

Some HF Antennas to Consider

There are an overwhelming number of HF antennas available to Ham radio from many different manufacturers. Making a choice can be an intimidating and frustrating task, particularly for the new Ham that simply wants to get a new rig on the air with minimal investment and construction. Experienced Hams that may have moved to a QTH with imposed CC&R antenna restrictions can be equally frustrated with trying to find a low profile HF antenna that has a reputation for performing well at low heights above ground. Hams that have space and the means to put up a beam antenna also are presented with many options. Quality antenna accessory suppliers for push up masts, baluns, coax, antenna tuners, can also be difficult to find.

This paper is aimed toward providing Hams with an overview of selected antenna manufacturers and their products. Its purpose is to expand your knowledge of the landscape of antenna choices, and increase the likelihood of selecting the best antenna solution to meet his or her specific need.

What follows are a number of antennas and manufacturers that Hams may wish to look at before making a decision. Absent from the list are many wire dipole like antennas such as G5RVs, Windoms, multi-band folded dipoles, etc. These are excellent antennas and you are encouraged to explore these offerings. Especially if they have the lot space with perhaps one or two trees that are spaced appropriately to act as elevated supports that are high enough above ground to permit good performance. Also absent are mobile antennas that might be candidates for conversion to perform as fixed base antennas. These motorized “screwdriver” mobile antennas, e.g.- from HiQ and Hi Sierra, are convenient in that they can be tuned mechanically via built in motors. It is their smaller size however that challenges them to be effective radiators of longer wavelength signals. See the HiQ website homepage, www.hiqantennas.com, for some interesting mobile antenna efficiency comparisons.

A general rule is that mobile, portable, and beam antennas are relatively more expensive than their fixed location counterparts. A pleasant and surprising exception to this general rule is the YP-3 Yagi from SuperAntennas. It is both a beam antenna and a portable antenna and is relatively inexpensive for its capabilities. More detail on this antenna can be found below. All of the antennas have received multiple reviews on www.eham.net/reviews. Reading these reviews, written by Hams who have actually used the antenna or product, can be very helpful towards making an informed decision.

Verticals and other near omnidirectional antennas

In general order of increasing price

Par End-Fedz – www.parelectronics.com Thin black wire antenna, full length half wave dipole with the coax connector at one end, instead of in the middle. Can be hung horizontal or as a “sloper”. No ground plane radials or counterpoise needed. Coax connector at one end provides for the potential to bring the feedpoint closer to the radio and make it stealthy, and minimize feed-line length. Email the address on the website for pricing - estimated to be in the \$50 to \$60 range per antenna. These antennas are for a single band, but with their relatively low cost, buying two, e.g.- 20M and 40M, is still less than many alternatives. Check the antenna specs on the website to be sure it will meet your space limitations and transmit power. (Also check out the 6M Moxon Beam if you are interested in a directional antenna for 6 Meters.)

Tak-Tenna 40M – www.tak-tenna.com A unique dipole with spiral wound elements that result in a form factor that resembles two bicycle wheels at the end of a 30 inch axle. It is stealthy in that it could be mistaken as an art-deco patio ornament. Can be mounted on a push up pole or hung outside an apartment either in a horizontal or vertical position. Radials are not required. Some report operating as low as 11 feet off the ground. With a good external tuner will work 20M and other bands. There is also a dedicated 20M model available. Estimated price is about \$130.

Hustler 4BTV – 6BTV verticals. www.dxengineering.com This antenna uses traps to electrically isolate sections and facilitate resonating on specific bands, thereby attempting to be multi-banded without using a tuner. The Traps are thicker than the antenna itself, prompting one Ham to describe its appearance as a tall snake that has been dining at regular intervals. These antennas can usually be purchased for around \$200. Experience has shown these to be challenging to setup and tune at initial installation due to interactions between “trapped” antenna sections and also differing ground conditions. These antennas can be purchased for less than \$200 and with a good radial field, and tuned, perform reasonably well. A mounting base will also be needed to complete the installation of this antenna. Some owners use a tuner to assist with frequency coverage on specific bands.

