NAB Radio TechCheck

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# Experimental Station's Experiences with FM Digital Power Increase

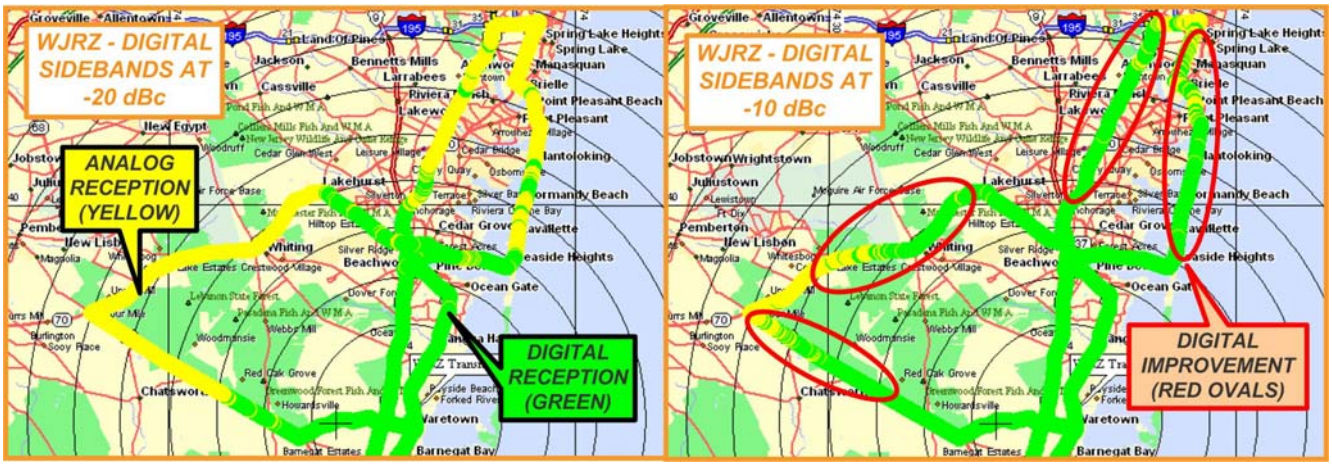


The FCC is presently accepting comments on four issues relevant to the request made by a group of broadcasters back in June of 2008 (the "Joint Parties") to allow for operation of the digital portion of an FM in-band/on-channel (IBOC) signal at elevated power levels (the full text of the FCC's Public Notice, which was released on May 22, 2009, is available at http://hraunfoss.fcc.gov/edocs_public/attachmatch/DA-09-1127A1.pdf). Comments on this matter are due Monday, July 6, 2009 and reply comments are due Friday, July 17, 2009 (see the December 15, 2008 issue of *Radio TechCheck* for information about NAB's original comments filed in this matter).

Coincident with the filing of the Joint Parties request, iBiquity Digital Corporation filed a comprehensive study with the FCC detailing their investigation of FM IBOC operation at elevated power levels, and concluding that raising the power of the digital portion of the hybrid FM IBOC signal by 10 dB, from the current level of -20 dB below the analog carrier (i.e., -20 dBc) to -10 dBc, would significantly improve digital coverage and not "meaningfully increase" potential interference to analog (see the June 16, 2008 issue of *Radio TechCheck* for additional information on the results of the iBiquity test program). These results were based upon actual operation of FM IBOC stations at a digital power level of -10 dBc (under experimental authority); the maps below, taken from this report, demonstrate the coverage improvement obtained by one of these stations, WJRZ-FM (Mahahawkin, NJ, Class A, 100.1 MHz).

A number of stations continue to operate (under experimental authority) at the -10 dBc elevated power level, and for this week's *Radio TechCheck*, NAB asked three broadcast engineering executives involved in these experiments to share some of there experiences in this regard. We first spoke with Glynn Walden, Senior Vice President Engineering with CBS Radio. Glynn told us about CBS Radio's experience operating station KROQ-FM (Pasadena, CA, Class B, 106.7 MHz) at elevated digital power:

> *"KROQ has been operating with a -10 dBc HD Radio digital carrier level for over two years. As our report to the FCC indicated, the indoor reception has been dramatically improved and the HD Radio digital mobile coverage is consistent with the analog signal. KROQ has two short-spaced second adjacent channels within the Los Angeles metro and in some locations KROQ is greater than 40 dB stronger than its second adjacent channel neighbors. Stations operating with elevated IBOC carrier levels are required to meet a tighter Out-of-Band Emissions (OBE) mask. The mask when applied to stations operating with elevated digital carrier power requires an additional 10 dB of OBE suppression. Field tests and the lack of any interference complaints demonstrate that KROQ's sustained -10 dBc operation has generated no second adjacent channel interference."*




Next, we spoke with Jeff Littlejohn, Executive Vice President – Distribution Development with Clear Channel Radio. Here's what Jeff told us:

> *"Several Clear Channel engineers had an opportunity to participate in the elevated (-10 dBc) digital carrier tests in New Haven, Philadelphia, Los Angeles and Detroit. During these tests, we concentrated on observing areas where it was predicted to most likely receive interference. However we did not observe any interference that could be attributed to the elevated digital carrier levels. In New Haven and Los Angeles, Clear Channel provided the 'host' station (WKCI and KOST respectively) for the elevated digital carriers. In neither case did Clear Channel receive any complaints of interference."*
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> *"The coverage increase that resulted from the elevated IBOC carriers allowed the digital coverage to more closely approach the existing analog coverage. Given the significantly increased digital coverage and the absence of any observed interference, it is important that the FCC and the Radio Industry moves forward expeditiously with broad approval of -10 dBc IBOC carrier levels."*

Finally, we spoke with Milford "Smitty" Smith, Vice President, Radio Engineering with Greater Media, Inc. Smitty told us about two Greater Media stations:

> WKLB-FM (Waltham, MA, Class B, 102.5 MHz): *"During December 2008, observations were made at the -10dbc power level. Extensive driving evaluations, both qualitative and quantitative, showed remarkable improvement in coverage relative to the currently authorized level of -20 dBc. In general, it was observed that the -10 dBc digital signal level approximates or, in some cases, slightly exceeds the coverage of WKLB-FM's full power analog signal."*
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> *"Particular care was taken to observe improvements in coverage in areas within 25 miles of the station's transmitter site. At the -20 dBc digital power level, there were numerous areas where the digital signal would routinely and predictably fade out due to terrain (referring to gentle rolling hills and valleys in rural areas outside the City of Boston) and man-made obstacles. During the several months of observations, it was apparent that all of these problems disappeared while operating at -10 dBc. There were no instances where the signal was lost in either vehicle in any areas where the signal loss was determined to be a problem at the -20 dBc level."*
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> WRAT-FM (Point Pleasant, NJ, Class A, 95.9 MHz): *"WRAT's studio and transmitter are located in the coastal region of New Jersey and, as such, are largely surrounded by terrain that is generally very flat and largely devoid of any significant obstructions, especially north and south of the transmitter location. Therefore, the station represents a nearly "best case" propagation scenario for its digital signal. In spite of these optimal conditions, the station, operating at -20 dBc since 2005, has observed a significant abbreviation of its digital coverage as compared to that of its analog facility."*
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> *"It appears that an increase in digital power to -10 dBc greatly improves the coverage for a Class A station in relatively flat terrain, both in terms of coverage area and the quality and robustness of that*

*coverage. This is critical, given the sudden and absolute failure mode of the HD Radio signal. Listeners are not likely to tolerate sudden drop outs more than occasionally before seeking an alternate audio source. Further, it appears that a power level very close to -10 dBc will be necessary to fully replicate analog coverage with the digital signal no interference to any FM station was reported or observed during this extended period of operation at the elevated digital power level, including to short spaced WBEN-FM, Philadelphia (also owned by Greater Media).”*

Broadcasters interested in filing comments in this proceeding may do so electronically by accessing the Electronic Comment Filing System (ECFS) at http://fjallfoss.fcc.gov/prod/ecfs/upload_v2.cgi. Filers should follow the instructions provided on the Web site for submitting comments, and should include their full name, U.S. Postal service mailing address, and the applicable proceeding number (in box 1): 99-325. Parties may also submit an electronic comment by email–to get filing instructions, send an e-mail to ecfs@fcc.gov, and include the words “get form” in the body of the message. A sample form and instructions will be sent by email in response.