

# RADIO WAVES AND RIPPLES

as 500 miles at night or even farther at times. The Catalina phone has been reported heard a distance of over 700 miles with this kind of receiver, but of course such results can be attributed to exceptional conditions.

(4) Regenerative type of receiver with antenna composed of two or four wires 50 or 100 feet long and at least 40 or 50 feet high. This is the ideal receiver for the amateur. For simplicity and reliability it has no equal. One of its chief characteristics is that it will amplify a weak distant signal until it is almost as loud as a nearby station. Radiophones can be heard satisfactorily if there is no interference 100 or 200 miles in the daylight and fairly well 500 miles at night using headphones. Spark stations can be copied as far as 2000 or 3000 miles at night.

(5) Regenerative receiver employing two or three-step amplifier and loud speaker. For public entertainment this is the logical receiver. No headphones are required, the incoming sound being carried out into the room or hall through a horn with the same degree of intensity as reproduction from a phonograph. Concerts from points 500 miles away or even farther should be received clearly at night. If geographical conditions are favorable radiophones may be heard 200 or 300 miles in daytime. If the receiver is so sensitive it is also capable of tuning up to 35,000 meters, wireless telegraph stations in Europe, Hawaii, the Philippine Islands and the United States can be heard any time with this apparatus.

(6) Audion receiver employing broadcast radio-frequency and audio-frequency amplification. Limited to the range of this style of receiver are governed by atmospheric conditions and interference. It is the most sensitive receiving apparatus yet devised and is fully able to detect low-power amateur stations 3000 or 4000 miles.

## VISITORS AT AUTO CAMP GROUNDS ENJOY RADIO CONCERTS SENT BY THE OREGONIAN

High-power Receiving Set and Magnavox Are Installed in Community Store—Music Is Heard More Than 600 Feet Away—Feature Is Proving Attractive to Restless Autoists.



PORTLAND AUTO CAMPERS ENJOYING A RADIO CONCERT BROADCAST FROM THE OREGONIAN TOWER FOR THEIR ESPECIAL BENEFIT LAST WEEK.

RADIO concerts both afternoon and evening is the latest convenience offered to the visitor at the auto camp grounds. A high-power receiving set and magnavox lately installed in the community store is now proving one of the best inducements ever offered to the restless autoist to stop and linger awhile within the vicinity of the Rose City.

A recent report phoned in from the camp grounds to The Oregonian during the broadcasting of a concert from The Oregonian radio tower, stated that the music was coming in so loud and clear at the camp that it could be heard more than 600 feet away from the magnavox.

The magnavox has been placed with its mouth pointing outside of the store so that there is room for several hundred persons to sit or stand about and hear the music comfortably. It is reported that impromptu dances are held at the camp now and then whenever dance music is broadcast from The Oregonian and other local transmitting stations.

## HOW FAR CAN I EXPECT TO HEAR WITH MY RECEIVING SET?

THE favorite question asked by radio fans and it is about the most difficult one to answer. As there are no set laws governing reception distances, it is practically impossible to estimate correctly the range of any particular type of apparatus. In general there may be said to be five or six different types of receiving sets in use today for the reception of radio telegraph and telephone traffic. These are as follows:

(1) Receiving apparatus employing the ordinary crystal detector with single inductance and low single-wire antenna. This type of receiver, provided the detector is adjusted properly, is capable of picking up radiophone concerts from a distance of ten miles, and spark signals from distances ranging from 10 to 100 miles daylight range, depending on the size of the transmitter. Amateur sparks may be heard as far as 20 miles with this simple receiver, while commercial stations may come in from about 100 miles.

(2) Crystal detector receiver of loose-coupler or double inductance type used in conjunction with a condenser, galena detector, high resistance phones (2000 or 3000 ohms) and an antenna composed of four or five wires at least 50 feet high and 100 feet long. With this receiver some very good results can be obtained. Radiophone concerts can be heard 50 miles, and spark stations as far

feet on the other, or the other 85 feet long and 75 feet on both ends? What is the difference between inductance and how? What is the difference between an audion amplifier and an audion detector tube? Please send hook-up for the set described above.

(1) How can you tell whether the current is D. C. or A. C.? (2) How do you tell the negative and positive leads on an A. C. current? (3) Place one of the wires over an ordinary pocket compass. If the needle begins to vibrate or fluctuate continually in both directions, the current is A. C. If the needle turns to one direction and remains there, the current is D. C. Another test is to place both wires on a glass of salt water that they are a couple of inches apart. If the water around one of the wires begins to bubble, the current is D. C. and that wire is the positive pole of the current. If the water around both wires begins to bubble the current is alternating.

