Joel R. Hallas, W1ZR, w1zr@arrl.org

More on Using a 40-Meter Dipole on 15 Meters

Q Allen, KC7O, (and others) responded to my discussion in the December 2016 column about why a 40-meter dipole wasn't as trivial to use on 15 meters as we thought in the days before standing-wave ratio (SWR) meters were common.[1] They raised the question of using what I'll call *mid-span loading*. Allen referred me to a 1991 *QST* article by Rus Healy, NJ2L, that described the approach.[2]

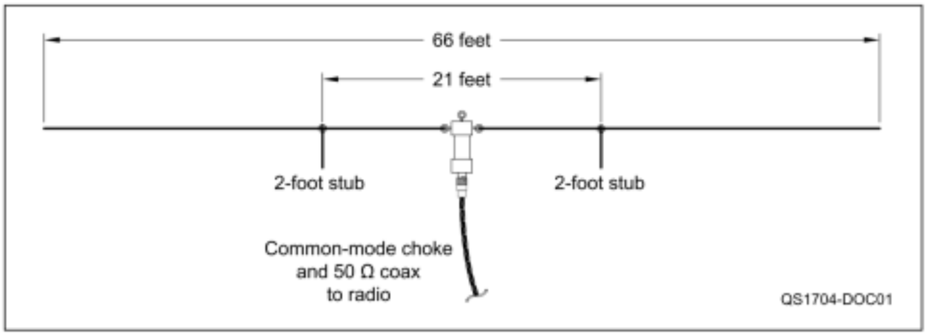

Figure 1 — Sketch of the 40-15 meter dipole using mid-span loading. The overall length needed to be shortened by 7 inches from its non-loaded length to have the 40-meter resonance at mid-band. The *EZNEC* model used #14 AWG bare copper wire at a height of 40 feet over medium ground with a conductivity of 0.005 S/m and a dielectric constant of 13.

A Rus proposed adding twisted-wire figure-eight stubs to each side of the dipole just inside of the 15-meter half-wave points. These provided a 15-meter resonance, without much effect on 40-meter operation. This has also been done using hanging wire stubs, but I couldn't find the reference. I have to agree that adding a few wire whiskers to the 40-meter dipole seems like a more attractive approach to two-band operation than my earlier suggestions, although my ideas may have been more in the spirit of using an actual 40-meter dipole on 15.

I modeled such a 40-meter dipole, as shown in Figure 1, and *EZNEC* predicted that it would work just about as desired.[3]

The 40- and 15-meter SWR plots are shown in Figures 2 and 3, respectively, with resonance at mid-band on both bands, as we wanted. The azimuth pattern of the antenna is just like that of a single-band, ½-wave dipole on 40 meters, as you would expect, and thus it is not shown. The pattern on 15 meters may not be quite what you would anticipate (see Figure 4). Unlike a 40-15 meter, two-band dipole using resonant traps, which would have dipole-like patterns on both bands, this antenna's 15-meter pattern is very similar to that of a 3/2-wave or the

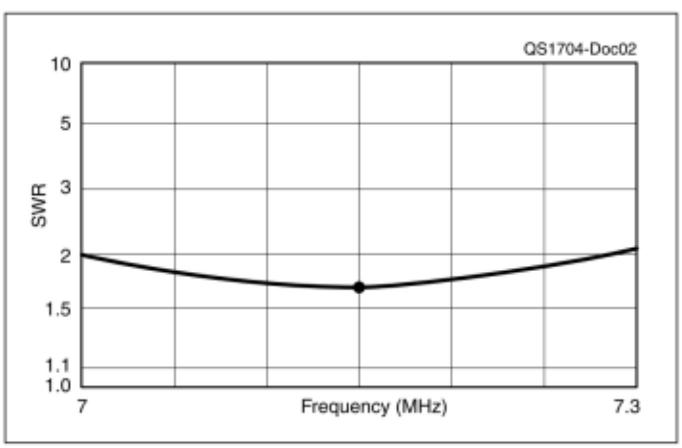

Figure 2 — SWR plot of the antenna from Figure 1 on 40 meters. The results are similar to a single-band, 40-meter dipole at the same height.

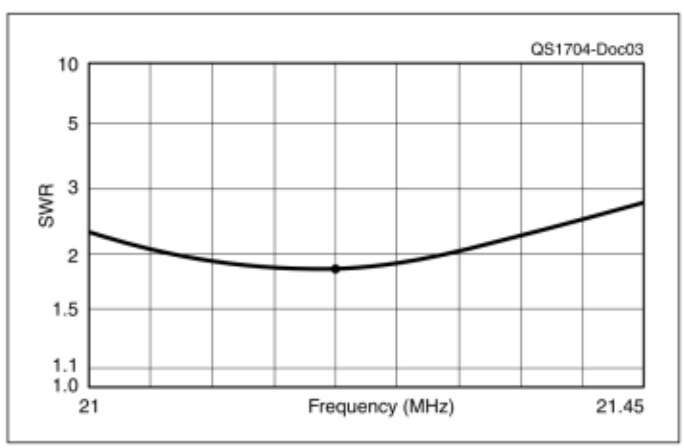

Figure 3 — SWR plot of the antenna from Figure 1 on 15 meters. The results are similar to a single-band, 15-meter dipole at the same height.

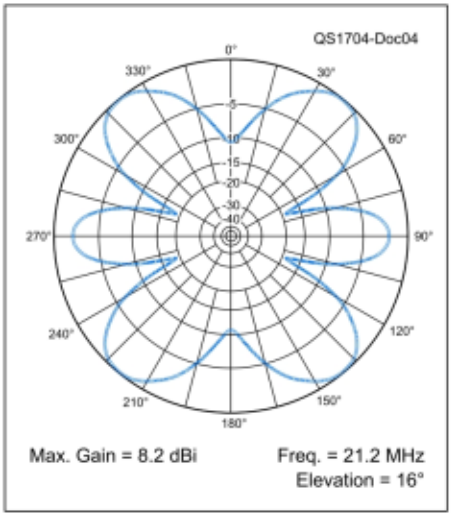

Figure 4 — Azimuth plot of the antenna from Figure 1 on 15 meters. As noted in the text, the pattern is much more like a 3/2-wave dipole than that of a ½ wave. The wire axis is vertical in the photo. The additional lobes may be helpful, but the nulls probably are not.

40-meter, ½-wave on 15 meters, as discussed in the December 2016 column. Thus, while the stubs shift the higher frequency resonance, they don't keep the currents entirely within the inner portion. The pattern, while different, will be generally useful for many, and it is probably a good trade, considering the reduction in cost and weight compared to traps.

Do you have a question? Ask the Doctor! Send your questions to "The Doctor," ARRL, 225 Main St., Newington, CT 06111, or e-mail your question to: **doctor@arrl.org**.