

# PHILCO SERVICEMAN

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RADIO · MANUFACTURERS · SERVICE · NEWS

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## Radio Manufacturers Service

EDITORIAL

**WE BELIEVE** that one of the quickest ways to improve conditions in the radio service industry is to get a large number of servicemen to advertise their business.

Many servicemen go along day after day without making any special effort to get any business from the prospects in their territory. An intensive advertising and sales promotion campaign put on by servicemen would automatically build up the good men and help weed out those who are inefficient or who, for some reason or another, do not belong in the business.

If an inefficient serviceman does this advertising and gets a number of calls from it, his customers will be dissatisfied, and it will not take very long for the news to spread around that his work cannot be depended upon.

A dependable serviceman, through advertising, will get increased business and, therefore, an increased number of satisfied customers, all of whom will bring him additional business.

A man who is not dependable will not be able to keep himself in business simply by advertising. A dependable man will find that his business will increase rapidly and become more profitable through the use of a consistent plan worked out to tell the people in his community that they can get their radios repaired by him and that the job will be done right.

Of course, a serviceman can write his own newspaper "ads," prepare his own handbills, and write his own letters for distribution in his neighborhood. In those cases where a serviceman has had previous experience in this line they might be satisfactory. In most cases, however, the serviceman would find it advisable to use the materials prepared and supplied through Radio Manufacturers Service in co-operation with the Philco advertising agency.

It seems reasonable that an agency of this kind, with their years of experience in the preparation of advertisements that get results, will be able to do a better job for the serviceman than if he attempted to do it himself.

In the past month advertising material supplied from Radio Manufacturers Service headquarters has been used in many parts of the country, with very gratifying results. It has helped many servicemen get started toward the Radio Manufacturers Service goal of "MORE SERVICE JOBS AND MORE PROFIT."

Advertise your business, but before spending your money for any advertising make sure that it is the kind which will actually get you more service jobs so that you too will have more profit.

## Microphonic Difficulties in Short-Wave Receivers

**S**HORT-WAVE radio receivers are much more subject to microphonic howl and vibration than standard broadcast receivers. There are many reasons for this condition, and when installing and servicing a short-wave set the serviceman must bear these items in mind.

When dealing with short waves it must be remembered that the tuning of relatively wide kilocycle bands is covered by comparatively small capacity and inductance changes. For example, a slight shifting in the adjustment of one or more of the high-frequency compensating condensers can throw the circuit out of alignment considerably. Occasionally such a thing as a vibrating compensating condenser plate will be found. Any sound from the speaker will tend to start this plate vibrating. This vibration alternately increases and decreases the condenser capacity by a very small amount, but in such a way as to set up a reproduction of this vibration in the form of a howl.

### VIBRATING ROTOR PLATE

Slight capacity changes of this nature can likewise be set up in the wiring to one of the high-frequency circuits or in the tuning condenser. Such vibration is occasionally traced to a vibrating plate in the rotor of the oscillator gang section. Since the tuning condenser can easily produce a howl, it is important that the entire condenser be flexibly mounted on soft rubber. Furthermore, it is necessary that the entire chassis be carefully supported on rubber and that no part of the chassis, such as the control shafts, be allowed to touch the cabinet.

One of the most common sources of microphonic trouble in short-wave receivers is in the tubes. A tube which has any microphonic tendencies will be much more likely to cause difficulty in a short-wave receiver than in a broadcast receiver. Here again the reason for the microphonic howl is due to the small capacity changes in a circuit when one or more of the elements in the tube vibrate.

### "FLUTTER" IN OSCILLATOR CIRCUIT

One of the less frequently encountered types of trouble in short-wave receivers is a noise which may be confused with microphonics, but which can more accurately be described as a flutter. This condition takes place when the receiver is tuned to a strong short-wave carrier. The noise is started when a strong electrical shock is imparted to the circuit, such as that which might be produced when a heavy musical note or chord is struck. The strong note produces a shock to the circuit by virtue of the heavy instantaneous current drain. Unless the circuit is adequately filtered to compensate for this shock, the excessive power drain will be reflected in the oscillator circuit by a slight fluctuation in the oscillator plate and grid voltages. This voltage change is sufficient to throw the oscillator slightly out of alignment for the instant. This instantaneous condition is amplified through the circuit and again reaches the audio portion, where further shock and voltage change are again reproduced. The same cycle of events takes place time after time, with a resulting flutter in the reproduction.

