

# **TECHNICAL EXHIBIT**

**§73.317(b-d) COMPLIANCE**

**W275CP - 102.9 MHz  
Canton, NC**

**April 2018**

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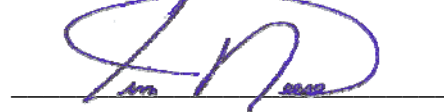
## ENGINEER'S CERTIFICATION

The data that comprises this report is based on field measurements made by Tim J. Neese, an officer of MultiTech Consulting, Inc., on the dates indicated in the report.

The report was prepared by the undersigned, whose qualifications are a matter of record before the Federal Communications Commission.

I declare under penalty of perjury that the contents of this report, with the exception of facts of which the Federal Communications Commission may take official notice, are true and accurate to the best of my knowledge and belief.

This the 30<sup>th</sup> day of April 2018.



Tim J. Neese, President  
MultiTech Consulting, Inc.

## DISCUSSION

To insure compliance with 47 C.F.R. §73.317(b-d), spurious emission measurements of di-plexed FM translator stations W275CP and W247BV, Canton, North Carolina and Asheville, North Carolina, respectively, were made.

W275CP operates on 102.9 MHz with an effective radiated power of 99 Watts, and is di-plexed with translator W247BV which operates on 97.3 MHz with an effective radiated power of 250 Watts. Both facilities utilize vertical-only polarization with directional radiation patterns. The master antenna is a single bay Scala CL-FM/V "Log Periodic" with a center of radiation 18 meters above ground level. Transmitters are combined and the antenna matched with a Kintronic Laboratories FMC2X300W2C star combiner.

All spectral data referenced herein was acquired using an Agilent Technologies model E4402B spectrum analyzer (SN: MY45105823), operated in accordance with the manufacturer's directions. The signal sample was acquired via a sample port with a directional coupler inserted between the combiner output and the antenna. The coupling coefficient(s) for frequencies between 1 MHz and 1000 MHz was provided by the coupler's manufacturer. In order to prevent analyzer overloading during the measurement of emissions removed from either carrier by more than 600 KHz, two filter arrangements were employed. For potential emissions below 150 MHz, notch filter networks tuned to the carrier frequencies were utilized. The filters provide an average 33 dB of attenuation at the carrier frequencies with a +/- 1 MHz bandwidth and pass all other frequencies between 1 MHz and 1000 MHz with no appreciable attenuation. For potential emissions above 150 MHz, a "high-pass" filter was utilized. The filter provides an average 35 dB of attenuation across the 88 to 108 MHz band and passes all frequencies above 110 MHz with no appreciable attenuation.

Utilizing manufacturer-provided insertion loss and antenna gain parameters, the output power of the W275CP and W247BV transmitters was adjusted to produce ERPs as specified within the construction permit and license, respectively. With both transmitters operating, measurements were made both with and without full FM modulation. Measurements were conducted on April 29, 2018 as a part of equipment commissioning and testing.

An analyzer screen capture demonstrating attenuation compliance for frequencies removed from W275CP's carrier by between 120 and 600 KHz with full FM modulation is attached as Exhibit 1.

In addition, high resolution measurements of computer-calculated harmonic products between the first and fifth order were made. All harmonic products were found to be greater than 75 dB below either station's carrier reference.

