

# MODELS 40-180, 40-185 and 40-190

## SPECIFICATIONS

**TYPE OF CIRCUIT:** Models 40-180, 40-185 and 40-190 are Electric Push-button and circuit 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 the 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 tunings 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 A. C.

**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:**

Model	Height	Width	Depth
Model 40-180, type "XF"	39 1/2"	28 1/2"	13 1/4"
Model 40-185, type "XX"	38"	29 1/2"	12 1/4"
Model 40-190, type "XF"	41"	29"	14 1/2"

**ALIGNING INSTRUCTIONS:** Page 9.

## REPLACEMENT PARTS

SCH. No.	DESCRIPTION	PART No.	SCH. No.	DESCRIPTION	PART No.	SCH. No.	DESCRIPTION	PART No.
1	Loop Ass'y (Broadcast)	38-9880	32	Tubular Cond. (.05 mfd.)	30-4519	64	Line Cond. (Bakelite, .01-.01 mfd.)	3903-DG
1A	Mica Cond. (250 mmfd.)	61-0033	33	Tubular Cond. (.2 mfd.)	30-4520	65	Pilot Lamp	34-2210
1B	Resistor (10,000 ohms, 1/2 watt)	33-110339	34	Resistor (150 ohms, 1/2 watt)	33-115339	66	Wave Switch	42-1490
2	Loop Ass'y (Short Wave)	38-9884	35	Resistor (33,000 ohms, 1/2 watt)	33-333339			
3	Compensator	31-6308	36	Resistor (1000 ohms, 1/2 watt)	33-210339			
4	Mica Cond. (5 mmfd.)	30-1097	37	2nd I. F. Trans. Ass'y	32-3246			
5	Mica Cond. (1250 mmfd.)	5886	38	Tubular Cond. (.01 mfd.)	30-4479			
6	Mica Cond. (250 mmfd.)	61-0033	39	Resistor (470,000 ohms, 1/2 watt)	33-447339			
7	Resistor (390 ohms, 1/2 watt)	33-119339	40	Resistor (33,000 ohms, 1/2 watt)	33-333339			
8	Tubular Cond. (.05 mfd.)	30-4444	40A	Tubular Cond. (.01 mfd.)	30-4479			
9	Resistor (1.0 meg., 1/2 watt)	33-510339	41	Volume Control (2.0 meg.)	33-5275			
10	Tubular Cond. (.05 mfd.)	30-4123	42	Tubular Cond. (.01 mfd.)	30-4479			
11	Resistor (33,000 ohms, 1/2 watt)	33-333339	43	Resistor (2.2 meg., 1/2 watt)	33-522339			
12	Resistor (10,000 ohms, 1/2 watt)	33-110339	44	Resistor (10.0 meg., 1/2 watt)	33-610339			
13	R. F. Coupling Trans.	32-3194	45	Mica Cond. (110 mmfd.)	30-1130			
14	Mica Cond. (100 mmfd.)	30-1128	46	Tubular Cond. (.01 mfd.)	30-4572			
15	Resistor (47,000 ohms, 1/2 watt)	33-347339	47	Resistor (220,000 ohms, 1/2 watt)	33-422339			
16	Resistor (4700 ohms, 1/2 watt)	33-247339	48	Resistor (1.0 meg., 1/2 watt)	33-510339			
17	Tubular Cond. (.05 mfd.)	30-4123	49	Resistor (470,000 ohms, 1/2 watt)	33-447339			
18	Oscillator Trans.	32-3195	50	Tubular Cond. (.003 mfd.)	30-4469			
19	Compensator (2 Section)	31-6298	51	Tone Control & On-Off Switch	33-5314			
20	Mica Cond. (5300 mmfd.)	30-1134	52	Tubular Cond. (.01 mfd.)	30-4572			
21	Tuning Cond. Ass'y	31-2391	53	Resistor (3900 ohms, 1/2 watt)	33-239339			
22	Mica Cond. (250 mmfd.)	61-0033	54	Resistor (470,000 ohms, 1/2 watt)	33-447339			
23	Silver Mica Cond. (370 mmfd.)	30-1110	55	Tubular Cond. (.003 mfd.)	30-4469			
24	Silver Mica Cond. (370 mmfd.)	30-1110	56	Output Trans.	32-8053			
25	Resistor (33,000 ohms, 1/2 watt)	33-333339	57	Cone & Voice Coil Ass'y (Spkr. Part No. 36-1479-2)	36-4089			
26	Push Button Switch	31-6299	58	Resistor (15 ohms, 1/2 watt)	33-015351			
28A	Coil No. 1	540-1060 K. C.	60	Resistor (150 ohms, 1 watt)	33-115451			
28B	Coil No. 2	540-1060 K. C.	61	Electrolytic Cond. (12 mfd., 350 V.)	30-2405			
28C	Coil No. 3	540-1060 K. C.	62	Field Coil (Replace Speaker, Part No. 36-1479)	36-1479			
28D	Coil No. 4	540-1060 K. C.	63	Power Transformer (115 Volts, 50 to 60 Cycle)	32-8052			
28E	Coil No. 5	650-1110 K. C.		(115 Volts, 25 Cycle)	32-8086			
28F	Coil No. 6	920-1600 K. C.		(120/240 Volts, 60 Cycle)	32-8092			
28G	Coil No. 7	920-1600 K. C.						
29	Resistor (4700 ohms, 1/2 watt)	33-247339						
30	1st I. F. Trans. Ass'y	32-3245						
31	Tubular Cond. (.05 mfd.)	30-4123						

