

**Before the
Federal Communications Commission
Washington, D.C. 20554**

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

**Reply Comments of
iBiquity Digital Corporation**

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Summary

In these Reply Comments, iBiquity encourages the Commission to proceed with an intermediate 6 dB power increase and a subsequent full 10 dB power increase for digital FM radio. iBiquity also argues that the introduction of new portable products this summer and fall has added new urgency to its request to increase power and urges the Commission to proceed immediately with the intermediate power increase rather than waiting until the completion of additional NPR testing. iBiquity further notes that it is unlikely that any NPR test results will be available until later this year, making it doubtful that any additional NPR input could be used by the Commission in time to implement a power increase this year.

The Commission should proceed with the across-the-board power increase iBiquity and the Joint Parties have advocated. NPR's alternative methodology using minimum separation distances and protection contours would restrict any power increase to the limited number of stations that exceed the Commission's minimum spacing and contour protection requirements. iBiquity and the Joint Commenters have shown few stations meet this criteria in major markets. NPR advocates an overly restrictive approach that would prevent any meaningful power increase from being implemented in the most populous regions of the country. These restrictions would impede a power increase in both the reserved and nonreserved portions of the FM band. The record in this proceeding demonstrates strong support for an across-the-board power increase and the feasibility of implementing such a power increase without causing harmful interference to analog stations in the vast majority of cases.

iBiquity's also believes SCA testing is not required in order to implement a power increase. There is little chance of first adjacent interference to SCA signals due to the limited coverage of SCA services. Any concerns about host interference to SCA signals can be managed

by the host station without the need for Commission regulation. iBiquity also notes that alternatives to a power increase, such as asymmetrical sidebands and single frequency networks are not commercially available features and cannot be implemented in the near future. Finally, iBiquity encourages the Commission to rely on its existing complaint procedures to address any interference concerns rather than implementing new administrative procedures.

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iBiquity Digital Corporation (“iBiquity”), by counsel, respectfully submits these reply comments in accordance with the Media Bureau’s recent Public Notice in this proceeding.¹ As is discussed below, iBiquity believes a digital power increase will enable broadcasters to deliver the full benefit of HD Radio™ technology to the largest possible audience while maintaining the integrity of existing analog FM signals. iBiquity therefore urges the Commission to authorize immediately a power increase of up to 6 dB for digital FM stations and to expeditiously consider the Joint Parties Request to increase digital power up to 10 dB.

In the most recent comments in this proceeding, there continues to be a consensus that a power increase will create a more robust digital FM service able to replicate analog FM coverage and enable in-building listening. The commercial broadcasters, through the comments of the Joint Commenters and the National Association of Broadcasters (“NAB”), emphasize that “the extensive field tests conducted at elevated HD Radio digital power levels found that increases up

¹ See *Comments Sought on Specific Issues Regarding Joint Parties Request for FM Digital Power Increase and Associated Technical Studies*, DA 09-1127, *Public Notice*, MM Docket No. 99-325 (May 22, 2009)(“Second Public Notice”).

to -10 dB would not result in harmful interference to adjacent analog signals.”² Based on the enormous investment that commercial broadcasters have in analog radio and the possible impact of the proposed power increase on this investment, it is impossible to ignore the fact that commercial radio operators are prepared today to increase the power of digital FM radio stations. This demonstrates the need for the power increase and the validity of the underlying technical basis to support the power increase.

I. The Commission Should Authorize the 6 dB Power Increase Prior to Obtaining NPR’s Report on Additional Testing

Although National Public Radio (“NPR”) and a number of other parties have asked the Commission to postpone a decision on a power increase until NPR completes additional testing, the record in this proceeding amply supports immediate action authorizing a power increase. iBiquity agrees with NPR’s key assertion that it wants a power increase “provided it does not cause harmful interference to analog radio services”³ The record in this proceeding contains sufficient evidence of the need for a power increase, strong industry support for a power increase and real-world field testing demonstrating the viability of a 10 dB power increase without causing harmful interference to analog in the vast majority of cases. NPR’s comments acknowledge the need for an immediate power increase. The question now is how to structure the appropriate authorization.

iBiquity does not share NPR’s concern that the proposed power increase will cause harmful interference to first adjacent analog radio stations nor does iBiquity agree with the other positions NPR and its supporters have advocated: (i) NPR supports a per station analysis rather

² See Comments (of the Joint Commenters), MM Docket No. 99-325, dated July 6, 2009 at 8. See also Comments of The National Association of Broadcasters, MM Docket No. 99-325, dated July 6, 2009.

³ Comments of National Public Radio, Inc., MM Docket No. 99-325, dated July 6, 2009 at 2 (“NPR Comments”).

than an across-the-board approach to a power increase; (ii) NPR believes there is no urgency for the Commission to make a decision about a power increase and that there is sufficient time to wait for additional test data NPR expects to have by early September; (iii) NPR believes SCA testing is a precondition to approving a power increase and (iv) NPR advocates alternative solutions other than a power increase. As is discussed in detail below, the Commission should set aside these concerns and focus on implementing a near-term power increase to enhance digital FM coverage.

