.C.)	32-3041
32	Silver Mica Cond. (370 mmfd.)	30-1110
33	Silver Mica Cond. (370 mmfd.)	30-1110
34	1st I. F. Trans.	32-3210
35	Tubular Cond. (.25 mfd.)	30-4589
36	Resistor (33,000 ohms, ½ watt)	33-333339
37	2nd I. F. Trans.	32-3213
38	Resistor (2.2 meg., ½ watt)	33-522339
39	Volume Control (500,000 ohms)	33-5319
40	Resistor (1000 ohms, ½ watt)	33-210339
41	Tubular Cond. (.01 mfd.)	30-4572
42	Mica Cond. (110 mmfd.)	30-1130
43	Tubular Cond. (.01 mfd.)	30-4572
44	Resistor (330,000 ohms, ½ watt)	33-433339
45	Resistor (470,000 ohms, ½ watt)	33-447339
46	Tubular Cond. (.003 mfd.)	30-4469
47	Tone Control and On-Off Switch (.4 meg.)	33-5333
48	Resistor (10.0 meg., ½ watt)	33-610339
49	Tubular Cond. (.006 mfd.)	30-4504
50	Output Trans.	32-8056
51	Cone and Voice Coil Assy. (Spkr. Part No. 36-1480-3)	36-4086
53	Electrolytic Cond. (4-4-8 mfd.)	30-2400

SCHE. No.	DESCRIPTION	PART No.
54	Tubular Cond. (.05 mfd.)	30-4123
55	Field Coil (Replace Spkr. Part No. 36-1480)	
56	Resistor (22 ohms, ½ watt)	33-022331
57	Resistor (270 ohms, 1 watt)	33-127439
58	Power Trans. (110 volt, 60 cycle)	32-8055
59	Line Cond. (.01-.01 mfd.)	3903-DG
60	Wave Switch	42-1495
61	Tuning Cond.	31-2375
62	Pilot Lamps	34-2064

MISCELLANEOUS PARTS

SCHE. No.	DESCRIPTION	PART No.
	Bezel	27-4842
	Cabinet	10398B
	Cable and Plug (Power Supply)	L-3199
	Clip (Coil Mtg.)	28-5003
	Dial	27-5507
	Drive Cord Assy. (Pointer)	31-2382
	Drive Cord Assy. (Tuning Cond.)	31-2400
	Escutcheon (Push Button)	27-4843
	Insulating Bushing (Insulate Drive Shaft)	27-9437
	Knobs (Push Buttons)	27-4824
	Knobs (Tuning, Tone, Volume, Wave Switch)	27-4332
	Pilot Lamp Socket Assy.	38-9908
	Pointer	56-1479
	Rubber Hose (Tuning Cond. Drive)	27-9432
	Spring (Tuning, Drive Cord)	28-8751
	Spring (Pointer, Drive Cord)	28-8953
	Spring Drive Shaft, Grounding))	28-8955
	Screw (Bezel Mtg.)	W-1834
	Speaker	36-1480
	Socket (Type 84 Tube)	27-6035
	Socket (Type 41 Tube)	27-6036
	Socket (Loktal, Type 1232, 7B7, 7C6 Tubes)	27-6131
	Socket (Type 6J8G Tube)	27-6120
	Tab (Dial)	27-5528
	Tab (Television)	27-9451
	Tab Kit	40-6474
	Tuning Shaft	56-6052
	Tuning Drive Drum Assy.	38-9883
	Washer ("C" Type, Tuning Shaft)	28-2043

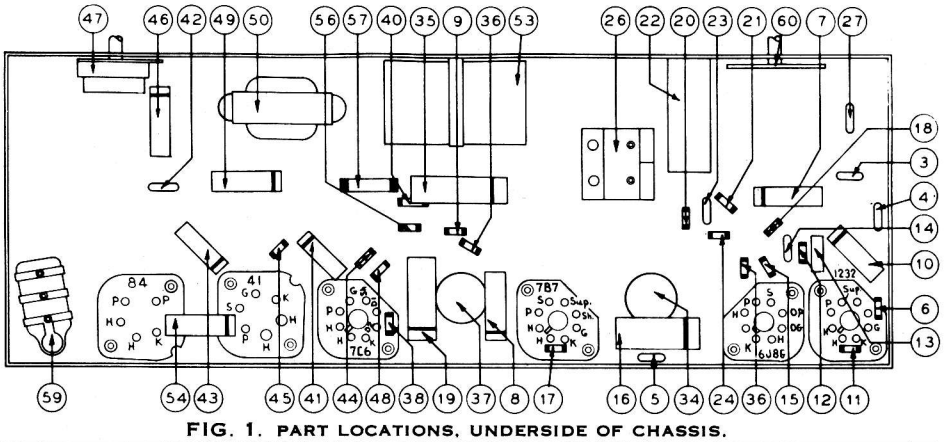


FIG. 1. PART LOCATIONS, UNDERSIDE OF CHASSIS.

MANY OF THE PARTS IN THIS PHILCO SUCH AS CONDENSERS AND RESISTORS, ARE HELD TO MUCH CLOSER TOLERANCE THAN STANDARD REPLACEMENT PARTS. GENUINE PHILCO REPLACEMENT PARTS MUST BE USED TO OBTAIN SATISFACTORY PERFORMANCE OF THIS MODEL.

PHILCO RADIO & TELEVISION CORP.

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