## MISCELLANEOUS PARTS

Bezel Ass'y	40-6489
Bezel Gasket	27-9175
Cable & Plug (Power Supply)	1-1199
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-1834FGI
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 (Hial)	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
(Spring Type, Tuning Shaft Ass'y)	28-4186

## PRODUCTION CHANGES

### MODEL 40-180

Run 4—Beginning with Run 4 receivers the converter tube was changed from a type 7J7 loktal to a 6J8G octal type. Tube sockets changed from Part No. 27-6129 to Part No. 27-6120.

Run 5—A new resistor Part No. 33-115339 not shown on diagram of Service Bulletin was added in series with plates of the 6J8G tube. This change was made to improve oscillator action at 18 M. C. Cathode resistor (34) changed from Part No. 33-115339 carbon type to Part No. 33-115336 wirewound.

### MODEL 40-185

Run 4—Beginning with Run 4 receivers the converter tube was changed from a type 7J7 loktal to a 6J8G octal type. Tube sockets changed from Part No. 27-6129 to Part No. 27-6120.

### MODEL 40-190

Run 4—Beginning with Run 4 receivers the converter tube was changed from a type 7J7 loktal to a 6J8G octal type. Tube sockets changed from Part No. 27-6129 to Part No. 27-6120.

Run 5—A new resistor Part No. 33-115339 not shown on diagram of the Service Bulletin was added in series with the plates of the 6J8G tube. This change was made to improve oscillation action at 18 M. C. Cathode resistor (34) changed from Part No. 33-115339 carbon type to Part No. 33-115336 wirewound.

### MODELS 40-180, 40-190

To prevent oscillation at the low end of the broadcast band the 2nd I. F. transformer (37) changed from Part No. 32-3246 to Part No. 32-3383.

The physical location of condenser (4) as shown in Fig. 2 of the Service Bulletin has been changed to prevent oscillation at 540 K. C. The condenser is now wired to a three lug wiring panel between the range switch and the volume control. The antenna lead is connected to one lug of the panel. This change is made on all sets marked Run No. 9, Model 40-180 and Run No. 10, Model 40-190.

### MODEL 40-185, 40-190

Beginning with Run "8" receivers the converter tube is changed from a type 6J8G octal to a 7J7 loktal. Tube sockets changed from Part No. 27-6120 to 27-6129 loktal. This change reverses the change made on Run "4" receivers.

