

How do I?

An occasional series

This week: A chat about antennas

The other day a new General Class operator and I were talking. He is in the process of assembling a HF (160-10m) station and doesn't know what to use for an antenna. Let's call him **Adventurous Learner** or "**AL**" for short. Eager Learner might be a better name.

AL, due to his studying for the General Class exam using the ARRL General Class License Manual and flash cards, kept seeing questions about Dipole antennas.

For example:

Question: G9 B11

What is the approximate length for a 1/2 wave dipole antenna cut for 3.550 MHz?

- A. 42 feet
- B. 84 feet
- C. 132 feet
- D. 263 feet

The correct answer is (C)

Question: G9 B05

How does antenna height affect the horizontal (azimuthal) radiation pattern of a horizontal dipole HF antenna?

- A. If the antenna is too high, the pattern becomes unpredictable
- B. Antenna height has no effect on the pattern
- C. If the antenna is less than 1/2 wavelength high, the azimuthal pattern is almost omnidirectional
- D. If the antenna is less than 1/2 wavelength high, radiation off the ends of the wire is eliminated

The correct answer is (C)

AL was led to believe from his reading and research that the "best" antenna is always a dipole. He really wants to get on 20 meters, so a 20 meter dipole seems like a reasonable choice. He just has a small issue: His lot is laid out such that wire antennas are problematic. They may not fit; and running multiple dipoles is a lot of work. It doesn't matter if **AL** wants a full 20 meter dipole, or a half wave, he doesn't know where to hang it.

AL was thinking in terms of what he wants to do on-the-air. DX is fun, and 20M is the primary DX band. 40M is typically regional, as is 75M. Many of the state NBEMS nets use 80/75M for the state net and 40M for the regional or national net. But don't forget the WARC bands: 30, 17, and 12M can be a lot of fun. And 15M can be a fun option between 10M and 40M.

AL is a retiree and retirees may have limited resources. **AL** has not been a ham long enough to have a scrap box of odd pieces of aluminum and coax and ladder line to build his own antenna. Commercial antennas these days may not cost much more than making your own, if you have to buy all the parts.

So **AL**'s question is what is his best choice. That led to an interesting discussion. These are my thoughts; your mileage may vary!

All antennas are a compromise. Most of us do not have the room, money or other resources to build the "perfect antenna". So the conversation begins with "What do I want the antenna to do for me?". It's been a few years since I first started in HF. These were my rules, and they work for me.

- A. It has to be multi band. I was new to the hobby; did not have much on air experience; did not have an Elmer to guide me; but just like a bag of golf clubs, I don't want to leave any band behind. You wouldn't start out on a golf course with just a driver and a sand wedge; why would you want to limit your band options?
- B. Band changing has to be hands off. When I was looking for antennas, many spoke of "easy band changes" by moving a jumper from one feed point to another. What? You want me to get up on a cold winter night and go outdoors to move a jumper from the 40M feed point to the 75M phone feed point? That's crazy. So much easier to just change bands on the transceiver and leave the antenna alone.
- C. Needs to be fairly broad. Some antennas work fine in the phone portion of 20M, but move down to the CW portion and the SWR is wrong. A tuner can help with that.
- D. Needs to be easy to maintain.
- E. Needs to be relatively robust and storm resistant.
- F. If you use a tower, the tower must be a tilt over.

Sounds simple enough? I spent basically 5 years antenna shopping. I had no clue how much I may play radio. It's maybe my 5th hobby. I was not really interested in DX. I had no interest in CW.

I looked at multiband wire antennas like the G5RV. I rejected it because 1) I didn't know where to hang it and 2) the people I tried to contact who used one, I had trouble hearing. The Carolina Windom looked interesting, but again I didn't know where to put it.

Beam antennas are expensive and generally require height, towers, rotators. That was a lot of money.

Verticals-the Butternut is an excellent antenna, but sort of expensive new and when I was looking around it was hard to find a used antenna.

I “settled”, via the Eham.net reviews, on a Comet CHA250B. It is a vertical. It does not require radials but may like a counterpoise. The price was right. It was easy to install and requires no maintenance other than keeping the mile-a-minute weed out of it. Out of the box you can use 80M-10M. You may not have the entire band, but you have enough.

I do not have a counterpoise. Maybe it would work better if I had one, but I have worked five continents and I probably have thirty confirmed countries on it. 39% of my QSOs are on 80M; I think 12% on 40M, 2% on 20M with 1% each on 30M, and 10M. 12, 15 and 17M I have a few. I even have a couple of QSOs on 6M and 160M.

Wait! I thought you said this is a 80-10M antenna. It is. But with the tuner I can get it in 160M well enough to get out 500 miles or so. I never really studied the design details, but it's about a 1/8 wave, probably NVIS 160M. Maybe with a counterpoise it would do better. But the real solution is probably a 160M dipole or multiband wire antenna for 160M.

Space limited? A Virginia Fone Net member a few years ago checked into the net on 75M using a wire antenna. He was traveling and simply connected his radio to a wire fence. Not sure if it was high tensile or electric fence wire but it worked well enough.

Hopefully this helps you find the ideal antenna for your station!

Catch 'ya on the air!