A. An Across-the-Board Approach is Preferable to a Per Station Approach.

iBiquity believes an across-the-board approach to a power increase offers the benefits of greater predictability, reduced regulatory burdens and lower administrative costs than a per station approach. iBiquity disagrees with NPR's view that a per station approach is more consistent with the Commission's existing regulations and would provide greater protections for analog broadcasting.⁴ NPR's arguments about the need for a per station analysis could have applied equally to the Commission's 2002 decision to authorize the existing FM power levels, but NPR never objected to an across-the-board power level at -20 dBc. In fact, NPR was an active proponent of the Commission's 2002 authorization of digital broadcasting.⁵ It is unclear why NPR now characterizes all across-the-board approaches as something that "cannot be reconciled with how the Commission historically has allocated radio broadcast facilities."⁶ When regulating HD Radio technology, the Commission historically has favored an across-the-board approach and rejected calls for station-by-station licensing.

⁴ *Id.* at 3.

⁵ Comments of National Public Radio, Inc., MM Docket No. 99-325, dated Feb. 19, 2002.

⁶ NPR Comments at 3.

NPR's proposal for a station-by-station licensing regime presents significant problems. Although NPR presents a proposal for stations in the nonreserved band based on minimum distance separations and for stations in the reserved band based on contour protections, the net result is the same. Under the NPR proposal only the limited number of stations that exceed minimum spacing or contour protections would be able to increase digital power. Moreover, any such increase would be in proportion to the degree that the station exceeds the FCC's minimum spacing or contour requirements.

In answer to questions iBiquity presented to NPR after filing of the NPR Comments, NPR supplied iBiquity with a draft table (attached hereto as Attachment A) illustrating the minimum distance separation approach NPR is advocating. iBiquity acknowledges this table is a draft and may not reflect NPR's final thinking, but it provides useful insight into the details of the approach advocated in the NPR Comments. In all cases, a power increase is not available unless the stations exceed minimum separation requirements. For example, as can be seen in the NPR table, a Class B station with a Class B first adjacent interferer would have to have 169 km separation to operate at -20 dBc. This is the minimum spacing specified by the FCC's Rules.⁷ To increase by 6 dB and operate at -14 dBc, however, there would need to be 199 km separation, a 20% increase above the specified minimum spacing for these stations. A full 10 dB increase would require 222 km separation. In reality, few stations would meet these criteria.

The Joint Parties Request assumed that properly spaced stations meeting the minimum FCC spacing requirements (or stations meeting the minimum contour protections) would be afforded the ability to increase power up to the -10 dBc level. iBiquity's recent comments

⁷ 47 C.F.R. § 73.207(b)(1) Table A.

applied the same logic but specified an intermediate increase of up to 6 dB to a -14 dBc level.⁸ NPR has turned this logic on its head and specified that stations meeting the minimum spacing or contour protection requirements are limited to the existing -20 dBc level. Only stations exceeding the minimums would be able to increase power. This approach would mean that virtually no stations in metropolitan markets, where the majority of listeners are located and where short spacing or failing to meet the minimum contour protections is the rule not the exception, would be able to increase power. In fact, applying NPR's logic, most stations in metropolitan markets should not be allowed to operate at -20 dBc, notwithstanding the fact that they are not causing any harmful interference. Following the NPR approach would mean that the majority of the population served by radio in this country would be denied any benefit from the power increase.

Stations operating at -20 dBc today, even those that are short spaced or that fail to meet the contour protection requirements, are not causing harmful interference to analog. All these stations, not just those that exceed the Commission's minimum spacing requirements, should be allowed to increase power. To the extent that the Commission believes it needs to implement any special protections to take into account short spacings or failures to adhere to contour protections, the Commission should start with the presumption of a 10 dB power increase (or 6 dB increase as an intermediate step) and impose a prorate reduction from that point. The Commission should not start from the presumption that properly spaced stations are limited to -20 dBc.

The Reply Comments of the Joint Commenters contain an analysis of several markets using the NPR distance separation criteria for a power increase. That analysis highlights that in

⁸ Comments of iBiquity Digital Corporation, MM Docket No. 99-324, dated July 6, 2009.

metropolitan markets the NPR approach would preclude virtually all nonreserved band stations from any power increase. For example, in the New York market, no station would be able to increase power from the current -20 dBc level. A similar result would be obtained using the contour protection approach NPR advocated for the reserved band. In the case of New York, only two of the seven stations in the reserved band would be eligible for any power increase and one of those two stations would be limited to a 3 dB increase. In Washington, D.C., only one of five stations in the reserved band would be eligible for any power increase, and that station would be limited to a 4 dB increase.⁹ Thus, in both the reserved and nonreserved band, the NPR approach would preclude any useful power increase.

Attachment C contains a technical analysis applying the NPR distance separation methodology to all the stations that have been used for high power testing. There has been no bona fide interference documented or reported from any of these stations, even for those that have operated at -10 dBc for over a year. Nonetheless, in all these cases, the NPR formulation would have prohibited any power increase. Taken to its logical conclusion, the NPR approach would prohibit all short spaced stations from operating at the existing -20 dBc digital power level. The Commission and the industry have rejected those types of unnecessary restrictions on digital operations. The experience of almost 2,000 stations broadcasting digitally for several years with essentially no interference has demonstrated, contrary to NPR's assertions, there is virtually no danger of IBOC interference even where NPR's models indicate extensive interference risk.

