

PHILCO SERVICEMAN

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RADIO • MANUFACTURERS • SERVICE • NEWS

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EDITORIAL

Be Ready for the Big Summer and Fall Business

IN PREVIOUS editorials and articles in the PHILCO SERVICEMAN and elsewhere we have endeavored to emphasize and impress on the serviceman the necessity of using advertising in its various forms to let the public in his neighborhood know of his presence and of the quality of his work. Judging by the thousands of R. M. S. signs in use and the millions of handbills, mailing cards, etc., which have been used and are being ordered, we feel that to some extent our recommendations have succeeded.

But now that you have let your neighbors know where you are and told them you can handle their radio service jobs—are you really prepared to give them 100 per cent prompt service? Can you replace a standard part which has burned out, FROM YOUR STOCK, or must you mail an order for it to your distributor and wait until he can ship it to you? Just as PHILCO has helped R. M. S. members get more service business, so Philco has made a study of the needs and provided an adequate yet economical method to handle that business.

With the June issue of the PHILCO SERVICEMAN a folder entitled "New Profit Makers" was enclosed. In it were described a number of carefully prepared and selected assortments of parts MOST FREQUENTLY REQUIRED in everyday service jobs. Selected after careful field surveys and reports by service engineers of years' experience, these assortments contain active parts only and represent the minimum possible investment for prompt, dependable service to your customers at all times and on all makes of radios. For example, the new Volume Control Kit, containing only eighteen units, will service 92 per cent of all PHILCO models—a total of over 5,000,000 home radios—plus many models of other makes.

Don't just promise quick service—be prepared to give it. Remember that a satisfied customer will recommend you, while one who is annoyed by having to wait a week or so for a replacement part is not likely to be much of a booster.

Every serviceman who intends to stay in business must carry a stock of parts in some form, and the serviceman who is wise will carry it in the form of a stock which will cover a maximum of makes and models at a minimum investment.

Radio Noise Interference Data Compiled

Power Companies Release Important Figures

DURING the recent PHILCO Havana cruises a tremendous amount of interest was shown on the part of all PHILCO distributors and dealers in the new PHILCO Interference Filter Kit. Every person in the radio industry realizes the importance of eliminating radio interference of all kinds. The new PHILCO High-Efficiency Aerial and the new PHILCO Interference Kit, consisting of various types of filters for all inter-

ference elimination at the source, will contribute tremendously toward the reception of better radio during the coming year.

As a matter of interest, we are listing below the analysis of radio noise complaints received by three large power companies during the past year. These figures are most startling and show the great need for interference elimination work:

| RESPONSIBILITY | COMPLAINTS | PERCENTAGE | VARIATIONS |
|-------------------------|------------|------------|--------------|
| Power Company | 2,207 | 23.6 | 11.3 to 33.4 |
| Other Utilities | 595 | 6.4 | 2.7 to 8.5 |
| Consumers' Equipment | 2,735 | 29.3 | 26.9 to 37.4 |
| Radio Sets | 1,214 | 13.0 | 7.6 to 17.5 |
| Transient and Unfounded | 2,583 | 27.0 | 23.6 to 31.4 |
| Total | 9,334 | 100.0 | |

| CONSUMERS' EQUIPMENT | COMPLAINTS | PERCENT-AGE OF CONS. EQUIP. | PERCENTAGE OF TOTAL COMPLAINTS |
|--|------------|-----------------------------|--------------------------------|
| Motor Devices | 984 | 36.0 | 10.5 |
| Interrupter Devices | 532 | 19.4 | 5.7 |
| Diathermy, X-Ray and Neon Sign Equipment | 258 | 9.5 | 2.8 |
| Ignition Equipment | 119 | 4.3 | 1.3 |
| Building Wiring Defects | 563 | 20.6 | 6.0 |
| Unclassified and Miscellaneous | 279 | 10.2 | 3.0 |
| Total | 2,735 | 100.0 | 29.3 |



Parts Department, Sunset Electric Company, PHILCO Distributors in Seattle, Wash.

Complete Audio and Speaker Testing Eliminates Guesswork

ELIMINATING guesswork in the final testing of a repaired set is the desire of every serviceman. The use of a beat frequency oscillator for speaker and audio testing answers the problem of a quick, accurate and reliable check-up and test.

Servicemen who have used a beat frequency oscillator such as the PHILCO Model 055 often ask themselves how they ever got along without a handy test instrument of this type.

