

There is a small group of Amateurs who meet regularly at a community park located in Fairview Heights, IL. Someone once called them The Antenna Builders Guild and the name stuck. The guild meets monthly to build and experiment with different antennas. Their favorite saying is, "We don't argue about whether it will work or not. We build it and test it to see if it will work." They had a meeting in October, 2010 to put up a new/old design for an antenna that is rather rare on the ham bands these days. The antenna is huge at over 330 feet long and around 180 feet wide. Not your typical city lot antenna. It was a Vee-Beam antenna and this is their story about building and testing it.

Antenna Builders Guild Report Oct 23, 2010



We had another Antenna Builders Guild meeting today at Pleasant Ridge Park. We put up a Vee-Beam antenna. Wow, what a beast. The design called for the legs of the antenna to form a vee with the feed point at the apex of the vee which is supposed to be suspended 50 or more feet in the air. The legs are supposed to be 330 feet long. The Vee is supposed to form an angle of about 44 degrees. You will see why I say, "Supposed to be" a little later in this report.

We ran into some problems when we got to the park. We wanted to point the beam at Europe. With an antenna that long we needed to use one of the pavilions that were west of a large open area so we could point the antenna to the northeast. Well, the good folks that hold the reservations for the park said earlier this week that nothing was reserved for the park so we figured we were in good shape and didn't bother reserving the site. It costs \$50 to reserve one of the pavilion.

When we got there, the area we wanted was reserved for a wedding. So, we settled on a different pavilion to have lunch in and moved operations to another area that did not have a covered, picnic area,

but was marginally large enough to fit our antenna. Actually this was probably a good move because with an antenna that long, you have to be careful where you put it up. The feed point is at supposed to be 50 feet in the air but the ends of the legs are right down near ground level. It would be easy for someone walking through the area to not see the wire of the antenna legs and accidentally “clothes-line” themselves. The new area we chose was well away from the public.

So, we inspected the new area and decided the antenna would fit. We measured out the 330 foot legs and trimmed the wire length. Frank, K7RMJ, built up two terminating resistors during the week before our gathering, one for each leg. The resistors were made of 20 each, 6.8 K resistors in parallel. The total resistance was 340 ohms. Close enough. He also built a center insulator from ¼ inch thick plexi-glass with holes drilled for the ladder feed line, holes to secure the antenna legs, and one hole in the end of the insulator to secure the rope used to raise and lower the feed point.

Then came the fun part: The legs, feed line were attached to the center insulator. Then we laid out the legs for the antenna to where we felt the ends should be and marked where the ground rods would be installed. Knowing that Murphy was lurking in the nearby trees, we made a good decision and decided to wait to drive the ground rods into the ground until after the apex end of the wires was in the air.

Shooting the rope over a tree is always fun but Murphy has a habit of raising his ugly head just at the least opportune time. The winds had picked up to over 20 MPH. It was fairly calm until time to raise the antenna. Dennis, KC9IXO used his sling-shot and spinning reel device to shoot a line over the tallest tree in the area. The first attempt missed where we wanted it to be. So we pulled it back and shot again. This time we got it up very close to where we wanted it and decided to leave it there. Next we attached the rope to the center insulator assembly and pulled it up. We got it up well over 45 feet and there were smiles all around. It was good enough.

We marched out to the ends of the legs and stretched the legs out until the wires were up off the ground. Wow, that much wire has some weight to it. Not only that, but when we stretched the legs out they were too long on one leg of the antenna and we were going to have to move it out a bit to get away from a ravine that dropped off about 20 feet. So we moved it over a ways and discovered the cement slab hiding under the dirt so we moved it a bit further. This meant suddenly the apex was no longer at 44 degrees as we had planned. It was now more like 55 degrees. Well, that’s okay. It means the radiation pattern for this antenna would have a bit wider beam width and a little less gain than planned. The original estimate was for a 30 to 35 degree beam width so we could afford to spread it out a bit. We hammered the ground rods into the ground, secured the first antenna leg to the rod insulator and attached the terminating resistors.

