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Hex-Beam Installation, 11 August 2003

Installation of the Utility Pole

There are many ways to support an amateur radio antenna. When I moved to Guntersville, Alabama, in December of 2002, I needed to have an antenna support which would be non-obtrusive, very strong, and permanent. I chose to have a utility pole installed, which would provide an antenna height of approximately 13 meters (40 feet) and which would require no guy wires. This page shows the process it takes to install such a pole.

W4TI Antenna Pole Installation 26 June 2003



That hole is six feet deep.



Bringing in a 45 foot pole. What would we do without the utility right-of-way?



Several large trees had to be removed to make room for the pole.



Next, the pole trailer was maneuvered into position.



The ground wire (solid copper 4 AWG wire) was stapled onto the pole.



Next the crane was used to bring the pole into position.



Everyone is standing well away from the pole. The crane operator said he had never dropped one - yet.



Now the base of the pole was brought above the hole.



The plumb line was used to help get the pole straight.



The braces keep the pole straight while everything settles.

The pole is now 39 feet tall, and should make a great antenna support.

Look! No guy wires required!

Installing the Rotator

30 July 2003



Once the pole was installed and had settled, the braces were removed and the pole steps were installed. The steps are Joslyn part number J1118, and are 5/8" by 10 inches long, with a threaded tip. They were installed after the pole was placed, by drilling a 5/8 inch hole 4 inches deep, screwing in a step, climbing one step up, and then repeating this procedure until the top was reached. The steps are at 14" intervals up the pole.



The bracket shown was fabricated to provide a proper mounting point for the Yaesu G-800SA rotator. The bracket is welded up from galvanized steel. The hole pattern in the angle stock matches the hole pattern which came in the pole, from the factory. The bolts shown go all the way through the pole. They are 5/8" x 10" hot dip galvanized steel, and just fit the pre-drilled holes in the pole. The large washers are necessary to spread the stress which the bolts put on the wood.

