

# SETTING AND OPERATING ELECTRIC PUSH-BUTTON TUNING

In order to adjust the electric automatic tuning push-button accurately for reception of broadcast stations, a signal generator, such as Philco Model 070, and a padding screw driver, Philco Part No. 45-2610, are required. With this equipment at hand, proceed as follows:—

1— Select five (5) or seven (7) of the most popular stations received in the locality (depending on the number of push-buttons on the model to be adjusted). Insert the station call letters into the windows above the buttons. The station with the lowest frequency is placed in the first or second button (depending on the model— see listing below) on the left and the highest frequency station in the extreme right button. Each push-button is adjusted by two set screws. These set screws are located on the rear of the chassis or push-button unit. Each set of screws is numbered and covers a frequency range as follows:—

## FREQUENCY RANGES OF PUSH-BUTTONS

### Model 41-100

PADDERS (right to left from rear)	Circuit	BUTTONS (left to right from front)	Frequency Range Kilocycles
1	Ant}	1	540 to 1030
2	Osc}		
3	Ant}	2	650 to 1100
4	Osc}		
5	Ant}	3	650 to 1100
6	Osc}		
7	Ant}	4	740 to 1240
8	Osc}		
9	Ant}	5	1160 to 1600
10	Osc}		
		6	Dial

### Models 41-246, 41-260, 41-265, 41-608, 41-609, 41-629

PADDERS (right to left from rear)	Circuit	BUTTONS (left to right from front)	Frequency Range Kilocycles
1	Ant}	1	540 to 980
2	Osc}		
3	Ant}	2	540 to 980
4	Osc}		
5	Ant}	3	710 to 1185
6	Osc}		
7	Ant}	4	850 to 1600
8	Osc}		
9	Ant}	5	1185 to 1720
10	Osc}		

### Models 41-105, 41-110

PADDERS (right to left from rear)	Circuit	BUTTONS (left to right from front)	Frequency Range Kilocycles
1	Ant}	1	540 to 1030
2	Osc}		
3	Ant}	2	650 to 1100
4	Osc}		
5	Ant}	3	650 to 1100
6	Osc}		
7	Ant}	4	740 to 1240
8	Osc}		
9	Ant}	5	1160 to 1600
10	Osc}		
11	Ant}	6	1160 to 1600
12	Osc}		

### Models 41-250, 41-255, 41-256, 41-280, 41-285, 41-287, 41-290, 41-296, 41-610, 41-611

PADDERS (right to left from rear)	Circuit	BUTTONS (left to right from front)	Frequency Range Kilocycles
1	{Ant}	1	On-Off
2	{Osc}	2	540 to 1060
3	{Ant}	3	540 to 1060
4	{Osc}		
5	{Ant}	4	540 to 1060
6	{Osc}		
7	{Ant}	5	650 to 1110
8	{Osc}		
9	{Ant}	6	650 to 1110
10	{Osc}		
11	{Ant}	7	920 to 1600
12	{Osc}		
13	{Ant}	8	920 to 1600
14	{Osc}		

### Models 41-225, 41-226

PADDERS (right to left from rear)	Circuit	BUTTONS (left to right from front)	Frequency Range Kilocycles
		1	On-Off
1	Ant}		
2	Osc}	2	540 to 1030
3	Ant}		
4	Osc}	3	650 to 1100
5	Ant}		
6	Osc}	4	740 to 1240
7	Ant}		
8	Osc}	5	900 to 1470
9	Ant}		
10	Osc}	6	1160 to 1600

### Models 41-295, 41-300, 41-315X

PADDERS (right to left from rear)	Circuit	BUTTONS (left to right from front)	Frequency Range Kilocycles
1		1	On-Off
2	{Ant}	2	540 to 1030
3	{Osc}		
4	{Ant}	3	540 to 1030
5	{Osc}		
6	{Ant}	4	540 to 1030
7	{Osc}		
8	{Ant}	5	650 to 1160
9	{Osc}		
10	{Ant}	6	650 to 1160
11	{Osc}		
12	{Ant}	7	900 to 1600
13	{Osc}		
14	{Ant}	8	900 to 1600
15	{Osc}		

## SETTING AND OPERATING ELECTRIC PUSH-BUTTON TUNING (CONTINUED)

Looking at the front of the cabinet, the second button from the left is adjusted by "Osc." and "Ant." set screws No. 1; the next push-button by "Osc." and "Ant." set screws No. 2, and the remaining push-buttons in order.

