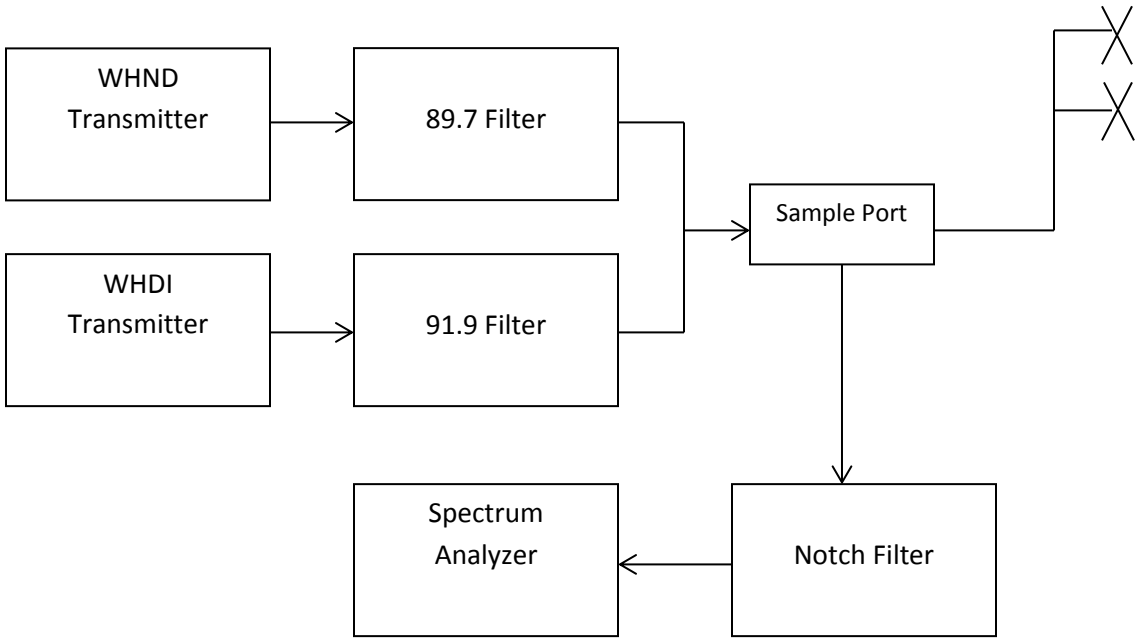
WHDI 91.9mHz
WHND 89.7mHz
Spectrum Measurements

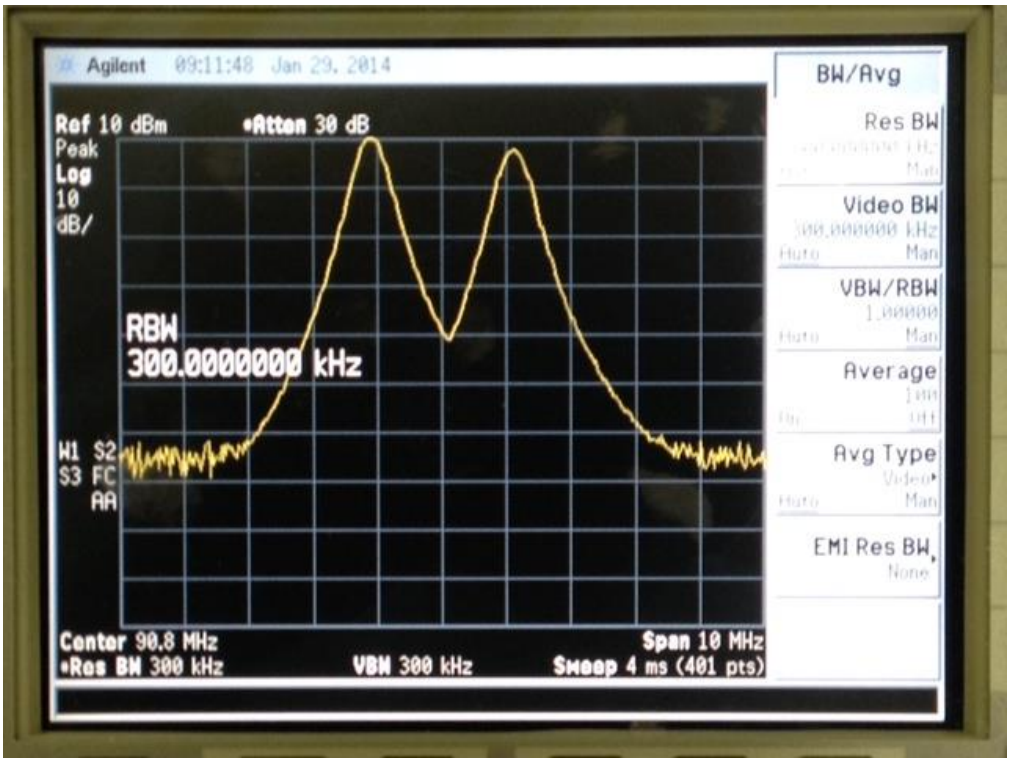
On January 29, 2014, a series of measurements were made on radio station WHDI (fac. ID 83611), 91.9mHz, Sister Bay, WI, and radio station WHND (fac. ID 83612), 89.7mHz, Sister Bay, WI, for the purpose of documenting compliance with Special Operating Condition #1 as specified on the WHDI construction permit (file no. BMPED-20130614AAE), and Special Operating Condition #3 as specified on the WHND construction permit (file no. BMPED-20130702ABQ) and Special Operating Condition #2, as subsequently specified on WHND construction permit (file no. BPED-20140523ACI). The results of these measurements are in this report.

