



Models 40-180, 40-185, 40-190

Specifications—Models 40-180, 40-185, 40-190

TYPE OF CIRCUIT: Models 40-180, 40-185 and 40-190 are Electric Push-button and dial tuned radios incorporating the new Philco Built-in Super Aerial system which eliminates an outside aerial and reduces local static interference to a minimum. The models are also designed to receive the sound of a television program tuned in by special type Philco Television Sets.

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. A 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.

In general, these models are similar with the exception of the number of tubes used and cabinet design. Model 40-180 employs a seven tube receiver. Models 40-185 and 40-190 employ eight tube receivers assembled in different type cabinets.

In addition, other features of design are: Continuously variable tone control; three tuning ranges covering the frequencies listed below; automatic bass compensation and degenerative push-pull pentode audio output circuit. Outside aerial connections are also provided for remote localities where station signal strength is very weak.

Each model is equipped with eight electric tuning push buttons for automatically selecting stations. Six of the push buttons are used for broadcast stations, one for selecting dial tuning and

one push button may be set up for use with a Philco wireless Record Player or the sound program tuned in by special Philco Television Sets.

POWER SUPPLY: 115 Volts, 25 and 60 cycle AC.

POWER CONSUMPTION: 60 watts.

FREQUENCY TUNING RANGES: Three.

540 to 1550 K. C.

1.5 to 3.4 K. C.

6.0 to 18 M. C.

INTERMEDIATE FREQUENCY: 455 K. C.

AUDIO OUTPUT: 2 watts.

PHILCO TUBES USED:

MODEL 40-180—1232, R. F.; 7J7, Converter; 7B7, I. F.; 7C6, Second Detector and First Audio; two 41, Audio Power Outputs; 84, Rectifier.

MODELS 40-185 AND 40-190—1232, R. F.; 7J7, Converter; 7B7, I. F.; 7A6, Detector; 7C6, First Audio; two 41, Power Outputs; 84, Rectifier.

CABINET DIMENSIONS:	Height	Width	Depth
Model 40-180, type "XF"	39½"	28⅝"	13¾"
Model 40-185, type "XX"	38 "	29½"	12¼"
Model 40-190, type "XF"	41 "	29 "	14½"

Adjusting Electric Push Button Tuning

In order to adjust the electric push buttons accurately for reception of broadcast stations, a vacuum tube voltmeter such as Philco Model 027 and 028 should be used. In addition, an insulated padding screw driver, Part No. 45-2610, and Loktal aligning adapter, Part No. 45-2767, are required. With this equipment at hand proceed as follows:

Select seven of the most popular stations received in the locality. Insert the station call letters into the windows above the buttons. The station with the lowest frequency is placed in the first button on the left and the highest frequency is placed in the seventh (7) push-button. Each push button is adjusted by two set screws located on the rear of the push button unit. Each set of screws is numbered and covers a frequency range as follows:

Push-Button	Frequency Range
1, 2, 3	540-1060 K. C.
4, 5	650-1110 K. C.
6, 7	920-1600 K. C.

Looking at the front of the cabinet, the first button on the left is adjusted by set screw No. 1. The next push button by set screw No. 2 and the remaining push buttons in order.

1. Remove the 7C6 A. F. tube from its socket and insert the aligning adaptor, then replace the tube in the adaptor. Connect the negative terminal of the vacuum tube voltmeter to the wire which protrudes from the side of the adaptor. Attach the positive terminal of the voltmeter to the chassis.

2. Turn the receiver on and set the tuning range knob to "Broadcast." Press "IN" "Dial" push-button (extreme right hand).

3. Set up the Model 077 Station Setter about 3 feet from the receiver and connect a loop constructed out of about 2 feet of wire to the high and ground output jacks of the signal generator. Turn the output controls to maximum and set the modulation control to "MOD. ON." Manually tune in the first station to be set up on push button No. 1. After doing this set the indicator of the 077 Signal Generator to the frequency of the station being received. As the indicator approaches the frequency of the station a whistle will be heard; leave the indicator at this point, then press "IN" No. 1 push-button. Using the insulated screw driver turn the No. 1 "Osc." screw until the broadcast station identified by the signal generator is heard; at this point, turn the indicator of the signal generator away from the frequency of the station. Readjust No. 1 "Osc." and "Ant." screws for maximum deflection of the vacuum tube voltmeter pointer. Station No. 1 is now adjusted properly. After setting up the first station the same procedure as outlined above is used for the remaining stations.

