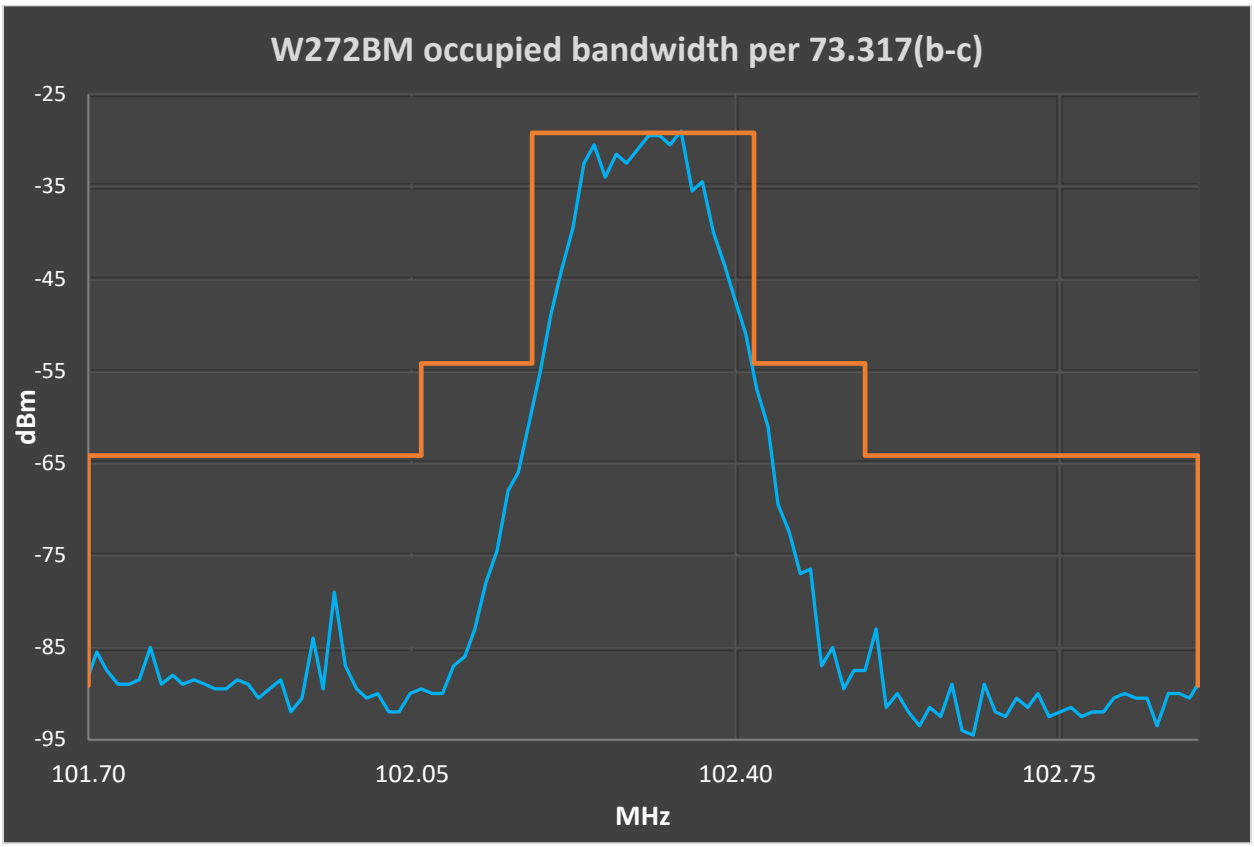
Special Operating Condition

Compliance with the spurious emissions requirements of
47 C.F.R. Sections 73.317(b) through 73.317(d)

W272BM shares an antenna with W213BQ, W278DD, and W300EF. Measurements were made with all stations simultaneously utilizing the shared antenna. A sample of all signals was derived from a calibrated -30 dB RF coupler (Connecticut Microwave Corp. model 450128) at the output (antenna side) of the combiner (Kintronic model FMC-4X1200W-V-RS). Additional inline attenuators (Mini-Circuits models BW-N6W5+, HAT-30+, and HAT-20+) provided an additional 56 dB of attenuation to avoid overload per the specifications of the spectrum analyzer. Shielded RG58A/U and double-shielded LMR-240 coaxial cables connected the final attenuator to an RF Explorer WSUB1G PLUS spectrum analyzer.