Two Oscillating Circuits

The beat frequency oscillator is simply two ordinary oscillating circuits operating at a slightly different frequency, this difference being controlled by changing the tuning-condenser setting in one circuit so as to vary the frequency difference from approximately 40 cycles to 8000 cycles. The difference between the two frequencies is the output of the beat frequency oscillator; in other words, an audio oscillator capable of giving a signal of 40 cycles to 8000 cycles.

Every time a radio receiver is repaired, it is necessary to determine if the speaker is functioning properly. This ordinarily means tuning the receiver to a variety of programs to insure proper cone response, without rattles, to all audio frequencies and running it at a volume much higher than normal. Even then the serviceman is not sure in his own mind that the speaker will continue to function properly after he is gone.

Testing a speaker in this manner naturally consumes time, and it is with the thought of saving time and providing a definite and sure way of testing speakers that PHILCO developed the Model 055 Beat Frequency Oscillator.

The operation of this instrument is simple yet very efficient, providing a complete tunable audio range from 40 to 8000 cycles, a range great enough to cover all modern high-fidelity receivers.

Cones Most Common Source

The majority of troubles found in speakers can be traced to defective or improperly centered cones, the trouble showing up in the form of a rattle. These rattles are predominant at certain audio frequencies, depending on the defect causing the rattle. By providing an instrument generating audio frequencies and tuning it across the audio range, these rattles will show up much quicker than they would on a broadcast program.

Cabinet rattles are the most difficult to find due to the fact that they only exist at certain resonant frequencies. By tuning the Model 055 to the particular frequency causing the cabinet rattle, you will have time to experiment and find the exact cause.

It often happens that a customer will complain about a rattle of some kind, and after a detailed search on the part of the serviceman, it develops that this rattle is a sympathetic vibration of some kind in a window, picture frame or al-

most any article in the room subject to slight vibration. It sometimes requires several visits because the music which is coming over the air at the time does not contain the frequencies which produce the vibration. The 055 tester can be used for this purpose, and the annoying vibration in the room can be located in a few seconds simply by adjusting the beat frequency oscillator until that particular frequency is heard which is the rattle or vibration.

To operate this instrument, simply plug the A.C. cord into the nearest receptacle, turn on the switch, connect a short piece of wire (approximately three feet) to the antenna post. It is not necessary to connect this wire to the antenna post of the receiver. Tune the station selector of the receiver to the frequency generated by the Model 055.

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Model 055 Speaker Tester Assembled in Metal Case

Philco Service Bulletins Show Many New Features

MANY favorable comments on the new PHILCO service bulletins have been received from dealers and servicemen in all parts of the country. Never before in the history of PHILCO have the PHILCO service bulletins contained so much valuable and essential service information in such a small folder.

The general description, as well as the complete electrical specifications, are most helpful in explaining to servicemen the details of the new models. The small underside view of the chassis, showing voltages from various points, enables the serviceman to make a rapid voltage test of the major portions of the circuit. The dial calibration data and the complete alignment instructions, with locations of the various compensating condensers, make the adjustments of the receiver much easier for the serviceman. The coil data, with resistance readings of the various windings, are shown in the schematic wiring diagram to facilitate rapid continuity test. The explanation of the switching arrangement in the wave-change switch permits a quick circuit test for continuity. Although the general form of the replacement parts list remains the same as in the past, it will be noted that the listing is much more complete inasmuch as there are many mechanical items shown on the list which do not appear electrically in the wiring diagram. Many of the improvements in the latest-type bulletins were made as a result of the questionnaire which was recently sent out to all members of Radio Manufacturers Service. PHILCO is co-operating with the servicemen, trying to give them the type of information wanted.