When this model is to be set up to receive the sound of a television program tuned in by the special type Philco Television Sets or when it is to be used in conjunction with a Philco Record Player, push-button No. 1 should be used. To tune in these programs, the same procedure as given for ordinary broadcast stations as outlined above is used.

Further details for setting up this receiver for operation with Philco Television Sets or Record Players are supplied with the instruments.

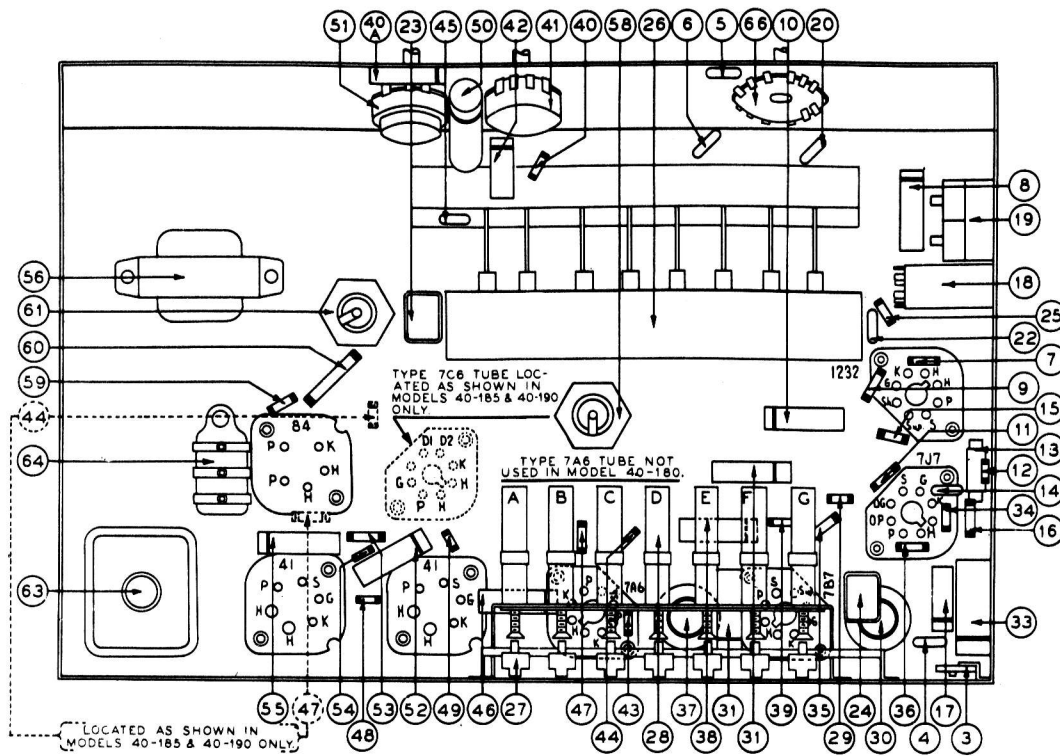


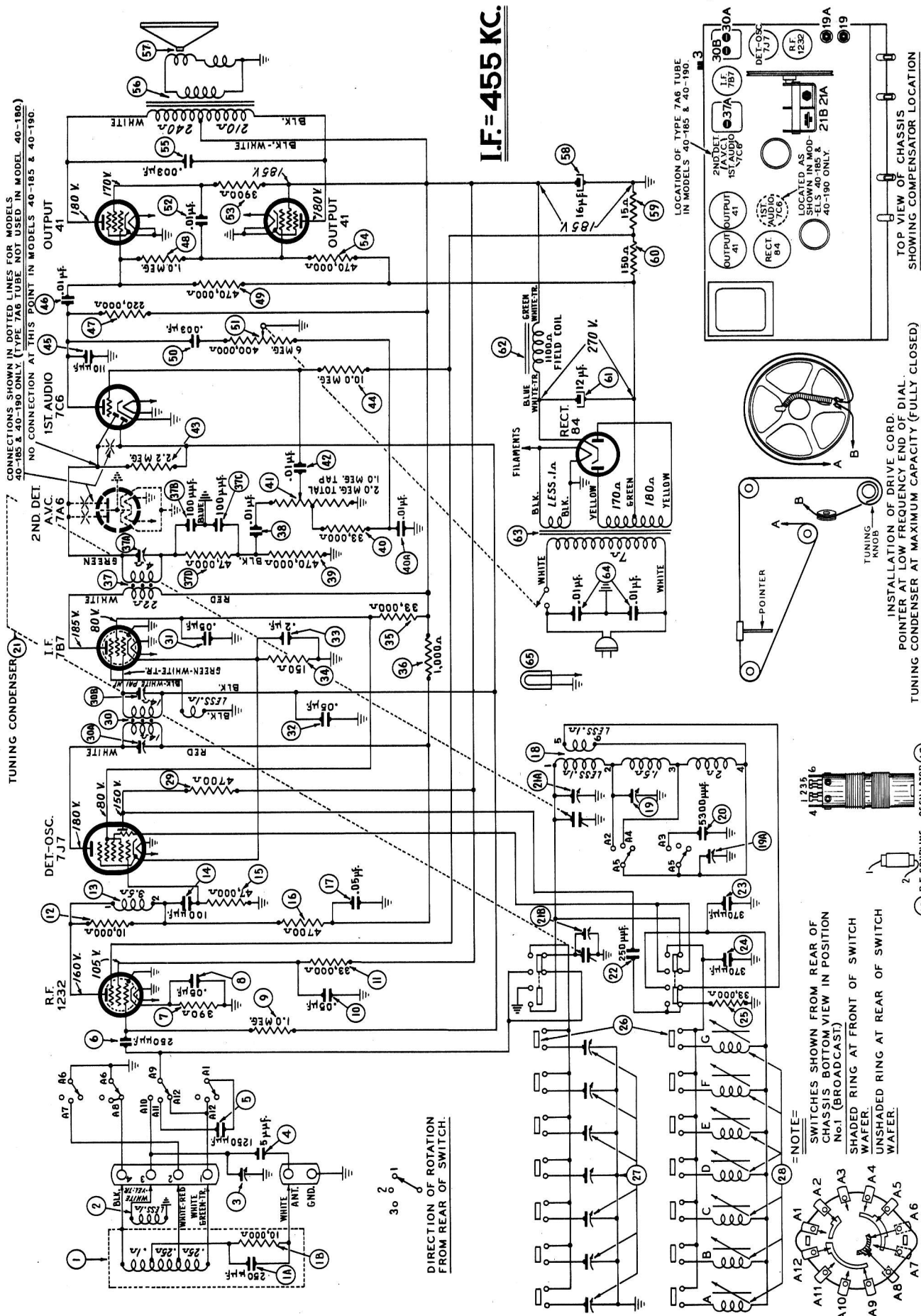
Fig. 2—Part locations underside of chassis

