

Inexpensive; Very Low Frequency Antenna (500Khz)

Date: Jan. 2007

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THE TEE SO IT IS PARALLEL TO THE ASSOCIATED ELLBO. This is a two dimensional structure, and flat is good!

The same procedure is used for attaching the 2 double Tees. The top double Tee is used so you can glue on a cap, drill a hole, and screw in a loop to hang the antenna. The bottom Tee is used so the wire can be threaded through the loop, and, although I have not done this yet, you can add a plastic electrical outlet box to put in the tuning capacitor, or a capacitor- inductor matching network.

By now I think you have the big picture. For the main "struts" you find the center of the loop, cut 4 pieces of 1 inch PVE tubing that intersect with the center double Tee, and sand both ends of each tube so they can easily be added and removed.



The wire loop antenna shown here is constructed from 1 inch diameter, 2 foot schedule 40 PVC pipe, single 1 inch Tee's, 1 inch Double Tee's, 1 inch 45 degree Elbow's, and Plastic Anchor's.

The dimension of the loop was carefully chosen. I had several pieces of PVC pipes left over from building a pool toy, and like most hams I wanted to put all the scrap to good use. I wish this was more scientific, but that's the ugly truth.

I glued ONE 45degree Elbow to each of the 8, 2 foot pipes. I then sanded the other end of each tube so it could be inserted and removed from its adjacent mating tube. This will allow assembly and removal of the loop structure after use.

The loop was then assembled on my garage floor and each tube was marked 1,2,,,8. I did this to make sure every connecting tube would slip easily into its mate.

The loop structure was clearly not self supporting at that stage. I marked the center of the vertical and horizontal tubes. I then cut the 4 tubes at there center line. For the 2 horizontal (left/right) tubes I glued a Tee. **MAKE SURE YOU APPLY THE GLUE AND QUICKLY ROTATE**



To hold the loop firmly together I drilled holes so I could insert "red" plastic anchor parts to each unglued connection. Why use red anchor parts? I'll leave that up to you.

Results:

Using heavy zip cord for wire I threaded the loop. Then I connected the two wires in the zip cord in parallel. Keeping the loop a few feet above ground and away from metal objects I measured and inductance of 6.4 uH and a Q of 196. With the two wires in series (two loops) I measured 27.2 uH and a Q of 323.

The theoretical value for 2 loops is 25.6 uH so I tend to think the measurements were correct.

Example/Conclusion:

Using this loop with parallel wires (6.4 uH), at 7 MHz it would **take 0.0807 pF** to resonate the loop. At a frequency of 500KHz the required capacitance is **15.8 nF**. All the values are clearly too small to be practical. This loop is useful in demonstrating a way of making inexpensive loop antennas easily, but there is little practical use for the ham, with the exception of **very low frequency** transmission.

See:

ANTENNAS, THEORY, AND PRACTICE
by Schellunoff

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