

## **Note concerning WQQA antenna orientation...**

The usual methods employed by licensed surveyors for determining precise antenna orientation could not be used in this case. The tower on which the KQQA antenna is mounted is a wind generator tower located on a farm adjacent to two barns. This made it difficult to properly view the antenna at a proper distance to determine azimuth. Consequently, an alternative method was used.

(Note: the FCC Audio Division previously accepted a similar method I used at KWHI, West Helena, AR).

The surveyor used precision GPS equipment, accurate to within millimeters. He established and marked with stakes and flags three points on the ground in a straight line along the panel antenna manufacturer's prescribed azimuth of 10 degrees true, plus and minus 90 degrees. One point was marked at the base of the tower precisely under the pivot point of the antenna array elements. Two points were also staked and flagged at a distance of about 10 meters along the 100-280 degree axis on both sides of the tower, and precisely aligned with the stake at the base of the tower. The panels of the antenna elements were sighted from atop the tower and perfectly aligned by the installer in parallel with this line. The driven elements of the antenna bays are oriented at exactly 100-90 degrees (or 280+90 degrees) from the surveyor's line. Consequently the antenna is properly oriented at 10 degrees true.

I hereby certify that, as the antenna installer, I personally climbed the tower, mounted and oriented the antenna bays in exact alignment with the 100-280 degree azimuth according to the line established by the licensed surveyor, Paul Nordwig.

We believe that this antenna system is aligned within 1 degree of the prescribed azimuth.

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KQQA, Forestville, WI  
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