⁹ A more detailed analysis of the reserved band stations in the New York and Washington, D.C. markets is contained in Attachment B.

iBiquity also finds NPR's complaints about the "white noise" quality of IBOC interference particularly problematic.¹⁰ The fact that any potential IBOC interference blends in with other interference in the FM band is one of the benefits of the technology and an aspect of the technology that makes HD Radio broadcasting more acceptable to users. iBiquity believes NPR's real objection is the potential for interference outside the protected contour.¹¹ However, the Commission has repeatedly rejected concerns based on interference outside the protected contour.

NPR notes in its comments that its concerns and recommendations are based on the results of the DRCIA study NPR conducted in 2008.¹² Notwithstanding NPR's assertion in its comments that the DRCIA study has "yet to be challenged on technical grounds,"¹³ iBiquity has repeatedly expressed to the Commission and the broadcast community iBiquity's detailed technical concerns about the DRCIA study's lack of field tests and overstatement of the potential for digital interference. Shortly after release of the DRCIA study, iBiquity and a number of commercial broadcasters conducted a private briefing at NPR's facilities presenting NPR's engineering and legal staff with detailed technical questions and concerns about NPR's methodology and analysis. As iBiquity has repeatedly pointed out, the DRCIA laboratory study predicts extensive interference at the existing -20 dBc power level, but this interference has not been found in the real world. There is no reason to have any greater confidence in the accuracy of the DRCIA study's conclusions about interference at -10 dBc.

¹⁰ NPR Comments at 4.

¹¹ *Id.* at 4 ("even more serious disruption to listeners who tune in beyond protected contours").

¹² National Public Radio Final Report to Corporation for Public Broadcasting, Digital Radio Coverage & Interference Analysis (DRCIA) Research Project, July 9, 2008.

¹³ NPR Comments at 3.

An across-the-board approach has the advantage of providing stations with greater certainty about what can be authorized and avoids the need for lengthy, time consuming and potentially costly engineering studies demonstrating each station's interference situation. The field tests iBiquity and the Joint Parties conducted have established a technical record to support an across-the-board power increase and identified the areas of greatest potential concern that require a stricter regulatory approach. iBiquity finds NPR's criticism of the use of fixed locations in iBiquity's studies unpersuasive.¹⁴ The methodology used in iBiquity's high power studies was identical to the methodology used in the -20 dBc digital testing that was analyzed and endorsed by both NPR and the full National Radio Systems Committee.¹⁵ The Commission has correctly found iBiquity's testing to be reliable, and years of commercial implementations have demonstrated the conservative nature of the iBiquity tests. If there is any criticism of the iBiquity test program at -20 dBc, it should be that those tests overstated the potential for IBOC interference when compared with the real world experience since 2002. There is no reason to believe the testing at -10 dBc suddenly understates the potential for digital interference.

B. There is an Urgent Need for a Power Increase, and Waiting for Further NPR Input Will Cause Unnecessary Delay.

There is ample evidence in the record that there is an urgent need for a power increase to support the introduction of new HD Radio products, and iBiquity believes it will take much longer than two months to receive the results of NPR's latest tests. Contrary to NPR's assertions, there is an urgent need to support the introduction of new portable HD Radio

¹⁴ *Id.* at 5.

¹⁵ Evaluation of the iBiquity Digital Corporation IBOC System, Part 1 – FM IBOC, Report from the Evaluation Working Group, National Radio Systems Committee, adopted Nov. 29, 2001. NPR was a voting member of the NRSC at the time of the NRSC adoption of the report, was present at the November 29, 2001 meeting adopting the report and voted in favor of adoption. Minutes, National Radio Systems Committee, DAB Subcommittee, dated November 29, 2001.

products. Less than one week ago, Best Buy began selling the first portable HD Radio receiver in a nationwide launch.¹⁶ This product introduction will be supported by a large radio advertising campaign being coordinated by the HD Radio Alliance.¹⁷ The initial reviews of the product have been quite positive,¹⁸ but strong consumer satisfaction will be a key to expanding the portable device market. iBiquity also anticipates a positive reaction to the introduction of the Zune HD currently scheduled for September. However, one recent review already noted a problem with coverage for the new portable device.¹⁹ The immediate increase in digital power iBiquity and the Joint Parties have proposed will help ensure better FM coverage and enhance the consumer experience with these portable products. This is vitally important during the initial roll-out phase of these products when consumer opinions about these devices will first be formed.

iBiquity also notes its concern extends beyond these two portable products. Automobile manufacturers and receiver manufacturers are planning future product introductions based on the currently authorized power level for the system and resulting digital coverage. A delay of the power increase by even a few months may postpone any increase in digital coverage until after the deadline for product planning decisions for 2011 or 2012. If that occurs, products are not

¹⁶ *Best Buy Releases First-Ever Portable HD Radio Receiver*, Press Release dated July 13, 2009 available at http://www.bestbuyinc.com/news_center/07-13-09/best-buy%C2%AE-releases-first-ever-portable-hd-radio-receiver.

