

PHILCO SERVICEMAN



RADIO • MANUFACTURERS • SERVICE • NEWS

DECEMBER, 1940

Simple Operating Features Improve Home Recording Performance

EDITORIAL

PROFESSION INSURANCE

Almost every time we pick up a newspaper or magazine we can read about some marvelous new medical discovery which prolongs life or relieves human suffering. Most of us today, particularly those of us with a scientific trend of mind, have no use for the old fashioned pill doctor, but we have the most profound respect for the physician whose heart is in his work sufficiently to keep up with the times in a medical way. Certainly he is the one who is going to do us the most good when illness strikes.

New Ideas for Old

Yet there are endless cases of one-time good doctors who have become mediocre or even quacks because they hadn't the ambition and energy to keep up with their profession. And the same applies to radio men. The radio profession is just like medicine—constantly changing, constantly improving, and constantly moving forward to new heights of applied knowledge. Through never-ending research, old ideas are being discarded for new ones. Old methods are being thrown out because new and superior methods have been found. Circuit theories, whether they be the complicated circuits of the human body or the complicated circuits of modern radio and television, are ever-changing for the sake of improvement.

Moves Fast

A frequent excuse for the professional man who allows himself to fall back into mediocrity is that he is so busy he hasn't the time to devote to a study of the new things. This is perfectly understandable, but as time goes on, he will have lost so many cases that the first thing he knows he won't have any practice left. It is only through constant study and reading that a serviceman can hope to keep up with a profession which changes and moves as fast as radio. The time which he takes for such study today is his guarantee of a continued profitable and enjoyable career next year and for the years to come.

Practical Helps Being Passed Along To Dealers

The tremendous national popularity of Philco Home Recording is constantly bringing new demands for more and more helpful information so as to permit better recordings to be made. It is Philco's policy to pass along to all dealers and servicemen just as quickly as possible any new helps of this kind which might be of assistance.

When making home recordings, it is essential that the speed at which the record is cut, be kept at or near 78 RPM. The load imposed on the motor when cutting a record is much greater than when playing back the recording and, when the difference in speed between recording and playing is in excess of four RPM, it becomes quite objectionable. Increased satisfaction with home recordings will result when the following conditions are observed and adjustments are made for the most suitable operation.

1—Allow the phonograph motor to become thoroughly warmed up before attempting to make a home recording. Play six records or more so that the grease in the gears becomes thoroughly loosened.

2—The fiber gear on the home recording gear train that engages the spindle should mesh loosely with the spindle gear in order to avoid binding. It may be necessary to enlarge the mounting hole in the record changer base in order to obtain this condition.

3—The cutting arm height adjusting screw should be set so that the cutting arm is just 1/4" above the record. Put the cutting needle in the crystal and place it on the record near the spindle. Check the cutting arm height — 1/4" above the record.

4—The needle pressure is very critical. Philco Scale, Part No. 45-2851, should be used, so that needle pressure can be adjusted accurately to 1 1/4 ounces with the cutting needle placed near the spindle. The needle pressure must be checked just as the needle is raised from the record.

5—The crystal "low level" stop should be adjusted, if necessary, to obtain 1/2" of free movement of the crystal in the cutting arm. With the needle resting on a record, raise the cutting arm slowly. There should be from 3/16" to 1/4" of motion of the cutting arm before the cutting needle lifts from the record. This will allow a free vertical movement of the crystal, compensating for any slight wobble in the turntable or record.

6—At the first sign of fuzzy or poor tone when making home recordings, change the cutting needle, replacing it with a new Philco cutting needle. A cutting needle should make between ten and twenty good clear recordings before it becomes necessary to replace it.

Two types of needles have been furnished in the past. The first recording needle was of the type normally known as a plow type needle. The cutting face of this needle is curved so that it actually digs into the surface of the record. This type has been replaced with a newer type which can be distinguished very readily from the plow type because the cutting face of the needle is flat and is parallel to the axis of the needle. The plow type needle can be used to make 6" home recordings satisfactorily, but it should not be used to make 10" home recordings, since it cuts too deeply into the record and will slow up the phono motor while cutting the outer edge of the record. The new flat face needle will be satisfactory when making the 10" recordings.

