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

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

SECOND REPORT AND ORDER
FIRST ORDER ON RECONSIDERATION AND
SECOND FURTHER NOTICE OF PROPOSED RULEMAKING

Adopted: March 22, 2007 **Released: May 31, 2007**

Comment Date: [60 days after date of publication in the Federal Register]
Reply Comment Date: [90 days after date of publication in the Federal Register]

By the Commission: Chairman Martin and Commissioners Tate and McDowell issuing separate statements; Commissioners Copps and Adelstein approving in part, dissenting in part and issuing separate statements.

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I. INTRODUCTION AND EXECUTIVE SUMMARY

1. In the *Digital Audio Broadcasting Report and Order*, we selected in-band, on-channel ("IBOC") as the technology enabling AM and FM radio broadcast stations to commence digital audio broadcasting ("DAB").[1] In the *DAB R&O*, we adopted notification procedures allowing existing AM and FM radio stations to begin digital transmissions immediately on an interim basis using the IBOC system developed by iBiquity Digital Corporation ("iBiquity"). We concluded that the adoption of a specific technology would facilitate the development of digital services for terrestrial broadcasters. We deferred consideration of final operational requirements and related broadcast licensing and service rule changes to a future date. In a *Further Notice of Proposed Rule Making* ("*FNPRM*") we addressed issues left unresolved in the *DAB R&O* and sought comment on what changes and amendments to Part 73 of the Commission's rules were necessary to facilitate the adoption of DAB.[2]

[1] *Digital Audio Broadcasting Systems And Their Impact On The Terrestrial Radio Broadcast Service*, First Report and Order, 17 FCC Rcd 19990 (2002) ("*DAB R&O*"). We note that in this *Second Report and Order* as well as in the *Second Further Notice of Proposed Rulemaking*, DAB generally refers to the digital service broadcast by radio stations whereas IBOC generally refers to the technical system supporting DAB service. This terminology, and the subject matter discussed herein, applies to terrestrial over-the-air broadcasting. Satellite radio service, offered by XM and Sirius, is not a subject under consideration in this proceeding.

[2] *Digital Audio Broadcasting Systems And Their Impact On The Terrestrial Radio Broadcast Service*, Further Notice of Proposed Rulemaking and Notice of Inquiry, 19 FCC Rcd 7505 (2004) ("*DAB FNPRM*" or "*DAB NOI*").

2. Through this proceeding, we seek to foster the development of a vibrant terrestrial digital radio service for the public and to ensure that radio stations successfully implement DAB.[3] Our goals in this *Second Report and Order* are to begin to adopt service rules and other requirements for terrestrial digital radio. However, we find it necessary to ask additional questions, in a *Second Further Notice of Proposed Rulemaking*, on how to preserve free over-the-air radio broadcasting while permitting licensees to offer new services on a subscription basis. We also resolve and dispose of several petitions for reconsideration that were filed in response to the *DAB R&O*.

3. In summary, the Commission, in this *Second Report and Order, First Order on Reconsideration, and Second Further Notice of Proposed Rulemaking*:

- Refrains from imposing a mandatory conversion schedule for radio stations to commence digital broadcast operations;
- Allows FM radio stations to operate in the extended hybrid digital mode;
- Requires that each local radio station broadcasting in digital mode provide a free over-the-air digital signal at least comparable in audio quality to its analog signal;
- Continues to require that the main digital broadcast stream simulcast the material aired on the analog signal;
- Adopts a flexible bandwidth policy permitting a radio station to transmit high quality audio, multiple program streams, and datacasting services at its discretion;
- Allows radio stations to time broker unused digital bandwidth to third parties, subject to certain regulatory requirements;
- Applies existing programming and operational statutory and regulatory requirements to all free DAB programming streams, but defers the issue of whether and how to apply any specific new public interest requirements;
- Authorizes AM nighttime operations and FM dual antenna configurations;
- Considers and addresses other technical matters, such as FM translator and booster operations and TV Channel 6 interference issues;
- Defers discussion of whether the Commission should impose content control requirements that would prevent listeners from archiving and redistributing digital musical recordings transmitted by digital broadcast stations;
- Recognizes that further negotiations between the United States and the international community are taking place to resolve possible disputes about the implementation and operation of DAB by domestic radio stations;
- Dismisses several pending Petitions for Reconsideration and Petitions for Rulemaking that asked, *inter alia*, the Commission to reconsider the adoption of iBiquity's IBOC system as the technology chosen for DAB transmission;
- Seeks further comment on appropriate limits to the amount of subscription services that may be offered by radio stations.

[3] Our statutory authority for implementing these goals is derived from, *inter alia*, Sections 1, 4, 303, 307, 312, and 315 of the Communications Act. *See* 47 U.S.C. §§ 151, 154, 303, 307, 312, and 315.

II. BACKGROUND

A. In-Band On-Channel Technology

4. IBOC technology makes use of the existing AM and FM bands (In-Band) by adding digital carriers to a radio station's analog signal, allowing broadcasters to transmit digitally on their existing channel assignments (On-Channel) while simultaneously maintaining their analog service.[4] iBiquity's IBOC DAB technology enables radio stations to provide enhanced sound fidelity, improved reception, multiple audio streams, and new data services. It permits the transmission of near-CD quality audio signals on the FM band, and improved fidelity on the AM band, to digital-ready radio receivers along with information services, such as station, song and artist identification, stock and news updates, and local traffic and weather bulletins. These digital signals are free from the static, hiss, pops, and fades associated with the current analog system. iBiquity's IBOC technology will also allow for new radios to be "backward and forward" compatible, allowing them to receive existing analog broadcasts from stations that have yet to convert and digital broadcasts from stations that have converted. Existing analog radios will continue to receive analog broadcast signals.[5]

5. The iBiquity IBOC system evaluated by the DAB Subcommittee of the National Radio Systems Committee ("NRSC")[6] are "hybrids" in that they permit the transmission of both analog and digital signals within the spectral emission mask of a single AM or FM channel. In the hybrid mode, the iBiquity IBOC system places digital information on frequencies immediately adjacent to the analog signal. The digital signals are transmitted using orthogonal frequency division multiplexing ("OFDM"). The FM IBOC system has an extended hybrid mode, providing greater digital capacity than the hybrid mode. The IBOC system is also designed to eventually permit radio stations to convert to an all-digital mode of operation. The IBOC system uses perceptual coding to discard information that the human ear cannot hear. This reduces the amount of digital information, and as a result, the frequency bandwidth required to transmit a high-quality digital audio signal. In addition, the IBOC system in hybrid mode is designed to blend to analog when digital reception fails. This blending feature eliminates a digital "cliff effect" that would otherwise result in the complete and abrupt loss of reception at locations where the digital signal fails.

B. The Regulatory Development of Digital Audio Broadcasting

6. In 1990, the Commission first considered the feasibility of terrestrial and satellite digital radio services.[7] As to the former, the Commission concluded that the digital terrestrial systems then under consideration were undeveloped and that it was premature to engage in discussions regarding DAB standards, testing, licensing, and other policy issues. In 1999, the Commission, recognizing new technological developments and innovations, commenced this proceeding to foster the adoption of a DAB system and develop a record regarding the legal and technical issues raised by the introduction of

[4] 19 FCC Rcd at 7605.

[5] *Id.*

[6] The NRSC is an industry group jointly sponsored by the National Association of Broadcasters and the Consumer Electronics Association.

[7] *Amendment of the Rules with Regard to the Establishment and Regulation of New Digital Audio Radio Services,* 5 FCC Rcd 5237 (1990).

DAB.[8] In the *DAB NPRM*, the Commission, *inter alia*, proposed criteria for the evaluation of DAB models and systems and considered certain DAB system testing, evaluation, and standard selection issues.[9]

7. In the *DAB R&O*, the Commission selected the hybrid AM and FM IBOC system tested by the NRSC as the *de facto* standard for interim digital operation. As of the effective date of the *DAB R&O*, we stated we would no longer entertain any proposal for digital radio broadcasting other than IBOC.[10] We found that IBOC was the best way to advance our DAB policy goals. We also found that this technology was supported by the broadcast industry and was the only approach that could be implemented in the near future. We recognized that the IBOC system was spectrum-efficient because it can accommodate digital operations for all existing AM and FM radio stations with no additional allocation of spectrum. The NRSC tests, as explained in the *DAB R&O*, showed that both AM and FM IBOC systems offer enhanced audio fidelity and increased robustness when encountering interference and other signal impairments. The tests also indicated that coverage for both systems would be at least comparable to analog coverage. We stated that audio fidelity and robustness will greatly improve when radio stations move to all-digital operations.

