

**Engineering Exhibit  
WKSJ-FM, Mobile, AL  
FID 53145  
Construction Permit – File Number  
BPH-20050414ACR**

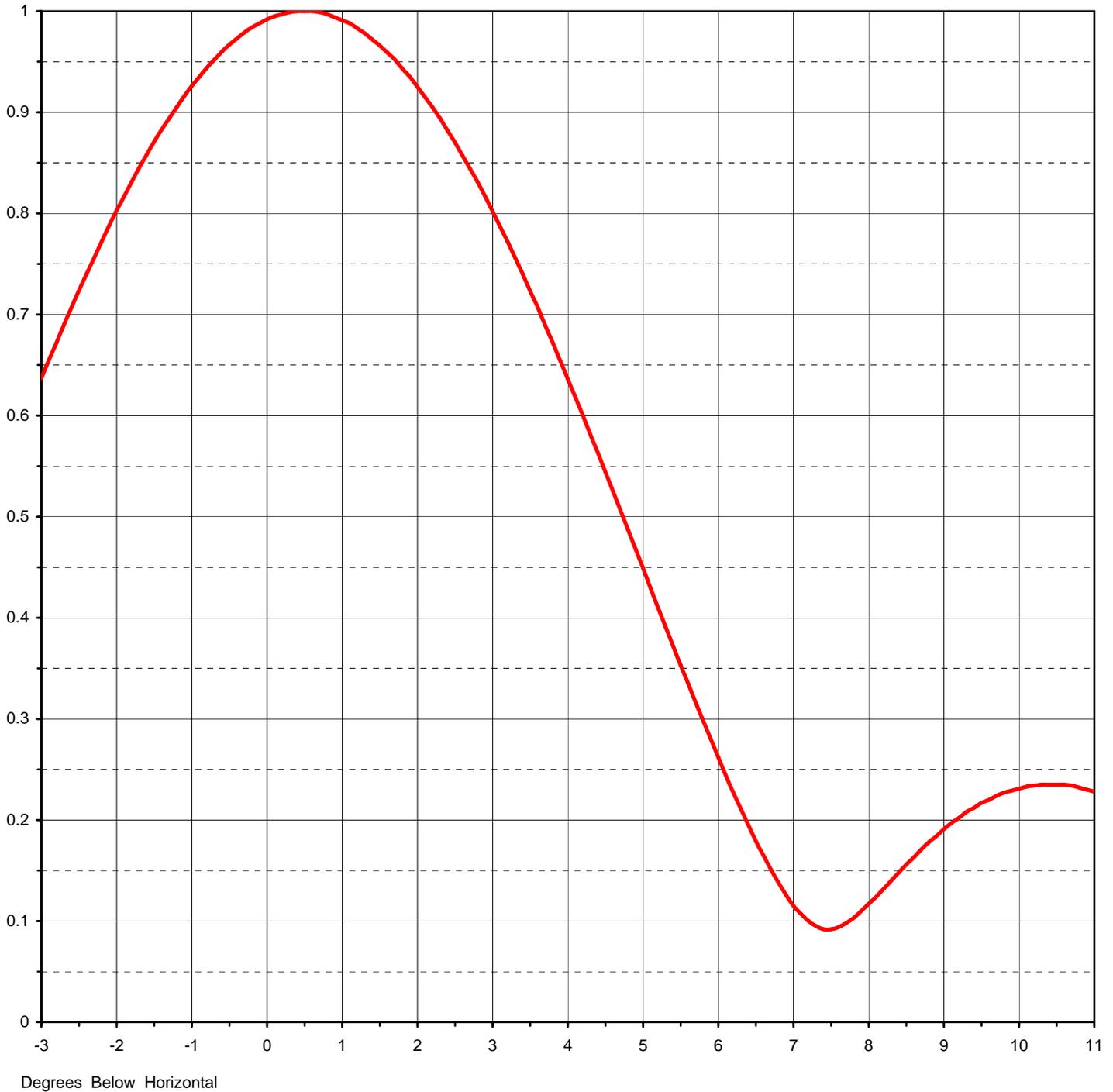
Special Operating Conditions or Restrictions “2”.  
Vertical Plane Radiation Pattern



