PHILCO SERVICEMAN

• RADIO • MANUFACTURERS • SERVICE • NEWS •

MARCH, 1934

Keeping Them Sold with the Philco Three-Purpose Antenna System

THE Philco Three-Purpose Antenna System has met with tremendous success in every section of the country. Anything in radio which is good, however, is sometimes subject to criticism by those few who do not fully understand it. Philco engineers have been called upon from time to time to investigate complaints on the performance of Three-Purpose Antenna installations, and without exception the examination in each case showed that something was wrong with the installation. If the complaint stated that there was no improvement after installing the Philco system, it was easily possible to prove beyond a doubt that there was an improvement, or that the installation was not made correctly. In the latter case, re-installing the equipment according to instructions was all that was necessary to prove the effectiveness of the Philco system.

The Philco Three-Purpose Antenna System is one of the greatest sales weapons ever given to dealers and servicemen to keep radio sets sold and customers happy. It has eliminated the old noise bugaboo of man-made static and has permitted good reception in dead-spot areas. The installation will positively do everything claimed for it, but the method of installing the equipment must be carried out according to instructions. Here are the important facts which will assure you 100 per cent. success in making installations of the Philco Three-Purpose Antenna System:

1. POSITION OF ANTENNA

Always locate the antenna as far away as possible from the sources of noise. Remember this: with a broadcast signal 1000 miles distant or more, the signal strength varies almost directly as the distance, but with interference from a nearby source, the signal strength varies as the square of the distance. This means that by placing an aerial wire 20 feet away instead of 10 feet from an interference-carrying electric wire, the strength of the interference signal is proportional to

$$\frac{1}{20^2} \text{ instead of } \frac{1}{10^2}$$

2. HEIGHT OF ANTENNA

Always place the antenna as high as possible. The greater the height, the greater is the signal pickup. Since an increase in height means getting the aerial farther away from noise sources, the greater will be the ratio of signal strength to noise level.

3. LENGTH OF ANTENNA

The horizontal length of the antenna in one continuous direction is just as important as height. The greater the length, the greater will be the strength of signal picked out

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Don't Forget to Loosen the Hold-Down Bolts!

Such a small factor as the chassis hold-down bolts seems like an insignificant reason for the loss of sales. Yet we know of any number of cases of dissatisfied customers and of actual loss of sales simply because of failure on the part of the dealer and serviceman to loosen the chassis hold-down bolts.

The radio set is unstable in its operation when this point is overlooked, and the tendency for microphonic howl makes the performance most unsatisfactory. For shipping reasons it is obviously necessary to have the chassis securely fastened in the cabinet; but for operation of the set it is necessary to have the chassis floating freely on its rubber supports. Whether the radio is being installed permanently or whether it is only on demonstration, it should be installed correctly, so that your customers will obtain the full benefit of every worthwhile feature built into the receiver.

In the past we have suggested various points to be checked in making an installation. Every serviceman knows how to install a set, but unless he has a tabulated list of the various operations, he may forget something which will be enough to cause the loss of a sale. Every one of the following points should be carefully observed on each installation. It is even suggested that you cut out this list, paste it on a piece of cardboard and carry it with you on each installation you make.

BEFORE YOU DELIVER A SET

1. Check all tubes and tube shields to see that they are in place.
2. Check the pilot light, making sure it is tight in its socket.
3. Check shadow tuning and make any necessary adjustments to assure proper action.
4. Check the general performance of the set, being sure that it plays correctly on stations at various points of the dial.
5. Inspect and polish the cabinet.

WHEN YOU INSTALL THE SET

1. Insist on a good aerial and ground. The PHILCO Three-Purpose Antenna should be used for standard broadcast receivers and the PHILCO Short-Wave Antenna for all-wave receivers.
2. Loosen the chassis hold-down bolts and make certain that the chassis is floating on its rubber supports.
3. Remove all packing material around the tubes.
4. Check the performance carefully.
5. Instruct owner by demonstrating correct tuning and volume control; also interstation noise suppression and bass compensating tone control on models having these features.

R. M. S. MEMBERS...

Are You Taking Advantage of Boake Carter's Broadcasts?

