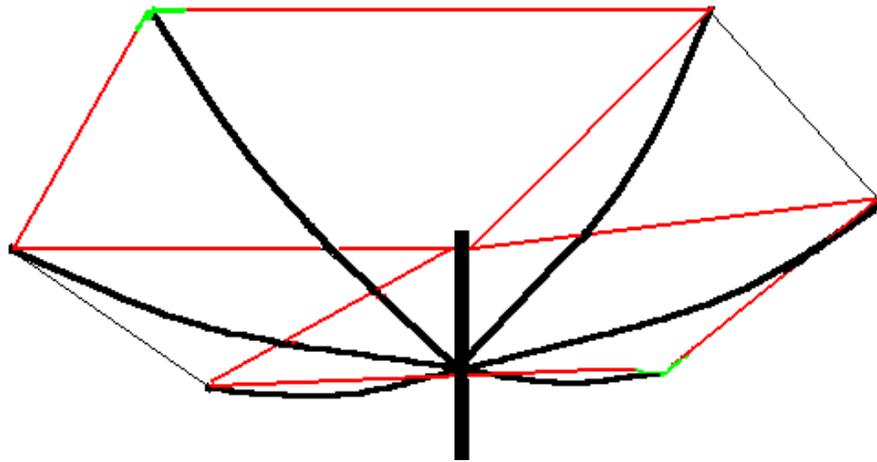


Hex Beam



A freely distributable presentation for any
Amateur Radio organization.

Created January 2013 by WN8U

Two kinds of antennas

Non-directional: Dipoles, end-feds, NVIS...
Verticals...

Directional: Beams and Yagis

Traditional beams



Traditional Beams

Beam antennas are typically large, heavy, and require a strong tower to support them. That's expensive.

Beam antennas usually only work on three bands or less

Beam antennas usually require extensive guying due to wind loads

Beam antennas are usually expensive.

What is a Hex Beam?

A Hex Beam or hexagonal beam is a two element, directional antenna

Can be configured mono-band or multi-band (most common)

Typically supports up to six bands (20, 17, 15, 12, 10, 6)

No tuner required, no loading coils or traps in design, single feed point, full legal limit, weighs under 25lbs, wind load of under 5 sq ft, and turning radius of 11 ft.

Typically better than 6dB of gain, F/B ratio comparable to a 2-element yagi.

What is a Hex Beam?