PHONOGRAPH ACCESSORIES PROVIDE ENDLESS PROFIT CHAIN



Philco 6 1/2" Metal Base Home Recording Blanks, Packed in Album Type Envelope

The many accessory items in the Philco parts line offer dealers countless opportunity for extra profits when selling radio phonograph combinations. The best part about such business is that it is constantly repeating itself, constantly bringing floor traffic into your store—live prospects for you to interest in new radios, new refrigerators and new merchandise of all types that you might have on your sales floor.

Complete Line Record Blanks

Since most of the new Philco light beam pickup radio phonograph models are sold with home recording, the obvious immediate requirement is an adequate supply of home recording blanks and needles. The following is a listing of these various items in the Philco line:

6	6 1/2" Flexible Home Recording Blanks (Kit Part No. 45-2822)	\$.75
3	10" Flexible Home Recording Blanks (Kit Part No. 45-2823)	\$1.00
5	6 1/2" Metal Base Home Recording Blanks (Kit Part No. 45-2838)	\$1.00
5	10" Metal Base Home Recording Blanks (Kit Part No. 45-2839)	\$2.25
5	Home Recording Needles (Kit Part No. 45-2824)	\$1.00

Floor Type Mike

For those who want a table or floor type microphone for home recording, there is available the microphone stand, Part No. 35-4070, which is standard equipment with the famous Model 905 Portable Amplifier. The home recording microphone can simply be unscrewed from its base and then attached to the stand to provide a convenient floor type microphone. The stand sells at a list price of \$6.25, Philco Part No. 35-4070. If an exten-

sion cable is wanted for the home recording microphone, this is available in a 25' length complete with plug fittings attached for \$2.50 list, Philco Part No. 41-3601.

In addition to the home recording accessories, there are the standard Philco record player needles, Part No. 40-6459, which sell at 25c list for a package of 35 needles. Each needle is good for playing up to twenty records. The special Philco Long Playing Needle, Part No. 45-2726, which will play a thousand records, sells at a list price of \$1.00.

Record Albums

The Philco record albums for standard 10" and 12" records are repeat sales items which can be sold to almost every purchaser of a radio phonograph combination. The profit from the sale of a set of these albums is more than enough to pay the cost of a service call when adjustment of the radio or phonograph might be necessary in the home. People who might say in the store, "I guess I won't bother now", will buy these handsome record albums when they are shown in the home. The 10" album, Philco Part No. 45-2834, sells at a list price of \$1.50, and the 12" size, Philco Part No. 45-2835, sells at \$1.75 list.

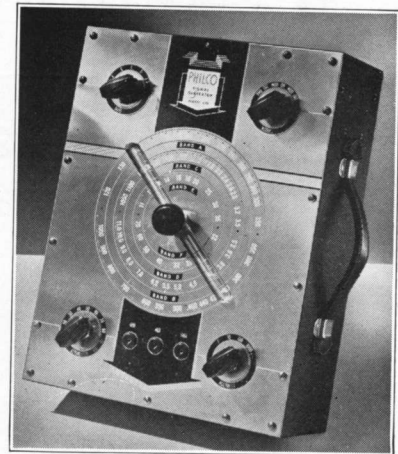
Every time a dealer sells a radio phonograph, he immediately opens up another outlet for repeat sales of accessories and supplies. The dealer who always has such supplies in stock and who makes it easy for the customer to buy them from a reminder display of some kind will profit not only from the direct sales of the accessories themselves, but from the sale of other household appliances which sales are the natural and never-failing result of *floor traffic*.

Special Resistor for Line Voltage Indication on 050 Tube Tester

There are some variations in the 25,000 ohm resistors used in the meter multiplier associated with the line voltage indicator of the 050 Tube Tester. This resistor is located on the wiring panel which is mounted on the power transformer. In order for the meter to indicate the line voltage correctly, the value of the resistor must be held within 2 1/2% plus or minus. A few cases have been reported where the resistance does not come within these limits.

The remedy is to replace the resistor with a special selected 25,000 ohm resistor. The Parts and Service Division will furnish these special resistors for this purpose, upon request.

New Signal Generator Announced by Philco



Philco's latest and finest contribution to the famous line of quality test equipment is the new Model 070 signal generator, successor to the famous Model 077.

