

TELEPHONE RECEIVERS ARE IMPORTANT UNIT IN RADIO SET

Addition of Efficient Head-Set Greatly Increases Sensitivity of Outfit—Phones Must Be Made Accurately and With Extreme Care—Fans Told What Features to Expect in Making Purchases—Interest Greater.

BY SAUL EMANUEL.

YOUR pair of telephone receivers is an important unit of your receiving set. As your phones are, so will your receiving set be, in its degree of efficiency. With a poor set of phones the best receiving set will give only fair results, while if a good head-set is added to only a fair receiving outfit, the sensitivity of the outfit will be greatly increased.

Because only very small currents of electricity operate a receiving set, the phones must be made accurately and with extreme care. When purchasing them, the fan should look for the following features of a well-made head set:

The winding of the magnets should be of from 2000 to 2500 ohms resistance; the two receivers to obtain the best results. The term "resistance" used as a standard of measurement for telephone receivers is often misleading to the novice. In reality, what the fan should look for in a receiver is the number of ampere-turns about the magnet. It is upon these that the strength of an electro-magnet is dependent.

An ampere turn is one turn of wire, through which there passes one ampere of current. The total number of ampere-turns in a telephone receiver is the number of turns multiplied by the current passing through in amperes.

Resistance is another thing. A receiver may be wound with a few turns of high resistance German silver wire and it will be rated at so many thousand ohms. But the ampere turns of such a receiver will be very few and the receiver will be practically worthless.

As receivers of this kind made by unscrupulous manufacturers sometimes appear, the fan who purchases should take care to purchase only when it is known that the magnets are wound with copper wire.

Another important feature to consider when purchasing telephone receivers is the type of diaphragm they contain. In all head sets with metallic diaphragms these are designed to vibrate best at a certain frequency. For the reception of broadcast speech and music, those receivers which are designed to respond to vibrations around 250 cycles will reproduce the broadcast with the clearest modulation. The metallic diaphragm receiver is considered as one of the most sensitive known today. Its construction differs a good deal from the others. In this type the diaphragm is attached to a pivot at the center of the magnet. The diaphragm is caused by means of an armature responding to the changes in strength of the magnetic field around the magnet. Owing to a slight leverage action of this armature attached by a pivot to the diaphragm, signals are amplified in the receiver itself.

The telephone receiver is a delicate piece of apparatus. It is very easily injured if it is knocked about or dropped on the floor. Receivers should always be hung up on a hook when not in use.

You've noticed, of course, that when you pull the diaphragm away from the magnets, it clings quite strongly to the magnets. This is due to the permanent magnetism in the magnet cores. All receivers are permanently magnetized.

In time this magnetism grows weaker and the phone becomes less sensitive. The magnetism may be renewed by being remagnetized. This can be done by sending it to the manufacturer, or if you have 110 volts of direct current in your house, connect the head-set across the power line for a few moments. Care must be taken, however, that the current is passing through the correct direction; otherwise the magnetism will be destroyed entirely.

Value of Radio to Nation to Be Emphasized.

Week to Be Dedicated to Advertising Programme.

THE extraordinary value of radio broadcasting to the educational, religious and recreational life of our country is to be emphasized during a national radio week, to be held everywhere from December 23 to 30.

During this week every organized or interested radio fan will endeavor to demonstrate to the uninitiated the wonders and benefits of this newly developed branch of science.

The effort to establish national radio week as an annual institution is backed by co-operative effort on the part of the newspapers, the radio press, manufacturers, dealers, amateurs and the great army of broadcast listeners.

The tentative programme arranged for the week, December 23 to 30, inclusive, is the most comprehensive plan ever undertaken to popularize radio with the great American public, and while only a general outline of the plan is so far available, it is known that it embraces programmes of national, state and local character, in which the 500 or more radio-phone broadcasting stations of the country will take an active and important part.

Special programmes to include the leaders among public officers, statesmen, educators and the musical and entertainment world in general are being arranged, all with the main idea of introducing radio to the uninitiated and firmly establishing it in its proper place as a recognized agency of bringing radio instruction and entertainment into the homes of the nation.

