

# INSTRUCTIONS

# PHILCO DYNAMIC TESTER

## MODEL 030

The Philco Dynamic Tester is extremely useful in locating defects in any type of radio with a minimum of time and effort. It operates on the principle of amplifying and reproducing a signal taken from any circuit of a radio in which a signal is normally present. It is easy to use, requiring no tuning to amplify signals of any frequency (radio, intermediate or audio frequency).

The Dynamic Tester not only indicates the presence of a signal but gives a comparative idea of its intensity. It can also be used to test public address amplifiers, microphone circuits and phonograph pickup circuits. The tester is designed to operate on a 115 Volt, 50 to 60 cycle A. C. power supply.

### TUBE COMPLEMENT

The tester contains four tubes. Three of the tubes (types 7C7, 7A5 and 7Y4) are mounted in the tester case, and a 6F5GT tube in the test prod assembly.

The complete test prod assembly including the tube it encloses can be removed from the socket at the end of the cable. The tube can be removed from the shield by grasping one of the base pins or locating pin with a pair of pliers. In replacing this tube in the shield, it is necessary to remove the switch from the end of the shield to connect the grid clip to the control grid cap of the tube.

### Connecting for Operation

1. Connect the dynamic tester to a 115 volt, 50 or 60 cycle power supply. Turn the attenuator control to the right until the power switch is in the "ON" position.
2. Connect the ground wire clip to the radio chassis. In the case of an A.C.-D.C. set, it might be necessary to reverse the power plug to either the dynamic tester or the radio under test or both for a minimum of hum pickup in the dynamic tester.
3. Turn the radio "ON," and tune in a strong local station. If the radio is inoperative, turn the dial to the setting for a local station. If a strong local station is not on the air, connect a signal generator and tune in any audio modulated R.F. signal in the broadcast or short-wave band. The following procedure should be used in testing the radio and other special apparatus.

### TEST PROCEDURE

Beginning with the input terminal (antenna or loop) touch the test prod to the various points at which a signal should be present, particularly the grid and plate of each amplifier tube. These various test points are indicated in the "Testing Signal Circuits" procedure and schematic diagram on the following pages.

At the R.F. end of the set, the signal level switch on the test prod assembly should be kept in the "High" position toward the tip. The attenuator should be turned all the way on when testing in the R.F. sections of the set and gradually retarded as the audio amplifier circuit is approached. As the test prod is moved from the test points in the R.F. section toward the audio circuit the signal should increase in volume. When testing the audio amplifier, the switch on the prod assembly should be turned to the "LOW" position.

When it is impossible to obtain a normal signal at some particular amplifier stage, testing for the exact location of the trouble can be completed by touching the test prod to the adjacent parts of the circuit.

## TESTING SIGNAL CIRCUITS

### 1. ANTENNA CIRCUIT TEST

- a. Place test prod at point "A"; with the attenuator on full, the signal should be heard weakly. The band switch should be tested in broadcast and S.W. positions, with a signal tuned in for each position.

### 2. R. F. CIRCUIT TEST

- a. Apply test prod at point "B" (plate of R.F. Tube); an increase in signal strength should be noted. When testing the S.W. band a signal should be tuned in above the middle of the tuning range (tuning condenser at least half meshed).

### 3. CONVERTER CIRCUIT (1st Detector Stage)

- a. Connect test prod to point "D" (grid signal should have same signal strength as point "B").
- b. Attach prod to point "E" (plate). The signal should increase greatly over point "D" (grid).

### 4. OSCILLATOR CIRCUIT

- a. Touch test prod to oscillator grid or plate "G." Momentarily short circuit the plate of oscillator section of gang with metallic instrument or wire. A click should be heard in the speaker of the tester when the short is applied and also when it is removed.

### 5. I. F. CIRCUIT

- a. Connect prod to point "H" (grid I.F.). Signal should be approximately the same as at point "E."
- b. Apply prod to point "J," (plate of I.F. tube). Signal should increase in strength over point "H" grid.

### 6. 2nd DETECTOR—A.V.C.

- a. Attach prod to diode plate, point "L." Signal should be heard.
- b. Apply test prod to points "M" and "U." A signal should NOT be heard at either of these points. If signal is heard there is a possibility of the A.V.C. by-pass condenser being open.

### 7. FIRST AUDIO STAGE

- a. Apply test prod to high end of volume control point "N"—push switch on test prod to "LOW" position. A weak audio signal should be heard.
- b. Apply test prod to point "O" (volume control). Volume control of radio in maximum position, signal should be heard with equal strength of point "N."
- c. Attach test prod to point "P" (plate of audio tube). Signal will greatly increase in strength if tube and associated circuit preceding are normal.
- d. While the illustrative diagram shows the 2nd detector A.V.C. and 1st audio stages in one tube, the same test as given above is used when these circuits are in separate tubes.

In some sets an intermediate audio stage will be found. In these radios the test prod should be attached to the grid and plate of the 2nd audio stage

and the signal strength noted. The signal should have greater gain than when tested at the 1st audio stage.

## 8. AUDIO OUTPUT CIRCUITS

- a. Connect test prod to point "Q" (grid). Signal should have same gain as was noted at point "P."
- b. Attach prod to point "R." Signal should have tremendous gain over the input point "Q."
- c. Apply test prod to point "S." Signal should be lower in volume than at point "R," depending upon ratio of transformer.

## ADDITIONAL USES AND SPECIAL TESTS

While the tester is primarily intended to indicate the presence of a signal in a circuit where it should normally be, it can also be used to detect signals in circuits in which the signals are supposed to be excluded through the action of by-pass condensers. In addition, it will be found useful in checking any special apparatus which develops an R.F. or audio signal.

