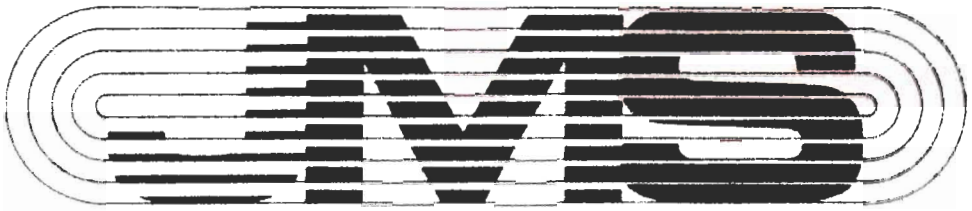

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Cincinnati, OH 45202

FM Performance and Emission Measurements Report

Translator W276DD 103.1 MHz
Covington, Kentucky
Facility ID 147546

December 2, 2016

PURPOSE

These measurements and report are in support of the Construction Permit requirements for new translator W276DD to verify FCC compliance when operated into a combiner and common antenna with existing translator W245AJ.

LOCATION

The site is located at 1906 Highland Avenue, Cincinnati, OH, and the common antenna is mounted on tower ASR #1019014. It should be noted that this multi-tenant tower site, and another only 1 km away, support numerous high power FM and TV stations which create challenges with these types of measurements. All possible steps were taken to ensure that the results were not adversely affected.

PROCEDURE

The equipment utilized for these measurements was a calibrated Anritsu MS2720T spectrum analyzer with FM mask, a Bird 4273 variable attenuator sample section, and Bird 43 wattmeter. An Eagle 210BFBF tuneable notch filter was inserted for harmonic measurements to reduce the fundamental level by approx 20 db to prevent overload of the spectrum analyzer mixer.

After the branch combiner was retuned by Shively and installed, the equipment was connected as shown in the attached diagram and both stations were operated at their proper TPO into the shared antenna. The following measurements were performed.

