

# PHILCO SERVICEMAN

Circulation, Over 30,000 Copies Monthly



RADIO · MANUFACTURERS · SERVICE · NEWS



MAY, 1935

## Editorial

**I**N A recent mailing to all Radio Manufacturers Service members made by PHILCO from Philadelphia it was requested that members write in, giving suggestions and criticisms regarding the R. M. S. program.

The favorable response to this request justifies every claim made for R. M. S. The rapid growth of this organization and the increase in work and profits obtained by members prove that co-operation of all servicemen in this way is of tremendous help.

A few examples picked out from the hundreds of letters received are:

"I think diagrams showing changes in different model receivers is a great boon to repairmen, so keep up the good work."

"This is just the material we have been wanting for years. We hope you will keep up the good work."

"The R. M. S. lessons are very good. We surely appreciate the many ways PHILCO is using to advertise the dealer and R. M. S. member."

"I was pleased to receive the bulletin of changes in models."

"The system of using list prices in your catalog is a very great improvement."

"I want to thank you very much for the most valuable material which you are sending to servicemen."

"It may be of particular interest to you to learn that a very strong recommendation was made to the committee to be guided by and adhere as closely as possible to the same formula as suggested by the PHILCO Company in their Radio Manufacturers Service."

The letters of thanks and appreciation which so many R. M. S. members have sent in to PHILCO show that R. M. S. is on the right track, and they justify the further expansion of the organization. Along with this expansion will be a greatly increased amount of helps of all kinds to members. Among these helps will be frequent direct mailings from Philadelphia, a large number of an improved type of lesson, many new sales helps and much technical information.

This will be an important year for R. M. S. members.

## New Philco Under-Car Aerial

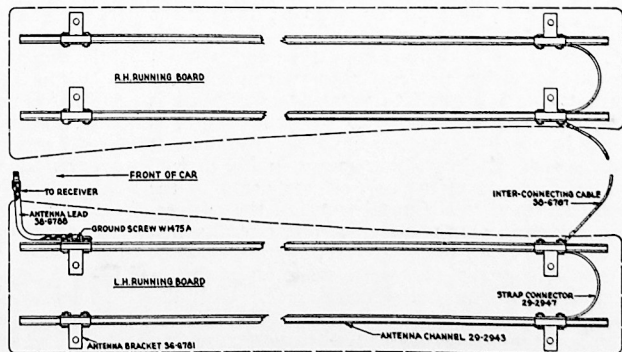
(Noise Reducing)

**A** NEW PHILCO under-car aerial, designed and perfected after many months of experiment in the PHILCO Research Laboratory, is now ready for the all-steel top automobiles. Some of the features of the new under-car aerial are noise reduction, efficiency in performance, neatness of appearance, and ease of installation.

The aerial is completely wired and assembled at the factory, so that it is necessary only to fasten the front and rear brackets under each running board onto the bolts which are already present, through the ends of the running board. The lead-in is soldered at the factory to the aerial itself, and the 66-inch length is ample to reach up to any radio to which connection is made by means of the connector soldered on the lead.

After this under-car aerial is installed, it is permanent and fixed, and as inflexible as the running board itself. There are no springs, no loose wires or other metal strips to vibrate, and the insulation against all road conditions and weather conditions is practically perfect. The quality of the material used is as fine as that of any similar material in the automobile itself. The aerial actually looks as though it were a part of the car. The aerial comes to you completely wired and assembled, ready to bolt on the car in one simple operation.

The list price of the new PHILCO under-car aerial, part 45-1128, is \$5.00.



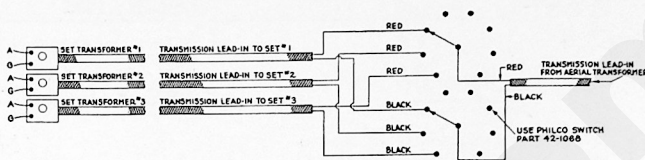
Philco Under-Car Aerial, Showing Method of Installing to Under Side of Running Board.

## Demonstrating in the Store

MANY dealers are confronted almost constantly with the problem of offering satisfactory radio demonstrations in the store. Noise from outside disturbances in many cases makes such demonstrations most difficult unless the PHILCO All-Wave or Three-Purpose Noise-Eliminating Aerials are employed.

When it is desired to demonstrate all-wave receivers in the store, the PHILCO All-Wave Antenna System should be employed. If all of the demonstrations are to be made at one point within the store, only one set transformer need be used. In order to get the most out of the noise-eliminating features of this aerial it is highly important that the set transformer, or switch box, as it is sometimes called, be placed at a point as near the antenna and ground terminals of the radio set as possible. This means that the set transformer should be connected to the end of the transmission line lead-in, but not permanently mounted on the wall or upon any cabinet, since various models will be used from time to time for demonstration. If the transformer is mounted on the wall, and comparatively long leads are run from the set transformer to the antenna and ground terminals of the receiver being demonstrated, considerable noise will be picked up and many of the benefits of the demonstration will be lost to the customer.