At least once each week, and usually two or three times, Boake Carter tells his thousands of radio listeners about Radio Manufacturers Service and the installation of the Philco Three-Purpose Antenna System and the Philco Short-Wave Antenna System.

Every member of R. M. S. who is not tying-in with this broadcast in some way is losing a good bet. The broadcasts are pulling in a big way, showing the public's interest in Boake Carter and in R. M. S. Thousands of letters are received by Philco from interested listeners, showing that Radio Manufacturers Service is receiving all of the public recognition which Philco has promised the members.

In order for you to obtain the full benefit from this tremendous publicity campaign it is essential that you take some immediate action on your own part to let the people in your community know that you are the local representative of Radio Manufacturers Service. Start your own publicity and advertising campaign now and go after the business which is rightfully yours. You will get service calls through your distributor from time to time, but you cannot afford to sit back and wait. Philco is spending thousands of dollars to bring before the public the name and services offered by R. M. S. Certainly it is to your advantage to cash in on this mammoth advertising program and to go after your share of that service and aerial installation business.

Boake Carter, Whose R. M. S. Broadcasts Are Bringing More Service and Installation Work to Members of Radio Manufacturers Service.

Your question of *how* can be answered readily —Advertise! Get across this idea in your local newspaper: "Boake Carter, Philco's popular news commentator, talks about the new Philco Three-Purpose Antenna System and the Philco Short-Wave Antenna System. Let us tell you more about these marvelous new radio developments. Complete Radio Service. Local members, Radio Manufacturers Service." Handbills, folders, postcards and letters can all be used with a Boake Carter tie-up. When people see that you are the local R. M. S. representative they will have confidence in you because they believe and have confidence in what Boake Carter tells them.

In the November issue of the PHILCO SERVICEMAN we featured a number of R. M. S. ads and promotional material. For the advancement of Radio Manufacturers Service as a whole and for the profit of individual members, we urge the use of all of this material in telling the public about R. M. S. Take advantage of the advertising efforts being put forth by Philco, get more immediate business for yourself now, and at the same time build up a strong reputation for yourself through your association in the public mind with Philco—the world's largest radio manufacturer.

R. M. S. ADVERTISING MATERIAL AVAILABLE THROUGH YOUR PHILCO DISTRIBUTOR

1. Display advertisements for your local newspaper. Complete mats of several suggested ads at 6 cents each.
2. Letterheads and envelopes imprinted with your name and address. Letterheads—250, $1.75; 500, $2.60; 1000, $3.75. Envelopes—250, $1.85; 500, $2.85; 1000, $4.90.
3. Billheads and business cards imprinted with your name and address. Billheads—250, $1.80; 500, $2.25; 1000, $2.95. Business cards—250, $1.35; 500, $1.70; 1000, $2.60.
4. Service letters printed on Radio Manufacturers Service letterhead, imprinted with your name and address: 250, $2.30; 500, $2.85; 1000, $4.20. Imprinted tags to tie on back of customers' radio: 250, $2.75; 500, $3.75; 1000, $6.25. Three-Purpose Antenna letter, imprinted with your name and address: 250, $2.35; 500, $2.90; 1000, $4.30.
5. Service folder, imprinted with your name and address: 250, $1.80; 500, $2.50; 1000, $3.50.
6. Service postcard, imprinted with your name and address: 250, $1.95; 500, $2.60; 1000, $3.75.

Samples of all of the above material can be seen at your Philco Distributor's Service Department.

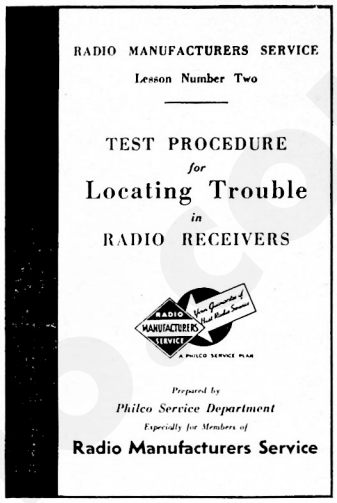
Second Radio Manufacturers Service Lesson

Radio Trouble Shooting

THE second of the popular Radio Manufacturers Service lessons is just off the press at this writing, and will be available to you when you receive this issue of the PHILCO SERVICEMAN. This lesson, Radio Trouble Shooting, covers in detail complete information on the general procedure for radio service tests.