From the appearance standpoint this new instrument is without question the most attractive that Philco has ever built. The panel is of polished steel baked lacquer with panel markings and control markings in three colors of baked enamel. The panel dimensions are 10" by 13" Antique bronze screws further offset the attractive panel. Of particular interest from the appearance as well as the operating standpoint is the new lucite magnifying pointer. Extreme accuracy in the setting is made possible by the greatly magnified hair-line indicator.

120 KC to 70 MC

The new signal generator covers on six different bands a frequency range from 120 K.C. to 70 M.C. Band A is from 120 to 350 K.C., band B from 350 to 1050 K.C., band C from 1050 K.C. to 3.5 M.C., band D from 3.5 to 11 M.C., band E from 11 M.C. to 35 M.C., and band F from 22 M.C. to 70 M.C. The calibrated attenuator ranging from 0 to 100 and the multiplier with ranges of 1, 10, 100, and 1000, provide convenient and accurate control of signal output. The medium and high output pin jacks provide further control of the output circuit.

Lucite Magnifying Pointer

One of the most desirable characteristics of the 070 is its complete freedom from strays and leakage signals. Because of the use of the lucite pointer indicator, which is a non-conductor, there is no leakage or radiation at this point as would be the case with a metal indicator arm. Complete shielding of the instrument in its metal panel and metal housing further prevents the possibility of any signal coming out of the unit except at the output terminals.

The Model 070 operates from standard 60 cycle A.C. power. The instrument is furnished complete with

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Record Changer Information Helps Promote Sales

Intermix Changer Adjustments Easily Made

Radio phonograph combinations are big business in the industry this year, and it is Philco's policy to furnish as much helpful information to dealers and servicemen as possible so that these fine new instruments can be kept in the peak of performance at all times.

Intermix Record Changer Adjustments

Before attempting any adjustments whatever, be sure that you are thoroughly familiar with the functions and with the cycle of operations of the record changer. These were fully described in the Philco Service Bulletin 369, dated October 1940. If a record changer is not operating properly, carefully analyze the operations before making any changes in the adjustments since many of the adjustments are interdependent. Changing one adjustment will often affect others.

Tone Arm Drag

Tone arm drag may be responsible for poor tone quality as well as faulty operation of the automatic record changer mechanism. With too much drag on the tone arm, the tone arm will not be free to follow the groove in the record and the sapphire will be pulled out of line and will turn the mirror so that the light beam is deflected from the light sensitive cell.

Too much drag on the tone arm may cause the changer mechanism to fail to trip at the end of the record. If the drag is too heavy, the sapphire will leave the spiral groove at the end of the record, when set for automatic operation. When set for manual operation, the friction of the clutch will cause the sapphire to jump from the trip groove at the end of the record, which is normal.

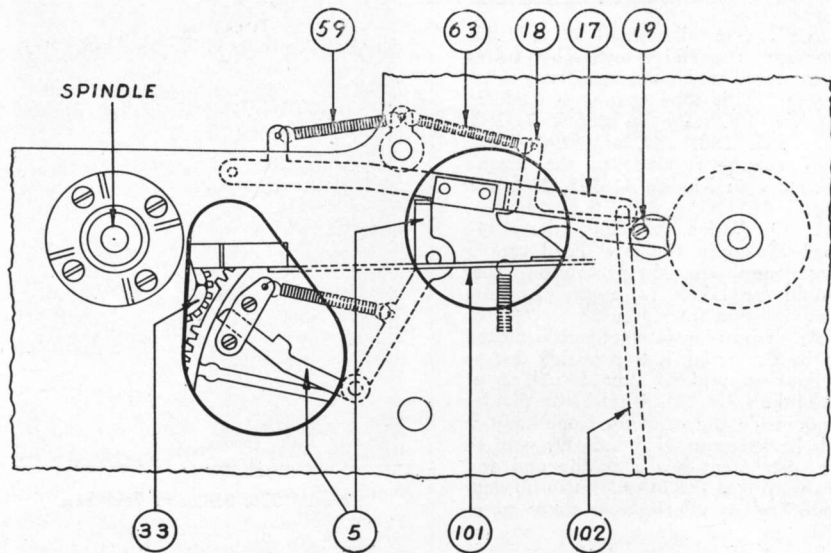
Since the grooves in the home recorded records are much lighter than the grooves in the commercial records, tone arm drag will cause the sapphire to jump out of the groove when playing home recordings.

