

Kilowatts and tower-mounted Yagis are out of range for many hams today. However, that shouldn't stop you from working a lot of great DX. KE4PT, with only an attic antenna himself, says CQ's annual DX Marathon proves the point.

You *Can* Enjoy DXing With a Modest Station ...and the CQ DX Marathon Shows the Way

BY KAI SIWIAK,* KE4PT

Successful and fun DXing is well within the reach of stations with modest radios and simple antennas. The secret is in having the confidence to try and in adhering to good operating practices. A massive "aluminum cloud" of antennas high above the shack along with top-of-the-line radios may help get you to the top spot in DXing, but you can do surprisingly well and enjoy your share of the DX with modest gear. The CQ DX Marathon is a great way to show how well you can do!

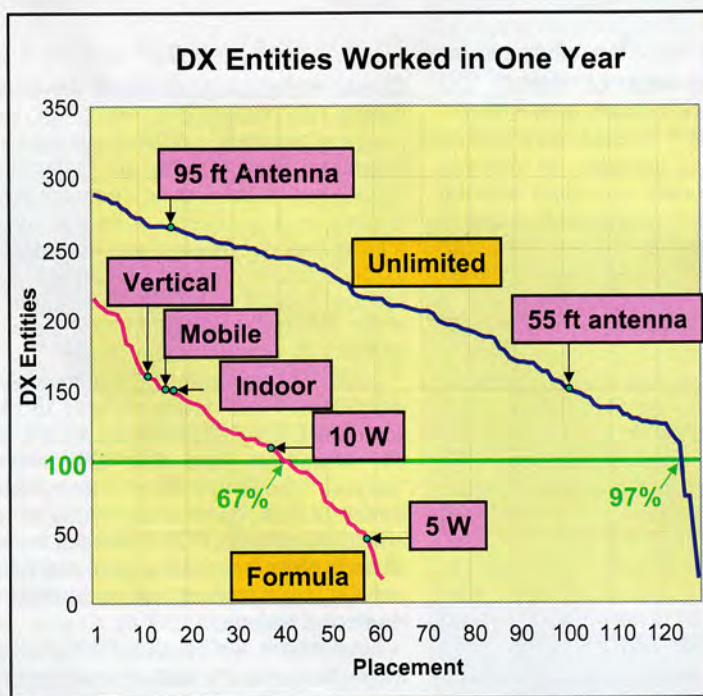
Successful DXing with simple gear is not new. My own experience with a modest station¹ bears out the virtues of both low power and modest antennas. My confirmed DXCC total stands at 197 entities, including 29 on 6 meters (best 6-meter DX was Malta), and I've managed WAS-TPA² #427, six bands of WAC (Worked All Continents), and a respectable

showing in the CQ DX Marathon for several years—all in the sunspot-challenged past few years. The same message is often repeated; as Bruce Pontius, NØADL³, points out, "Your Voice Can Be Heard!" with low power and simple antennas. Fully two-thirds of the "Formula Class" entries in the DX Marathon (see below) worked more than 100 DX entities!

Estimating Performance

We can learn exactly how effective simple stations can be by looking at the results of the annual CQ DX Marathon. The Marathon provides a uniform way to measure DX achievement, and data are readily available from published results each year. The Marathon rules are: work as many DX entities as possible between January 1 and December 31 each year (no QSLs needed; you are on your honor); everyone has the same goal and same time frame. There are two contest classes, which is what provides us with a way to track

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In one calendar year, even with a few sunspots...

Unlimited Class stations can work almost 300 DX entities in a year: *up to 30 dB advantage over modest station*

Modest stations 100 watts or less and with no significant antenna gain can work over 200 DX entities in a year

QRP station (10 watts) can aspire to 100 DX entities!

Fig. 1—DX entities worked versus placement in the 2008 CQ DX Marathon.

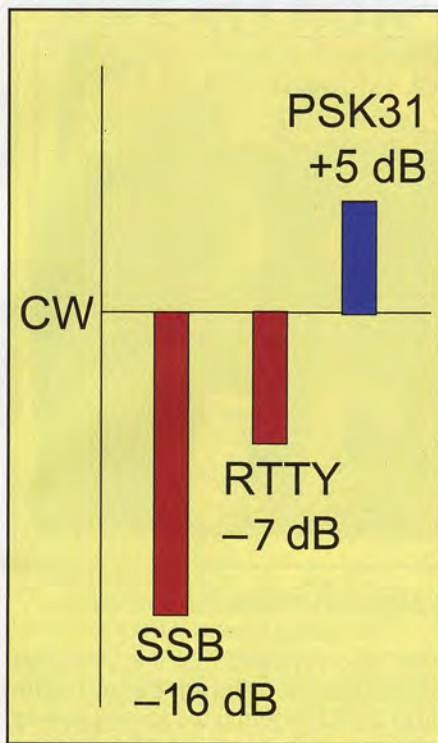


Fig. 2—SSB, RTTY, and PSK31 link performance compared with CW.

performance based on antennas and power. The two DX Marathon categories are:

- Unlimited Class: any antenna, any legal power level; and
- Formula Class:
 - * Option 1—10 watts, antennas on single tower, height under 65 feet
 - * Option 2—100 watts with either simple verticals less than 33 feet above ground; or wire antennas less than 60 feet above ground; no arrays, Yagis, or quads.

