

# PHILCO SERVICEMAN

• SERVICE • NEWS • FOR • PHILCO • DEALERS •

MAY, 1933

## Philco All-Purpose Set Tester

MODEL 048

**NEW! . . .  
COMPACT! . . .  
REVOLUTIONARY!**

**COMPLETE  
Radio Testing Equipment  
In One Small Portable Case**

Handles every Service Job and meets all Testing Requirements from the Crystal Set up to the latest Super with duo-diode-triode tubes. Will not become obsolete with future radio developments.

- 5 A. C. Voltage Ranges
- 5 D. C. Voltage Ranges
- 3 D. C. Milliammeter Ranges
- 3 Ohmmeter Ranges
- 5 A. C. Output Meter Ranges
- Capacity Meter
- Complete Tube Test

### READ THESE SPECIFICATIONS!

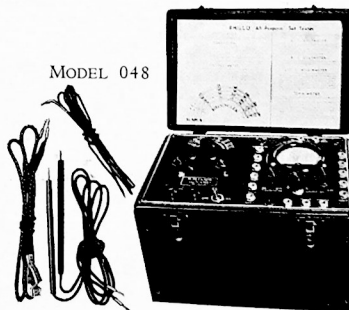
Twenty-two meter ranges and signal generator at a price made possible by Philco laboratory design and construction. Rugged instrument—easy to read, quick change of scales, no danger of taking false readings. Accurate signal generator, calibrated in K.C. on the instrument panel (no graphs to consult). Finest type precision movement meter. All test leads designed to simplify your service job. Real universal clip for connections of screen grid tubes or antenna post, sturdy test prods designed for long service. New exclusive Philco output circuit adapters, will fit 4-, 5-, 6-, 7 and 8-prong sockets, connect output meter to any type output circuit without removing tubes from chassis. All leads plug into tester panel.

Variable Frequency I. F. and R. F. Signal Generator from 105 K. C. to 2000 K. C.

All Test Prods, Leads, Batteries, Tube, etc. included—

Service Men's Price  
Complete . . . . \$40<sup>50</sup>

MODEL 048



## Truly An "All-Purpose" Tester

### At The Bench As Well As On The Job It Meets Every Service Need

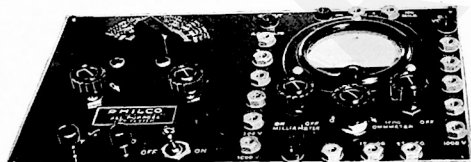
THE extreme flexibility of the Philco "All-Purpose" Set Tester cannot be too strongly emphasized. It is THE all-around useful testing instrument. It is absolutely fundamental—basic, and it may be said to make all other testing instruments "accessories." The remarkable flexibility of the tester may be shown by illustrating its use in actual practice.

#### Test Procedure

When taken to the customer's home, the signal generator is connected by means of the shielded leads to the aerial and ground of the receiver and the output meter connected to the output circuit. By tuning in an R. F. signal in the receiver we know at once whether the set is dead or in operation.

If no signals are heard, the signal generator may be connected to the detector (second detector in a super) and the audio system checked. Defects in any of the other audio stages may be easily checked by advancing the output indicator. Assuming that the A. F. is functioning, the signal generator is connected to the grid of the various stages, and moved stage by stage using the I. F. or R. F. signal as needed until the defective stage is located.

Once the defective stage is located, the chassis may be removed from the cabinet and the defect within the stage traced down by using the ohmmeter. Repairs if of a simple nature may be done in the home, otherwise the chassis is taken to the service bench. By showing the defect to the customer, there will be no question as to the need for repairs.



LABORATORY PRECISION

Before repairs are considered complete, the point to point voltages may be checked and the relative sensitivity and selectivity of the set noted. Corrections for selectivity and sensitivity are made with this instrument using the signal generator and output meter.

Some service men, if they prefer, may check an inactive set by measuring the resistance from the socket prong contacts to the chassis in the usual point to point resistance method through the tube socket holes. Others may prefer to use the point to point voltage test by probing from the under side of the chassis when in operation. Defects in any inactive receiver may be located with the ohmmeter. Defective parts may be checked with the multi-range ohmmeter.

#### Tube Test on the Job

Tube testing is accomplished by setting up the signal generator, connecting the output meter to the set and tuning in the signal generator signal. The deflection on the output meter is noted. Then a new tube is tried in the set. If the output

goes up to a marked degree on trying a new tube in the socket, it is absolute proof that the set will work better with that tube than with the old one.

#### Convincing the Customer

A demonstration like this to a customer is far more convincing than any sales talk. It sells tubes and satisfies the customer. This means money in the pocket of the service man. As a matter of fact the service man must carry a set of tubes for immediate replacement purposes regardless of the tube testing method employed, and that does not entail an extra carrying load.

