

# Correctly Installed Aerial Is Big Asset In Successful Operation of Crystal Radio

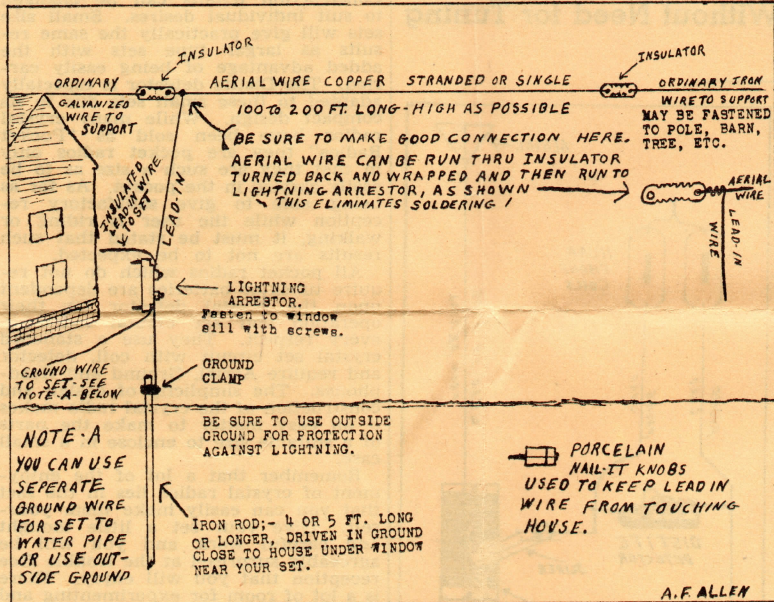
Distance Reception Requires Aerial at Greatest Height Possible and 100 to 200 Feet Long.

Since a crystal radio uses no tubes or batteries and is dependent for its operation upon the signal received from the broadcasting station, your success depends a lot upon correctly installing the Aerial to take full advantage of this signal.

If you are located close to a broadcast station your aerial may be very simple, sometimes a wire strung around the room will be satisfactory. For best results and especially where distance reception is desired, the aerial should be as high as possible (30 feet or more) and from 100 to 200 feet long. The simplest outdoor aerial is merely a single copper wire run from a tree, garage, barn or other suitable support to your house as shown in drawing below.

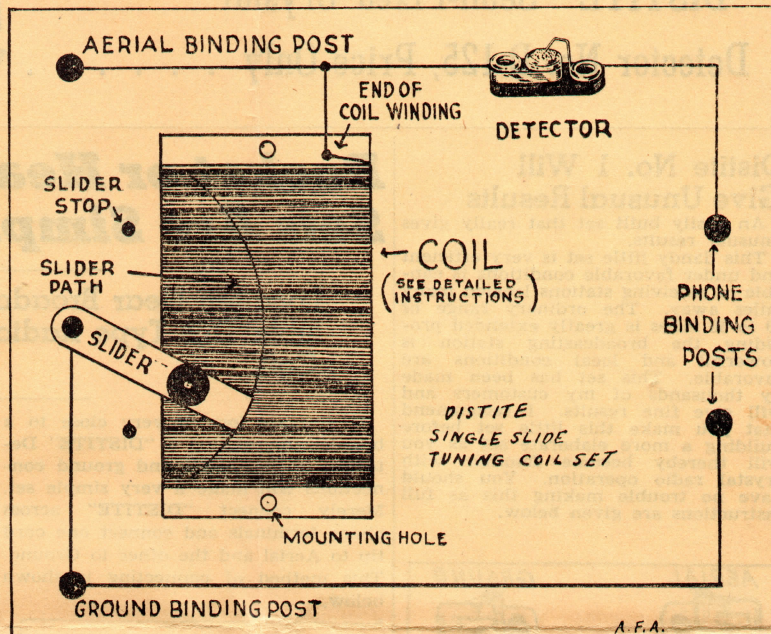
Best connection is made by soldering. If a tree is used for support be sure insulator is placed beyond branches. Bring the insulated lead-in wire down to the window, fastening to the house with nail-it knobs. Run your wire under the window sash, strip the insulation from end of wire and connect to ground post of your set.

