



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

Clear Channel Broadcasting Licenses, Inc.

WMIA-FM – 93.9 MHz

Miami Beach, FL (Facility ID No: 51978)

WMGE(FM) – 94.9 MHz

Miami Beach, FL (Facility ID No: 51979)

WHYI-FM – 100.7 MHz

Fort Lauderdale, FL (Facility ID No: 41381)

WSHE-FM – 103.5 MHz

Fort Lauderdale, FL (Facility ID No: 67193)

WBGG-FM – 105.9 MHz

Fort Lauderdale, FL (Facility ID No: 11965)

December 12, 2012

Occupied Bandwidth and Spurious Emissions Measurements

Measurements were conducted to demonstrate that WMIA-FM, Miami Beach, FL, WMGE(FM), Miami Beach, FL, WHYI-FM, Fort Lauderdale, FL, WSHE-FM, Fort Lauderdale, FL and WBGG-FM, Fort Lauderdale, FL operating into a combined auxiliary antenna system, comply with section 73.317(b) through 73.317(d) of the FCC Rules and Regulations. Randall L. Mullinax conducted the measurements on December 12, 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 signals of all 5 stations 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. With the exception of the unmodulated carrier reference levels, for all measurements within the FM band an EMR Model FM6354/SB-2 bandpass filter between two 6 dB pads (Bird model 5-A-MFN-06 or equivalent) was utilized ahead of the analyzer to avoid overload and to provide isolation.

The measured unmodulated carrier level of all five stations was 0 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 through 5, 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
WMIA-FM

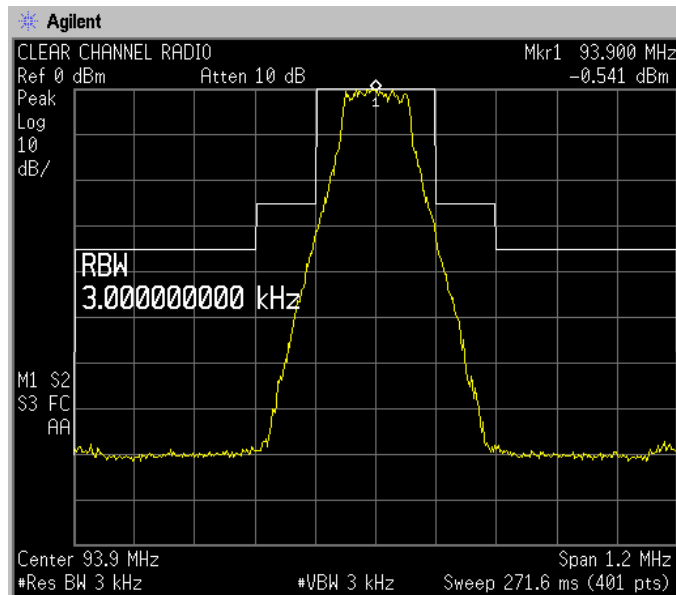


Figure 2
WMGE(FM)