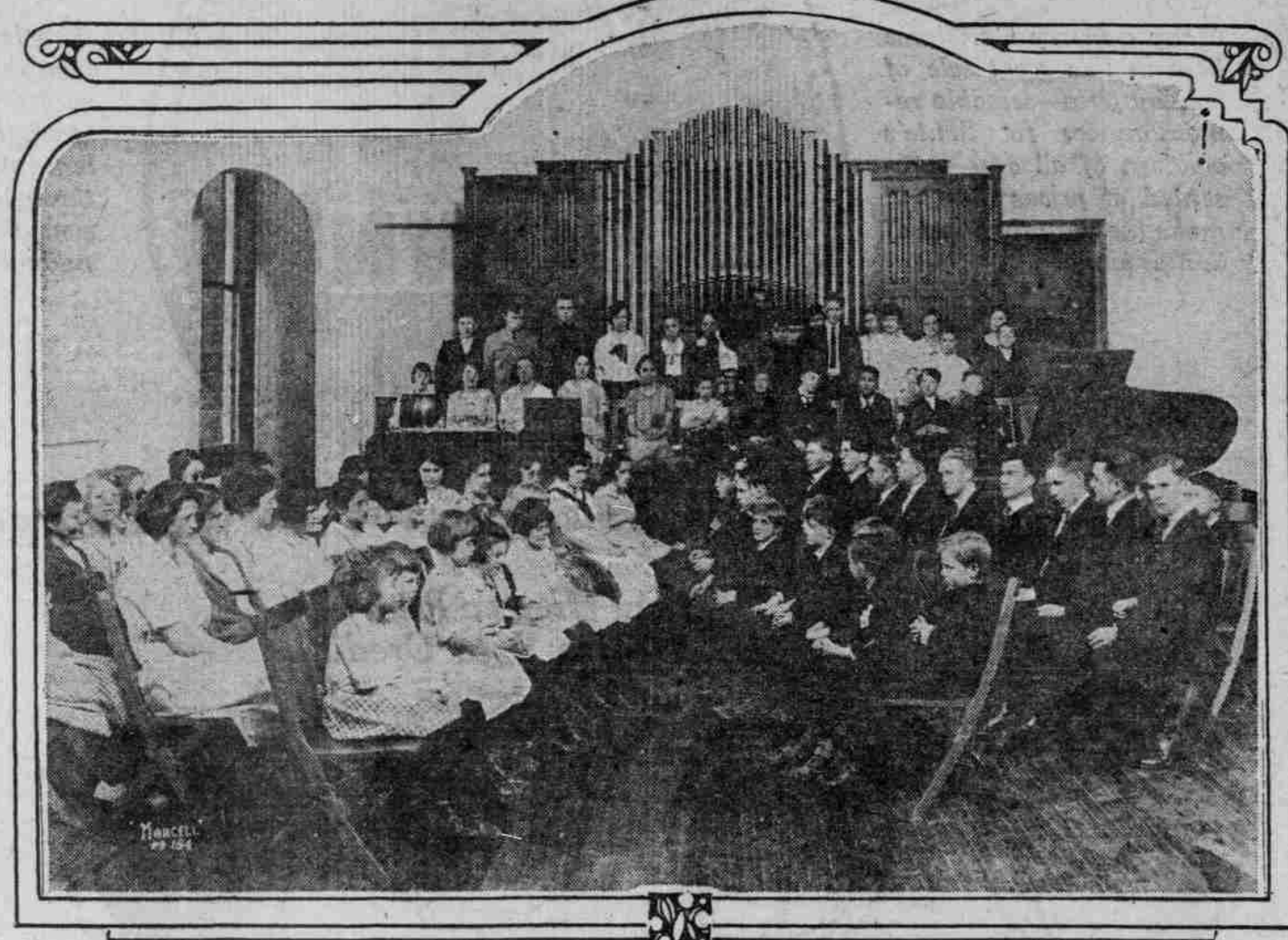
The plan to hold national radio week started a few weeks ago at a meeting in New York city which was attended by 50 editors and publishers of radio publications. It grew so rapidly that before they had left the meeting an executive committee had been appointed, with J. Andrew White, editor of Wireless Age, as chairman.