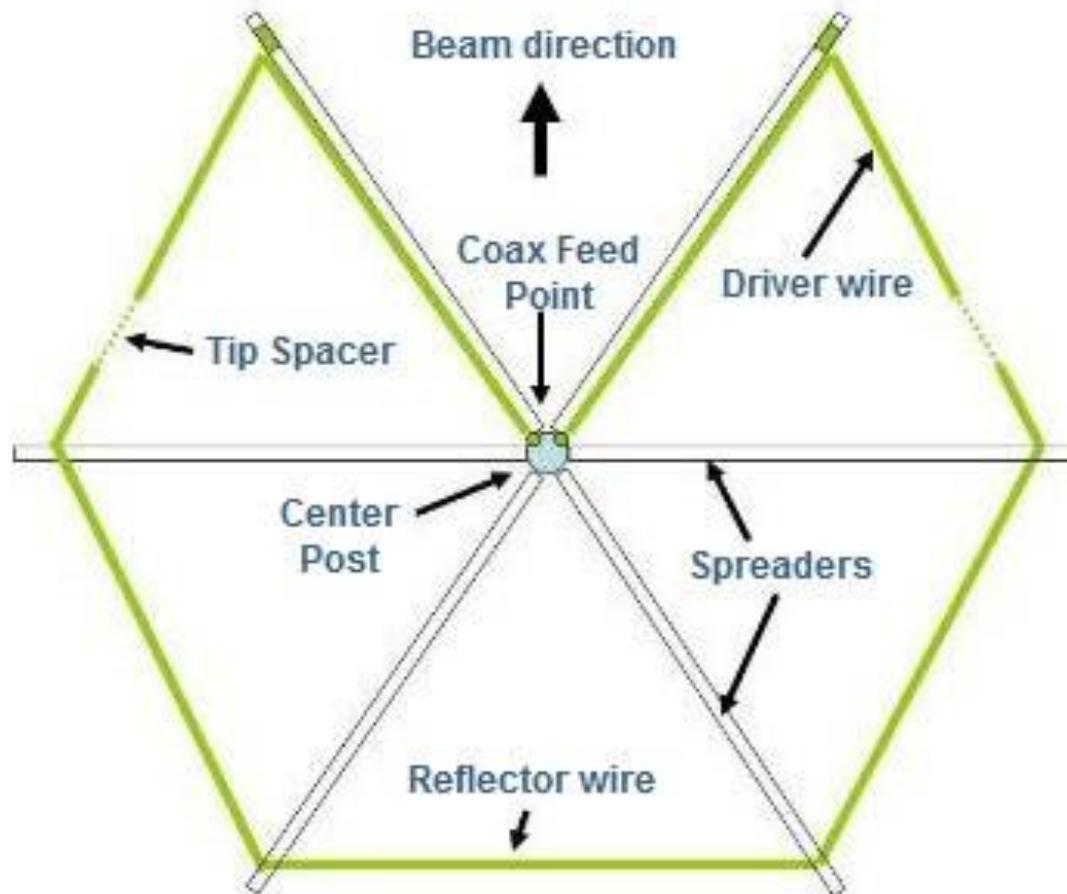
There are two versions of the Hex Beam

- The classic Hex Beam by Traffie Technologies
- The G3TXQ Broadband Hex Beam

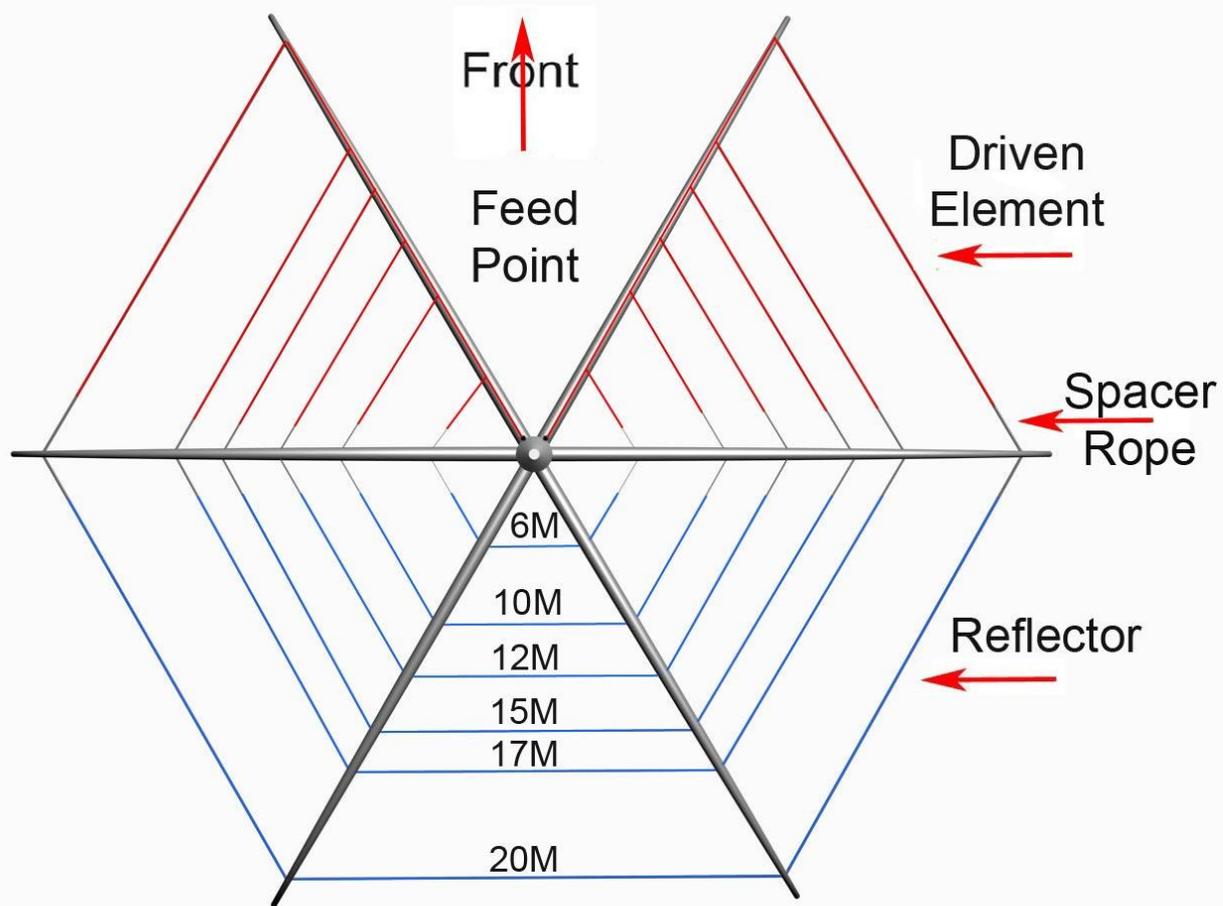
We will focus on the G3TXQ Broadband Hex Beam design and its variants. Advantages over the classic beam is broader band coverage, better gain and better F/B ratio.