The PHILCO All-Wave Antenna System, unlike the PHILCO Three-Purpose Antenna System, is not adaptable for use with more than one set transformer on a single installation at any given time. If more than one demonstration point is required in the store, then a multiple switch should be arranged at some central point in the store so that a transmission line lead-in can be fed to any one of the different set transformers mounted at or near the various sets to be demonstrated. The diagram appearing on this page indicates clearly the method of connection, so that only one antenna



Switch Connections for Multiple Demonstration, Using PHILCO All-Wave Antenna.

transformer is connected to the lead-in and aerial system at any given time.

The PHILCO Three-Purpose Antenna System is intended for noise reduction on standard broadcast receivers only. The Three-Purpose Antenna will afford excellent noise-free reception and is particularly adaptable for store demonstration use because more than one outlet can be employed with a single aerial installation without any serious effect on sensitivity. This antenna system should not be used for short-wave demonstrations, however, because it is designed only for the standard broadcast band.

The use of a good noise-eliminating aerial system in the store will result in more sales of radio sets. The customer's reaction to any new radio set is invariably determined by what he hears the first time the set is turned on. If there is considerable noise when you attempt to demonstrate the set to him in your store, no amount of explaining on your part will serve to eliminate completely from his mind the fact that the radio is noisy. On the other hand, if you have a good aerial installation in your store, and if you get the flat portion of your aerial at a good height out of the noise field, you can give your customers the very best possible demonstration of a radio set, and you will profit accordingly by increased sales.

## Eliminating Interference From Electric Refrigerators

MOST of the electric refrigerators of the newer types are now completely filtered for radio interference. Many of the older units in operation, however, are bad offenders, with the result that the set owner is inclined to use his radio less than he would without the interference.

This trouble can be corrected with comparative ease simply by making the necessary installation of condensers in the power circuit. Most of the AC motors are of the induction type and will not produce interference except when starting. In the majority of AC installations where interference is experienced, it will be found that the trouble is caused by current leakage or improper grounding at some point. In general, the motor should be well grounded by means of a wire connection to the compressor and to the metal frame of the refrigerator box itself. In some cases, better results will be obtained by actually connecting this network to a nearby water pipe. In other cases, such a ground connection will increase rather than decrease the interference.

In some installations all of the interference can be taken out by placing two .5 mfd. condensers across the power line within a few inches of the

motor terminals. These condensers are connected in series across the line and the common center point of the condensers is then grounded to the frame of the motor. There may be some occasions when better results will be obtained by using only one condenser from one side of the line to the frame of the motor. In any case, the rated working voltage of the condenser should be somewhat in excess of the power line voltage, so that there will be no possibility of interruption of service.

The PHILCO tubular condenser Part No. 30-4007 is used extensively for this purpose. This is a .5 mfd. (200 working volts) condenser which sells at a list price of 50c, subject to your regular parts discount.

## FIRST TIME IN HISTORY

HAVE you seen the full-page ads on the PHILCO "All-Wave Aerial," beginning with the April 6th issue of *Collier's* and the April 20th issue of *The Saturday Evening Post*? This is the first time in history that any manufacturer has ever featured full-page national aerial advertising. This is just one more thing that PHILCO is doing to help dealers and R. M. S. members get more aerial business.

## RADIO INSTITUTE OF THE AUDIBLE ARTS

Philco Again Gives Servicemen Another Big Help in Making More Profit

THE Radio Institute of the Audible Arts, founded recently by PHILCO as a service to the radio public, is a direct stimulus to the business of the members of Radio Manufacturers Service.

Through news letters, program bulletins listing outstanding offerings on the air, studies of various aspects of radio by recognized authorities, active correspondence with group leaders the country over, and full page advertisements appearing in *The Saturday Evening Post* and *Collier's*, the Institute has been fulfilling its purpose of stimulating wider appreciation of available programs and fuller utilization of the radio as an instrument of entertainment and education.

All of these activities are of definite, practical value to R. M. S. men. From the many communications received by the Radio Institute from correspondents in all parts of the country, we know that its activities have awakened new interest in radio; have increased the hours of listening and the number of listeners; and that these listeners, because they appreciate the worth of the service rendered them by the Institute, are grateful to PHILCO.

To the serviceman, this increased use of the radio means more business, for the more the public uses the radio and the more interested it is, the more the serviceman will be needed to keep the sets in perfect condition. Through the Radio Institute of the Audible Arts PHILCO is making it possible for any R. M. S. man to increase his business, not only by stimulating more interest in radio, but also by creating even more good will for PHILCO than ever, which in turn is reflected favorably on servicemen who are members of R. M. S.

Capitalize on PHILCO'S Radio Institute. Acquaint your customers with the services offered by this organization. Get copies of the program bulletins from your distributor, and leave them with customers when you call. Also distribute copies of the envelope-size folder which explains the purpose and activities of the Institute. Encourage music leaders, educational and club leaders with whom you have contact, to get in touch with the Radio Institute of the Audible Arts, at 80 Broadway, New York City.

By making the Institute as widely known as possible in your community, you will be encouraging radio owners to listen in more frequently, which will result in more business for you as members of R. M. S. And you will be taking full advantage of the good will that the Institute is earning for you.

## PHILCO REDUCES PRICE ON AUTOMOBILE RADIO LOCK FORMERLY \$1.25, NOW \$1.00

**STEAL RADIO FROM PARKED CAR**

**AUTO-RADIO ROBBERS JAWED**

### PHILCO AUTO-RADIO LOCK

*Protect Your Auto Radio from Sneak Thieves!*

**Cheapest Kind of Insurance!**


**PROTECT YOUR CAR FROM DAMAGE BY THESE MARAUDERS WHO WOULD MUTILATE IT WHILE ATTEMPTING TO STEAL THE RADIO!**

**STOP THIEF!**

**STOP THIEF!**

**STOP THIEF!**

**STOP THIEF!**



**\$1.25 INSTALLED**  
(COMPLETE WITH TWO KEYS)

SERVICEMEN and dealers who do automobile radio service and installation work will be glad to learn that the PHILCO automobile radio lock has recently been reduced in price from \$1.25 list to \$1.00 list.

The auto radio lock has been a favorite item with thousands of auto radio set owners, because it enables them to lock the set in the car permanently without any danger of the set being stolen. A special bolt is supplied with the lock to replace one of the present mounting bolts. The body of the lock fits over the end of the special bolt on the motor side of the dash. The entire construction is of heavy tool steel, making it almost impossible to remove the lock under any circumstances without the key.

Your PHILCO distributor can supply you with the locks at the new low price, and you should be in a position to sell one of these to each of your customers for whom you have made an automobile radio installation.



**BOAKE CARTER'S R.M.S. Broadcasts**



Here is another of Boake Carter's recent broadcasts to get more business for R. M. S. members:

"But PHILCO'S changed its old order, too, with results that shock, because one can hardly credit one's ears. A new all-wave aerial has been perfected by PHILCO engineers. This time, they said, no matter where you live, in a big city, or out in the country, reception on your own radio will be immensely improved. Prove it, I scoffed. And prove it they did, and how, to use the vernacular. It means reception almost as good for the city man as the fellow in the country. The difference between the old and the new aerials is unbelievable, until you've heard the difference yourself. A Radio Manufacturers Service man can put it up. He'll do it the right and proper way—and then, tune for yourself and see if I'm not right and not exaggerating."