The second leg was easier because there was plenty of room to stretch it out without running into that pesky ravine or the cement slabs we found near the other leg. We pounded the ground rod in and secured the antenna leg then attached the other terminating resistor and started walking back to the apex where the rig was being set up. That is when we noticed the leg that we had stretched out so well was on the ground again. Oops. What happened?

It seems that the rope we pulled over the tree back at the apex went over some tree limbs that were not as sturdy as we thought they were. The rope dropped down several feet to a lower limb. It was still about 35 feet in the air and since we planned on using the antenna on 40 through 10 meters we decided 35 feet was good enough because it was still over ¼ wave above ground on the lowest frequency we

were planning to use. We pulled as much slack out of the rope at the feed end as we could but it was not enough to get the ends off the ground.

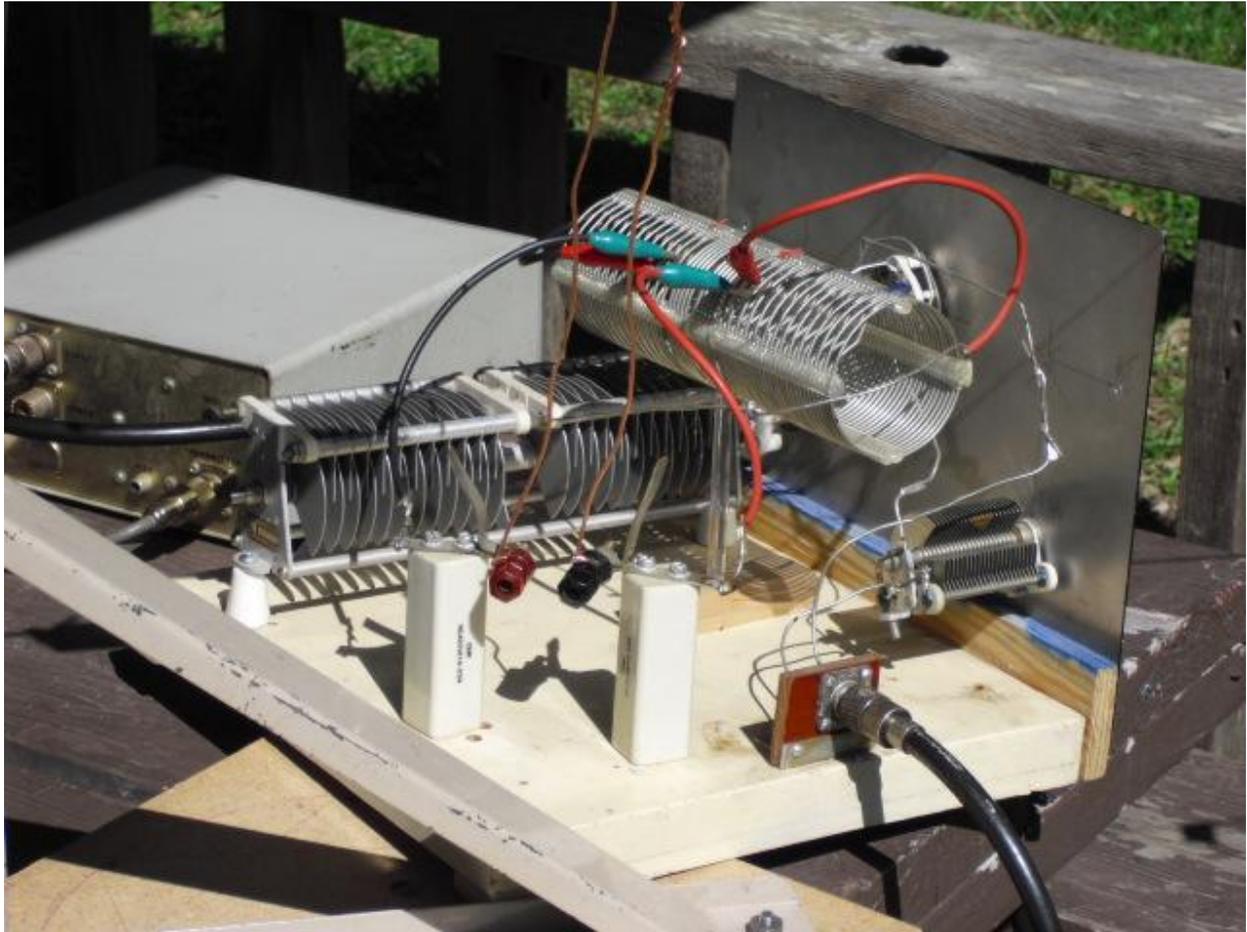
So, we marched back out to the ground rods at the ends of the legs to move them back a bit. The ground rods took considerable effort to drive into the ground and we didn't have the room to move one of them any further without getting into that ravine again. So, plan "B" was put into action. We shortened that leg of the antenna by 4 feet. That got the antenna leg up off the ground nicely. So we re-attached the leg to the insulator on the ground rod, re-connected the terminating resistor and headed for the other ground rod at the other antenna leg.



