Telescoping PVC Mast

Getting it up in awkward places.

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My family and I camp a lot, and good places to hang up antennas are sometimes hard to find. I decided I needed a mast that was very portable—meaning it had to fit in the bed of my full-sized pickup truck, be at least 20 feet tall when erected, be lightweight, and cost very little for materials. Ease of construction did not enter into my plans—but as it turned out, this is a very easy to build mast.

My first thought was to make it out of metal, but having installed my own sprinkling system, and having built many antennas with PVC pipe and fittings, my thoughts soon were turned to PVC. I wanted my mast to come apart easily, or, in some other way, break down to eight feet in length. A telescoping mast seemed the easiest solution for handling and storage.

After dry-fitting and laying the pipe out on the hardware store floor, I bought the parts for about $20 and went home to try putting my new mast together.

A very important part of the mast is that the reducer bushings must be enlarged slightly so the pipe will slide through it. I used a drum sander in my drill press to enlarge both reducer bushings.

Construction

H in **Fig. 1** on pipe B is a 1/4-inch-diameter hole drilled through both sides of the pipe, 12 inches from the bottom. This is to hold pipe B in place when it is extended out of pipe A. I put a three-inch-long quarter-inch bolt through hole *H* and hole *I* in pipe C.

Fig. 2 shows how all the fittings and pipes go together. I did not cement the fittings to the pipe. They have a taper fit and will hold very well with a little pressure. If you cement them they're stuck forever.

The two-inch coupler *G* presses down on the two-inch pipe A. The two-inch to one-and-one-half-inch reducer *F,* which has been reamed out so that the one-and-one-half-inch pipe will slide through it, fits into the two-inch coupler *G*.

The one-and-one-half-inch coupler *E* presses onto the one-and-one-half-inch pipe B. The one-and-one-half-inch to one-inch reducer *D*, which has been reamed out so that the one-inch pipe C will slide through it, presses into the coupler *E*.

Pipe C has quarter-inch holes *I* drilled at 12-inch locations starting from the top and ending about two feet from the bottom. These are to be used to adjust the height of pipe C.

Pipe B fits into *F* and pipe C fits into

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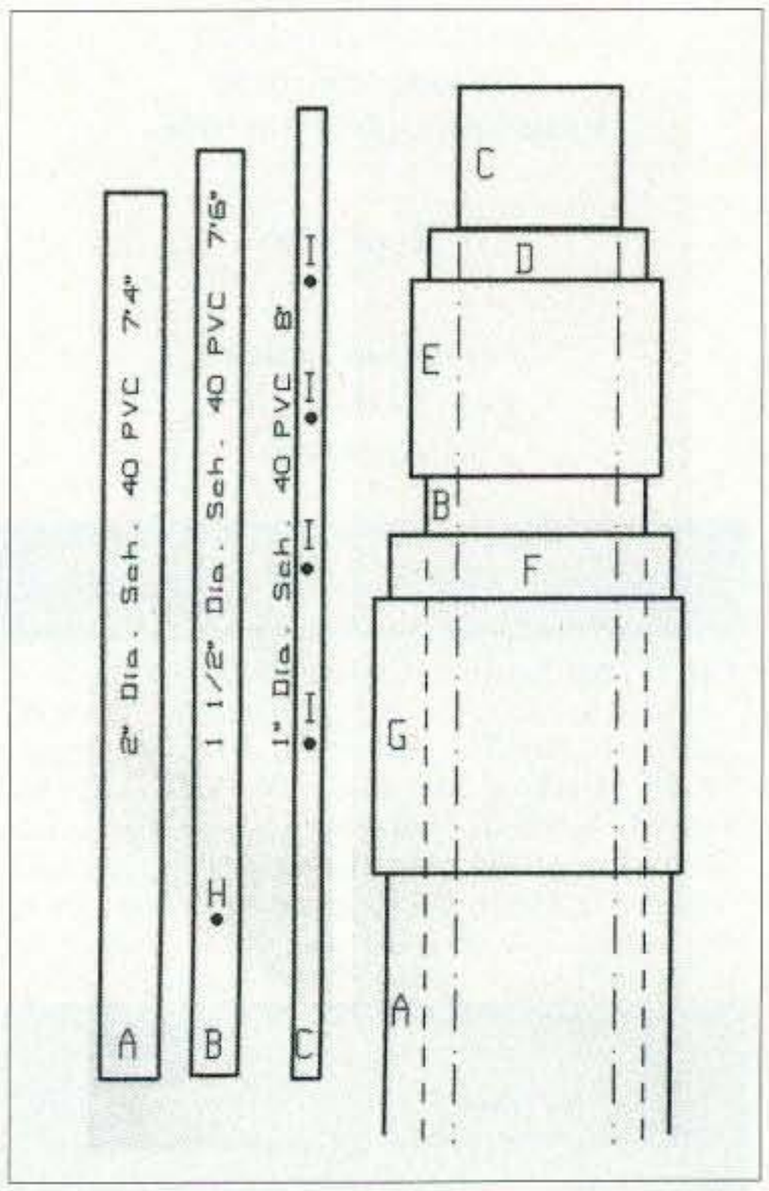

Fig. 1. *Lengths.* ***Fig. 2.*** *The pipes.*

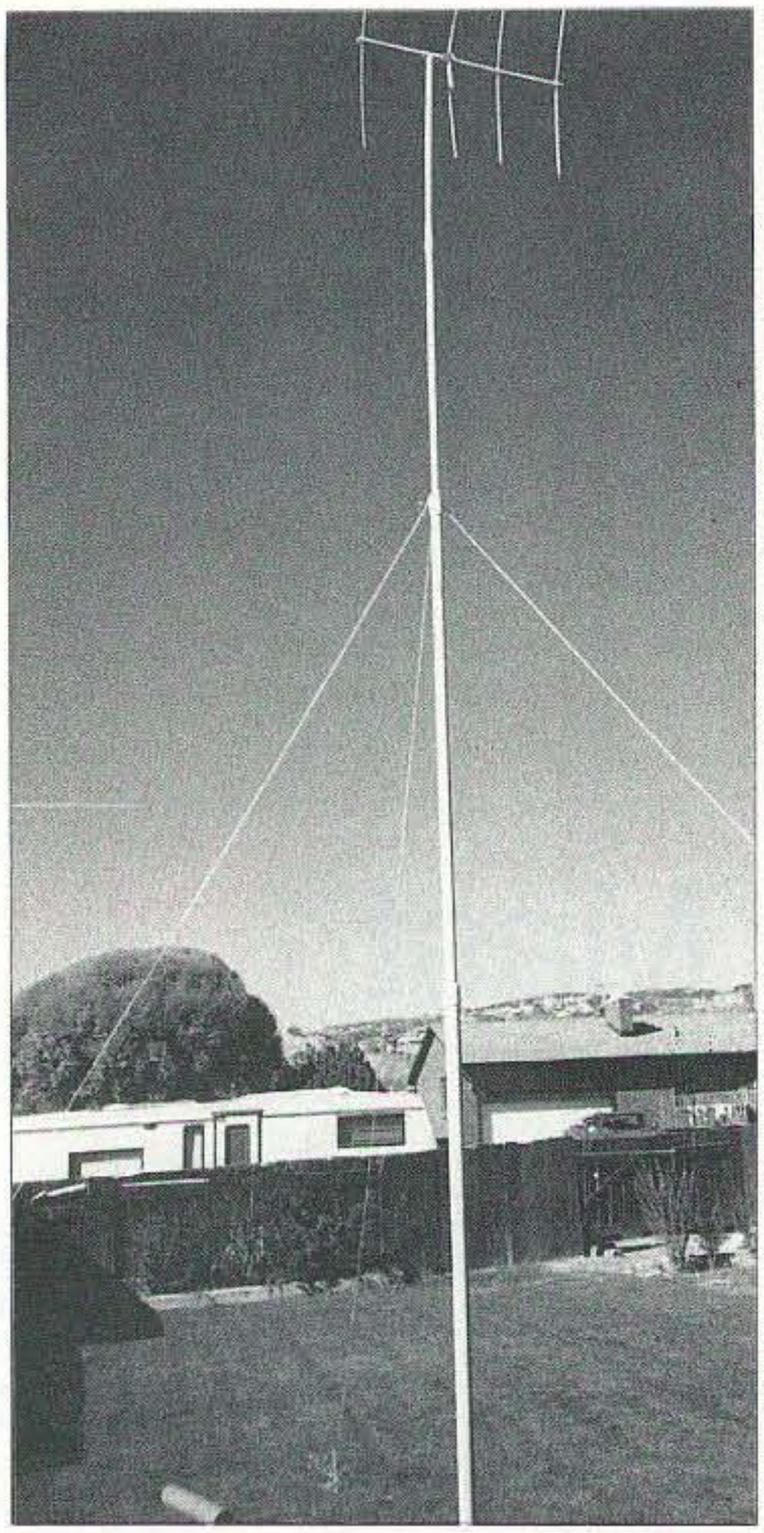

Photo A. *Mast with Insta-Flex two-meter yagi beam.*

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D. This all slides together to make a nice eight-foot-long collapsed mast. To extend it to 20 feet, pull C out to the bottom quarter-inch hole and insert a bolt through the hole. Let it rest on *D*. Pull B out to the quarter-inch hole *H*, stick a bolt through the hole and let it rest on *F*. I use three nylon ropes as guys; I loop them over C and let them slide down to rest on *D*. Alternatively, they could be made to attach closer to the top of C.

Modifications

Another modification I made later was to place a one-inch wooden dowel inside pipe C for extra strength when supporting heavier antennas. The next modification was to get a one-inch coupler, sand it down so that it would slide inside pipe B, and set it on the bottom of pipe C, to take the slop out of the two pipes. Pipe B in pipe A is a good fit by itself.

