

The Radio Hotel - Broadbanding, Nittany Lions Style

by W5RH

Trying to attain a fairly flat 50 Ohm SWR response across each of our ham bands is a mixed bag. Narrow bands like 12 meters or 17 meters are easy. Even 20 meters can be done; but when you deal with 80/75 meters you run into high SWR at the ends of a the bands when the dipole's matched resonance is at the center of the band (figure 1). This dilemma of flattening the swr curve across the whole 80 meter band has been bugging the heck out of low banders for years. Many have developed systems to accomplish it. The goal is to obtain the low SWR curve, but keep the antenna efficient.

Figure 1

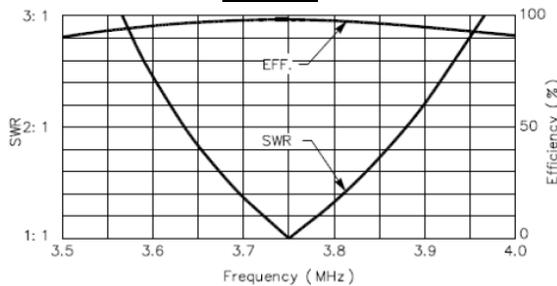
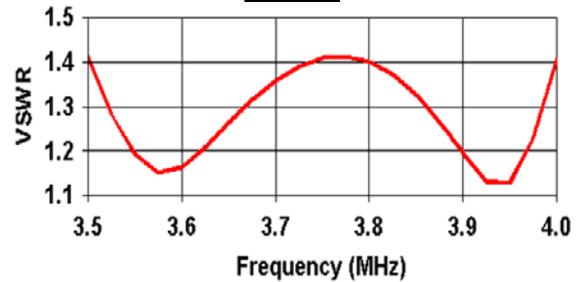


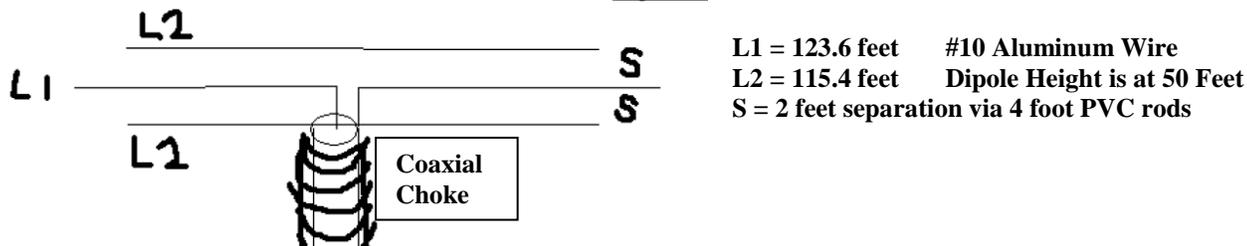
Figure 2



As I said, solutions are many. For example: the cage (thick) dipole, the coax cable bazooka, the multi-wire fan dipole, the Snyder and even the TTFD, etc. (Google them all for a look at their methodologies). One recent method I ran across was invented and implemented at Penn State University, home of the Nittany Lions (and college days home to 2017 GHH Featured Speaker and Dayton Antenna Forum Coordinator - K3LR). This broadband method (SWR result – see Figure 2) was presented by Jim Breakall, WA3FET, at the 2016 Dayton Hamvention Antenna Forum and can be had for your perusal at www.k3lr.com/Dayton/Dayton2016/wa3fet.pdf.

The Nittany Lions' method uses wires strung as shown in **Figure 3**. Essentially, running close-spaced wires parallel to the driven/resonant dipole element.

Figure 3



This method is similar to the Coupled-Resonator Principle for multiband, resonant dipole implementations outlined in The ARRL Antenna Compendium #5 by K9AY. The closely spaced, multi-banding scheme feeds one dipole (usually the lowest in freq) and then another higher frequency dipole, or dipoles, are brought in close proximity to this driven element and when the proper distance is met for the coupled dipole, a low SWR point for that additional band appears. InnovAntennas, out of the UK, is using this feed methodology for their line of multiband Yagi's and dipoles.

Note: The K3LR web site (www.K3LR.com) has an archive of all of the presentations from the Dayton Hamvention Antenna Forum from 2004 to 2016. Check it out. The Dayton Hamvention Antenna Forum is one good reason to make it to Dayton 2018 – actually a bit east of Dayton – in Xenia, OH.

Enjoy your hobby. 73.....Rick – The Radio Hotel

Next Time – Recent Trends in Yagi-Uda Designs

*The purpose of **The Radio Hotel** is to give you a practical kick start into exploring the workings of antenna systems. Google the buzz words and find out what they mean. Read up on antenna system theory to see how it all works together. You will be glad you did.*

