NAB Radio TechCheck

The Weekly NAB Newsletter for Radio Broadcast Engineers

July 13, 2009

New FieldTest Data on FM IBOC at Elevated Power Levels Submitted to FCC

Two new field test reports were submitted to the FCC last week in response to the FCC's Public Notice on operation of FM in-band/on-channel (IBOC) digital radio at elevated power levels. These reports, prepared by Charles River Broadcasting Company (a subsidiary of Greater Media, Inc., Braintree, Mass. www.greatermedia.com) and iBiquity Digital Corporation (Columbia, Md. www.ibiquity.com), detail results from tests analyzing the digital signal performance of station WKLB-FM (102.5 MHz, Class B, Waltham, Mass.) at various power levels ranging from -20 dBc (the level currently permitted under FCC rules) up to and including -10 dBc (the maximum operating power being proposed).

In the first report, coverage of WKLB's signal for digital power levels of -20, -14, and -10 dBc was established along a number of test routes (see maps below illustrating results for -20 and -10 dBc cases) using a mobile test platform with a JVC KD-HDR50 automotive receiver. The first map (at left) shows how at the currently authorized -20 dBc power level, there are significant digital coverage deficiencies within the WKLB-FM 54 dBu protected analog contour, on all routes measured (green represents digital reception and red represents areas where receiver blended to analog due to deficiencies in the digital signal).

As detailed in the report, a close examination of each route shows multiple instances of intermittent loss of digital service, even prior to those areas where digital service is largely absent. In the second map, representing service at -10 dBc, marked improvement in digital service is shown. Other than the terrain-shadowed area in the Providence/Pawtucket and Plymouth areas, digital reception within the protected contour is virtually flawless over the various routes. According to the report, other than those areas just noted, there are virtually NO areas where even momentary digital signal dropouts are evident.

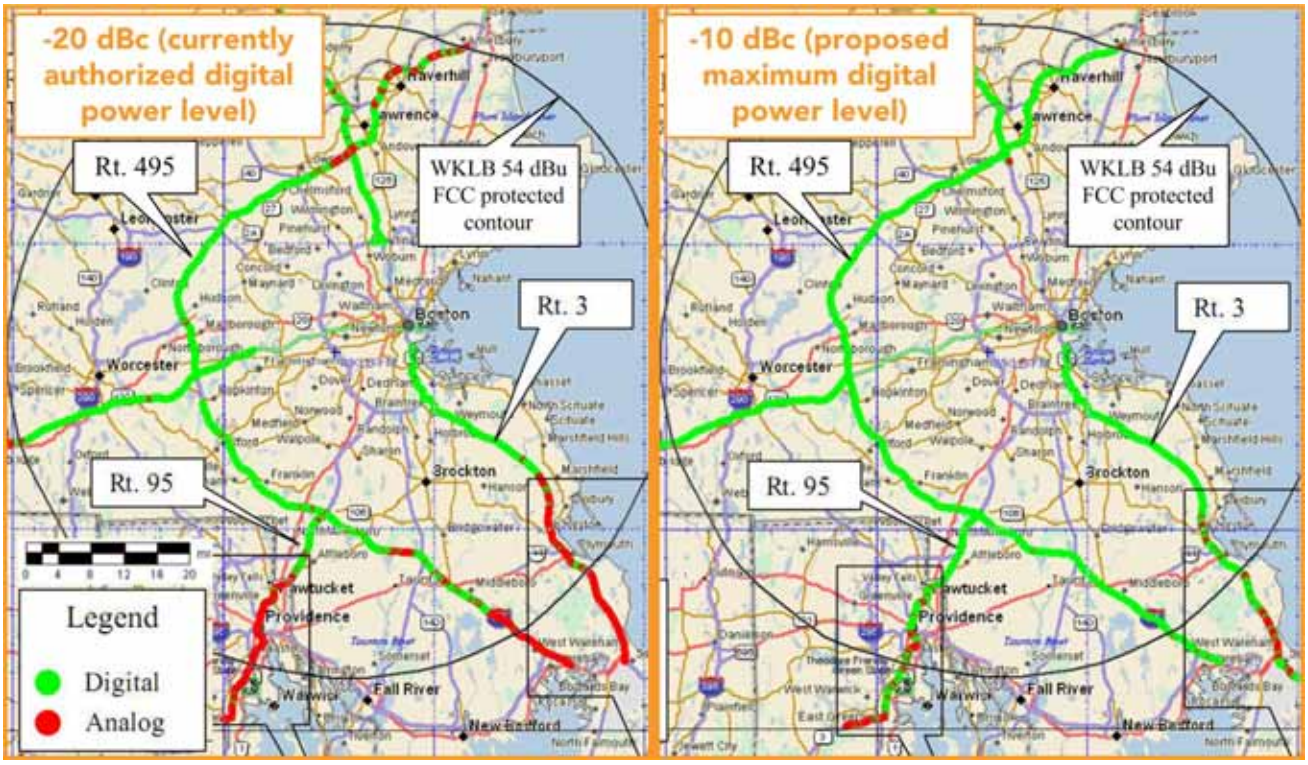
The second report, entitled "FM HD Radio System Performance in Building Interiors at Elevated Digital Carrier Levels," complements and significantly expands upon a similar report done by CBS Radio for the Los Angeles, California area which was featured in the November 3, 2008 issue of *Radio TechCheck*. In this latest study, observations of indoor reception were made using digital signal power levels from -20 to -10 dBc (in 2 dB increments), inside a variety of structures representative of the majority of those found in the greater Boston area, at six different locations. The first three structures were all located within the urban core of Boston, within 8-10 miles of the WKLB-FM transmission facility:

- **Greater Media studio building, Dorchester section of Boston**: representative of low rise (two story) masonry, steel and glass construction;
- **The Caning Shop, Cambridge section of Boston**: a single story structure (with an occupied lower level) of wood and masonry construction;
- **The Prudential Tower, Back Bay section of Boston**: a high rise skyscraper of steel, aluminum and glass construction.

The other three sites were located at approximately the edge of digital coverage (assuming the currently authorized -20 dBc power level):

- **Andover, Mass.**: a typical two story, split level residence of wood frame construction;
- **Devens, Mass.**: headquarters of the Comrex Corporation, a two story steel framed, wood building typical of many small to medium size commercial structures;
- **North Attleboro, Mass.**: a three story apartment building of poured concrete (with rebar) construction.

Two receiver models were used in this testing. A Sony XDR-S10HDiP table radio was used for evaluation at numerous fixed locations within each structure. As many as four of these receivers, each operated with the manufacturer-supplied antennas, were utilized simultaneously to characterize reception at various locations within each structure. The second receiver, a prototype KRI portable arm band radio, was operated as it would be by a typical user, being moved about the interior of each structure to ascertain the availability of digital radio reception. All receivers utilized were characterized in the iBiquity Digital Corporation laboratory to verify that



each met its published specifications.

These indoor tests demonstrated that building penetration is a significant challenge at the -20 dBc digital power level. While the incremental power levels (those between -20 and -10 dBc) were shown to offer some improvement, the report concludes that only a full 10 dB increase will permit reliable service to portable receivers and result in a close approximation of analog coverage.

A complete copy of these reports can be obtained from the FCC Electronic Comment Filing System (ECFS) webpage – to obtain, go to http://fjallfoss.fcc.gov/prod/ecfs/comsrch_v2.cgi and enter the following information –1) Proceeding: 99-325, 4) Filed on behalf of: Charles River – then select "Retrieve Document List" at the bottom of the page.

Additional information on the Public Notice is provided in the June 29, 2009 issue of Radio TechCheck. Reply comments are due to the FCC by Friday, July 17, 2009. Broadcasters interested in filing replies 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.

2009 NAB Radio Show Engineering Program

This year's three-day Radio Show Engineering Program focuses on planning, building and maintaining an IP-based radio facility, operating under emergency conditions, computerized antenna modeling, preventing tower failures, datacasting opportunities and much more. Our engineering sessions are presented in a workshop-type environment where you have ample time to ask questions and interact with experts and your industry peers. To access the details on the Engineering Program, click here.

The relaxed atmosphere of the Radio Show means you always have plenty of time to network with exhibitors. You'll learn about their latest products while enjoying lunch and snacks on the show floor. For busy radio engineers, the NAB Radio Show is an excellent way to advance your technical education and maintain your edge in an increasingly competitive business.