With him, serving on the committee, are Arthur H. Lynch, editor of Radio Broadcast; H. Gernsbacher, editor of Radio News; Laurence Nixon, editor of Radio Dealer; Roland B. Hennessy, editor of Radio World; and Arthur H. Halloran, editor of Radio.

Aiding this committee is a general committee, and on the latter are the names of the editors of

BLIND AT WASHINGTON STATE SCHOOL ENTERTAINED AT BEST OF OPERAS THROUGH INSTALLATION OF RADIO SET

New Field of Enjoyment Opened to Students at Vancouver Institution and Many Tedious Trips to Portland and Other Cities Are Avoided Since Musical Programmes Now Can Be Had at Any Time and Right at Home—Demand for Set Great.



STUDENTS OF THE WASHINGTON STATE SCHOOL FOR BLIND ENJOYING A CONCERT BROADCAST FROM THE OREGONIAN HIGH-POWER STATION.

VANCOUVER, Wash., Dec. 16.—(Special).—To most folks radio is just a novel means of entertainment—the alternative to a trip to a movie or theater. But to students at the Washington State School for the Blind, whose activities are necessarily more limited than those persons in full possession of their eight, radio opens up an entirely new field and another means of contact with the outside world. The blind students love music and they seldom miss an opportunity to hear a concert or an opera. But the plotting of a large group of students to Portland during the

opera season is not easy, although every one of the recent operas in Portland was attended by pupils from the state school. Concerts at the school here can be held only occasionally.

Since the installation of a fine radio set equipped with a magnavox in the school auditorium, the students can "listen in" every night to the best in the musical world. In the month that the set has been in operation the auditorium has become the most popular room in the whole school. Concerts which heretofore have involved a tedious trip to Vancouver or Portland or the importation of artists from outside cities are enjoyed with no more

effort than the walk from study rooms to the auditorium.

"The machine is in constant use every night from the time broadcasting begins until 10 o'clock," Mrs. Herbert Chapman, wife of the superintendent, an instructor at the school, declared. "The children drift in after their studying is done, and on nights when special concerts are being broadcast we have no assembly in the auditorium."

"The Oregonian concerts are wonderfully fine and clear. It seems as if the performers were right in the room. We hear concerts frequently from outside cities as well

—Seattle, San Francisco and Salt Lake City. One night we picked up a broadcasting station on the east coast, in New Jersey, I think."

About 65 children from all parts of Washington are registered at the school this year. They range in age from little tots of 5 and 6 years of age to young women and youths of high school age. Only a small percentage of them are totally blind and most of them can see enough light to find their way about. They are as happy as any other children, and for the very reason that one of their faculties is impaired they make better use of the others than the average person.

RADIO QUERIES AND ANSWERS

Editor Radio Department:

1. How do you operate a crystal set using a variocoupler, variable condenser, fixed condenser and antenna detector? Please send me the above hook-up.

2. What is meant by C. W. transmission?

3. My antenna is 20 feet high at one end and 35 feet high on the other. Would I be able to hear any better or farther if I raised both ends to 40 feet?

4. Will you send me the rules for volts, amperes, meters, millimeters, millihenries, etc.?

T. R., Portland, Or.

1. The operation of a receiving set is too lengthy a subject to be taken up in the limited space of this column. If you will send an addressed and stamped envelope, will furnish you the hook-up and directions for operating the set.

2. C. W. is the abbreviated term for "continuous waves," such as are set up by an oscillating vacuum tube.

3. Yes, if the antenna is raised higher on both ends the results will be better in reception of signals.

4. Would advise you to get a good book on radio in which these rules are contained. All these rules for which you ask will take up a good sized chapter in any radio book.

Editor Radio Department:

1. How do you connect two 2000 mfd fixed condensers to make a total capacity of .0017?

2. Will the two condensers give better results if used around the phones?

3. Which is better, a variable condenser in the aerial circuit or one placed in parallel around the primary of the variocoupler?

4. How many turns are usual in the primary of a variocoupler?

L. W., Portland, Or.

1. Connect the two condensers in series, that is, the end of one is connected to the end of the other, while the two outside ends are placed around the phones.