We performed similar magic at the other ground rod. We shortened that leg by 4 feet then re-attached everything and stood back to admire our handy-work. We knew it was exactly 4 feet by using the "TLAR" method of length determination. "That Looks About Right". Now it was time to answer the "BIG" question. Will it work? So we started the march back to the apex once more. All the walking must have been good for me because everyone was really tired by the time we got home that evening.

Meanwhile the crew at the rig had been busy laying out AC power from the outlet near the restroom building. There are advantages to holding our antenna parties in a public park as nice as this one. The crew also unpacked the antenna tuner. It is a really nice unit that Don, WN9V, built. It is a link coupled tuner. It may not be pretty and shiny like your typical commercial unit, but it works extremely well. It is an antenna tuner and balun all in one unit. There is no toroid to change values when it gets hot. It uses

an air core inductor instead and a pair of variable capacitors. I do believe we could match a screen door on 160 meters with it.



The rig, an ICOM IC-740 was fired up, the tuner was tuned up and away we went. The first thing we noticed was that it was already noon and there were very few stations on 20 meters. Yes, we could hear a few stations but none were very loud. Most were S-5 or weaker. We worked a few stations but where were all the LOUD stations that we expected. By now it was lunch time so we took a break.

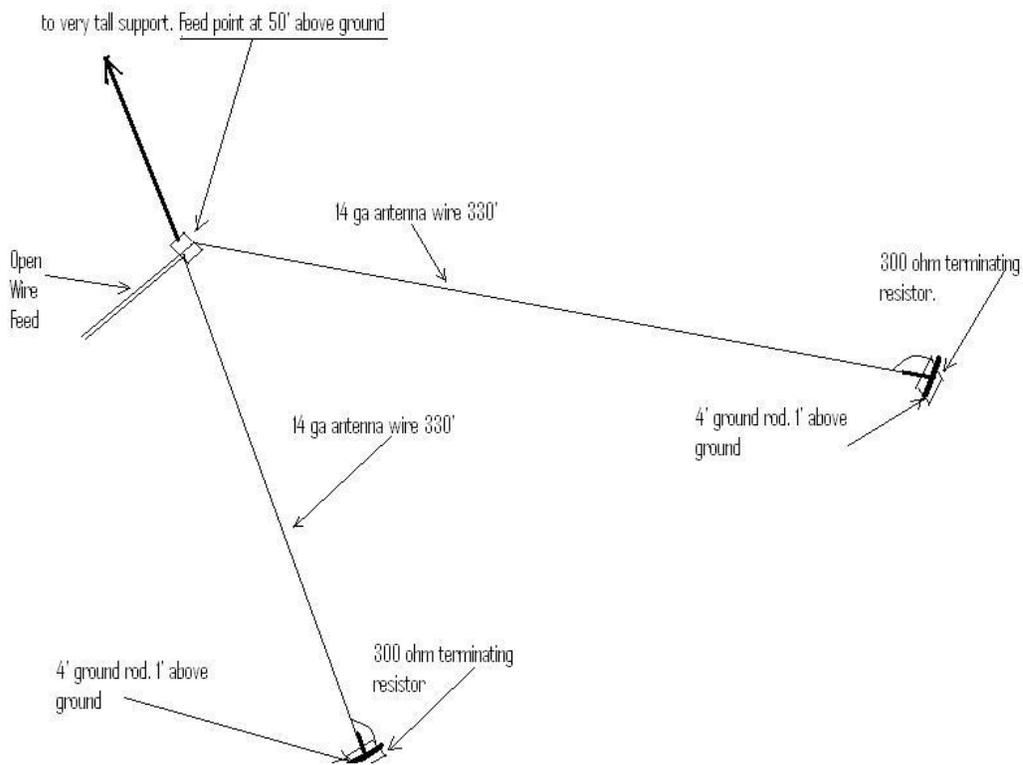


Lunch is an important part of our little Antenna Builders Guild. Dennis brought out some of his home brew chili that had been brewing for several hours in the crock-pot. Frank brought out a big tub of potato salad, some tortilla chips and a jar of salsa and we all sat under the pavilion and enjoyed some really good food.

Then we went back to the rig and tuned up on 17 meters. At first there was not much on but we made contact with Pete, G3CCX, on the shores of the English Channel. His signal was only about S-1 at first. We chatted with him for 20 minutes and as we chatted his signal got stronger and stronger. By the end of the QSO his signal was up over S-5 and still climbing. Next we tuned around and found several stations that were even louder. It was as if someone had opened the flood gates because 17 meters was suddenly very crowded. I have been a ham since 1959 but I have never heard 17 meters with that many strong signals before. We listened to a round table of stations that were all S-9 or louder for a while. G0MJS, G0KN and Ian, G13DZE in Northern Ireland.