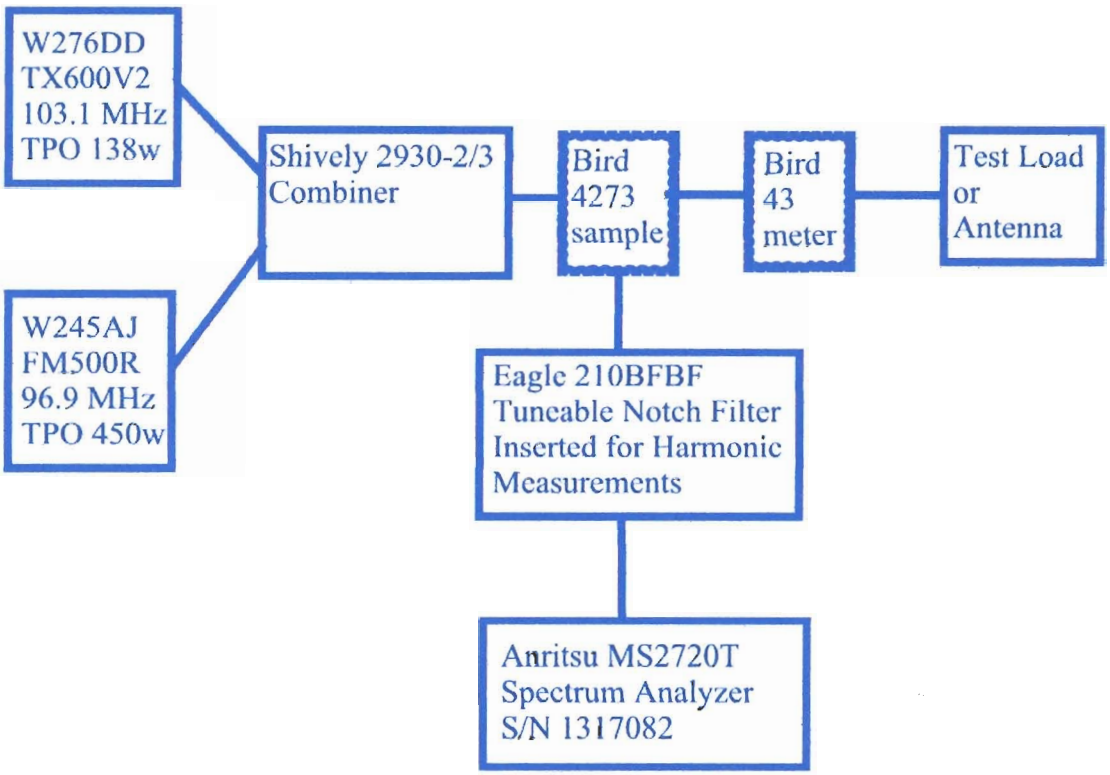
POWER CALIBRATION

The proper Transmitter Output Power (TPO) was calculated as follows:

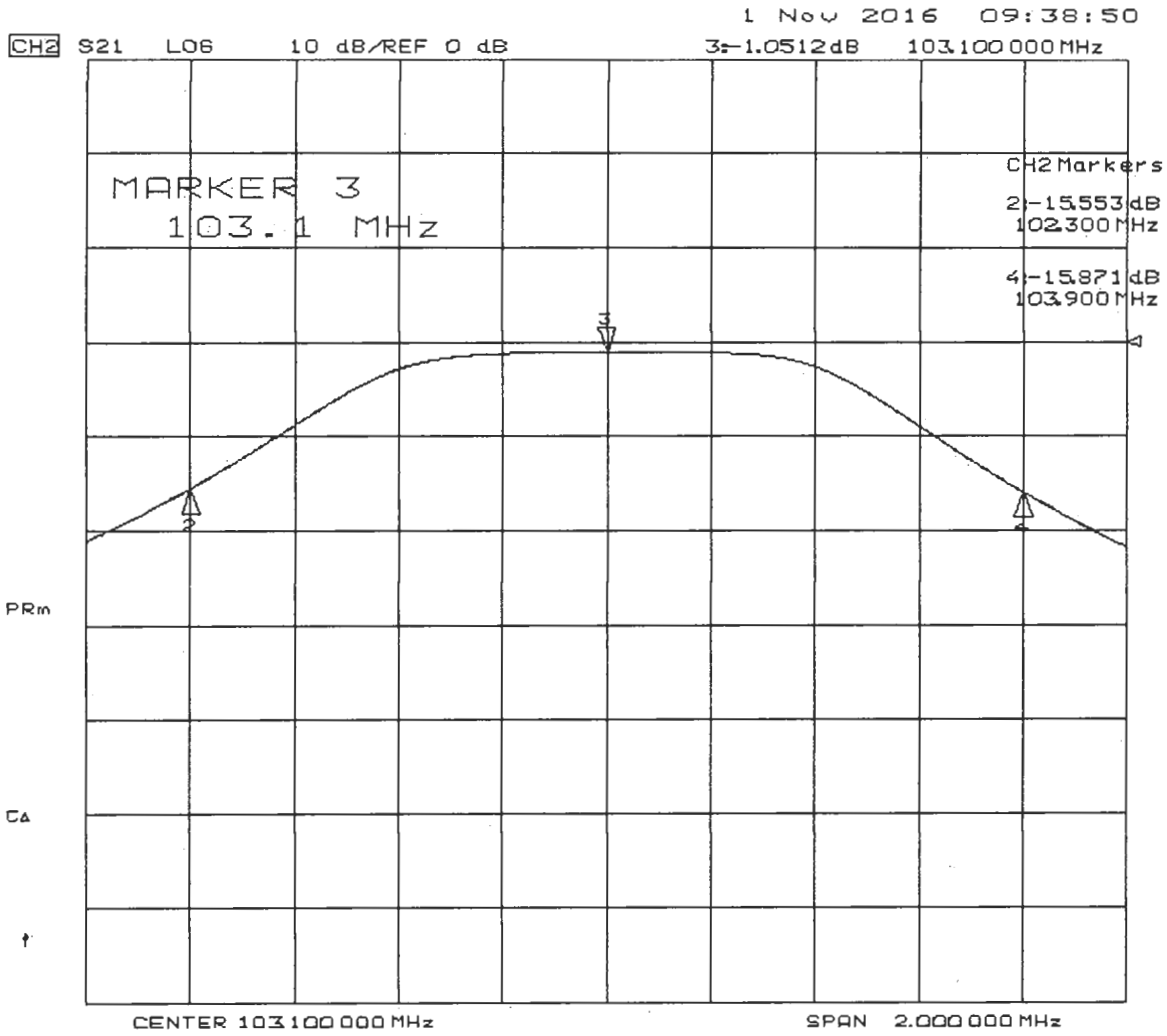
The CP #BMPFT-20160822AAC lists an **ERP of 0.075KW**
Scala lists the FMVMP-1 antenna gain at this frequency as **1.26 (1 dBd)**
The W245AJ feedline run is 726 ft of EC5-50
Feedline loss = **-2.612dB** at 103.1 MHz (**EFF 0.548**)
Shively test data (attached) lists **-1.0512 dB** insertion loss at 103.1 MHz
TPO = 138 watts

