

Tips and Lessons to Improve your 80-Meter Contest Scores

I obtained my first Amateur Radio license at the age of 15, in 1977. Our family had just moved to a 6-acre location on the outskirts of Cedar Grove, Wisconsin. It was exactly what the doctor ordered for a new ham and his younger brother, who were into racing dirt bikes and go-carts. I was drawn to ham radio by the ability to launch a radio signal from my home into the sky and talk to others around the world. Forty-one years later it still fascinates me.

After upgrading to General, I developed an interest in the low bands. Back then, the low bands were considered 40 and 80 meters. LORAN and power restrictions made 160 meters a bridge too far for most contesters and DXers. I still have my copy of ON4UN's first book, then called *80-Meter DXing*, published in 1978. Having plenty of room to spread out, I put up a Hy-Gain Hy-Tower (AV-18HT) with a bunch of radials using aluminum fence wire purchased from Sears. A year later I noticed the radials were disintegrating, turning to powder.

Lesson #1: Some soils are not conducive to using aluminum wire.

Nonetheless, the AV-18HT opened a whole new world of 80-meter DXing for me. It was an amazing rush to be called by a 3B8 during the CQ World Wide DX SSB from the black hole of W9. It remains so to this day.

The Quest for a Better 80-Meter Signal

Some years later, after a move to Virginia, the AV-18HT was back up on my 1/3-acre lot along with a 70-foot tower hosting a TH-7. What I lacked was room for any sort of receive antenna. After an assignment to the Philippines (KE9A/DU3), I returned to Virginia and purchased a home with a 1-acre lot. About that time four-square transmit arrays were gaining popularity on 80 meters. I *had* to have one!

The installation was less than ideal, with a 90-foot tower in very close proximity and a poor ground system. But, it opened a whole new world on 80 meters that I had only dreamed of. I completed 5BWAZ after a QSO with JT1CO. The four-square also helped me achieve the 1998 CQ WW DX SSB 80-meter record from W4, which still stands.

In 2004, I realized a long-time dream by winning CQ WW DX SSB SOAB HP Unassisted category for the US, aided in

part by low-band numbers that exceeded anything I had done in the past. Behind our 1-acre property were 11 wooded acres, which hosted a couple of Beverage receive antennas.

Lesson #2: As the saying goes, the Beverages that work best are those installed on someone else's property. [With the property owner's permission, of course. — Ed.]

In 2010, with a bit of good fortune, I purchased a 17-acre property just a mile from my QTH. Most of it is wooded, and in some areas, it is not level. But it opened a bunch of possibilities for low-band antennas. One of these was the 80-meter eight-circle transmit array in *ON4UN's Low-Band DXing*. K9DX (160 meters) and K4JA (80 meters) were the first two I know of who built the nine-circle array — no doubt an excellent performer. Feeding the nine-circle array is not for the faint of heart, however. You really need to know what you are doing as not only are varying phase angles involved, but different currents. The eight-circle can be quadrature fed (90° increments) with equal current levels to each element. If you want to squeeze a little more gain out of the array, you can use something on the order of 120°.

Building it was a multi-year, weekend project, also not for the faint of heart. Everything is times eight. Eight 0.25 λ elements, 60 0.25 λ radials per element

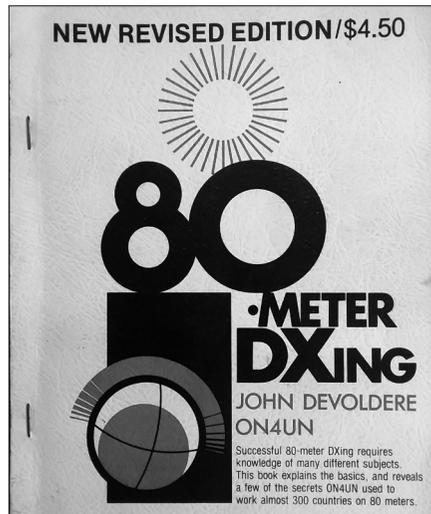


Figure 1 — The inspiration for my 80 Meter DXing efforts was ON4UN's *80-Meter DXing*.



Figure 2 — The phasing unit for the 80-meter eight-circle transmit antenna.

times eight. Because the radius is 95 feet, quarter-wave lines to each element are physically too short, thus requiring 0.75λ lines, each a little over 200 feet long, times eight. You get the picture.