### INCREASE FILTER CAPACITY

In the PHILCO short-wave receivers a resistance and capacity filter is provided to overcome this condition. In the Model 16 this filter is seen as No. 84 resistor and No. 62A condenser in the wiring diagram of Service Bulletin No. 165. In some chassis of the Model 16 it may be found on rare occasions that an increase in the capacity of condenser No. 62A is required to eliminate this tendency of the circuit to flutter. It will be found that in the majority of cases the reason for the flutter is not because of any defect in the set, but because of peculiar local receiving conditions. An increase from 2 mfd. to 8 mfd. will entirely remedy the trouble.

## Correct Impregnation Overcomes Wire Leakage

THE demand for better hook-up wire every day becomes more apparent. New high-gain radio frequency systems and short-wave receivers required a new type of wire and insulation for efficient performance.

The insulation resistance power factor and moisture absorption must be considered with great care when selecting wire for radio repairs or new work.

PHILCO research laboratories have carefully selected and specified wire that meets the above-mentioned requirements. In some of these tests it was found that electrical leakage takes place in several ways. The most important is surface leakage and electrolytic action. These conditions are caused by impure textiles and inferior impregnating compounds. The electrolytic action takes place at certain humidities to which insulation material is subjected. Insulated wire in humid atmosphere collects small beads of water on the insulation sur-

face. Exposure for periods of time will cause these beads to unite to form a continuous film of water. This water dissolves the soluble chemicals often found in dyestuffs and salts used to wash cotton and other materials, thus causing electrolytic action. This will form a series of conducting paths to the chassis with resulting losses.

Certain kinds of wire insulation show a decided phase difference when subjected to high humidity. When this humidity is removed by heating, the phase difference decreases. Impregnating the insulation with a high dielectric having all impurities removed, reduces this effect.

When selecting wire for radio work, be sure to avoid these troubles and use quality wire supplied by PHILCO. Your PHILCO distributor has a display board with various kinds of wire used in receivers. This wire can be obtained from the distributor in 100-ft. and 1000-ft. spools.

## I. R. S. M. and R. M. S. Hold Joint Session

ON SEPTEMBER 17 the New York chapter of the Institute of Radio Servicemen held a joint session with Radio Manufacturers Service at the Pennsylvania Hotel, in New York. Approximately 1000 servicemen, practically the entire Institute membership of the New York territory, were in attendance. The meeting was conducted by service officials from the PHILCO factory.

The R. M. S. plans and activities — past, present and future — were discussed. A number of helpful suggestions were given to the servicemen on how more money could be made in radio service work. The new PHILCO High Fidelity receiver was described in detail and a valuable booklet, further describing the circuit, was given to each man in attendance.

Again, on October 19, during the Eastern Convention of the I. R. S. M. at the Pennsylvania Hotel, in New York, officials of PHILCO and of the Institute gathered for a

discussion of co-operative plans of the Institute and of R. M. S.

During the past the two organizations have worked closely together, both for the benefit and advancement of the serviceman. As a result of the meeting, plans have been laid for further co-operation and working together for the common interests of the service industry.