IAC Double Bazooka and Stealth Flagpole Antennas www.iacantennas.com IAC Double Bazookas are hybrid wire antennas that are broad banded, and with a Tuner can be multi-banded. Check out the various models, i.e. - regular Double Bazookas, “Shorty” Double Bazookas, and Phased Array configurations. These are not exactly stealthy, but if you’ve got some room and leeway at your QTH, these wire antennas are extremely broad banded due to a unique design, are quiet, i.e. – low noise on receive, will take full legal limit, and perform remarkably well. They were originally developed at MIT during WWII as a radar antenna. Radials not needed. Prices run \$116 to \$268 depending on the model. The ones from IAC seem to be made the best. The Stealth Flagpole vertical models, i.e. – SB-10 & SB-40, come with a radial kit. Before selecting one of the Flagpole models, be sure to read the Installation Instructions to understand the bands of operation and the effort needed to install one.

Verticals from DXEngineering www.dxengineering.com A recent introduction of a line of vertical antennas from DXEngineering that appears to be in direct competition with the very successful performance reputation established by the verticals from Zero-Five Antennas below.

Zero-Five Multiband Verticals and Flagpole Antennas www.zerofive-antennas.com and flagpoles at www.zerofivesolutions.com The original 43 foot multi-band vertical will do 10M thru 160M with a good tuner at full legal limit. It is free standing and is constructed of tapered sections of lightweight high strength aircraft aluminum. It comes with a fold over mount and can be “walked” up and down easily by one person. As with all base fed verticals, a good radial ground system is needed to work well as a DX antenna. A local Ham in the area with CC&R restrictions achieved stealth by removing the top 23 feet and operating this antenna day or night as a 20 foot flagpole with good DX results. Optionally at night, in about 10 minutes using the fold-over mount, the antenna can be “walked down, the flag removed, and the top 23 feet added for better DX results. (Note: Unlike the Multi-band models, the specific flagpole models on the Solutions website do not have a fold over mount). Verticals are generally good DX antennas due to the lower take off angle of their signal. However, they tend to pick up more local noise than horizontal antennas, and require some additional effort to install the base and the radial field. Comtek and Array Solutions also provide devices for phasing multiple verticals to achieve directionality and gain. Zero-Five also has a new line of budget Verticals in the \$270 range. Tom, the Zero-Five owner, provides good customer support and technical guidance. He makes these antennas in the Chicago USA area. If you get a Zero-Five multi-band antenna, follow his recommendation regarding using high quality Tuner, Coax, and Balun components.

Outbacker Outreach or Outreach 500 www.outbackerantennas.com A 12 foot portable multi-band vertical antenna. Band changes are performed manually at the antenna by plugging a wire “fly lead”, coiled around the base of the antenna, into band labeled sockets on the antenna. It’s pricey at \$339 or \$449 , but the Outreach 500 model will take up to 600 watts PEP. Both Outreach models perform reasonably well as DX antennas. They achieve stealth because their base section is very slender with small bumps that make it look like a tree branch with the thin top whip being almost invisible beyond 50 feet. A local Ham mounted the antenna via an L-bracket from Hi-Sierra onto a 6 foot pipe which was inserted into a patio umbrella stand. About 14 portable radials were then spread out from the base. Results were good. The antenna and mast could easily be pulled horizontal to access the fly lead and change bands. Alternately there is an “Outpost” tripod base offered by Outbacker for \$235. This antenna was also used by a group of Hams one year for field day with good results. Outbackers can be purchased through Amateur Electronic Supply, www.aesham.com

TransWorld TW 2010 Adventurer - www.transworldantennas.com A portable vertical antenna about 9 to 11 feet in height, which because it is center fed, does not need radials. It has the appearance of an H placed on its side. It is relatively small in footprint and therefore could be considered stealthy. It is somewhat expensive but has been reported as being well constructed. Several models are available - review the website's FAQ portion. The coax feed line should be as horizontal as possible approaching the center vertical element feed point of this antenna to avoid interference with the radiated signal.