Proposal Number **DCA-10732** Revision: **2**  
Date **20-Jun-06**  
Call Letters **WKSJ**  
Location **Mobile, AL**  
Customer **Cumulus**  
Antenna Type **DCBR-O3-9FMB/27H-2-N**

### ELEVATION PATTERN

RMS Gain at Main Lobe	<b>4.35 ( 6.38 dB )</b>	Beam Tilt	<b>0.50 deg</b>
RMS Gain at Horizontal	<b>4.28 ( 6.31 dB )</b>	Frequency	<b>94.90 MHz</b>
Calculated / Measured	<b>Calculated</b>	Drawing #	<b>09C087050</b>

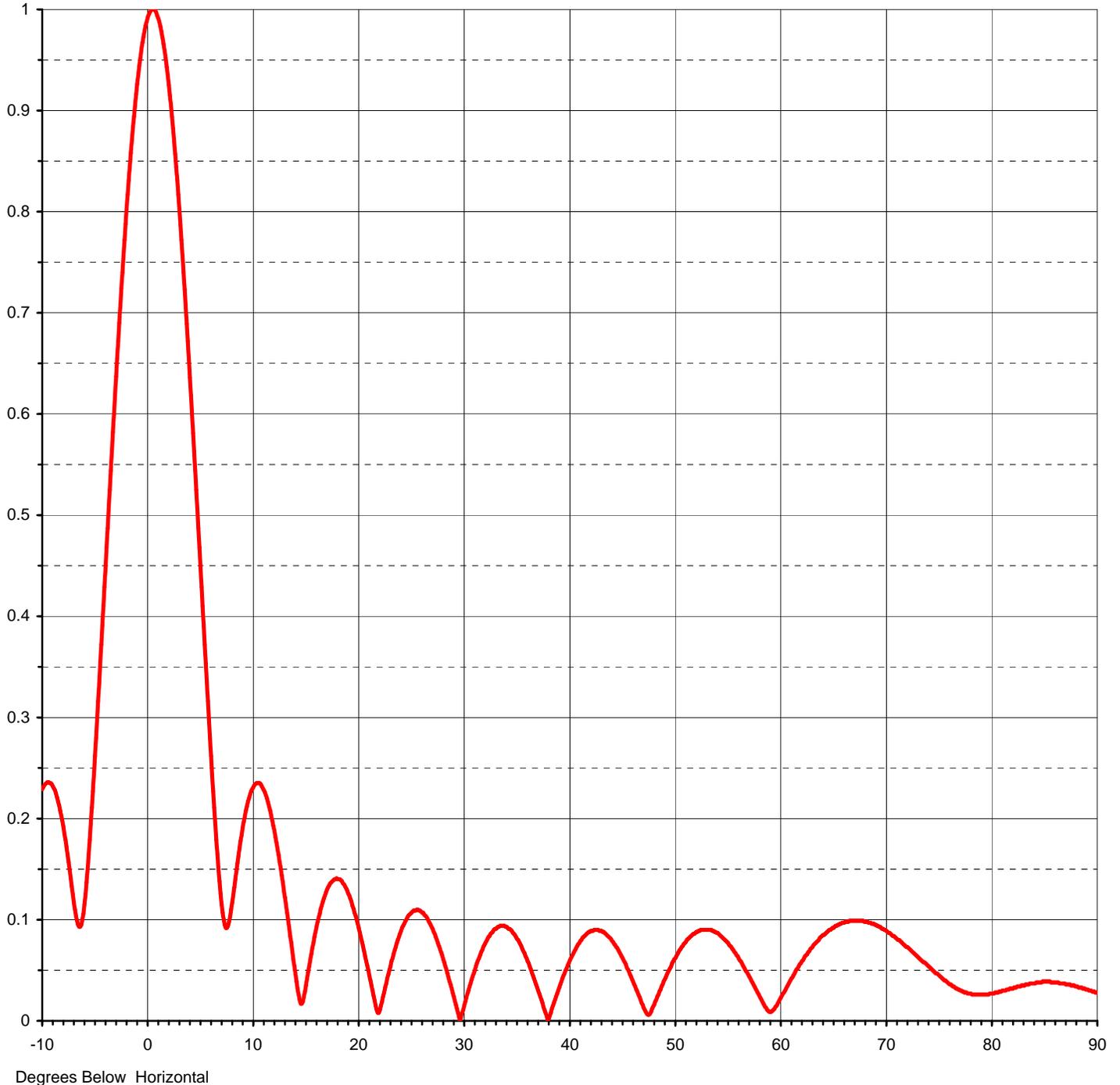




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## TABULATION OF ELEVATION PATTERN