The type accepted BW Broadcast TX600V2 transmitter was set at 138 watts forward (zero reflected) and verified with a Bird 43 wattmeter

Test Equipment Configuration



33264
Retune 2930-2/3
2 station LP branched combiner
Insertion loss/isolation



47 CFR 73.317(b)(c)(d) Spurious Emissions Compliance

The requirements of 73.317 are:

(b) Any emission appearing on a frequency removed from the carrier by between 120 kHz and 240 kHz inclusive must be attenuated at least 25 dB below the level of the unmodulated carrier. Compliance with this requirement will be deemed to show the occupied bandwidth to be 240 kHz or less.

(c) Any emission appearing on a frequency removed from the carrier by more than 240 kHz and up to and including 600 kHz must be attenuated at least 35dB below the level of the unmodulated carrier.

d) Any emission appearing on a frequency removed from the carrier by more than 600 kHz must be attenuated at least 43 + 10 Log[10](Power, in watts) dB below the level of the unmodulated carrier, or 80 dB, whichever is the lesser attenuation

For W276DD that = 43 + 10 log(10) 138 watts = 43+10 (2.1398) = **64.4dB**

The spectrum immediately above and below the unmodulated carriers of both translators was examined to verify compliance with 47CFR 73.317(b)(c)(d) for spurious emissions ± 600 KHz

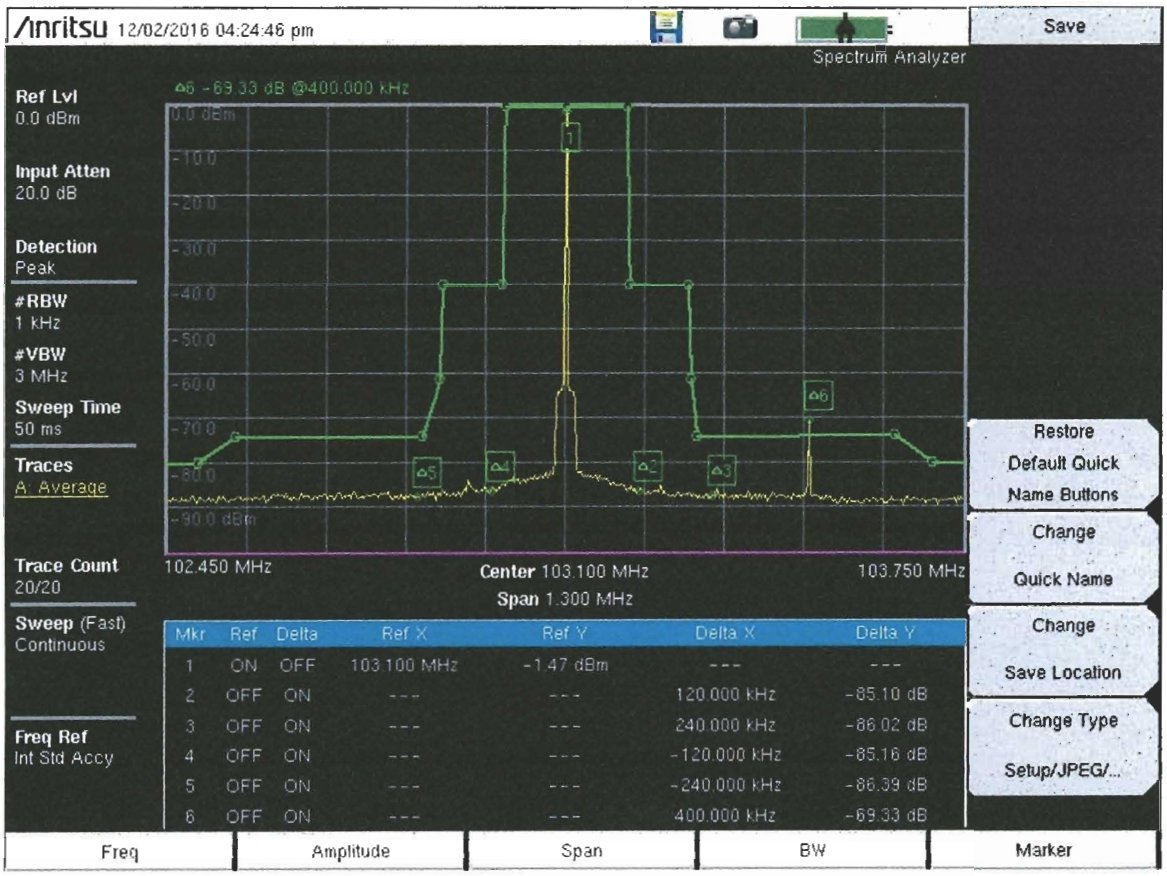
The Occupied Bandwidth of the modulated carrier was also measured and compared to the FM mask limits

