

# PHILCO SERVICEMAN

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RADIO • MANUFACTURERS • SERVICE • NEWS

NOVEMBER, 1937



## EDITORIAL

### Co-operation for the Industry

**D**URING recent years radio has become one of the most important factors in the increased use of electric power. The radio industry is essentially a branch of the electrical industry and, from a power standpoint, is just as important to the electric power industry as washing machines, electric irons, vacuum cleaners and fans combined.

This new customer of the electric power industry is one that is being treated with the greatest respect because of its great potential buying power. Evidence of this fact is shown in the desire of the power companies to co-operate with radio dealers and servicemen.

In practically every city and town, the local electric light and power company maintains at least one man whose job it is to go out on radio interference complaints and to recommend, either to the radio owner or to the power company, the necessary corrections, depending upon whose equipment is causing the trouble. There are two reasons for this co-operation. First, if the trouble lies within the equipment of the power company, it is an economy to effect the necessary corrections to eliminate power losses and deterioration of apparatus. Second, power companies realize that if radio interference is present, customers will not use their radio and hence the amount of power consumption is lessened.

Electric companies are willing to co-operate with the service industry in general because it is to their advantage to have all radio sets in working condition so that power consumption will be increased.

If you have a service problem which you think your electric power company can help you solve, do not hesitate to get in touch with them. You will be doing good for yourself and for the industry.

## Wisconsin Dealer Knows His Aerials

### Has Experience of 300 Installations

**F**ROM Milwaukee, Wis., we received word from W. H. Roth, vice president of Radio Specialty Company, PHILCO distributors, with which he includes a letter from his good dealer in Rhineland, Wis., the Schooley-Forbes Hardware Company. We know that all PHILCO dealers and servicemen will be greatly interested in getting this reaction of the Schooley-Forbes Company in connection with the new PHILCO High-Efficiency Aerial.

"Mr. W. H. Roth, Vice President,  
"Radio Specialty Company,  
"829 North Broadway,  
"Milwaukee, Wis.

"Dear Mr. Roth:

"Having just returned from the dealer-servicemen's meeting at Stevens Point, Wis., where I heard several discussions concerning poor radio reception, I thought you might be interested to know of the success we have had with the PHILCO High-Efficiency Aerial up here in Northern Wisconsin.

"We have made approximately 300 installations, using this aerial with exceptional results. In many cases, by carefully planning the best location for

the flat top in regards to possible noise radiation, using a series of insulators at both ends, and otherwise following the suggestions offered by PHILCO engineers, we have been able to get very good reception in locations where it had been practically impossible before. This, of course, helps our business considerably. In fact, we attribute many of our new set sales to an original inquiry about the PHILCO High-Efficiency Aerial.

"I have personally made or supervised each of these installations to make sure that everything was done right, and the customer satisfaction thus gained is one of our best assets. We make an installation of this type with every all-wave set sold, also on many older models and other make sets by using the PHILCO set transformer. In the latter case it invariably leads to a new PHILCO sale because of the satisfaction this aerial gives when properly installed.

"Many dealers and servicemen seem inclined to be a little negligent in their aerial installations, possibly because they do not realize the benefits derived from spending a little time and effort doing a good job. In our opinion, there is no stronger sales story than the excellent results we have achieved, and, believe me, we have adverse conditions here in Rhineland so far as radio reception is concerned.

(Continued on Page 4)



Parts Department, The Roycraft Company, PHILCO Distributors in Minneapolis, Minn.

## 077 Signal Generator Features Many Innovations

### Attenuator Controls Constant Frequency Output

LABORATORY-TYPE signal generators which are used in the Research and Engineering Laboratories of PHILCO cost as much as \$10,000 for one instrument. The ordinary semi-portable type signal generator, which is used for ordinary work around the laboratory, costs \$1400.00.

#### Laboratory-Type Instrument

PHILCO has come closer to the ideal laboratory-type instrument in the Model 077 Signal Generator than any manufacturer has ever been able to do in producing a portable, service type signal generator. High output, complete attenuation, accuracy of calibration, AC-operated power supply are absolute essentials in a service-type signal-generator, and all of these requirements have been definitely met in the PHILCO Model 077. The output is sufficient to put a strong signal through a small radio whose compensators are completely out of adjustment.