Replacement Parts—Models 40-180, 40-185, 40-190

Sch. No.	Description	Part No.	Sch. No.	Description	Part No.
1	Loop Ass'y (Broadcast)	38-9880	46	Tubular Cond. (.01 mfd.)	30-4572
1A	Mica Cond. (250 mmfd.)	61-0033	47	Resistor (220,000 ohms, ½ watt)	33-422339
1B	Resistor (10,000 ohms, ½ watt)	33-310339	48	Resistor (1.0 meg., ½ watt)	33-510339
2	Loop Ass'y (Short Wave)	38-9884	49	Resistor (470,000 ohms, ½ watt)	33-447339
3	Compensator	31-6308	50	Tubular Cond. (.003 mfd.)	30-4469
4	Mica Cond. (5 mmfd.)	30-1097	51	Tone Control & On-Off Switch	33-5314
5	Mica Cond. (1250 mmfd.)	5886	52	Tubular Cond. (.01 mfd.)	30-4572
6	Mica Cond. (250 mmfd.)	61-0033	53	Resistor (3900 ohms, ½ watt)	33-239339
7	Resistor (390 ohms, ½ watt)	33-139339	54	Resistor (470,000 ohms, ½ watt)	33-447339
8	Tubular Cond. (.05 mfd.)	30-4444	55	Tubular Cond. (.003 mfd.)	30-4469
9	Resistor (1.0 meg., ½ watt)	33-510339	56	Output Trans.	32-8053
10	Tubular Cond. (.05 mfd.)	30-4123	57	Cone & Voice Coil Ass'y (Spkr. Part No. 36-1479-2)	36-4089
11	Resistor (33,000 ohms, ½ watt)	33-333339		(Spkr. Part No. 36-1479-4)	36-4111
12	Resistor (10,000 ohms, ½ watt)	33-310339	58	Electrolytic Cond. (16 mfd., 200 V.)	30-2406
13	R. F. Coupling Trans.	32-3194	59	Resistor (15 ohms, ½ watt)	33-015351
14	Mica Cond. (100 mmfd.)	30-1128	60	Resistor (150 ohms, 1 watt)	33-115451
15	Resistor (47,000 ohms, ½ watt)	33-347339	61	Electrolytic Cond. (12 mfd., 350 V.)	30-2405
16	Resistor (4700 ohms, ½ watt)	33-247339	62	Field Coil (Replace Spkr., Part No. 36-1479)	
17	Tubular Cond. (.05 mfd.)	30-4123	63	Power Trans. (115 Volts, 50 to 60 Cycle)	32-8052
18	Oscillator Trans.	32-3195	64	Line Cond. (Bakelite, .01-.01 mfd.)	3903-DG
19	Compensator (2 Section)	31-6298	65	Pilot Lamp	34-2210
20	Mica Cond. (5300 mmfd.)	30-1134	66	Wave Switch	42-1490
21	Tuning Cond. Ass'y	31-2391			
22	Mica Cond. (250 mmfd.)	61-0033			
23	Silver Mica Cond. (370 mmfd.)	30-1110			
24	Silver Mica Cond. (370 mmfd.)	30-1110			
25	Resistor (33,000 ohms, ½ watt)	33-333339			
26	Push Button Switch	42-1489			
27	Padder Strip (Push Buttons)	31-6299			
28	Coil Strip Ass'y				
28A	Coil No. 1				
28B	Coil No. 2	540-1060 K. C.			
28C	Coil No. 3				
28D	Coil No. 4				
28E	Coil No. 5	650-1110 K. C.			
28F	Coil No. 6				
28G	Coil No. 7	920-1600 K. C.			
29	Resistor (4700 ohms, ½ watt)	33-247339			
30	1st I. F. Trans. Ass'y	32-3245			
31	Tubular Cond. (.05 mfd.)	30-4123			
32	Tubular Cond. (.05 mfd.)	30-4519			
33	Tubular Cond. (.2 mfd.)	30-4536			
34	Resistor (150 ohms, ½ watt)	33-115339			
35	Resistor (33,000 ohms, ½ watt)	33-333339			
36	Resistor (1000 ohms, ½ watt)	33-210339			
37	2nd I. F. Trans. Ass'y	32-3246			
38	Tubular Cond. (.01 mfd.)	30-4479			
39	Resistor (470,000 ohms, ½ watt)	33-447339			
40	Resistor (33,000 ohms, ½ watt)	33-333339			
40A	Tubular Cond. (.01 mfd.)	30-4479			
41	Volume Control (2.0 meg.)	33-5275			
42	Tubular Cond. (.01 mfd.)	30-4479			
43	Resistor (2.2 megs., ½ watt)	33-522339			
44	Resistor (10.0 megs., ½ watt)	33-610339			
45	Mica Cond. (110 mmfd.)	30-1130			