Elevation Pattern Drawing #: **09C087050-90**

Angle	Field										
-10.0	0.229	2.4	0.882	10.6	0.235	30.5	0.030	51.0	0.077	71.5	0.077
-9.5	0.236	2.6	0.857	10.8	0.234	31.0	0.047	51.5	0.083	72.0	0.073
-9.0	0.232	2.8	0.831	11.0	0.230	31.5	0.062	52.0	0.087	72.5	0.068
-8.5	0.217	3.0	0.802	11.5	0.216	32.0	0.075	52.5	0.090	73.0	0.063
-8.0	0.192	3.2	0.772	12.0	0.193	32.5	0.084	53.0	0.090	73.5	0.058
-7.5	0.157	3.4	0.740	12.5	0.164	33.0	0.091	53.5	0.090	74.0	0.054
-7.0	0.117	3.6	0.707	13.0	0.129	33.5	0.094	54.0	0.087	74.5	0.049
-6.5	0.093	3.8	0.672	13.5	0.092	34.0	0.093	54.5	0.083	75.0	0.045
-6.0	0.115	4.0	0.636	14.0	0.054	34.5	0.090	55.0	0.078	75.5	0.040
-5.5	0.179	4.2	0.600	14.5	0.021	35.0	0.083	55.5	0.071	76.0	0.036
-5.0	0.262	4.4	0.563	15.0	0.029	35.5	0.074	56.0	0.064	76.5	0.033
-4.5	0.353	4.6	0.525	15.5	0.060	36.0	0.062	56.5	0.055	77.0	0.030
-4.0	0.448	4.8	0.487	16.0	0.088	36.5	0.048	57.0	0.046	77.5	0.028
-3.5	0.544	5.0	0.449	16.5	0.111	37.0	0.033	57.5	0.036	78.0	0.027
-3.0	0.637	5.2	0.410	17.0	0.127	37.5	0.018	58.0	0.026	78.5	0.026
-2.8	0.672	5.4	0.372	17.5	0.137	38.0	0.001	58.5	0.016	79.0	0.026
-2.6	0.707	5.6	0.335	18.0	0.141	38.5	0.015	59.0	0.009	79.5	0.026
-2.4	0.740	5.8	0.298	18.5	0.138	39.0	0.030	59.5	0.012	80.0	0.027
-2.2	0.772	6.0	0.262	19.0	0.129	39.5	0.045	60.0	0.021	80.5	0.028
-2.0	0.803	6.2	0.227	19.5	0.114	40.0	0.057	60.5	0.030	81.0	0.030
-1.8	0.831	6.4	0.195	20.0	0.096	40.5	0.068	61.0	0.040	81.5	0.031
-1.6	0.858	6.6	0.165	20.5	0.074	41.0	0.077	61.5	0.049	82.0	0.032
-1.4	0.883	6.8	0.138	21.0	0.050	41.5	0.084	62.0	0.057	82.5	0.034
-1.2	0.905	7.0	0.115	21.5	0.025	42.0	0.088	62.5	0.065	83.0	0.035
-1.0	0.926	7.2	0.100	22.0	0.008	42.5	0.090	63.0	0.072	83.5	0.036
-0.8	0.944	7.4	0.092	22.5	0.028	43.0	0.089	63.5	0.078	84.0	0.037
-0.6	0.960	7.6	0.094	23.0	0.050	43.5	0.086	64.0	0.084	84.5	0.038
-0.4	0.973	7.8	0.103	23.5	0.070	44.0	0.081	64.5	0.089	85.0	0.039
-0.2	0.984	8.0	0.117	24.0	0.086	44.5	0.073	65.0	0.092	85.5	0.039
0.0	0.992	8.2	0.132	24.5	0.098	45.0	0.064	65.5	0.095	86.0	0.038
0.2	0.997	8.4	0.148	25.0	0.106	45.5	0.053	66.0	0.097	86.5	0.037
0.4	1.000	8.6	0.163	25.5	0.109	46.0	0.041	66.5	0.099	87.0	0.036
0.6	1.000	8.8	0.178	26.0	0.108	46.5	0.029	67.0	0.099	87.5	0.035
0.8	0.997	9.0	0.191	26.5	0.103	47.0	0.016	67.5	0.099	88.0	0.034
1.0	0.991	9.2	0.202	27.0	0.093	47.5	0.006	68.0	0.098	88.5	0.033
1.2	0.983	9.4	0.212	27.5	0.080	48.0	0.014	68.5	0.097	89.0	0.031
1.4	0.972	9.6	0.220	28.0	0.065	48.5	0.026	69.0	0.095	89.5	0.029
1.6	0.959	9.8	0.224	28.5	0.047	49.0	0.039	69.5	0.092	90.0	0.028
1.8	0.943	10.0	0.229	29.0	0.028	49.5	0.050	70.0	0.089		
2.0	0.925	10.2	0.233	29.5	0.008	50.0	0.061	70.5	0.085		
2.2	0.905	10.4	0.235	30.0	0.011	50.5	0.070	71.0	0.081		