For occupied bandwidth measurement per 73.317(b & c), the spectrum analyzer was placed in the peak hold mode. The measured unmodulated carrier level of W272BM of -29.2 dBm was used as the reference level. As shown in the figure below, emissions appearing on frequencies removed from the carrier frequency by between 120 kHz and 240 kHz were attenuated by at least 25 dB below the unmodulated carrier level indicating that the occupied bandwidth of the transmitter is 240 kHz or less and emissions appearing on frequencies removed from the carrier frequency by between 240 kHz and 600 kHz were attenuated by at least 35 dB.



Measurements were taken to verify compliance with 73.317(d) for potential intermodulation and harmonic frequency emissions and potential intermodulation products. For harmonic and spurious and intermodulation measurements, the measured unmodulated carrier level of W272BM was -31.5 dBm which was used as the reference level. With a transmitter power output of 1,355 watts, all harmonic, spurious and intermodulation products from the W272BM transmitter must be attenuated by 43 + 10(log 1355) = 74.3 dB (in this case, not to exceed an absolute maximum level of -105.8 dBm).

To minimize the possible generation of false spurious or intermodulation products inside the analyzer itself, four tuned notch cavity filters were placed in series between the final attenuator and the analyzer resulting in 20 dB attenuation of each of four the fundamental signals.

Because W272BM shares the antenna with W213BQ on 90.5 MHz, W278DD on 103.5 MHz, and W300EF on 107.9 MHz, the following frequencies for potential 3rd and 5th order intermodulation products were measured with the following results:

Frequency (MHz)	Absolute value (dBm)	Relative to carrier (dBc)	Required maximum limit (dBc)
55.7	-113.0	-81.5	-74.3
64.5	-113.0	-81.5	-74.3
66.9	-113.0	-81.5	-74.3
73.1	-113.0	-81.5	-74.3
77.5	-113.0	-81.5	-74.3
78.7	-113.0	-81.5	-74.3
84.9	-111.2	-79.7	-74.3
86.1	-111.5	-80.0	-74.3
89.3	-108.7	-77.2	-74.3
91.1	-113.0	-81.5	-74.3
91.7	-112.5	-81.0	-74.3
94.7	-112.2	-80.7	-74.3
94.9	-111.1	-79.6	-74.3
96.1	-107.9	-76.4	-74.3
96.7	-108.0	-76.5	-74.3
97.9	-109.0	-77.5	-74.3
99.1	-106.2	-74.7	-74.3
99.9	-107.4	-75.9	-74.3
101.1	-106.7	-75.2	-74.3
104.7	-106.1	-74.6	-74.3
105.9	-105.9	-74.4	-74.3
106.7	-108.1	-76.6	-74.3
109.1	-110.0	-78.5	-74.3
112.3	-112.5	-81.0	-74.3

113.5	-112.5	-81.0	-74.3
114.1	-111.6	-80.1	-74.3
115.3	-111.5	-80.0	-74.3
116.5	-112.5	-81.0	-74.3
116.7	-112.5	-81.0	-74.3
119.1	-112.5	-81.0	-74.3
119.7	-112.5	-81.0	-74.3
120.9	-112.5	-81.0	-74.3
125.3	-113.5	-82.0	-74.3
125.9	-113.5	-82.0	-74.3
129.5	-113.5	-82.0	-74.3
142.7	-112.5	-81.0	-74.3

Harmonics were measured from the 2nd to the 9th. For these measurements, a high-pass Mini-Circuits model BHP-175+ filter was placed in-line to attenuate frequencies below 160 MHz to prevent analyzer-induced harmonic generation. All 2nd through 9th order harmonics were below -74.3 dBc referenced to the unmodulated W272BM carrier (-31.5 dBm reference):

Frequency (MHz)	**Absolute value (dBm)**	**Relative to carrier (dBc)**	**Required maximum limit (dBc)**
204.6	-106.5	-75.0	-74.3
306.9	-107.5	-76.0	-74.3
409.2	-109.5	-78.0	-74.3
511.5	-107.5	-76.0	-74.3
613.8	-108.5	-77.0	-74.3
716.1	-108.5	-77.0	-74.3
818.4	-109.0	-77.5	-74.3
920.7	-107.5	-76.0	-74.3

Since all measurements were below -74.3 dBc, W272BM complies with the requirements of Rule 73.317(d). Therefore, no spurious emissions were observed due to the addition of the W272BM carrier to the shared antenna and the Special Operating Condition is met.