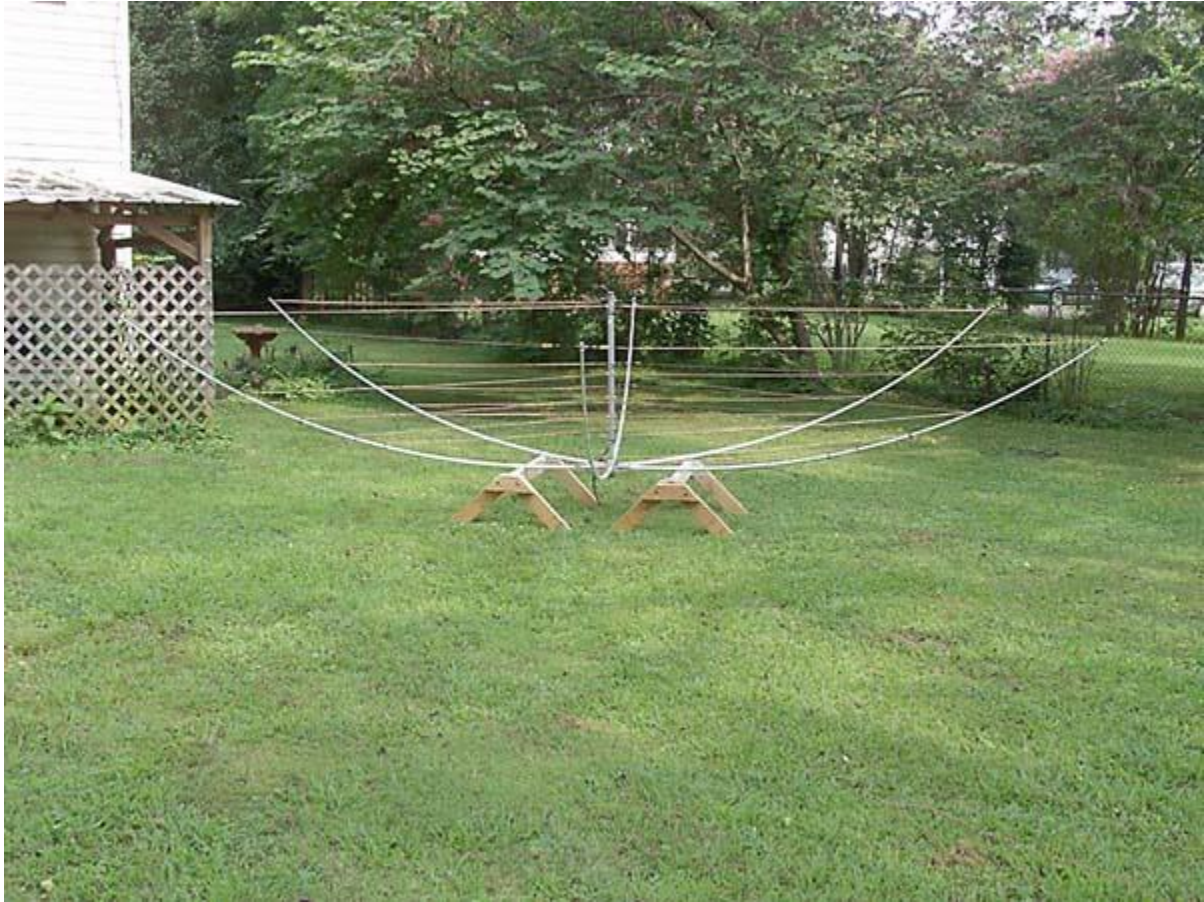


The bracket and rotator were preassembled and tested on the ground, and then hauled up the pole and bolted on as shown. The mast for the antenna has a step in it, which was required to match the rotator top bracket to the antenna. The Rotator needs at least a 1 1/2" diameter mast, and the antenna requires a 1" (ID) water pipe, which is too small for the rotator. I fixed this by adding a short sleeve of 1 1/4" (ID) water pipe over the bottom of the 1" (ID) water pipe mast. I cast an epoxy buffer in between the two, and all of the pieces are pinned together with the Yaesu-supplied 9mm bolt. It is very stout indeed. Note that the 4 AWG solid ground wire has not yet been connected, nor has the rotator's control cable been attached.



This is the over-all view of the pole with the rotator attached. The 39-foot high pole now has an additional 2 feet of bracket, rotator, and mast, for a total antenna height of 41 feet.

Installing the Hex-Beam



Here is the HX-B5i five band Hex-Beam, assembled and awaiting installation. Solo construction took about 2 1/2 hours. There were no missing parts, and everything fit just fine.



This is the feedpoint of the HX-B5i Hex-Beam. The red wires shown here are the 20 M driven element, and the black wires are the 20 M reflector.



This is the Hex-Beam base. Everything attaches to that big hexagonal aluminum plate. The black blob on the RG-213 feedline is an RF choke, made from six Amidon FB-77-1024 Ferrite cores, wrapped up and weatherproofed.



Braver men than I would have simply muscled the Hex-Beam up onto the rotator, but I was not able to do so. I tried to do it without the crane, but in the end decided that it would be less expensive to pay the minimum charge for the crane to come up from Gadsden Alabama, than to risk damaging the antenna or find myself in the hospital emergency room. Here we see the crane lifting the Hex-Beam into place. Here I am guiding it to line up the rotator stub with the bottom hub on the Hex-Beam.



Next it was necessary to tighten the hex screws in the hub to initially lock the hub to the rotator stub. There is also a bolt which goes through the hub and stub in order to completely fix the direction of the Hex-Beam.



The riskiest part of the whole process was climbing up past the plate and disconnecting the crane strap. The vertical mast above that point is plastic and is not safe to use for support. As can be seen here, between the crane operator and I we got the disconnection accomplished.



Here is a detailed picture of the completed rigging of the feedline for the HX-5Bi Hex-Beam, and the control cable for the Yaesu G-800SA rotator. Proper strain relief for the cable is the next step to be done.



This picture from the other side shows the entire antenna, rotator, and pole attachment. This is a very strong setup, and there is every reason to believe that it should survive many years. Our only worry is birds - very large birds. We have seen a nesting pair of osprey in the neighborhood, and I have to wonder if they are attracted to this sort of structure. (These birds have what appears to be a 1.6-meter wingspan).



Finally, this is what the entire installation looks like from the ground. The height of the Hex-Beam is about 13 meters (41 ft.) and no guys are required. There is a 40 meter (135 ft) long flat top attached right below it.

All of my tests show that the Hex-Beam works well, and I have every reason to like it. It is very directional, and the difference on receive between it and the wire I was using is nothing short of amazing. There are deep nulls about 135 degrees to both left and right of the main lobe. I get great signal reports, better than with any other setup I have ever owned.

But really, there are three attributes which make it fit my needs. First it is compact. The turning radius is all of 3 meters, which makes it so that it fits in our very narrow downtown city lot. Second, it does not look like a typical ham antenna. The TH-3 I had in California was a complaint magnet, because everyone knew what it was. Third, it covers 20-17-15-12-10 meters equally well. For my operation (primarily CW or PSK-31, and usually barefoot) this is a great advance.