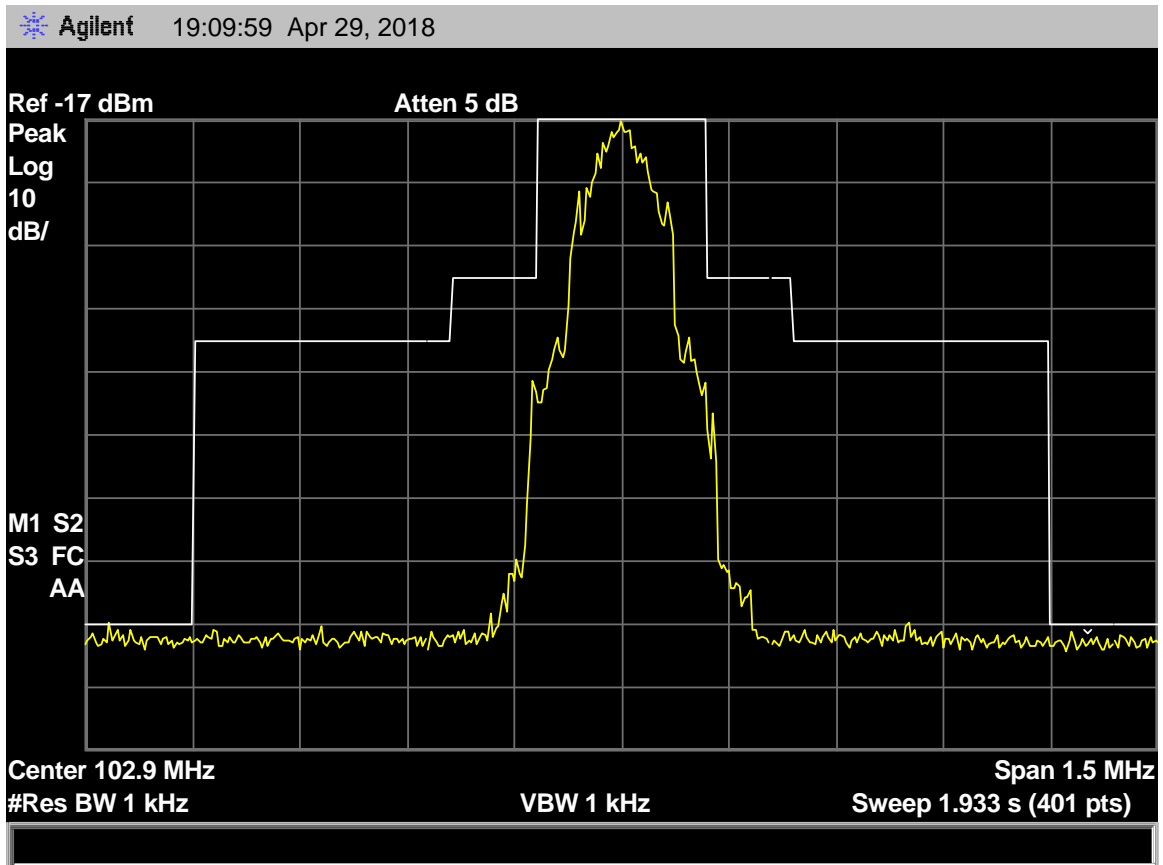
Attached as Exhibit 2 is a copy of the computer-calculated first through fifth order potential harmonic products, and the measured results for each.

All data indicates the proposed combined operation of W275CP and W247BV is in compliance with 47 C.F.R. §73.317(b-d).

# EXHIBIT 1

W275CP 102.9 MHz

Attenuation of frequencies removed from carrier by 120 to 600 KHz



## EXHIBIT 2

W275CP – 102.9 MHz & W247BV – 97.3 MHz

Tabulation of Potential Harmonic Products

Frequency MHz	Measured Level dBc
5.600	> -80
11.200	> -80
16.800	> -80
22.400	> -80
28.000	> -80
74.900	> -80
80.500	> -80
86.100	> -80
91.700	> -75
108.500	> -80
114.100	> -80
119.700	> -80
125.300	> -80
177.800	> -80
183.400	> -80
189.000	> -80
194.600	> -80
200.200	> -80
205.800	> -80
211.400	> -80
217.000	> -80
222.600	> -80
280.700	> -80
286.300	> -80
291.900	> -80
297.500	> -80
303.100	> -80
308.700	> -80
314.300	> -80

Frequency MHz	Measured Level dBc
319.900	> -80
383.600	> -80
389.200	> -80
394.800	> -80
400.400	> -80
406.000	> -80
411.600	> -80
417.200	> -80
486.500	> -80
492.100	> -80
497.700	> -80
503.300	> -80
508.900	> -80
514.500	> -80
589.400	> -80
595.000	> -80
600.600	> -80
606.200	> -80
611.800	> -80
692.300	> -80
697.900	> -80
703.500	> -80
709.100	> -80
795.200	> -80
800.800	> -80
806.400	> -80
898.100	> -80
903.700	> -80