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# The "Lop-Eared" Rabbit -

## A Tunable VHF Antenna

This month we'll take a look at an easy-to-make antenna which is tuneable over approximately the top half of the VHF band (for scanners, the most useful portion of that band). This antenna is a variation on our old friend, the vertical groundplane antenna, and is a good performer in areas of fair, moderate, or strong signal level.

The "rabbit" part of the name comes from the fact that the antenna is made from a "rabbit ears" TV antenna. The "lop-eared" part is an allusion to the fact that the two "ears" of the antenna are usually set to different lengths, giving a "lop-eared" look to the antenna. Let's see how one is built and used.

**Parts List for the Lop-Eared Antenna**

a. one rabbit-ears TV antenna
b. one 5 to 6 foot length of 50-ohm coaxial cable with RF connector to fit your scanner
c. two 3 foot lengths of insulated wire

### Some Surgery on the Rabbit

A rabbit-ear TV antenna comes with a length of 300-ohm twinlead cable attached to the base-end of the two telescoping antenna elements. For the new antenna you will make of the old rabbit ears, both of the two telescoping elements will be connected to the center conductor of a coaxial lead-in cable. A good way to make that connection is by cutting the old twin-lead about two inches from where it joins the elements.

Put the rest of the cable in your junk box. Then use the two inch bit of cable left attached to the elements as a means of attaching those elements to the new lead-in cable which you will install on the lop-eared antenna. See Figure 1.

You will have to trim the insulation off the end of the remaining two inch length of the old cable in order to make the new connection. Once the insulation is removed, the wires should look clean and metallic. If you are unsure whether they are clean, scrape them a bit with a knife or even sandpaper to brighten them.

### Attaching the Coax Lead-in Cable

Start preparing the antenna-end of the coax by carefully cutting off about two inches of the outer insulation on the coax. Then you need to get the inner conductor of the coax out of the braid where you can work with it. This can be done by teasing a hole in the coax braid, near where the outer insulation starts, and pulling the inner conductor through. If you'd rather, you can unbraid the outer shield to expose the inner conductor. Either way will work fine.

Once you have the inner conductor of the coax out where you can work with it, trim its insulation back to expose about one inch or so of the inner conductor wire. Check the wire and make sure it is clean, as discussed above. Then twist the end of the inner conductor wire together with both the exposed ends of the short piece of twinlead cable wire you prepared earlier. Be sure to leave enough slack in the wires attached to the elements so that the elements can be moved on their pivots without breaking the wires.

If you can solder this connection, great. If you can't, then wrap the wires tightly together, bend them together in a lump, and crimp the lump together with a pair of pliers. Once you have made the connection secure, wrap it well with plastic electrical tape.

Next, prepare two insulated wires about three feet long. A length of AC zip cord, pulled apart, to make two separate wires, is a good source for these wires. Remove about one inch of insulation from one end of each wire. Now wrap these two ends together with the shield of the coax, and either solder the three of them together, or lump and crimp them as described above. Cover this connection, and any exposed coax braid, with plastic electrical tape.

### To Finish the Antenna

Run the coaxial cable out of the base of the antenna. For this you can use the hole which originally was used for the same purpose by the old twinlead cable (which is no longer used). If the old twinlead didn't have a hole for exiting the base (some just run out under the bottom of the base) drill a hole in the base to let the coax exit. You also may need to make two small holes for the insulated wires to exit the base. Put these holes opposite one another near the bottom of the base.

It is probably best to epoxy the coax and insulated wires to the base where they exit, so that they can't slide back and forth through the hole, and cause the wires inside to break. Temporarily, they can be taped in place, if you don't wish to glue them. Now put an RF connector appropriate to your scanner on the far end of the coax, and the antenna is finished.

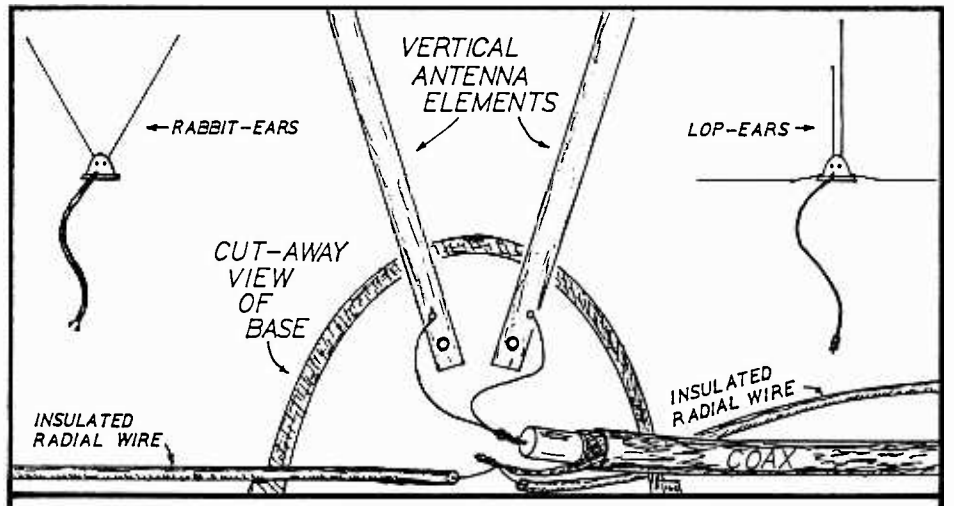


FIG.1. CONNECTIONS FOR THE LOP-EARED ANTENNA

## Using the Antenna

Set the antenna in a convenient location, and run the two insulated wires horizontally out of the base in opposite directions to one another (i.e., they make a straight line). If you can't run them straight or horizontally, do the best that you can. For lower frequency VHF stations, use longer lengths of the telescoping elements, and for higher frequency signals, make the elements shorter.

With two elements, one set short and one set long, the antenna will have a broader bandwidth than with a single element. Try various combinations and see what works best for you. Remember, with strong or moderately strong signals, any setting should work OK. For the weaker signals, finding a "best length" for one of the elements may be what you need to bring the signals in at listenable levels.

## RADIO RIDDLES

**Last month** I asked, "Alexander Graham Bell, in addition to inventing the telephone, actually invented a form of "wireless" telephony. But his wireless system was not the kind of wireless that led to the development of radio. What was his system and how did it work?"

Were you able to get this one? Bell invented a kind of "wireless" communication system called the "photophone." This device used a beam of light reflected from a diaphragm to transmit voice across distance. Reception was via a selenium cell, battery, and telephone earpiece.

Although this device offers relatively "eavesdropper free" communication, it was never exploited to any extent. Various forms of this device appear in electronic hobby magazines yet today, usually without realizing they should credit Bell as the inventor.

**This Month:** We've just discussed a rabbit-ear antenna, but have you ever heard of the "big ear" antenna? What is it, and who made it famous? Find the answer to this month's riddle, and much more, next month in your copy of *Monitoring Times*. Til then, Peace, DX, and 73. mt