Special Operating Conditions or Restrictions “3”.  
Spurious Emissions Requirements



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

**CC Licenses, LLC  
WKSJ-FM – 94.9 MHz  
Mobile, AL (Facility ID No: 53145)**  
**And**  
**Cumulus Licensing LLC  
WBLX-FM – 92.9 MHz  
Mobile, AL (Facility ID No: 2450)**  
**WJLQ(FM) – 100.7 MHz  
Pensacola, FL (Facility ID No: 12143)**  
**WYOK(FM) – 104.1 MHz  
Atmore, AL (Facility ID No: 8680)**

**June 6, 2006**

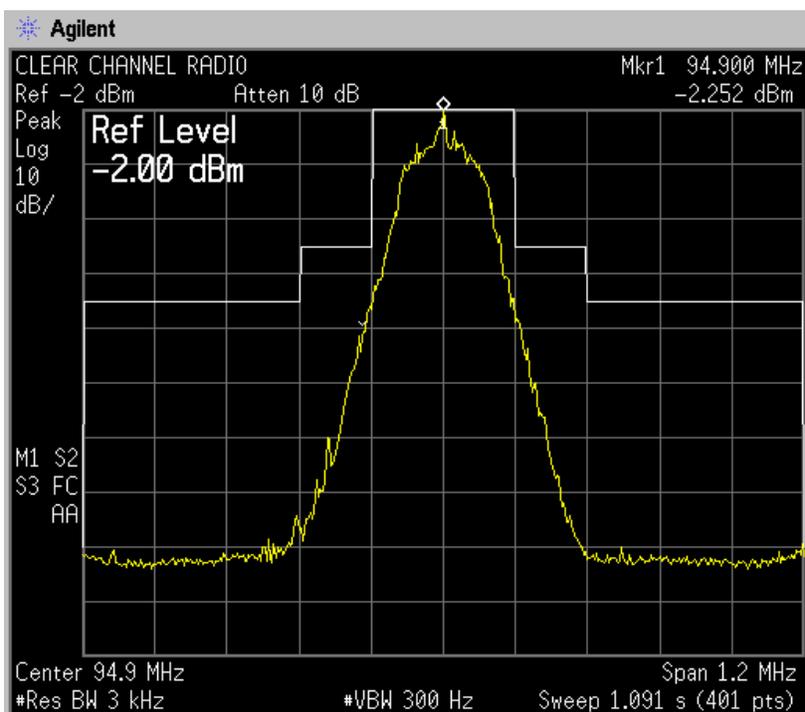
## **Occupied Bandwidth and Spurious Emissions Measurements**

Measurements were conducted to demonstrate that WKSJ-FM, Mobile, AL, WBLX-FM, Mobile, AL, WJLQ(FM), Pensacola, FL and WYOK(FM), Atmore, AL operating into a combined 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 June 6, 2006, during the experimental period, with all stations simultaneously utilizing the shared antenna as specified in “Special operating conditions or restrictions 3” of the WKSJ-FM Construction Permit BPH-20050414ACR. The spectrum analyzer used for the measurements was an Agilent Technologies model E4402B, S/N MY41441731. A sample of the WKSJ-FM, WBLX-FM, WJLQ(FM) and WYOK(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-223 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.