Hex Beam Components

Single Band G3TXQ Broad Band Hexagonal Beam
(Top View)



Hex Beam Components



Hex Beam Components



Mounting

Because of the light weight and low wind load of a typical Hex Beam, a large tower (Rohn 25G and such) isn't needed.

A push-up mast (such as Rohn 9H50, 35ft, \$150 or less) can be used.

The push-up mast/hex beam combo is best used with a rotor mounted at the bottom of the mast. A Yaesu G-450 is adequate for such an installation (\$250 or less).

Mounting

Here is an example of a ground mounted push-up mast with a hex beam:



Mounting

Here is an example of a post mounted push-up mast with a hex beam using a thrust bearing for more support:



Mounting

Another example, this time of the rotor at the bottom of a post-mounted mast.



Mounting



Mounting

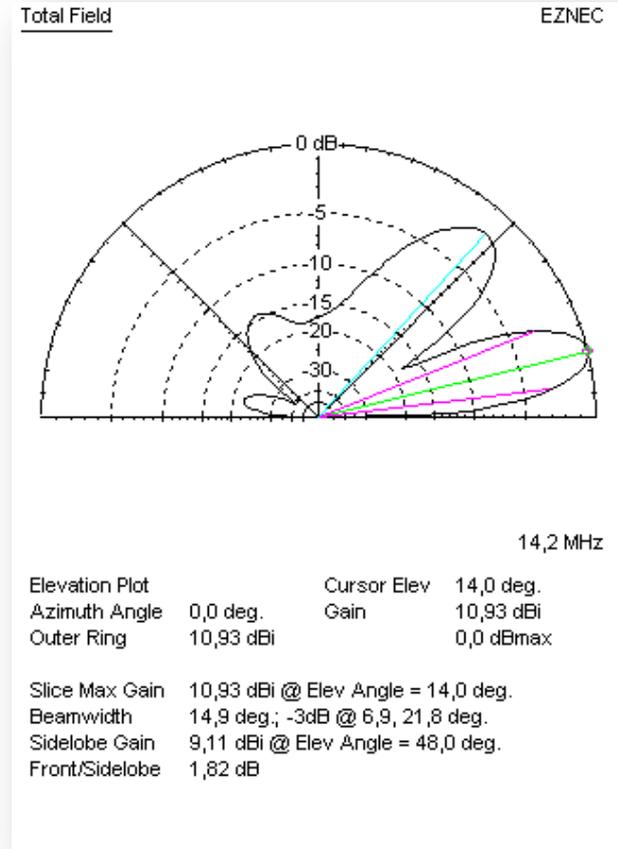
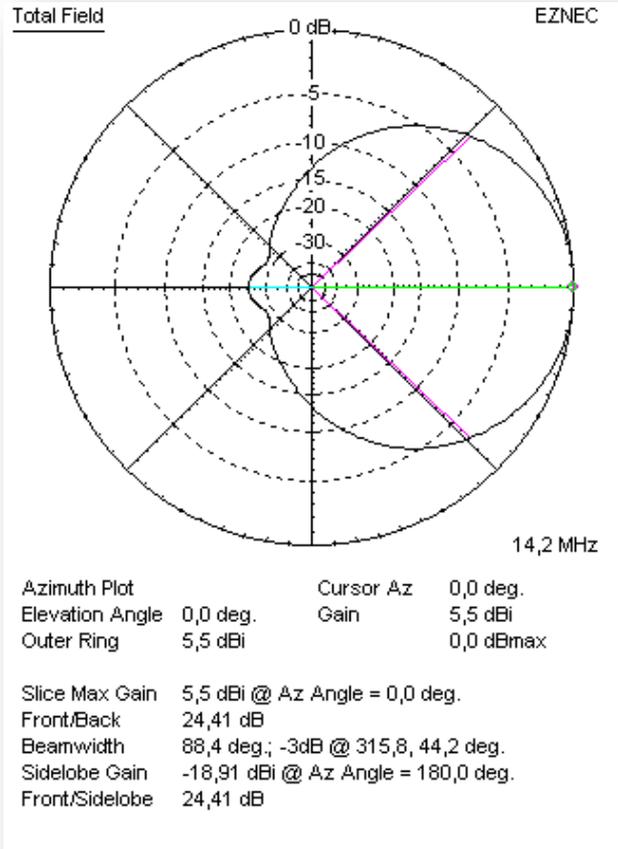
Here is an example of a ground mounted push-up mast with a hex beam, using part of the house for additional support:



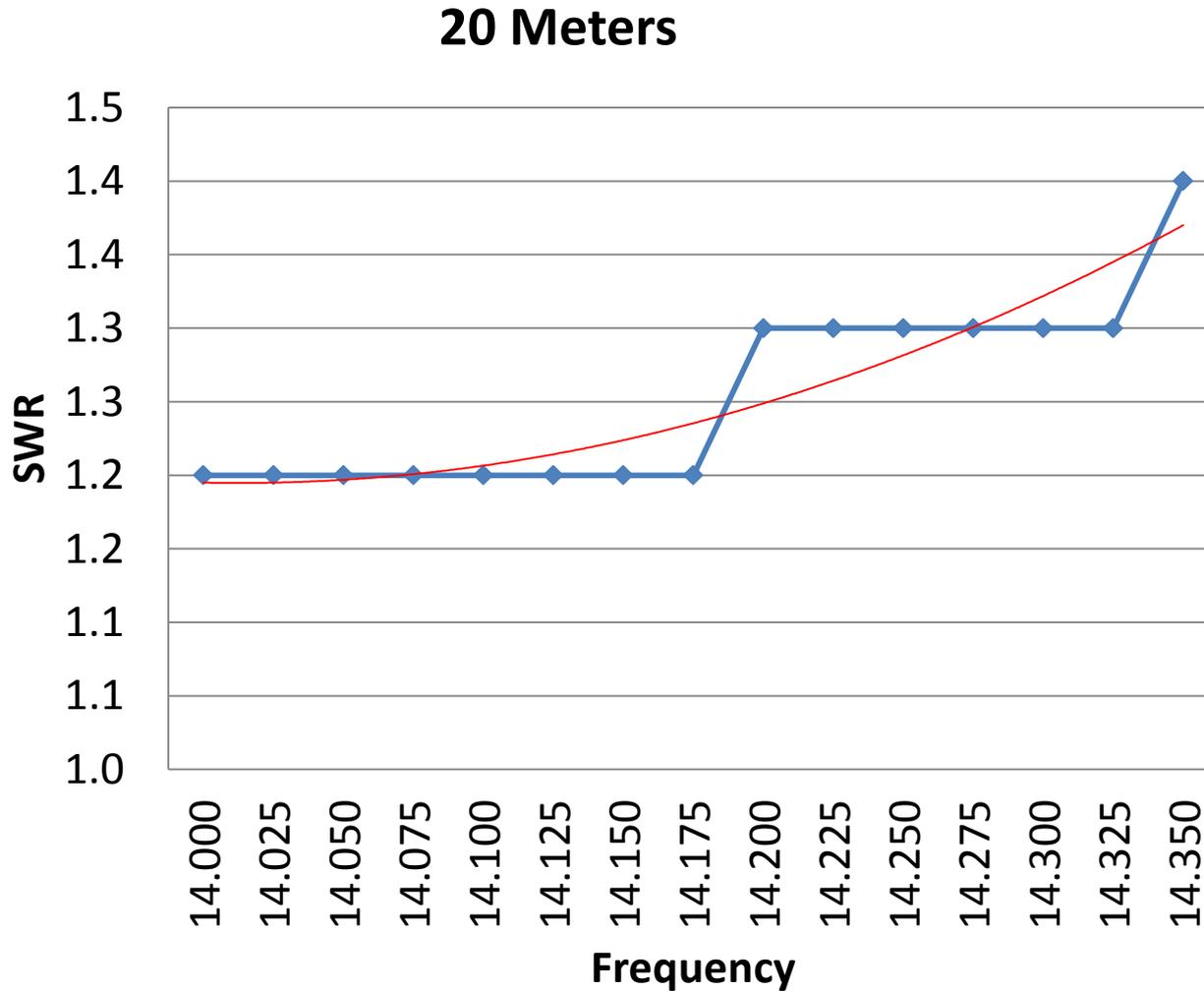
Mounting



EZNEC – 20m

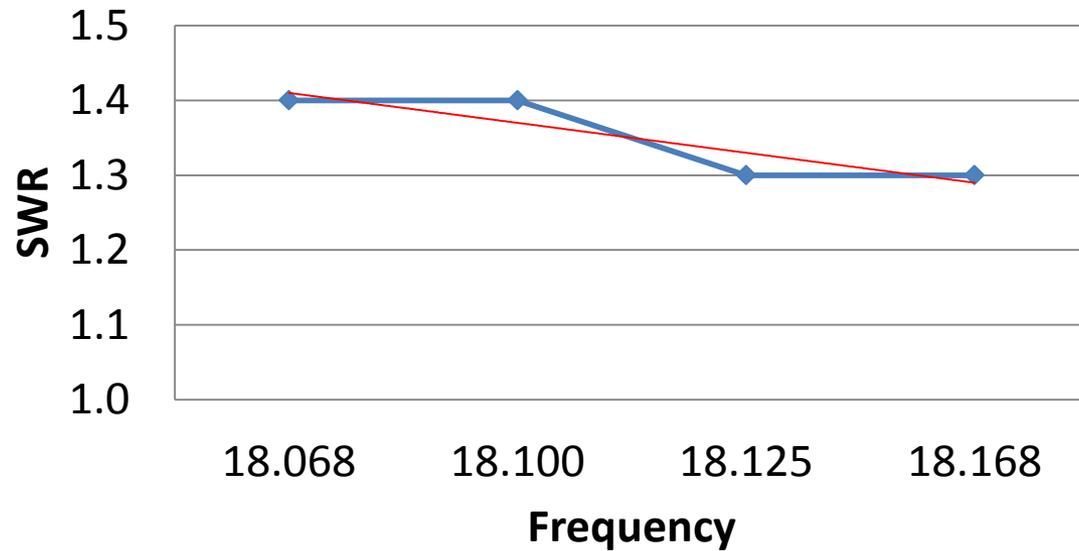