# Complete List of All Philco Volume Controls

Part No.	Model Set or Replacement	Value	Switch	Remarks	Part No.	Model Set or Replacement	Value	Switch	Remarks
3076	86-76-511	10,000 ohms	No	Carbon	33-5032	Replacement	20,000 ohms	Yes	Carbon
3528	65	2000 ohms	No	Wire	33-5033	Replacement	20,000 ohms	Yes	Carbon
3790	95	500,000 ohms	No	Carbon	33-5034	Replacement	12,000 ohms	Yes	Carbon
3879	76	250 ohms	No	Wire	33-5035	Replacement	8000 ohms	Yes	Carbon
4056	40	1750 ohms	No	Wire	33-5036	Replacement	5000 ohms	Yes	Carbon
4093	30-96-111-112	500,000 ohms	No	Carbon	33-5037	Replacement	50,000 ohms	Yes	Carbon
4094	20-21-41-42-77	250/5000 ohms	No	Dual-wire	33-5038	Replacement	20,000 ohms	Yes	Carbon
4141	46	1750 ohms	No	Wire	33-5039	Replacement	500,000 ohms	Yes	Carbon
4463	3	1 megohm	No	Carbon	33-5040	Replacement	2000 ohms	Yes	Wire
5056	370	210/5000 ohms	Yes	Dual-wire Counter-clockwise	33-5041	Replacement	2 megohms	No	Carbon
					33-5042	Replacement	1 megohm	No	Carbon
					33-5043	Replacement	500,000 ohms	No	Carbon
					33-5044	Replacement	250,000 ohms	No	Carbon
5039	70(no AVC)—90 (2-45s) 470	210/5000 ohms	No	Dual-wire	33-5045	Replacement	100,000 ohms	No	Carbon
5232	50	1750/5000 ohms	No	Dual-wire	33-5046	Replacement	20,000 ohms	No	Carbon
5317	35	5000/5000 ohms	No	Dual-wire	33-5047	Replacement	20,000 ohms	No	Carbon
5724	90 (with 1-47)—490	500,000 ohms	No	Carbon	33-5048	Replacement	12,000 ohms	No	Carbon
6015	70 (AVC)—90 (2-47s)	1 megohm	No	Carbon	33-5049	Replacement	8000 ohms	No	Carbon
6109	7	100,000 ohms	DPST	Carbon	33-5050	Replacement	100,000 ohms	No	Carbon
6415	48-51-52	5000 ohms	No	Wire	33-5051	Replacement	50,000 ohms	No	Carbon
6499	47-71-91 (early)	1 megohm	No	Carbon	33-5052	Replacement	20,000 ohms	No	Carbon
6892	43	1 megohm	Yes	Carbon	33-5053	Replacement	500,000 ohms	No	Carbon-tapped
7050	15 (Code 221)	350,000 ohms	No	Carbon	33-5054	Replacement	2000 ohms	No	Wire
7239	37	5000/5000 ohms	No	Dual-wire	33-5055	S4	20,000 ohms	Yes	Carbon
7322	8	350,000 ohms	DPST	Carbon	33-5056	G	500,000 ohms	Yes	Carbon
7325	6-9-12-A-B	1 megohm	DPST	Carbon	33-5057	58-59	20,000 ohms	Yes	Carbon
8054	15-14-91 (late)	350,000 ohms	No	Carbon-tapped	33-5058	Substitute 38-5606 AC-206	500,000 ohms	Yes	Carbon
33-5000	19 (with police band)	350,000 ohms	No	Carbon-tapped			350,000 ohms	No	Carbon
33-5001	53	20,000 ohms	Yes	Carbon	33-5063	32	350,000 ohms	Yes	Carbon
33-5002	81	20,000 ohms	Yes	Carbon	33-5064	34	350,000 ohms	Yes	Carbon
33-5003	Obsolete (substitute 6415)				33-5066	Substitute 33-5097 28-29-45	350,000 ohms	Yes	Carbon-tapped
33-5004	19 (No police band) 89 (No police band) 89 (After Run 16, Code 123)	350,000 ohms	Yes	Carbon	33-5067	G (Code 122)-N	350,000 ohms	Yes	Carbon-tapped
					33-5068	144	350,000 ohms	Yes	Carbon-tapped
					33-5069	18 (Code 124)	350,000 ohms	No	Carbon-tapped
					33-5071	200-201	500,000 ohms	Yes	Carbon-2 taps
33-5005	80	20,000 ohms	Yes	Carbon	33-5077	Replacement	50,000 ohms	Yes	Carbon
33-5006	60-66	350,000 ohms	Yes	Carbon	33-5078	Replacement	50,000 ohms	No	Carbon
33-5007	89 (With police before Run 16, Code 123)	350,000 ohms	No	Carbon	33-5079	Replacement	30,000 ohms	Yes	Carbon
33-5008	048 (early)	250 ohms	No	Wire	33-5080	Replacement	30,000 ohms	No	Carbon
					33-5081	Replacement	10,000 ohms	Yes	Carbon
					33-5082	Replacement	10,000 ohms	No	Carbon
33-5009	5	350,000 ohms	Yes	Carbon	33-5087	38 (Code 123)	20,000 ohms	No	Carbon
33-5010	54	350,000 ohms	Yes	Carbon	33-5088	PI-CZ-DU-SE-C6	350,000 ohms	Yes	Carbon-tapped
33-5011	57	20,000 ohms	Yes	Carbon	33-5094	38	20,000 ohms	No	Carbon
33-5012	Obsolete—substitute 33- Models 16 and 17	5015 (interstation)	suppres	sion control)—	38-5280	19 (Old dial) C-D	250,000 ohms	Yes	Carbon-tapped
33-5013	Obsolete—substitute 33- Models 16 and 17	5022 for Model 16			38-5511	10 (Airplane) E	250,000 ohms	Yes	Carbon-tapped
33-5014	Obsolete—substitute 33- Models 16 and 17	5023 for Model 16			38-5534	S00-700-H-R-DPV (Air- plane)	500,000 ohms	Yes	Carbon-tapped
33-5017	38 (Below Code 123)	20,000 ohms	No	Carbon	33-5606	S00-11-J-Q (Old dial)	500,000 ohms	Yes	Carbon-tapped
33-5018	Substitute 38-5280				38-5851	S00-10 (Code 122)	350,000 ohms	Yes	Carbon-tapped
33-5020	39	350,000 ohms	DPST	Carbon	38-5935	C (Code 122)—D (Code 122)	350,000 ohms	Yes	Carbon-tapped
33-5021	048-025	250 ohms	Yes	Wire	38-6022	H (Code 122) Packard	350,000 ohms	Yes	Carbon-tapped
33-5022	16	2 megohms	Yes	Carbon-tapped	38-6297	AC 266	350,000 ohms	Yes	Carbon-tapped
33-5023	17	2 megohms	Yes	Carbon-tapped	38-6055	S06	350,000 ohms	No	Carbon-tapped
33-5024	118-18 (Codes 121-2-3)	350,000 ohms	Yes	Carbon-tapped	33-5070	Substitute 33-5103 200- 201	8775-2000-8775 ohms	Yes	Carbon-tapped
33-5025	44	350,000 ohms	Yes	Carbon					
33-5027	Replacement	2 megohms	Yes	Carbon	33-5083	Substitute 33-5103 200- 201	8775-1500-8775 ohms	Yes	Carbon-tapped
33-5028	Replacement	1 megohm	Yes	Carbon					
33-5029	Replacement	500,000 ohms	Yes	Carbon					
33-5030	Replacement	250,000 ohms	Yes	Carbon	33-5072	Substitute 38-5851 (10- D-Code 122)	350,000 ohms	Yes	Carbon-tapped
33-5031	Replacement	100,000 ohms	Yes	Carbon					

