

**Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, DC 20554**

In the Matter of)
)
Digital Audio Broadcasting Systems) MB Docket No. 99-325
And Their Impact On The Terrestrial)
Radio Broadcast Service)

To: Office of the Secretary
Attn: The Media Bureau, Audio Division

REPLY COMMENTS

The signatories hereto (the “Joint Parties”), by their attorneys, hereby submit Reply Comments in response to the November 1, 2011 Public Notice in the above-captioned proceeding. The Joint Parties, which include the licensees of more than 315 commercial FM radio stations nationwide and prominent broadcast equipment manufacturers, reiterate their support for the proposal made by iBiquity Digital Corporation (“iBiquity”) and National Public Radio, Inc. (“NPR”) to permit FM radio stations operating in digital mode to operate with asymmetric digital sideband power levels (the “Asymmetric Sideband Proposal”).¹

The Asymmetric Sideband Proposal would allow numerous FM stations, whose digital power levels are currently limited by the requirement that they operate with equal, symmetric digital sideband power levels, to increase their digital coverage area and fill in locations where they currently experience service gaps without the creation of harmful interference to first adjacent stations.

¹ *Comment Sought on Request for FM Asymmetric Sideband Operation and Associated Technical Studies*, FCC 99-325 (rel. Nov. 1, 2011) (the “Public Notice”).

As discussed by the Joint Parties in their earlier Comments, the Media Bureau's January 2010 Order allowed all FM stations to voluntarily increase their digital effective radiated power levels by 6 dB (from -20 dBc to -14 dBc), with some stations permitted to increase their digital power by as much as 10 dB (to -10 dBc), depending on distance separations from first-adjacent stations (the "HD Radio Power Increase"). In many instances, the Asymmetric Sideband Proposal would allow those stations whose digital power levels are currently limited by the geographic proximity of a first-adjacent station to take additional advantage of the HD Power Increase, thereby improving digital service to the public. The Asymmetric Sideband Proposal would permit this by allowing those power-limited FM stations to increase the digital power level of the digital sideband furthest from the currently-limiting first-adjacent station's frequency. This power increase opportunity would provide the benefits of increased digital power operation while continuing to protect first-adjacent stations from harmful interference.

The reports previously submitted by iBiquity and NPR in support of the Asymmetric Sideband Proposal clearly demonstrate that asymmetric digital operation can allow FM stations to improve their digital signal contour and reduce the areas in which they currently experience service gaps. The HD Radio Asymmetric Sideband Laboratory Test Report, submitted in this proceeding with the Comments of iBiquity Digital Corporation, provides additional support for the Asymmetric Sideband Proposal, noting that such operation can improve the signal to noise ratio for HD Radio broadcasts.²

In these Reply Comments, the Joint Parties address Comments filed by Jonathan E. Hardis regarding the Asymmetric Sideband Proposal which allege, inter alia, that certain statements previously made by the Joint Parties in support of the 2010 HD Radio Power Increase

² *Comments of iBiquity Digital Corporation*, MM Docket No. 99-325, at 3 (submitted Dec. 19, 2011).

were false.³ Specifically, Mr. Hardis attempts to dispute the Joint Parties' assertion that digital signals operating at a -10dBc pursuant to the HD Radio Power Increase would remain in compliance with the FCC's existing FM emissions mask.⁴ However, it is Mr. Hardis who is incorrect.

As reflected by the attached Engineering Statement submitted by numerous extremely prominent engineers whose qualifications are well known to the Commission, Mr. Hardis' claims are based on an incorrect reading of FM emissions mask requirements, as set forth in Section 73.317 of the Commission's Rules.⁵ Specifically, the Engineering Statement demonstrates that Mr. Hardis has incorrectly attempted to re-interpret the FM emissions mask rule as applying to a set of aggregated, multiple emissions within a particular bandwidth.

However, rather than measuring the aggregated channels removed from the relevant carrier by between 120 kHz and 240 kHz, the FM emissions mask is properly applied to "any emission" in that frequency. As a result, contrary to Mr. Hardis' assertion, the Joint Parties were correct to state that HD Radio operation at the -10 dB power level comply with the Commission's FM emissions mask. The accuracy of the interpretation advanced by the Joint Parties is reflected by the historical practice of the FCC and the broadcast engineering community.

The comments and studies submitted in response to the Asymmetric Sideband Proposal provide overwhelming support for the adoption of the proposal and demonstrate the benefits it will provide to digital FM performance while protecting first adjacent stations from harmful

³ *Comments, Jonathan E. Hardis*, MM Docket No. 99-325, at 6 (submitted Dec. 19, 2011).

⁴ *Id.*

⁵ 47 C.F.R. § 73.317.

interference. Accordingly, the Joint Parties respectfully encourage the Commission to adopt the proposal and implement it as soon as is practicable.

Respectfully submitted,

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Continental Electronics Corp.
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Engineering Statement

Section 73.317 of the FCC's rules, which addresses out of band emissions (OBE), provides for generous levels of OBE because the FM transmission systems that existed at the time the rule was adopted had far greater levels of OBE than current FM transmission equipment. The FCC's allocations and distance spacing between stations was based on the 73.317 mask and the ability of the then current generation of receivers to reject adjacent and co channel interference.

Taken together, the generosity of the mask established by Section 73.317 of the Commission's rules, older receiver designs, and the resultant station distance spacing separations have allowed for the introduction of an FM IBOC service.

Section 73.317 of the Commission's rules states:

(b) Any emission appearing on a frequency removed from the carrier by between 120 kHz and 240 kHz inclusive must be attenuated at least 25 dB below the level of the unmodulated carrier (dBc). Compliance with this requirement will be deemed to show the occupied bandwidth to be 240 kHz or less.

The rule uses the term "any emission," in the singular, as it was the Commission's anticipation that there would be multiple spurious emissions within this region and the amplitude of each of these spurious emissions was not to exceed -25 dBc. While the concept of summing multiple signals into a total power level was mathematically possible at the time the rule was adopted, the ability to make such measurements in the real world was likely not technically possible and did not come into common use until actual digital transmissions were initiated¹.

The filings made in this proceeding by Jonathan E. Hardis reimagine Section 73.317 by using Total Power Spectral Density (PSD) as the basis of his arguments. Under his interpretation of this rule, Hardis contends that the IBOC power is 5 dB higher than the -25 dBc mask. However, the traditional understanding and practice of the FCC and broadcast engineering community has been to treat each spurious emission as a separate entity with each IBOC carrier, as defined by the iBiquity specification, to be at -45.8 dBc² or 20.8 dB below the mask.

¹ In the early part of the 21st century modern, reasonably priced spectrum analyzers with the ability to add up the sum of multiple signals within a given bandwidth became available.

² The IBOC system consists of 382 carriers at -45.8 dBc when summed equal -20 dBc.

The FCC rule, to reflect Hardis' reinterpretation, would have to be rewritten as follows:

(b) The sum of all emissions appearing on a frequency removed from the carrier by between 120 kHz and 240 kHz inclusive must be attenuated at least 25 dB below the level of the unmodulated carrier (dBc).

Although the concept of PSD may have been known at the time Section 73.317 was adopted, the understanding and practice by the FCC and the broadcast engineering community has been to treat each spurious emission as a separate entity, with compliance with the rule determined to be met if each and any individual emission observed is at least -25 dB below the carrier.

Signed:

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