Tubes Used in New 1937 Philco Models

| Model | Type Tube | No. | Model | Type Tube | No. | Model | Type Tube | No. | Model | Type Tube | No. |
|--------|-----------|-----|--------|-----------|------|--------|-----------|-----|--------|-----------|-----|
| 37-33 | 1D7G | 1 | 6A8G | 5Y4G | 1 | 37-623 | 6K5G | 1 | | 6K5G | 1 |
| | 1D5G | 1 | 6N7G | 1D5G | 1 | | 6F6G | 2 | | 6F6G | 2 |
| | 1H6G | 1 | 6H6G | 1D5G | 2 | | 5X4G | 1 | | 5X4G | 1 |
| | 1H4G | 1 | 6F6G | 1H4G | 1 | | 6K7G | 2 | 37-665 | 6K7G | 2 |
| | 1E7G | 1 | 6J5G | 1F7G | 1 | | 6A8G | 1 | | 6A8G | 1 |
| 37-34 | 1D7G | 1 | 6B4G | 1I6G | 1 | | 6J5G | 2 | | 6J5G | 2 |
| | 1D5G | 1 | 5V4G | 37-630 | 6K7G | 2 | 6K5G | 1 | | 6K5G | 1 |
| | 1H6G | 1 | 6A8G | 6A8G | 1 | | 6F6G | 1 | | 6F6G | 1 |
| | 1H4G | 1 | 6J7G | 6Q7G | 1 | | 5Y4G | 1 | 37-670 | 6K7G | 2 |
| | 1E7G | 1 | 6K6G | 6F6G | 1 | | 6A8G | 1 | | 6A8G | 1 |
| 37-38 | 1C7G | 1 | 5Y4G | 5Y4G | 1 | | 6J5G | 4 | | 6J5G | 4 |
| | 1D5G | 1 | 6A8G | 37-640 | 6K7G | 2 | 6K5G | 1 | | 6K5G | 1 |
| | 1H4G | 2 | 6K7G | 6A8G | 1 | | 6K5G | 1 | | 6K5G | 1 |
| | 1E5G | 1 | 6Q7G | 6Q7G | 1 | | 6F6G | 1 | | 6F6G | 1 |
| | 1I6G | 1 | 25A6G | 6F6G | 2 | | 5X4G | 1 | 37-675 | 6K7G | 3 |
| 37-60 | 6K7G | 1 | 25Z6G | 5Y4G | 1 | | 6L7G | 1 | | 6L7G | 1 |
| | 6A8G | 1 | 37-604 | 6A8G | 1 | 37-641 | 6A8G | 1 | | 6A8G | 1 |
| | 6Q7G | 1 | 6K7G | 6K7G | 1 | | 6A8G | 1 | | 6A8G | 1 |
| | 1E5G | 1 | 6Q7G | 6Q7G | 1 | | 6N7G | 1 | | 6N7G | 1 |
| | 6K7G | 1 | 25A6G | 25A6G | 1 | | 6H6G | 1 | | 6H6G | 1 |
| 37-61 | 6A8G | 1 | 25Z6G | 6Q7G | 1 | 37-643 | 6H6G | 1 | | 6H6G | 1 |
| | 6K7G | 1 | 37-610 | 6K7G | 1 | | 6F6G | 1 | | 6F6G | 1 |
| | 6Q7G | 1 | 6A8G | 6A8G | 1 | | 5X4G | 1 | | 5X4G | 1 |
| | 6F6G | 1 | 6Q7G | 6Q7G | 1 | | 6K7G | 5 | 37-690 | 6K7G | 5 |
| | 5Y4G | 1 | 6F6G | 1E5G | 2 | | 6L7G | 1 | | 6L7G | 1 |
| 37-84 | 6I7G | 2 | 5Y4G | 1I6G | 1 | | 6A8G | 1 | | 6A8G | 1 |
| | 6F6G | 1 | 37-611 | 6A8G | 1 | 37-650 | 6K7G | 2 | | 6K7G | 2 |
| | 5Y4G | 1 | 6K7G | 6K7G | 1 | | 6N7G | 1 | | 6N7G | 1 |
| 37-89 | 6K7G | 2 | 6Q7G | 6A8G | 1 | | 6H6G | 1 | | 6H6G | 1 |
| | 6A8G | 1 | 25A6G | 6F6G | 2 | | 6J5G | 4 | | 6J5G | 4 |
| | 6Q7G | 1 | 25Z6G | 6F6G | 2 | | 6B8G | 1 | | 6B8G | 1 |
| | 6F6G | 1 | 37-620 | 6K7G | 2 | | 6B4G | 2 | | 6B4G | 2 |
| | 5Y4G | 1 | 6A8G | 6A8G | 1 | 37-660 | 6K7G | 2 | | 6K7G | 2 |
| 37-116 | 6K7G | 4 | 6Q7G | 6Q7G | 1 | | 5X4G | 2 | | 5X4G | 2 |
| | 6L7G | 1 | 6F6G | 6F6G | 1 | | 6F6G | 1 | | 6F6G | 1 |

Philco Magnetic Tuning Described

MAGNETIC tuning, one of the most outstanding features of the larger models of the new PHILCO line, is of utmost interest to every serviceman. Magnetic tuning operates in such a way that it pulls stations toward the adjusted frequency in much the same way as a magnet pulls. As soon as the set is tuned close to the frequency of any strong station, magnetic tuning goes into action and places the adjustment on the exact frequency of that station and holds the tuning there as long as desired. This eliminates off-frequency tuning and distortion because of inaccurate tuning.