¹⁷ *See HD Radio Advertising . . . the upgrade adventure continues!*, Press Release dated June 23, 2009 available at http://www.hdradio.com/press_room.php?newscontent=366.

¹⁸ *See e.g. Best Buy releases first-ever portable HD Radio receiver*, RBR.com, dated July 10, 2009 available at <http://www.rbr.com/radio/ENGINEERING/95/15723.html>.

¹⁹ Baig, *Sirius XM Premium, portable Insignia HD Radio hit flat note*, USA Today, July 16, 2009 available at http://www.usatoday.com/tech/columnist/edwardbaig/2009-07-15-hd-radio-review-sirius-insignia-baig_N.htm.

delayed by a single month or two. It may be a full year before that manufacturer will reconsider the product launch.

iBiquity also believes it is unlikely that the new NPR test information will be available by early September. Despite NPR's best intentions and aspirations, it is unlikely that the testing can be completed and results prepared for presentation to the Commission in less than two months. At this point, NPR has only just run a "pilot" test required in order to validate and design the actual test program. NPR has to present those pilot test results to its peer review group before proceeding with actual testing, although preliminary results have indicated significant changes in the original test program will be required before the tests can be completed. Although NPR has provided its review group with a high level overview of the test program, detailed test procedures have not yet been prepared or reviewed by the oversight group. All these steps need to be completed before testing can begin. Today there is no agreement on test procedures, test bed configuration, audio samples, test conditions or any other definitive aspect of the test program.

NPR also has not taken into account the likelihood of unforeseen delays in the test program. After years of testing digital radio, iBiquity feels confident in its view that testing always takes much longer than planned. For example, the first field audio samples for the NPR pilot were not usable due to improper equipment configurations and problematic atmospheric conditions. Those audio samples had to be rerecorded after a two week delay. Even if NPR is able to finish data collection in the next six weeks, the test results must be presented to the review group and be approved by the study's sponsors at the Corporation for Public Broadcasting before anything can be presented to the Commission. Based on the multi-month delays the industry experienced before release of NPR's DRCIA study, iBiquity finds it impossible to anticipate that useful information will be available to the FCC or the industry in a

matter of a few weeks. iBiquity believes it is much more likely that useful information will not become available until the end of this year at the earliest.

iBiquity also notes there is no consensus within the review group that the NPR test program will provide information that will resolve any of the questions NPR has raised. The heart of the test program is a mobile test where participants will listen to prerecorded audio while riding in a car. The review group has expressed numerous concerns about the test program to NPR, which concerns have not been resolved. For example, the test material will be generated in a lab rather than gathered in the field, so it is unclear if it will be truly representative of a real world listener experience. The testing will be limited to the audio environment of one or two vehicles rather than giving a comprehensive view of mobile listening. Finally, because the test subject will not be driving the car, the test will not be able to take into account the impact of driver concentration on any driver perceptions of audio impairments. Due to the uniqueness of this new testing program, iBiquity cannot predict with any accuracy whether or not the test program will produce useful input to the Commission.

Based on the urgent need for Commission action and the lack of clarity about the timing or value of the output of the NPR test program, iBiquity strongly encourages the Commission to move forward with an intermediate power increase pending receipt of further input from NPR. Any delay will only penalize listeners and decrease the potential for strong consumer acceptance of the new products being introduced this summer and fall.

C. SCA Testing is Not Required to Approve a Power Increase.

Previous testing has confirmed that HD Radio broadcasting does not cause harmful interference to first adjacent analog SCA broadcasts,²⁰ and there is no evidence that this analysis

²⁰ Further Report on Analog SCA Compatibility with iBiquity Digital's FM-IBOC System, Tests Performed at the Advanced Television Technology Center, dated March 2002; Advanced Television Technology

would change due to a power increase. iBiquity is a strong supporter of radio reading services and other accessibility services that make use of analog SCAs and has worked for many years to minimize any impact HD Radio broadcasting may have on those services. Based on its experience with SCA services and the limited coverage area of those services, iBiquity is confident HD Radio broadcasts, even at a -10 dBc power level, will not degrade first adjacent SCA services.

It is well understood that analog SCAs do not extend throughout the entire protected contour of a station. In a typical Class B station, it would be expected that useful SCA services would be limited to the 60 or 65 dB contour. Because this area is well within the host station's protected contour and much closer to the host station's analog transmitter than the first adjacent digital signal, there is little risk of interference from the first adjacent digital signal. The only valid concern could be the potential impact from the host station's digital signal to the host station's SCA service. But this issue is wholly within the control of the host station and should not require Commission regulation. If a station is hosting an important SCA service and finds that the digital signal is impacting the analog service, the host station can elect to forego a power increase or can elect to increase power by less than 10 dB. But there is no need for the Commission to delay consideration of a power increase in order to address this issue. All stations hosting SCA services already have all the tools necessary to analyze and address any host interference problems that may arise.