The spectrum beyond ± 600 KHz was examined with particular attention to the intermodulation products of both carriers out to the 9th order to verify compliance of at least –64.4 dB

3rd order = 90.70 MHz and 109.3 MHz
5th order = 84.50 MHz and 115.50 MHz
7th order = 78.30 MHz and 121.70 MHz
9th order = 72.10 MHz and 127.90 MHz

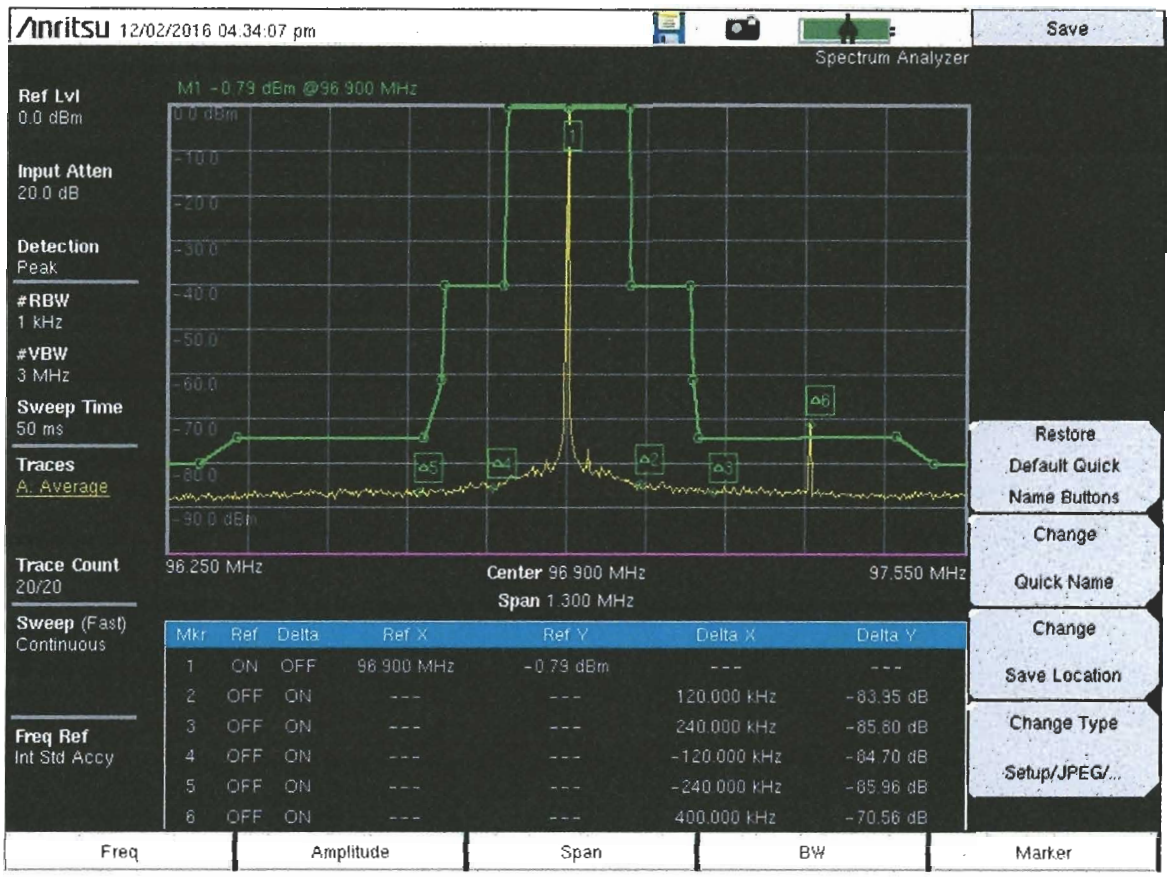
Finally the 2nd to 6th harmonics of W276DD were measured to verify compliance of at least –64.4 dB

