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

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

NOTICE OF PROPOSED RULE MAKING

Adopted: November 1, 1999 **Released: November 1, 1999**

Comment Date: [75 days from the date of publication in the Federal Register]
Reply Date: [105 days from the date of publication in the Federal Register]

By the Commission:

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Appendix A: Initial Regulatory Flexibility Analysis

I. INTRODUCTION

1. Digital audio broadcasting ("DAB") technology is in various stages of development and implementation throughout the world. Its proponents claim that it has the capacity to move the American radio broadcast service "to the next plateau of audio performance by providing listeners with enhanced sound quality more closely resembling original source material and digital recordings."[1] DAB technology utilizes new and efficient audio compression techniques that reduce the amount of bandwidth required to transmit a high-quality audio signal. In addition, DAB transmission systems can be designed to achieve the same coverage as analog signals at lower powers, and to achieve greater robustness to interference and other impairments. Proponents also contend that a DAB system would enable radio broadcasters to offer the public an array of new auxiliary services.[2] Thus, DAB technology has the potential to significantly enhance the American radio broadcast service.

2. The Commission is initiating this rule making proceeding to consider alternative approaches to introducing DAB service to the American public. The catalyst for this action is the progress of in-band, on-channel ("IBOC") DAB technology, which IBOC system proponents assert is in a final stage of development.[3] IBOC systems are designed to allow the simultaneous broadcast of analog and digital radio signals in the AM and FM bands without disrupting existing analog service. IBOC DAB systems have not been conclusively proven to be technically viable at this point in time, yet great strides have been made and the systems certainly hold real promise. It is helpful for the Commission to determine whether an IBOC model and/or a model utilizing new radio spectrum would be the best means of promptly introducing DAB service in the United States. By initiating this proceeding now, we can foster the further development of IBOC systems, as well as new-spectrum DAB alternatives, help DAB system proponents identify design issues of public interest dimension and, where possible, encourage modifications that advance these policy objectives. We also can begin developing a complete record regarding the issues raised by this new technology. The resolution of these issues will shape fundamentally the nature of our radio broadcast service for years to come, and we intend to be in a position to act expeditiously when the time is ripe.[4]

3. In this *Notice*, the Commission: (1) reaffirms its commitment to provide radio broadcasters with the opportunity to take advantage of DAB technology; (2) identifies Commission public policy objectives for the introduction of DAB service; (3) proposes criteria

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[1] Comments of Lucent Technologies Inc. ("Lucent") at 5. All comments cited in this *Notice*, unless otherwise specified, were filed in response to USA Digital Radio, Inc.'s ("USADR") *Petition for Rulemaking* ("*Petition*") to permit the introduction of DAB service in the AM and FM radio bands, which was placed on public notice on November 6, 1998 (RM-9395). USADR's *Petition* is discussed below.

[2] *See* Comments of Lucent at 6-7 (DAB's auxiliary applications may include "financial market information and breaking news, up-to-the-minute traffic and road conditions (including suggestions for alternate routes), transportation and travel updates (flight and train arrivals and departures as well as hotel vacancies and room prices), and electronic newspapers. . . . [and] an automated and feature-rich digital EAS [Emergency Alert System.]").

[3] *See infra*, ¶ 10. At this time we know of three IBOC system proponents: USADR, Lucent and Digital Radio Express, Inc. ("DRE").

[4] For these reasons, we disagree with the commenters who argued in response to USADR's *Petition* that the Commission should wait until IBOC systems are demonstrated to be fully viable before initiating a proceeding. *See, e.g.*, Comments of Big City Radio, Inc. at 2; Comments of Lucent at 25.

for the evaluation of DAB models and systems; (4) evaluates IBOC and new-spectrum DAB models; (5) inquires as to the need for a mandatory DAB transmission standard; and (6) considers certain DAB system testing, evaluation and standard selection issues.

II. BACKGROUND

A. The Current Radio Broadcast Service and the Commission's Commitment to Enabling Broadcasters to Convert to Digital Transmissions.