D. Alternative Approaches Such as Asymmetrical Sidebands Cannot Offer a Near-Term Solution.

Although NPR offers several suggestions for alternatives to a power increase, these options are not implementable in a reasonable time frame. NPR has suggested the use of

Center, Supplementary Analog SCA Compatibility Tests, Summary of Results, Document No. 02-16, dated April 2002.

asymmetrical sidebands and single frequency networks as an alternative to a power increase.²¹ Although these may be viable options in the long run for certain stations, iBiquity notes these capabilities currently are not implemented in commercially available HD Radio hardware and do not offer a near-term solution for improving HD Radio coverage. Although iBiquity continues to work on developing these capabilities and other enhancements, a power increase remains the best way to improve HD Radio coverage in a reasonable timeframe.

II. The Commission's Complaint Process is an Appropriate Mechanism to Address Any Interference Issues from a Power Increase

Any interference issues that arise from a power increase can be addressed on a case-by-case basis under the Commission's existing rules and do not require new rules or procedures. Several of the comments make passing reference to anecdotal evidence of digital interference.²² However, most of these references appear to express concern about interference outside the protected contour, interference that the Commission's Rules do not restrict. To date, as far as iBiquity is aware, there have been no legitimate complaints of FM digital interference that have required Commission action. iBiquity recognizes there may be some isolated incidents where interference occurs, but generally any such interference is at the edge of the protected contour. The situation of KRRN-FM²³ is a good example of the isolated incidents iBiquity and the broadcast community have always anticipated. KRRN-FM is a classic "rim shot" attempting to reach the Las Vegas market but not quite covering the metropolitan area within its protected contour. It also has a second adjacent located in Las Vegas, in the direction that KRRN-FM is attempting to reach. This is precisely the type of situation that iBiquity and the NRSC identified

²¹ NPR Comments at 14.

²² See e.g. Comments of Educational Media Foundation, MM Docket No. 99-325 dated July 6, 2009 at 2.

²³ See Comments of Entravision Holdings, LLC., MM Docket No. 99-325, dated July 2, 2009.

as the most likely to result in some level of interference at the edge of coverage. However, this type of isolated incident should not stand in the way of a comprehensive power increase for most stations. To the extent that the Commission believes a station such as KRRN-FM might be entitled to special protection, the Commission's existing rules provide a mechanism for addressing the station's concerns. The Commission does not need to delay a power increase for the entire FM industry in order to address isolated incidents.

III. Conclusion

iBiquity, the broadcasters, manufacturers and consumers have all made a substantial investment in HD Radio technology. Prompt approval of an interim 6 dB power increase and subsequent approval of a 10 dB increase will enhance this existing investment and ensure that listeners are able to reap the promise of radio's transition to digital. As discussed above, NPR also recognizes the need for an interim solution to insure a robust HD Radio service. However, the solution proposed by NPR is unworkable and must be rejected. Commercial broadcasters are confident that the existing technical studies in the record in this proceeding demonstrate that first adjacent FM stations will not be impaired by a 6 or 10 dB power increase. The commercial broadcasters have billions of dollars in investment that would be most at risk if the power increase results in harmful interference. The fact that commercial broadcasters are prepared to immediately adopt the Joint Parties proposal demonstrates the viability of the power increase.

For the foregoing reasons, iBiquity Digital Corporation urges the Commission to authorize an intermediate power increase of 6 dB and work toward authorization of a full 10 dB increase.