I. R. S. M. and R. M. S. Meeting, Pennsylvania Hotel, New York City, September 17, 1934

## Tubes Used in All Philco Receivers

Model No.	Tubes Required	Model No.	Tubes Required	Model No.	Tubes Required
14 (Code 221 & 2)	2-44, 1-36, 3-37, 2-42, 1-80	47	1-36, 2-44, 3-37, 2-43	144	1-6A7, 2-78, 1-75, 1-42, 1-80
14(Code121-2-3-4)	2-78, 1-6A7, 1-37, 1-77, 3-42, 1-80	48	1-44, 2-36, 1-43, 1-No. 9	200	1-6A7, 3-78, 1-37, 1-75, 3-42, 1-5Z3
15	4-44, 4-37, 2-42, 1-80	49	1-6A7, 2-78, 1-76, 1-85, 2-43	201	1-6A7, 3-78, 1-37, 1-75, 3-42, 1-5Z3
16	1-76, 2-77, 3-78, 3-42, 1-37, 1-5Z3	50	3-24, 1-47, 1-80	220	3-24, 1-27, 2-71A, 1-80
16B (Code 125)	1-76, 2-77, 3-78, 3-42, 1-37, 1-80	51	2-24, 1-35, 1-47, 1-80	270	4-24, 1-27, 1-47, 1-80
16 (Code 126)	1-37, 2-77, 3-78, 1-76, 3-42, 1-80	52	2-24, 1-35, 1-47, 1-80	470	5-24, 2-27, 1-47, 1-80
17	1-37, 2-77, 3-78, 1-76, 3-42, 1-5Z3	53	1-12Z3, 1-43, 2-77	490	4-24, 5-27, 1-47, 1-80
17B	1-6A7, 3-78, 2-37, 1-77, 3-42, 1-5Z3	54	1-25Z5, 1-43, 1-75, 1-6A7, 1-78	500	1-76, 2-77, 3-78, 3-42, 1-37, 1-5Z3
18	1-6A7, 3-78, 2-37, 1-77, 3-42, 1-80	57	2-77, 1-42, 1-80	501	1-76, 2-77, 3-78, 3-42, 1-37, 1-5Z3
19	1-6A7, 2-78, 1-75, 3-42, 1-80	58	2-77, 1-42, 1-80	503	2-78, 1-6A7, 1-75, 3-42, 1-80
20	1-36, 2-44, 1-75, 1-42, 1-80	59	2-77, 1-42, 1-80	504	1-6A7, 2-78, 1-75, 1-42, 1-80
21	3-24, 1-27, 2-71A, 1-80	60	1-6A7, 1-78, 1-75, 1-42, 1-80	505	1-6A7, 1-78, 1-75, 1-42, 1-80
22	3-24, 1-27, 2-45, 1-80	65	2-24, 2-45, 1-80, 1-27	506	1-6A7, 2-78, 1-75, 1-42, 1-80
23	1-36, 3-44, 1-37, 1-42, 1-80	66	1-6A7, 1-78, 1-75, 1-42, 1-80	507	1-6A7, 2-78, 1-75, 3-42, 1-80
24	1-36, 2-44, 3-37, 2-42, 1-80	70	4-24, 1-27, 1-47, 1-80	511	4-26, 1-27, 1-71A, 1-80
25	2-24, 1-35, 1-47, 1-80	70 Above			
26	4-44, 2-37, 1-42, 1-80	Serial 22,000	3-35, 1-24, 1-27, 1-47, 1-80		