8. We established the following requirements for radio stations in the *DAB R&O*: (1) during interim IBOC operations, stations must broadcast the same main channel program material in both analog and digital modes; (2) interim IBOC facilities must use the station's authorized antenna system;[11] (3) due to interference concerns, stations implementing IBOC must communicate to the Commission the transmitter power output (for both analog and digital transmitters, if applicable) and must certify that the analog effective radiated power remains consistent with the station's authorization; (4) pending adoption of final rules, a licensee's authorization to transmit IBOC signals may be modified or cancelled by the Commission without prior notice or a right to a hearing to eliminate objectionable interference; and (5) IBOC AM stations may only operate during daytime hours.[12]

9. In the *DAB FNPRM*, our goal was to create a record that would lead to permanent DAB policies and requirements. We sought public input on several issues related to digital audio broadcasting. Specifically we sought comment on: (1) the appropriate policies the Commission may adopt to encourage radio stations to convert from an analog-only radio service to a hybrid analog/digital radio service, and, eventually, to an all-digital radio service; (2) the types of digital services the Commission should permit radio stations to offer; (3) how noncommercial educational ("NCE") FM and low power FM stations may provide digital radio service to the public; (4) how the Commission's existing programming and operational rules should be applied to DAB; and (5) what changes and amendments to the Commission's technical rules are necessary to further the introduction of DAB.[13]

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[8] *Digital Audio Broadcasting Systems And Their Impact On The Terrestrial Radio Broadcast Service,* 15 FCC Rcd 1722, 1726-27 (1999) ("*DAB NPRM*").

[9] *Id.* at 1723.

[10] *See DAB R&O*, 17 FCC Rcd at 20006.

[11] A public notice seeking comment on the use of a dual FM antenna system was issued by the Media Bureau after the *DAB R&O* was released. The Media Bureau approved the use of separate FM antennas in 2004. *See* Public Notice, *Use of Separate Antennas to Initiate Digital FM Transmissions Approved*, 19 FCC Rcd 4722 (2004).

[12] *See DAB R&O,* 17 FCC Rcd at 20004-05.

[13] *See DAB FNPRM*, 19 FCC Rcd 7505, *et. seq.*

10. In the *DAB NOI*, we asked whether the transmission of digital radio signals, as a free over-the-air service, would create an environment for persons to engage in indiscriminate recording and Internet redistribution of musical recordings that are part of unencrypted free digital audio broadcasts and sought comment on how this matter should be addressed.[14] On this point, we have been informed that interested parties are attempting to resolve this issue through a marketplace solution.[15] We encourage this approach. Accordingly, we will defer further action on this issue at this time. In the *DAB NOI*, we also raised for comment whether there were international broadcast treaty matters that needed to be addressed at this time to ensure that DAB is successfully implemented in the United States.[16]

C. Radio Statistics

11. As of August 1, 2005, approximately 900 radio stations have entered into licensing agreements with iBiquity for its IBOC technology.[17] Currently, 1,272 stations (195 AM and 1,077 FM) are authorized by the Commission to broadcast using the IBOC system, and approximately 700 FM stations have requested and received special temporary authority for multicasting.[18] These stations are mostly located in the top 50 markets in the country and reach 60 percent of all potential listeners. At least 10 stations are on the air in each of the following markets: Los Angeles, Chicago, San Francisco, Boston, Detroit and Atlanta. Approximately, 85 percent of the IBOC stations on the air are FM stations and 15 percent are AM stations. iBiquity has announced that 21 of the nation's top radio broadcast groups have committed to accelerate broadcast conversion of 2,000 AM and FM stations to IBOC technology. Clear Channel Communications, Entercom and Cox Radio have all made substantial commitments to convert many of their stations to digital over the next few years.[19] Moreover, ten of the largest radio firms have formed a strategic alliance to coordinate the rollout of DAB. This effort includes the coordination of multicast formats, securing digital automotive receiver designs, and lowering the price points for digital radio receivers.

III. POLICIES AND RULES FOR DAB

A. The DAB Standard

12. In the *DAB R&O*, we stated that the adoption of a DAB standard will facilitate an efficient and orderly transition to digital radio, and we supported a public and open standard-setting process.[20] In the *DAB FNPRM*, we encouraged the NRSC to provide us with information on the standard

[14] *See DAB NOI*, 19 FCC Rcd at 7531.

[15] *See* RIAA *Ex Parte* (filed April 4, 2005).

[16] *See DAB NOI*, 19 FCC Rcd at 7532.

[17] *See* iBiquity Reply Comments (NRSC-5 proceeding) at 2. *See* Appendix A for a list of all commenters and reply commenters. As of September 30, 2005, there were 10,973 commercial radio stations, as well as 2,626 FM educational radio stations in the United States. Of the commercial stations, 6,215 were FM stations and 4,758 were AM stations. There were also 3,920 FM translator and booster stations. *See Broadcast Station Totals* as of September 30, 2005 (MB rel. Dec. 8, 2005) (Public Notice).

[18] CDBS Database, Audio Services Division, Media Bureau, *Digital Stations As Of March 22, 2007.*

[19] *See* iBiquity *Ex Parte* (filed March 4, 2005).

[20] 17 FCC Rcd at 20006.

setting process as events warrant.[21] On April 16, 2005, the NRSC announced approval of the initial NRSC IBOC standard known as NRSC-5.[22] On May 18, 2005, the NRSC submitted NRSC-5 to the Commission for consideration and evaluation.[23] The NRSC adopted the NRSC-5-A IBOC broadcasting standard in September 2005. The NRSC-5-A IBOC standard adds sections concerning Advanced Application Services and a new reference document to the NRSC-5 IBOC standard, but the NRSC has not yet submitted the NRSC-5-A IBOC standard to the Commission for review. While our consideration of the NRSC-5 IBOC standards is continuing, we find that it is in the public interest to adopt certain policies, rules, and requirements for digital radio before we have completed our evaluation of the standards. Radio stations and equipment manufacturers need to move forward with the DAB conversion, and we need not wait until after final action is taken on the IBOC standards to provide such guidance to them.

B. Conversion Policy

13. In the *DAB FNPRM*, we sought comment on the pace of the analog to digital radio conversion and the possibility of an all-digital terrestrial radio system in the future.[24] We noted that Congress codified December 31, 2006, as the analog television termination date with certain exceptions,[25] and we recognized that there is no analogous congressional mandate for the termination of analog radio broadcasting. We stated that the Commission has not considered a date certain as to when radio stations should commence digital broadcast operations because radio stations, unlike television stations, are not using additional spectrum to provide digital service. We also stated that band-clearing is not an issue. Based on these factors, we found that there was no immediate need to consider mandatory transition policies of the type contemplated with respect to DTV. However, we reoognized the spectrum efficiencies and related new service opportunities inherent in the IBOC system. As such, we sought comment on what changes in our rules would likely encourage radio stations to convert to a hybrid or an all-digital transmission system and asked whether the government, the marketplace, or both should determine the speed of conversion from analog to hybrid and, eventually, to all digital radio service. We also asked whether we should conduct periodic reviews, in terms of the number of DAB receivers on the

[21] 19 FCC Rcd at 7527.

[22] *See* NRSC Press Release, *NRSC Approves Digital Radio Broadcasting Standard*, April 16, 2005. The standard is based on iBiquity's IBOC technology. In the iBiquity system, audio source coding and compression are handled by iBiquity's HD codec. NRSC-5 does not include specifications for audio source coding and compression. iBiquity has committed to license all patents necessary to implement NRSC-5, either with or without the HD codec. It is also possible within the NRSC-5 standard to use audio source coding and compression schemes other than iBiquity's HD codec. *See* Letter from Michael Petricone, CEA; and Valerie Schulte, NAB, to Marlene Dortch, Secretary, FCC, dated May 18, 2005.

[23] A *Public Notice* seeking comments on the NRSC-5 standard was issued by the Media Bureau on June 16, 2005. *See Comment Sought on National Radio Systems Committee's "In-Band/On-Channel Digital Radio Broadcasting Standard NRSC-5"* (MB rel. June 16, 2005). Following the close of the comment cycle in August 2005, we will review the filings and then take further action.

[24] *DAB FNPRM*, 19 FCC Rcd at 7512.

[25] *See Balanced Budget Act of 1997*, Pub. L. No. 105-33, § 3003, 111 Stat. 251, (codified as amended at 47 U.S.C. § 309(j)(14)(B)).

market and DAB stations on the air, to help us decide how to set policy as the conversion to digital audio broadcasting moves forward.[26]

14. Commenters generally support a marketplace transition to digital audio broadcasting.[27] For example, the State Broadcasters Associations ("SBAs") states that the Commission should allow market forces to govern the adoption of DAB by the radio industry and that no station should be required to adopt IBOC or any other digital technology.[28] The Public Interest Coalition ("PIC") agrees that the market should govern the pace of the DAB transition.[29]

15. We will not establish a deadline for radio stations to convert to digital broadcasting. Stations may decide if, and when, they will provide digital service to the public. Several reasons support this decision. First, unlike television licensees, radio stations are under no statutory mandate to convert to a digital format. Second, a hard deadline is unnecessary given that DAB uses an in-band technology that does not require the allocation of additional spectrum. Thus, the spectrum reclamation needs that exist for DTV do not exist here. Moreover, there is no evidence in the record that marketplace forces cannot propel the DAB conversion forward, and effective markets tend to provide better solutions than regulatory schemes.

16. iBiquity argues that in the early stages of the transition, the Commission should favor and protect existing analog signals. It states that this could be accomplished by limiting the power level and bandwidth occupancy of the digital carriers in the hybrid mode. At some point in the future, when the Commission determines there is sufficient market penetration of digital receivers, iBiquity asserts that the public interest will be best served by reversing this presumption to favor digital operations. At that time, broadcasters will no longer need to protect analog operations by limiting the digital signal and stations should have the option to implement all-digital broadcasts.[30] We decline to adopt iBiquity's presumption policy because it is too early in the DAB conversion process for us to consider such a mechanism. We find that such a policy, if adopted now, may have unknown and unintended consequences for a new technology that has yet to be accepted by the public or widely adopted by the broadcast industry.

