

The Radio Hotel – SWR -- Last Gas For Cycle 25

by Rick Hiller – W5RH

A plea for more 5%'ers

I have been writing about Standing Wave Ratio (or SWR) for some time now, explaining what it is and how it is measured and what it means, etc. (See it all on bvarc.org/home/tech-pages/). But, I feel that most of my explanations are a trifle too deep in theory and detail and simply don't enhance the practical picture of designing, building and implementing antennas for Ham use. So with this column of May 2021 I am going to lay it on the line and finish the SWR topic from a simplistic, practical perspective.

Most hams know that to build a dipole antenna you have to figure the length: $468 / F \text{ MHz} =$ length in feet. Then you buy some material: wire, insulators, coax, connectors, etc. and build the dipole. Once constructed you hang it from the nearest tree or mast, etc. as high as you can get it or as high as the coax will allow you to go. You connect your radio and SWR meter to the coax and see what the SWR is across the band and adjust the wire length to obtain optimum (low SWR) results for the desired band portion. [Others that have an antenna analyzer run a "scan" of the band in question.] The SWR will be lowest at the point of resonance, no matter what the feed Z, and that point will hopefully be within the band boundaries. If your goal is CW/digital, lowest SWR should occur in the lower portion of the band. If phone is your target, the SWR should be lowest in the upper portions of the band and if you wish to work both, then some place in the middle of the band is best. For a simple dipole the sweet spot of SWR should be, at resonance, 1.5:1 maybe up to 2:1. Your radio will love you for it, as most transceivers want less than 3:1 SWR for full power out.

So there you have it: the bare bones guidelines for putting up a single band dipole antenna. This describes the needs of 95% of the hams that put up HF dipoles. No need to know what SWR actually is, other than knowing that the SWR measurement has to be about 1.5:1 or 2:1 etc. Don't need to know why it exists, how it is calculated or even how it is measured and probably don't need to worry about the influence it has on your antenna systems performance. If the SWR numbers are low, "the cat is in the bag" with no need to open that bag up again. Move on. Go operate Cycle 25. Make QSO's and get to know the band you have built the antenna for. Have fun.

Now, if you are in the 5% of Hams that wish to know all about SWR and Return Loss and Impedance, etc. etc. etc. There is plenty of information fodder on the web and in books that tell you all about it and explain it in a multitude of ways, one of which you are sure to readily understand. This is where I, personally, find solace within Ham Radio: knowing and understanding antenna systems. Do I need to know this in order to get on the air? No, I could very easily be a member of the 95% group. Now, that is all well and good until something goes awry; then, out come the tools. But what good are tools without the knowledge of how things work. What good are your watt meter or SWR meter or Nano VNA (tools used to troubleshoot and fix the problems) if you don't understand how your antenna system works. So, my plea is for you to strive to be one of the 5%'ers. You'll certainly be glad you did.

Best of luck and enjoy your hobby....73, Rick W5RH