Every serviceman, regardless of how proficient he may be, can get many helpful ideas from the booklet. The old "catch-as-catch-can" methods of service test procedure are obsolete. A careful study of this lesson will enable every serviceman to adopt a logical and greatly simplified procedure in locating radio troubles.

Your copy can be obtained at a very nominal cost from your PHILCO distributor. Call at his Service Department at once to make sure of obtaining your copy while the supply lasts.



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of the air and delivered to the antenna terminal of the radio. The increase in the amount of signal pickup is very evident when the antenna length is increased 50 or 100 per cent. However, there is no appreciable increase in the amount of background noise.

4. ISOLATING THE ANTENNA

The antenna wire and the lead-in wire from one end of the antenna to the antenna transformer should be isolated from nearby wires, trees, building walls, roofs, etc. Such objects absorb the signal strength from the antenna and thus reduce the efficiency. Furthermore, the antenna and lead-in should be well insulated with porcelain insulators to prevent further loss of signal strength.

5. LOCATION OF ANTENNA TRANSFORMER

The whole secret of noise elimination and increased efficiency of reception is dependent upon mounting the antenna transformer as high as possible and getting a good mass ground connection at the same level. This means that the antenna transformer should preferably be mounted on the roof and grounded to a metal vent-pipe or overflow pipe. If such a ground is not available, the next best connection would be to a water or radiator pipe on the upper floor of the house or building. Mounting the antenna transformer on the roof and making the actual ground connection on the floor below will be no more effective than mounting the transformer at the same floor level of the ground connection. It is evident from the above that mounting the antenna transformer on the roof and running a wire down the side of the house to the earth or to an outside water pipe will not give any better results than if the transformer were mounted at the actual ground level.

Remember that most noise pickup in the ordinary antenna is in the lead-in wire between the antenna and the radio; also, that most of the losses in signal strength occur in the lead-in wire. Mounting the antenna transformer at a high level with a good ground at this level permits running the transmission wire lead-in through the noise and signal-loss area with perfect efficiency of reception.

6. MAKING THE GROUND CONNECTION

In the great majority of cases the ground clamp furnished with the Philco Three-Purpose Antenna System will be used for the ground connection. In some cases it will be desirable to bore a hole through a vent pipe near the top and use a machine screw and nut to fasten the ground connection. Remember that the ground connection will be subjected to all kinds of weather; be sure to clean the surface of the connection carefully; make a permanent connection, which will not corrode later and produce noise.

7. INSTALLING THE TRANSMISSION LINE

The Philco weatherproof transmission line is extended from the antenna transformer to the set transformer. The line can be run along the wall of the building or near wires and water pipes without affecting reception in any way. In the best installations, however, the wire is fastened with porcelain nail-on knobs to prevent possible wire breakage by swaying in the wind or to avoid damage resulting from sharp bends in the line. Any length of transmission line can be used up to 400 feet without affecting signal strength or noise level. The wire should enter the house through the porcelain tube insulator supplied with the kit. Inside the house the wire can be fastened with insulated staples.

8. INSTALLING SET TRANSFORMER

The set transformer should be mounted on the back of the cabinet as near the antenna terminal of the radio as possible. Short direct wires should run from the "ANT" and "GND" terminals of the transformer to the antenna and ground terminals of the radio. In extreme cases of interference it will be desirable to mount the transformer on the back of the chassis, so that the wire to the antenna terminal can

be made an absolute minimum length. Modern radio sets are so sensitive that a few inches of wire between the antenna terminal on the set and the "ANT" terminal of the set transformer is sufficient to pick up noise. Therefore, the set transformer must be mounted near the antenna terminal, and in no case should it ever be mounted on the baseboard behind the radio cabinet. Never use a ground connection *at the radio set;* the system will not be effective if such connection is made.

9. INSTALLING EXTRA SET TRANSFORMERS

Additional set transformers for extra radio outlets up to four can be installed at any point along the transmission line. Here again it is important that the set transformer be mounted as near the antenna terminal of the radio as possible. If more than four set transformers are used on a single aerial, the overall signal strength at each outlet will be reduced.