Special Circuit for Applied I. F.

A special circuit to which I.F. signal is supplied is used to produce a D.C. bias that varies with the frequency of the signal in the I.F. If the set is exactly tuned so that the I.F. carrier is exactly 470 K.C., this bias is zero, but if the signal is different from 470 K.C., a positive or negative bias is produced, depending upon whether the actual I.F. is high or low in frequency.

This bias is fed back to the R. F. mechanical unit and operates to correct the frequency of the oscillator. If the I.F. frequency is lower than 470 K.C., the overall operation is to increase the oscillator frequency, thus raising the I.F. frequency. If the reverse is the case, the polarity of the control bias is reversed

and the oscillator frequency is reduced. In either case the circuit works to bring back the I.F. frequency toward its center value of 470 K.C., for which the I.F. circuits are padded. As in any other governing device, this control action cannot be 100 per cent perfect, but in our present sets it is actually 97 to 99 per cent perfect on usable signals; that is, if the set is mistuned by 1 K.C. (the control not acting), throwing the control into action will reduce the mistuning to as little as 10 to 30 cycles, depending upon the signal frequency and strength.

Signal Held Over Wide Range

As no control bias can be generated in the absence of I.F. signal, it is necessary to tune the set manually to a point inside its selectivity band; this is approximately within 5 K.C. of resonance when the set is in the sharp position and 10 K.C. when in the expanded position. At this point the control bias begins to build up in a cumulative manner, and the I.F. signal jumps into tune. Once "locked in" in this way, the signal is held over a wide range of dial movement, amounting to a total of about ten channels in the B.C. band to twenty-five or more channels at 18 megacycles. The limit that may be reached depends upon the ability of the control action to keep up with the mistuning of the set. When it can no longer do so the signal "jumps out" and control is lost.

Feature Can Be Eliminated by Switch

In order to permit tuning in a weak station near a stronger one, which latter might easily "drag" over the desired signal, a switch is provided to throw the control out of action. This is accomplished by shorting out the control bias mentioned above. When this switch is in the "off" position, the set is in no way different from the ordinary set. The desired weak signal may be approximately tuned in and then brought into perfect tune by throwing the switch "on." This procedure is also recommended in any case when tuning by knob is used, if high-fidelity tuning is desired.

Questions and Answers

1. Q. Why has the I.F. been changed in all the new '37 PHILCO models from 460 K.C. to 470 K.C.?

A. After considerable investigation on the part of the PHILCO Engineering Department, it was found that the least amount of commercial code interference would be obtained throughout the country as a whole if the I.F. were adjusted to 470 K.C. instead of 460 K.C. There may still be some locations where interference will be obtained with the 470 K.C. adjustments. In this event it will be necessary either to repad the I.F. to a different frequency, such as 460 or even 450, or to use a wave trap which is adjusted to the frequency of the I.F.

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New R. M. S. Sales Promotional Material Creates Wide Interest



1937 R. M. S. Sales Promotion Display Stand

THE new R. M. S. Display Stand has created a tremendous amount of interest among members of Radio Manufacturers Service.

This stand, which was recently placed on display by your PHILCO distributor, contains samples and illustrations of all the new R. M. S. sales promotional material—handbills, letterheads, window decalcomanias and new-business-getting advertising material of all kinds are displayed and priced for your convenience. There is also an illustration of the new R. M. S. shop coat, the electric sign, the new flange sign and other items of interest to members of Radio Manufacturers Service.

Be sure that you see these valuable sales helps the next time you go to your PHILCO distributor's service department. They are designed by advertising experts to assist you in getting more service business.

Speaker Tester

(Continued from Page 2)

The volume control may then be adjusted for any desired volume. To control the audio range, use the tuning control on the Model 055.

The Model 055 is supplied in a kit form for assembly by the serviceman. This kit sells at a list price of \$25, less your regular parts discount.

★ New Idea ★ KNOB PACKAGE Self-Salesman



● Let this novel display package sell new-style Knobs for you... List Price \$7.60.