#### Special Bridge Circuit

The special bridge-type attenuator and multiplier of the 077 produce a constant output impedance of 100 ohms regardless of the attenuator setting. This means that the frequency of the R.F. or I.F. signal going to the radio set will be absolutely constant at all times regardless of the attenuator setting. Correct output frequency control with attenuation has been a serious problem with test equipment designers at all times. The Model 077 is the first signal generator for the serviceman that provides a high degree of accuracy with maximum attenuation.

In the past it was almost impossible to build an AC-operated signal generator which would retain its frequency calibration with variation in line voltage. PHILCO engineers succeeded in building a special circuit in the 077 which would accomplish this desirable result. Hence, the 077 is AC operated instead of battery operated, and yet the same degree of constancy is maintained.

#### Built for Punishment

When the 077 is calibrated in the factory, it is checked against crystal-controlled master oscillators which are used for factory engineering laboratory tests of all kinds. The special compensating condensers of the 077 hold their adjustment with a minimum of drift. A service oscillator must be capable of taking a tremendous amount of punishment, due to the fact that it is handled many times a day. The 077 is designed to do just this. Its rugged construction will keep it performing

## KRAEUTER PLIERS

### Given Free During November

accurately for a long period of time before any calibration check might be necessary.

One of the reasons for the extreme stability of the 077 is the modulating circuit design. The 077 has an extremely high R.F. output signal which is modulated about 30 per cent. This makes for greater stability and eliminates undesirable and confusing harmonics which might otherwise result when a higher percentage modulation is employed. The high overall R.F. output, together with the 30 per cent modulated signal, produces more than adequate audio signal to permit output meter adjustments in all cases as an indication of output signal strength.



Boake  
Carter's

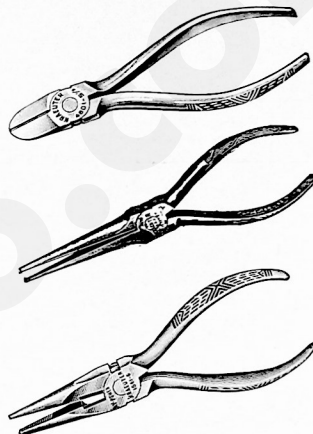
R. M. S.  
Broadcasts



BOAKE CARTER continues to broadcast for Radio Manufacturers Service. We quote below one of his recent R. M. S. talks over the air:

"Ah, but would that he had called in a PHILCO-trained Radio Manufacturers Serviceman—then his radio wouldn't have quit on him the time he needed it most. For it is to save those of us who have radios just such unfortunate happenings, as suffered by this Chicago father, that PHILCO has this great army of servicemen scattered all over the nation. They are efficiently trained, know their jobs from A to Z, are kind, courteous and charge standardized prices for the work they do. And it is worth the while of any radio owner to look up in his phone book for the nearest Radio Manufacturers Serviceman to come and simply give his radio a once-over, to see that everything is all right, that there are no weak tubes; or maybe a condenser which, for want of examination, may go out just when you want to use your radio most. Any PHILCO dealer can give you the dope on this far-flung organization of the best servicemen in the country PHILCO maintains.

THE trade slogan, "Ask Any Mechanic," of Krauter pliers is the manufacturer's best reference for quality. The fine quality of Krauter pliers for electrical and radio work has made them



the standard for the industry just the same as the fine quality of PHILCO Identified Resistors has made them standard. The difference is that PHILCO Identified Resistors cost no more than ordinary resistors.

PHILCO has now made it possible for you to obtain both of these high-grade products on a November special which has never before been equaled. During the month of November only, you can obtain free your choice of any one of three different styles of Krauter pliers with the purchase of the PHILCO Identified Resistor Kit.