17. Nevertheless, as enunciated in more detail below, we take significant steps to facilitate the digital radio conversion by adopting rules and policies that encourage radio stations to invest in digital equipment and programming. For example, we permit radio stations to provide various types of digital service as long as one free over-the-air digital stream of equal or greater quality than the station's existing analog signal is available for listeners. We also establish technical rules, such as permitting AM nighttime service, intended to reinvigorate the AM band. To ensure that DAB adoption proceeds in a

[26] *DAB FNPRM*, 19 FCC Rcd at 7512.

[27] *See* Cox Radio Comments at 2; Clear Channel Comments at 2; Nebraska Rural Radio Association Comments at 3; Susquehanna Radio Comments at 2; Miller Media Group Comments at 3; Infinity Comments at 3-4; National Public Radio Comments at 16; iBiquity Comments at 5; Kenwood Comments at 7; Harris Comments at 12.

[28] SBA Comments at 6-7.

[29] Public Interest Coalition ("PIC") Reply Comments at iii. PIC states that allowing market forces to guide the digital radio transition will permit stations to convert at a pace dictated by their own needs. *Id.*

[30] iBiquity Comments at 12.

timely manner, we will conduct periodic reviews of digital service and receiver penetration, as suggested by iBiquity, as circumstances warrant.[31]

18. Extended Hybrid Mode. NAB asserts that the Commission's authorization of extended hybrid mode DAB operations will further the conversion process. According to NAB, the extended hybrid mode, which adds up to 50 kbps[32] of data carrying capacity to an FM IBOC signal, will allow broadcasters to support a range of datacasting services without affecting the quality of the 96 kbps main channel digital audio signal. NAB asserts that while the use of the FM extended hybrid mode increases the bandwidth occupancy of the digital carriers, this will not increase interference to adjacent channels since the additional (*i.e.*, extended hybrid) digital carriers fall between a station's primary digital carriers and its host analog signal. Consequently, each broadcaster will be able to control the level of impact these extended hybrid signals may have on its own transmission. NAB comments that the Commission should authorize broadcasters to adopt all three extended hybrid modes[33] and allow broadcasters to make the appropriate operational decisions based on the needs of their listeners.[34] NPR submitted a detailed report in November 2004 about the effect of extended hybrid operation on the host analog signal in various receivers. The report concludes that the FM extended hybrid mode does not affect host analog reception in car radios, home stereo receivers, or subsidiary communications authorization receivers.[35]

19. The FM extended hybrid mode holds great promise for both broadcasters and their listeners. NPR has submitted data showing that the FM extended hybrid mode will work in most circumstances. NPR's report provides an ample basis for permitting radio stations to operate in an extended hybrid mode. Authorization of this digital mode will permit broadcasters to offer new and innovative services, especially to underserved populations, such as the visually impaired and non-English speaking citizens. If interference issues do arise, we are confident that the Commission staff will be able to resolve disputes on a case-by-case basis, and we intend that the staff will address these complaints in a timely fashion. In this connection, the Media Bureau has full authority to adjust and, if necessary, prohibit hybrid operations by broadcasters.

20. All-digital Mode. In the *DAB FNPRM*, we recognized that it may be premature to adopt policies for all-digital radio operation given that there are no standards for this type of broadcasting.[36]

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[31] iBiquity states that the Commission should conduct periodic reviews of station conversions and receiver penetration to ensure the functioning of market forces. iBiquity recommends the commencement of a first review five years after adoption of a *Second Report and Order* in this proceeding to check on the progress of the conversion. iBiquity Comments at 12-13. Other commenters agree that the Commission should periodically review the progress of the DAB conversion process. *See* SBAs Comments at 7 (stating that the Commission should facilitate the collection of data needed for monitoring the transition from analog to digital, but it should not undertake pervasive industry regulation unless, and until, it is clear the marketplace has indeed faltered); *see also* Cox Comments at 3.

[32] "kbps" is the acronym for kilobits per second (1000 bits per second).

[33] In the extended hybrid mode, digital carriers are added at frequencies immediately adjacent to the analog FM signal. The three extended hybrid modes (MP2, MP3, and MP4) are defined by the number of digital partitions added (one, two, or four pairs), respectively.

[34] NAB Reply Comments at 13-14.

[35] *See* NPR *Ex Parte* (filed Nov. 3, 2004).

[36] 19 FCC Rcd at 7511.

NAB agrees that adoption of policies and procedures relating to the all-digital mode of IBOC operation would be premature in the absence of "comprehensive and impartial testing" of all-digital systems. NAB states, however, that it is important to recognize that the all-digital mode is an integral part of the IBOC DAB system specification and that the software iBiquity provides to its transmitter and receiver manufacturer licensees includes an all-digital mode of operation. NAB states that when the time is ripe to consider use of the all-digital mode, consumers and broadcasters who have already invested in IBOC DAB equipment will not be disenfranchised and a smooth transition from a hybrid to an all-digital environment will be assured.[37]

21. NPR states that it is premature for the Commission to contemplate a regulatory structure for all-digital terrestrial radio. It states that the elegance of the DAB transition is that the public, through its response to digital services, will determine the pace of the transition. NPR further states that until the transition to all-digital operation becomes more imminent, the Commission should refrain from adopting any policy affecting all-digital DAB.[38] PIC states that the Commission should use its authority to facilitate public participation in the further development of digital radio technology.[39]

22. The ultimate goal of this proceeding is to establish a robust and competitive all-digital terrestrial radio system. We agree with NPR that it is premature, however, to consider the adoption of policies and rules for an all-digital mode of operation. There are many unresolved technical issues associated with the all-digital radio broadcast system and radio stations do not plan to offer all-digital service in the near future. Broadcasters, of course, are encouraged to experiment with an all-digital service, with appropriate authorization, but for regulatory purposes, our principle focus at this stage is to ensure that the ground rules are set for the introduction of hybrid IBOC DAB. When DAB receiver penetration has reached a critical mass and most, if not all, radio stations broadcast in a hybrid digital format, we will begin to explore the technical and policy issues germane to an all-digital terrestrial radio environment.

C. Service Rules

1. Flexible Uses

23. As explained above, the IBOC DAB system provides radio stations with new flexibility and capabilities. First and foremost, it allows FM broadcasters to scale their audio quality from 96 kbps downward in 1 kbps or smaller increments. Any reduction below 96 kbps frees capacity that can be devoted to other services. The AM system offers two levels of audio quality. The "core" AM carriers provide 20 kbps of robust monophonic sound. The "enhanced" layer adds an additional 16 kbps of digital carriers and enables full stereo sound. The AM system design allows broadcasters to devote the full 36 kbps to a single audio signal or, in the future, select only the 20 kbps core mode for audio and devote the remaining 16 kbps enhanced carriers for other services.

24. The scaling of the audio codec,[40] which permits broadcasters to reduce the number of bits devoted to the main channel audio signal, may affect the quality of the audio. However, it will not

[37] NAB Comments at 4. iBiquity agrees that additional work is required before there is an industry consensus on the IBOC all-digital system. iBiquity Comments at 13.

[38] NPR Comments at 24.

[39] PIC Comments at 16.

[40] An audio codec compresses digital audio data prior to transmission and decompresses data received.

impact the robustness of the signal. The audio quality may be affected because the reduction in the bit rate may increase the likelihood of digital artifacts. The trade-off between bits and audio quality is not linear. There can be a substantial reduction in bit rate before most listeners would notice any digital artifacts that might impact audio quality. The broadcasters' and listeners' tolerance for reduced audio quality depends on many factors, most importantly, station program format.

25. The IBOC DAB system thus allows radio stations to broadcast a single high quality audio signal, multiple streams of lower quality audio, or various combinations of different quality audio signals. In addition, the system is capable of non-broadcast uses that are non-audio and/or subscription-based in nature. In the *DAB FNPRM*, we tentatively found that permitting radio stations to use their bandwidth in a flexible manner is in the public interest.[41]

26. NAB states that a digital radio station's service offerings should be determined by the licensee rather than by government mandate. NAB explains that digital business models will vary from licensee to licensee. Some stations, such as those with jazz or classical music genres, may choose to focus their resources on promoting the highest quality audio signal, while others may want to broadcast multiple streams of news, weather or financial information. NAB submits that these kinds of decisions are best left to consumer demand and the marketplace.[42] NAB states that beyond an obligation to deliver at least one main audio channel of equal or better quality than a station's existing analog service, broadcasters should retain the flexibility to scale signals to enhance audio quality, to upgrade existing supplementary services, or offer new services for their audiences. NAB concludes that for DAB to fulfill its potential, supplementary services must be a viable option.[43] NPR states that the Commission should not specify the amount of capacity stations should allocate to any given audio or data service.[44] NPR argues that radio station licensees, like digital television licensees, should have the freedom to develop innovative services for the public.[45]

27. iBiquity also urges the Commission to adopt a flexible approach to its service rules because radio stations have only begun to explore the IBOC system options. iBiquity asserts that this approach will encourage broadcasters to experiment and will foster the development of innovative new services for the listening public. iBiquity states that the imposition of unnecessarily restrictive service rules will have the effect of stifling the development of new services.[46] Cox likewise suggests that the Commission should maintain a "do no harm" position, arguing that if concerns arise later in the conversion, the Commission can always adopt responsive rules at that time.[47] There were no comments criticizing the adoption of a flexible use policy.

