

# Digging Deeper – Solar Flux, the A Index and CQWW Propagation from Zone 2

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The following is a supplement to the article, “‘From Zone 2 Canada, This is VE2DXY,’ Operating a Contest DX-competition for CQ WW SSB,” which appeared in the August 2010 issue of CQ magazine:

The high latitudes of Zone 2 (north of 50° N) make for some unique propagation. Each year, we compare our logs with previous year’s contacts, looking for areas of similarity and difference between solar activity, the number of contacts, countries and zones we have worked. During the post-contest season, we review the comparisons, and discuss ideas for improving our results in future contests. For the purposes of this article, our comparisons begin in 2004; and because there is a noticeable degree of correlation between the A-index values and K-index values, we have chosen to use the A-index values and solar flux to illustrate our analysis.

Despite somewhat weak propagation our overall score in CQWW SSB 2009 was higher than ever achieved in previous years. When you take into account the benefits gained from the lower noise, higher efficiency loop antennas we used in 2009, improved radios and a moderate improvement in the solar flux, it becomes apparent why our numbers of contacts, countries and zones increased (see fig. 1).

By looking at the total numbers of countries worked by band versus the A-index (fig. 2), as the A-index increased, there was a significant decrease in the overall numbers of countries worked. An A-index greater than 7 is usually considered to be unsettled, but still quiet enough to hear weak signals. When the A-index goes above 15 (as we found in

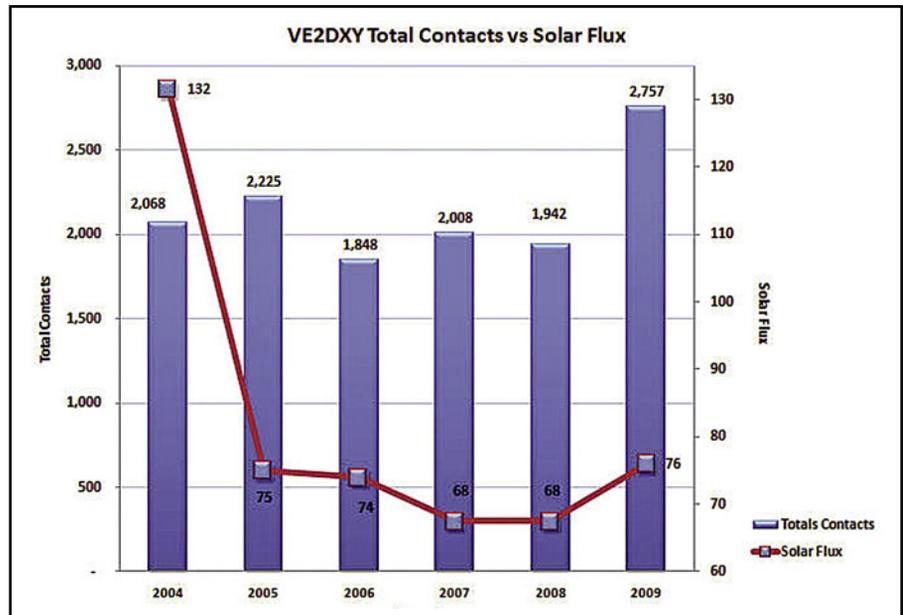


Fig. 1\_ Comparison of VE2DXY total contacts and solar flux numbers, 2004–2009. The 2009 results are influenced by changes in radios and antennas.

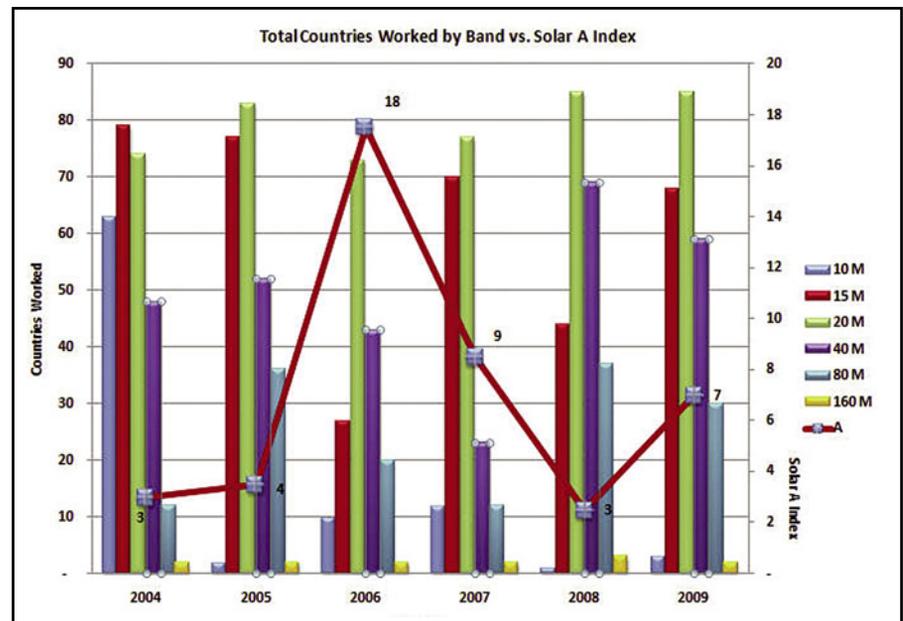


Fig. 2– Total countries worked by band vs. solar A-index. Note the inverse relationship.

