A1-1-1

CONSTRUCTION OF A SIMPLE SPIRAL LOOP ANTENNA

In essence a loop is a coil of wire tuned with a variable capacitor which is connected indirectly to a receiver thru an extra winding. This winding is connected to the two antenna terminals on a communications receiver or to the ground and antenna terminals of other receivers. There are two types of loops commonly in use - the spiral and the box. Both have their advantages; the spiral is somewhat easier to build and materials cost less. Generally, the bigger the loop the greater the gain will be, that is, the more signal will reach the receiver. However, the loop antenna is primarily designed for use inside a room, and this places limitations on its size.

The materials needed for this loop are as follows: one 1" (25mm) thick dowel, of length determined by the size of the loop you want, but 3' (90cm) is good for the first time; one 5/8" (16mm) thick dowel rod, to be cut 2/3 the length of the thicker dowel - in this case, about 2' (60cm); about 150' (46m) of wire, #18 insulated (Belden Wire #20 will do); one 365 pf variable capacitor; one 1¼" (32mm) long bolt, about 1/8" (3mm) thick; and some scrap wood for improvising a base for the loop.

The first step is to drill holes in the two dowels for the wire to pass through. You should drill about 25 holes approximately 1/16" (1½mm) in diameter starting from the top of the larger dowel going down, with 3/8" (9½mm) between holes. Then, still working on the larger dowel, start one foot (30cm) from the bottom and drill another 25 holes working up. On the small dowel do the same thing working in from each end, again leaving 3/8" (9½mm) between holes. The drilling is best done with a drill press or an electric drill, but it can be done with a hand drill, although there's more risk of splitting the dowel. Next, the two dowels must be connected. Drill a hole with the diameter of the smaller dowel (5/8" - 16mm) through a spot which is equidistant between the two sets of 25 holes already drilled (about a foot from the top). Insert the smaller dowel to make a cross. After the crossarms are made, drill a hole the size of the bolt you have through the intersection. Bolt the two crossarms together to make it secure.

The frame is now ready for winding the coil of wire. Take one end of your long wire and start stringing it thru the holes, as shown in the diagram. After you have wound 12 turns, skip a hole on each cross arm, then continue winding the loop through the remaining 12 holes. When you have finished, leave sufficient wire at each end of your coil to run the wires down the longer dowel to the base. Now take a shorter piece of wire and feed it through the remaining holes to form a second loop of wire. Leave the leads on this smaller loop long enough to reach your receiver. You might want to fasten the leads to the longer dowel with insulated carpet staples.

Now take the leads from the larger coil of wire and connect them to the variable capacitor - one to the base and one to one of the terminals provided. Connect the ends of the one-turn pickup loop to the two antenna terminals on the receiver (or the ground and antenna terminals). If there are two antenna terminals and a ground, you might want to experiment by putting a jumper between one antenna terminal and ground to see if there is any difference.

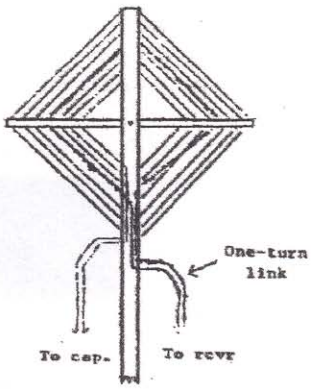
Now you need a base to support the loop. Take a thick block of wood and drill part-way through it with a 1" auger so that the thicker dowel will fit loosely into it. Then nail on cross supports and a board on top with a 1" hole in it, similar to the diagram.

Now you are ready to use the loop. With the antenna connected, turn on your receiver, tune to a station, and tune the variable capacitor. You'll notice that there will be one point at which the capacitor will produce a much greater signal strength. By turning the loop, you can increase or weaken the signal strength. You will find that there are two points at which the loop will give a much weaker signal strength - the nulls. These should be when the face of the loop is pointing at the station, one on either side. If you have constructed your loop carefully, the two nulls should be exactly opposite one another.

You can use the directional property of the loop to "null out" interfering stations on the same frequency, or even interfering stations on adjacent frequencies. Point the null toward the station you want to eliminate and tune for the station you want to hear.

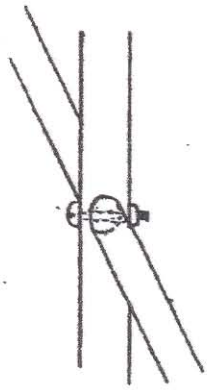
Signals received with this type of loop probably will not be as strong as those received with a longwire, but the directional characteristics very often help to receive clearer signals. As you progress in the hobby, you can add a transistorized amplifier to the loop to boost the signal strength. There are a number of articles offered as IRCA Reprints which describe other modifications you can make.

If your loop does not tune to the entire BCB band, you will need to add or subtract wire from the main coil. Add wire if the loop doesn't tune to the bottom of the band; subtract some wire if it doesn't reach to the top of the band. You can also experiment with different capacitors, and combinations.

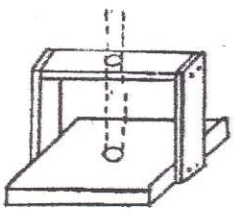


GENERAL DIAGRAM

For simplicity a number of coils in this diagram are omitted.



CENTER SECTION DETAIL



POSSIBLE BASE

MODIFICATIONS TO THE IRCA SPIRAL LOOP PLANS

by Keith Birlingmair

While listening to the jumble on 1280 khz, with CJHS dominant, I began thinking about building a larger spiral loop. (Mine is 2' square.)

But then I reflected on what a long grueling job stringing that wire was. I told myself, "There's no way I'm going to do that again."

And thereby came up with the following modifications:

First of all, forget about using dowels. Use 1" square pieces of hardwood (such as oak) cut the required lengths, 2' and 3' in the original plans.

Next, instead of drilling holes at the indicated spacing, cut ¼" (6mm) deep grooves at a slight angle toward center. (See figure 1.)

And third, cut ½" (13mm) deep grooves 1" (25mm) wide one foot from one end of each piece. Then drill a hole through the two and bolt them together. (See figure 2.)

These modifications should lessen construction time considerably, and eliminate the precision drilling necessary when using the dowels.

Figure 1.

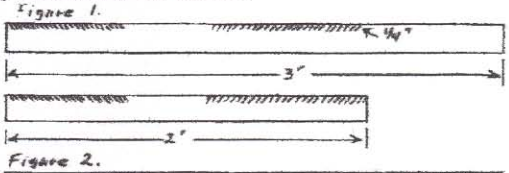


Figure 2.