A trip to your local lumber yard, some basic tools and minimal woodworking skills are all you need to build this field antenna support.

The Versatile, Handy Portable Antenna Stand

BY GARY "JOE" MAYFIELD,* KKØSD

This handy portable antenna stand was built in an afternoon and has proven to be very useful for 20-plus years. I would never begin to describe myself as a carpenter; this stand can be built well with simple hand tools for a minimal expense by the novice woodworker.

First, a little history: In 1991, the Mesilla Valley Radio Club of Las Cruces, New Mexico, decided to try Field Day at North Star Mesa in the beautiful Gila Wilderness. It is an awesome but primitive site. As a young—okay younger—satellite enthusiast, I headed the satellite station with some experienced guidance from Bob Creason, W5XR, and Jim Grove, N5BKW (SK). North Star Mesa is a rocky and often windy site, so we needed a way to deploy the antennas without putting stakes in the ground and without much of anything to tie down to. These were fairly large antennas designed for working AO-13 and AO-10. On top of this, the stand had to fit in the back seat of the sports car I was driving at the time. We talked about using a commercially made tripod, but were concerned the base would not be as stable we needed. I came up with the idea for this stand (see photo A), and with a little help from Bob, the rest, as they say, is history.

Tools and Materials

Enough storytelling, so let's get to building. The parts list is shown in Table I. If you walk out of the lumber yard with these items, you will have all you need. If you would rather scrounge some or all of the parts, I can totally relate.

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Photo A. Antenna stand at Field Day 2013

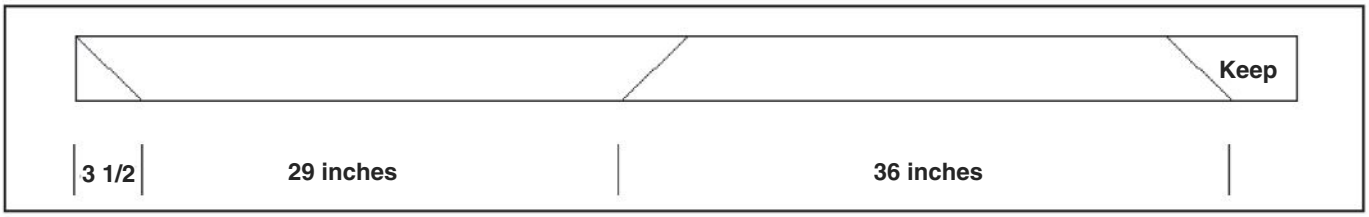

Fig. 1. Support cutting diagram

(2) 8 foot 2" × 4" lumber
(2) "Stud Length" 92 5/8" x 2x x 4" lumber
(2) 8 foot 1" x 4" lumber
(4) 3 1/2 inch wide strap hinges w/screws
(8) 1/2 inch by 3 inch bolts
(4) 1/2 inch by 4 inch bolts
(12) 1/2 inch washers
(1) Bottle of Wood Glue
(12) 1/2 inch tee nuts
(1) Small box 2 inch sheet-rock screws
(1) 20-foot piece of lightweight rope
(5) 1-inch heavy duty screw in eyes
(1) 2-inch paint brush
(1) Quart of exterior paint
(1) Small bag large enough to hold all the bolts

