Multiband Wire Antennas

Focus is on the Hex Beam
Concepts to Consider

- Bending of Antenna Elements
- Spacing Between Elements
- Feed Point Considerations
- Mounting Methods
- Wire Management
- Environmental Wind, Ice etc.
Some multiband Wire antennas

- Fan Dipole
- Cobb Web Antenna  Omnidirectional  Multiband
- Spider Beam  -  Multiband Multi Element
- X Beam Single Band - Predecessor to Hex Beam
- Classic Hex Beam  Mike Traffie  N1HXA
- Broad Band Hex Beam  Steve Hunt  G3TXQ
Multiband Dipole most common
Cobweb Antenna
The Cobb Web Antenna
Cobb Web Characteristics

• 5 Bands on an 8 ½ foot square
• Omnidirectional
• Requires 4:1 matching
• Can Be built from simple materials
• Light Weight
• Jeff Maddox KG5AMQ Built one of these
• G3TXQ has a good description and design info
• Could fit in some attics
Spider Beam Multi Band Multi Element

directors

drivers

reflectors
Used on many Dxpeditions
V shape reduces overall size
Light Weight
Highest Gain of all these Antennas

- At least 3 elements on most Bands
- 4 elements on 10 meters
- The Manufacturer Builds portable Models
- Makes it attractive for Dxpeditions
- For details go to www.spiderbeam.com
Historical Hex Beam Development

• The origin of the Hex was probably the X-Beam
• Published in the ARRL hand book
• Similar to Moxon
• Single band operation
• Mike Traffie created his antenna in 1992
• G3TXQ created the Broadband in 2002
Predecessor to the Hex
just some additional bending

- Driven Element
- Wire
- Reflector
- Rope

The X-Beam
More Bending Leads to the Hex

Classical Hex Beam

Driver

Reflector

Broadband Hex Beam

Driver

Reflector
The Hex Beam or Beams

• Good Reviews on DX
• Coverage of 20 through 6 meters with the WARC bands
• Compact and lightweight
• Good directionality 20 DB or better FB
• Two basic types: Broadband G3TXQ – The Traffie N1HXA Classic
Size Comparisons

**Spiderbeam**
- Elements: 3*/band
- Radius: 16 ½ ft.
- Wingspan: 33 ft.
- GAIN: see chart
- Weight: 14 lbs.
  *4 elements on 10m

**Hexbeam**
- Elements: 2/band
- Radius: 11 ft.
- Wingspan: 22 ft.
- GAIN: see chart
- Weight: 13 lbs.
  *(source: Home Brew)*

**Spiderbeam HD**
- Elements: 3*/band
- Radius: 16 ½ ft.
- Wingspan: 33 ft.
- GAIN: see chart
- Weight: 23 lbs.
  *4 elements on 10m

**Hexbeam**
- Elements: 2/band
- Radius: 11 ft.
- Wingspan: 22 ft.
- GAIN: see chart
- Weight: 24 lbs.
  *(source: K4KIO)*

The Spiderbeam is 50% larger than the Hex Beam.

The Hex Beam is 2/3 the size of the Spiderbeam.
Hex versus 3 element 20 Meter Yagi
Comparison with 5 band TW Antenna
Where do you start?

• Lots of Internet sources mostly for the Broadband model
• Best source: the G3TXQ web site – Steve Hunt built hundreds of models and tuned and tested them
• K4KIO commercialized the G3TXQ model and published a DIY model for the build it crowd.
• Yahoo has a forum on Hex Beams
Broadband Hex Beam Specs

• Beam Diameter: Approximately 22 feet
• Height from Base: 39 1/2 inches
• Weight <29 lbs
• Wind Surface Area: approximately 5 Sq. Ft.
• SWR: < 1.75:1 at 50 feet < 2.0 :1 @ 20 feet
• Typical: <1.5:1
• Power Rating: 1500 Watts
• Front to back: >10db all bands
• Typical: > 15db all bands
• Gain: Equivalent to 2 element beam
Components

- Baseplate – generally Hex shaped – other shapes also used
- Spreaders – generally fiberglass – Mike Traffie has his custom made – K4KIO - Max Gain Systems– DX Engineering - some use fishing poles
- Center pole – Coax feed – many variations – Coax Jumpers – Coax Poles – Balanced feeders
Components ( continued )

• Wire guides – K4KIO uses Rubber guides with SS center - early DIY used loops made of wire ties - Traffie uses plastic tubes – All generally use hose clamps to position the wires

• Rope to Hold Spreaders in position – Most use Dacron rope – some use rope with Kevlar – Traffie uses phillistran
Center Pole Types
Baseplate Types

3/16 Aluminum BASE

Bolt going through the side

Starting threads with 1/4-20, add drip to bottom of PVC fitting and fit 4 bolts, place bolt going threw at back of the back angle to help prevent the bolts from turning.
Hex with push-up Mast
My first Hex
Rotor Mount and Thrust Bearing
Present Installation with 30-40–80 Dipoles
Texas Towers
KP2CX US Virgin Is.
Bob Burkett Hex with 2 meter
K5DCZ
Some Thoughts for the Future

- Smaller Versions
- Attic Hex - Ghost version
- Classic Hex with special 20 meter design
- Less than 16 ft diameter vs 19.5 feet
- Looking at small size 30 – 40 meter version
- Standard 40 meter is 42 ft in diameter
- Shooting for under 35 ft diameter with same performance