

17 December 2003
15 Grandon Road
Dayton, OH 45419

ARRL
Attn: Frequency Measuring Test
225 Main Street
Newington, CT 06111

Re: N8UR FMT Results

Here are my results for the 2003 Frequency Measuring Test:

80M: 3 585 383.685 Hz

40M: 7 050 409.949 Hz

Although we copied W1AW's CW bulletin run on 20M prior to the FMT, by the time the test rolled around propagation went away and we heard no sign of the station on either 20M or 15M, so I don't have a report for those bands.

We ran what was probably the world's first (only?) Multi-Multi FMT this year. Both Daun, N8ASB and Mike, WB8GXB (who are providing their reports to you separately) came to my house for the test, setting up their own gear but using the same reference oscillator and antenna as me. In addition to Daun and Mike, another four or five of the local gang stopped by to witness the goings on.

We even had a "rover" station – Tom, N8ZM, was hoping to join us but ended up driving home from a business meeting at FMT time. Since he carries a spectrum analyzer around with him for a living, he pulled over to the side of the road, fired up the analyzer (using an inverter plugged into the car cigarette lighter) and tried to tune in W1AW. Unfortunately, his noise level was so high he couldn't hear the station at all.

I used the same measurement technique this year as in 2002, but with somewhat different equipment. A surplus HP 3586C selective voltmeter served as both the receiver and, by using its built-in tracking generator, the reference or marker generator. I tuned in W1AW using the 3586C's 400Hz filter, and then injected the tracking generator through an attenuator and splitter. I adjusted the frequency so there was a small (less than 50Hz) offset between the two signals, and fed the audio into a sound card for further processing.

Using the "Baudline" (<http://www.baudline.com>) Linux-based spectrum analysis software, I was able to measure the difference between the W1AW signal and the reference with a resolution of ~0.015Hz. Thanks to improvements in Baudline, that's almost an order of magnitude better than I was able to get using the same software last year. Subtracting the delta frequency from the reference generator frequency yielded

W1AW's frequency – I hope!!!

The antenna used this year was the same Gap vertical as last year; I hope to get a wire antenna up one of these days which may result in better signals from W1AW here in Ohio. The frequency reference that drove all the gear was an HP 5065A Rubidium standard with a 12 channel distribution amplifier. I had been monitoring the 5065A with a Loran-C monitor for a couple of months and consequently knew the frequency offset to be less than 1×10^{-12} .

We had great fun with the FMT this year, and look forward to doing it again in 2004!

73,

John Ackermann N8UR
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