**GROUND:** The use of a good ground connection is an absolute necessity for the successful operation of crystal sets. The simplest way is merely to connect wire to a water pipe. It is better to use the cold water pipe as this ordinarily leads more directly to the outside. Connection to pipe should be by means of clamp. If a water pipe is not available take a piece of iron



## The Popular

### "DISTITE" SINGLE SLIDE TUNING COIL SET



This is a very efficient little radio and the circuit used can be used with any size coil. This is the standard single slide tuning coil circuit used by practically all makers of commercial crystal sets. It has proven very practical and efficient and is considered best for small crystal sets. I describe two coils, which vary in size as you can select the size you wish to make. Either will give satisfactory results.

**COIL No. 1.** Cut a piece of plywood or masonite  $\frac{1}{4}$ " thick 3 inches long by  $1\frac{1}{2}$ " wide. Drill two small holes in each end for mounting. About  $\frac{1}{8}$ " from each end drill two small holes close to edge to anchor wire ends. Use No. 28 Enameled wire and wind about 250 turns of wire single layer being sure to have wire close together and tightly wound.

**COIL No. 2.** This coil is wound on wood form  $\frac{3}{4}$  inches thick by 3 inches long and  $1\frac{1}{2}$  inches wide. Wind this coil single layer with No. 26 enameled wire.

Slider can be made of flattened out Fahnestock clip or cut from a piece of sheet brass or tin. Size 5-16" x  $1\frac{1}{2}$ " with hole punched in one end for mounting, round one end and turn down about  $\frac{1}{8}$ " for contacting coil.

**CONSTRUCTION NOTES:** The size of coil can be changed and different size wire used. I do not recommend using wire smaller than No. 28 or larger than No. 26 for small size sets. If you desire to make large size sets No. 24 or No. 22 wire will be satisfactory. Enameled wire is easier to handle and takes up less space. Coils should always be wound carefully so that the turns will be tight and close to each other, so the slider will move smoothly over the surface. After the set is assembled and slider arm is in place, move slider back and forth, holding the contact end tightly against wire until the enamel is cut through and bright copper shows. This allows slider to make contact with the various turns so that more or less turns of wire are in the circuit. This varies the capacity of the coil and tunes the set to the various wave lengths. For connecting the various parts of your set together you can use the same size wire as used in your coil. Be sure to remove insulation completely (with knife or sandpaper) at connection points. If connections are not made carefully your set will not work. It is best to solder but if wires are tightly twisted together they should give no trouble.

This is the type aerial in greatest use and is hard to beat. If space is limited wire can be run to other supports, in shape of L or V, taking care to insulate (with aerial insulator) at all supports.

If a more elaborate aerial is desired wires can be arranged in parallel, two or more wires can be used. The advantage of this construction is that more wire surface is exposed with corresponding gain in amount of current picked up. If you are located where you have plenty of space you will find it interesting to experiment with various types and lengths of aerial.

**WARNING: DO NOT ERECT YOUR AERIAL OVER OR UNDER ELECTRIC LINES. TO DO SO IS DANGEROUS.**

Before proceeding with the erection of your aerial study the various locations available. If possible run your wire in the direction of station you are most anxious to receive. Keep in mind the location of set in the house so that lead-in wire can be easily run to a window near your set. Be sure to do the work carefully and remember that the aerial wire is sometimes subjected to severe strains.

After selecting the location cut the wire to length, fasten the insulators to each end. To the other ends of insulators fasten lengths of wire necessary to fasten to supports. Before raising the wire in place, remove six inches of insulation from lead-in wire and securely twist around aerial wire.

rod or pipe, the longer the better, and drive in the ground as close to your set as possible. Connect ground wire to top of rod or pipe making sure that pipe is cleaned thoroughly where connection is made to assure good contact. The use of ground clamp is recommended. Sometimes several rods spaced about two feet apart and connected together will improve results. A very efficient ground can be made by soldering wire to old copper boiler or auto radiator and burying this in several feet of moist soil. Use insulated copper wire (Stranded preferred) and run as direct to set as possible.