Respectfully submitted,

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Attachment A

NPR Draft Distance Separation Analysis

Interim Allowable IBOC Power and Distance Separation Table

Protected Class	Interferer Class	F(50,50) Service Contour (km)	-20dBc & 1st Adj. Min. Sep. Dist. (km)	Intf. To Srv. Cont. Dist (km)	F(50,10) Interf. at Srv. Cont. (dBu)	-18dBc IBOC Allowable Field (dBu)	-18dBc Dist. To Prot. Ctr. (km)	-18dBc Min. Sep. Dist. (km)	-16dBc Allowable Field (dBu)	-16dBc Dist. To Prot. Ctr. (km)	-16dBc Min. Sep. Dist. (km)	-14dBc Allowable Field (dBu)	-14dBc Dist. To Prot. Ctr. (km)	-14dBc Min. Sep. Dist. (km)	-12dBc Allowable Field (dBu)	-12dBc Dist. To Prot. Ctr. (km)	-12dBc Min. Sep. Dist. (km)	-10dBc Allowable Field (dBu)	-10dBc Dist. To Prot. Ctr. (km)	-10dBc Min. Sep. Dist. (km)
A	A	28	72	44	53.9	51.9	49.2	77	49.9	54.5	82	47.9	59.9	88	45.9	66.1	94	43.9	72.8	101
A	B	28	113	85	51.9	49.9	91.8	120	47.9	99.1	127	45.9	107.4	135	43.9	117.3	145	41.9	128.0	156
A	B1	28	96	68	51.5	49.5	74.8	103	47.5	81.9	110	45.5	89.2	117	43.5	96.9	125	41.5	105.8	134
A	C	28	165	137	53.9	51.9	144.8	173	49.9	152.8	181	47.9	160.9	189	45.9	168.9	197	43.9	177.5	206
A	C0	28	152	124	54.0	52.0	131.9	160	50.0	139.7	168	48.0	148.6	177	46.0	158.0	186	44.0	167.2	195
A	C1	28	133	105	54.0	52.0	112.1	140	50.0	120.6	149	48.0	130.0	158	46.0	139.3	167	44.0	149.3	177
A	C2	28	106	78	54.0	52.0	84.6	113	50.0	91.4	119	48.0	98.6	127	46.0	106.8	135	44.0	116.7	145
A	C3	28	89	61	53.7	51.7	67.3	95	49.7	74.1	102	47.7	81.2	109	45.7	88.4	116	43.7	96.1	124
B1	A	45	96	51	51.2	49.2	56.3	101	47.2	61.9	107	45.2	68.3	113	43.2	75.2	120	41.2	82.3	127
B1	B	45	145	100	47.7	45.7	108.5	153	43.7	118.6	164	41.7	129.2	174	39.7	139.4	184	37.7	150.6	196
B1	B1	45	114	69	51.2	49.2	75.9	121	47.2	83.0	128	45.2	90.3	135	43.2	98.1	143	41.2	107.3	152
B1	C	45	193	148	51.1	49.1	156.1	201	47.1	164.1	209	45.1	172.2	217	43.1	181.4	226	41.1	192.0	237
B1	C0	45	180	135	51.2	49.2	143.1	188	47.2	152.4	197	45.2	161.7	207	43.2	170.8	216	41.2	180.6	226
B1	C1	45	161	116	51.0	49.0	125.1	170	47.0	134.5	179	45.0	143.9	189	43.0	154.5	200	41.0	165.8	211
B1	C2	45	134	89	50.7	48.7	96.0	141	46.7	103.8	149	44.7	113.1	158	42.7	123.7	169	40.7	134.1	179
B1	C3	45	114	69	51.2	49.2	75.9	121	47.2	83.0	128	45.2	90.3	135	43.2	98.1	143	41.2	107.3	152
B	A	65	113	48	52.3	50.3	53.3	118	48.3	58.6	124	46.3	64.6	130	44.3	71.3	136	42.3	78.2	143
B	B	65	169	104	46.7	44.7	113.3	178	42.7	123.9	189	40.7	134.3	199	38.7	144.6	210	36.7	156.8	222
B	B1	65	145	80	48.1	46.1	87.2	152	44.1	94.7	160	42.1	103.3	168	40.1	113.3	178	38.1	124.8	190
B	C	65	217	152	50.1	48.1	160.1	225	46.1	168.1	233	44.1	176.6	242	42.1	186.6	252	40.1	197.3	262
B	C0	65	214	149	47.9	45.9	158.3	223	43.9	167.5	233	41.9	176.9	242	39.9	187.6	253	37.9	198.4	263
B	C1	65	195	130	48.0	46.0	139.3	204	44.0	149.3	214	42.0	160.3	225	40.0	171.9	237	38.0	182.9	248
B	C2	65	169	104	46.7	44.7	113.3	178	42.7	123.9	189	40.7	134.3	199	38.7	144.6	210	36.7	156.8	222
B	C3	65	145	80	48.1	46.1	87.2	152	44.1	94.7	160	42.1	103.3	168	40.1	113.3	178	38.1	124.8	190
C0	A	83	152	69	45.0	43.0	75.9	159	41.0	83.0	166	39.0	90.3	173	37.0	98.1	181	35.0	107.3	190
C0	B	83	214	131	41.3	39.3	141.2	224	37.3	152.8	236	35.3	164.6	248	33.3	175.6	259	31.3	186.6	270
C0	B1	83	180	97	43.5	41.5	105.9	189	39.5	116.5	200	37.5	127.9	211	35.5	138.3	221	33.5	149.2	232
C0	C	83	220	137	53.9	51.9	144.8	228	49.9	152.8	236	47.9	160.9	244	45.9	168.9	252	43.9	177.5	261