After a while they broke up and we called Ian in North Ireland. He was running 400 watts and was peaking S-9 plus 10 db. He gave us an S-6 signal report at first but by the end of the QSO he said we were peaking over S-9. When we started comparing stations, we discovered he was also running a Vee-Beam. His was a bit larger than ours at 660 feet per leg with an apex at 90 feet. Since we were only running about 40 watts, this was a significant signal report. He was running 10 db more power than we were but we were peaking at S-9 and he was peaking at 10 db over S-9.



Wow, that was quite a coincidence since the Vee-Beam is not common on the amateur bands. We went on to work several other stations. Stations heard or worked were all over the US, with the loudest in the northeast. Stations heard and/or worked were as follows:

**20 Meters:**

F6DGE France, E77AW Bosnia and Herzegovina, IK7XTE Italy, SV2KBS Greece, 9A8W Croatia, WB2MIC Vermont, HA8IH Hungary, KB4GYT 14.185 portable QRP South Carolina, OS8A Belgium, HA7TM Hungary, MX5RC England,

**17 Meters:**

G3CCX England, G0MJS England, G0KN England, and GI3DZE North Ireland, EA8ABT Spain

**15 Meters:**

HK1R Colombia

**12 Meters:**

ZD8ZZ not sure of QTH, VP5/N1WON Turks Caicos Islands,

**10 Meters:**

PU5ATX Brazil

**Beacons**

K6FRC 28.275 and 28.300

WA6MHZ 28.279  
K6LLL 28.2035  
K9JHQ 28.2565

The stations logged from South America and Central America make a good point. Just because the beam was pointed at Europe does not completely eliminate all other directions. It just means it works best in that direction. Not bad for only 40 watts. Something we noticed with this antenna was a lack of QRN. There was very little noise on any of the bands. Even 40 meters, which is usually has an ambient noise level of around S-5 to 6 was extremely quiet. The ambient noise on 40 was S-1. I have become a believer in terminated wire antennas.

That is our report. We hope other Antenna Builder Guilds will form and start doing what we do. We discovered it by accident when a bunch of us got together just to have a social event with a bunch of other hams and discovered we all love to build antennas. This is an outstanding way to learn more about antennas and to help some of the newer hams get their stations on the air with a decent signal. We do get visitors who need help sorting out their antenna systems and we are always glad to help whenever we can. We also get a lot of curious non-ham visitors because we hold this event in a public park. Just how neat is that?!?!?

Attendees at the antenna party this month were

Dennis KC9IXO, Pat KC0ZIW, Alan KB9ZVL, Jim WI9X, Don WN9V and yours truly, Frank K7RMJ.