

March 5, 2004

Ms. Marlene H. Dortch
Secretary
Federal Communications Commission
445 Twelfth Street, S.W.
Washington, D.C. 20554

Re: MM Docket No. 99-325

Dear Ms. Dortch:

The National Association of Broadcasters (“NAB”) hereby submits these recommendations concerning nighttime operation of AM In-Band/On-Channel (“IBOC”) digital radio. This action follows completion of the work of an ad-hoc technical group of broadcast engineers convened by NAB to consider this issue and consideration of this issue by NAB’s Radio Board. Our Radio Board is very optimistic that AM IBOC will offer AM broadcasters and their listeners near FM-quality within broadcasters’ core service areas. Our recommendations here are based on and reference iBiquity Digital Corporation’s technical reports on AM IBOC nighttime service to be submitted very shortly to the Commission by iBiquity as part of this docket.

As is discussed below, NAB recommends that the FCC extend the current interim authorization for IBOC service to permit nighttime AM broadcasts. Moreover, NAB recommends that the Commission extend this nighttime authorization to all AM stations currently authorized for nighttime broadcasts. Further, NAB recommends that the Commission establish nighttime authorization on a blanket basis for all digital AM stations rather than requiring broadcasters to seek a separate nighttime authorization. Finally, NAB recognizes that the commencement of nighttime AM IBOC broadcasts may create new instances of interference in certain situations, and notes that the recommendations made for authorization of this service include Commission action to use its existing authority to address instances of unexpected levels of interference on a case-by-case basis.

NAB believes that the benefits to be gained for AM broadcasters and AM listeners will prove to far outweigh the limited additional interference predicted by iBiquity’s studies. The First Report and Order in this proceeding reached a similar conclusion, finding that “some additional interference outside a station’s protected

contour is an acceptable tradeoff given the larger public interest benefits at stake.”¹ All in all, and as the First Report and Order in this proceeding found the record evidence suggested,² AM IBOC, including nighttime operation, promises to provide a richly enhanced listening experience and a revitalization of the AM service.

A. Introduction

Following the Commission’s 2002 *Report and Order* authorizing stations to commence digital broadcasts limited AM IBOC to daytime service, NAB formed an Ad-hoc Technical Group on AM IBOC Nighttime Performance (“Technical Group”) with the goals of advising iBiquity Digital Corporation on its plans for further simulation and testing of AM IBOC at night, and of reviewing the reports and data resulting from iBiquity’s investigations. Although the Technical Group did not develop formal test procedures, it provided iBiquity with advice on the structure of analytical studies and field tests iBiquity proposed. Moreover, Technical Group members participated in the field tests by providing stations for testing, participating as observers during the collection of audio recordings and participating in the subjective evaluation program.

The Technical Group reviewed the following three formal submissions from iBiquity:

- 1) An analytical study of the impact of AM IBOC on nighttime analog broadcasts;³
- 2) Field trials of nighttime AM IBOC on two Class A stations and subjective evaluations of the impact of IBOC on nighttime analog broadcasts;⁴ and
- 3) Field performance test results providing nighttime digital coverage information.⁵

Based on these documents, discussions of the Technical Group, and other working documents prepared by iBiquity and other participants, the Technical Group concluded that the advantages of nighttime IBOC operation were substantial. The Technical Group recognized, however, that there will be instances of interference from the introduction of IBOC in the severely interference constricted nighttime AM band. However, the Technical Group concluded that these instances of interference should not impede the widespread rollout of nighttime AM IBOC. The Technical Group

¹ *Digital Audio Broadcasting Systems and Their Impact on the Terrestrial Radio Broadcast Service*, MM Docket No. 99-325, *Report and Order* (Oct. 11, 2002) at 15.

² *Id.* at 26.

³ “AM Nighttime Compatibility Study,” iBiquity Digital Corporation, May 23, 2003.

⁴ “Field Report AM Nighttime Compatibility,” iBiquity Digital Corporation, October 31, 2003.

⁵ “Field Report AM Nighttime Performance,” iBiquity Digital Corporation, October 20, 2003.

recommended that the NAB endorse nighttime AM IBOC service with the provision that the FCC should address instances of unanticipated interference on a case-by-case basis.