Beam Antennas

Super Antennas YP-3 Portable 3-element Yagi www.superantennas.com A unique value proposition in that this is both a beam antenna and a portable antenna offered at a relatively reasonable price.. This antenna has always brought the excitement of DX to local events like field day, ham fests, and club picnics. It has accomplished this mostly while operating battery portable at about 10 watts of power. (The antenna is rated at over 500 Watts.) I specifically recall Vern, W6MMA, operating battery portable at 10 Watts from his back patio in Lincoln, California. His YP-3 Yagi antenna was on a 20 foot portable mast in his backyard and he was having a SSB contact on 20 meters with a Ham in New Zealand and receiving a 5x6 signal report! His home is in a CC&R'd subdivision. This lightweight antenna was on a 20 foot portable mast and below the roofline of the surrounding 2 story homes, which provided a sense of stealth to the operating environment. Operating portable in this manner, he could always lower the antenna below the fence line if he needed to and realistically say he was just testing his portable configuration out. Overall this created a climate of comfort and confidence that encouraged operating in this mode on an extended basis. Something for the QTH challenged Ham that has yearned to operate with a beam antenna, but always felt it was beyond consideration.

SteppIR from Fluid Motion. www.steppir.com Yagi Beam Antennas using a patented technology that enables them to automatically tune by changing the length of their elements via a motor driven copper-beryllium tape that extends and retracts inside a fiberglass tube. A Tuner is not needed since the Antenna is in effect customized on the fly by its Controller to match the current operating frequency. The antenna and its supplied Controller are not inexpensive but they perform very well. They also make two models of verticals using this technology. A Ham in the local area has the smaller vertical and disguises it as a flagpole. The manufacturer states the vertical provides a safety aspect for pets and children since the radiating element is encased in the fiberglass tube. Also, as a vertical, by fully retracting the tape into a stow position it becomes potentially less attractive to lightning.

Optibeam OBW 10-5. www.arrayolutions.com A 10 element five band moxon design wire beam. Optibeam is a respected German manufacturer of primarily strong and rugged high quality beam Yagi antennas using a patented single coax feed design. This antenna is a Moxon wire beam antenna that by design and quality of construction will survive extreme weather and wind conditions. The Moxon design use of thin wires, instead of a Yagi's thicker aluminum elements, presents for many a lower profile with reduced visual impact to the neighborhood. Array Solutions is the US distributor for Optibeam antennas. Array Solutions, located in Sunnyvale, Texas, is a manufacturer and distributor of high quality Ham radio products. Hams that buy from Array Solutions generally give high marks for product quality and customer satisfaction. Array Solutions also sells Zero-Five vertical antennas.

Cubex Cubical Quads www.cubex.com US manufacturer of 2-, 3-, and 4-element quads and quad building parts. Cubical Quad beam antennas are neither stealthy, low profile, or inexpensive, but their performance and gain as a DX beam antenna is at the top of many a DXer's list. A 2 element quad has been compared in performance to a 3 element Yagi.. Quads are quiet on receive and have a low signal take off angle relative to their installed height.

Gem Quads at www.gemquad.com A Cubical Quad Canadian manufacturer that will be back in business with expected shipments in early 2009.

Traffie Hex beam www.hexbeam.com A wire beam antenna with a support framework that looks like the framework of a very large umbrella blown inside out and mounted vertically in a "birdbath" position. It's relatively lightweight and has a slightly smaller turning radius than a Yagi.

Hexbeam Do-It-Yourself Kits www.hexkit.com and www.mgs4u.com/hexbeam-kit.htm These are websites of component kit suppliers for Do-It-Yourself (DIY) hex-beam antenna builders. Particularly useful for Hams that wish to build an improved broad banded design version of this antenna as detailed at www.leoshoemaker.com/hexbeambyk4kio/general.html.

Some Antenna System Accessory Suppliers

- Baluns – Balun designs, Array Solutions, DX-engineering
- Antenna Tuners/Couplers – LDG, W4RT, Palstar, Ten-Tec, MFJ, SGC, Array Solutions
- Filters – ICE, Idiom Press, Palstar, Parelectronics
- RF Ground Strap & Accessories – Universal Radio, Georgia Copper, AES, HRO
- Fiberglass Heavy Duty Push up Masts - Max Gain Systems, MFJ
- Telescoping Metal Masts – Force 12, Texas Towers
- Antenna wire and support rope – The Wireman
- Antenna Building Parts – Dxengineering, Texas Towers, Penninger, Max Gain systems, Cubex Quads, Texas Towers
- Antenna Phasing Systems - IAC antennas, Comtek, DX engineering, Array Solutions
- Coax Cable and Connectors – Cable Xperts, DXEngineering, Times Microwave LMR- 400 and LMR-600 series, Andrew Heliax, AES, HRO

73 and good DX,

Roger (K6OU) 11/18/08