

2 Element Fox Hunt Quad by AB9CA

A couple of club members have asked about the 2 element quad used for fox hunts. I'll post it here so that most all club members have access. Note that AFAIK this is an original design. I did not lift it from any source, but rather started with a blank screen using EZNEC v3. My goal was to optimize the front-to-back ratio. I wanted to get a deep null off the back. The finished antenna appears to do that.

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The dimensions of the 2 element fox hunt quad:

	Circumference	Each side
Driven element	86"	21.5"
Reflector	88.75"	22.1875" (22 3/16")

Spacing - Driven element to Reflector: 12"

Wire: #10 bare copper

Some photos as well as the radiation pattern are included.

Note that the dimensions shown are finished sizes - you'll need to add whatever overlap is needed to secure the element ends.

As the photos show, I used plastic pipe for the boom and other supporting members. Cheap, readily available, and seems to work well.

Modeling indicates that even small changes to the dimensions can have a meaningful impact, so the antenna needs to be built to fairly close tolerances. I built mine to +/- 1/4" ea. leg, and it works about as the model indicates.

I would suggest that you **not** change the wire size. Quads are sensitive to most everything and this includes wire size. Also, use only bare wire, do not use insulated wire. That would change the effective length of the elements and severely distort the pattern.

You will, for sure, want to include the choke shown in the photo. Without that, stray current on the outside of the feedline will significantly distort the pattern.

The dimensions of the gamma match are approx. 1" x 8". #10 wire is used. The value of the trimmer cap is not known - it is from my junk box. Best guess is that it is a 10-50 pf trimmer. I doubt that the gamma match is necessary for fox hunting, which is receive only. I added it to get a sufficiently low SWR should I want to use the antenna for transmitting.

The radiation pattern shows a front-to-back ratio of about 34 dB, and this seems to be pretty close. I've not measured anything greater than about 27 dB. 2m is plagued with reflections, which tend to fill in the nulls, and it is difficult eliminate their influence, hence, deep nulls are hard to find on 2m.

The boom passes through a Tee and is secured by hose clamps. This allows the antenna to be rotated from vertical polarization to horizontal should it be necessary to locate a horizontally polarized Tx.

For fox hunting, using the main lobe, off the front, seems to work better than using the null, off the back, most of the time. Although the front lobe is somewhat broad, the use of an attenuator to get the signal down to the noise will yield a very good bearing on the transmitter.

And . . . if you'd like to know more about antennas . . . I would direct you to the website of L. B. Cebik, W4RNL, <<http://www.cebik.com/radio.html>>, where you will find lots and lots of antenna info. While I doubt you'll find this exact antenna on his site, you will find a treasure trove of antenna info.