Table I. Parts list

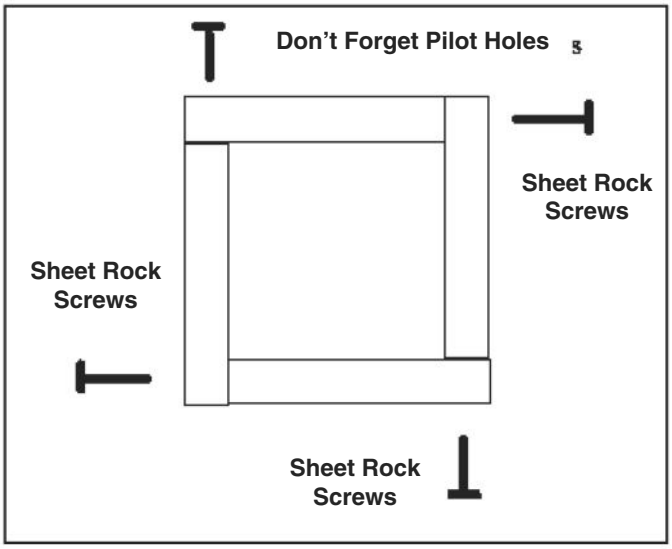

Fig. 2. Wooden tube end view

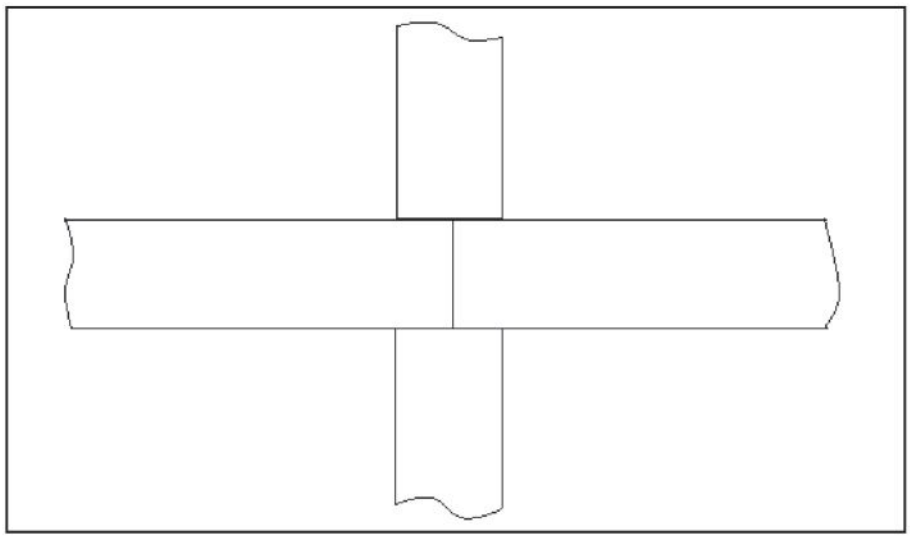

Fig. 3. 2×4 placement

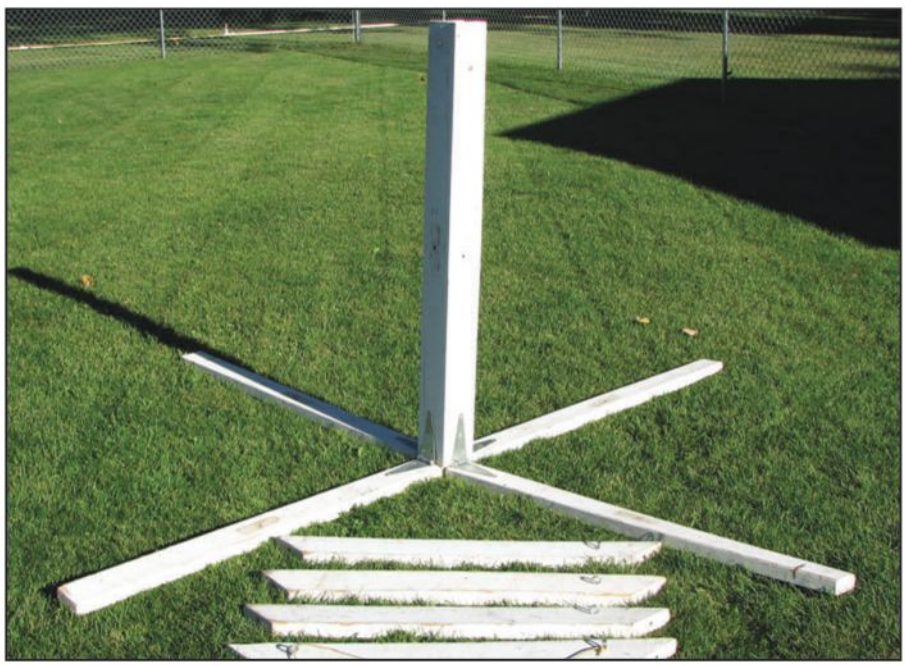

Photo B. Antenna stand without supports attached

I am going to assume you have a drill, drill bits, tape measure, saw, hammer, and the other tools most folks have. If you have more advanced tools and know-how, by all means use them!

There isn't a lot of wood to cut and there will be very little left over. Please make sure to use all of your tools safely. Eye and hearing protection are mandatory when dealing with loud power tools.

First, we will make each 8-foot board into a pair of 4-foot boards. Nothing is real critical, but I always try to make the cuts as square as possible and cut the boards as close to exactly the same length as I can. This should result in four 1" × 4" boards and four 2" × 4" boards that are all 4 feet long.

Next you need to cut the "stud length" 2" × 4" boards into the side supports. These are 45-degree cuts and a good place to use your miter saw if you have one. I used "stud length" because they are cheaper at my lumber yard. Again, any length will work as long as the short edge of the "keep" piece is at least 6 inches long. Cut the 45s so the long edges are 36 inches. Check the cutting diagram in fig. 1 for guidance. When done, you will have four trapezoids that are 36 inches on the long side. Save the two "keep" pieces, as we will use them in a minute.