PHILCO RADIO & TELEVISION CORP. OF CALIFORNIA

218 Fremont Street

San Francisco, Cal.

PRINTED IN U. S. A.

I. I. FARWELL, Service Manager

# RADIO MANUFACTURERS SERVICE



PHILCO RADIO & TELEVISION CORP., of Calif.

218 Fremont Street

San Francisco, Cal.

R. M. S. HEADQUARTERS

Garfield 5232

May 13th, 1935

TO ALL R.M.S. MEMBERS:

You will have use for the Philco "Want Pad" enclosed with this issue of the "SERVICEMAN". Hang it up in your store or shop to facilitate the quick delivery of GENUINE PHILCO PARTS.

Here is how it works. Beside being a "memo", there are ten postcards in the pad which are already addressed to PHILCO, and which require no postage. When you require an all-wave aerial, condenser, resistor, etc. for a Philco or any make of radio, simply jot it down on a card and mail it.

May we ask, as a favor to avoid delay, that you order by catalog or service bulletin part number, as well as description. The reference to model number of the Philco set for which the part is required is also helpful.

Philco's Fall Season opens June 1st, and we sincerely hope that you will enjoy with us some of the Philco prosperity and success which has been so evident. As a tip - SELL GENUINE PHILCO PARTS AND TUBES for all your service work, and create a satisfied group of customers. Avoid the use of cheap or doubtful parts.

Thanking you for past favors, we are

Yours very truly,

PHILCO RADIO & TELEVISION  
CORPORATION OF CALIFORNIA

By IVYN I. FARWELL  
Parts & Service Division

IIF:J

# BIG NEWS!

## WESTERN UNION TIES UP WITH RADIO MANUFACTURERS SERVICE

THE COMPANY WILL APPRECIATE SUGGESTIONS FROM ITS PATRONS CONCERNING ITS SERVICE

1291-S

**CLASS OF SERVICE**

This is a full-rate Telegram or Cablegram unless its deferred character is indicated by a suitable sign above or preceding the address.

**WESTERN UNION**

H. B. WHITE  
PRESIDENT

NEWCOMB CARLTON  
CHAIRMAN OF THE BOARD

J. C. WALLEVER  
FIRST VICE-PRESIDENT

**SIGNS**

DL = Day Letter

NM = Night Message

NL = Night Letter

LC = Deferred Cable

NLT = Cable Night Letter

Ship Radiogram

The filing time as shown in the date line on full-rate telegrams and day letters, and the time of receipt at destination as shown on all messages, is STANDARD TIME.

Received at

## The Most Marvelous Plan Ever Announced for Increasing Your Radio Service Business

Here it is—by special arrangement made by PHILCO with the Western Union Telegraph Company, the millions of radio owners throughout the entire United States can now contact you for radio service simply by telephoning Western Union.

Think of what this means! You know that tens of thousands of radio owners right this minute want radio service. They don't know which way to turn. They don't know where you are located or how to get in touch with you. But now—by means of this splendid PHILCO-Western Union contact plan—this entire vast market is to be opened to you and all other R. M. S. members.