How does it work? I'm sure it would benefit from further fine tuning of the network, and its location in a wooded area may degrade performance a tad, but so far, so good. I don't have high-band antennas at this location yet, so for the 2017 CQ WW DX SSB, the decision was made to do single-band (80), high-power, unassisted. I finished #1 in the US with 559 QSOs, 23 zones, and 90 countries. Conditions were not all that good.

For comparison, W3LPL, in the multi-multi category, had 680 QSOs, 22 zones, and 95 countries. Not bad at all. 2017 also brought a #1 US plaque for 80-meter single-band in the ARRL DX CW contest. One other memorable achievement was a February 15, 2017, QSO with XX9D at 22:48 UTC via my southeast long path. The window that time of the year between the Washington, DC, area and Macau is very, very narrow. The day of the QSO, XX9D was an honest S-7, which should have made the contact a breeze. But, I was looking directly into a nasty line of thunderstorms sitting off the US east coast of the US, directly in line with the path to XX9, which produced almost constant S-9 +20 static crashes. It took some luck and a tremendous amount of concentration to pull him out of that mess.

For receive I am using a Hi-Z eight-element 80-meter single-band vertical array with a 100-foot radius. It does well, but I have some work to do. During several CW DX contests I've listened to K7SV operating on 80 meters from NR4M. The transmit antenna to Europe at NR4M is a four-element wire quad strung between two 200-foot towers. For receive they use diversity receive on a K3, with the quad and a 2 λ Beverage. In more than one contest, Larry was hearing weak stations I couldn't hear at all. The Hi-Z should be on par with the Beverage. It could be that the quad outperforms the Hi-Z array in some cases.

This fall I would like to run some tests, using *WSPR* units, on my eight-circle transmit array and NR4M's quad, to see how the two compare.

Lessons Learned and Tips to Improve Your Results on 80 Meters

Tip #1 — Receiving Antennas are critically important. This should come as no surprise, but being able to hear is king! This applies equally to DX and domestic contesting. Here are some suggestions:

Check out some of the WWROF Webinars (wwrof.org/category/webinar-archive/): OH6LI "Receiving Antenna

Metrics with Examples," and N4IS "Waller Flag Construction," paying particular attention to the section on eliminating noise sources. Another good source is <http://w8ji.com/receiving.htm>. Look at some of the small vertical receive arrays available on the market. There is a three-element array with a small 50-foot spacing footprint that can be installed temporarily, if room is an issue. Time spent on this subject will pay off greatly! If you use a directional array, make sure you spin the control and listen in all directions, especially during domestic contests.

Tip #2 — Optimize Your Transmit Antenna(s). Another no brainer: Optimize your transmit antenna(s). Here you must define your goals. Are you interested primarily in DX or in domestic contesting? Or both? Dean Straw, N6BV, gave an excellent presentation years ago called "Contest Antennas — Domestic or DX, What's your pleasure?" You can find it by Googling the title or searching YouTube. (If you can't find it, drop me an email.)