### 1. OPEN BY-PASS CONDENSERS

#### a. Automatic Volume Control (A.V.C.) Circuit

By applying the test prod to points "M" and "U" the filtering condition of the A.V.C. circuit can be checked. A signal SHOULD NOT be heard at either of these points. If a signal is heard it will indicate trouble in the filter condensers or resistors of the A.V.C. circuit.

#### b. Screen grid circuits.

Application of the test prod to any screen grid tube contact will indicate the filtering action of the by-pass condensers. Under normal operation a signal should NOT be present. If the signal appears in these circuits it will indicate trouble in the by-pass condensers (being open or partially open).

### 2. HUM (HUM FILTER CONDENSERS)

- a. Abnormal hum can be located with the tester by applying the test prod to points "O" and "T" in the audio filter circuit. If abnormal hum is heard at any of these points it will indicate trouble in the filter resistors or by-pass condensers. Hum comparison tests can be made in any circuit with the tester.

### 3. LEAKY COUPLING CONDENSERS (Between Audio Stages)

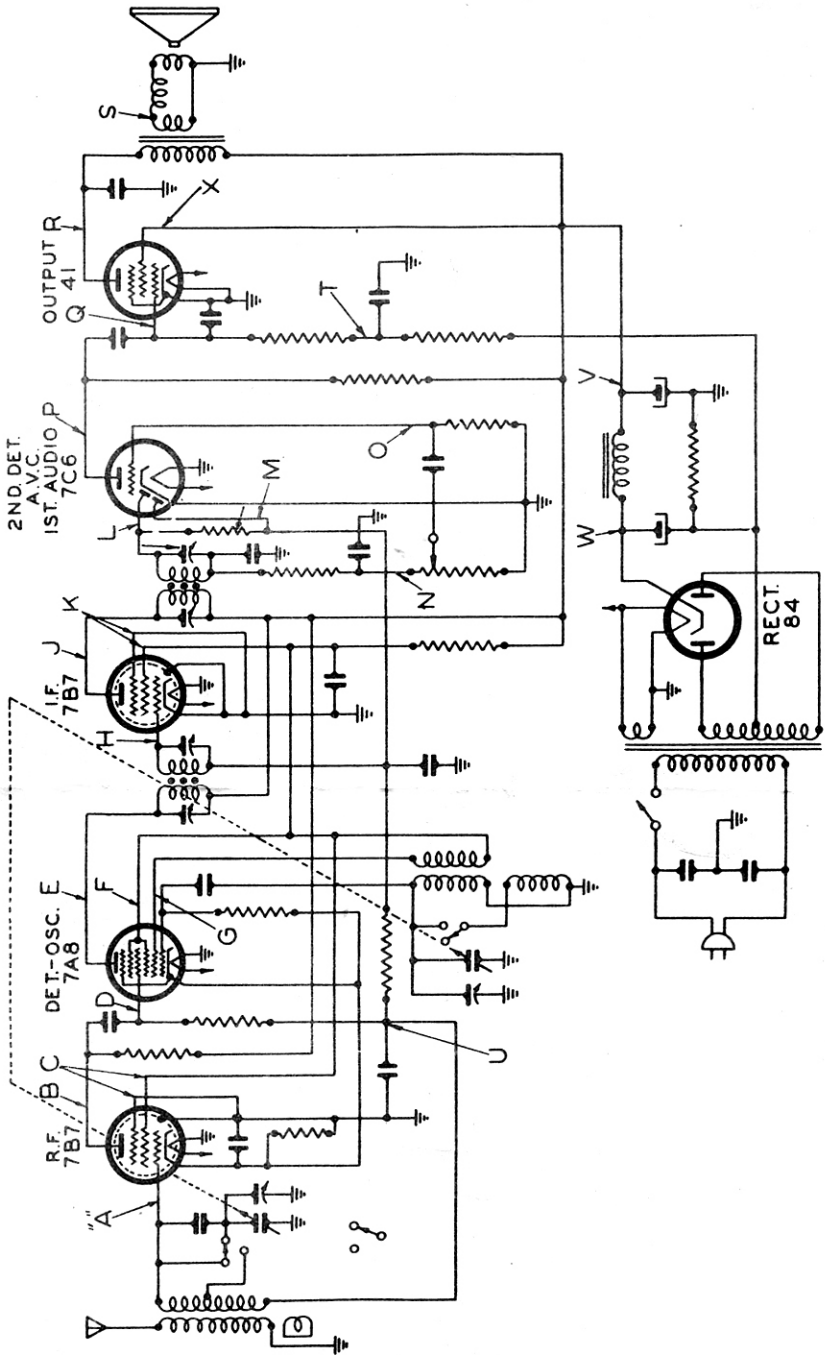
The Dynamic tester will also be found helpful in locating leaky coupling condensers (noisy) in audio circuits such as the condenser between points "P" and "Q." If this condenser is leaky the signal will be noisy or weak at point "Q." If the condenser is shorted no signal will be heard at "Q." This test also is useful in testing coupling condensers in the R.F. such as at points "B" and "D."

### 4. PHONOGRAPH CIRCUITS

The dynamic tester will also test phonograph pickup circuits. The test prod is applied to the various connections in the phonograph circuit beginning at the pickup and working back through the audio amplifier stage to the speaker.

### 5. MICROPHONE CIRCUITS

The Dynamic tester works equally well in testing microphone circuits. The procedure being the same as phonograph circuits, beginning, however, with the microphone connections and testing through the various mixer and audio stage signal points.



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Part No.  
 39-7522

Printed in  
 U. S. A.