



**Occupied Bandwidth and  
Spurious Emissions Measurements  
To Demonstrate Compliance with  
Section 73.317(b) through 73.317(d) of the  
FCC Rules and Regulations**

**Citicasters Licenses, Inc.  
WMTX(FM) – 100.7 MHz  
Tampa, FL (Facility ID No: 23078)  
WFLZ-FM – 93.3 MHz  
Tampa, FL (Facility ID No: 29732)  
WFUS(FM) – 103.5 MHz  
Gulfport, FL (Facility ID No: 63984)**

**November 16, 2012**

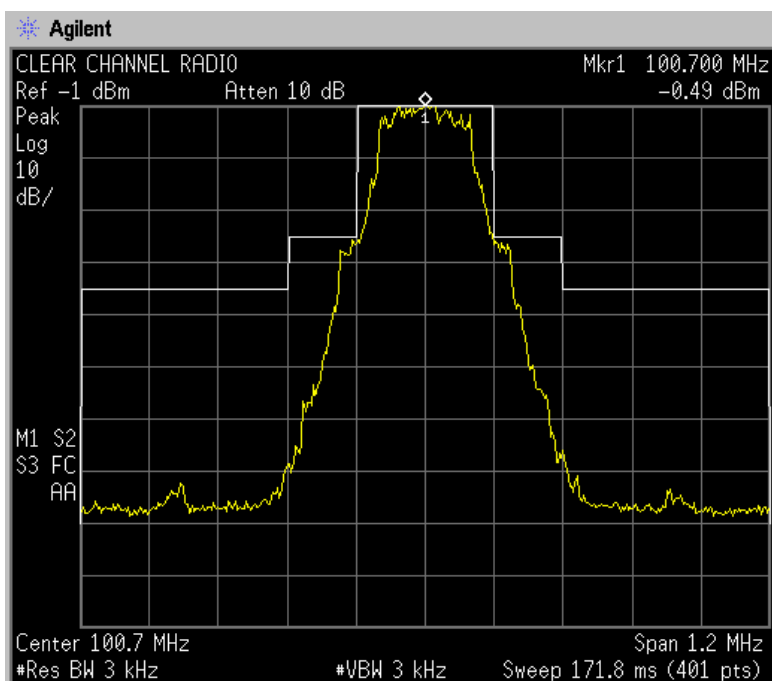
## **Occupied Bandwidth and Spurious Emissions Measurements**

Measurements were conducted to demonstrate that WMTX(FM), Tampa, FL, WFLZ-FM, Tampa, FL and WFUS(FM), Gulfport, FL operating into a combined auxiliary antenna system, comply with section 73.317(b) through 73.317(d) of the FCC Rules and Regulations as specified in “Special operating conditions or restrictions” 1 of the WMTX(FM) construction permit BXPB-20110216AAR and “Special operating conditions or restrictions” 2 of the WFLZ-FM and WFUS(FM) construction permits BXPB-20110216AAN and BXPB-20110216AAS . Randall L. Mullinax conducted the measurements on November 16, 2012, with all stations simultaneously utilizing the shared antenna. The spectrum analyzer used for the measurements was an Agilent Technologies model E4402B, S/N MY41441731. A sample of the WMTX(FM), WFLZ-FM and WFUS(FM) signals was derived from the auxiliary transmission line at the output of the combiner and was coupled to the analyzer using a short length of RG-223 50Ω double-shielded coaxial cable. Two 6 dB pads (Bird model 5-A-MFN-06 or equivalent) were inserted ahead of the analyzer to avoid overload and to provide isolation.