(1) For rectifier use make a saturated solution of the ammonium phosphate. (2) As the A. C. current is continually changing in direction, there are no such things as positive or negative lead to an A. C. current.

(1) The variometer is the most efficient for short-wave radiophone reception in conjunction with a crystal detector. (2) A length of lamp cord with plenty of slack is used to connect it to the rotating coil so that it can easily revolve in and out of the stationary coil. (3) The best plan is to use the whole automobile frame, engine and all, for the ground.

(1) What size wire is the best suited for a regenerative receiver? (2) Could I get any better results by raising the detector tube about 3 inches from the base and placing the grid coil on top of it?

(1) In putting up an aerial for a crystal set and also a long wave aerial, how many wires should be used to get the best results? (2) How far apart should these wires be if a three-wire aerial is used? (3) Kindly give distances for both 100 and 150 feet long will give you the best results for receiving radiophone.

(1) Yes; evidently there is an open circuit in both of your coils. (2) The vibrator can only be used to make and break a current for a spark coil.

(1) I have wound a transformer coil from an old Ford coil, as described in Radio News for June, but when connected to a dry cell, neither primary nor secondary coil will pass a current. Is this a sign that the wires are broken? (2) I have a vibrator with good platinum points. Is there any use I can put this in the wire harness? (3) E. F. C. P. Portland, Ore.

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(1) Will the following set consisting of 9-000 Cunningham detector tube, double slide tuner, potentiometer, grid leak, variable condenser, 2000-ohm phones, rheostat, allow me to hear Portland and Seattle? I live 50 miles south of Portland. (2) Will an inductance coil with 100 turns of No. 24 wire increase the wave length? (3) Which would be the best aerial, one 200 feet long, 45 feet on one end and 65

## RADIO QUERIES AND ANSWERS

Editor Radio Waves and Ripplies: In connecting the wires of the aerial to the sticks across that holds the wires apart do you just wind the wire around the sticks or do you use a screwdriver to push the wire through the holes?

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## Several Terms in Radio Explained to Fans.

Amplification, Filament, Variometer, Plate Battery Defined.

THE following are explanations of several terms which some of the new fans are meeting and finding difficulty in understanding their application in radio telephony:

(1) Amplification.—Amplifiers employing the vacuum tube may be divided into two classes, the radio-frequency amplifier which increases the strength of the radio-frequency signals in a receiving set before it passes through the detector tube, and the audio-frequency amplifier which increases the strength of the signal after it has been changed by the detector tube from an inaudible to an audible frequency.

(1) For all-round short-wave radiophone reception, the variometer regenerative receiver is the best known today. (2) The super-selective receiver described in the April-May Radio News is tuned to different wave lengths by varying the condensers. (3) From 100 to 600 meters. (4) The type receiver described does not require tapped inductances as the wave lengths are varied by the use of condensers. (5) The single-circuit regenerative receiver using a variometer-coupler with the secondary coil as a tickler is an excellent type outfit for long-range work and can be assembled for around \$35 to \$40, including batteries and telephone receivers.

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## Radio Fans Need License.

CLEVELAND.—Radio enthusiasts here must now pay a license fee of 50 cents, both for sending and receiving. City council recently passed an ordinance requiring licensing and inspection of all radio stations, professional as well as amateur, in this city.

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## RADIO FOR CAMPING TRIP CAN BE ARRANGED EASILY

Two Types Are Most Successful and Will Bring Concerts From Twenty-five to Two Hundred Miles Away.

The following constitute a radio receiver in its simplest form: A crystal detector, aerial and ground and head receiver and battery. The crystal detector is a small piece of sensitive crystal such as galena, silicon, etc., embedded in a piece of solder of lead. The aerial may be a bedspring, a wire fence, a length of wire dropped from a high window or that of the customary construction. The ground wire may be connected to a water pipe, a piece of copper plate buried in the ground or to a water pipe driven in the ground.

Across the circuit between the aerial, detector and ground the telephone receiver should be connected. This instrument will handle tones up to the speaker word, although under excellent conditions and when close to a transmitting station it may, but it will pick up spark signals and is a very good and inexpensive set for the "little fellow" to experiment with.

A good rule for estimating the wave length of the antenna is as follows: Add the length to the lead-in. Add to this total by two and add the result to the antenna already made. This will give the approximate wave length in meters. Example: Length of aerial, 65 feet; lead-in, 12 feet; ground, 20 feet; 85 plus 12 plus 20 equals 117; divide by 2, equals 58; add 195 to 58, equals 178, equals wave length. Here the fixed factor is to add to the length of the aerial, the ground and the lead-in one-third of the length of the aerial. Thus if the antenna is 65 feet long, add to it the length of the ground and the lead-in one-third of 65, or 21.67, to get a total length of 86.67 feet.