C0	C0	83	207	124	54.0	52.0	131.9	215	50.0	139.7	223	48.0	148.6	232	46.0	158.0	241	44.0	167.2	250
C0	C1	83	196	113	51.8	49.8	121.7	205	47.8	131.1	214	45.8	140.4	223	43.8	150.6	234	41.8	161.6	245
C0	C2	83	176	93	49.6	47.6	100.4	183	45.6	108.9	192	43.6	119.1	202	41.6	129.7	213	39.6	139.9	223
C0	C3	83	163	80	48.1	46.1	87.2	170	44.1	94.7	178	42.1	103.3	186	40.1	113.3	196	38.1	124.8	208
C1	A	72	133	61	47.5	45.5	67.3	139	43.5	74.1	146	41.5	81.2	153	39.5	88.4	160	37.5	96.1	168
C1	B	72	195	123	42.8	40.8	133.4	205	38.8	143.8	216	36.8	155.8	228	34.8	167.2	239	32.8	178.3	250
C1	B1	72	161	89	45.6	43.6	96.7	169	41.6	105.6	178	39.6	116.1	188	37.6	127.5	200	35.6	138.0	210
C1	C	72	209	137	53.9	51.9	144.8	217	49.9	152.8	225	47.9	160.9	233	45.9	168.9	241	43.9	177.5	250
C1	C0	72	196	124	54.0	52.0	131.9	204	50.0	139.7	212	48.0	148.6	221	46.0	158.0	230	44.0	167.2	239
C1	C1	72	177	105	54.0	52.0	112.1	184	50.0	120.6	193	48.0	130.0	202	46.0	139.3	211	44.0	149.3	221
C1	C2	72	158	86	51.6	49.6	92.9	165	47.6	100.2	172	45.6	108.7	181	43.6	118.9	191	41.6	129.5	202
C1	C3	72	144	72	50.3	48.3	79.0	151	46.3	86.2	158	44.3	93.6	166	42.3	102.0	174	40.3	111.8	184
C2	A	52	106	54	50.1	48.1	59.4	111	46.1	65.5	117	44.1	72.2	124	42.1	79.2	131	40.1	86.4	138
C2	B	52	169	117	44.0	42.0	127.6	180	40.0	137.9	190	38.0	148.8	201	36.0	161.0	213	34.0	172.1	224
C2	B1	52	134	82	47.5	45.5	89.2	141	43.5	97.0	149	41.5	105.9	158	39.5	116.9	168	37.5	127.9	180
C2	C	52	188	136	54.1	52.1	143.8	196	50.1	151.8	204	48.1	159.8	212	46.1	167.9	220	44.1	176.3	228
C2	C0	52	176	124	54.0	52.0	131.9	184	50.0	139.7	192	48.0	148.6	201	46.0	158.0	210	44.0	167.2	219
C2	C1	52	158	106	53.7	51.7	113.3	165	49.7	122.0	174	47.7	131.4	183	45.7	140.7	193	43.7	150.9	203
C2	C2	52	130	78	54.0	52.0	84.6	137	50.0	91.4	143	48.0	98.6	151	46.0	106.8	159	44.0	116.7	169
C2	C3	52	117	65	52.4	50.4	71.7	124	48.4	78.7	131	46.4	85.9	138	44.4	93.3	145	42.4	101.6	154
C3	A	39	89	50	51.6	49.6	55.3	94	47.6	60.8	100	45.6	67.1	106	43.6	73.9	113	41.6	80.9	120
C3	B	39	145	106	46.2	44.2	115.7	155	42.2	126.3	165	40.2	136.6	176	38.2	147.3	186	36.2	159.6	199
C3	B1	39	114	75	49.5	47.5	82.1	121	45.5	89.3	128	43.5	97.1	136	41.5	106.0	145	39.5	116.6	156
C3	C	39	176	137	53.9	51.9	144.8	184	49.9	152.8	192	47.9	160.9	200	45.9	168.9	208	43.9	177.5	217
C3	C0	39	163	124	54.0	52.0	131.9	171	50.0	139.7	179	48.0	148.6	188	46.0	158.0	197	44.0	167.2	206
C3	C1	39	144	105	54.0	52.0	112.1	151	50.0	120.6	160	48.0	130.0	169	46.0	139.3	178	44.0	149.3	188
C3	C2	39	117	78	54.0	52.0	84.6	124	50.0	91.4	130	48.0	98.6	138	46.0	106.8	146	44.0	116.7	156
C3	C3	39	99	60	54.1	52.1	66.2	105	50.1	72.9	112	48.1	80.0	119	46.1	87.2	126	44.1	94.7	134
C	A	92	165	73	43.8	41.8	80.0	172	39.8	87.2	179	37.8	94.8	187	35.8	103.3	195	33.8	113.4	205
C	B	92	217	125	42.5	40.5	135.3	227	38.5	145.8	238	36.5	158.1	250	34.5	169.3	261	32.5	180.3	272
C	B1	92	193	101	42.6	40.6	110.7	203	38.6	121.9	214	36.6	132.9	225	34.6	143.2	235	32.6	154.9	247
C	C	92	241	149	50.8	48.8	157.1	249	46.8	165.1	257	44.8	173.3	265	42.8	182.7	275	40.8	193.3	285
C	C0	92	220	128	53.0	51.0	135.8	228	49.0	144.0	236	47.0	153.4	245	45.0	162.7	255	43.0	171.8	264
C	C1	92	209	117	50.8	48.8	126.2	218	46.8	135.5	228	44.8	145.1	237	42.8	155.8	248	40.8	167.2	259
C	C2	92	188	96	48.7	46.7	103.8	196	44.7	113.0	205	42.7	123.6	216	40.7	134.0	226	38.7	144.4	236
C	C3	92	176	84	46.9	44.9	91.3	183	42.9	99.3	191	40.9	108.7	201	38.9	119.7	212	36.9	130.9	223