MISCELLANEOUS PARTS

Description	Part No.
Bezel Ass'y	40-6489
Bezel Gasket	27-9175
Cable & Plug (Power Supply)	L-3199
Cabinet Model 40-180	10372B
Cabinet Model 40-185	10400A
Cabinet Model 40-190	10391A
Clip (Coil mtg.)	28-5003
Dial	27-5508
Dial Tuning Drum Ass'y	38-9856
Drive Cord Ass'y	31-2383
Knobs (Tuning, Tone, Volume, Wave Switch)	27-4332
Knobs (Pushbuttons)	27-4852
Pilot Lamp Socket Ass'y	38-9607
Pointer	56-1516
Screws (Bezel mtg.)	W-1834FG1
Spring (Drive Cord)	28-8913
Spring (Dial Background Plate mtg.)	28-8908
Socket (Type 84 Tube)	27-6035
Socket (Type 41 Tube)	27-6036
Socket (Loktal, Type 7J7 Tube)	27-6129
Socket (Loktal, Type 7A6, 7C6 Tubes)	27-6131
Speaker	36-1479
Tab (Dial)	27-5530
Tab (Television)	27-9449
Tab Kit	40-6475
Tuning Shaft Ass'y	38-9874
Washer ("C" Type, Tuning Shaft Ass'y)	28-2043
Washer (Spring Type, Tuning Shaft Ass'y)	28-4186



SCHEMATIC DIAGRAM MODELS 40-180, 40-185 & 40-190

Fig. 1—Schematic Diagram

The voltages indicated were measured with a Philco Model 027 Voltmeter (1000 ohms per volt) — Power supply 115 volts, 60 cycle — Volume control minimum — No signal being received — Range switch "Brdcst."

Aligning of Compensating Condensers Equipment Required

(1) *Signal Generator.* In order to properly adjust this receiver an accurately 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) *Indicating Device.* 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. When using the vacuum tube voltmeter, an aligning adapter, Philco Part No. 45-2767, is necessary for connecting to the A. V. C. circuit. 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, and fiber wrench, Philco Part No. 7696.

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, then replace the tube in the adaptor. Connect the negative terminal of the vacuum tube voltmeter to the wire (light color) 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. circuit, the aligning adaptor is inserted in the 7C6 A. F. tube socket. The vacuum tube voltmeter remains connected to the adaptor as given in the above paragraph.

With the voltmeter connected in this manner a very sensitive indication of the A. V. C. voltage is obtained when the padders are adjusted. If an audio output meter is used, connect it to the plate

and socket terminals of the 41 output tube and adjust the output meter for the 0 to 30 A. C. scale.

After connecting the aligning indicator, 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 is made from a few turns of wire and connected to the signal generator output terminals; the loop 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.

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Operations	SIGNAL GENERATOR		RECEIVER			Remarks
	Output Connections	Dial Frequency	Dial Frequency	Control Settings	Adjust Compensators for Max. Signal	
1	High Side to No. 1 Ter. Loop Panel	I. F. 455 K. C.	580 K. C. No Signal	Range Sw. "Brdcst." Volume "Max." Push-Button "Dial"	37A, 30, 30A	See Note A.
2	Use Loop on Generator	18 M. C.	18 M. C.	Range Sw. "SW." Volume "Max." Push-Button "Dial."	21A	Note B. Note D.
3	Use Loop on Generator	1400 K. C.	1400 K. C.	Range Sw. "Brdcst." Volume "Max."	19A, 21B	
4	Use Loop on Generator	580 K. C.	580 K. C.	Range Sw. "Brdcst." Volume "Max."	19	Roll Cond. Note C.
5	Use Loop on Generator	1400 K. C.	1400 K. C.	Range Sw. "Brdcst." Volume "Max."	19A, 21B	Roll Cond. Note C.
6	Use Loop on Generator	18 M. C.	18 M. C.	Range Sw. "SW."	3	Roll Cond. Note C.

NOTE A—A "Dummy Antenna" consisting of a .1 mfd. condenser is connected in series with the signal generator output lead (high side).

NOTE B—**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 the schematic diagram.

NOTE C—When adjusting the low frequency compensator of Range One (Broadcast) or the antenna and R. F. 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 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.

NOTE D—To accurately adjust the high frequency oscillator compensator to the fundamental instead of the image signal, turn the oscillator compensator to the maximum capacity position (clockwise). From this position slowly turn the compensator counter-clockwise until a second peak is obtained on the output meter. Adjust the compensator for maximum output at this second peak.

If the above procedure is correctly performed, the image signal will be found (much weaker) by turning the receiver dial 910 K. C. below the frequency being used on any high frequency range.

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 AND TELEVISION CORPORATION

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