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[41] 19 FCC Rcd at 7513. Section 303 of the Act compels the Commission to "study new uses for radio, provide for experimental uses of frequencies, and generally encourage the larger and more effective uses of radio in the public interest." 47 U.S.C. § 303(g).

[42] NAB Comments at 8.

[43] NAB Reply Comments at 9.

[44] NPR Comments at 19.

[45] *Id.* at 12.

[46] iBiquity Comments at 13.

[47] Cox Comments at 3-4.

28. We expect and intend that the fundamental use of DAB will be for the provision of free over-the-air radio service. We will, therefore, require radio stations to provide at least one free digital over-the-air audio broadcast service. Specifically, radio stations operating in a digital mode must provide one free digital audio programming service that is comparable to or better in audio quality than that of their current analog service. Such a baseline requirement mirrors the Commission's analogous requirement for digital television stations, and is based on the same underlying policy consideration that significant benefits from digital conversion should flow directly to the public.[48] We do not here alter the requirement set forth in the *DAB R&O* that a radio station must simulcast its analog programming service on its digital signal. However, we will revisit the simulcasting requirement in the future when we decide whether or not to approve the NRSC-5 standard. In any event, simulcasting is part of the IBOC operational structure and a radio station must duplicate its programming if it wants the DAB "blend" feature to work properly.[49]

29. Taking these points into consideration, we will permit radio stations to use their frequencies as the marketplace dictates, an approach supported by dozens of interested parties and consistent with our digital television policy.[50] We are hopeful that this flexibility also will lead to a more rapid conversion to DAB. We elaborate on this issue below by addressing issues raised regarding some of the services DAB stations might choose to provide.

a. Digital Audio Broadcasting Signal Quality

30. In the *DAB FNPRM*, we sought comment on whether or not we should require broadcasters to provide a high quality digital audio signal and, if so, what minimum bandwidth should be required for this purpose. We also sought comment on the amount of capacity necessary to allow radio stations to broadcast a high quality digital signal while permitting the introduction of new datacasting and audio services.[51]

31. iBiquity supports the use of the IBOC system to improve audio quality. It believes, however, that market forces should be allowed to determine the optimal quality levels of the IBOC system. iBiquity argues that the Commission should not establish minimum quality requirements, but rather should allow radio stations to make their own determination of the appropriate level of audio quality for their particular listeners.[52] NAB states that, at this early point in the digital radio transition, it is impossible to conclude with any measure of certainty the number of bits necessary to support a good quality main audio signal or how many secondary audio streams an IBOC radio station can transmit

[48] *In the Matter of Advanced Television Systems and Their Impact Upon the Existing Television Broadcast Service*, 12 FCC Rcd 12809, 12820-21 (1997).

[49] *See* ¶ 5, *supra*.

[50] *See, e.g.*, Infinity Broadcasting Comments at 5-6; Clear Channel Comments at 3-4; NAB Reply Comments at 4-15; *see also* Greater Media Comments at 5-8.

[51] 19 FCC Rcd at 7513.

[52] iBiquity Comments at iii.

without degrading audio quality.[53] Cox Radio adds that any restrictions contemplated by the Commission may become obsolete soon after they are adopted.[54]

32. As discussed above, we decline to require broadcasters to dedicate a minimum level of digital bandwidth to provide a high quality digital signal. Instead, we leave the decision as to the quality of the signal provided to the discretion of the radio station licensee, subject to the comparable signal obligation discussed earlier.[55] The IBOC system allows stations to offer the public high quality audio, as well as a broad variety of other innovative services. We believe that we should provide broadcasters with the freedom to innovate and respond to the marketplace in developing not only the mix of services, but also the quality of the audio they will offer the public.

b. Multicasting

33. The IBOC FM DAB system permits an FM radio station to broadcast multiple audio programming services within its assigned channel. As AM IBOC operation develops, iBiquity plans to introduce the option to split the digital AM bitstream into two channels. In order to provide multiple digital programming streams, a radio station must reduce the audio bit rate of its main channel broadcasts or use the extended hybrid mode to obtain additional capacity that can be devoted to a lower bit rate supplemental audio channel. Testing conducted by NPR established the viability of this functionality and also demonstrated that the supplemental channel will have coverage equivalent to the coverage of the main channel audio signal.[56] Due in part to IBOC system design constraints, however, any supplemental audio services will not be able to take advantage of the blend function available to the main channel audio. The blend function enhances rapid tuning for the main channel digital signal and provides an analog backup signal in the event the main channel audio signal is lost. Therefore, any supplemental channel will require several seconds for tuning and will experience muting of the audio in the event of signal loss.[57]

34. In the *DAB FNPRM*, we asked how the availability of additional audio streams can further our diversity goals, particularly for people with disabilities and minority or underserved segments of the community. We tentatively concluded that adopting DAB service rules that encourage more audio streams would promote program diversity, and that, once the Commission adopts a policy in this area, radio stations would no longer need to obtain experimental authority to broadcast multiple digital programming streams.[58]

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[53] NAB Comments at 9.

[54] Cox Comments at 4.

[55] *See supra* at ¶ 29 (radio stations must provide a free digital audio programming service that is comparable to or better in audio quality than that of their current analog service).

[56] *See Tomorrow Radio Field Testing in the Washington, D.C., New York City, San Francisco and Los Angeles Radio Markets*, January 6, 2004.

[57] iBiquity Comments at 19-20.

[58] 19 FCC Rcd at 7513-14. On March 8, 2005, the Media Bureau issued a *Public Notice* that clarified its policy regarding the provision of multiple audio streams by radio stations broadcasting in a digital format. The Bureau noted that multicast operations do not fall within the scope of the notification procedures authorized in the *First Report and Order* in this proceeding. As such, licensees are required to obtain experimental authorization up until the time that the Commission changes its policies and procedures. *See* Public Notice, *Commission Clarifies Policy Regarding Multiple Audio Streams in IBOC Transmissions*, DA 05-609 (MB rel. Mar. 8, 2005).

35. Generally, commenters urged the Commission to authorize multicasting on a permanent basis, and at the same time, asked us to avoid excessive regulation that would disadvantage any new type of digital service.[59] Specifically, commenters emphasized the benefits of multiple digital audio channels and how that IBOC feature will ensure the continuing viability of radio reading services[60] as well as enhance the ability of broadcasters to offer more niche programming and public affairs broadcasts.[61]

36. The IBOC system makes it possible for FM radio stations to air additional streams of traditional radio programming (*e.g.*, music, news, and sports), public safety services (*e.g.*, national security announcements), assisted living services (*e.g.*, radio reading services), non-English language programming, and news services to underserved populations.[62] Many stations commented that multicasting will foster the expansion of local public affairs programming generally[63] and programming serving the Latino, Asian, and other communities of common cultural interest, in particular.[64] A number of such stations comment that they will use their digital capacity to broadcast more foreign language services.[65] Indeed, a large number of NCE stations filed comments specifically stating that the following program services are likely to emerge: (1) special programming for English as a Second Language ("ESL") listeners; (2) native American programming;[66] (3) public affairs programming, such as school board, civic and local government meetings;[67] (4) youth, young adult and student productions;[68] (5) reading services for the blind;[69] (6) homeland security/public safety programming;[70] (7) arts and culture

[59] *See, e.g*, Cox Comments at 3-4; Susquehanna Broadcasting Comments at 3-4; *see also* Entercom Communications Comments at 4-5.

[60] *See, e.g.*, International Association of Audio Information Services ("IAAIS") Comments *passim*; Harris Comments at 5; and NPR Comments (filed Feb. 19, 2002 in this docket) at 5-6.

[61] *See, e.g.*, WAMU Comments at 3; WERU comments at 1; Wisconsin Educational Communications Board Comments at 1-3; and Capitol Broadcasting Reply Comments at 3-6;

[62] Experts state that one 96 kbps FM channel could be divided into up to eight streams of digital programming. *See* Leslie Stimson, *Radio Groups Ponder Multi-Channel*, Radio World, March 30, 2005.

[63] *See, e.g.*, KUAC-FM Comments at 1 (considering using multicasting to supplement existing services including the live broadcast of the Fairbanks North Star Borough Assembly and School Board meetings).

[64] *See, e.g.*, Alaska Public Broadcasting Commission Comments at 1 ("We have a number of Alaska Native populations with specific Native language needs that could be met using the supplemental audio channel. In fact, in many of our communities we have significant percentages of Latinos, Asian/Pacific Island languages and they too need special services that simply cannot be met using a single channel.").

[65] *See, e.g.*, KUVO Comments at 1 ("Providing more Hispanic music and education to our community is one of our main objectives and this [supplemental audio] channel would help us accomplish that goal."); KRVS-FM Comments (noting location of Acadiana region of French speaking people within the station's service area and the station's interest in multicasting to provide a "majority French/indigenous channel").

[66] KISU-FM Comments at 1; KUAT-FM Comments at 2.

[67] KUT-FM Comments at 1; KBRW-AM/FM Comments at 1.

[68] WNCU-FM Comments at 3.

[69] KMUW-FM Comments at 1; WDUQ-FM Comments at 1.

[70] KERA-FM Comments at 1.

programming;[71] (8) breaking news/special news events/emergency alerts;[72] (9) international news coverage;[73] and (10) educational/children's programming.[74] NPR has announced that it will offer five music services for multicast streams on affiliated public radio stations.[75] In addition, iBiquity reports that commercial radio broadcasters, including Infinity, Capitol Broadcasting, and Greater Media have all launched new multicast digital radio streams with different formats in the summer of 2005.[76]

37. We will permit radio stations to provide multiple audio streams of digital programming without the need for individual station approval by the Commission.[77] We believe that radio stations can best stimulate consumers' interest in digital audio services if they are able to offer the programs that are the most attractive to their communities. Further, allowing radio stations the flexibility to provide multicast services will allow them to offer a mix of services that can promote increased consumer acceptance of DAB, which, in turn, will likely speed the conversion process. Additionally, diversity of programming services may result from multicasting and provide programming to unserved and underserved segments of the population. We strongly encourage digital audio broadcasters to use their additional channels for local civic and public affairs programming and programming that serves minorities, underserved populations, and non-English speaking communities.

38. Mt. Wilson Broadcasters opposes Commission action authorizing multicasting, at least at the present time, arguing that "splitting the channel" will derogate the service provided by FM radio stations.[78] NPR asserts that Mt. Wilson Broadcasters is misinformed about the purposes of DAB, the technical feasibility of multicasting, and the competitive consequences of authorizing full-power broadcast stations to broadcast multiple audio channels. We find that multicasting will not derogate the service as Mt. Wilson argues. An FM station commencing DAB operations will have approximately the same geographic reach for its digital signal as for its analog signal. Moreover, splitting the FM signal into multiple digital streams will not harm listeners in any manner. As noted above, a licensee must provide a broadcast stream at least equivalent in quality to its existing analog service. In fact, an FM

[71] WBGO-FM Comments at 1; WHYY-FM Comments at 1.

[72] WAMU-FM Comments at 3.

[73] KQED-FM Comments at 2.

[74] WAER-FM Comments at 1; WDET-FM Comments at 1.

[75] *See NPR's Tomorrow Radio Initiative Brings Multicasting to Digital Radio*, http://www.npr.org/about/press/050418.tomorrowradio.html, April 18, 2005 ("This summer, NPR will begin offering five programmed music formats to multicasting stations: classical, jazz, electronica, triple-A, and folk. Other program offerings NPR is developing for stations with new channels include a news and information service and formats that would serve culturally diverse audiences."). *See also Westwood One to Offer Multicast Programs, at* http://www.radioworld.com/dailynews/one.php?id=7011 ("Westwood said it would make its lineup of news, sports, talk and entertainment programming, as well as its traffic and information content available to HD Radio FM broadcasters multicast services.").

[76] *See* iBiquity Reply Comments (NRSC-5 proceeding) at 3 (stating that the "Commission will continue to see broadcasters experimenting with new formats, services and creative solutions that will provide great benefits to listeners, increase consumer choice and promote diversity in broadcasting.")

[77] FM stations currently multicasting pursuant to experimental authority from the Commission are released from the requirement to submit a report, as specified in the letter granting multicasting authority.

[78] Mt. Wilson FM Broadcasters Comments at 1.

station operating a digital service will be able to provide more services than it could with only its analog signal. Accordingly we perceive no derogation of the type forecast by Mt. Wilson Broadcasters.

39. Time Brokering. In the *DAB FNPRM*, we sought comment on the extent, if any, to which we should permit radio stations to lease unused or excess bandwidth to unaffiliated audio programmers. In this context, we noted that an unaffiliated entity may schedule the programming output of a particular digital audio stream for a period of time under a contract with the licensee. We stated that radio stations may benefit from leasing unused or excess air-time because they would have additional funds to invest in new programming, which, in turn, would benefit the public. We asked whether our diversity goals will be furthered if we allow independent programmers to lease excess capacity from broadcast licensees.[79]

40. We will permit radio stations to enter into time brokerage agreements[80] for their digital bandwidth. Because these agreements are essentially leasing arrangements, they achieve benefits similar to those achieved through leasing arrangements. The Commission has for many years permitted brokering of FM subcarriers and excess digital television bandwidth.[81] Moreover, we permit stations to enter into time brokerage agreements on their main broadcast channels. Subject to our attribution rules, as noted below, broadcasters will have the flexibility in structuring business arrangements and attracting capital to make DAB a success. We agree with the SBAs that the adoption of this policy will allow licensees to recoup some of the costs associated with the digital conversion, and to increase outlet diversity.[82] We strongly encourage digital audio broadcasters to enter in such agreements with "eligible entities,"[83] which often include businesses owned by women and minorities. Moreover, the brokering of individual digital streams will provide a means to overcome some financial impediments to getting involved in broadcasting and there is a potential for new market entrants to take advantage of such arrangements. Whatever the agreement, it is the licensee who remains responsible for ensuring the fulfillment of all obligations incumbent upon a broadcast licensee, including ultimate control over program material aired on its station's facilities.

41. In the *DAB FNPRM*, we also asked how Section 310(d) of the Act,[84] regarding transfers of control, should apply to these situations as well as how the Commission's broadcast ownership limits and attribution rules would be affected if an unaffiliated programmer, that is also the licensee of another station in the same market, leases one of the additional audio streams. Moreover, we asked whether there

[79] 19 FCC Rcd at 7514.

[80] "Time brokerage" (also known as "local marketing") is the sale by a licensee of discrete blocks of time to a "broker" that supplies the programming to fill that time and sells the commercial spot announcements in it.

[81] 47 C.F.R. § 73.624(c)(2).

[82] SBAs Comments at 6, 10.

[83] An eligible entity is an entity that would qualify as a small business consistent with SBA standards for its industry grouping. *See 2002 Biennial Regulatory Review - Review of the Commission's Broadcast Ownership Rules and Other Rules Adopted Pursuant to Section 202 of the Telecommunications Act of 1996*, 18 FCC Rcd. 13620, 13811 n. 1043 (2003).

[84] *See* 47 U.S.C. § 310(d) ("No construction permit or station license, or any rights thereunder, shall be transferred, assigned, or disposed of in any manner, voluntarily or involuntarily, directly or indirectly, or by transfer of control of any corporation holding such permit or license, to any person except upon application to the Commission and upon finding by the Commission that the public interest, convenience, and necessity will be served thereby.").

should be an overall limit to the amount of programming time a particular radio station can broker or lease to others.[85]

42. A number of commenters raise issues regarding the interplay between multiple audio streams, brokering, and ownership issues.[86] Specifically, PIC argues, and we agree, that a licensee owning the maximum permissible number of stations in a particular market should not be allowed to acquire additional broadcast streams through time brokering agreements.[87] Under the Commission's established policies for attribution of such agreements, we count the brokered station toward the brokering licensee's permissible ownership totals under the local broadcast ownership rules. Where an entity owns or has an attributable interest in one or more stations in a local radio market, time brokering of another station in that market for more than 15 percent of the brokered station's broadcast time per week will result in counting the brokered station toward the brokering licensee's ownership caps.[88] We clarify that, in the multicast context, a station owner who programs more than 15 percent of the total weekly hours broadcast on a digital audio stream of another station in the market will be considered to have an attributable interest in the brokered station. The interest attributable to a station owner in such circumstances is equivalent to the percentage of total broadcast time that the stream which is attributable to the station owner constitutes. Under a time brokering agreement, licensees must ensure that they maintain full, effective, and ultimate control over all material aired on their stations. Therefore, time brokering agreements do not raise transfer of control issues under Section 310(d) of the Act.

c. Datacasting

43. In the analog context, all FM stations are authorized to transmit secondary services via an automatic subsidiary communications authorization ("SCA") under Section 73.295 of the Commission's rules. Subsidiary communication services are those transmitted on a subcarrier within the FM baseband signal, not including services that enhance the main program broadcast service or exclusively relate to station operations. Subsidiary communications include, but are not limited to, services such as radio reading services, utility load management, market and financial data and news, paging and calling, traffic control signal switching, bilingual television audio, and point to point or multipoint messages.[89] Some FM broadcasters currently provide emergency alert system notifications and paging functions under SCA authorization.

44. Section 73.593 of the Commission's rules pertains to subsidiary communications services broadcast by NCE FM radio stations. Under our rules, the licensee of an NCE FM station is not required to use its subcarrier capacity, but if it chooses to do so, it is governed by the SCA rules for commercial FM stations regarding the types of permissible subcarrier uses and the manner in which

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[85] 19 FCC Rcd at 7514.

[86] For example, REC Networks assert that when there is a substantial penetration of DAB receivers in the marketplace, owners of multiple FM stations in a single market should consolidate their multiple FM station broadcasts on a single channel, multicast their programming services using IBOC technology, and then divest their additional transmitter facilities. REC Networks Comments at 3. The SBAs state that brokering of a multicast audio stream would not constitute an illegal transfer of control. They argue that leasing of a digital stream is consistent with longstanding Commission treatment of time brokerage arrangements. SBAs Comments at 10.

[87] PIC Reply Comments at 14.

[88] *See* 47 C.F.R. § 73.3555(a) and notes j(1) and (2).