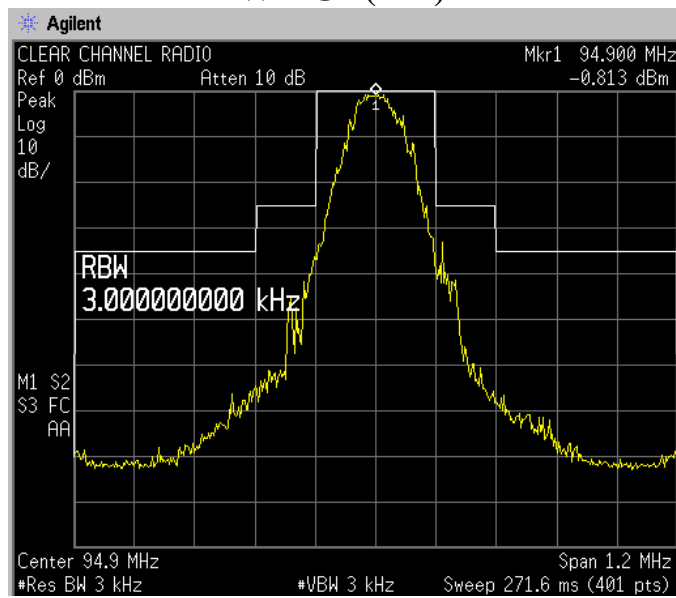


Figure 3
WHYI-FM

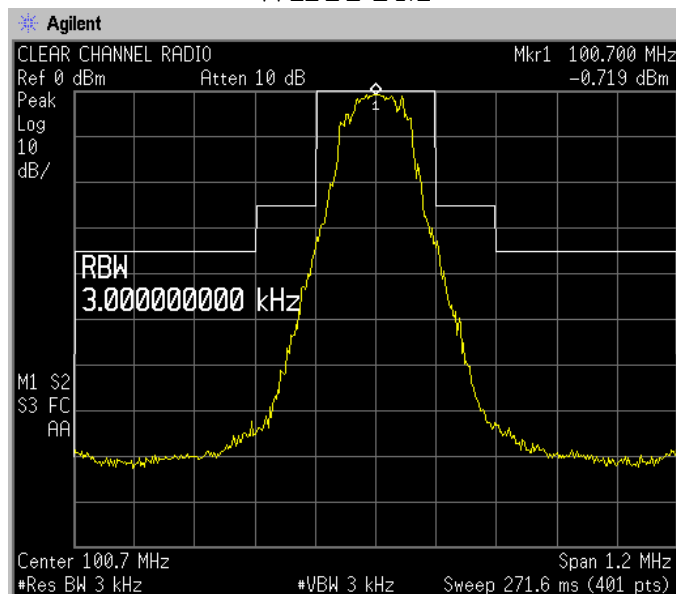


Figure 4
WSHE-FM

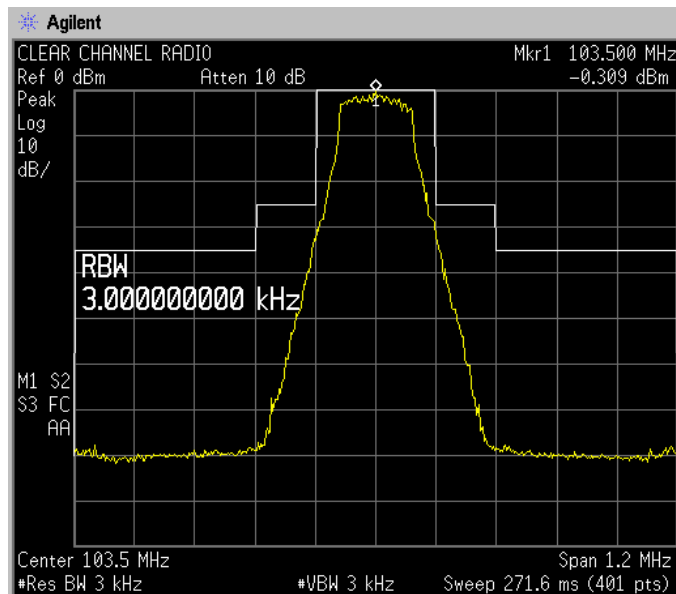
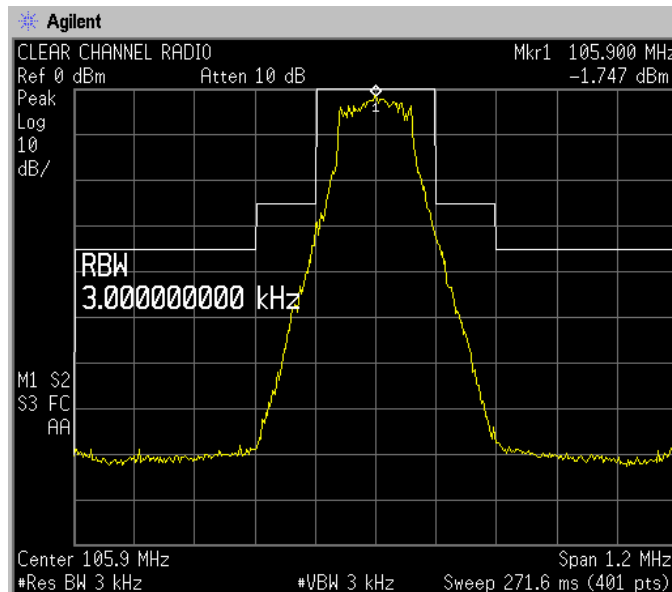


Figure 5
WBGG-FM



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. As previously stated, an EMR Model FM6354/SB-2 bandpass filter was utilized for measurements within the FM band (88-108 MHz) but for measurements outside the FM band, the bandpass filter was removed and a K&L Microwave Model 11N53-98/30-N/NP notch filter was inserted between the two 6 dB pads. This notch filter attenuates all frequencies within the FM band by 45 dB or greater to avoid the possible generation of false spurious or intermodulation products in the analyzer.