### Here is how the plan works:

1. Customer needs radio service.
2. Asks any telephone operator for Western Union.
3. Tells Western Union "I want an R. M. S. man to repair my radio."
4. These calls are delivered by Western Union to PHILCO distributor.
5. PHILCO distributor selects R. M. S. member nearest customer.
6. Selected R. M. S. member is called on telephone or mailed a "Service Call Notice."
7. R. M. S. member pays PHILCO distributor ten cents for each Western Union-PHILCO Service Call.
8. You call on customer and inspect radio.
9. Give customer estimate on repair.
10. Complete the service call and collect your charges for work completed.

### Here is how it will be advertised:

1. Boake Carter will tell an audience estimated at 40,000,000 people to simply call Western Union in order to get R. M. S. Service.
2. Every PHILCO owner is told that when he wants expert radio service he should call Western Union and ask them to have a Radio Manufacturers Service man call.
3. National PHILCO advertising will tell the public to call Western Union in order to get R. M. S.
4. Local tie-in advertisements run by PHILCO distributors will also instruct the public to call Western Union for R. M. S.
5. Direct mail literature, hand bills, envelope stuffers and local dealer and serviceman advertisements will carry copy identifying R. M. S. with Western Union and Philco.

There will be a great deal of public interest in this plan. Western Union commands a great deal of prestige and good will on the part of the public. PHILCO, in founding R. M. S., lends its name and good will to your service job. R. M. S. members will be sent to customers by PHILCO through Western Union. PHILCO will give you an R. M. S. identification card which will identify you as a member. You will get your card by mail, direct from PHILCO, early in June.

PHILCO distributors will require that expert workmanship, ninety days' guarantee to the customer and genuine PHILCO parts shall be used on each Western Union-PHILCO Service Call.

**REMEMBER—Only Ten Cents for Each Service Call**

## Editorial

### LICENSING WILL NOT SOLVE SERVICE PROBLEMS

WHETHER the radio serviceman is licensed or not will not be the important factor in his business. Licensing will not bring him more customers, nor will it make him more money. More service work and more profits can and will be had by radio servicemen who build up a reputation for doing quality repair work at reasonable prices.

### Do You Remember When — A Few Years Ago

PRICES for radio service work varied with every serviceman because there was no gauge of a standard price schedule?

Every radio serviceman was an individual operator working entirely alone and without the benefits and prestige of national association?

Such a thing was never heard of as publicizing the radio service industry over a nation-wide broadcasting chain every week?

Most of the men engaged in radio service work were up against the advertising of the fifty-cent service call gyps?

Thousands of people were being victimized every day by "tube jerkers" pretending to be high-class servicemen?

## Philco Announces THE NEW MODEL 088 ALL-WAVE SIGNAL GENERATOR



PHILCO'S Latest Service Contribution—The Model 088 Signal Generator.

ONE of the finest all-wave signal generators ever offered to the serviceman has just been announced by PHILCO.

This new piece of service equipment is known as PHILCO Model 088 All-Wave Signal Generator. It has five separate scales, each of which is accurately calibrated and easy to read. The scales range continuously in frequency from 110 K.C. to 20 megacycles. In each case the individual scale is a fundamental oscillator frequency range. In other words, no harmonics are used to get additional ranges, because in each case the oscillator circuit is operating on a fundamental frequency at all times. The attenuator is continuously variable, but is calibrated in ten points, making it possible to obtain measurements of sensitivity when testing the receiver.

The panel of the Model 088 is furnished in attractive chromium plate or polished brass. It is made in both styles so that the thousands of servicemen who have already purchased the PHILCO Model 025 circuit tester can obtain the brass-panel Model 088 and thus have a complete set of test equipment all in one unit. A special wooden case is available as a separate item, so that the Model 088 and the Model 025 can both be carried together as a complete unit.

The circuit of the 088 is a highly stabilized electron-coupled oscillator arrangement using the type 1C6 tube. This tube operates on two 22½-volt "B" batteries and two 1½-volt flashlight cells. The 8-ohm resistor in series with one side of the flashlight battery produces the filament voltage of the proper value for the 1C6 tube.

The 088 has been designed by the PHILCO Research Department in conjunction with the PHILCO Service Department, and affords all of the desirable features which the serviceman requires in an all-wave signal generator.