**HEADPHONES:** Many different makes of headphones are available from electrical and radio dealers, at low prices. I recommend 2000 ohm headphones for use with crystal sets. You may be able to find a good used set in your neighborhood as many thousands of headphones were sold in the early days of radio. Old telephone receivers can be used if you are close to broadcasting station, these are generally of a low ohmage (75 ohms) and are not very sensitive.

The above described sets are by no means all types of crystal sets. Many methods of tuning have been devised and if you will follow magazines such as Popular Mechanics, Popular Science, Science & Mechanics, Mechanics Illustrated and Radio-Craft you will find from time to time articles describing crystal radios that you can easily make.

ALVA F. ALLEN

Pioneer maker of radio crystals

Clinton, Mo., U. S. A.

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# Make Your Own Crystal Radio Sets!

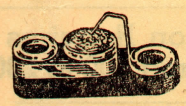
SIMPLE, PRACTICAL, TUBELESS, BATTERYLESS

Using the Famous

"DISTITE" Semi-Fixed Crystal

Detector No. D-125, Price Only . . . . .

# 50c



Actual Size

This miniature Crystal Detector is suitable for use in any circuit requiring a crystal detector. Size only 15-16" x 7-16". While "Distite" is small and compact you will find it sensitive and practical as

any of the larger types. TO ADJUST "Distite" lift small cat-whisker wire slightly and move to point on mineral where signals are loudest. Do not scratch surface of mineral.

## Distite No. 1 Will Give Unusual Results

An easily built set that really gives unusual results. This dandy little set is very efficient and under favorable conditions is capable of receiving stations located many miles away. The ordinary range of 10 to 50 miles is greatly extended providing the broadcasting station is powerful and local conditions are favorable. This set has been made by thousands of my customers and will give fine results. I recommend that you make this little set before building a more elaborate set as you will thereby become familiar with crystal radio operation. You should have no trouble making this as full instructions are given below.



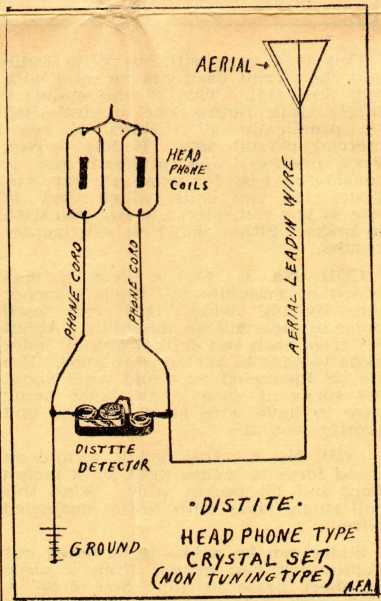
The coil is made of 25 feet of No. 24 enameled magnet wire (other size wire can be used, also cotton or silk covered wire is satisfactory). You should also experiment with various lengths of wire in coil. Wind wire around form about 2 inches in diameter, slip wire from form and wrap a small piece of tape around edge of coil and tack tape to base. Leave wire end about 3 inches long to fasten to binding posts. You can tune this set by opening and closing the turns of wire as you would a book. This varies the capacity (or wave length) to a surprising extent and allows some separation of stations.

- PARTS REQUIRED;-**
- 25 feet No. 24 Enameled wire. (See above.)
  - 4 Binding post clips.
  - Distite Midget Semi-Fixed Detector No. D. 125.
  - Base may be made of wood. Recommended size 3 inches x 4½ inches.

## Pocket or Headphone Type Sets Are Simplest to Make

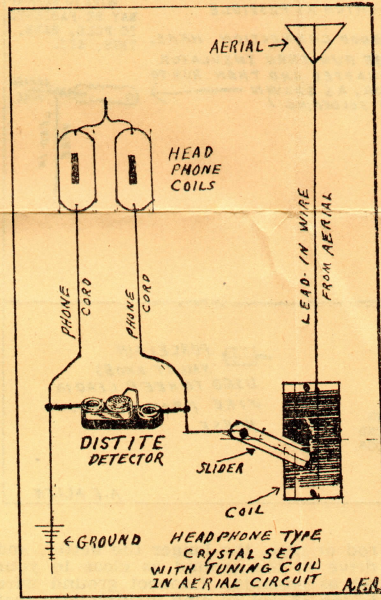
### Location Near Broadcasting Station Makes Possible This Type Radio Without Need for Tuning Coil.