The most likely intermodulation frequencies through the 3rd order in the range 2.5 MHz to 500 MHz that could be produced by the combined operation of the five stations and harmonic frequencies were calculated and the results of the measurements at these frequencies are listed in Table 1. The internal tracking generator in the spectrum analyzer was used to tune the bandpass filter and to measure the insertion loss of the filters. The attenuation of each product was calculated using the formula below and is reported rounded to the nearest decibel in Table 1:

Reference Level (dBm) – Measured Product (dBm) – Filter Insertion Loss (dB) = Attenuation (dB)
Example: 0 dBm – (-95.9 dBm) – 1.6 dB = 94.3 dB (Rounds to 94 dB).

Table 1


Frequency A	105.9
Frequency B	103.5
Frequency C	100.7
Frequency D	94.9
Frequency E	93.9

DESCRIPTION	FREQ. MHZ	ATTENUATION DB	DESCRIPTION	FREQ. MHZ	ATTENUATION DB
A + B	209.4	>95	D+C-A	89.7	>95
A + (2 X B)	312.9	>95	A+C-D	111.7	>95
B + (2 X A)	315.3	>95	D+B+C	299.1	>95
2 X A	211.8	>95	D+B-C	97.7	>95
(2 X A) - B	108.3	>95	B+C-D	109.3	>95
2 X B	207	>95	D+C-B	92.1	>95
(2 X B) - A	101.1	90	A + E	199.8	>95
3 X A	317.7	>95	A - E	12	>95
3 X B	310.5	>95	A + (2 X E)	293.7	>95
A + C	206.6	>95	E + (2 X A)	305.7	>95
A - C	5.2	>95	(2 X A) - E	117.9	>95
A + (2 X C)	307.3	>95	2 X E	187.8	>95
C + (2 X A)	312.5	>95	(2 X E) - A	81.9	>95
(2 X A) - C	111.1	>95	3 X E	281.7	>95
2 X C	201.4	>95	B + C	204.2	>95
(2 X C) - A	95.5	>95	B - C	2.8	>95
3 X C	302.1	>95	B + (2 X C)	304.9	>95
A+B+C	310.1	>95	C + (2 X B)	307.7	>95
A+B-C	108.7	>95	(2 X B) - C	106.3	93
B+C-A	98.3	>95	(2 X C) - B	97.9	>95
A+C-B	103.1	93	B + D	198.4	>95
A + D	200.8	>95	B - D	8.6	>95
A - D	11	>95	B + (2 X D)	293.3	>95
A + (2 X D)	295.7	>95	D + (2 X B)	301.9	>95
D + (2 X A)	306.7	>95	(2 X B) - D	112.1	>95
(2 X A) - D	116.9	>95	(2 X D) - B	86.3	>95
2 X D	189.8	>95	B + E	197.4	93
(2 X D) - A	83.9	>95	B - E	9.6	>95
3 X D	284.7	>95	(2 X B) - E	113.1	>95
A+B+D	304.3	>95	(2 X E) - B	84.3	>95
A+B-D	114.5	>95	A+B+E	303.3	>95
B+D-A	92.5	>95	A+B-E	115.5	>95
A+D-B	97.3	94	B+E-A	91.5	>95
A+D+C	301.5	>95	A+E-B	96.3	>95
A+D-C	100.1	>95	A+E+C	300.5	>95

Table 1

DESCRIPTION	FREQ. MHZ	ATTENUATION DB	DESCRIPTION	FREQ. MHZ	ATTENUATION DB
A+E-C	99.1	90	A+E-D	104.9	>95
E+C-A	88.7	>95	B+D+E	292.3	>95
A+C-E	112.7	>95	B+D-E	104.5	>95
C + D	195.6	95	D+E-B	85.3	>95
C - D	5.8	>95	B+E-D	102.5	>95
C + (2 X D)	290.5	>95	C + E	194.6	94
D + (2 X C)	296.3	>95	C - E	6.8	>95
(2 X C) - D	106.5	>95	C + (2 X E)	288.5	>95
(2 X D) - C	89.1	>95	E + (2 X C)	295.3	>95
C+B+E	303.3	>95	(2 X C) - E	107.5	89
C+B-E	115.5	>95	(2 X E) - C	87.1	>95
B+E-C	91.5	>95	C+D+E	289.5	>95
C+E-B	96.3	>95	C+D-E	101.7	>95
A+D+E	294.7	>95	D+E-C	88.1	>95
A+D-E	106.9	>95	C+E-D	99.7	>95
D+E-A	82.9	>95			

The results of these measurements confirm that the combined operations of WMIA-FM, WMGE(FM), WHYI-FM, WSHE-FM and WBGG-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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