B. Review of the Tests and Study Results

The tests and studies conducted by iBiquity demonstrated the IBOC system can be expected to provide digital service at night to the core market served by existing analog AM broadcasts. The results also showed that, in the majority of circumstances, any interference to existing groundwave analog broadcasts will occur at the edge of coverage and is not expected to impact a station's core listenership.

iBiquity's analytical compatibility study was designed to assess the impact of groundwave and skywave IBOC signals on analog groundwave service assuming a worst case scenario when all stations in North America have converted to digital broadcasting. Its study concluded that, in most cases, any impact from IBOC is restricted to the fringe area outside a station's Nighttime Interference Free contour ("NIF").⁶ The study confirmed that for most AM stations, existing levels of analog co-channel interference are the limiting factors in AM nighttime coverage. For these stations, the levels of co-channel interference exceed the levels of IBOC interference and mask the IBOC signal. The iBiquity study found this masking to be most apparent for Class C channels. Introduction of IBOC on adjacent channels was found to have little impact on the already constricted service areas of those stations.⁷

For Class A stations, the iBiquity study portrays a somewhat different situation. Class A stations lack significant co-channel interferers, so there is limited potential to mask IBOC interference. However, Class A stations generally are adjacent to other Class A stations. As a result, there may be only one or two adjacent channel stations introducing IBOC interference to a Class A station.

Where stations with large coverage areas are adjacent to crowded local channels, the iBiquity study found the introduction of IBOC on all the local stations would increase the noise floor and impact the large coverage area of the adjacent channel station. Even under this scenario, however, the impact is on the outer coverage area rather than in an area of core listenership.⁸

In the field trials, iBiquity considered the impact of groundwave and skywave IBOC on both groundwave and skywave analog broadcasts, using two Class A stations. The field trials found that, for these two stations, the introduction of IBOC skywave has a limited impact on analog groundwave service. The field trials confirmed that the area of impact is on the fringe of coverage well outside the NIF contour. Similarly, the field trials found a minimal impact from groundwave IBOC interference to analog skywave

⁶ AM Nighttime Compatibility Study at 2.

⁷ *Id.* at 3.

⁸ *Id.* at 3-4.

service. In that case, the impact is a ring around the edge of the digital station's coverage area. The field trials found IBOC skywave's impact on distant analog skywave to be the most likely area of significant impact. There, the studies showed some reduction in the availability of distant skywave service, although that service would not be eliminated. Given the variable and inconsistent nature of distant skywave service already, the Technical Group concluded that the improvement in local AM service was well worth the reduction in distant service.

The Technical Group concluded that the field trials, when combined with the analytical study, provided sufficient support for endorsing nighttime AM IBOC service with the proviso that the FCC would address unexpected interference.

The Technical Group also considered the extent of AM IBOC performance. In this case, the group relied primarily on field test performance data from two Class A stations and field observations of several members of the Technical Group that had primary experience with nighttime AM IBOC service. The Technical Group concluded that the high levels of nighttime AM analog interference limit the range of AM IBOC coverage. However, the Technical Group concluded the digital coverage was substantial enough to proceed with nighttime digital service as long as the FCC would address unanticipated reductions in stations' analog service.

C. Radio Board Endorsement

Based on the work of the Technical Group and the subsequent recommendation of NAB's Digital Radio Committee, the NAB Radio Board endorsed the following resolution of the Digital Radio Committee at its January 20, 2004 meeting:

- The dramatically improved audio quality from IBOC service at night is well worth the predicted and limited reductions in analog coverage;
- The FCC should therefore authorize nighttime AM IBOC service on an interim basis; and
- In the event that there are reductions in stations' primary nighttime analog service areas beyond those predicted by the studies, the FCC should take steps to address those problems.

The NAB Radio Board recognizes that any additional interference that may be produced by the introduction of IBOC at night will primarily impact distant skywave signals. The Board believes that the improvements promised by IBOC for local AM listeners is well worth a tradeoff of far distant skywave signal coverage.

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D. Conclusion

For the foregoing reasons, NAB encourages the Commission to authorize AM broadcasters to commence nighttime IBOC broadcasts with appropriate interference resolution mechanisms. NAB further encourages the Commission to extend this authorization to all AM broadcasters licensed for nighttime analog services without the need for individual station authorizations. This will allow AM broadcasters to better understand the opportunities and challenges of IBOC and it will provide incentive for receiver manufacturers to market IBOC receivers.

Respectfully submitted,

A handwritten signature in black ink, appearing to read "Jack N. Goodman". The signature is written in a cursive, flowing style.

Jack N. Goodman