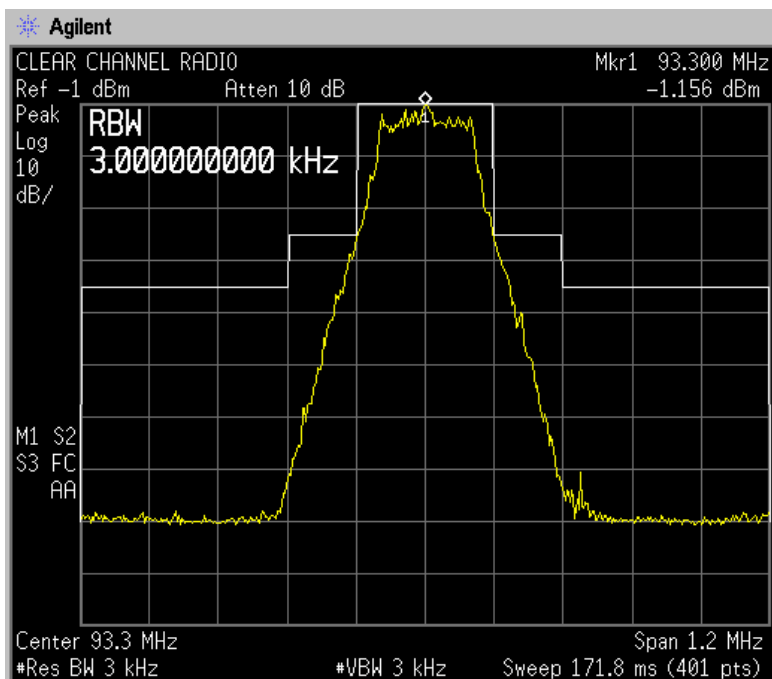
The measured unmodulated carrier level of all three stations was -1 dBm which was used as the reference for all harmonic, spurious and intermodulation measurements. All measurements were conducted with the transmitters and associated equipment adjusted as used in normal program operation.

For all occupied bandwidth measurements, the spectrum analyzer was placed in the peak hold mode for at least 10 minutes per measurement before the waveforms were observed. As shown in Figures 1, 2 and 3, all transmitters were observed to be in full compliance with section 73.317(b) of the FCC Rules with emissions appearing on frequencies removed from the carrier frequencies by between 120 kHz and 240 kHz attenuated by at least 25 dB below the unmodulated carrier level indicating the occupied bandwidth of each transmitter to be 240 kHz or less. All transmitters were also observed to be in full compliance with section 73.317(c) of the FCC Rules with emissions appearing on frequencies removed from the carrier frequencies by between 240 kHz and 600 kHz attenuated by at least 35 dB.

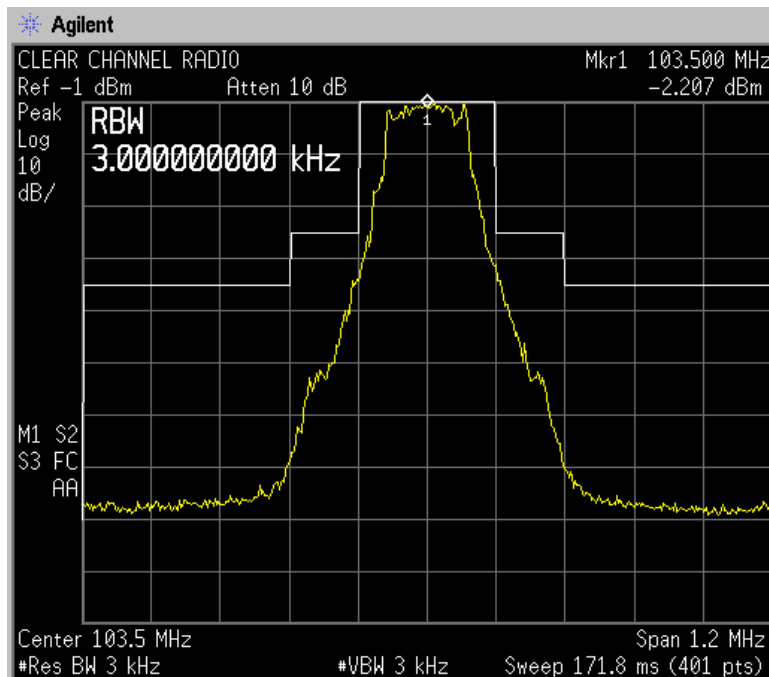
**Figure 1**  
**WMTX(FM)**



**Figure 2**  
**WFLZ-FM**



**Figure 3**  
**WFUS(FM)**



Extensive measurements were also conducted to insure that emissions appearing on frequencies removed from the carrier frequencies by more than 600 kHz were attenuated by at least 80 dB as required by section 73.317(d) of the FCC Rules. To facilitate these measurements, notch filters were placed between the two 6 dB pads so that the spectrum analyzer gain could be increased by up to 20 dB. The filters were necessary to avoid the possible generation of false spurious or intermodulation products in the analyzer. The attenuation of the notch filters was 39.5 dB at 100.7 MHz, 22.9 dB at 93.3 MHz and 48.2 dB at 103.5 MHz.