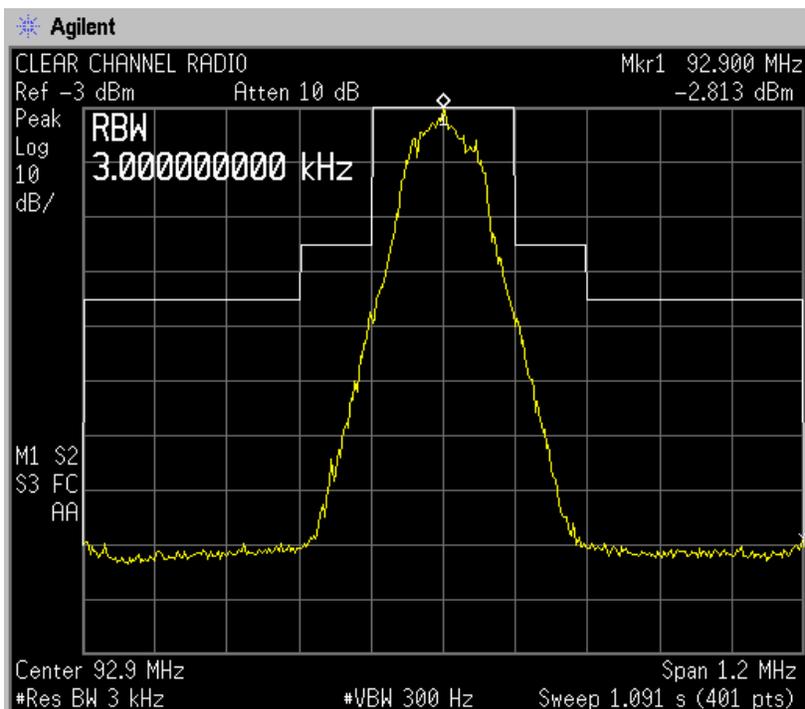
The measured unmodulated carrier level of WKSJ-FM, WJLQ(FM) and WYOK(FM) was -2 dBm and the unmodulated carrier level of WBLX-FM was -3 dBm. Since the WBLX-FM reference level was lower, it was used as the reference for all harmonic, spurious and intermodulation measurements. All measurements were conducted 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. As shown in Figures 1, 2, 3 and 4, 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.