W276DD 103.1 ± 120 KHz ± 240 KHz to ± 600 KHz



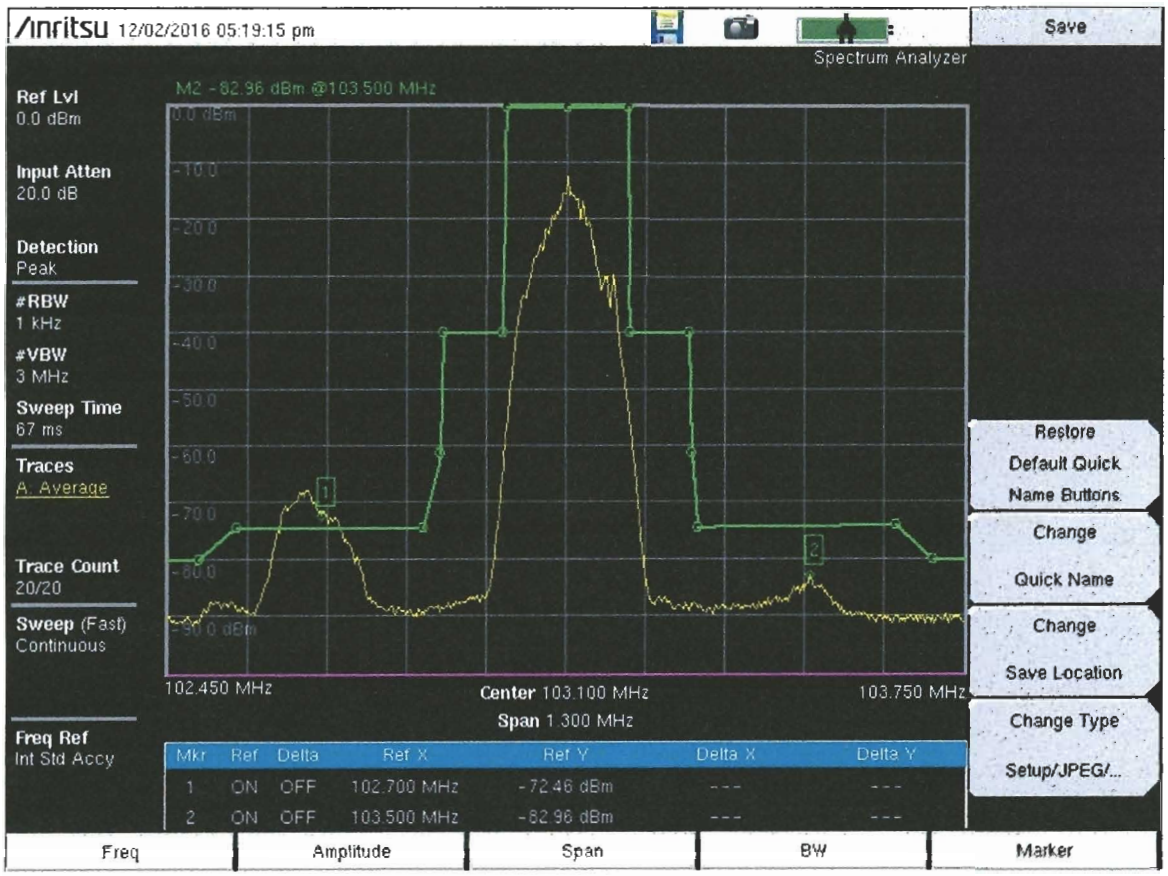
Note: The signal at + 400 KHz is from another signal at this site and NOT a product of the stations being measured