Radio receiving stunts are being reported almost every day. Not very long ago a young radio fan "built" a receiver that was small enough to go in a matchbox. One clever girl reporter felt she must have her radio to beguile the tedium of "wait" in the ante-chamber of the great—and at public meetings! So a colleague devised a radio garter for her use. The receiver is in the garter and is connected with the ground and the woman's ear by eyeglass snap-chains.

Another tiny set is sold in the form of a ring and a third is exactly like a slim pocketbook. Some New York hotels now give you radio to tea. The radio apparatus keeps "my lady" informed of the world's doings when the orchestra isn't playing. There is a new hotel going up on Long Island which is to have radio in every room! There are to be 600 rooms—and 600 radio sets. The owners expect to pay \$150,000 for this privilege. But who doubts that they will get it?

Nor is old Europe so far behind in the matter of radio as many imagine, although every government is practicing a monopoly of its particular ether. Several of the Berlin-Hamburg trains have radio stations on board which are at the disposal of passengers. And two French railway companies are to install radio phones on their trains.

The best practice seems to indicate that a loop four to six feet square, having six turns of wire spaced one-quarter of an inch apart, will outwork any other form of loop on the market for shortwave work. For longwave work, the loop

is not worth considering, and is more of an experiment than a success. The following constitute a radio receiver in its simplest form: A crystal detector, aerial and ground and head receiver and battery. The crystal detector is a small piece of sensitive crystal such as galena, silicon, etc., embedded in a piece of solder of lead. The aerial may be a bedspring, a wire fence, a length of wire dropped from a high window or that of the customary construction. The ground wire may be connected to a water pipe, a piece of copper plate buried in the ground or to a water pipe driven in the ground.

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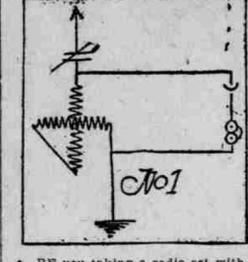


Diagram 1—Hook-up for variometer crystal set for short-range reception.

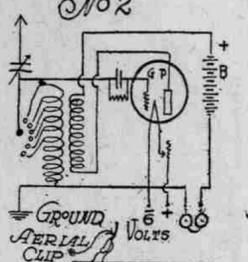


Diagram 2—Hook-up for portable regenerative receiver and sketch of case in which such set can be assembled for taking along on a camping trip.

ARE you taking a radio set with you on your camping trip this summer? If not, why not? The world's news and musical entertainment beside the blazing campfire are yours if you will but take advantage of them. It won't take up an awful lot of room in your little old fiver, and as for an aerial, a roll of wire carried along will do the trick nicely.

There are two types of sets on the market today which are very satisfactory for the camping and vacation trip. Type No. 1 is the regenerative receiver, which is very sensitive and will bring in stations as far as 200 miles away. The parts for this set are a loose-coupler or a variometer, a variable condenser, and a variable capacitor, and a crystal detector. If you make the set yourself connect it up as in diagram No. 1 and assemble it in a small portable case.

Type No. 2 is the regenerative receiver, which is very sensitive and will bring in stations as far as 200 miles away. The parts for this set are a loose-coupler or a variometer, a variable condenser, and a variable capacitor, and a crystal detector. If you make the set yourself connect it up as in diagram No. 2 and assemble it in a small portable case.

Connect up this type as in diagram No. 2. The sketch underneath this diagram shows a good method of assembling such set in a portable case so that it will take up but little room. The secondary of the variometer acts as a tickler on the plate circuit and produces regeneration. Be careful to have the negatives of your two batteries connected together as shown.

A two-stage amplifier and magnavox can be connected to this type if it is desired to entertain a big crowd with the radio features. When you make camp for the night, attach a rock to one end of the coil of wire and throw one end of it as far up into a high tree as you can. It will be better if at least 25 feet of the wire is insulated so that it will be clear of any of the tree's branches.

For a ground drive a metal spike in wet earth. Or better yet, attach one end of a wire to a piece of metal and throw it in a nearby stream or lake.

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SEE THE NEW General Electric Set Now on display in our store. Come in and hear the BROADCASTING Daily from 12 noon until 6 P. M. COMPLETE SETS OR THE MAKIN'S See Us Ten Years in the Radio Business



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