The most likely intermodulation frequencies in the range 2.5 MHz to 550 MHz that could be produced by the combined operation of WMTX(FM), WFLZ-FM and WFUS(FM) and harmonic frequencies through the 5<sup>th</sup> harmonic were calculated and the results of the measurements at these frequencies are listed in Table 1.


**Table 1**

Frequency A	103.5
Frequency B	100.7
Frequency C	93.3

DESCRIPTION	FREQ. MHZ	ATTENUATION DB	DESCRIPTION	FREQ. MHZ	ATTENUATION DB
A + B	204.2	>100	(2 X A) + (3 X C)	486.9	>100
A - B	2.8	>100	(2 X C) + (3 X A)	497.1	>100
A + (2 X B)	304.9	>100	(3 X A) - C	217.2	>100
B + (2 X A)	307.7	>100	3 X C	279.9	>100
A + (3 X B)	405.6	>100	(3 X C) - A	176.4	>100
B + (3 X A)	411.2	>100	(3 X A) - (2 X C)	123.9	>100
2 X A	207	>100	(3 X C) - (2 X A)	72.9	>100
(2 X A) - B	106.3	>100	(3 X A) - (3 X C)	30.6	>100
2 X B	201.4	>100	B + C	194	>100
(2 X B) - A	97.9	>100	B - C	7.4	>100
(2 X A) + (2 X B)	408.4	>100	B + (2 X C)	287.3	>100
(2 X A) - (2 X B)	5.6	>100	C + (2 X B)	294.7	>100
(2 X A) + (3 X B)	509.1	>100	B + (3 X C)	380.6	>100
(2 X B) + (3 X A)	511.9	>100	C + (3 X B)	395.4	>100
3 X A	310.5	>100	(2 X B) - C	108.1	>100
(3 X A) - B	209.8	>100	(2 X C) - B	85.9	>100
3 X B	302.1	>100	(2 X B) + (2 X C)	388	>100
(3 X B) - A	198.6	>100	(2 X B) - (2 X C)	14.8	>100
(3 X A) - (2 X B)	109.1	>100	(2 X B) + (3 X C)	481.3	>100
(3 X B) - (2 X A)	95.1	>100	(2 X C) + (3 X B)	488.7	>100
(3 X A) - (3 X B)	8.4	>100	(3 X B) - C	208.8	>100
A + C	196.8	>100	(3 X C) - B	179.2	>100
A - C	10.2	>100	(3 X B) - (2 X C)	115.5	>100
A + (2 X C)	290.1	>100	(3 X C) - (2 X B)	78.5	>100
C + (2 X A)	300.3	>100	(3 X B) - (3 X C)	22.2	>100
A + (3 X C)	383.4	>100	4 X A	414	>100
C + (3 X A)	403.8	>100	4 X B	402.8	>100
(2 X A) - C	113.7	>100	4 X C	373.2	>100
2 X C	186.6	>100	5 X A	517.5	>100
(2 X C) - A	83.1	>100	5 X B	503.5	>100
(2 X A) + (2 X C)	393.6	>100	5 X C	466.5	>100
(2 X A) - (2 X C)	20.4	>100			

While special attention was given to the “product” frequencies listed in Table 1, measurements were conducted covering the entire range of frequencies between 2.5 MHz and 550 MHz. Over this frequency range, no signals were detected at levels greater than -81 dBm (80 dB below the unmodulated carrier level which was -1 dBm).

The results of these measurements confirm that the combined operations of WMTX(FM), WFLZ-FM and WFUS(FM) into the shared auxiliary antenna are in full compliance with section 73.317(b) through 73.317(d) of the FCC Rules and Regulations.

  
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