I used the published CQ DX Marathon results to compare how well top-guns in the Unlimited Class did versus modest stations in the Formula Class. I also obtained private QSO data from several hams to provide more details.

Comparing Stations

The performance of Unlimited Class stations and Formula Class stations is compared in fig. 1. The #1 place finisher in the Unlimited Class (upper trace) worked nearly 300 DX entities in a year. Fig. 1 also shows that in one calendar year, even with few sunspots, the #1 place finisher in the Formula Class (lower trace) worked over 200 DX entities in one year. Similarly, a QRP station (10 watts) can aspire to working at least 100 DX entities!

The bottom line is that working a hundred DX entities is possible within one

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Photo A— The indoor antenna at KE4PT was good enough to gather 100 CQ DX Marathon entities in two months.

year using 10 to 100 watts and simple antennas; indeed, 67% of Formula Class stations worked 100 or more DX entities in the CQ DX Marathon. It is, of course, no surprise that this percentage increases to 97% for Unlimited Class (Yagis on optimum-height towers, kilowatt power levels). Good operating practices play a role in both categories.

Several points in fig. 1 are highlighted by magenta tags. The **5W** and **10W** stations were specifically identified in the CQ DX Marathon published results. Other tags are from radio amateurs who were kind enough to share their private QSO data with me. Specifically, **vertical** antenna data are from Anneke, PB7XYL; **mobile** data were supplied by Nori, JA7OXR; **95-foot** antenna data are courtesy of Norm, W4QN; the **55-foot** antenna data are from Esteban, W4DTA; and the **indoor** antenna data (see photo A) are my own (KE4PT). The left part of photo A shows the end of my attic-mounted inverted “L,” and the right-hand photo shows the top section of the “L.” The antenna is fed through an ICOM AH-4 antenna tuner and covers 160–6 meters, although efficiency is low on the 80-meter and 160-meter bands.

The private QSO additional data show that an Unlimited Class station can work 100 DX entities in less than a month, and that modest stations (including my indoor antenna station) can hit that mark in two to three months. The data further show that choice of operating mode is important.

Operating Mode Matters

If we take, for example, a 100-watt PEP transmitter, the CW average power is 44 watts, while with SSB it is only 22 watts. That is two-to-one or 3 dB in favor of CW. At the other end of a radio link, a receiver CW filter noise bandwidth of 350 Hz compared with 2700 Hz for SSB translates to another 9-dB advantage for CW. Then there is the operator factor: CW operators, especially experienced DX operators, tend to listen more intently to CW, resulting in another approximately 4-dB CW advantage. Thus, the total advantage for CW over SSB is approximately 16 dB, or about three S-units. We can make similar calculations to show that RTTY is 7-dB disadvantaged to CW, and that PSK31 is 5 dB *better*-performing than CW, all further depending on QRM, QRN, QSB, and your radio settings. This 21-dB spread in performance among various modes is shown pictorially in fig. 2.

The private QSO data also revealed that the Unlimited Class stations could operate flexibly, using any desired mode at will. However, with up to 21-dB performance spread among the modes, modest stations often need the performance advantage of the digital modes or CW to make the DX QSO.

Looking to the Future

The performance edge that the newer digital modes offer bodes well for new hams and future hams. In “days of old,” we old-timers could rely on a junk television chassis, or Army surplus gear, to cobble together credible homebrew transmitters and receivers. Yes, we built our own, but those “junk box” sources are no longer available. The good news, though, is that today’s new hams can find many excellent transceivers in the 100-watt class, and they have easy access to a wide variety of cheap computers. Digital hardware is the new “junk box” staple. The homebrewing contributions of newer hams are increasingly likely to be in the mating of radios with computers—and further improving the efficiency of digital modes. Bottom line: New hams with new ideas can easily aspire to a successful ham radio DXing career. Any Elmers out there paying attention?

Summary

You *can* be heard, and you *can* enjoy DXing successfully with a modest station and a modest antenna. The keys to success are your own confidence and good DX operating habits! It should now be no surprise that mobiles, low verticals, and indoor antennas can yield very impressive results, especially if those station operators avail themselves of the performance advantage of CW and the narrow band digital modes. Above all, “Have fun!”

Notes

1. K. Siwiak, KE4PT, “All Band Attic Antenna,” *QST*, October 2007, p. 33.
2. ARRL Worked All States Triple Play Award—earned for contacting and confirming via Logbook of the World all 50 states on CW, voice, and digital modes. See <<http://www.arrl.org/triple-play>> for details.
3. B. Pontius, NØADL, “Your Voice *Can* Be Heard!” *QST*, September 2009, p. 53.