Questions and Answers

(Continued from Page 3)

2. Q. Does PHILCO have a special I.F. wave trap for the new '37 models?

A. Yes. There is a new wave trap available, PHILCO Part No. 38-8067, for this purpose. The trap is so constructed that it can be attached to the high-efficiency aerial terminal strip on the back of the new radio chassis. The trap is adjusted to 470 K.C., so as to afford maximum blocking of the interfering signal at the frequency of the I.F. circuit.

3. Q. Does the new PHILCO Foreign Station Demonstrator have the noise-reducing feature of the PHILCO High-Efficiency Aerial?

A. No. The foreign station demonstrator is intended for quick installation by the salesman who is demonstrating the set in the home. The lead-in from the aerial to the set is comparatively short, and the noise-eliminating feature is unnecessary in a case of this kind.

4. Q. What is the difference between the PHILCO High-Efficiency Aerial shipped with the 1937 PHILCO sets and the new PHILCO All-Wave Aerial described in the June issue of the PHILCO SERVICEMAN?

A. There is no difference between these two. The new PHILCO All-Wave Aerial is intended for sale to those customers who have the last year's all-wave aerial and who want greatly improved performance from their sets. It is also intended for sale to owners of other makes of radio sets, where the best possible results are desired from the aerial system. This new aerial can be connected without a set transformer directly to the transmission line terminals of any competitive make of receiver employing the built-in set transformer. When used with sets that do not have the built-in set transformer, the PHILCO set transformer, Part No. 42-1095, list price \$1.50, should be employed.

5. Q. Will the new PHILCO automatic tuning device on the de luxe models be subject to the slight tuning errors which characterized sets of this kind in the past?

A. No. The PHILCO magnetic tuning system permits correct operation of automatic tuning for the first time. The tendency of the magnetic tuning to hold a station over a wide tuning range permits accurate tuning automatically and permits the necessary amount of drift or slight off-calibration that would result from a mechanical tuning device of this kind. Magnetic tuning holds the station at all times and thus permits real automatic tuning of any favored group of stations.

New Philco Aerial a Necessity for Store Demonstrations

THE use of the new PHILCO High-Efficiency Aerial has become a *must* for store demonstrations of the new PHILCO 1937 models. The extreme high efficiency of the new aerial makes it so much superior in performance to last year's PHILCO All-Wave Aerial that the demonstration cannot be complete without the later-type aerial.

It is PHILCO's recommendation that every PHILCO dealer look to his store demonstration set-up for an improvement that will result in increased radio-set sales this year. Every dealer knows that the all-important impression to make upon a customer or a prospect is that first impression when he first hears the radio perform. If you have all of the radio sets in your store tied on to one or two aerials for demonstration purposes, you know that you cannot get the proper results, and that it is necessary to explain to the customer in each case that better performance can be expected in the home with a good aerial installation. Why not be absolutely convincing at the start and not have to make excuses for the presence of noise and the lack of good foreign reception?

This can be accomplished easily by using the PHILCO High-Efficiency Aerial for store demonstrations and employing the PHILCO multiple-aerial switches to connect the desired set automatically to the aerial. It is only necessary to turn on

the set on your demonstration floor, and this operation automatically connects the transmission line of the high-efficiency aerial system to that one set and leaves the line disconnected from all other sets on the floor. In this way you can get maximum foreign reception and absolute noise reduction, both of which are most important factors in the initial demonstration to a new prospect in your store. The profit which you will make from *only one*, plus sale of a large radio, will more than pay for your expense in making a high-quality aerial installation for your store.

The new PHILCO High-Efficiency Aerial should be installed in place of last year's aerial at once, so that you can start demonstrating the new '37 model PHILCOS in the correct manner. The multiple-aerial switches are available in two sizes—one for sets from three to seven tubes and the larger size for sets of seven tubes or more. Both items are priced the same at \$4.85 list, subject to your regular parts discount.

Do not feel that you are buying another aerial and some switches for store demonstration, but think rather in terms of a small investment in the highest class of demonstration equipment which enables you to sell far more radio sets this year than you ever have sold in the past

**"HOME DEMONSTRATIONS" IN THE STORE
WITH THE
PHILCO MULTIPLE-AERIAL SWITCH**

Without

NO ALIBI OR SALES ARGUMENT WILL REMOVE THIS UNFAVORABLE FIRST IMPRESSION

With

THE CONFIDENCE THAT THIS PHILCO DEVICE GIVES THE SALESMAN, SIMPLIFIES SELLING

DEVLIN-DREW COMPANY

718 "F" Street

Fresno, California