[89] *See* 47 C.F.R. § 73.295.

subcarrier operations are conducted. A significant difference from the commercial FM SCA rules, however, is the requirement that the remunerative use of an NCE FM station's subcarrier capacity not be detrimental to the provision of existing or potential radio reading services for the blind or otherwise inconsistent with its public broadcasting responsibilities.[90]

45. Similarly, Section 73.127 of the Commission's rules permits AM broadcast stations to use their AM carriers to transmit signals not audible on ordinary consumer receivers for both broadcast and non-broadcast purposes.[91] A station's AM carrier service authorization may not be retained or transferred in any manner separate from the station's license. The licensee must establish that the broadcast operation is in the public interest wholly apart from the subsidiary communications services provided.[92] For both AM and FM services, the licensee must retain control over all material transmitted in a broadcast mode via the station's facilities and has the right to reject any material that it deems inappropriate or undesirable.[93]

46. iBiquity, in a partnership with broadcasters and equipment manufacturers, has developed IBOC data services for terrestrial radio stations. The IBOC system permits radio stations to offer varied and robust datacasting applications. Using an established standard ID3 format,[94] information services can be used to provide listeners with song, CD title, and artist information. In addition, information and host profiles will complement advertisements and talk radio formats. Synchronized multimedia integration language ('SMIL"), a protocol used by iBiquity as the foundation for advanced application services ("AAS"), allows for the creation and delivery of new data services in the future.[95] Some possible commercial applications envisioned by iBiquity include: (1) enhanced information services such as weather and traffic alerts delivered to DAB receivers as a text and/or audio format; (2) enhanced advertising services;[96] (3) listener controlled main audio services providing the ability to pause, store, fast-forward, index, and replay audio programming via an integrated program guide with simplified and standard user interface options; and (4) supplementary data delivery that will spur the introduction of automatic driving assistance applications, navigation and rear-seat entertainment programming.[97] We sought comment on whether we should permit radio stations to distribute any and all types of datacasting

[90] *See* 47 C.F.R. § 73.593.

[91] *See* 47 C.F.R. § 73.127.

[92] In the analog context, the station identification, delayed recording, and sponsor identification announcements required by Sections 73.1201, 73.1208, and 73.1212 are not applicable to leased communications services transmitted via services that are not of a general broadcast nature. *See* 47 C.F.R. § 73.127; 47 C.F.R. §§ 73.1201, 73.1208, and 73.1212.

[93] *See* 47 C.F.R. §§ 73.127(e) and 73.295(e).

[94] ID3 is a file tagging software used to provide text information such as artist name and song title information. ID3 also supports text descriptions with ads, such as phone numbers and Web addresses.

[95] *See* http://www.ibiquity.com/technology/standards.htm, for a general discussion of new datacasting opportunities; *see also*, Leslie Stimson, *Radio Groups Ponder Multi-Channel*, Radio World, Mar. 30, 2005 (listing possible new datacasting services as remote digital audio recording and downloading DAB streams to MP3 players and computer hard drives).

[96] Robert Struble, iBiquity's CEO, has noted that the text of advertising messages could be synchronized to display on a DAB receiver's text screen at the same time as a related commercial is broadcast. *See* Glenn Fleishman, *Revolution on the Radio*, New York Times, July 28, 2005, at C11.

[97] *See* http://www.ibiquity.com/technology/data.htm.

services. We also sought comment on what data services digital noncommercial educational stations should be permitted to offer.[98]

47. iBiquity urges the Commission to authorize datacasting services and to include sufficient flexibility in the datacasting authorization to promote innovation in this area. iBiquity states that there is tremendous opportunity for the development of low-cost innovative datacasting services. iBiquity submits that the greater capacity and reliability of data services based on the IBOC system will help ensure that data services are introduced. It suggests that promotion of datacasting will help introduce new services to the public and will also provide added value for consumers who invest in IBOC receivers.[99] NAB similarly asserts that datacasting services are still in the nascent stage, and that the Commission's main goal at this time should be to encourage and enable broadcasters to innovate and experiment with these aspects of digital radio. NAB maintains that providing broadcasters with flexibility in this area will expedite the emergence of DAB.[100] Bloomberg states that the Commission must not unnecessarily limit the ability of the DAB platform to carry program-associated data or other additional, innovative data services. It argues that the best way to encourage investment, and thereby spur terrestrial radio broadcasters to make the conversion to DAB, is to provide broadcasters with the utmost flexibility to develop new digital applications.[101] The SBAs state that the Commission should permit licensees to provide for datacasting, within the constraints of the IBOC technical standards, mainly because it would enhance the multiplicity of information sources.[102] NPR states that the opportunity to offer datacasting services will motivate stations to develop new services beyond what is available today. It expects stations to use their technical capabilities to provide homeland security-related services, addressing local, regional, or national events and emergencies, and provide expanded weather alerts, traffic safety, and other public safety services.[103]

48. Consistent with our decision with regard to audio multicasting services, we conclude that permitting broadcast licensees flexibility with regard to the provision of datacasting services is in the public interest. We will permit radio stations to provide any type of digital datacasting service, consistent with existing broadcast policies and rules applicable to analog SCA services, as long as it does not derogate the mandated stream of free audio programming. Our aim is to promote innovation and experimentation that will lead to applications that will serve the public, such as song and artist information as well as enhanced news, weather, and emergency updates. We note that, for reasons discussed *infra*, we will currently only allow datacasting that is subscription pursuant to an experimental authorization granted by the Commission.

2. Ancillary Subscription Services

49. Radio stations may wish to offer certain digital audio or data content under a subscription model. In this context, ancillary subscription services may be available for a fee or the

[98] 19 FCC Rcd at 7516.

[99] iBiquity Comments at 23-24.

[100] NAB Comments at 12. SBAs state that the Commission should allow supply and demand to determine what datacasting services are deployed in a market. SBAs Comments at 13.

[101] Bloomberg Reply Comments at 3.

[102] SBAs Comments at 6.

[103] NPR Comments at 6-7.

listener may simply need to enter a code to access the service.[104] In the *DAB FNPRM*, we sought comment on whether we should permit ancillary subscription services.[105] One proposal offered in the *DAB FNPRM* was to permit ancillary subscription services as long as they do not derogate the free services a radio station broadcasts. We also asked whether we should impose spectrum fees for that portion of digital bandwidth used for ancillary subscription services. Commenters generally urged the Commission to permit ancillary subscription services,[106] but argued against the imposition of fees associated with the offering of such services.[107] Nevertheless, we remain concerned that pay services, left unrestricted, could overwhelm free over-the-air services, to the detriment of the listening public. We expect terrestrial radio service to remain a free over-the-air service and, therefore, the amount of capacity devoted to ancillary subscription services must be limited. We thus seek further comment on ancillary subscription service issues in a *Second Further Notice of Proposed Rulemaking*, found below. Until this *Rulemaking* is completed and a determination is made regarding assessment of the five percent fee, discussed *infra*, we will only allow ancillary subscription services pursuant to an experimental authorization granted by the Commission. We would grant such authorizations for uses that serve the public interest, including current subcarrier services like radio reading services.

3. Noncommercial Educational Stations

50. NCE radio stations face unique opportunities and challenges as they move to implement DAB. The Act states that a "noncommercial educational broadcast station" must be "owned and operated by a public agency or nonprofit private foundation, cooperation, or association" or "owned and operated by a municipality and which transmits only noncommercial programs for educational purposes."[108] In 1981, Congress amended the Act to give NCE stations more flexibility to generate funds for their operations.[109] As amended, Section 399B of the Act permits NCE stations to provide facilities and services in exchange for remuneration as long as those uses do not interfere with the station's "provision of public telecommunications services."[110] Section 399B, however, does not permit NCE stations to make their facilities "available to any person for the broadcasting of any advertisement."[111] Section 73.503 of the Commission's rules addresses the licensing requirements and service of NCE FM stations. Under our rules, an NCE FM broadcast station will be licensed only to a nonprofit educational

[104] IBOC DAB has the potential to limit access to certain channels by receiver serial number, just like satellite radio receivers are presently able to do.

[105] 19 FCC Rcd at 7516.

[106] *See* iBiquity Comments at 17; NPR Comments at 18; and NAB Comments at 11.

[107] iBiquity argues that broadcasters can currently provide both datacasting and supplemental audio channels using SCA analog frequencies without incurring additional spectrum fees and the same approach should be applied to digital services. iBiquity Comments at 19-20. NAB states that it would be inappropriate to consider fees at this time because a fee requirement would have the effect of discouraging innovation and new services that would benefit the public. NAB Comments at 13. We seek further comment on fees in the *Second Further Notice of Proposed Rulemaking*, below.

[108] 47 U.S.C. § 397(6).

[109] *See Omnibus Budget Reconciliation Act of 1981*, Pub. Law No. 97-35, § 1231, 95 Stat. 357, 731 (codified at 47 U.S.C. § 399B); *see also* H.R. Rep. No. 97-82, at 13-14.

[110] Section 399B also requires that public stations engaged in revenue generating activities comply with accounting procedures designed to separately identify these commercial revenues and costs, and it prohibits Corporation for Public Broadcasting funds from being used to defray any costs associated with these activities. 47 U.S.C. § 399B.