If you are located very close to a broadcasting station a "DISTITE" Detector, phone, aerial and ground connections will make a very simple set. Merely connect "DISTITE" across phone terminals and connect one cord tip to Aerial and the other to Ground. This method of connecting is shown below.



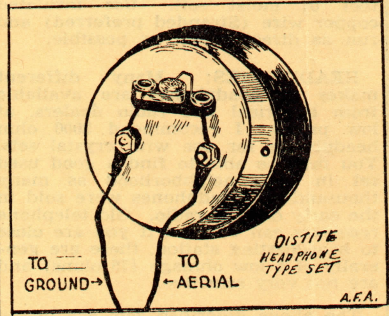
DRAWING "A"

While this is a very simple type crystal radio many thousands of so called pocket radios using this identical hookup have been sold in years past at prices ranging from \$3.95 up. This is the simplest crystal set possible to make as no tuning coil is used. For this reason this type set is suitable for local reception only and will rarely work for distances exceeding 15 to 25 miles. Drawing A shows how Detector is connected when single phone is used. Drawing C shows Distite Detector mounted on back of single phone. If double phones are used it will be necessary to connect Detector across phone cord terminals as mentioned previously. To use this set merely connect one phone cord tip to Aerial and the other to Ground, then adjust catwhisker contact until signals are loudest. If you are very close to a broadcasting station it is sometimes



DRAWING "B"

possible to receive programs using either the Aerial or Ground connection alone. Results with this set can



DRAWING "C"

be improved by connecting a tuning coil in the aerial circuit as shown in Figure B. Coils described elsewhere in this circular may be used.

## Distite Detector Is Best for Small Sets

In making a pocket size crystal set the main thing is to make the parts small in size so as to be readily enclosed in a small case. Details are given herein of several different sets. Construction details can be changed to suit individual desires. Small size sets will give practically the same results as larger type sets with the added advantage of being easily carried. The Distite detector is especially adapted to these small sets due to its compact design. While many crystal radios have been sold as "Pocket Radios" they are pocket radios only in that they are such a size as to be easily carried in the pocket. As far as being able to give satisfactory reception while the user is riding or walking, it must be stated that such results are not to be expected.

All pocket radios which do not require tubes or batteries are dependent upon the crystal detector for their operation and are crystal radios in every respect. They use a standard crystal set circuit with coil, detector and require Aerial, Ground and Headphones. The simplicity of design and construction of the crystal radio makes it an easy matter to make the parts of a suitable size to enclose in a small case.

Remember that a lot of the enjoyment of crystal radios lies in the fact that you can easily make them yourself. Give your set a little thought and careful work and you will be agreeably surprised at the trouble free reception that you will enjoy. There is a lot of room for experimenting and I recommend that you do as much of this as you can. If you have an idea try it out, don't merely wonder if it will work, try it, it may not work but again it may. I have lots of fellows write me asking if such and such an arrangement will work when in less time than it takes to write a letter they could give it a trial.

## Many Hours Pleasure Will Reward Your Work

**SPECIAL NOTE:** Crystal radios are broad tuning and sometimes it is difficult to separate one station from another. Remember this is the simplest possible radio and you should not expect the same results that you would from complex tube sets. As with electric radios reception is always better at night than during the day. Greater distances can be covered in winter than in summer. You will be amply repaid for the time you spend in making and installing your set by the many hours of pleasure you will spend in listening to the world's best programs received by your very own set.

**CRYSTAL RADIOS** use NO TUBES OR BATTERIES and depend on the current received from the broadcasting station for their operation. The results obtained depend upon a suitable and efficient AERIAL and GROUND and the use of sensitive headphones. The **CRYSTAL RADIO** is the simplest of all radio receiving sets. You will find that you can easily make any of the sets described.