

## Cage Doublet

The final antenna that I have used in my arsenal/antenna farm isn't compact at all, but rather a fat dipole (we called it a *Cage Dipole*). It is somewhat shorter than a full-sized doublet or dipole.

Why is this a useful antenna? Well, bandwidth is a function of radiator diameter. At 0.064 in. (14 ga. wire), the bandwidth is pretty narrow. Increase that diameter to 8 or 12 inches and you might cover all of 75/80 meters (CW and SSB) within a 2:1 bandwidth. Plus, it gets a bit shorter. The theory is that by increasing diameter size you decrease Q without impacting efficiency (through lowering radiation resistance).

The concept is to have 6 or 8 dipole wires parallel to each other, kept spread apart with a spacer. PVC pipe (an 8" or 12" diameter) with holes drilled through sections provide a good spacing. Every 10-12' or so is adequate spacing. Make sure you drill holes on the appropriate angle to evenly distribute the wire.

You use the pipe and cut it into 3/8 to 1/2" cross sections. Drill the holes through the thickness of the wall, on the correct angle, slightly larger than the wire to be used. We found it easier to use a support (strong, like a tree) to extend the wires while threading the wires into the spacers. Don't worry too much about spacing the spacers exactly. They are there for mechanical support, and placement isn't critical. In fact, we put all of them on one end of the wires, then tied the wires together, THEN spaced them. Work on one side of the doublet (dipole) at a time, and **BE PATIENT!** At 80m this thing can have the cooperative factor of a slinky that has been wound too tight.

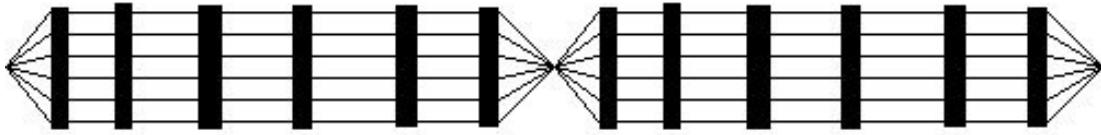
A word on type of wire. I found stranded difficult to work with. Solid wire, left alone for a few days with good pressure on both ends will tend to lose the tendency to curl. I found some copper-clad electric fence wire, which worked beautifully.

What about dimensions? My material doesn't have formulas, but a rule of thumb is that the standard dipole formula, less 4% for 8" diameter. A standard 80m dipole, using the  $468/f(\text{MHz})$  formula, is 124.82'. Less 4%, the length of the 8" diameter "cage" dipole is 119.8'. This gives a 2:1 bandwidth of 375 kHz (in practice my bandwidth was a bit bigger). A 12" diameter would be somewhat shorter still, perhaps 5%. Don't be afraid to build it a bit long and trim as needed, just as you might a typical dipole. They are easier to trim than construct!

What is the benefit (other than bandwidth) for this antenna? Well, actually, it appears to exhibit some gain. On receive the larger capture area appears to be the reason, and

on transmit the antenna appears tremendously efficient (resulting in increased signal strength). Higher latitude installations might be aware that this antenna won't generate a lot of heat, so ice loading becomes a concern. Again the copper clad wire helps.

Overall construction:



Detail of spreader:

