Trees Are for the Birds

The ham's secret weapon—PVC!

Peter A. Bergman NØBLX
3517 Estate Dr. SW
Brainerd MN 56401

When I moved from a trailer court to a house on a half acre in the country, I thought that all my HF antenna problems were solved. I had been using a 40-10 trap vertical clamped to the hitch on the mobile home but now I had room and I had trees. I could hang all the wire antennas I wanted from the tops of those lovely trees.

Well, sort of. For one thing, all the larger trees are at the back of the lot and the tallest tree in the front of the house is still only eight feet tall. I think we have all heard the joke about the elephant and the acorn, but I wasn't willing to wait twenty years.

After one particularly frustrating afternoon spent trying to shoot a line over the top of my tallest tree, I knew that something else had to be done. Slingshots are for kids and trees are for the birds.

What I wanted was something that was readily available, easy to work with, durable, and cheap. Since I am involved in Civil Air Patrol communications, I wanted to produce a mast that was easy to store, transport, and set up. And cheap. With that in mind, I started to experiment.

I was already using a mast made of two sections of three-inch schedule 40 PVC to support the feedpoint of a pair of inverted vee dipoles. It worked, but I wasn't happy with it. I wanted more height and I wanted it to be stronger and straighter. The sections were joined with a standard pipe coupling. It seemed that no matter what I did, the top wanted to lean one way or the other—sometimes both ways at the same time! I had joined the coupler to the pipe sections with bolts and large sheet metal screws instead of PVC cement because I didn't want to have to use a saw to take it apart. A few too many trips to the Saint Solenoid Day Festival and all I'd have is a lot of short pieces.

I decided to continue working with PVC, but needed a better method of joining the mast sections. I had tried telescoping successive sizes but that didn't seem to work very well either. Finally I hit on two methods that I really like.

First, I cut some scrap three-inch-diameter ABS pipe I had in the junk box and split it lengthwise with a saber saw. A table saw would have worked better, so use it if you have one. Then I measured the length to find and mark the middle. Joiners less than one foot long don't seem to do the job, but more than two feet seems wasteful. Next comes the

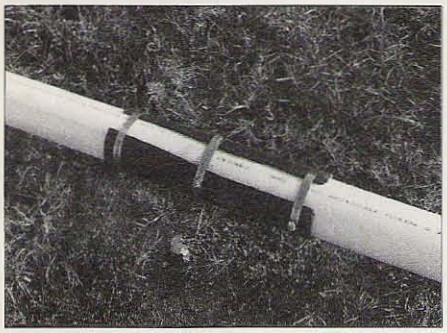

Photo A. *Joint detail.*

Photo B. *Strong but flexible.*

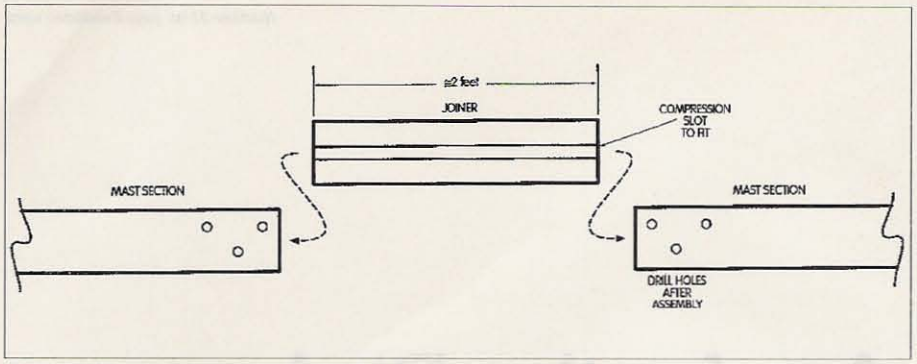

Fig. 1. *Internal joint.*

tricky part: sliding the joiner over the mast sections.

For its weight, schedule 40 PVC is strong and very springy. The best tool I found for that job was a Stanley Wonder Bar™, which is one of those small handyman-style pry bars that are available almost anywhere that sells tools. Insert the short leg of the bar into the saw cut a couple inches from the end of the joiner pipe. Then rotate the long leg parallel to the pipe. The width of the bar is just about right to spread the joiner pipe to slide over the end of the mast section.

After you have slid the joiner to the mark you made earlier, secure it with a hose clamp. Then use the Wonder Bar to spread the other end of the joiner so you can get the next mast section started.

Once you have the second section slid in against the first, you can install the other two hose clamps (**Photo A**). Be very careful when spreading the joiner pipe. If your spreading tool slips, you could find yourself trying to drive to the emergency room with a foot or two of pipe clamped very painfully to some part of your anatomy. Using this method costs about two dollars per joint, but these joints are strong and reusable while retaining some flexibility (**Photos B** and **C**).

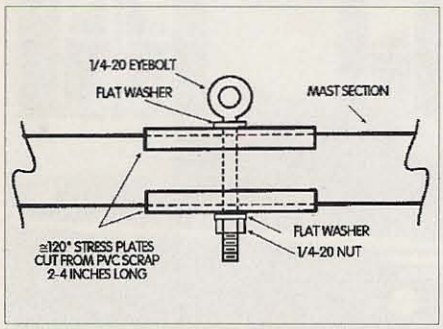

Fig. 2. *Guy line attachment detail—antenna attachment similar.*

The other method I'm using is a sort of inversion of the one just described. Start by splitting a two-foot length of PVC lengthwise as before, but remove enough additional material so that the joiner can be compressed and slid inside the mast section. Use a hose clamp to compress the first few inches of the joiner. Once the joiner is started into the mast you can move the clamp to facilitate the rest of the operation.

Once you have the joiner inserted halfway, lock it in place with two or three #6 or #8 sheet metal screws. Then you can use the clamp to get the next mast section started. This method is about a buck and a half cheaper per joint than the other and is very strong and flexible. I have a 30-foot mast I built of inch-and-a-half schedule 40 PVC—it has performed very well supporting one end of my G5RV (**Photo D**).

After a particularly nasty ice storm last winter, I was dismayed to find that the inch-and-a-half mast had almost been tied in an overhand knot. Somewhat disheartened, I went out and started knocking the ice off the guys, antenna, and mast. As the weight was removed, I was pleased to see the mast trying to straighten itself. Once the top of the mast was out of my reach a spare mast was used to push the top higher where it finally toggled upright. Since retensioning the guys, the mast has served me well. The three-inch mast at the other end of the antenna has given no trouble despite being guyed only at the top.

Late last winter I woke one morning to find that, overnight, we'd had five inches of very wet snow, the kind that weighs about a metric ton to the shovelful. The antenna was still up and the inch-and-a-half mast was just fine, despite the fact that with the sticky snow, the guy lines and antenna had grown to almost the diameter of the mast.

Photo C. *The three-inch by 30-foot mast at work.*

PVC pipe is readily available, inexpensive, and durable. If you need a mast for permanent or portable use, you might want to consider the ideas I've presented here. Even if you use three-inch pipe, you can produce a 30-foot mast that is strong, inexpensive, and easy to transport and erect.

Have fun, and be careful out there... 73...

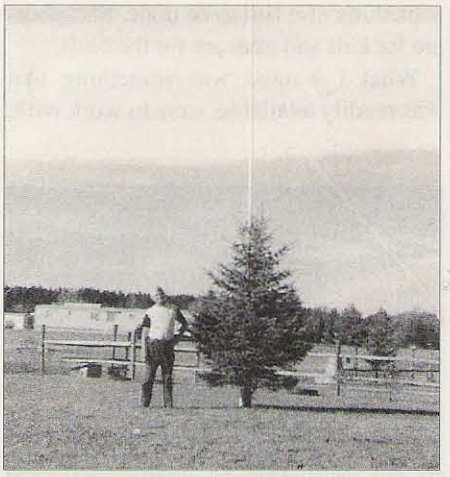

Photo D. *The 1-1/2-inch by 30-foot mast (photo by Chandra KBØYXB).*