2— Turn the receiver "on" and set the "Tuning Range Selector" or push-button for "Dial" tuning.

3— Set up the Model 070 signal generator about 3 feet from the receiver and connect a loop aerial (made from a few turns of wire 12 inches in diameter) 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."

4— Manually tune in on the radio the first station to be set up; (usually No. 1 push-button first). After doing this, set the indicator of the 070 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.

5— Turn the receiver tuning range selector to "push-button" and press in No. 1 button. (Models without a tuning range selector, simply press in push-button to be set up). Using the insulated screw

driver, turn the No. 1 "Osc." screw until the broadcast station identified by the signal generator is heard; then turn signal generator indicator off the frequency of the station.

6— Readjust No. 1 "Osc." and "Ant." screws until the station is heard clearly and distinctly. The adjustment of No. 1 push-button is then complete. After setting up the first station the same procedure as outlined above is used for the remaining stations.

While the above procedure is satisfactory in setting up push-buttons for stations, a very accurate adjustment can be obtained with a vacuum tube voltmeter. The instructions for using a vacuum tube voltmeter will be found below under "Using Vacuum Tube Voltmeter for Aligning Compensators and Adjusting Push-Buttons."

When any of these models are to be set up to receive the sound of a television program, tuned in by special type Philco television sets, or if they are to be used in conjunction with a Philco Record Player, push-button No. 1 should be used. To adjust the push-button on these instruments, the same procedure as outlined above is used.

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

## USING VACUUM TUBE VOLTMETER FOR ALIGNING COMPENSATORS AND ADJUSTING PUSH-BUTTONS

Precision adjustment of the compensating condensers and push buttons on automatic tuning models is obtained by the use of a vacuum tube voltmeter in the A.V.C. circuit. To set up stations or adjust compensator for best reception, a signal generator such as Philco Model 070 and vacuum tube voltmeter such as Philco Model 028 or 027 should be used. With this equipment proceed as follows:

1. Attach the negative (—) terminal of the vacuum tube voltmeter through a 2 megohm resistor to any point in the circuit where the A.V.C. voltage can be obtained, such as the grid of the I.F. tube, R.F. tube, or diode circuit of the A.V.C. tube. Connect the positive (+) terminal to the ground connection or chassis of the receiver. In AC-DC sets the positive (+) terminal of the vacuum tube voltmeter should be connected to (B—) of the receiver.

For aligning receivers with loktal type tubes, an aligning adaptor, Philco Part No. 45-2767 may be used with the vacuum tube voltmeter. To use the adaptor, remove the second detector 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 vacuum tube voltmeter to the black wire of the adaptor.

2. With the vacuum tube voltmeter connected to the receiver, the signal generator is connected to the antenna and ground terminals of the receiver.

3. Manually tune in the first station to be set up on push button. After doing this, set the indicator of the signal generator to the frequency of the station to be received. As the indicator approaches the frequency of the station, a whistle will be heard; leave the indicator at this point. Press in the push button being set up. With a padding stick, turn the push button oscillator 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. Re-adjust the push button oscillator and antenna padders for maximum deflection on the vacuum tube voltmeter. When this point is obtained, the push button is adjusted for maximum signal strength. After setting up the first station, the same procedure as outlined above is used for the remaining stations.

4. When aligning the R.F. and I.F. compensating condensers of the receiver, the procedure as outlined in paragraphs 1, 2, and 3 is followed with the exception that the push buttons are not depressed. The signal generator and receiver dials are set to the frequency desired or specified in the aligning procedures given for the various radios in this manual. The R.F. and I.F. padders of the set can then be adjusted for maximum signal strength, with the vacuum tube voltmeter connected to the A.V.C. circuit.