



# INNOVATIVE BROADCAST SERVICES

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

**To Demonstrate Compliance with  
Section 73.317(b) through 73.317(d) of the  
FCC Rules and Regulations**

**Chase Radio Properties, L.L.C.**

**WKNN-FM – 99.1 MHz**

**Pascagoula, MS**

**Facility ID: 61367**

**WMJY(FM) – 93.7 MHz**

**Biloxi, MS**

**Facility ID: 61368**

**February 20, 2002**

Measurements were conducted to demonstrate that WKNN-FM, Pascagoula, MS and WMJY (FM), Biloxi, MS operating into a combined antenna system as specified in Construction Permits BPH-20000428AAX and BPH-20000428AAW, comply with section 73.317(b) through 73.317(d) of the FCC Rules and Regulations. The measurements were conducted on February 20, 2002 by Olen A. Booth, chief engineer of Innovative Broadcast Services, with both stations simultaneously utilizing the shared antenna as specified in "Special operating conditions or restrictions 1" of both Construction Permits. The spectrum analyzer used for the measurements was an IFR model A-7550, S/N 3851. A sample of the WKNN-FM and WMJY (FM) signals was derived from the main transmission line at the output of the combiner and was coupled to the analyzer using a short length of RG-142 50Ω double-shielded coaxial cable. Two 6 dB pads (Bird model 5-A-MFN-06) were inserted ahead of the analyzer to avoid overload and to provide isolation.

The unmodulated carrier level of WKNN-FM was +15.5 dBm and the unmodulated carrier level of WMJY (FM) was +16 dBm. Since the WKNN-FM reference level was lower, it 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. Both 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. Both 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.

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 ahead of the spectrum analyzer 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 30 dB at 93.7 MHz and 26 dB at 99.1 MHz.

All harmonic and intermodulation frequencies in the range of frequencies between 5 MHz and 1000 MHz through the 3<sup>rd</sup> order that could be produced by the combined operation of WKNN-FM and WMJY (FM) were predicted with a computer program, the results of which are shown in Table 1.

TABLE 1

Frequency No. 1: 93.7  
 Frequency No. 2: 99.1

Maximum Order Of Products Checked: 3

#	Order	x	Freq.	Sum/Diff	Order	x	Freq.	=	Product
1.	1	x	93.7	+	1	x	99.1	=	192.8
2.	1	x	99.1	+	1	x	93.7	=	192.8
3.	1	x	99.1	-	1	x	93.7	=	5.4
4.	1	x	93.7	+	2	x	99.1	=	291.9
5.	1	x	93.7	+	2	x	93.7	=	385.5
6.	1	x	93.7	+	3	x	99.1	=	391
7.	1	x	99.1	+	2	x	93.7	=	390.3
8.	2	x	93.7	=				=	187.4
9.	2	x	93.7	+	1	x	99.1	=	385.5
10.	2	x	93.7	-	1	x	99.1	=	99.3
11.	2	x	99.1	=				=	190.3
12.	2	x	99.1	+	1	x	93.7	=	291.9
13.	2	x	99.1	-	1	x	93.7	=	104.5
14.	2	x	93.7	+	2	x	99.1	=	385.6
15.	2	x	93.7	+	2	x	93.7	=	385.6
16.	2	x	99.1	-	2	x	93.7	=	10.8
17.	2	x	93.7	+	3	x	99.1	=	484.7
18.	2	x	99.1	+	3	x	93.7	=	479.3
19.	3	x	93.7	=				=	281.1
20.	3	x	93.7	+	1	x	99.1	=	390.2
21.	3	x	93.7	-	1	x	99.1	=	182
22.	3	x	99.1	=				=	297.3
23.	3	x	99.1	+	1	x	93.7	=	391
24.	3	x	99.1	-	1	x	93.7	=	203.6
25.	3	x	93.7	+	3	x	99.1	=	479.3
26.	3	x	93.7	-	3	x	99.1	=	82.9
27.	3	x	99.1	+	2	x	93.7	=	404.7
28.	3	x	99.1	-	2	x	93.7	=	109.9
29.	3	x	93.7	+	3	x	99.1	=	578.4
30.	3	x	93.7	+	3	x	93.7	=	578.4
31.	3	x	99.1	-	3	x	93.7	=	15.3

# Order x Freq. Plus Order x Freq. Minus Order x Freq. = Product

No More Frequency Products Within Desired Range

While special attention was given to the "product" frequencies listed in Table 1, measurements were conducted covering the entire range of frequencies between 5 MHz and 800 MHz. The only signals detected at levels attenuated by less than 80 dB below the unmodulated carrier levels and appearing on frequencies removed from the WKNN-FM and WMJY (FM) carrier frequencies by more than 600 kHz were the carriers of nearby FM and television stations. In each case where these signals were observed to be at a level greater than -64.5 dBm (80 dB below the unmodulated carrier level of WKNN-FM which was +15.5 dBm) both the WKNN-FM and WMJY (FM) transmitters were turned off while the amplitude of the signal was observed to be unchanged, indicating

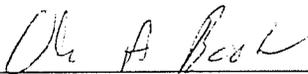
that the signal was not the result of the combined operation of WKNN-FM and WMJY (FM).

Results of the measurements at the specific frequencies where harmonic or intermodulation products were predicted to possibly occur are shown in Table 2.

TABLE 2

DESCRIPTION	FREQ. MHz	ATTENUATION dB	DESCRIPTION	FREQ. MHz	ATTENUATION dB
93.7 + 99.1	192.8	86.5	3 X 99.1	297.3	98.5
99.1 - 93.7	5.4	93.5	(3 X 99.1) - 93.7	203.6	110.5
(2 X 99.1) + 93.7	291.9	105.5	(3 X 93.7) - (2 X 99.1)	82.9	105.5
(2 X 93.7) + 99.1	286.5	94.5	(3 X 99.1) - (2 X 93.7)	109.9	99.5
(3 X 99.1) + 93.7	391.0	99.5	(3 X 93.7) + (3 X 99.1)	578.4	110.5
(3 X 93.7) + 99.1	380.2	98.5	(3 X 99.1) - (3 X 93.7)	16.2	110.5
2 x 93.7	187.4	97.5	4 X 93.7	374.8	110.5
(2 X 93.7) - 99.1	88.3	80.5	4 X 99.1	396.4	107.5
2 X 99.1	198.2	95.5	5 X 93.7	468.5	103.5
(2 X 99.1) - 93.7	104.5	90.5	5 X 99.1	495.5	97.5
(2 X 93.7) + (2 X 99.1)	385.6	110.5	6 X 93.7	562.2	113.5
(2 X 99.1) - (2 X 93.7)	10.8	111.5	6 X 99.1	594.6	110.5
(2 X 93.7) + (3 X 99.1)	484.7	105.5	7 X 93.7	655.9	110.5
(2 X 99.1) + (3 X 93.7)	479.3	105.5	7 X 99.1	693.7	111.5
3 X 93.7	281.1	98.5	8 X 93.7	749.6	107.5
(3 X 93.7) - 99.1	182.0	110.5	8 X 99.1	792.8	107.7

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

  
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 Olen A. Booth