[111] 47 U.S.C. § 399B(a)(2).

organization and upon showing that the station will be used for the advancement of an educational program.[112] Although the Commission does not reserve frequencies for NCE use in the AM service, and thus has not codified noncommercial eligibility rules for this service, the Commission has treated AM stations that satisfy the NCE FM eligibility rules as noncommercial AM stations.[113] Under Section 73.621 of the Commission's rules, public television stations are required to furnish primarily an educational as well as a nonprofit and noncommercial broadcast service.[114]

51. In 2001, the Commission concluded that an NCE television licensee must use a substantial majority of its digital television capacity for nonprofit, noncommercial, educational broadcast services.[115] In addition, the Commission held that the statutory prohibition against broadcasting of advertising on NCE television stations applies to broadcast programming streams provided by NCE licensees, but does not apply to any ancillary or supplementary services presented on their excess DTV channels that do not constitute broadcasting.[116] In *Office of Communication, Inc. of United Church of Christ v. F.C.C.*, the U.S. Court of Appeals for the District of Columbia Circuit upheld the *DTV NCE A&S Order*.[117] In the *DAB FNPRM*, we sought comment on what, if any, special rules or considerations should apply to NCE radio stations in light of our decision regarding NCE DTV stations and the D.C. Circuit's *UCC* decision. We also sought comment on how we can ensure NCE radio stations remain noncommercial in nature as the radio industry converts to DAB.[118]

52. NPR favors a flexible use policy for NCE station digital bandwidth. It states that it does not expect the remunerative use of digital bandwidth to result in a profusion of commercial service offerings by NCE radio stations. NPR further states that it expects any subscription or other services provided by NCE stations to relate to each station's NCE mission. For instance, although subscription services are not anticipated for several generations of digital radio receivers, some NCE radio stations may experiment with offering "pledge-free," but otherwise identical, versions of their free over-the-air services to those listeners who financially support the station.[119] NPR adds that since the authorization of enhanced underwriting and remunerative subcarrier services in the early 1980s, the ensuing diversity of revenue sources has emerged as the key to public radio's independence from any single revenue source. According to NPR, while the remunerative use of NCE station facilities and analog spectrum has, to date, provided only modest amounts of revenue, the remunerative use of digital technology will enable NCE

[112] *See* 47 C.F.R. § 73.503(a)(2).

[113] *See Reexamination of the Comparative Standard for Noncommercial Educational Applicants*, 18 FCC Rcd 6691, 6695 n.28 (2003).

[114] Section 73.621 of the Commission's rules provides that "noncommercial educational broadcast stations will be licensed only to nonprofit educational organizations upon a showing that the proposed stations will be used primarily to serve the educational needs of the community; for the advancement of educational programs; and to furnish a nonprofit and noncommercial television broadcast service." 47 C.F.R. § 73.621.

[115] *See Ancillary or Supplementary Use of Digital Television Capacity by Noncommercial Licensees*, 16 FCC Rcd 19042 (2001) ("*DTV NCE A&S Order*").

[116] *Id.* Like commercial DTV stations, NCE DTV licensees must pay a fee of five percent of gross revenues generated by ancillary or supplementary services provided on their DTV service.

[117] *Office of Communication, Inc. of United Church of Christ v. F.C.C.*, 327 F.3d 1222 (D.C. Cir. 2003).

[118] 19 FCC Rcd at 7530.

[119] NPR Reply Comments at 19.

stations to better weather the periodic downturns in corporate and foundation underwriting, membership dues, and, in the case of public radio, state and federal funding.[120]

53. PIC argues that NCE radio stations, like NCE television stations, should be obligated to "use their entire digital capacity primarily for a nonprofit, noncommercial, educational broadcast service," meaning a "substantial majority" of the entire digital capacity.[121] PIC urges the Commission not to repeat the "error" it made in authorizing NCE DTV stations to offer remunerative services.[122] PIC also asserts that the "over commercialization" resulting from remunerative activities will discourage public support for public broadcasting.[123] PIC additionally claims that allowing NCE radio stations to offer advertising supported non-broadcast services violates the intent underlying the original reservation of spectrum and will reduce "the ratio of noncommercial-to-commercial programming."[124]

54. NPR objects to PIC's suggestions, stating that NCE television stations are subject to a more exacting regulatory mandate to furnish "primarily" a non-profit and noncommercial television broadcast service.[125] NCE radio stations, on the other hand, are licensed "for the advancement of an educational program."[126] NPR notes that the Commission adopted a higher standard for NCE television stations because such stations use greater amounts of spectrum, have more extensive coverage areas, and are far fewer in number.[127] NPR also asserts that requiring NCE radio stations to reserve a "substantial majority" of their entire digital capacity for a free NCE service would significantly restrict station flexibility to determine the appropriate mix of services, and how much capacity to devote to each, based on the specific needs of their community of service.[128] NPR states, for example, that such a "substantial majority" requirement would prevent stations from dividing the 96 kbps bitstream into two 48 kbps service streams.[129] According to NPR, a minimum quantitative requirement, and one requiring a "substantial majority" of the bitstream, in particular, would countermand the inevitable improvement in audio coding technology that will otherwise permit higher quality audio using fewer kilobits.

55. We defer consideration of the issues discussed above to a later date. As noted above, we have decided to further examine the offering of subscription services in a *Second Further Notice of Proposed Rulemaking*. In addition to our concern about maintaining the free nature of all terrestrial radio

[120] NPR Comments at 18.

[121] PIC Comments at 42-43.

[122] *Id.* at 44.

[123] *Id.* at 45.

[124] *Id.* at 44-45.

[125] NPR Reply Comments at 16-17. *See* 47 C.F.R. § 73.621.

[126] 47 C.F.R. § 73.503(a)(2).

[127] NPR Reply Comments at 16-17.

[128] *Id.* at 17.

[129] This is an approach that WAMU-FM is pursuing. *See Public Radio Stations Tentatively Embracing 2nd Digital Audio Channel*, Communications Daily, at 9, June 25, 2004 (noting that, pursuant to tests conducted under an experimental license, "WAMU has found that splitting the bandwidth evenly into 48 kbps each was 'extremely good' for both the main and the supplemental channel [sic]").

services, we wish to preserve the noncommercial educational nature of NCE service. We will address both issues after considering the comments in response to our *Second Further Notice of Proposed Rulemaking*. In any event, we hold that an NCE radio station is obligated, like its commercial counterpart, to provide at least one free over-the-air digital programming stream that is comparable to or better in audio quality than its analog signal.

4. Low Power FM

56. In 2000, the Commission authorized the licensing of two new classes of FM radio stations, one operating at a maximum power of 100 watts and one operating at a maximum power of 10 watts.[130] Both types of stations, known as low power FM ("LPFM") stations, were authorized in a manner that protects existing FM service. The Commission stated that LPFM stations would be operated on a NCE basis by entities that do not hold an attributable interest in any other broadcast station or other media subject to our broadcast ownership rules. The Commission established the new LPFM service to create new broadcasting opportunities for locally-based organizations to serve their communities. In the *DAB FNPRM*, we sought comment on the conversion of LPFM stations to digital operation and the potential impact of such a conversion on other stations.[131]

57. iBiquity states that LPFM stations should have the option to convert to digital operations. It states that IBOC-based equipment can operate at the 100 watt power levels authorized for LPFM service. iBiquity asserts that in the case of 10 watt stations, however, the extremely low power level of those stations may make digital broadcasts infeasible. The IBOC system broadcasts the digital signal at one percent of the station's analog power level. In the case of a 10 watt LPFM station, that digital power level would fall below the noise floor and would be difficult for any digital receiver to recover; however, this would not be the case with 100 watt LPFM stations. iBiquity notes that because these LPFM stations are required to comply with the Commission's adjacent channel interference restrictions, the introduction of digital broadcasts by these stations should not create harmful new interference.[132]

58. We find that if an LPFM station intends to transmit in digital, and is technically capable of doing so, there should be no regulatory impediments preventing its adoption of the IBOC technology. We recognize that LPFM is a new service which involves non-commercial, community-oriented stations and that these stations have limited resources. We are committed to working with these stations to address issues regarding their transition to digital as they arise. We note that in 2005 the Commission released a *Second Order on Reconsideration and Further Notice of Proposed Rulemaking*, which further advanced the introduction of LPFM service in numerous areas across the United States.[133] This *Second*

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[130] *See generally Creation of Low Power Radio Service*, 15 FCC Rcd 2205 (2000). We note that a 100 watt Low Power FM station can serve an area with a radius of approximately 3.5 miles. The Commission has yet to authorize any 10 watt stations in the LPFM service.

[131] 19 FCC Rcd at 7531.

[132] iBiquity Comments at 33.

[133] *See Creation of a Low Power Radio Service*, 20 FCC Rcd 6763 (2005).

Order addressed technical, operational, and ownership issues necessary for the further development of the service.[134]

5. Licensing Procedures

59. Under Section 73.1695 of the Commission's rules, the Commission considers whether a proposed change or modification of a transmission standard for a broadcast station would be in the public interest.[135] Sections 73.3571 and 73.3573 of the Commission's rules discuss the processing of AM and FM broadcast station applications, respectively.[136] In the *DAB FNPRM*, we sought comment on what, if anything, the Commission should do to amend or replace these procedural requirements in the context of DAB. With regard to mandatory paperwork, Section 73.3500 of the Commission's rules lists the applications and report forms that must be filed by an actual or potential broadcast licensee in certain circumstances.[137] In the *DAB FNPRM*, we sought comment on which forms and applications must be modified because of DAB.[138] We find that certain changes to our licensing processes are necessary to accommodate DAB operations. Rather than amend the administrative licensing requirements and generate new forms now, however, we will delegate the authority to make such changes, to the extent possible, to the Media Bureau. This delegation permits the Bureau staff to make changes on an expedited basis as circumstances warrant, subject to Office of Management and Budget approval under the Paperwork Reduction Act.