10. SPECIAL INSTALLATIONS

A three-terminal toggle switch and mounting bracket are provided as standard equipment in the Philco Three-Purpose Antenna kit. The switch is for use on sets with police and airplane reception where the frequency range is above 1500 K. C. The switch in the short-wave position connects both wires of the transmission line to the antenna terminal of the radio set, giving somewhat the same effect as an ordinary aerial. The use of this switch in conjunction with the Three-Purpose Antenna affords excellent reception between 1500 K. C. and 4000 K. C. (4 megacycles). In standard short-wave sets the frequency range is much higher than 4000 K. C., and the Three-Purpose Antenna System is not recommended. The Philco Short-Wave Antenna kit should be used instead.

In some very old receivers, notably those of the early battery type, a low-impedance antenna input circuit is used. Most receivers of this type have a separately operated tuning condenser to make the antenna circuit tune to the other circuits. In such cases better results with the Three-Purpose Antenna System will often be obtained by omitting the set transformer entirely and connecting the red wire of the transmission line direct to the antenna terminal of the set, and the black wire to the ground terminal.

PRICE CORRECTIONS

On page 10 of January, 1934, parts catalog the following price corrections should be made:

Kit, Part No. 45-1010.	Net Dealer Price	$7.20
Kit, Part No. 45-1012.	Net Dealer Price	5.04
Kit, Part No. 45-1013.	Net Dealer Price	6.48
Kit, Part No. 6566A.	Net Dealer Price	3.75

On page 27:

Part No. L-1556 should read L-1551, 100-foot rolls of transmission line. Net Dealer Price $2.40

Questions and Answers

1 Q. What is the cause of failure of oscillation in such Models as the 38, 89 and 19?

A. This condition may be caused by a weak oscillator tube. Usually the replacement of this tube will correct the fault. In some cases it has been found that cracked mica in the oscillator compensating condenser causes leakage across the plates of the condenser and stops or weakens oscillation. This condition can be corrected by replacing the mica in the compensating condenser. In some climates subject to extreme humidity there may be a certain amount of leakage across the bakelite insulation between the stator and rotor plates of the tuning condenser. It will be found in such cases as this that the bakelite has a rough surface rather than a smooth one. The only remedy is to replace the tuning condenser with a new unit having the smooth bakelite insulation.

2 Q. How can 460 K. C. interference from commercial code stations be eliminated on PHILCO sets having 460 K. C. intermediate frequency?

A. In the case of the Models 16 and 44 this interference can usually be corrected by readjusting the wave trap for minimum signal at the interfering frequency. On other models, and on extreme cases with the Model 16, it may be necessary to readjust the intermediate frequency to a lower value. For example, the compensating condensers of the intermediate frequency circuit can be readjusted to 440 K. C. or to some other frequency at which no code interference is present. It will, of course, be necessary to readjust the high frequency and low frequency oscillator compensating condensers in order to produce the correct intermediate frequency to which the I. F. circuit has been adjusted. In some locations adjacent to extremely powerful code stations it may be necessary to use a wave trap to prevent intermediate frequency signal interference. Such a wave trap has been designed by PHILCO especially for this purpose and can be obtained from your PHILCO distributor at a small cost. This trap is known as PHILCO part No. 38-5570.

3 Q. In the Model 16, what is the remedy for intermediate frequency oscillation characterized by squeals and sometimes by motor boating?

A. This condition is present in some of the earlier models of the 16, and can be corrected by changing the .05 mfd. by-pass condenser which runs from one end of the secondary of the second intermediate frequency transformer No. 38 to ground. Examination of the chassis will show a long wire running from a terminal on the second intermediate frequency coil over to a black bakelite condenser mounted at one end of the chassis. This wire should be cut out entirely and a small .05 mfd. tubular condenser, PHILCO part No. 30-4123, soldered at the coil terminal and at the ground terminal of an adjacent black bakelite by-pass condenser. In this way the path for by-passing this portion of the circuit is greatly shortened and the oscillation is entirely eliminated.

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Printed in U. S. A.