The tone arm drag should be less than 1/10th of an ounce. To check this, the changer mechanism should be stopped with the clutch members disengaged, i. e. — with the clutch release lever 101 on a high spot on the cam on the intermediate gear 33. The record changer must be set for manual operation.

Block up the tone arm by inserting a piece of cardboard between the adjusting screw on the light beam pick-up mounting bracket and the tone arm. With a spring scale (Philco Part No. 45-2851) measure the tone arm drag. Attach the spring scale to the head end of the tone arm and measure the tone arm by pulling the head toward the turntable spindle. The drag should not be greater than 1/10th of an ounce. If the drag is greater it is caused by:—

(a) Insufficient clearance between the clutch members.

Watch the clutch assembly while swinging the tone arm back and



5—CAM LATCH AND TRIGGER ASSEMBLY
 17—TRIP ARM ASSEMBLY
 18—TRIP LEVER ASSEMBLY
 19—TRIP ADJUSTING CAM
 33—INTERMEDIATE GEAR ASSEMBLY
 59—TRIP ARM SPRING
 63—TRIP LEVER SPRING
 101—CLUTCH RELEASE LEVER
 102—TRIP LOCK ROD

forth. The two moving members of the clutch must not transmit any motion to the other two clutch plates. If the clutch is not opening enough, bend the forked end of the release lever 101 slightly to give greater opening between the clutch plates.

(b) Friction in the tone arm spindle assembly.

The tone arm shaft and the tone arm elevator pin must be free to lift up and down and must seat freely. If the spindle binds at any point it may be due to insufficient clearance in the hole in the end of the swing bracket 64, or the shaft or pin may be bent. If the shaft or pin is bent, it will be necessary to replace it. If there is insufficient clearance in the hole in the bracket, the stud at the other end of the bracket should be bent in the direction to give the proper clearance.

(c) Insufficient clearance between the trip lever 18 and the trip arm 17.

There must be a perceptible clearance between the trip arm 17 and the trip lever 18. With the changer set for manual operation, the trip lever 18 must pulse freely without rubbing on the trip arm while the motor is turning over. Also, the trip arm 17 must have a small amount of play and must not bind on the cam trigger 5.

This is covered under Trip Sensitivity, since these adjustments likewise affect the Trip Sensitivity adjustments.

Trip Sensitivity

In addition to tone arm drag, other conditions affecting trip operation are:—

(a) Too little tension or too much friction in the trip mechanism. To check trip sensitivity, the motor should be stopped and the clutch plates en-

gaged, i. e. — with the clutch release arm 101 on a low spot on the cam on the intermediate gears and with the master gear in the playing position. With the changer set for automatic operation, measure the pull of the tone arm required to trip the cam latch and trigger assembly. It should be between 3/8 and 5/8 ounces.

If the cam latch is released with less than 3/8 ounce tension, the mechanism will be too sensitive and will pre-trip in operation.

If more than 5/8 ounce is required to trip the cam latch, it is quite possible that the mechanism will fail to trip on an oscillating groove in a record. The amount of pull required to trip the cam latch can be adjusted by stretching or shortening the spring 59 on the trip arm, provided, however, there is no friction or binding of parts which is making the trip mechanism too insensitive.

With the motor stopped, change the control to the manual setting. There must be a small amount of play between trip arm 17 and the cam trigger 5. This can be obtained by bending the end of the trip arm 17 with a pair of pliers, twisting it toward the switch knob assembly. This is equivalent to lengthening the trip lock rod 102. There should not be so much play that the cam trigger 5 can be tripped by the movement of the trip arm 17 while in the manual position. After this adjustment has been properly made, there will be no apparent movement of the trip arm when changing from the manual to automatic setting.

There must be a perceptible clearance (.005") between the trip arm 17 and the trip lever 18 so that the trip

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Questions & Answers

1. Q. What simple change can be made to increase sensitivity in some of the larger models of the 1941 Philco line?

A. The installation of a 7H7 tube in place of a 7B7 is often helpful in cases where maximum sensitivity is required. This tube change is made in the first I.F. stage in Models 41-300, 295, 285, 280, 287, and 290. The same change is made in the second I.F. stage in Models 41-265, 260, and 250.