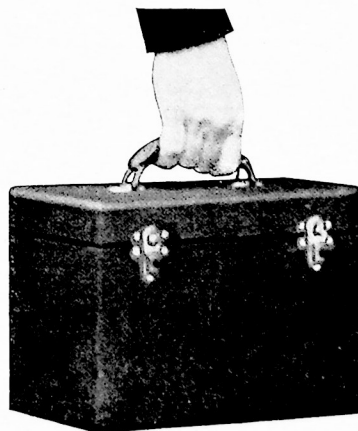
The I. F. and R. F. signal generator with its positive output level control permits the checking of the sensitivity of the receiver. For example, with a set known to be very sensitive, the output is noted for a given input on one of the output ranges. The set in question may be compared to this setting. Without changing the position of the station selector on the receiver, the frequency of the signal generator is varied slightly, noting the drop in output. In this way a clear cut picture of the selectivity is obtained.

The selectivity of a T. R. F. receiver is quickly improved if a defect is indicated, by realigning the gang condensers. With a super the I. F. stages are aligned and the oscillator made to track with the R. F. system. As the case may be, the modulated R. F. and I. F. ranges of the signal generator are used and the output indicator connected to the output stages.

Plate supply currents may be measured, when desired, with the 0-.5, 0-1 and 0-100 milliammeter. With the basic 0-0.5 milliammeter and the built-in A. C. to D. C. rectifier, many special testing circuits may be built for shop use.

Capacity measurements of any condenser from .01 mfd. to 2 mfd. can be made by using an external potentiometer and resistor and a 60 cycle power supply.

*Continued on page 3*



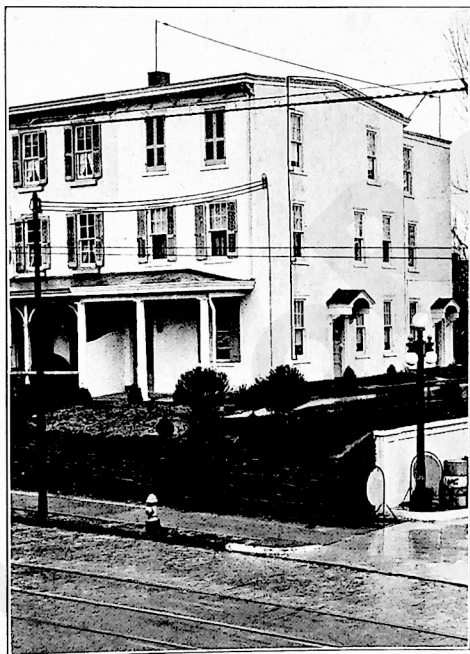
PORTABLE CONVENIENCE

## Extra Profits for the Serviceman

PHILCO'S daily broadcasts of Boake Carter are enabling Frank M. Scheers, active serviceman of Camden, New Jersey, to make some extra profits on the sale and installation of the Philco Three Purpose Antenna System.

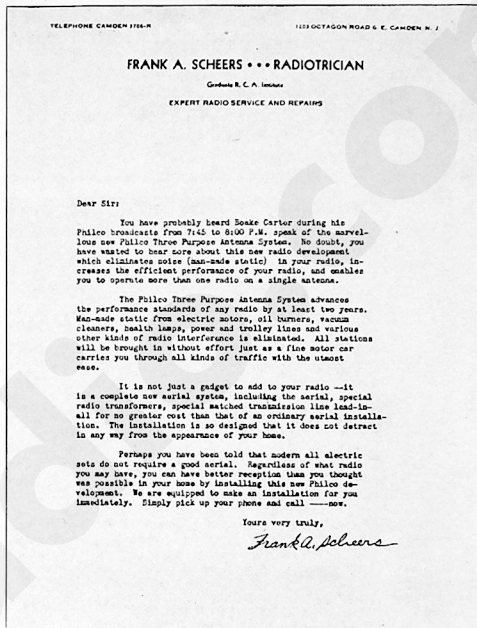
In making his daily service contacts, Mr. Scheers always asks each of his customer's opinion of the Boake Carter broadcasts of Philco. It is then an easy matter to lead up to the subject of the Philco Three Purpose Antenna System which Boake Carter often mentions. People are greatly interested, and it is not a difficult matter to make sales.