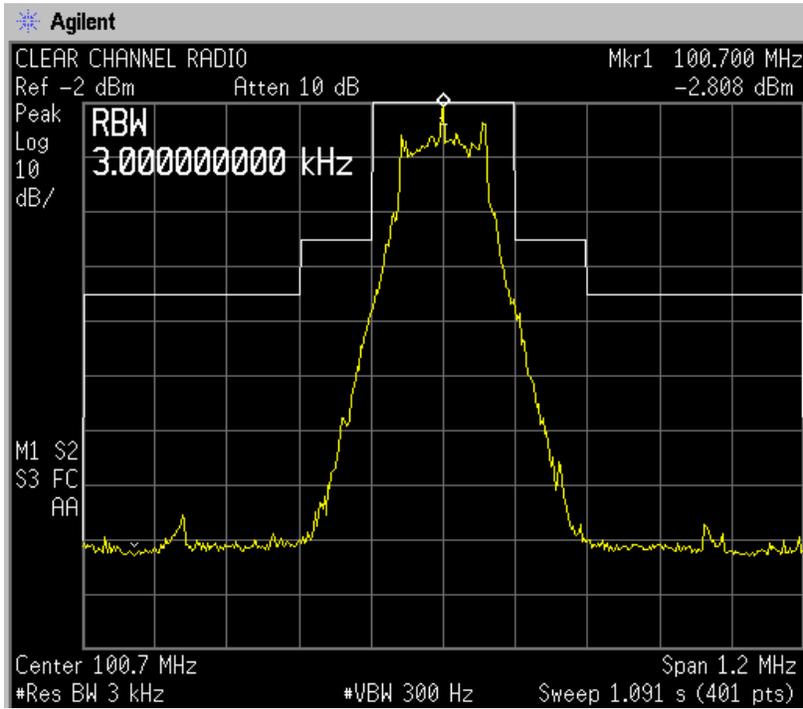
**Figure 1**  
**WKSJ-FM**



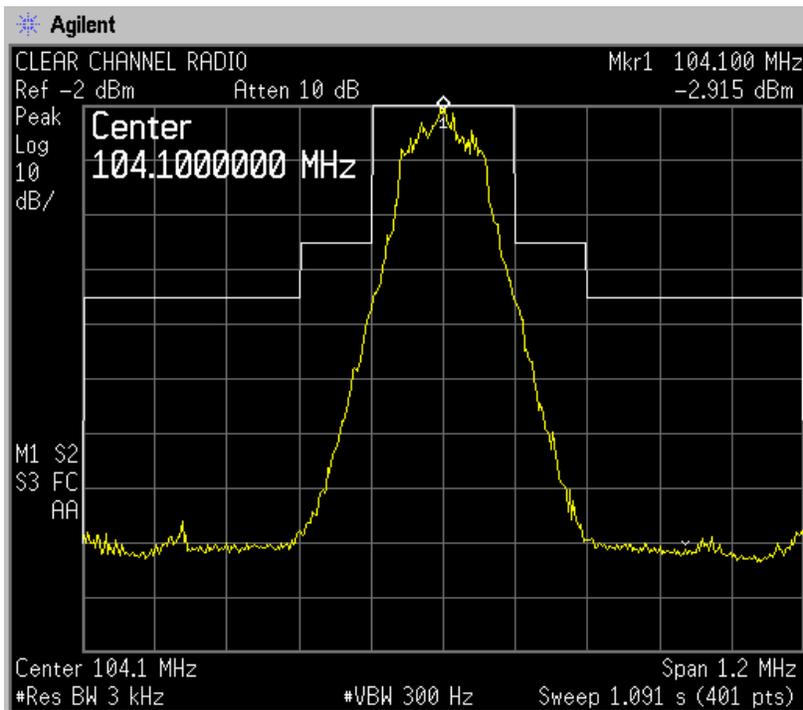
**Figure 2**  
**WBLX-FM**



**Figure 3**  
**WJLQ(FM)**



**Figure 4**  
**WYOK(FM)**



Extensive measurement 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 17.7 dB at 94.9 MHz, 16.2 dB at 92.9 MHz, 24.2 dB at 100.7 MHz and 19.4 dB at 104.1 MHz.

The most likely intermodulation frequencies in the range 2 MHz to 550 MHz that could be produced by the combined operation of WKSJ-FM, WBLX-FM, WJLQ(FM) and WYOK(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	104.1
Frequency B	100.7
Frequency C	94.9
Frequency D	92.9

DESCRIPTION	FREQ. MHZ	ATTENUATION DB	DESCRIPTION	FREQ. MHZ	ATTENUATION DB
A + B	204.8	>100	(3 X A) - (3 X B)	10.2	>100
A - B	3.4	>100	A + C	199	97
A + (2 X B)	305.5	>100	A - C	9.2	>100
B + (2 X A)	308.9	>100	A + (2 X C)	293.9	>100
A + (3 X B)	406.2	>100	C + (2 X A)	303.1	>100
B + (3 X A)	413	>100	A + (3 X C)	388.8	>100
2 X A	208.2	>100	C + (3 X A)	407.2	>100
(2 X A) - B	107.5	>100	(2 X A) - C	113.3	>100
2 X B	201.4	>100	2 X C	189.8	98
(2 X B) - A	97.3	>100	(2 X C) - A	85.7	>100
(2 X A) + (2 X B)	409.6	>100	(2 X A) + (2 X C)	398	>100
(2 X A) - (2 X B)	6.8	>100	(2 X A) - (2 X C)	18.4	>100
(2 X A) + (3 X B)	510.3	>100	(2 X A) + (3 X C)	492.9	>100
(2 X B) + (3 X A)	513.7	>100	(2 X C) + (3 X A)	502.1	>100
3 X A	312.3	>100	(3 X A) - C	217.4	>100
(3 X A) - B	211.6	>100	3 X C	284.7	85
3 X B	302.1	>100	(3 X C) - A	180.6	>100
(3 X B) - A	198	>100	(3 X A) - (2 X C)	122.5	>100
(3 X A) - (2 X B)	110.9	>100	(3 X C) - (2 X A)	76.5	>100
(3 X B) - (2 X A)	93.9	>100	(3 X A) - (3 X C)	27.6	>100

