

## **SYZYGY**

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For those of us who fly the flag of Probability, unexpected alignments are disturbing. Deep unexpected alignments are terrifying. I moved a step closer to “deep” last week.

I had been installing a new antenna for my amateur radio station. This project required significant cable-cutting, connector fitting and soldering, and mystifying mechanical assembly. Fluency in Old Saxon helped. Somewhere in the middle of the job, I also decided to “improve” my lightning protection. (Having been less than a block away from an antenna when it was struck by lightning, I can report it is best to accept the testimony of others on this subject.)

To test whether my rigging cohered, I connected a 10-year-old antenna analyzer (technically, a combination of a radio-frequency (RF) signal injector, an RF reflected-power analyzer, and an RF reactance analyzer) to it. I got measurements that looked like the bottom of a canary cage. To try to make sense of what the analyzer was saying, I connected the same antenna system to a software-defined-radio (SDR) receiver I had and fed the results into my computer. The software user interface to that SDR produces blinding technical detail, but it was clear enough that I was receiving far fewer stations than I thought I should be, and their signal strength was right at the noise threshold of the receiver. I cross-checked the performance of my SDR setup with two US SDR-based web sites and concluded that there was likely something wrong with my antenna system.

Or not? When do you trust a piece of electronics that is a decade old and whose operation you probably don't remember because you last used it 10 years ago? And when are any two geographically separated radio systems really comparable? It's a short step from questions like these to “What is “like” like?” Many good people have innocently wandered into that question and like, you know, have never been heard from again.

When in doubt, as my beagle says, read the @#\$\$! manual. If you can. The documentation that came with the antenna analyzer was apparently written by someone who had inhaled too much solder vapor as a child and then went to law school. The manual said there was third-party analysis and graphing software (not provided or supported by the analyzer vendor) that might be able to make sense of the gibberish I was seeing. I followed the link the analyzer vendor supplied for that software. The link was broken.

Most normally constituted people would recognize that result for the rabbit hole that it is. But most amateur radio operators are rabid rabbit-deniers. I rummaged about on the Internet and found a product might have been a third-generation descendant of the software the hardware vendor suggested. I downloaded and installed it, only to discover that its user manual was written in French.

I can read enough French to get into serious trouble.

After a few diagnostic experiments, I became convinced that a coax plug I had installed was internally shorted (likely due to my lack of soldering skill). I removed the plug and installed a new one. I reconnected the antenna analyzer to the plug and got outputs that were sensible for a properly operating antenna of the configuration I had installed. I then switched the plug to my SDR/computer combination. The signal strength was 25 times my earlier results, and I could easily receive ~15 stations on one of frequency bands the antenna was meant to cover. This performance, furthermore, was comparable to what I had seen on the two website/SDR systems I had surveyed earlier.

That was proof enough for me. People who know how to spell “Maxwell’s equations” the same way two times out of three might say that my experiments showed nothing. But as Aristotle said, the mark of wisdom is knowing the precision of which a subject admits. (Translation from the Geek: if a rubber knife is the only knife you have, it’s the knife you use.)

Several of stations I could receive were communicating in Morse code. I often use such sources for code practice, so I selected one. The operator’s code speed (maybe 15 words per minute) lay at the edge of my current competence, but I could still grasp 95% of it. Then the transmitting station signed.

It was French.

Under like circumstances, a rational man would infer that, with high probability, he was about to be struck by an asteroid.