

# **TECHNICAL EXHIBIT**

**§73.317(b-d) COMPLIANCE**

**W231DH - 94.1 MHz  
Gainesville, FL**

**October 2023**

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## ENGINEER'S CERTIFICATION

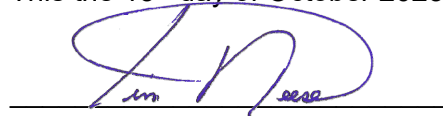
The data that comprises this report is based on field measurements made by Tim J. Neese, an officer of MultiTech Consulting, Inc., on the dates indicated in the report.

Where applicable, information from the FCC's secondary database and data on file was utilized. While believed accurate, errors or omissions in the database or file data and any damages resulting from such shall not be the liability of this firm.

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 13<sup>th</sup> day of October 2023.



Tim J. Neese, President  
MultiTech Consulting, Inc.

## DISCUSSION

To ensure compliance with 47 C.F.R. §73.317(b-d), spurious emission measurements of di-plexed FM translator stations W231DH and W242CS, Gainesville, FL were made.

Each station holds a construction permit and this study was conducted as a condition of licensing for each. In accordance with the construction permit, W231DH operates on 94.1 MHz with an effective radiated power of 250 Watts non-directional, and is di-plexed with translator W242CS which operates on 96.3 MHz with an effective radiated power of 175 Watts non-directional. The master antenna is a Nicom BKG77-2/M with a center of radiation 76 meters above ground level. Transmitters are combined and the antenna matched with a Shively Labs 2930-3-06 (100459-G501) branched 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, notch filter networks tuned to the carrier frequencies were employed. The filters provide an average 30.0 dB of attenuation at the carrier frequencies and pass all other frequencies between 1 MHz and 1000 MHz with no appreciable attenuation.

Utilizing manufacturer-provided insertion loss and antenna gain parameters, the output power of the W231DH and W242CS transmitters was adjusted to produce ERPs as specified within their construction permits. With both transmitters operating, measurements were made both with and without full FM modulation. Measurements were conducted on October 13, 2023 as a part of equipment commissioning and testing.

An analyzer screen capture demonstrating attenuation compliance for frequencies removed from W231DH'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 1<sup>st</sup> and 5<sup>th</sup> order were made. All harmonic products were found to be greater than 82 dB below either station's carrier reference.

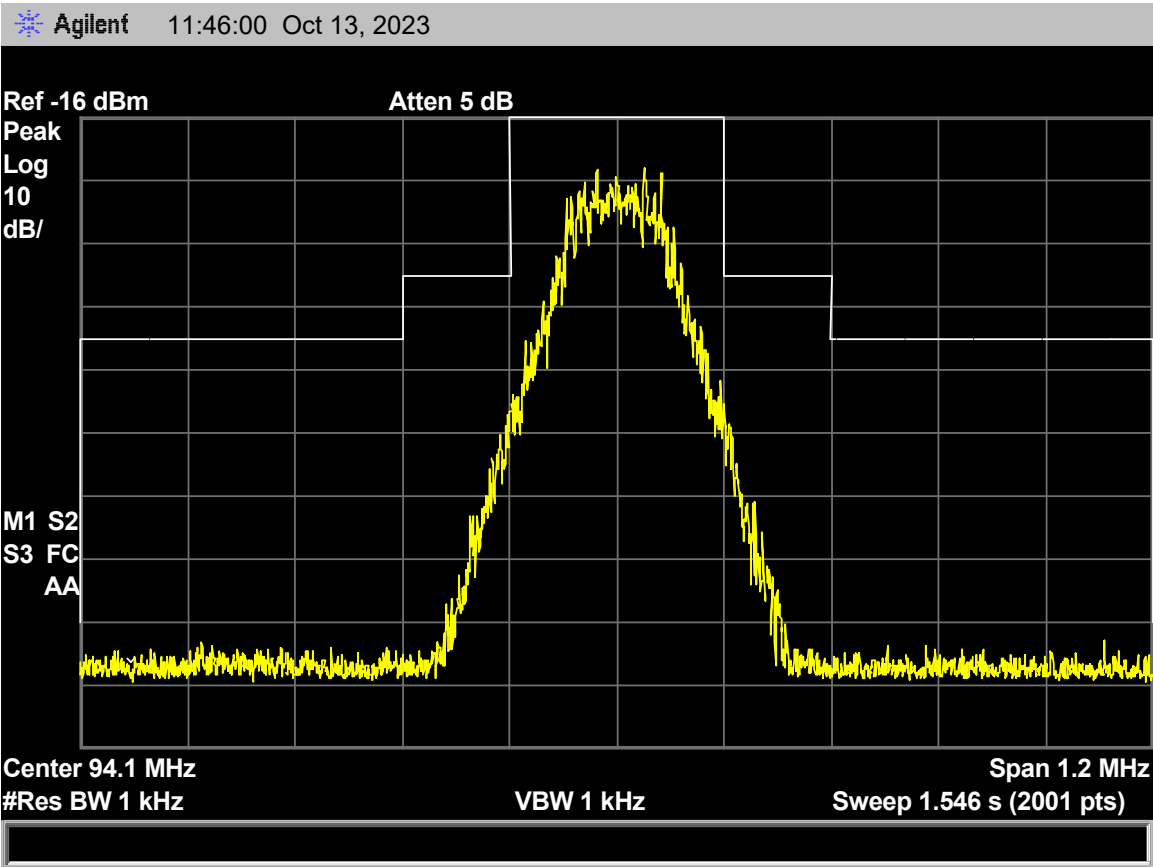
Attached as Exhibit 2 is a copy of the computer-calculated 1<sup>st</sup> through 5<sup>th</sup> order potential harmonic products, and the measured results for each.

All data indicates the proposed combined operation of W231DH and W242CS is in compliance with 47 C.F.R. §73.317(b-d).

EXHIBIT 1

W231DH 94.1 MHz

Attenuation of frequencies removed from carrier by between 120 and 600 KHz



## EXHIBIT 2

W231DH – 94.1 MHz & W242CS – 96.3 MHz

Tabulation of Potential Harmonic Products

Frequency MHz	Measured Level dBc
2.200	> -85
4.400	> -85
6.600	> -85
8.800	> -85
11.000	> -85
85.300	> -85
87.500	> -85
89.700	> -85
91.900	> -82
98.500	> -82
100.700	> -85
102.900	> -85
105.100	> -85
181.600	> -85
183.800	> -85
186.000	> -85
188.200	> -85
190.400	> -85
192.600	> -85
194.800	> -85

Frequency MHz	Measured Level dBc
197.000	> -85
199.200	> -85
277.900	> -85
280.100	> -85
282.300	> -85
284.500	> -85
286.700	> -85
288.900	> -85
291.100	> -82
293.300	> -85
374.200	> -85
376.400	> -85
378.600	> -85
380.800	> -85
383.000	> -85
385.200	> -85
387.400	> -85
470.500	> -85
472.700	> -85
474.900	> -85

Frequency MHz	Measured Level dBc
477.100	> -85
479.300	> -85
481.500	> -85
566.800	> -85
569.000	> -85
571.200	> -85
573.400	> -85
575.600	> -85
663.100	> -85
665.300	> -85
667.500	> -85
669.700	> -85
759.400	> -85
761.600	> -85
763.800	> -85
855.700	> -85
857.900	> -85
952.000	> -85