27	1-36, 1-42, 1-75, 2-44, 1-80	71	3-44, 1-36, 1-37, 1-42, 1-80		<b>TRANSITONE MODELS</b>
28	1-36, 2-14, 1-75, 1-42, 1-80	76	3-24, 1-27, 2-45, 1-80	3	3-24, 2-01A, 2-71A
29	1-6A7, 2-39/44, 1-75, 1-43, 1-25Z5	77	3-24, 1-27, 2-45, 1-80	5	1-6A7, 1-78, 1-75, 1-41, 1-84
30	1-6A7, 2-39/44, 1-75, 1-42, 1-80	80	2-36, 1-42, 1-80	6	3-36, 1-85, 1-41
31	3-32, 3-30, 2-21	81	2-77, 1-42, 1-80	6F	3-36, 1-85, 1-41, 1-84
32	1-36, 2-39/44, 1-75, 1-42, 1-84	84	2-77, 1-42, 1-80	7 (1st Type)	3-36, 2-38
34	1-1-C-6, 2-34, 2-30, 1-32, 1-19	86	4-26, 1-27, 2-71A, 1-80	7 (2d Type)	3-36, 1-38, 1-41
34A	1-1-C-6, 2-34, 2-30, 1-32, 1-19, 1-1-C-1	87	4-26, 1-27, 2-45, 1-80	8	3-36, 1-38, 2-41
35	3-32, 3-30, 1-33	89	1-36, 2-44, 1-75, 1-42, 1-80	9	3-36, 1-85, 1-37, 1-79
36	3-32, 3-30, 1-33, 1-No. 6	90	4-24, 2-27, 2-45, 1-80	9F	3-36, 1-85, 1-37, 1-79, 1-84
37	1-15, 2-32, 1-30, 1-19, 1-No. 6	90 Above		10	2-39/44, 1-6A7, 1-75, 1-42, 1-84
38	1-15, 2-32, 1-30, 1-19	Serial 237,001	3-24, 4-27, 1-47, 1-80 <sup>1</sup>	11	2-44, 1-77, 1-75, 1-42, 1-84
38A	1-15, 2-32, 1-30, 1-19, 1-No. 6	90 Above		12 (Code 121)	3-36, 1-38, 2-41
38 (Code 123)	1-1A6, 2-32, 1-30, 1-19	Serial B53,100	2-35, 1-24, 3-27, 2-47, 1-80	12 (Code 122)	3-36, 1-37, 1-85, 1-79.
38A (Code 123)	1-1A6, 2-32, 1-30, 1-19, 1-1A1	91	2-44, 1-36, 3-37, 2-42, 1-80	700	2-44, 1-77, 1-75, 1-42, 1-84
40	3-24, 1-27, 2-71A	95	3-24, 3-27, 2-45, 1-80 <sup>1</sup>	800	1-6A7, 2-44, 1-37, 1-75, 1-79, 1-84
41	3-24, 1-27, 2-71A	96	3-24, 3-27, 2-45, 1-80	802	1-6A7, 2-44, 1-37, 1-75, 1-79, 1-84
42	3-24, 1-27, 2-71A	111	4-24, 4-27, 2-45, 1-80 <sup>1</sup>		
43	4-44, 2-37, 1-42, 1-80	112	4-24, 4-27, 2-45, 1-80		
44	1-6A7, 2-78, 1-75, 1-42, 1-80	112 Above			<b>SHORT-WAVE CONVERTER</b>
45	1-6A7, 2-39/44, 1-75, 1-42, 1-80	Serial 174,001	4-24, 4-27, 2-47, 1-80	4	1-24, 1-27, 1-80
46	3-14, 1-17, 2-71A, 1-No. 2	118	1-6A7, 2-78, 1-75, 3-42, 1-80		