Parts List

Qty.	Description
1	7' 4" length 2-inch-diameter s/40 PVC pipe
1	7' 6" length 1-1/2-inch-diameter s/40 PVC pipe
1	8' length 1-inch-diameter s/40 PVC pipe
1	2-inch coupler
1	1-1/2-inch coupler
1	1-inch coupler
1	2-inch to 1-1/2-inch reducer bushing
1	1-1/2-inch to 1-inch reducer bushing
2	1/4-inch bolts, each 3 inches long
1	2-inch cap for bottom of pipe A

Miscellaneous: Nylon™ rope for guys; 1-inch-diameter wooden dowel for extra strength

Table 1. *Parts list for the telescoping PVC mast.*

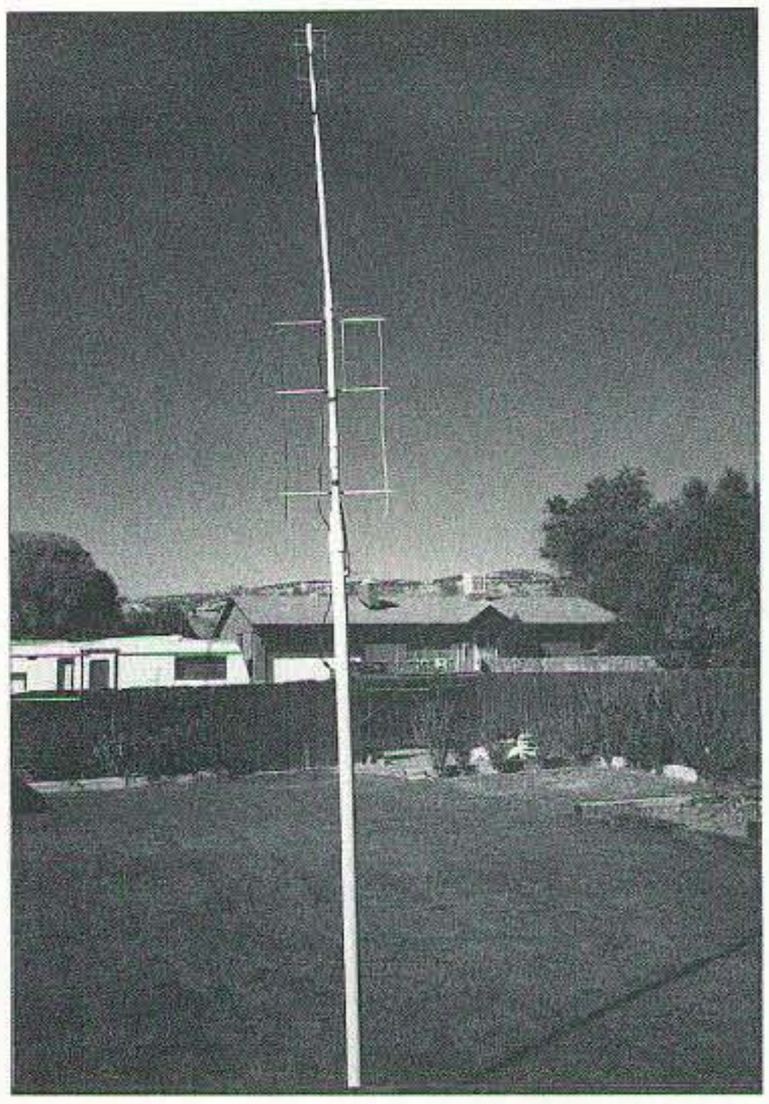

Photo B. *Mast with two-meter and 70 cm top-fed, out-of-phase, phased vertical antenna. Design by Nizar A. Mullani KØNM, from "Top-Fed, Out-of-Phase, Phased-Verticals (TOP) Antenna," published in March 1997's* 73 Amateur Radio Today.

I also have a two-inch cap for the bottom of pipe A. I sanded it out a little so that it will not fit too tightly and it can be taken off. I put the cap on when that mast is placed on the ground, and take it off if I want to install the mast on the two-inch-ball trailer hitch of my pickup truck (or the one on the back of my camp trailer).

Of course, my favorite antenna to set on top of the mast is the "Insta-Flex Two-Meter Yagi Beam" I designed, which was published in the April 1997 issue of *73 Amateur Radio Today* (see **Photo A**). My PVC mast has also supported a 10-meter dipole made of surplus military whips. The latest antennas to grace the top of my mast have been Nizar A. Mullani KØNM's design. They're called the "Top-Fed, Out-of-Phase, Phased-Verticals (TOP) Antenna," and were explained in the March 1997 issue of *73*. I have made both a two-meter and a 440 version of the "TOP"; they are easy to make and work well. (**Photo B**). *N.B. Check out Nizar's article—it's very interesting.* 73