The list price of the Model 088 is \$32.50, making a net price to the serviceman of only \$19.50. Be sure to see this latest PHILCO development now at your PHILCO distributor's Service Department.

and . . . the most *Complete*

★ SERVICE and TEST UNIT ★

Available to Service Men

# PHILCO Model 099

*Combination* ALL-WAVE SIGNAL-GENERATOR and CIRCUIT-TESTER

*Includes*

THE NEW PRECISION

**PHILCO 088**

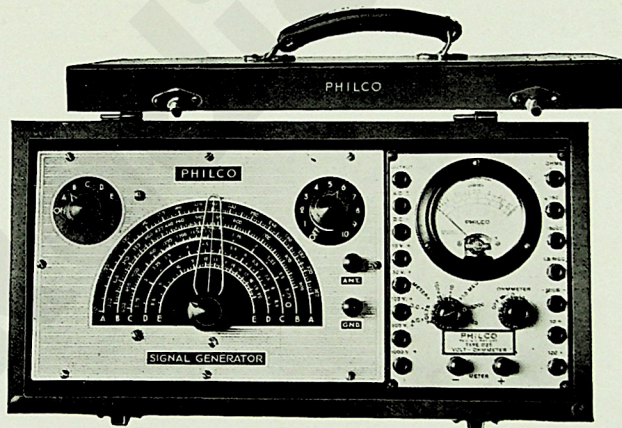
All-Wave Signal-Generator

(Described On Other Side)

and the WORLD FAMOUS

**PHILCO 025**

Circuit Tester



*Finest Precision Complete Radio-Servicing Unit!*

### Model 025 Circuit Tester

(Built into Model 099)

PHILCO'S famous complete testing unit for making all tests on a radio receiver: Voltage, Current, Resistance, Capacity and Output.

5 A. C. Voltage Ranges: 0-10 volts; 0-30 volts; 0-100 volts; 0-300 volts; 0-1000 volts.

5 D. C. Voltage Ranges: Same as A. C. Ranges listed above.

5 Output Meter Voltage Ranges: Same as A. C. Ranges listed above.

3 Milliammeter Ranges: 0-1 mil.; 0-10 mils.; 0-100 mils. Special 10 amperes shunt included for automobile radio current tests.

3 Ohmmeter Ranges: 0-1½ megohms; 0-15000 ohms; 0-150 ohms. Meter adaptable for capacity tests. Rotary Switch controls all meter ranges and connections.

### EVERYTHING THE SERVICEMAN NEEDS

PHILCO Model 099 provides the serviceman with the highest type complete radio servicing unit. The new "088" All-Wave Signal Generator, plus the now well-known "025" Circuit Tester, covers every possible need of the serviceman, and guarantees him 100% accuracy in all testing and adjusting operations.

The two units are fitted into a beautiful polished walnut case and all necessary connecting leads and adapters required for making the various operations and tests are included. A quality instrument throughout—in both appearance and performance.

**PHILCO Model 099**

**Combination Unit**

**COMPLETE, IN WALNUT CASE**

**\$100<sup>00</sup>**  
LIST PRICE



# Another Achievement of PHILCO ENGINEERING DESIGN

## New . . . . . PHILCO "088"

Designed and Perfected in the Research Laboratories of PHILCO, World's Largest Radio Manufacturer. . . . Guaranteed to produce a precision job of alignment on any type Radio Receiver. . . .

*All-Wave*  
**SIGNAL GENERATOR**

**Fundamental Frequency**

**MODEL 088**  
*All-Wave*  
**SIGNAL GENERATOR**

ONLY  
**\$32<sup>50</sup>**  
(Less Batteries)  
**LIST PRICE**

Full Discount to Servicemen

### SPECIFICATIONS OF MODEL 088

**Variable Condenser:** Extremely low loss, low capacity rugged condenser designed especially for service use.

**Wave Bands:** Five, giving continuous frequency range from 110 to 20,000 kilocycles. All frequencies appear on the scales on panel in large readable numerals. No charts, graphs or curves to bother with.

**Compensation:** Individual compensating for each wave band, not affecting any of the others. Special XM262 formula moulded compensating condensers. Moisture-proof and unaffected by temperature change.

**Coils:** Specially designed solenoid-type coils used on all high-frequency bands, giving permanent stability of frequency calibration.

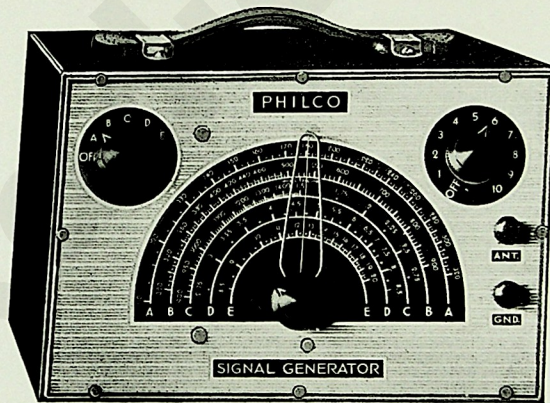
**Waveband Switch:** Combined with on-off switch: first clockwise movement places unit in operation.

**Signal Attenuation:** 20,000 to 1 in broadcast band; more than sufficient range for realigning sets which are completely "out," yet signal can be reduced to minimum for "hairline" adjustment of sensitive circuits.

**Knobs:** New type knurled knobs with built-in pointer. Frequency control knob is special type with hairline indicator.

**Panel:** Satin finish, chromium plated; special design of extremely attractive appearance.

**Case:** All metal, black crackle finish.



MODEL 088 SIGNAL GENERATOR

LOOK AT THESE FEATURES!

- ALL-WAVE:  
110 K.C. to 20 M.C.
- All Fundamental Frequencies  
No harmonics used
- Ball-bearing Tuning  
Smooth and accurate;  
5 to 1 reduction ratio
- All Standard I.F.'s Appear  
on the Scale
- Direct Reading Scales
- Precision Calibration
- New PHILCO Tube,  
Designed for High  
Frequency Use
- Self-modulated
- Vibration Proof
- Super-stability
- Electron-coupled
- Non-drift Padders
- 400-cycle Modulation
- Extremely Economical
- All Necessary Clips and  
Leads Furnished

# PHILCO

REG. U.S. PAT. OFF.

## HEADPHONE and ADAPTOR KIT

### INSTRUCTIONS FOR USE

The **PHILCO Headphone Kit** is easily connected to practically all radios in use today. In those sets having a single tube output stage, the adaptor is used in the output stage socket. In those sets having a driver tube ahead of the output stage, the adaptor plugs into the driver tube socket.

The **Headphone Adaptor Kit** can be used with radios of any make that are in either one of the two groups as described above.

Following is a list of the **PHILCO** radio models with which the adaptor can be used without changing any connections. Sets marked with an asterisk use a driver tube, and the adaptor plug must be placed in that socket.

MODEL	MODEL
*14 (Code 121 and 122)	60
*16	66
*17	71
*18	80
19	81
22	84
28	89
29	118*
32	144
43	200*
44	201*
45	610
48	611
53	620
54	630
57	650*
58	660*
59	116*

### INSTRUCTIONS FOR CONNECTING

1. Remove the output tube (last tube, type 41, 42, 43, 2A5) from its socket; or the driver tube on set starred in list above.
2. Insert the adaptor plug into the socket in place of the tube.
3. Insert the tube which you removed into the holes in top of the adaptor plug.
4. Insert phone plug into jack at end of adaptor box.

### INSTRUCTIONS FOR USE

The operation of the radio is the same when using headphones as when using the speaker. However, since less volume is required to operate the phones, the volume control on the set can be kept turned down to a low level.

# PHILCO

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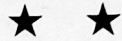
TORONTO

PHILADELPHIA

LONDON

# PHILCO

REG. U.S. PAT. OFF.



... *Another Convenience*

for Radio Owners ...

## ... HEADPHONE RECEPTION ...



**PHILCO HEADPHONE AND ADAPTOR KIT**  
A useful addition to ANY RADIO

- Ideal for the Short-wave Fan . . .
- Just right for the late-hour "D-Xer". . .
- Perfect for the "Individual Listener"

**"LISTEN IN". . . at any time WITHOUT DISTURBING OTHERS!**

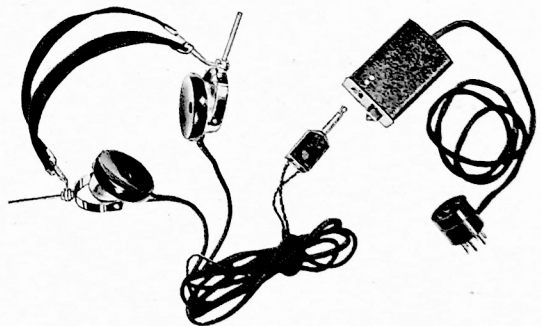
Here is a new PHILCO product which fills a long-felt need. Enables the radio owner to listen in comfortably, at any time of the day or night, without disturbing anyone. A desirable accessory for any radio.

Extremely light weight DeLuxe headphones—can be worn for hours without discomfort, and provide maximum sensitivity to weak signals from distant stations.

For Deaf Persons: Many persons who are hard-of-hearing can enjoy headphone reception although unable to hear the radio when operated in the usual way. The Philco Headphone and Adaptor Kit fits their needs perfectly.

### FEATURES:—

1. Easy to connect!  
(Just plug into tube socket.)
2. Speaker automatically cut out while headphones are in use.
3. Light weight, highest quality headphones give maximum comfort and finest tone.
4. Can be left connected permanently—does not affect tone of speaker.
5. Operates on radios with either a single output tube or a driver tube ahead of the output (see list of PHILCO models on back of this sheet).



See back of sheet for instructions.

**PHILCO HEADPHONE AND ADAPTOR KIT** **\$7<sup>50</sup>**  
Part No. 45-1167  
Complete with  
DeLuxe Lightweight Phones  
LIST PRICE