2. This can only be determined by experiment. With some phones more capacity is needed than with others. However, the capacity of the phone condenser is not critical and almost any size will work well.

3. For short work the variable condenser should be placed in the aerial circuit. For longer waves, around the primary coil.

4. Sixty turns is the usual number in the standard size coupler.

Editor Radio Department:

1. Can I add one or two steps of amplification to a peanut set? If so, please send me a hook-up.

2. With this set and amplifier and an antenna 37 feet high and 125 feet long, how far can I hear?

3. Could I hear still further if I added a variometer?

L. R., Portland, Or.

1. Yes. Send a stamped and addressed envelope and the hook-up will be supplied to you.

2. No definite distance can be guaranteed with any type of receiver, as the reception depends on many other things, such as the locality in which you live, the atmospheric conditions, the proximity of power wires, or type ground you use. However, under good conditions such a set often will receive from as far as 1000 miles.

3. If the variometer is placed in the plate circuit of the detector, so that the circuit is made regenera-

Editor Radio Department:

1. How do the different minerals answer crystal detector fan in sensitiveness?

2. Can a crystal detector be hooked up to a phonograph cabinet so that more than one person can hear the concerts at one time?

3. What is the best type of tuning unit for the crystal detector?

L. F. R., Goldendale, Wash.

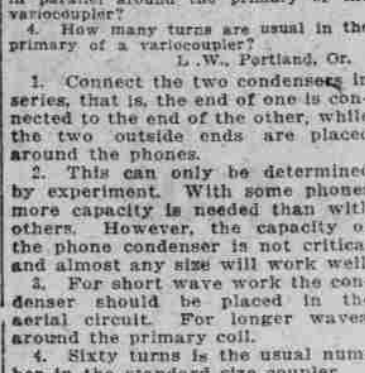
1. Galena is considered the most sensitive of any of the known minerals. Following galena come silicon, perikon (bornitzenite), iron pyrites and carbonium. The last mineral usually requires a local battery.

2. Unless one or two stages of amplification are used in addition to the crystal detector, it is not advisable to hook the set to a phonographic sound chambers. Without the amplification the signals won't be strong enough to be heard very far from the ears.

3. The loose coupler or vario-

SIMPLE RADIO-FREQUENCY HOOK-UP IS ILLUSTRATED

Coil Consisting of From 40 to 60 Turns of No. 24 or No. 26 Enameled Wire Is Used.



The stage of radio frequency can be added to a detector without use of transformer in this hook-up. X—Standard variocoupler. Y—Single slide inductance coil of from 40 to 60 turns. V. C.—Eleven-plate variable condenser.

A SIMPLE radio-frequency hook-up which will bring in the long distance stations is shown in the hook-up above. It requires a little more care in tuning, but unusual results have been obtained with it all over the country.

Instead of the usual radio-frequency amplifying transformer, this hook-up uses a coil consisting of from 40 to 60 turns of No. 24 or No. 26 enameled wire wound on a three-inch tube. This coil should be provided with a slider arrangement so that each turn can be cut in or out as desired. A single-slide tuning coil purchased in any of the shops will do nicely.

A one-plate condenser is used in shunt to the coil, for fine adjustment. A larger condenser can be used, but it should have a vernier attachment. The two units are connected between the plate of the amplifier tube and the positive end of the "B" battery, as shown in the diagram.

Other units necessary for this amplifier, to those who have only a detector set, are the following: An amplifier tube, a 22½ volt "B" battery and a rheostat. The same A or six-volt storage battery can be used for also lighting the amplifier tube. Both "B" batteries are connected in series.

First place the condenser (and the one in shunt to the coupling coil

Hints for Fans.

What is good for commercial stations should be good for the beginners and amateurs. A shield for the lead-in is used on ships to prevent rain from coming down through the deck insulator. You can profit by using this also, as it prevents rain from leaking through your improvised lead-in insulator. It resembles a funnel, and in fact, can be made from a large funnel such as used in garages for pouring gasoline into machines. A good, strong cork is placed in the small neck of the funnel. The aerial lead-in is pushed through the cork. Sealing wax is then poured in the funnel to make a good background for the cork. The funnel is then shellacked to resist rust.