## A New Vibrator for Majestic Auto Radio

PHILCO has recently made available to all servicemen a replacement vibrator unit for Majestic Auto Radio receivers. This vibrator, which has been designed according to PHILCO engineering specifications for Majestic receivers, supplies a greatly needed item in the replacement line. Heretofore it has been difficult for servicemen to obtain a reliable replacement unit, with the original Majestic source of supply off the market.

The new PHILCO Majestic vibrator is meeting with widespread favor with servicemen in all parts of the country. The unit is readily obtainable

from any PHILCO distributor or Transitone Automobile Radio distributor. It is known as PHILCO Part No. 38-6057, and sells at a list price of \$6.00, or a net serviceman's cost of \$3.60.

PHILCO has recently announced another price reduction on PHILCO vibrator units. The PHILCO vibrator for Transitone Automobile receivers formerly sold at a list price of \$6.00. It is now available at a new low price of \$5.00 list. The part number of this vibrator is 38-5036.

Be Sure to See the New 048A at Your Philco Distributors

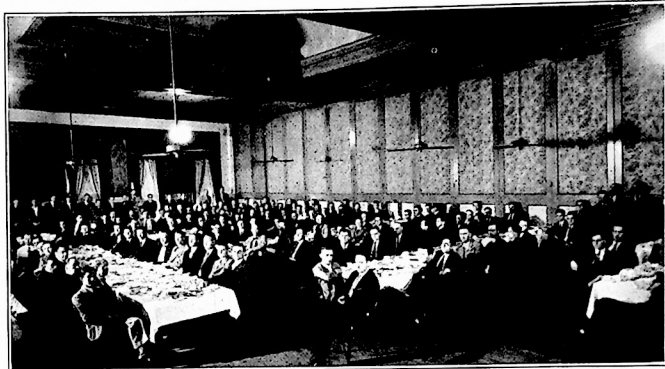
## Southern Distributor Holds Large R. M. S. Meeting

THE largest R. M. S. meeting ever held in the South was conducted on October 11 by the A. K. Sutton Company, Inc., PHILCO distributors in Charlotte, N. C.

The meeting was started at 12.30 P. M. with a luncheon in the Chamber of Commerce Building in Charlotte and was attended by over 200 members of R. M. S. in the North and South Carolina territories.

A report of R. M. S. activities up to the present time was given in detail by PHILCO factory men. Future plans were outlined and were given the hearty approval of all in attendance. The PHILCO High Fidelity Model 200X was described and the many desirable features of High Fidelity were explained in detail.

Mr. Sutton, president of A. K. Sutton Company, Inc., is an honorary member of Radio Manufacturers Service. He has asked that his wishes be extended to every R. M. S. member for the greatest prosperity and success during the present radio season.



R. M. S. Meeting, Charlotte, N. C., October 11, 1934

## Questions and Answers

1 Q. What is the best substitute condenser in the Models 45 and 66 to replace a shorted .1 mfd. condenser in the plate circuit of the 75 tube (41 in the wiring diagram of Service Bulletin No. 191)?

A. In those cases where the condenser has shorted it is suggested that a black bakelite condenser, Part No. 3615BM, be substituted. It will, of course, be necessary to drill a hole in the chassis for mounting this condenser. In the Model 29 the corresponding condenser is .25 mfd. and should be replaced, if the original becomes shorted, with a metal case condenser, Part No. 04360. It will be necessary to lengthen the lead on this condenser three inches.

2 Q. What is the cause of dial slipping in the Model 16, codes 125 and 126?

A. Some of the first production of this type chassis gave difficulty with dial drive slipping, which was traceable to the drive cord. After the set had been in operation for a period of time the heat was sufficient to soften the impregnating material in the cord, and thus produce slipping of the drive. The new cords which are now being used have been specially impregnated with tar and resin to prevent this type of slipping. Replacement cords can be obtained from your PHILCO distributor if needed, Part No. 30-3152.

3 Q. What is the cause of a rattle in the Model 200, similar to speaker rattle?

A. This condition is sometimes caused by resonant vibration of the sound diffuser, which is mounted between the speaker and the front of the grill. The vibration can be readily eliminated by bending one or more of the diffuser vanes slightly. Some experiment may be required before the particular vane is located and the vibration eliminated.

4 Q. How is it possible on the Model 16 and other short-wave receivers to obtain CW amateur and commercial code transmission?

A. This can be done without altering the receiver in any way through the use of the PHILCO 024 Signal Generator. The grid lead of the signal generator is removed and a 200,000 ohm resistor, PHILCO Part No. 33-1048, is then connected across the grid condenser. This change makes the 024 function as an unmodulated signal generator. It is then coupled to the I. F. circuit of the short-wave receiver by connecting the ground terminal of the signal generator to the ground terminal of the chassis and inserting a wire from the antenna terminal of the signal generator through the small opening for the control grid lead in the shield can of the second I. F. tube. It is unnecessary to make any electrical connections of the wire at this point, since the coupling is obtained capacitively. When it is desired to obtain CW reception it is only necessary to tune the signal generator to a frequency slightly different from the I. F. of the receiver in order to produce a beat note.

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