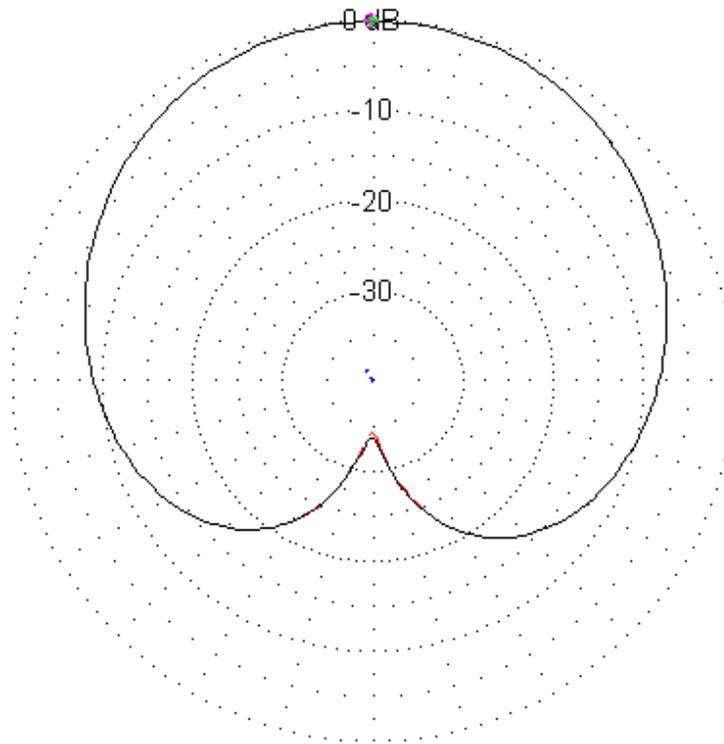
73 de dave
ab9ca

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Figure 1. Radiation Pattern

EZNEC

Total
H pol
V pol



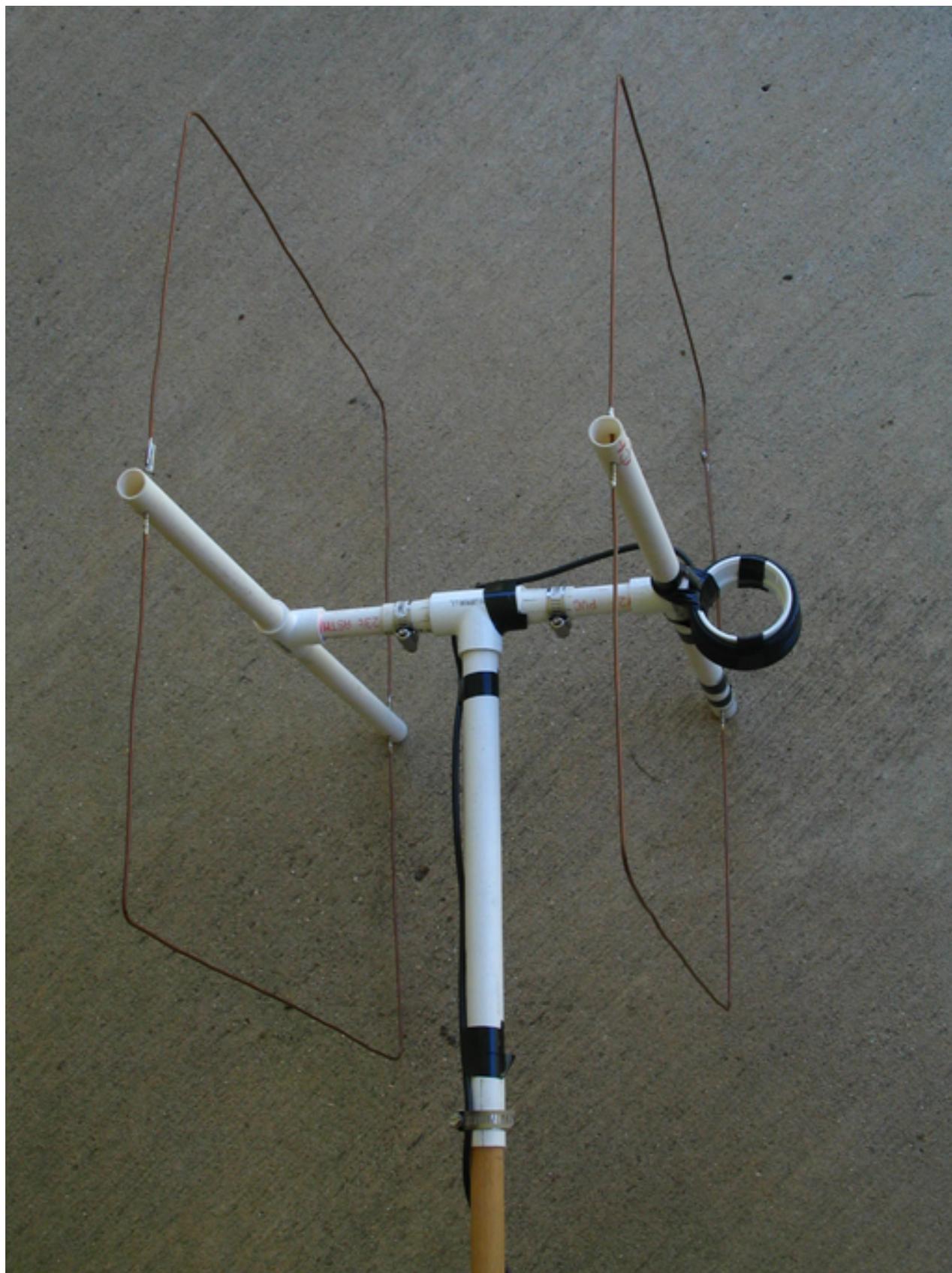
146.5 MHz

Azimuth Plot
Elevation Angle 6.0 deg.
Outer Ring 9.34dBi

3D Max Gain 9.34 dBi
Slice Max Gain 9.23 dBi @ Bearing = 2.0 deg.
Front/Back 33.55 dB
Beamwidth 96.1 deg.; -3dB @ 313.5, 49.6 deg.
Sidelobe Gain < -100 dBi
Front/Sidelobe > 100 dB

Cursor Bear 0.0 deg.
Gain 9.22 dBi
-0.12 dBmax

Figure 2. Antenna - Note that the antenna is lying on its side on a concrete patio, hence the textured gray background!



The careful viewer will detect that the antenna has encountered a few low hanging branches . . .

Figure 3. Detail of choke and gamma match