Some lead-in insulators are merely porcelain tubes. These can be laid flat and brought through the opening just above the window sill by raising the window two inches and placing a piece of wood between the window and the sill. The board should have a piece of weather stripping between it and the window. The holes for the insulators should be bored on a down slant so that water will not run into the room, but will drop off outside.

Aerial supports. It is advisable to support the aerial by means of pulleys and ropes, so that it may be lowered for repairs. Good galvanized pulleys and rope can be had at a low price, or flexible wire may be purchased at a reasonable figure. Wire is preferable to rope, as the latter stretches in damp weather and stretches when dry. It rots very easily, too.

Answer—Galena is one of the best minerals to use as a crystal. However all galena is not blessed with sensitive spots. Get a piece as large as possible and then if you do not get the desired results when the "X" whisker is brought in light contact and after a careful search, break the crystal into pieces and try each piece again. Be careful always in handling a crystal to keep grease and oil foreign matter from the face of it, as it is impossible to get results with a dirty crystal. Should you find that your crystal is not clean use a bit of cotton and a few drops of carbon tetrachloride to clean the surface.

It is advisable to solder all joints, but when working on the aerial this is not always practicable. Where it cannot be done a good substitute follows: First clean the wires to be spliced and join them by making a Western Union splice, then wrap several layers of tinfoil over the splice and last apply tape.

Each stage of amplification requires another tube.

Sohn's waves travel at the rate of 1100 feet a second.

A radio set may act very differently on different days under different conditions.

Hang up the receivers when not in use. They will retain their sensitivity longer than by being knocked about on the floor. Constant jars will reduce the effectiveness of the permanent magnets in the receivers.

Head Sets 2600 Ohm

Marvel Crystal Receiving Set \$12.95

Complete set with head phones and antenna equipment, all ready to put up. This set will receive from 100 to 1000 meters and is a big value at this low price.

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A CHRISTMAS GIFT

One of the best CHRISTMAS gifts you could make for your family is a GOOD RADIO set. A RADIO set is something that will be in use the year round and will give you more enjoyment than anything else you may get.

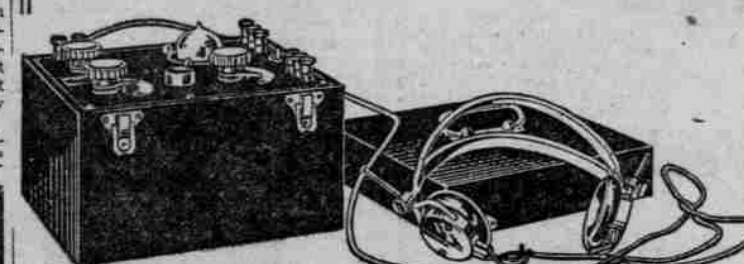
We are selling our GUARANTEED sets for CASH or TERMS. The terms will put a set in your home for CHRISTMAS and you can pay for it during next year. These sets are built by our EXPERTS, and are going very FAST so in order to have yours for CHRISTMAS you should place your order NOW.

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Every article in our store at a reduction of 35 per cent and some reduced a great deal more. ABSOLUTELY NOTHING RESERVED! All mail orders must be accompanied by sufficient postage. No C. O. D. shipments, no charge accounts, no exchange of returns. This is a wonderful opportunity.

MAKE IT A RADIO XMAS

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	Regular Price	Sale Price
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6 Profco Receiver, Detector and two-stage amplifier, nice cabinet	\$110.00	\$55.00
5 Clapp-Eastman Regenerative Receiver, cabinet	\$40.00	\$30.00
4 Superphone and two-stage Amplifier	\$110.00	\$55.00
3 Magnavox two-stage power Amplifier	\$30.00	\$18.00
2 Westinghouse Receiver, Detector and two-stage. (This is one of the best receivers made for long distance)	\$132.50	\$82.75
100 Electro Knobs and Dials, 3-inch, 4-inch hole	\$1.00	40c
Pirco Sockets, bakelite base, nickel plate shell	90c	55c
Pirco Sockets, bakelite base, nickel double shell	2.75	50c
Pirco Sockets, bakelite base, nickel triple shell	3.75	20c
Radio Service Sockets, bakelite base	1.00	20c

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