SWR – 20m (typical)



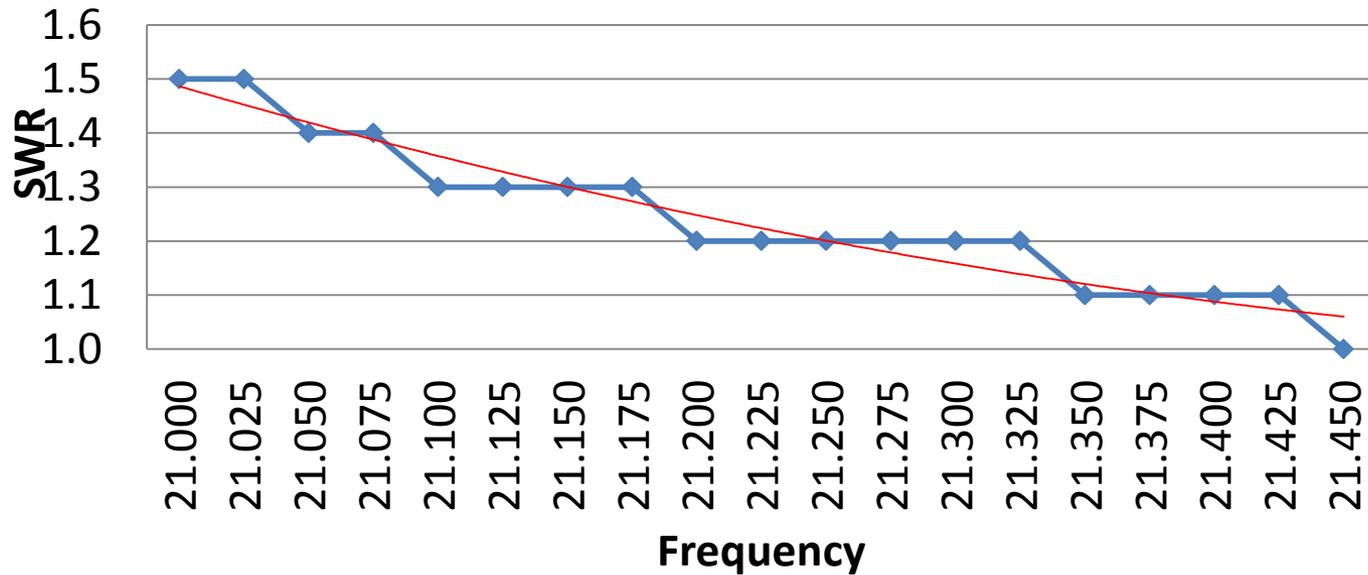
SWR – 17m (typical)