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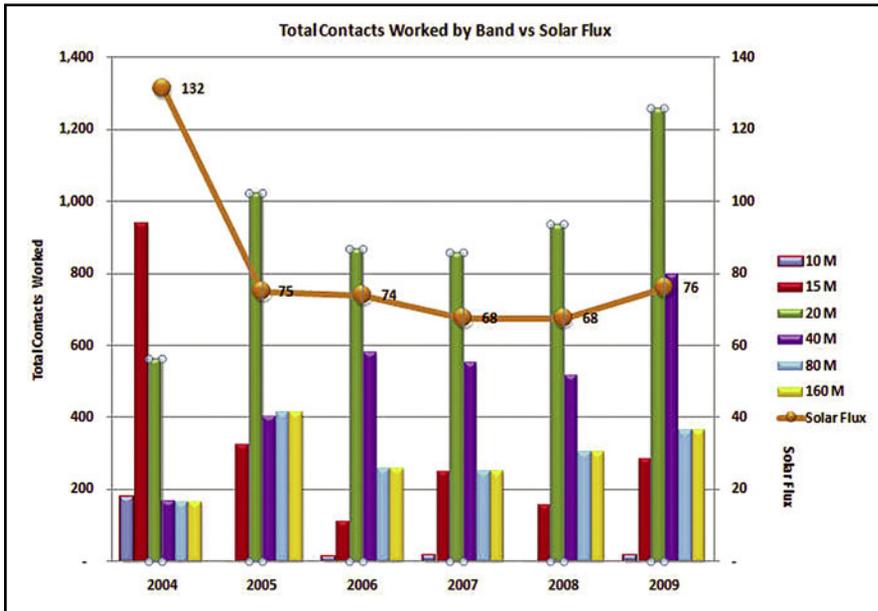


Fig. 3– Total contacts by band compared with solar flux levels. Again, results are also influenced by changes in antennas and radios.

2006), the bands become very noisy, limiting our ability to hear weak signals. Combine a relatively quiet band in 2009, however, with a low A-index and a slightly higher solar flux, plus improvements in antennas and radios, and our overall contacts-by-band count increases, as it did in 2009, when we were able to work a total of 247 countries compared to 239 band countries in 2008. Another example of the impact of high solar flux and a low A-index on overall country count by band occurred in 2004. With band openings on both 10

and 15 meters, we had the highest total countries by band of 278 (fig. 3). Fig. 3 shows the impact of improved antenna performance on 20 meters with 1,259 contacts in 2009 compared to 917 contacts in 2008. Given our location and antenna restrictions, we are now convinced that the use of loop antennas and wire Vee beams gave an advantage in our northern location. [Note to art dept: "Vee" above is correct] With our location roughly equidistant between the U.S. and Europe, we have always found that getting into Africa and

Asia from Zone 2 is difficult, making the total number of zones we can work challenging. The highest number we have ever worked was in 2004 with 94 band zones in the log. The principal difference in 2004 was that we had a high solar flux combined with a low A-index value, which helped propagation. Our lowest number of zones worked by band was in 2006 which coincided with the highest solar A-value, producing only 71 zones worked by band. None of us is able to influence propagation conditions except with wishful thinking, but by making improvements in our antennas and radios in 2009 during a period of relatively low solar activity we were able to get our second highest number of zones worked by band with 80 (fig. 4).

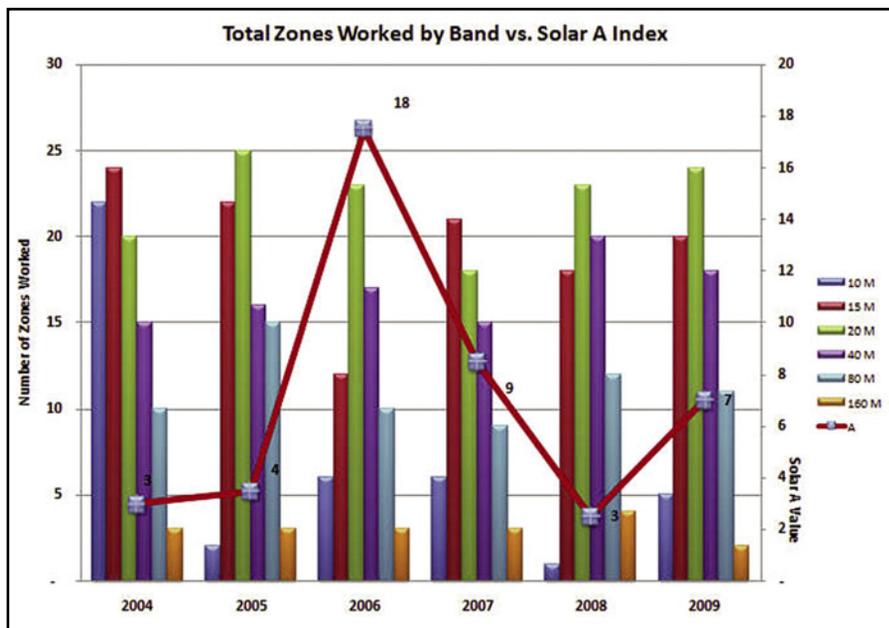


Fig. 4– Total zones worked by band vs. solar A-index between 2004 and 2009.