In addition to this extra business from his regular customers, Mr. Scheers has used with success the letter which is reproduced on this page. He selects from the telephone directory a number of names of people residing in a fairly prosperous section. The neighborhood may not be particularly noisy for radio reception, but the people are usually the type who appreciate better radio performance. He sends out the



A TYPICAL INSTALLATION OF THE PHILCO THREE PURPOSE ANTENNA SYSTEM

Connections from the single antenna on the roof are brought down through the transmission line and in through the window sill at each of the three apartments in the building. Note the lead-in to the antenna transformer wire from the aerial to the antenna transformer on the roof is brought down at the end farthest removed from the trolley and power lines in the street.



letter and then makes a personal call on these prospects after a few days.

Even though the customer may never reply to the letter, the serviceman has been afforded an introduction, and he is thus in a position to follow up these prospects with a much higher percentage of sales than if he tried door-to-door canvassing.

You can sell and install the Philco Three Purpose Antenna System in your community if you will tell people about it. Your customers who will not spend the money for a new radio will spend \$10.00 for improved reception, providing they can be assured of this improvement beforehand. If you have not already done so, install the Philco Three Purpose Antenna System on your own radio, see how marvelous is the new performance—sell yourself first, then you will have little difficulty selling others, because you can positively *guarantee* better radio reception—and, remember, your profit on every job is \$7.00.

Truly an "All-Purpose" Tester—Continued from page 2

Service men who adopt the Philco "All-Purpose" Set Tester will still be able to use the set analyzer method in such cases where it may seem preferable to them by building adapters and special set testing equipment to use with the Philco "All-Purpose." It lends itself readily to this purpose, although it is complete without it exactly as described here.

## Adjusting the Police Thriller on Philco Model 81

THE adjustment of the two additional compensating condensers in the police frequency band on the Model 81 is made at 1700 K. C. and 2400 K. C. These condensers are located on the under side of the chassis, and are indicated as ⑧ and ⑨ in the diagrams of Philco Service Bulletin No. 154.

The condenser No. ⑧ is adjusted by setting the dial at approximately 1700 K. C. and adjusting for maximum vol-

ume on a police broadcast station at this frequency. The condenser No. ⑨ is adjusted in the same manner at 2400 K. C.

If a broadcast frequency oscillator is available, it can be set for 850 K. C., and the second harmonic at 1700 K. C. then used for the adjustment of condenser No. ⑧. It can again be set at 1200 K. C. and the second harmonic at 2400 K. C. employed for the adjustment of condenser No. ⑨.

**WHITE TRANSMISSION LINE** for inside wiring of the Philco Three Purpose Antenna System has just been announced by Philco. This wire, which is identical in its electrical characteristics with the standard weatherproof wire supplied in the kit, is known as Philco part No. L-1591 and sells at the same price as the standard wire—\$2.00 list for a roll of 100 feet.

## Questions and Answers

1.—Q. What is the explanation of the increased efficiency in reception when using the Philco Three Purpose Antenna System?

A. In the ordinary aerial and lead-in, the wires themselves offer a certain resistance or impedance to the passage of the incoming radio signal. That portion of the antenna which is high above ground is picking up more radio signal all the time to offset this resistance of the wire. That portion of the antenna which runs down the house (lead-in), and which runs through the basement or through the comparatively shielded building still has the same amount of resistance, but it is not picking up as much signal as the higher section. The result is a loss in efficiency which increases with an increased length of lead-in. An ordinary lead-in loses signal strength through leakage to the walls, pipes, etc.

In the Philco system the incoming signal is stepped down through the antenna transformer, is run through the low impedance lead-in transmission line in which losses are practically negligible, and is again stepped up in the radio set.

2.—Q. What are the various causes of microphonic howl in a radio receiver?

A. The most common reason for microphonic howl is failure to loosen the radio chassis hold-down bolts so as to allow the chassis to float on its soft rubber supports. A micro-

phonic tube, particularly in the detector oscillator or second detector socket, is also a common source of microphonic trouble. In certain models, particularly the short-wave sets, it is important that the tuning condenser be floating on its soft rubber support pads on the chassis; in many cases microphonic howl can be corrected by loosening the tuning condenser mounting screws. Care should always be observed in all models that no part of the chassis is touching the cabinet; it often happens that a volume control or station selector shaft will be touching the side of the cabinet opening and produce a microphonic howl. In the Philco Model 43, a hardened rubber gasket on the movable station indicator bracket will produce microphonic howl. In some remote cases it has been found that a vibrating plate in one of the I. F. or high frequency compensating condensers will produce microphonic howl.

3.—Q. What is the cause of excessive wear of the dial drive cable on the Models 71 and 91?

A. This is caused by setting the dial too far inward on its shaft, allowing the outer edge of the dial to rub against the cord as the dial is turned. It can be corrected by loosening the set screw in the dial hub and moving the dial out on its shaft until complete clearance of this cord is obtained.

## PHILCO RADIO & TELEVISION CORPORATION

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