17 Meters



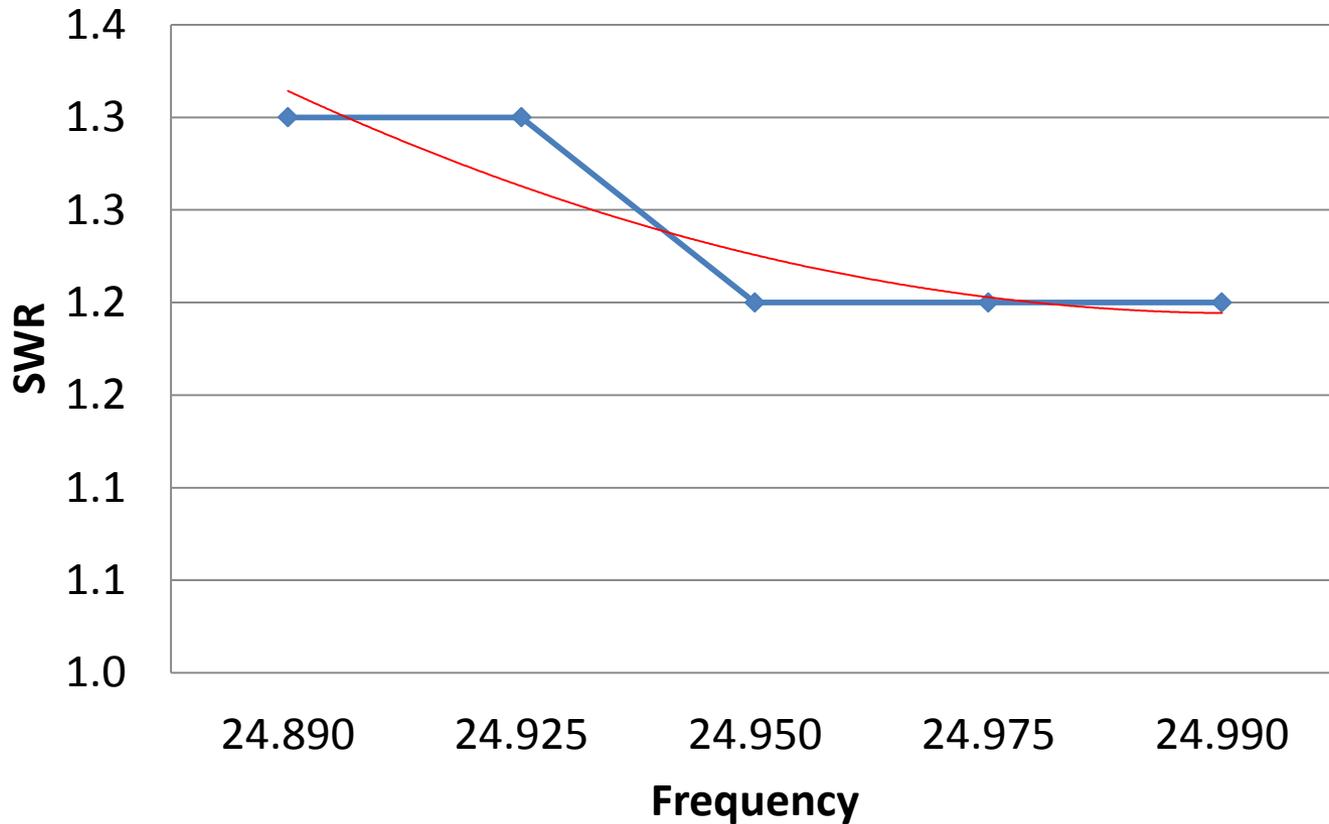
EZNEC – 15m (typical)

15 Meters



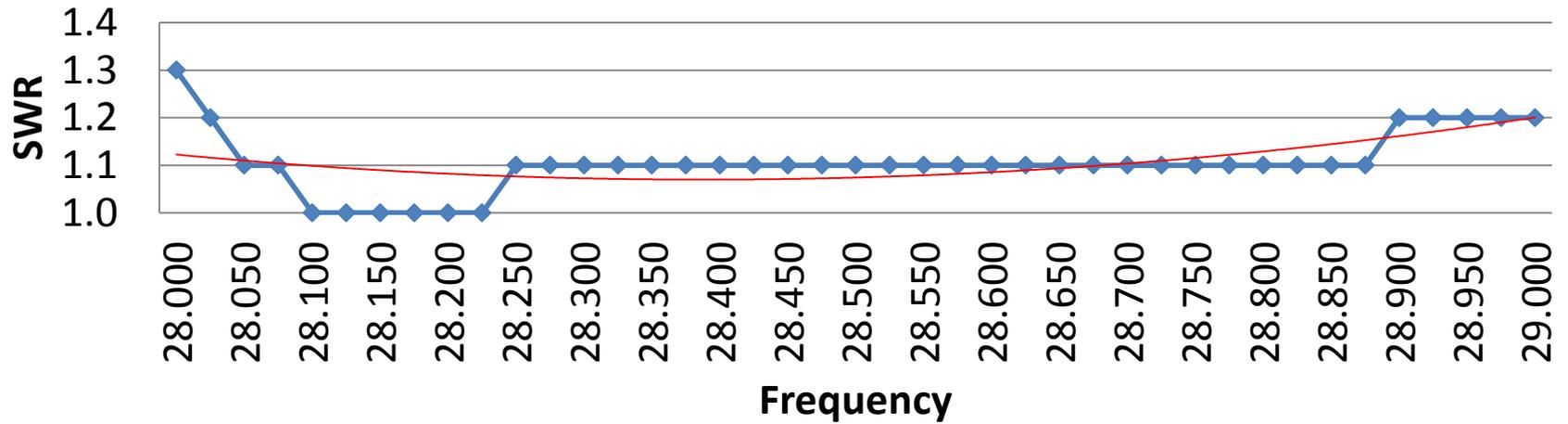
EZNEC – 12m (typical)