This kit is a basic assortment of two each of fifty different resistors (100 resistors total) of the most commonly used one-watt values. The resistors are arranged in a heavy substantial box which serves as a permanent container for all future resistor stock. The wires of the resistors fit into supporting slots with sufficient depth in each slot for six resistors. The basic stock is packed with two resistors of the same value in each slot. Thus it is possible for the serviceman who uses more resistors of one value than another to build up his stock to suit his own individual needs. With the PHILCO Identified Resistor Kit there is always available practically every value resistor that will ever be required for any type of set.

The net dealer and serviceman price of this kit (Part No. 45-1248) is \$12.00. With this you receive entirely free your choice of any one of three types of Krauter pliers, the highest quality grade Krauter builds—the 6 inch cutters, the 7 inch long nose, or the 6 inch needle nose with side cutters. See your PHILCO distributor now while his stock lasts.

## Tube Facts Help Replacement Sales

HERE is a good story to use with your customers when selling them a new set of tubes for their radio:

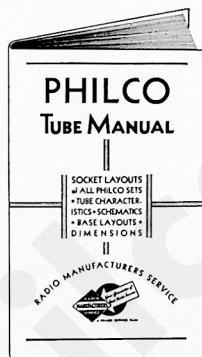
"Suppose you were to line up twelve or fifteen electric light bulbs in a row and operate them several hours a day for a year's time. Certainly, at the end of that time some of the bulbs would be burned out or would at least be extremely inefficient, and you would expect to make replacements.

"In a radio set the tubes are far more complicated than the ordinary electric light bulbs, and yet many people expect tubes to continue performing for an indefinite period without replacement."

"In order to supply the PHILCO demand for the millions of tubes each year, it is necessary that 400 tubes be produced per hour throughout the entire year. It requires approximately thirty minutes to build a radio tube."

In order to get the most out of the radio set it is essential that the tubes be tested at frequent intervals and that the necessary replacements of weak or noisy tubes made at that time.

## Complete Philco Tube Manual Now Available



A SIXTY-FOUR-PAGE Tube Manual has just been announced by PHILCO and is now available to all servicemen and dealers through the PHILCO distributor. This important book contains tube socket layouts for every PHILCO set which has been made, from the beginning up to and including the 1938 line. Complete tube characteristics are also given for all types of PHILCO high-efficiency tubes. Tube-base wiring layouts are included so that it is easy to determine the internal connections to the various base pins. Every serviceman and dealer will want to get his copy of this valuable booklet at once. See your PHILCO distributor and learn how you can obtain a copy absolutely free.

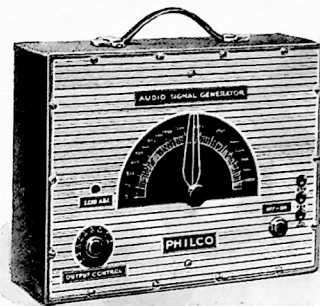
## A New Method of Checking Radio Sets

### Audio Signal Generator Provides Dealer Quick Performance Test

A SERVICE dealer recently made the following statement: "The audio oscillator is the most valuable piece of service equipment I ever had." He was speaking about the PHILCO Model 044 Audio Signal Generator in connection with its use for general service testing.

Comparatively few servicemen and dealers realize the tremendous advantages of an audio signal generator. The reason is that these men have been able to get along after a fashion, without the audio unit in the past. Up until this time there has never been a high-quality audio signal generator available for servicemen at low cost. Those who are using the new PHILCO Model 044 invariably say that it is a tremendous help to them from a standpoint of saving time and saving additional service calls.

Most dealers and servicemen would like to be able to check a set quickly and completely and, most important of all, check with a scientific degree of accuracy. This means that the element of guesswork in listening to a few seconds' performance of broadcasting must be eliminated. It is a simple matter to substitute for the broadcast signal in this test a pure audio signal, which is variable from the lowest audio frequencies which the set is capable of reproducing to the highest. The actual range of the Model 044 is approximately 60 cycles to 11,000 cycles. Any rattles, buzzes, microphonics or distortion of any kind would immediately be shown in this test. In the case of a suspected set, instead of waiting for a certain frequency note to appear



PHILCO Model 044 Audio Signal Generator.

in the broadcast music, the serviceman would simply turn the audio oscillator over its range from low to high. At some point within that range he would find the frequency which was responsible for the trouble, and could then easily and quickly locate the cause.