W245AJ 96.9 MHz ± 120 KHz ± 240 KHz and ± 600 KHz



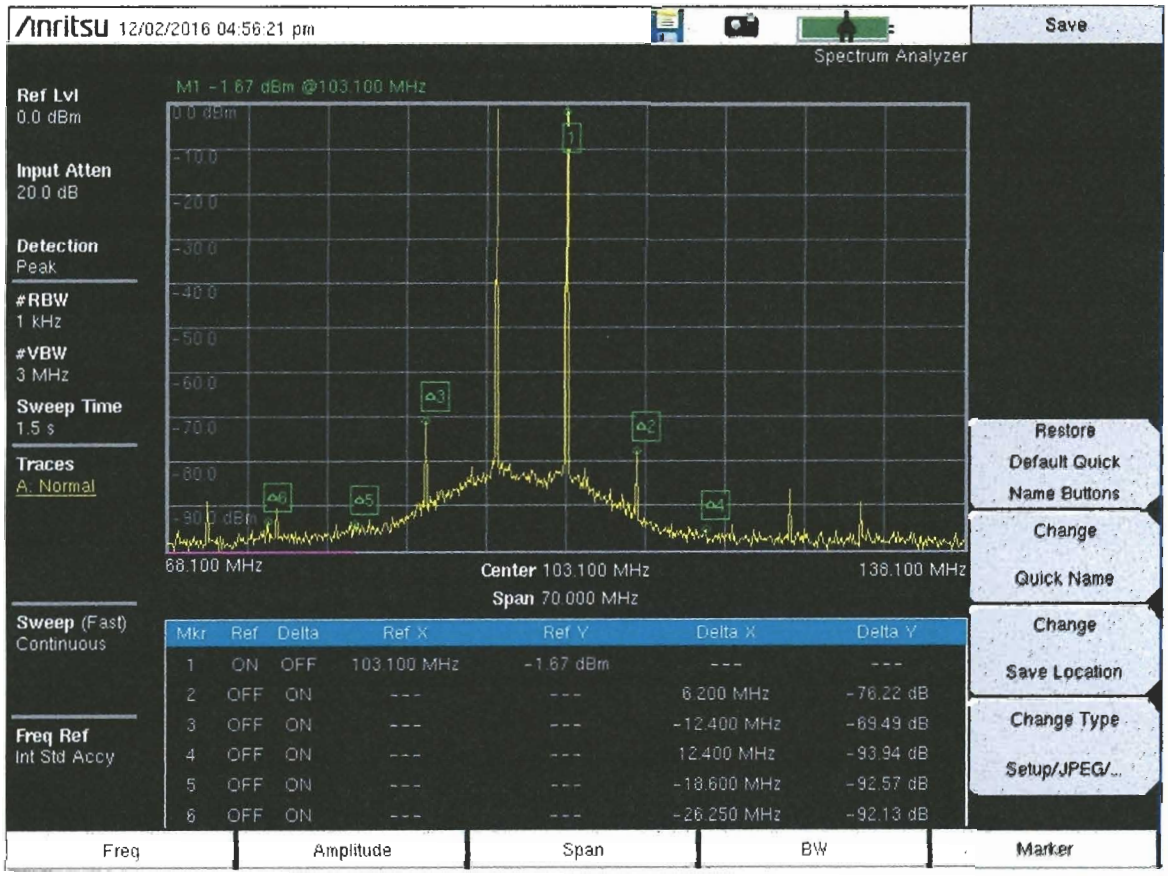
Note: The signal at + 400 KHz is from another signal at this site and NOT a product of the stations being measured