12 Meters

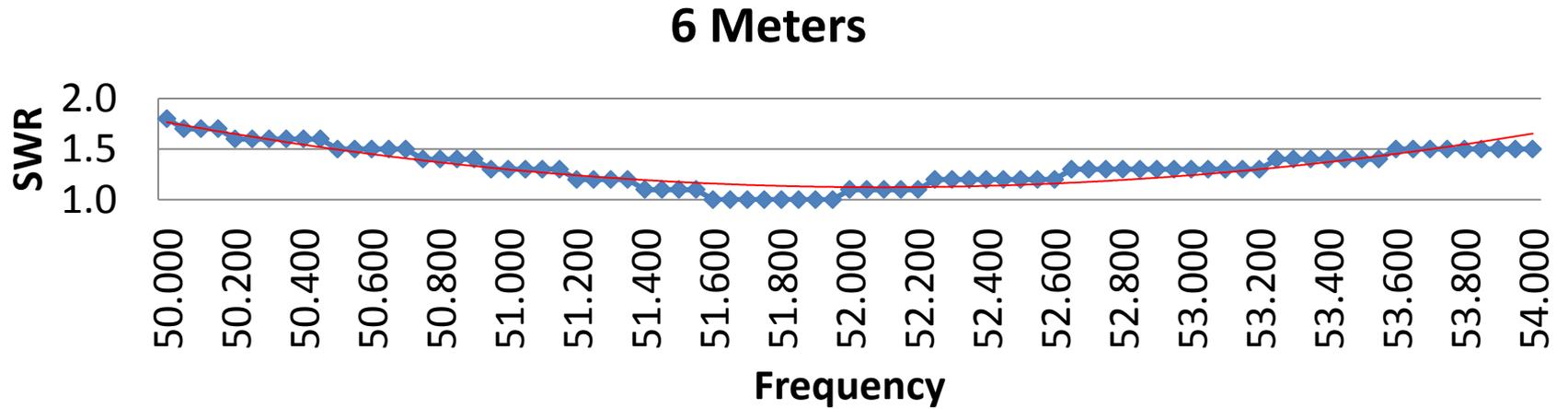


EZNEC – 10m (typical)

10 Meters



EZNEC – 6m (typical)



How to get one

Build Your own:

- Base plate
- Fiberglass rods
- Center post
- Support cords
- Antenna wire
- Odds/ends (hooks, eyelets, coax ends, etc)

Hex Beam Hub



Hex Beam DIY Resources

Home Brew Hex Beam Page by W1GQL

<http://midcoast.com/~w1gql/hex/buildyour.htm>

G3TXQ Broadband Hexbeam

<http://www.karinya.net/g3txq/hexbeam/broadband/>

KE4NU Broadband Hex Beam

<http://www.hamuniverse.com/ke4nuhexbeam.html>

How to get one

There are a number of individuals who made excellent hex beam kits:

- K4KIO – Very popular, requires some tuning
- N4NRR – Gaining popularity, pre-tuned
- K5BOB – More expensive, uses minimal metal
- DX Engineering – Brand Name

\$500 - \$700 average cost.

