

# FM Bandwidth, spurious emissions, and harmonic measurements in accordance with 47 CFR 73

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BMLFT20180730AAG – Pensacola, Fl – 250 watts on 92.3 MHz.  
BLFT20180706ABI – Pensacola, Fl – 250 watts on 94.5 MHz.  
BNPFT20171215ABD – Pensacola, Fl – 250 watts on 99.1 MHz.

Nathan Smith

8/18/2018

**FM Bandwidth, spurious emissions, and harmonic measurements in accordance with 47 CFR 73.317.**

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**Results Summary**

FM measurements were conducted as described at approximately 2:00 pm, August 15, 2018 for the three stations combined into one antenna located at 30 29 59.9 lat / 87 13 8.7 lon:

BMLFT20180730AAG – Pensacola, Fl – 250 watts on 92.3 MHz. Combiner loss: 0.94 dB.

BLFT20180706ABI – Pensacola, Fl – 250 watts on 94.5 MHz. Combiner loss: 1.31 dB.

BNPFT20171215ABD – Pensacola, Fl – 250 watts on 99.1 MHz. Combiner loss: 1.12 dB.

The worst case intermodulation product was at 89.9 MHz at -70 dBc, Second harmonics were so low as to be in the noise of the instrument. Third harmonics were so low as to be in the noise of the instrument. Stations that operate with 250 watts are required to attenuate these spurious products - 67 dBc. It is concluded that these measurements show the station(s) being in compliance with the rules.

## **Regulatory standards of comparison**

These tests have been conducted to determine compliance of the FM broadcast station with 47 CFR, 73.317. Specifically, spurious emissions, harmonic radiation, occupied bandwidth, and any other radiation not specifically authorized by the terms of the license was examined. The standard to which these tests were measured against is as follows:

Emissions removed from center carrier frequency between 120 and 240 khz must be greater than 25 decibels below carrier.

Those between 240 and 600 khz must be 35 dB lower than carrier;

All emissions beyond 600 khz must be  $43 + 10 \log^{10} (\text{watts})$  dB below carrier, or 80 dB, whichever is the lesser attenuation.

In this case, with 250 watts effective radiated power, the requirement is at least 67 dB below carrier level.

## Engineer's Certification

I, Nathan Smith, certify:

That my qualifications as a radio engineer are on record with the Federal Communications Commission;

That I am currently employed by ADX Communications of Escambia, LLC as Chief Broadcast Engineer;

That the tests, measurements and accompanying technical analysis depicted in this document were either supervised by, or personally conducted by myself, and that all information presented is true and accurate to the best of my knowledge and belief.



Nathan Smith

Subscribed and sworn to before me: 8/18/2018 date.

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Notary Public

My commission expires:  
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### **Instrumentation list**

1. Rigol DSA815-TG spectrum analyzer, SN DSA8A152201157
2. Standard, adjustable telescoping dipole antenna.
3. Three resonant vertical monopoles for FM band, 2<sup>nd</sup> and 3<sup>rd</sup> harmonic of FM band.
4. Shively Labs 3 station branched combiner, SN 35519.

### **Calibration**

All instrumentation was tested and calibrated prior to its use to ensure compliance with manufacturers' specifications.

## Measurement Procedure

In off-air sample cases, the telescoping antenna was adjusted to resonate at the frequency in being measured by adjusting its length using standard formula:  $\text{Length in feet} = 468 / \text{frequency in Mhz}$ . This formula was previously validated with this antenna by checking resonance. Bandwidth measurements were made in strict accordance with 73.317 in all respects, using the peak-recording mode of the spectrum analyzer. Harmonic measurements were made at the same location, adjusting the antenna to the harmonic frequency length, to ensure matched impedance and standard gain. For vertical polarization, resonant vehicle-mounted monopoles were used.