A speaker cone which is not properly centered or which is mechanically damaged in some way will rattle at certain frequencies. It might take a period of several minutes or even hours to locate a rattle of this kind, if it were necessary to wait for the particular frequency which produces the rattle to appear in a broadcast program. When a test is made on broadcast, the serviceman is not even sure that the test is complete, simply because the particular frequency may not have been broadcast during the period of the test. By using the audio signal generator, all elements of guesswork and human error are eliminated. The serviceman simply connects the output leads of the audio signal generator to the antenna and ground terminals of the radio and then proceeds to turn the tuning knob of the signal generator through its complete audio range. This is a quick, accurate and reliable test for overall R.F. and audio performance.

Every radio dealer realizes the great importance of thoroughly checking a radio set in a store before he makes delivery of the set to the customer. When the dealer is rushed, however, he is quite likely to eliminate this important test and take a chance on the set performing correctly. In a very great percentage of cases, service calls are made necessary at a later date because the set was not checked thoroughly at the beginning. Such service calls are not only expensive in themselves, but are expensive from the standpoint of customer dissatisfaction with resulting percentage of reverts.

With the PHILCO Model 044 Audio Signal Generator, it is now possible for every dealer to make a quick and accurate overall performance test on every type and manufacture of radio set before placing that set in the truck for delivery to the customer. The entire test can be made in not over two minutes' time, and it may save many hours and many dollars later.

### Uses for the 044 Audio Signal Generator

1. Locating speaker rattles and buzzes caused by improperly centered voice coils or damaged cones.
2. Locating rattles caused by loose metal parts in the radio, such as coil shields, tube shields, metal brackets, etc.
3. Locating buzzes which are caused by loose audio transformer laminations.
4. Locating buzzes caused by loose or vibrating parts of the cabinet.
5. Checking overall audio performance to locate causes of distortion.
6. Checking sets for microphonic conditions. High audio output essential.
7. Locating vibrating metal or wood parts in automobile radio installations.

## Questions and Answers

Q. 1 Are there extension cables available for the PHILCO portable Amplifier Model 905 Microphone and Speaker?

A. Yes, the Microphone Extension Cable is 20 feet in length and is known as PHILCO Part No. 41-3383. The speaker extension cable is 25 feet in length and is known as PHILCO Part No. 41-3390. Both of these cables are constructed of the same material as the standard cables packed with the complete unit. The microphone cable sells at a list price of \$4.75 and the speaker cable at a list price of \$1.60.

Q. 2. Why does the Model 905 sound louder and more clear than other amplifiers rated at 10 watts output?

A. This is because of the high degree of efficiency in the PHILCO permanent magnet dynamic speakers used in the amplifier. The air gap in these speakers is extremely small. This means that, with a given amount of output into the voice coil circuit, the speaker will respond with much more volume than the ordinary type of speaker. The Model 905 is rated conservatively at 10 watts output. Many competitive amplifiers might have a lower undistorted output and would still be rated higher in watts by the manufacturer. The important thing in an amplifier is the amount of volume and the tone quality which reaches the ear. The Model 905 excels in both of these respects.

Q. 3. What type tubes are used in the Model 905 Amplifier?

A. Two Type 6J7G tubes are used as first and second audio, and two type 6F6G are used in the output. The rectifier is a type 5V4G.

Q. 4. How can a dealer who has purchased a 905 employ it to best advantage?

A. The most profitable way for a dealer to realize his investment in a Model 905 is to use the amplifier for various kinds of gatherings and functions where a number of prospective purchasers of radio sets are brought together. Clubs, church socials, political meetings are just a few examples. In some cases a dealer will want to loan the equipment without charge in return for the good-will and advertising which will result. In other cases, the dealer may want to make a small charge of \$5.00 or \$10.00 for the use of the equipment. In the latter case he can pay for the amplifier within a very short time. In all cases a sign should be placed on both speakers calling attention to the fact that the PHILCO amplifier is loaned by Mr. Dealer.