Tip #3 — Learn 80-Meter Propagation. Almost all my Zone 26 QSOs over the years

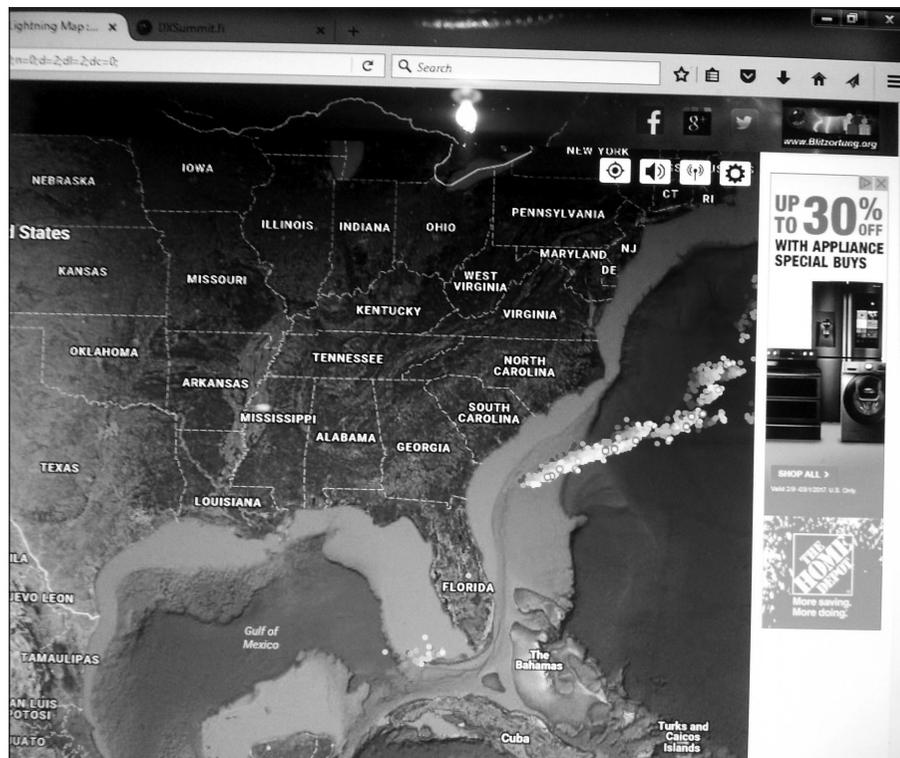


Figure 3 — The impact on a QSO with XX9D of thunderstorms directly in line with the path to Macau.



Figure 4 — The installation of a Hi-Z 40, 80, and 160 meter eight-element receive array at XW4ZW. The array was provided courtesy of Hi-Z.

have been at my sunset, via the southeast, and not at my morning, when the band is almost always open to Asia. Come October and November CQ WW DX, sunset is also a great time for me to work VK6, which can often be a double multiplier (VK and Zone 29). Nothing beats spending time on the band learning it and exploring it before the contest starts.

Tip #4 — Use a gray line map in the shack. I find it helpful to have a sunrise/sunset map running real time. It helps to keep an eye on the VK6 path, for example, as well as on a visual display as sunrise sweeps over Europe, when I really want to push and scoop up as many Europeans as I can before signals disappear. I was always partial to *Geoclock*, but it may not run properly on newer operating systems. *DX Atlas* is also good. Most logging programs show sunrise/sunset time in the QSO window. Another possibility is the *Geochron*, as discussed in the July/August issue of *NCJ* that discussed what was new at Dayton.

Tip #5 — DX SSB, to operate split or not. Contesters in the US can operate SSB down to 3600 kHz. With all that room, why do some stations operate split, transmitting above 3800 kHz, listening down in the band? It seems like a waste of spectrum. I've wrestled with this myself and occasionally get questions from the "crowd" above 3800. I'll try both — split and simplex — further down the band, but it seems to be that my rate is better when I'm split. I suspect that is because on the DX end, particularly in Europe, the band is less crowded, and it is easier to hear stations above 3800 kHz. Try both. When one method dries up, try the other.

Tip #6 — Be aware of SSB band plans. For example, Australia 3535 – 3620, 3640 – 3700, and their DX window 3776 – 3800. Japan's 3702 – 3716, 3745 – 3770, and 3791 – 3805.

Tip #7 — Develop an effective way to stay alert. This is especially important when things get slow. Personally, I tend to bog down from 3 to 5 AM, when the European runs end. For domestic contesting, this is a good time to take a break, if you are in a category that is time limited. For DX contesting, you need to keep cranking away. It is especially challenging for North American operators to maintain a rate at this time of the contest, but there are multipliers in the Pacific to be had. A few could make the difference.

Tip #8 — Know when to hold 'em, know when to fold 'em. Know when to walk away. How many times have you heard loud DX stations that you call and call, and they keep CQing in your face? Chances are they are in a high noise or interference environment. It's maddening, especially if the station is a multiplier. But don't waste an excessive amount of time. Jot down the call sign or mark the station and check back a little later, if your logging program has a band map or S&P memories.

Tip #9 — Dealing with deliberate QRM (DQRM). Anyone who has spent time calling "CQ contest" on 80-meter SSB either in a domestic or DX contest has almost certainly run into poor and disruptive operators. The fact that they have nothing better to do but harass you at 1 AM says it all. Ninety-nine percent of the time I ignore them, as if they are not even there. Most of the time it works. Obviously, it's easier to do with high power and good antennas. If the DQRMer is causing you to struggle, though, you have a choice to make. Stick it out or take off, if your score is suffering. But you are best off if you don't engage with them.

Tip #10 — Never underestimate the benefit of 80 meters. Eighty meters can be a very productive band in domestic contests, even with low antennas and low power. A simple dipole or inverted V at 50 feet can produce some very good results. And don't be afraid to try running. Even a short run of, say, 15 – 30 minutes can be a big boost to your score. When the run dries up, go back to S&P. You can always try running again later.