D. Programming and Operational Rules

1. Public Interest Issues

60. The *DAB FNPRM* sought comment on a number of policies and requirements impacting the public interest. Such subjects as sponsorship identification, political advertising, and cigarette advertising were raised for comment.[139] The Commission received extensive comment on several issues, including radio reading services, the emergency alert system, and station identification. Therefore, these subjects are discussed separately below.

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[134] In the *Second Order on Reconsideration*, the Commission modified its rules governing minor changes and technical minor amendments for LPFM stations. We also clarified the definition of locally originated programming for purposes of resolving mutually exclusive LPFM applications. In the *Further Notice of Proposed Rulemaking*, the Commission sought comment on a number of technical and ownership issues related to LPFM. *See Creation of a Low Power Radio Service*, 20 FCC Rcd at 6768.

[135] *See* 47 C.F.R. § 73.1695.

[136] *See* 47 C.F.R. §§ 73.3571, 73.3573.

[137] *See* 47 C.F.R. § 73.3500.

[138] *See* 19 FCC Rcd at 7528. We note that the following forms may be at issue: (1) Form 301—Application for Authority to Construct or Make Changes in a Commercial Broadcast Station; (2) Form 302---AM--Application for AM Broadcast Station License; (3) Form 302-FM—Application for FM Broadcast Station License; (4) Form 340—Application for Authority to Construct or Make Changes in a Noncommercial Educational Broadcast Station; (5) Form 349---Application for Authority to Construct or Make Change in an FM Translator or FM Booster Station; and (6) Form 350—Application for an FM Translator or FM Booster Station License. In the *DAB FNPRM*, we sought comment on any specific changes to these forms. *Id.*

[139] 19 FCC Rcd at 7518-21.

a. Public Interest Obligations

61. It is incumbent upon the Commission to ensure that broadcast radio and television stations serve the "public interest, convenience and necessity."[140] To ensure that broadcasters' service meets this high standard, both the Congress and the Commission have devised various program-related and operational duties that licensees must discharge. Broadcasters, for example, are required to air programming responsive to community needs and interests and have other service obligations.[141] We remain committed to enforcing our statutory mandate to ensure that broadcasters serve the public interest and remind broadcasters of the importance of meeting their existing public interest obligations. We also encourage them to increase public disclosure of the ways in which they serve the public interest. Our current requirements, including those implementing specific statutory requirements, were developed for broadcasters who were essentially limited by technology to a single, analog audio programming service and minor ancillary services. The potential for a more flexible and dynamic use of the radio spectrum, as a result of IBOC, gives rise to important questions about the nature of program-related and operating obligations in digital broadcasting because the scope of those responsibilities has not been defined.

62. In the *DAB FNPRM*, we sought comment on how to apply such obligations to DAB.[142] We also tentatively concluded that the conversion to DAB will not require changes to the following requirements: (1) Sections 312(a)(7)[143] and 315[144] of the Act and Sections 73.1940-44 of the Commission's rules—political broadcasting; (2) Section 507 of the Act and Section 73.4180 of the

[140] 47 U.S.C. § 303.

[141] *See, e.g.*, 47 C.F.R. § 73.3526(e)(12) (commercial stations); 47 C.F.R. § 73.3527(e)(8) (noncommercial stations).

[142] 19 FCC Rcd at 7517.

[143] Section 312(a)(7) provides that "[t]he Commission may revoke any station license or construction permit for willful or repeated failure to allow reasonable access to or permit purchase of reasonable amounts of time for the use of a broadcasting station by a legally qualified candidate for Federal elective office on behalf of his candidacy." 47 U.S.C. § 312(a)(7); *see* 47 C.F.R. § 73.1944. This right of access does not apply to candidates for state or local offices.

[144] Section 315(a) of the Act, as amended, provides that "if any licensee shall permit any person who is a legally qualified candidate for any public office to use a broadcasting station, he shall afford equal opportunities to all other such candidates for that office in the use of such broadcasting station." 47 U.S.C. § 315(a); *see* 47 C.F.R. § 73.1941. Section 73.1940 of the Commission's rules defines "legally qualified candidate" as any person who has publicly announced his or her intention to run for nomination or office, is qualified under the applicable local, state, or federal law to hold office for which he or she is a candidate, and has qualified for ballot placement or has otherwise met all the qualifications set forth in the Commission's rules. 47 C.F.R. § 73.1940. In addition, both the Act and the rules narrowly define the term "use" and exclude from the definition candidates' appearances in *bona fide* newscasts, interviews, documentaries, and the on-the-spot coverage of news events. 47 U.S.C. § 315(a)(1)-(4); *see* 47 C.F.R. § 73.1941(a)(1)-(4). Licensees have no power of censorship over the material broadcast under the equal opportunity provisions of Section 315(a). 47 U.S.C. § 315(a); *see* 47 C.F.R. § 73.1941. Two years ago, Congress amended the lowest unit charge provision of Section 315, codified the Commission's existing political file rule, and expanded that rule to require that a broadcast's station's public file contain information regarding certain issue advertising. *See Bipartisan Campaign Reform Act of 2002*, P. Law 107-155, 116 Stat. 81, 2002 ("BCRA"). The Supreme Court upheld these amendments to the Communications Act in *McConnell v. FEC*, 124 S. Ct. 619 (2003).

Commission's rules—payment disclosure;[145] (3) Section 508 of the Act—prohibited contest practices;[146] (4) Section 317 of the Act and Section 73.1212 of the Commission's rules—sponsorship identification[147]; (5) Section 1335 of Title 15 and Section 73.4055 of the Commission's rules—cigarette advertising;[148] and (6) Section 73.1208 of the Commission's rules—broadcast of taped or recorded material.[149] However, we sought comment on how such requirements should be applied to multicast services and whether the requirements apply to subscription services.[150]

63. In its comments, PIC outlines certain areas in which the Commission should take action to ensure digital radio stations adequately serve the public interest.[151] For example, PIC suggests that a

[145] Section 507 of the Act states that "Any employee of a radio station who accepts or agrees to accept from any person (other than such station), or any person (other than such station) who pays or agrees to pay such employee, any money, service or other valuable consideration for the broadcast of any matter over such station must, in advance of such broadcast, disclose the fact of such acceptance or agreement to such station."). 47 U.S.C. § 508; 47 C.F.R. § 73.4180. The requirement, in industry parlance, addresses "payola" and "plugola." Payola occurs when a station fails to announce the receipt of something valuable in return for the inclusion of material in a broadcast. Plugola describes a situation in which a station fails to identify an outside business interest of the licensee, its parent, its affiliates, or an employee in the broadcast of particular materials.

[146] Section 508 of the Act addresses prohibited practices in contests of knowledge, skill, or chance. Under the Act, it is unlawful for any person, with intent to deceive the listening or viewing public, to supply to any contestant in a purportedly bona fide contest of intellectual knowledge or intellectual skill any special and secret assistance whereby the outcome of such contest will be in whole or in part prearranged or predetermined. *See* 47 U.S.C. § 509.

[147] Section 317 of the Act and the Commission's rules state that all matter broadcast by any radio station for which any money, service or other valuable consideration is directly or indirectly paid, must announce that such matter is paid for or furnished by the paying party. *See* 47 U.S.C. § 317(a)(1); 47 C.F.R. § 73.1212.

[148] Section 1335 of Title 15 of the U.S. Code, and the Commission's implementing regulations, makes it illegal to advertise cigarettes and little cigars on any medium of electronic communication subject to the Commission's jurisdiction. *See* 15 U.S.C. § 1335; 47 C.F.R. § 73.4055. Thus, application of this rule to DAB is statutorily required.

[149] Under Section 73.1208, any taped, filmed or recorded program material in which time is of special significance, or by which an affirmative attempt is made to create the impression that it is occurring simultaneously with the broadcast, must be announced at the beginning as taped, filmed or recorded. The language of the announcement shall be clear and in terms commonly understood by the public. The purpose of this rule is to avoid public confusion by informing the listening audience that the material presented is not being broadcast in real time. *See* 47 C.F.R. § 73.1208.

[150] 19 FCC Rcd at 7521.

[151] Specifically, PIC promotes the following six principles: (1) free, over-the-air radio is a vital national interest that must be preserved and protected for civic, public safety, informational, and cultural reasons; (2) broadcasters must add as much additional capacity for the provision of new and independent voices or for serving underserved communities as they add for other purposes, such as offering commercial services that increase format diversity or subscription services; (3) radio must use digital technology to improve its offering of emergency information to all audiences, including those listening to subscription services, no later than it deploys other new services; (4) core statutory obligations must apply to all newly-created digital channels, and need modest alteration for a digital environment; (5) benefits that accrue to digital audio broadcasters must be accompanied by specific public interest obligations enforced through Commission rules and renewal processing guidelines; and (6) the Commission must ensure that technology advancements support a broader benefit to the public. *See* PIC Comments at 8-14.