



Using Asymmetric Digital Sidebands with FM IBOC

Since the FCC's authorization earlier this year of a voluntary digital power increase for FM radio stations, many FM broadcasters using the HD Radio IBOC digital radio system have been considering taking advantage of this new capability (see the [February 1, 2010 issue](#) of *Radio TechCheck* for information on the FCC's authorization, and the [August 9, 2010 issue](#) for information on stations that have already increased their power). One "tool" for managing this power increase that is currently being experimented with is the use of asymmetric digital sidebands, whereby one sideband is kept lower than the other in order to protect a radio station on a first adjacent channel frequency from undue interference.

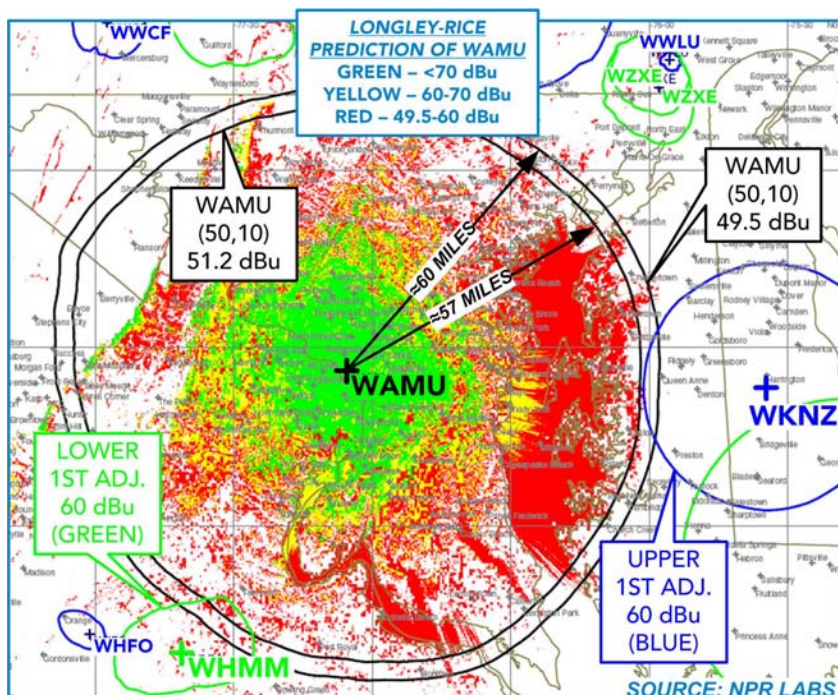
With the asymmetric sideband approach, a broadcaster can maximize the digital power in each sideband and not be limited on both sidebands due to a potential interference situation that exists on only one. Currently, FCC rules do not allow for asymmetric sideband operation, so any station interested in doing this must apply for an experimental license. At the recently held Radio Show (Washington, D.C., www.radioshowweb.com), FCC staffers indicated that once sufficient experimental information on this mode of operation has been submitted, the Media Bureau will be able to consider modifying the rules to allow asymmetric sideband operation. At this point, manufacturers have just begun to offer an asymmetric digital sideband option, so it is not likely that any existing broadcast equipment in use will support an asymmetric mode of operation.

Last month, Washington, D.C. station WAMU (88.5 MHz, channel 203B) was granted an experimental license for asymmetric sideband operation and this was discussed recently both at the Public Engineering Radio Conference (PERC) and the Radio Show (see the [October 4, 2010 issue](#) of *Radio TechCheck* for a brief write-up as well as a spectrum plot). The application for experimental license filed by WAMU is available on the FCC Media Bureau's CDBS Public Access Web page – to obtain a copy:

- Go to the CDBS Public Access web page at http://licensing.fcc.gov/prod/cdb/publicacc/prod/cdb_pa.htm;
- Click on the link to "Search for Station Information;"
- Enter "WAMU" in the CALL SIGN field, then scroll down the page and click on SUBMIT STATION SEARCH;
- The Station Search Results for WAMU will be displayed; at the far right, click on CLICK FOR DETAILS;
- Scroll down this page, and click on VIEW CORRESPONDENCE FOLDER;
- Finally, locate the row with the September 21, 2010 "Imported Letter" and CLICK TO VIEW that Imported Letter. The FCC's reply, granting this request, is also available by clicking to view the September 28, 2010 Imported Letter.

Included in this application was a propagation study done for WAMU by NPR Labs, an excerpt from which is shown in the figure at right. The two WAMU contours in the figure correspond to limits placed upon stations by the FCC on the amount of digital power increase allowed, which depends upon the proximity of nearby upper and lower first-adjacent signals.

Under the new FCC rules, nearly all stations are allowed to increase their digital power from



the original -20 dBc to -14 dBc. For a station to increase its digital power to the maximum allowable -10 dBc, all first-adjacent channel 60 dBu contours must fall outside of the digital station's 49.5 dBu contour (the 51.2 dBu contour represents the point at which a station may increase digital power from -14 to -13 dBc). The NPR Labs study determined that the 60 dBu contours for two first-adjacent channel signals, WHMM (lower) and WKNZ (upper), fall within WAMU's 49.5 dBu contour, hence prohibiting an increase to -10 dBc on both upper and lower digital sidebands.

However, the engineering study points out that for WKNZ, the overlap of WAMU's 49.5 dBu contour occurs in a rural area with low population, and further, based on the Longley-Rice study, there are virtually no locations within the overlap area that would be subject to interference from WAMU. Consequently, WAMU requested (and obtained) permission to operate the upper digital sideband at the maximum allowed -10 dBc power level. Also noted in the study is the fact that neither WKNZ nor WHMM are currently operational (WKNZ is expected to become operational mid-October, and WHMM has not yet been constructed), further ensuring that granting of the experimental license should not result in any undue interference.

Under the terms of the license, WAMU must submit a report to the FCC detailing the methodology employed and the results obtained within 90 days following the conclusion of the experimental operation. This information will likely be helpful to the FCC in determining whether to authorize asymmetric sideband operation. Additional testing is scheduled for later this month at Greater Media station WKLB (Waltham, Mass., 102.5 MHz, channel 273B). This testing is being conducted by iBiquity Digital Corporation and is partly funded by the NAB FASTROAD technology advocacy program (www.nabfastroad.org). The results from these tests will be submitted to the FCC, as well.

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