

# **KWKD Randolph, UT**

## **Spurious Emissions Report**

On the evening of July 22, 2003, we made equipment performance measurements for radio station KWKD Randolph, UT. These measurements were made as a condition of Construction Permit BMPH-20020214AAM.

KWKD is one of two stations sharing a master antenna system at the Humpy Peak transmitter site in the Uinta Mountains, south of Evanston, WY. The outputs of the two stations are combined using a constant impedance balanced bandpass filter combining system Model 2540 designed and fabricated by Shively Labs of Bridgeton, ME.

Measurements were made while both stations broadcast programming material typical to its daily operation. KWKD operates stereophonically and has no subsidiary communications services. Both stations were operating into the combined antenna system at the full permitted power during the measurements.

Section 73.317 (b) and (c) require that all signals between 120 and 240 kHz removed from the carrier be attenuated below the level of the carrier by at least 25 dB, all signals between 240 kHz and 600 kHz removed from the carrier be attenuated by at least 35 dB below the level of the carrier, and that all signals greater than 600 kHz removed from the carrier be attenuated by at least 80 dB below the level of the carrier.

Three sets of measurements were made to assure compliance with these requirements. The first measurement looked at the spectrum between -600 kHz and +600 kHz, relative to the carrier frequency, in order to assess the station's occupied bandwidth under modulation. The second measurement looked at the spectrum from -1 MHz to -600 kHz and +600 kHz to +1 MHz, relative to the carrier frequency, to look for near-in intermodulation products. The third measurement scanned the spectrum from 9 kHz to 1 GHz in order to detect any out-of-band intermodulation products or harmonics.

All measurements were taken with an IFR AN940 Spectrum Analyzer, serial number 1009, within current calibration. Unfortunately, we were not able to save plots of the analysis to a computer because of communications problems between the computer and the analyzer. As a result, we have included numerical data demonstrating compliance with the Commission's rules.

To measure the occupied bandwidth, the spectrum analyzer was set to 102.3 MHz center frequency, 200 kHz/div span, 3 kHz resolution bandwidth, 30 dB of attenuation, and 10 kHz video filtering. This results in a measurement noise floor of approximately -104 dBC. An unmodulated carrier was used to establish the reference point at the top of the screen. The analyzer was, then, placed in peak hold mode and modulation was once again applied. After 10 minutes of data collection, the following data was collected:

KWKD Carrier Frequency = 102.3 MHz

<b>FREQUENCY</b>	<b>SIGNAL</b>	<b>DIFFERENCE</b>	<b>REQUIRED</b>	<b>PASS?</b>
Carrier +0 kHz	-23 dBC	0 dB down	n/a	yes
Carrier -120 kHz	-54 dBC	31 dB down	25 dB down	yes
Carrier +120 kHz	-53 dBC	30 dB down	25 dB down	yes
Carrier -240 kHz	-81 dBC	58 dB down	35 dB down	yes
Carrier +240 kHz	-83 dBC	60 dB down	35 dB down	yes
Carrier -600 kHz	-104 dBC	81 dB down	80 dB down	yes
Carrier +600 kHz	-104 dBC	81 dB down	80 dB down	yes
Noise Floor:	-104 dBC	82 dB down	80 dB down	yes

It can be clearly seen from this data that the occupied bandwidth of KWKD lies well within the prescribed limits between -600 kHz and +600 kHz, relative to the carrier frequency.


To make the second set of measurements, the analyzer was once again placed in peak hold mode, data collected for ten minutes, and data from the resulting spectrum was examined. The signal that appeared 800 kHz above the KWKD carrier was identified as KKKI Oakley, UT, which is also part of the Humpy Peak antenna system. Other than this signal, there are no signals above the prescribed emissions limit.

To measure spurious signals and harmonics, the spectrum analyzer was set to 2 MHz/div span, 10 kHz resolution bandwidth, 30 dB of attenuation, and 30 kHz video filtering. The analyzer was initially set at 10 MHz center frequency and the incremented successively by 20 MHz to scan the spectrum from 9 kHz to 1 GHz. Any signals that were greater than -80 dBC were noted. Upon completion of the scan, each noted signal was compared to a list of known transmitters in the area and the analyzer was used to demodulate the signal. All of the signals noted were identified as being either the other station in the combined system or ingress from other known transmitters. No intermodulation products, spurious signals, or harmonics were found that could be attributed to the operation of KWKD.

In light of the above measurements, we believe that KWKD is in full compliance with the requirements of Section 73.317 (a-d).

This report was prepared by us, and is based on measurements made by us. To the best of our knowledge, all statements made herein are true and reflect the actual facts of the matter. Our qualifications are a matter of record with the Commission.

Respectfully submitted:

A handwritten signature in black ink that reads "Scot W. Mathews". The script is cursive and fluid.

Scot Mathews, Director of Engineering  
Simmons Media Group

A handwritten signature in black ink that reads "Kevin Terry". The script is cursive and fluid.

Kevin Terry, Director of Engineering  
Millcreek Broadcasting, LLC