DESCRIPTION	FREQ. MHZ	ATTENUATION DB	DESCRIPTION	FREQ. MHZ	ATTENUATION DB
A + D	197	98	D + (2 X B)	294.3	>100
A - D	11.2	>100	B + (3 X D)	379.4	>100
A + (2 X D)	289.9	>100	D + (3 X B)	395	>100
D + (2 X A)	301.1	>100	(2 X B) - D	108.5	>100
A + (3 X D)	382.8	>100	(2 X D) - B	85.1	>100
D + (3 X A)	405.2	>100	(2 X B) + (2 X D)	387.2	>100
(2 X A) - D	115.3	>100	(2 X B) - (2 X D)	15.6	>100
2 X D	185.8	>100	(2 X B) + (3 X D)	480.1	>100
(2 X D) - A	81.7	>100	(2 X D) + (3 X B)	487.9	>100
(2 X A) + (2 X D)	394	>100	(3 X B) - D	209.2	>100
(2 X A) - (2 X D)	22.4	>100	(3 X D) - B	178	>100
(2 X A) + (3 X D)	486.9	>100	(3 X B) - (2 X D)	116.3	>100
(2 X D) + (3 X A)	498.1	>100	(3 X D) - (2 X B)	77.3	>100
(3 X A) - D	219.4	>100	(3 X B) - (3 X D)	23.4	>100
3 X D	278.7	>100	C + D	187.8	95
(3 X D) - A	174.6	>100	C - D	2	97
(3 X A) - (2 X D)	126.5	>100	C + (2 X D)	280.7	>100
(3 X D) - (2 X A)	70.5	>100	D + (2 X C)	282.7	>100
(3 X A) - (3 X D)	33.6	>100	C + (3 X D)	373.6	>100
B + C	195.6	97	D + (3 X C)	377.6	>100
B - C	5.8	99	(2 X C) - D	96.9	>100
B + (2 X C)	290.5	>100	(2 X D) - C	90.9	98
C + (2 X B)	296.3	>100	(2 X C) + (2 X D)	375.6	>100
B + (3 X C)	385.4	>100	(2 X C) - (2 X D)	4	>100
C + (3 X B)	397	>100	(2 X C) + (3 X D)	468.5	>100
(2 X B) - C	106.5	>100	(2 X D) + (3 X C)	470.5	>100
(2 X C) - B	89.1	>100	(3 X C) - D	191.8	>100
(2 X B) + (2 X C)	391.2	>100	(3 X D) - C	183.8	>100
(2 X B) - (2 X C)	11.6	>100	(3 X C) - (2 X D)	98.9	>100
(2 X B) + (3 X C)	486.1	>100	(3 X D) - (2 X C)	88.9	99
(2 X C) + (3 X B)	491.9	>100	(3 X C) - (3 X D)	6	>100
(3 X B) - C	207.2	>100	4 X A	416.4	>100
(3 X C) - B	184	>100	4 X B	402.8	>100
(3 X B) - (2 X C)	112.3	>100	4 X C	379.6	97
(3 X C) - (2 X B)	83.3	>100	4 X D	371.6	>100
(3 X B) - (3 X C)	17.4	>100	5 X A	520.5	97
B + D	193.6	98	5 X B	503.5	>100
B - D	7.8	99	5 X C	474.5	>100
B + (2 X D)	286.5	>100	5 X D	464.5	>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 MHz and 550 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 WKSJ-FM, WBLX-FM, WJLQ(FM) and WYOK(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 -83 dBm (80 dB below the unmodulated carrier level of WBLX-FM which was -3 dBm) the WKSJ-FM, WBLX-FM, WJLQ(FM) and WYOK(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 WKSJ-FM, WBLX-FM, WJLQ(FM) and WYOK(FM).

The results of these measurements confirm that the combined operations of WKSJ-FM, WBLX-FM, WJLQ(FM) and WYOK(FM) into the 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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Regional Engineer  
Clear Channel Radio