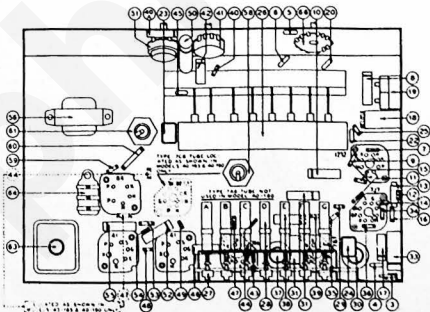
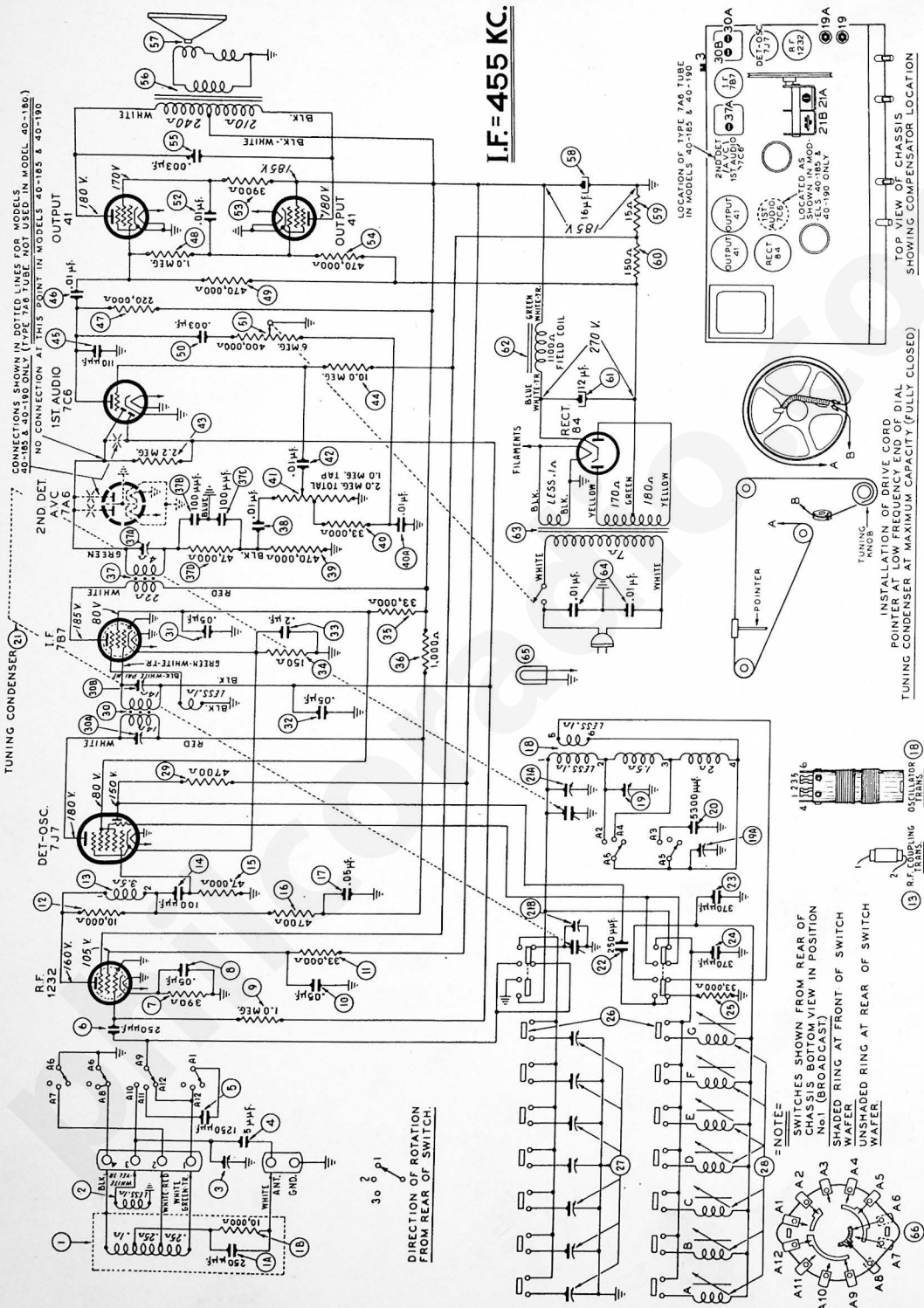


Fig. 1—Part locations underside of chassis

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I.F. = 455 KC.



CONNECTIONS SHOWN IN DOTTED LINES FOR MODELS 40-185 & 40-180 ONLY (TYPE 7A6 TUBE, NOT USED IN MODEL 40-180)

TUNING CONDENSER (21)

DET-OSC 7J7

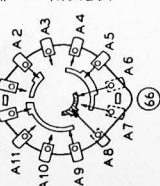
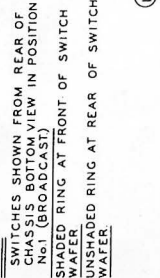
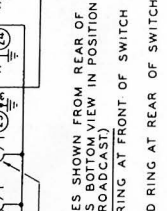
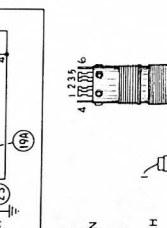
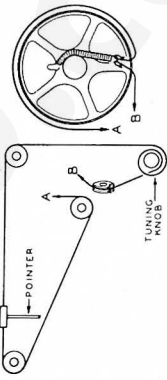
RF 1232

1ST AUDIO 6X4

2ND DET 7A6

OUTPUT 63

DIRECTION OF ROTATION FROM REAR OF SWITCH.



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

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 "Brdcast."

# MODELS 40-180, 40-185 and 40-190

## ALIGNING R. F. AND I. F. COMPENSATORS

(See page 9 for Push Button Adjustments)

### 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 adaptor, 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.

### 40-180 - 185 - 190

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. "Brdest." 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. "Brdest." Volume "Max."	19A, 21B	
4	Use Loop on Generator	580 K. C.	580 K. C.	Range Sw. "Brdest." Volume "Max."	19	Roll Cond. Note C.
5	Use Loop on Generator	1400 K. C.	1400 K. C.	Range Sw. "Brdest." 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.