2. Q. When installing the 1941 Ford Philco in the new Ford cars is there any special precaution that should be taken to assure freedom from ignition interference?

A. If ignition interference is picked up by the aerial, it is probably due to a poor ground or complete lack of grounding on the windshield divider strip inside the car. In some cases it will be necessary to bond this strip to the instrument board at one end and to the roof at the other. Also on generator relays which have three terminals on one side and one on the other, it is necessary to ground the single terminal to the relay mounting lug.

3. Q. In Model 41-90 what is the reason for the .01 mfd. coupling condenser No. 13 in the wiring diagram of the instruction sheet being used in place of the .004 mfd.?

A. The substitution of a larger size condenser does not affect the operation of the radio in any way. If a smaller condenser than .004 were used, however, trouble would be encountered. This change was made simply for convenience in production.

4. Q. How is it possible to prevent the leads of a home recording cutting head from being caught on the tone arm height adjusting screw?

A. These leads can be wrapped around the spindle of the cutting arm clockwise two complete turns. This will prevent the leads from becoming caught on the height adjusting screw.

5. Q. What is the purpose of the small brush which is packed with the home recording kits?

A. This brush is intended to be used for removing the cuttings while making a home recording record. The cuttings should be brushed lightly over toward the spindle so that they will be wrapped around the motor spindle as the recording progresses. The brush must be moved over the record very lightly since if any considerable pressure were applied, there would be a tendency to slow down the motor and thus produce incorrect recording speed.

SERVICEMEN OFFERED EQUIPMENT BARGAIN



Model 026, 014, and Tool Bag

One of the greatest bargains ever offered in radio service equipment is now available through the Philco distributors. This combination includes the famous Model 026 Circuit Tester, the new Model 014 Push Button Signal Generator, and a sturdy zipper case tool bag, suitable for carrying both of these instruments as well as an adequate supply of necessary tools, all three for \$29.75 net. If desired, the Philco Model 044 audio signal generator can be substituted for the 026 at the same price.

Here is a chance for the serviceman to get some additional equipment, the kind that can be used conveniently and accurately, both in the shop and out on the job—and the kind that will take the abuse and punishment to which portable service equipment must necessarily be subjected.

For setting up push buttons on new sets or for resetting push buttons on sets which have been in operation for a period of time, the 014 signal generator is fast and accurate. When the new broadcast station frequency allotments go into effect, the 014 is going to be indispensable to the serviceman. The 026 has established a great name for itself in Philco's line of test equipment—another of those famous instruments that rang the bell so loud you can still hear it. Thousands of these have been sold and many more servicemen will want to add this model to their line of portable test equipment as a second unit in addition to the 027 signal generator which they might prefer to use in the shop. Servicemen

who do not now possess a good circuit tester will find the 026 a revelation in accuracy and time saving. Those who are adequately provided with circuit tester equipment can take advantage of the same offer with the 044 audio signal generator—the instrument so desirable in making audio amplifier and speaker tests.

Remember, you have your choice of the 026 circuit tester or the 044 audio signal generator; you also get the 014 push button signal generator, and the big roomy tool bag—all for \$29.75 net.

New Signal Generator Announced by Philco

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detachable power cord and also with output test leads.

Low Priced Quality

Now here is the best news of all. This fine new instrument, greatly improved over its predecessor, sells at a net dealer price of only \$29.75. You can see the 070 at your Philco distributor's Service Department now. Decide now that you are going to have the finest commercial signal generator both with the respect to electrical quality and appearance quality.

Record Changer Information Helps Promote Sales

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lever will pulse freely while the motor is running and with the mechanism set for manual operation. This can be obtained by adjusting the cam 19.

The spring 59 must have sufficient tension to return the trip arm to its normal position after the change cycle has started. If it does not, the trouble is probably caused by too much friction somewhere along the trip lock rod 102, which locks the trip arm and prevents it from operating when the mechanism is in the manual position. If this rod and the switch latch are absolutely free and do not bind whatever, and the switch arm still does not re-set itself, then the trip arm spring 59 requires shortening.

Correction

In the September issue of the Philco Serviceman the Philco Dial Drive Accessory Kit, Part No. 45-2840, was priced at \$1.88 net dealer price. This figure should have been \$2.70.

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