## Tube Listing for 1938 Philco Models

(Continued From October Issue)

**I**N the October Issue of the PHILCO Serviceman we printed a tube listing for the 1938 PHILCO models. We continue this listing to complete the 1938 line.

In the tube types covered in the October listing under the Model 2 we showed a 6J5G, diode, and a 6K7G, audio. This should be a single 6R7G, which takes the place of both tubes mentioned above. Under the Model 93 in the October listing, we indicated a 6Q7G for the diode audio. This tube should be 6R7G.

\*116 (Code 121) 6K7G, R.F.; 6L7G, Mixer; 6A8G, Oscillator; 6N7G, Control; 6K7G, 6K7G, Expanded I.F.; 6K7G, A.F.C. Driver; 6J5G, 6J5G, Discriminator A.F.C.; 6J5G, Diode; 6R7G, Audio; 6J5G, Driver; 6L6G, 6L6G, Output; 5X4G, Rectifier.

620 (Code 125) 6U7G, R.F.; 6A8G, Det. Osc.; 6K7G, I.F.; 6Q7G, Diode Audio; 6F6G, Output; 5Y4G, Rectifier.

623 1D5GT, R.F.; 1C7G, Osc. Det.; 1D5GT, I.F.; 1F7G, Diode Pentode; 1H4G, Driver; 1J6G, Output.

624 1D5GT, R.F. Amp.; 1C7G, Det. Osc.; 1D5GT, I.F. Amp.; 1F7G, 2nd Det. and 1st A.F.; 1H4G, Driver; 1J6G, Output.

690 (Code 125) 6U7G, R.F.; 6B8G, R.F. A.V.C.; 6A8G, Mixer; 6A8G, Osc.; 6N7G, Control; 6K7G, 6K7G, I.F.; 6K7G, A.F.C. Driver; 6H6G, Discriminator; 6J5G, I.F., A.V.C.; 6J5G, 2nd Det.; 6J5G, Bass A.V.C.; 6K7G, Bass Amp.; 6R7G, 1st Audio; 6N7G, 2nd Audio; 6F6G, Driver; 6L6G, 6L6G, Output; 5X4G, 5X4G, Rectifiers.

\*116, Code 125, differs from Code 121 in R.F. and Mixer only.  
38-116 (Code 125) 6U7G, R.F.; 6A8G Mixer.

**THE** Phillips head bit mentioned in last month's issue as Part No. 45-2522 should be No. 45-2524. The price is 45 cents list.

## Cable Eliminates Extra Wiring for Philco Phone

**A**SPECIAL extension cable provides a convenient means of bringing the wires from various remote PHILCO Phone stations up to the master control unit through a single neat-appearing cable. No doubt many PHILCO Phone installations have been made with several pairs of twisted wire extending up on the desk or table where the master control is located. A neat-looking 8-foot cable eliminates all of this unattractive wiring and permits easy, quick connections or disconnections at any time. This special 8-foot cable is known as PHILCO Part No. 45-2443. It has a terminal strip on one end for mounting on the baseboard or on the floor where the remote wires terminate. Spade terminal color-coded wires at the other end connect to the back of the master control unit.

## Rider's Philco Alignment Book Big Hit With Servicemen

**J**OHN F. RIDER's book, *Aligning PHILCO Receivers*, has obtained a wide distribution among servicemen throughout the country. This collection of alignment instructions prepared in collaboration with PHILCO Parts and Service Division, covers every PHILCO receiver, from the earliest up to the latest 1937 model. To those servicemen who have not already obtained their copy of Rider's PHILCO aligning book, we recommend that you get this important manual from your PHILCO distributor at once.

## Wisconsin Dealer Knows His Aerials

(Continued from Page 1)

"In short, we are thoroughly convinced that a good aerial installation is of prime importance, and certainly recommend it to every dealer and serviceman who wishes to build a successful radio business in his territory.

"Very truly yours,

"C. A. BUDREAU,

"Radio Department."

## DEVLIN-DREW COMPANY

718 "F" Street

Fresno, California