W276DD 103.1 Occupied Bandwidth - modulated carrier

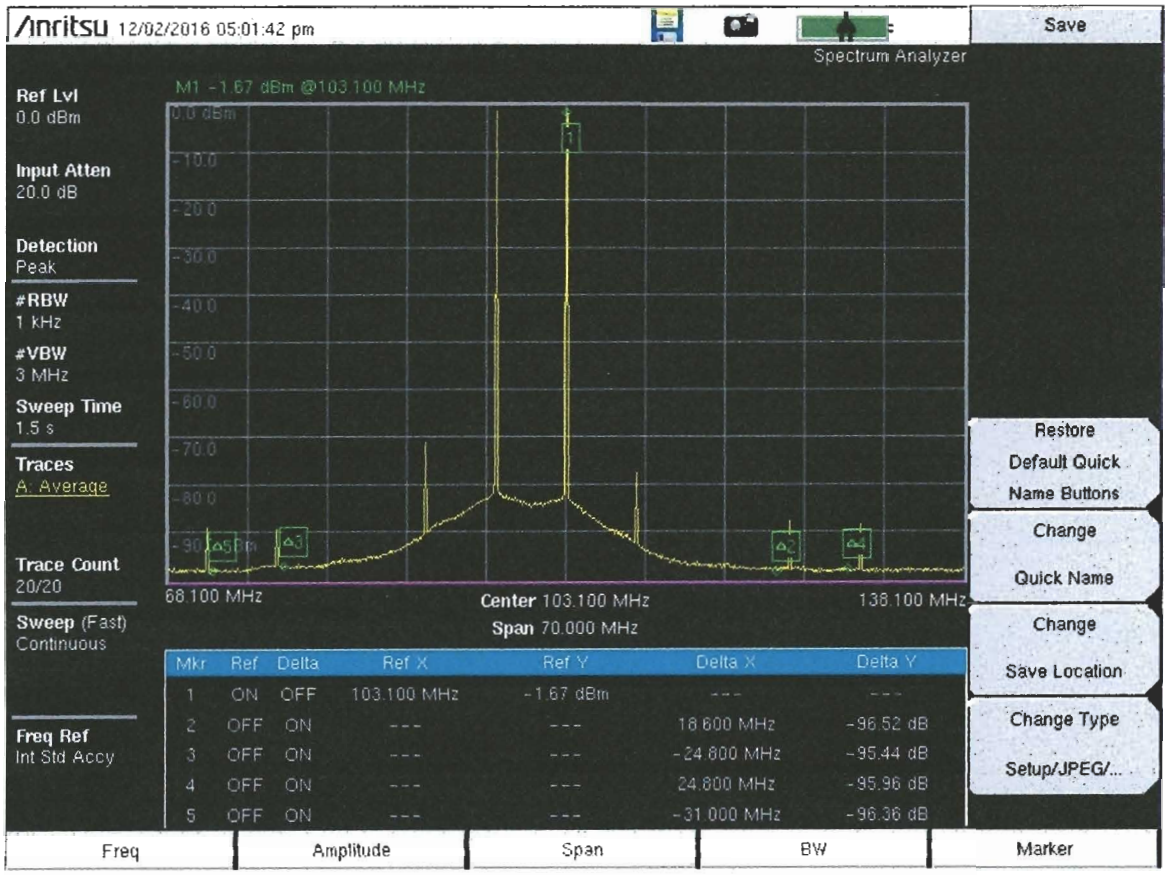


Note: The signals at 102.7 MHz and 103.5 MHz are from other nearby stations and NOT a product of the stations being measured