A two-channel combiner consisting of a filter for WHDI (Shively 2606-3A) and a filter for WHND (Shively 2516-3A) is used to combine WHND and WHDI into a single antenna (Shively 6810BB-6D-CF). The sketch below details the transmitter, combiner, antenna, and test equipment configuration used for these measurements:

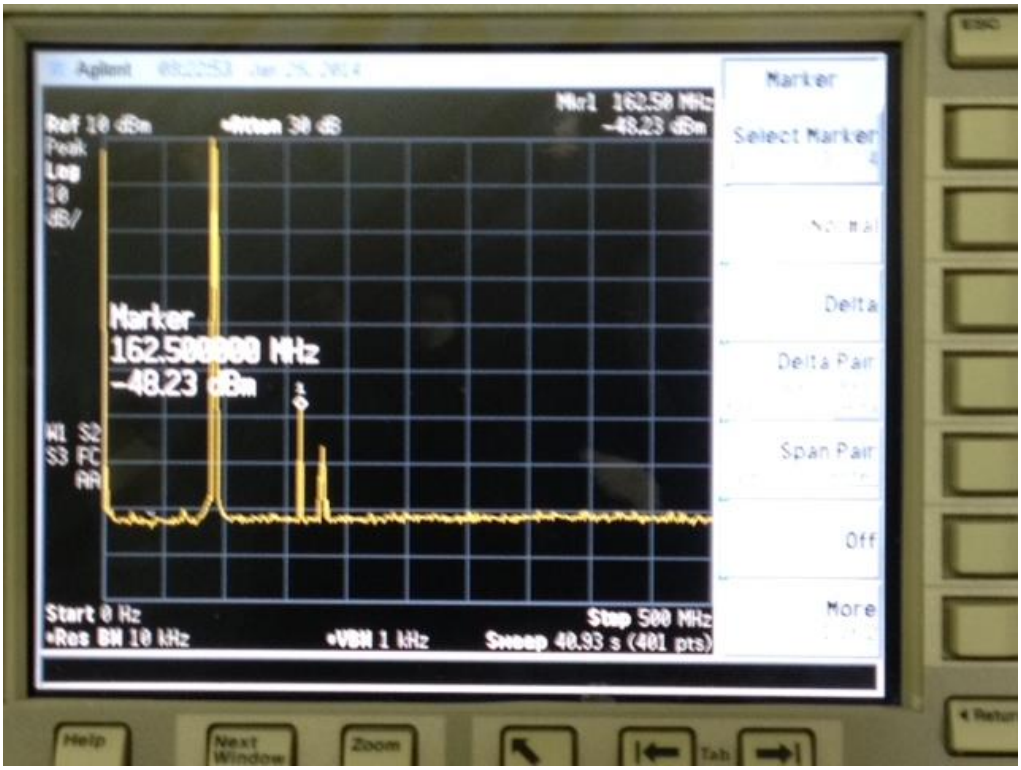


Spectrum Analyzer: Agilent 4402B, serial number MY45113663

The results of the measurements show no spurious emissions in the range of 50 mHz to 450mHz. The measurements began with adjustment of the spectrum analyzer for a span of 10mHz and a bandwidth of 300kHz, setting the higher-power WHND/89.7 carrier to a “0dB” reference level as detailed in the display shown below:

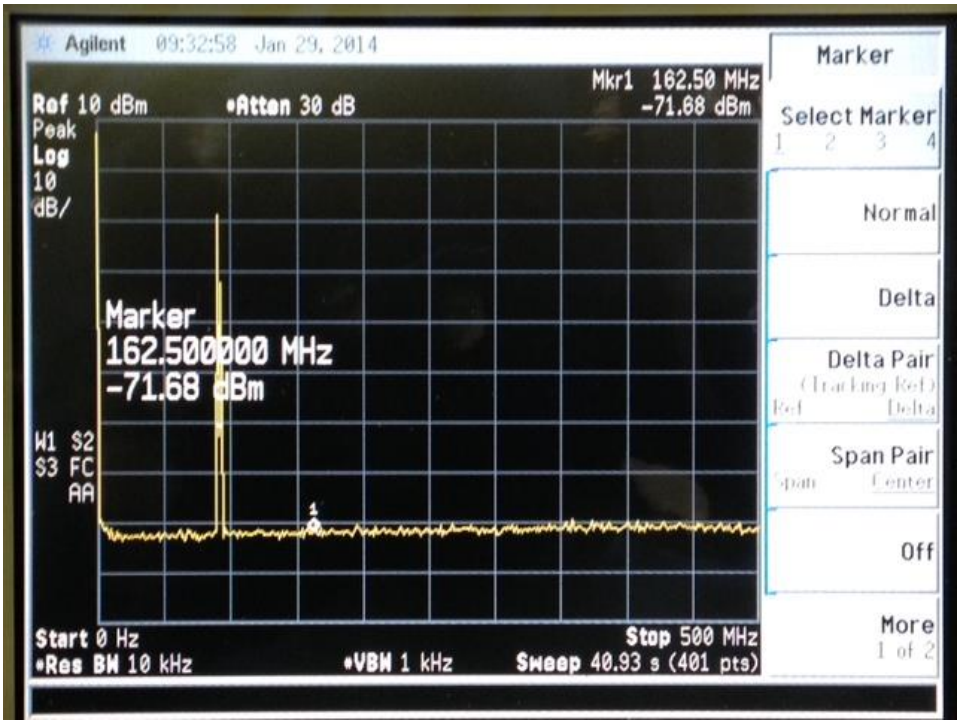


The image below was the first measurement made of the two stations, with the span adjusted to 0-500mHz. It was obvious that the analyzer's front-end was being overloaded by the input signals since a 10dB reduction in the input signals resulted in a greater than 10dB reduction in the spurious signals. Note that the marked signal is a co-located NOAA weather transmitter.

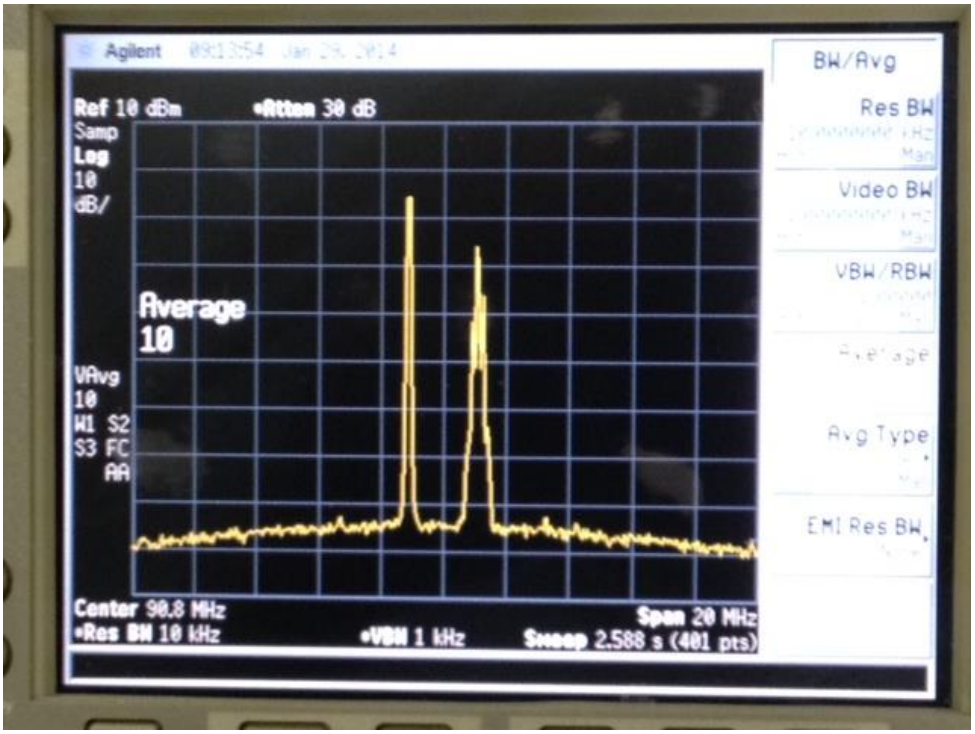


The image below was the result of the insertion of a tuned notch filter with an out-of-notch insertion loss of less than 1dB, and a 3dB bandwidth of approximately 3mHz. This filter reduced the amplitude of the fundamental signals on 89.7mHz and 91.9mHz sufficiently to eliminate the analyzer-induced spurious emissions, however the co-located NOAA weather transmitter signal remains, as indicated by the marker.

The next measurement (below) is identical to the measurement above, except the co-located NOAA weather transmitter has been turned off.



And finally, the measurement below was taken with a span of 20mHz, with the tuned trap installed, clearly demonstrating no measurable 2a-b signal at 87.5mHz, and no 2b-a signal at 94.1mHz.



As can be seen from the measurements, no spurious emissions exceed limits as specified in 73.317(b)-73.317(d).

Respectfully submitted by:

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6/25/2014