Attachment B

Protected Contour Analysis for Reserved Band Stations

Reserved Band High Power IBOC Candidate Stations

	Station of Interest						First Adjacent Station						Hi-Power By Prediction Model				
	Call Sign	State	City	Frequency	ERP	Class	Call Sign	State	City	Frequency	ERP	Class	Dist km	Victim Protected Ctr (F5050)	IBOC Sin Fl at Victim Ctr (F5010)	Maximum IBOC Power (dBc)	Hi-Power Candidate?
New York City	WBGO	NJ	NEWARK	88.3	4500	B1	WCWP	NY	BROOKVILLE	88.1	100	A	49.26	60	57	-23	No
	WNYU-FM	NY	NEW YORK	89.1	8300	B1	WFRS	NY	SMITHTOWN	88.9	1500	A	62.1	60	54	-20	No
	WSOU	NJ	SOUTH ORANGE	89.5	2400	A	WNJY	NJ	NETCONG	89.3	520	A	41.57	60	54	-20	No
	WKCR-FM	NY	NEW YORK	89.9	630	B1	WRDR	NJ	FREEHOLD TOWNSHIP	89.7	5000	A	61.48	60	54	-20	No
	WFUV	NY	NEW YORK	90.7	46000	B	WBJB-FM	NJ	LINCROFT	90.5	900	A	65.61	60	54	-20	No
	WFMU	NJ	EAST ORANGE	91.1	1250	A	WVKR-FM	NY	POUGHKEEPSIE	91.3	3700	B1	96.6	60	43	-9	Yes
	WNYE	NY	NEW YORK	91.5	2000	B1	WVKR-FM	NY	POUGHKEEPSIE	91.3	3700	B1	98.23	60	51	-17	Yes
Washington DC	WAMU	DC	WASHINGTON	88.5	50000	B	WXPH	PA	MIDDLETOWN	88.7	7000	B	128.57	60	50	-16	Yes
	WPFW	DC	WASHINGTON	89.3	50000	B	WGMS	MD	HAGERSTOWN	89.1	900	B1	91.92	60	54	-20	No
	WCSP-FM	DC	WASHINGTON	90.1	36000	B	WPER	VA	CULPEPER	89.9	41000	B	73.27	60	54	-20	No
	WETA	DC	WASHINGTON	90.9	75000	B	WHFC	MD	BEL AIR	91.1	1100	A	104.18	60	55	-21	No
	WGTS	MD	TAKOMA PARK	91.9	23500	B	WZXH	MD	HAGERSTOWN	91.7	900	A	79.98	60	54	-20	No

The above table contains the protected contour analysis for reserved band stations in New York and Washington, D.C. Each reserved band station is shown in the left column with its most significant first adjacent station listed in the middle. Stations that currently operate digitally are highlighted in yellow. The column at the right margin (highlighted in purple) indicates whether the station would be authorized to increase power or not using the NPR criteria. The second column from the right (highlighted in green) shows the maximum digital power each station would be permitted to operate at using the NPR criteria. WFMU would be able to implement a full 10 dB increase but WNYE would be limited to a 3 dB increase and WAMU would be limited to a 4 dB increase.

Attachment C

Distance Separation Analysis for Stations Used in High Power Testing

Stations Used for High Power Testing

Station of Interest						First Adjacent Station						Hi-Power By Spacing (47 CFR 73.207)			
Call Sign	State	City	Frequency	ERP	Class	Call Sign	State	City	Frequency	ERP	Class	Dist km	Minimum 73.207 Spacing	Distance Differential (km)	Hi-Power Candidate?
WBEN-FM	PA	PHILADELPHIA	95.7	8900	B	WPLJ	NY	NEW YORK	95.5	6700	B	132.21	169	-36.79	No
WRAT	NJ	POINT PLEASANT	95.9	1450	A	WBEN-FM	PA	PHILADELPHIA	95.7	11000	B	104.3	113	-8.7	No
WJRZ-FM	NJ	MANAHAWKIN	100.1	1700	A	WHTZ	NJ	NEWARK	100.3	6000	B	107.08	113	-5.92	No
WKCI-FM	CT	HAMDEN	101.3	12000	B	WPDH	NY	POUGHKEEPSIE	101.5	4400	B	93.18	169	-75.82	No
WMGK	PA	PHILADELPHIA	102.9	8900	B	WWFS	NY	NEW YORK	102.7	6000	B	132.21	170	-37.79	No
KOST	CA	LOS ANGELES	103.5	12500	B	KVYB	CA	SANTA BARBARA	103.3	105000	B	83.12	169	-86	No
WDHA	NJ	DOVER	105.5	1000	A	WDAS	PA	PHILADELPHIA	105.3	16500	B	109.45	113	-3.55	No
KROQ-FM	CA	PASADENA	106.7	5500	B	KIXA	CA	LUCERNE VALLEY	106.5	560	A	104.62	113	-8	No

The above table contains the distance separation analysis for the stations iBiquity and the Joint Parties used in the high power test program. Each test station is shown in the left column with its most significant first adjacent station listed in the middle. The column at the right margin (highlighted in purple) indicates that none of these stations would be authorized to increase power using the NPR distance separation criteria. The second column from the right (highlighted in green) shows the deficiency in kilometers for each station that would be required to have the distance separation require by the NPR criteria. For example, for WBEN-FM, the station would need to be 36.79 km farther apart from WPLJ in order to be eligible for any power increase.