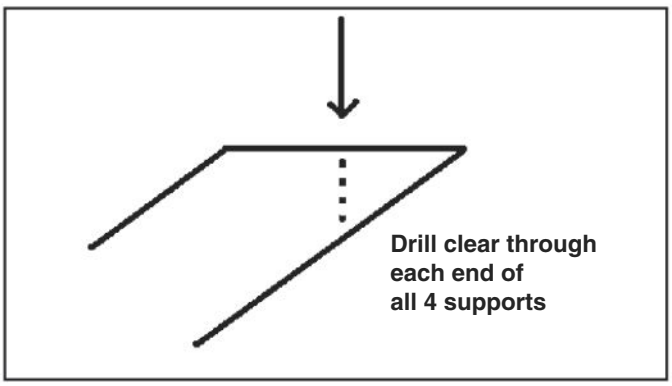

Fig. 4. Drilling pattern for angled supports

Photo D. Block shown inside tube during assembly

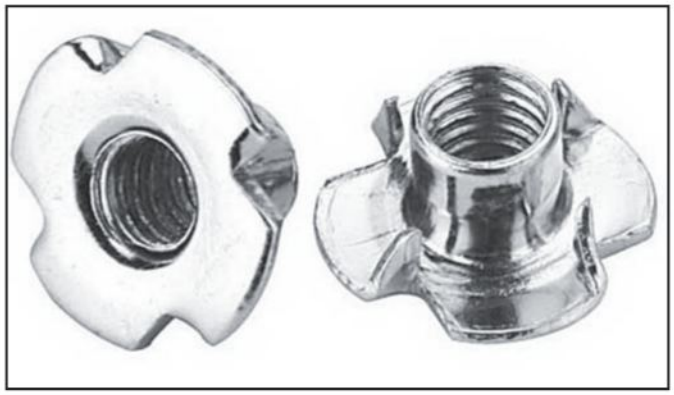

Photo C. Tee nuts

This next step was added 20 years after the original construction, but provides for a better, sturdier stand at essentially no additional cost. It is not essential, but it is recommended. Cut each "keep" piece into a 6-inch-long rectangle. Glue and clamp the 6-inch pieces together to form a $3\frac{1}{2}" \times 3\frac{1}{2}" \times 6"$ block. Carefully trim the block to $2\frac{3}{4}" \times 2\frac{3}{4}" \times 6"$ after the glue has set, and then drill a hole lengthwise through the center of the block for drainage. I used a $\frac{1}{4}$-inch spade bit.

Assembly

Once the sawing is complete, it is time to start assembly. You are going to make a square tube with the $1" \times 4"$ lumber. The tube is constructed for maximum symmetry and held together with sheet-rock screws. Do not use any glue, as you will

be taking it back apart a couple of steps from now. I strongly recommend drilling pilot holes where you place the screws to help prevent the wood from splitting.

Fig. 2 shows the end view of the wooden tube. You will want to use at least four evenly spaced screws along each side of each tube.

Once you have the tube constructed, place the 4-foot-long 2" × 4" pieces on the ground with the ends butted together as shown in fig. 3. Stand the tube upright where the four 2×4s come together. Center the tube over this spot and attach the hinges between the tube and the 2" × 4" pieces. The result will be a very wobbly antenna stand as shown in photo B.

Looking again at photo A, it should be pretty clear where we are going at this point. Our wobbly tube needs some support. Real carpenters are going to cringe at how I do the next couple of steps. If you have true carpentry skills, by all means do it as you see fit. My steps are just one method to make everything fit. Take the four trapezoid pieces and drill straight down through the center of the angled edge that you cut as shown in fig. 4. This will result in drilling eight holes, one in each end of each trapezoid-shaped support piece. Drill a hole slightly larger than 1/2 inch so the bolts will slide in.

Put the supports in place up against the wobbly tube. A brick or weight of some kind can be placed against the support on the 2" × 4" base piece to hold the support in place. Mark the tube and the base pieces where the holes in the supports line up. You should be able to reach a pencil through the holes to mark the wood underneath. If you have my skills, the supports will not be interchangeable, but the holes will line up if you do it this way. You should label the tube sides and their corresponding supports. Mine are simply labeled a, b, c, and d. Each support now has a 1" × 4" hinged to an associated 2×4.

Next, drill slightly larger than 1/2-inch holes into the tube and through the base pieces where you have marked. While you are at it, drill another hole in the center of each side of the tube about 4 inches down from the top. These holes will hold the "keeper" bolts that keep your mast from spinning and/or wobbling.

Now for the trick: Remove the sheetrock screws holding the tube together. Hammer tee nuts over the holes on what would be the inside of the tube. If you are not familiar with tee nuts, they can be seen in photo C. Once I hammer the tee nuts in place, I like to put a little paint on them just to remind them of where they are supposed to stay. The remaining tee nuts should be hammered over the holes on the bottom of the base pieces.

Photo E. Pieces ready to bundle up for easy portability

The next step is to reassemble the tube with the tee nuts securely mounted inside. When reassembling the tube, place the block we created at the "bottom" of the tube. This will give the hinge screws something a little beefier to screw into, as shown in photo D. I added glue to the pieces when doing this assembly.

After assembling my stand, I painted it with exterior house paint just to make it hold up longer. As I mentioned, my side supports only fit one way, so be sure to re-label them after painting. The final step is to screw two eyes into one side support and a single eye into the others. This will allow you to lay out the pieces as shown in photo E and then roll them up into an easy-carry bundle as shown in photo F. I added a small fabric bag to hold the hardware.

An Excellent Support

The stand has proven to be real handy for Field Day and other times when you just need something to hold up a mast. As an added feature, you can attach just three of the supports, insert your mast, mount your antenna, and then tip up the stand with mast and antenna assembled. Then simply add the fourth support and you are ready to operate.

Photo F. All bundled up and ready to go