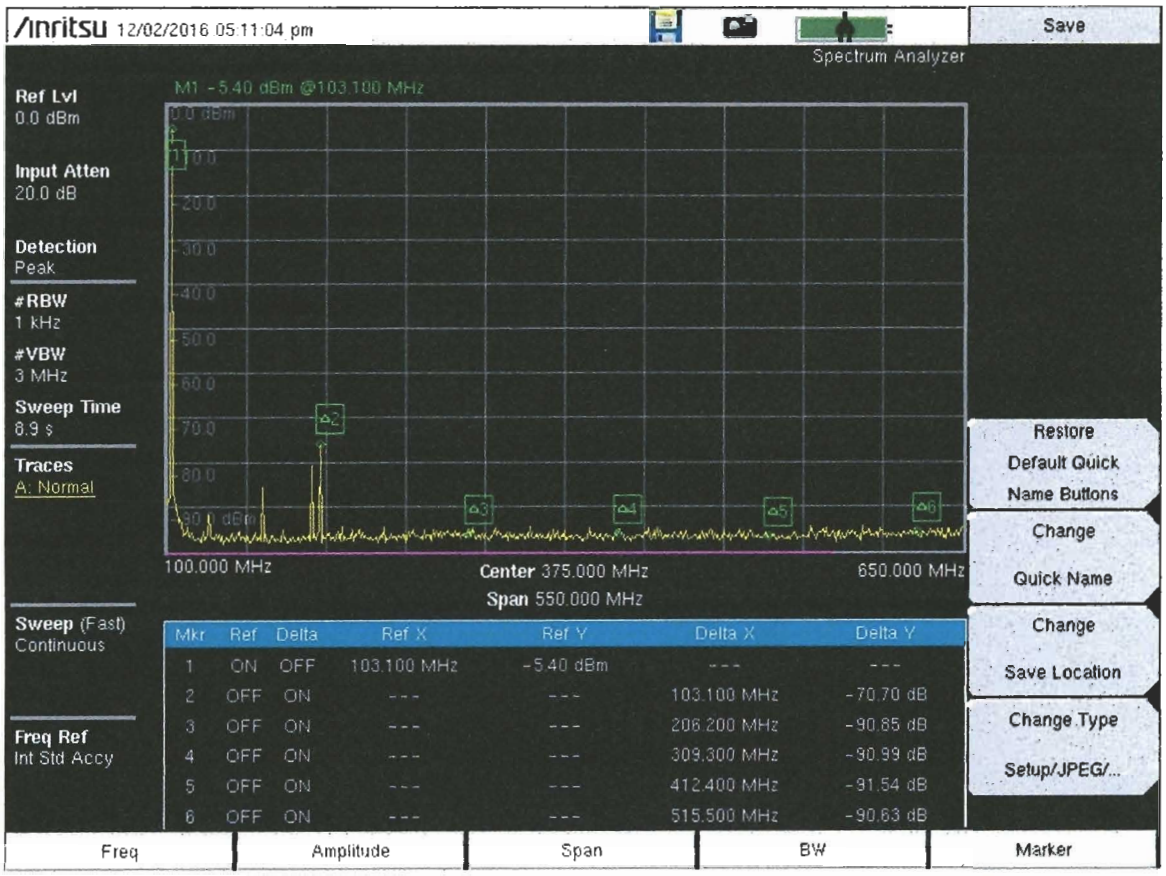
W276DD 103.1 Intermod Products – 3rd and 5th order



W276DD 103.1 Intermod Products – 7th and 9th order



W276DD 103.1 Harmonics – 2nd to 6th

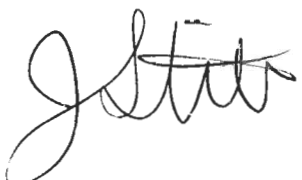


CONCLUSIONS

The emission measurements contained in this report indicate W276DD is in compliance with the requirements contained in 47 CFR 73.317 (b)(c)(d) and meet the stipulations contained in the FCC Construction Permit to qualify for Program Test Authority.

QUALIFICATIONS

The measurements contained in this report were made by myself or under my direct supervision. I have been engaged in broadcast engineering for over 40 years serving over 130 clients. I have designed and installed dozens of radio and TV transmission facilities and have the requisite knowledge and experience to conduct these measurements.



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