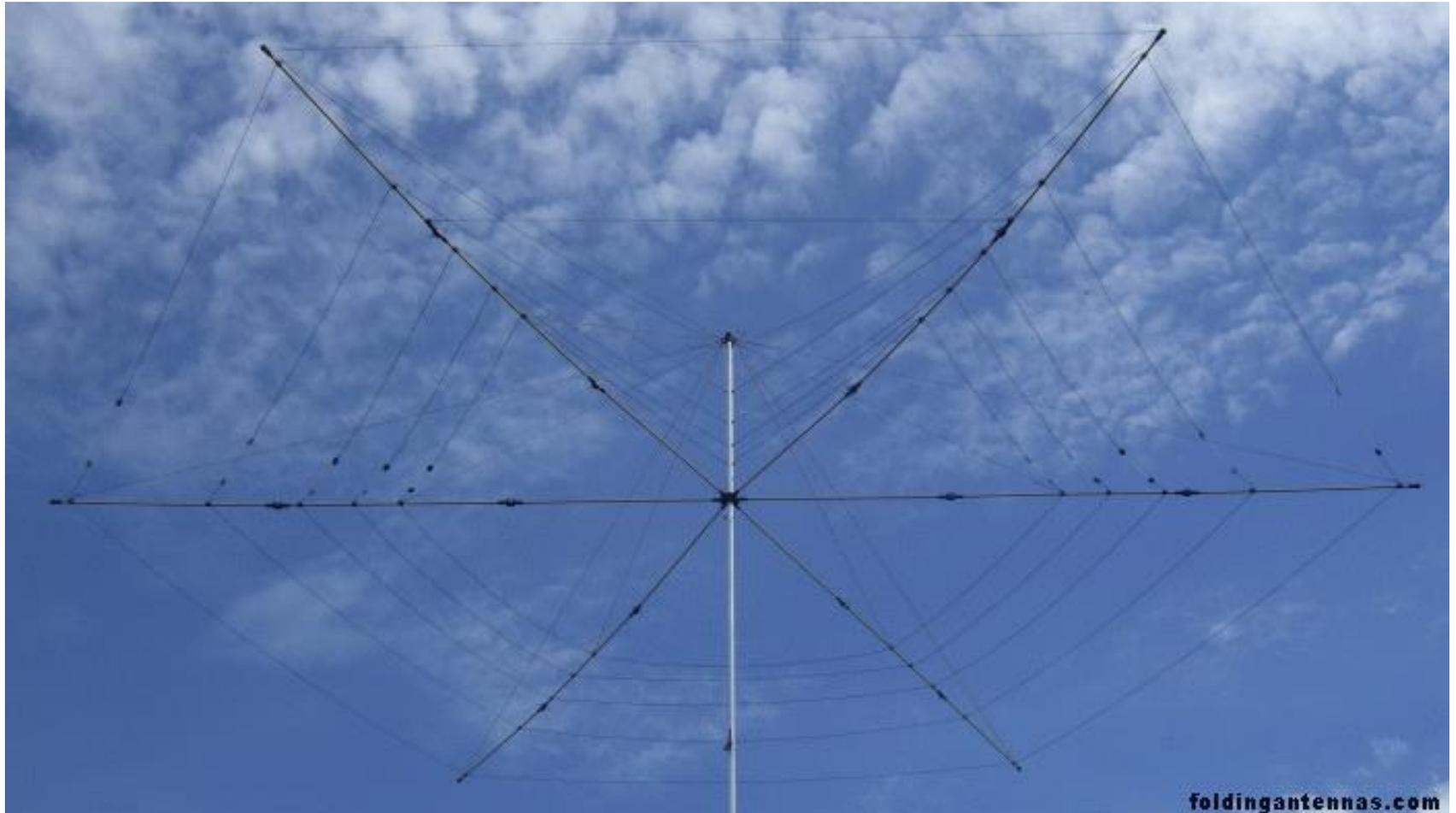
Portable Hex Beam

The folding beam is a 2-element directive antenna for five amateur bands (20/17/15/12/10m band, 6m band optional).

It consists of wire elements attached to a support structure in a concentric way. The center post carries the support cords and is a coaxial feeder for the drivers.

The driver/reflector arrangements are fixed to the fibreglass spreaders.

Portable Hex Beam



Portable Hex Beam

The feed point cord support is molded onto the center post.
Connector SO-239 (N type socket optional at no extra cost)



Portable Hex Beam

The hub takes up six swivel spreaders and electrically isolates the center post from the mast or rotator underneath



Portable Hex Beam

The spreader sections are connected with locking swivel joints



Portable Hex Beam

An open swivel joint



Portable Hex Beam

The spreader tips have rounded heads with zig zag slots for the support cords



Portable Hex Beam

Clamping the wires onto the spreaders is a snap with special clips!



Portable Hex Beam

Antenna collapsed to only 1.15 m (45") total length

