

THE PHILCO METHOD OF TROUBLE-SHOOTING

The method presented here is specifically for radios, but the principles of the method can also be applied to other types of electronic equipment.

The PHILCO METHOD is simplified, practical, and convenient to use, resulting in faster and more efficient service. By the use of this method, personnel with limited experience can trouble-shoot equipment with a minimum of time and labor.

The BASIS of the PHILCO METHOD of trouble-shooting is

FIRST

GENERAL LOCALIZATION OF TROUBLE to a single section of the radio.

SECOND

ISOLATION OF THE FAULTY CIRCUIT within that section.

THIRD

LOCATION OF THE DEFECTIVE PART within that circuit.

Efficient trouble-shooting must be methodical. Haphazard testing kills time!

In the PHILCO METHOD of trouble-shooting, analysis of the radio is based upon functional sections. A complex radio system is reduced to the following functional sections

POWER SUPPLY
AUDIO CIRCUITS
I-F, DETECTOR, AND A-V-C CIRCUITS
R-F AND CONVERTER CIRCUITS

Analysis by sections enables the technician to apply his general knowledge to any specific radio.

In the PHILCO METHOD, GENERAL LOCALIZATION OF TROUBLE to a functional section is accomplished by

Testing at specific master test points throughout the radio. However, whenever possible, needless testing should be avoided by examination of the operational indications.

In the PHILCO METHOD, ISOLATION OF THE FAULTY CIRCUIT is accomplished by

A series of tests at minor test points within a particular functional section.

LOCATION OF THE DEFECTIVE PART is then accomplished by simple voltage and resistance measurements, tube tests, or condenser substitutions.

The Philco Service Manual uses the Philco Method of trouble-shooting. Test charts systematically localize the trouble, and also isolate the trouble to a particular circuit. These charts make use of test points, which are indicated on the schematic diagram and base views.

Master test points (first step of chart for each section) are used to localize trouble to a functional section.

Minor test points (remaining steps of chart) are used to isolate trouble to a faulty circuit.

The Philco Service Manual also includes:

SPECIFICATIONS

CIRCUIT DESCRIPTION

PRELIMINARY CHECKS

DIAL CALIBRATION

ALIGNMENT PROCEDURE

REPLACEMENT PARTS LIST

APPLY THE PHILCO METHOD AS OUTLINED BELOW

First—Localize the trouble

1. Visual Inspection

Carefully inspect the radio for loose or broken wires, burned or broken resistors or condensers, etc. An inspection of this type may immediately localize the trouble.

2. Listening Test

Listen to the radio. Quite frequently, it is possible to localize the trouble to a functional section by simply listening.

3. Checks at Master Test Points

When the visual inspection and listening test do not clearly localize the trouble, make checks at the master test points throughout the radio, working from the power supply back to the aerial. These test points are selected so as to provide a quick over-all check of the various functional sections. Normal indications for these sections eliminate the sections from suspicion; an abnormal indication localizes the trouble to a particular section.

Second—Isolate the faulty circuit

1. Visual Inspection

Make a detailed visual inspection of the section to which trouble has been localized. Look for tubes loose in their sockets. Look for burned or overheated parts. By such an inspection, it may be possible to immediately isolate the faulty circuit.

2. Checks at Minor Test Points

Except for the power-supply section, which is checked with a voltmeter, isolate the faulty circuit by the use of a signal generator. Apply the output of the generator to the stage or stages under test, working from the output toward the input, and use an output meter or the radio speaker to determine whether the signal passes through properly. The trouble is thus isolated to the stage or stages between the test point at which an abnormal indication is obtained and the preceding test point, at which a normal indication was obtained.

Third—Locate the defective part

Measure the tube electrode voltages and circuit resistances, test the tubes, and substitute condensers for those suspected of being open, as required.



