Antenna and Tuner Notes by W4ZST

I am often asked about antennas and tuners by new hams. I still tend to recommend the non-resonant tuned dipole long-wire antenna as the most versatile antenna and tuner combination. It is also the most economical antenna that I have found. It will get you on all the HF ham bands and make contacts.

There are so many antenna, tuner and SWR myths around that they are hard to stop. Most prevalent is that if the SWR is high then your signal does not get out. This is untrue but still makes the rounds as gospel among the ham community. Another myth is that ladder line radiates and is dangerous. It is true that if the antenna fed with ladder line is not balanced (tuned properly) then there will be some radiation from the ladder line, but if it is balanced (with the tuner), the fields around the ladder line cancel out and there is no radiation. It is also easily possible to locate the required balun outside and not bring the ladder line into the shack if one prefers but it is really not necessary. Another are the wild claims made about the G5RV antenna. It was designed originally as a 20 meter antenna that could be used without a tuner. That is what it is regardless of all the hype around. Use on any other band does require a tuner to be effective. The G5RV prices are also high in my opinion, higher than needed for the performance compared to the simpler dipole.

There is a nice article in the North Fulton Club Newletter written by Jim Stafford W4QO that sums up many of the things that I would also say about antennas and tuners. It is available online, pages 4 and 5, of http://nfarl.org/enews/eNEWS_2017-03.pdf. All the NFARL newsletters are on the web site and there are usually technical articles in every issue. There are other papers and info on their website too.

I see so many advertisements for ‘mystery antennas’, G5RV’s with various claims, off-center fed, end fed and others. Almost all at prices considerably higher than for a dipole kit. The basic dipole antenna is likely simpler, cheaper, more efficient and with a better radiation pattern than any of those antennas.

The definitive work on antennas is ‘Reflections’ (I, II or III) by Walt Maxwell W2DU (SK). The books are sometimes seen used at hamfests and portions are online also. Reflections III is still in print and available. Google ‘reflections by walt maxwell’ and you will find several pdf files that you can read and or download too. Highly recommended.

As to End-fed antennas, also called single-wire or long-wire, they may be useful for some folks. Do be aware that they will absolutely require an external tuner and the single wire feedline will radiate from the tuner on out. Unless you have an absolutely unique situation that would only allow this type of antenna, I would steer you away from it. There is some further good information at w8ji.com. Go there, then to ‘Antennas’, then look at ‘long wire antenna random wire’, ‘end fed ½ wave matching system end feed’ or ‘Zepp end fed antennas’. Much more antenna info on this site also. One might consider using a remote auto-tuner like the MFJ 926B if needed for this type of antenna.

Tuners. I have always used a manual tuner and still recommend that method. An external tuner with internal balun is required to feed a balanced dipole such as just described. Built-in tuners in your radios will tune a coax fed unbalanced antenna up to a certain mismatch but do not have the matching range of an external tuner and will not usually even with a balun. External automatic tuners may or may not have as large a range as a manual tuner. I have never found the time it has taken to adjust a manual tuner to be a detriment to my operating. Generally, I will tune it in the center of the band I intend to operate and then can go up or down that band without retuning. Usually at the band edges, the SWR will increase somewhat, but not enough to need to retune. I have also found that switched inductor tuners can be tuned quite a bit faster than a roller inductor type. Do realize though that the inductor should NOT be switched while transmitting in contrast to the roller inductor which can be adjusted while transmitting. Once you characterize your antenna installation, you will know which inductor switch setting for each band you operate and can easily select that first, then tune the two capacitors for maximum power out and minimum SWR. BTW, the loss of ladder line is much lower than coax although this is not much of an issue on the HF bands.

Someone with experience with external auto-tuners will have to weigh in on that subject as I just haven't had that experience myself. And I have very seldom used the internal tuners in radios I have owned as I have always used the dipole antenna fed with ladder line requiring the external tuner.

Finally, I have scanned a four page description about the Flat-Top dipole antenna that I had drawn up for new hams and given to them in the past. It will be posted here on the web page also.