4. The Commission often has recognized the importance of our free, over-the-air radio broadcast service, with its unrivaled accessibility and unique ability to provide local news, information and public service programming.[5] Although this vital communications service continues to grow and prosper, it faces significant technical limitations[6] and competitive challenges. Opportunities for new and improved FM service are limited by spectrum congestion in most major and mid-sized radio markets.[7] The Commission has proposed a new, low power FM ("LPFM") service, but acknowledged that there may be difficulty finding sufficient spectrum for the new service.[8] With regard to the AM band, we have recognized that "many stations currently experience significant interference and degraded reception[.]"[9] The radio broadcast service also faces competitive challenges from new digital audio technologies offering consumers enhanced sound fidelity and other services, including the recently-authorized satellite digital audio radio service ("satellite DARS").[10] Many have argued that the Commission must provide radio broadcasters with the opportunity to convert to a digital platform to enable them to compete effectively and to ensure the continued viability of this important service.[11]

5. In 1990, the Commission opened a proceeding to consider the authorization of digital radio services.[12] The proceeding initially addressed both a satellite DARS and a terrestrial DAB service. As the record developed, however, it became evident that the IBOC DAB systems then under consideration for a terrestrial service were not technically feasible, and the proceeding

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[5] *See, e.g., Establishment of Rules and Policies for the Digital Audio Radio Satellite Service in the 2310-2360 MHz Frequency Band, Report and Order, Memorandum Opinion and Order and Further Notice of Proposed Rulemaking* in GEN Docket No. 90-357, 12 FCC Rcd 5754, 5769 (1997) ("*Docket No. 90-357 MO&O*").

[6] *See Petition*, Appendix D.

[7] *See, e.g., 1998 Biennial Regulatory Review—Streamlining of Radio Technical Rules in Parts 73 and 74 of the Commission's Rules, Notice of Proposed Rule Making and Order* in MM Docket No. 98-93, 13 FCC Rcd 14849, 14857 (1998).

[8] *Creation of a Low Power Radio Service, Notice of Proposed Rule Making* in MM Docket No. 99-25, 14 FCC Rcd 2471, 2489 (1999) ("*LPFM Notice*"). The Commission proposed the LPFM service to "address unmet needs for community-oriented radio broadcasting, foster opportunities for new radio broadcast ownership, and promote additional diversity in radio voices and program services." *Id.* at 2471.

[9] *Id.* at 2478 (citations omitted). According to USADR, AM stations nationwide "capture only 18% of local commercial share" due in large part to their inability to provide high quality sound. *Petition* at 5.

[10] *See Docket No. 90-357 MO&O*, 12 FCC Rcd at 5756; *Notice of Proposed Rule Making and Further Notice of Inquiry* in GEN Docket No. 90-357, 7 FCC Rcd 7776, 7778 (1992) ("*Docket No. 90-357 NPRM*").

[11] *See infra*, ¶¶ 12-13.

[12] *Notice of Inquiry* in GEN Docket No. 90-357, 5 FCC Rcd 5237 (1990).

ultimately focused on satellite DARS spectrum allocation, service and licensing issues. Nevertheless, the Commission advanced several principles relevant here. Most importantly to the instant proceeding, the Commission emphasized its conviction that "existing radio broadcasters can and should have the opportunity to take advantage of new digital radio technologies[.]"[13]

> [W]e anticipate that technical advances will soon permit both AM and FM broadcasters to offer improved digital sound. . . . Some of the systems being tested are designed specifically to permit digital broadcasting within the existing AM and FM bands. We fully support these developments, and we see great promise in these innovations for providing improved services to consumers. These innovations will also help promote the future viability of our terrestrial broadcasting system, which provides local news and public affairs programming.[14]

The Commission also expressed its willingness to "act expeditiously to consider any appropriate changes to our rules" when the time was ripe.[15]

6. In addition, the Commission emphasized localism as a "touchstone value" of the terrestrial radio broadcast service.[16] Many radio broadcasters argued that authorization of a satellite DARS would have an adverse impact on the existing radio broadcast industry. Some also argued that satellite DARS should be delayed until a terrestrial DAB system was close to implementation. In rejecting such arguments, the Commission stated that "[o]ur concern about licensing satellite DARS focuses on its impact on the provision of locally oriented radio service."[17] In this regard, it concluded that "the record does not demonstrate that licensing satellite DARS would have such a strong adverse impact that it threatens the provision of local radio service."[18] Although the Commission recognized that the two services would compete to some extent, it found that the new satellite DARS would complement existing, local radio broadcasting stations by providing regional and national services.[19]

B. The Present Development of IBOC and Other DAB Systems.

7. *Current IBOC system designs.* As stated above, IBOC systems are designed to allow the simultaneous broadcast of analog and digital signals in the AM and FM bands without disruption of existing analog service. The Commission's rules impose limits or "emission masks" on the power of a station's signal inside and outside its assigned channel.[20] Together with minimum spacing requirements, emission masks prevent interference by limiting a station's signal strength relative to other, nearby stations operating on co- and adjacent channels. These limits are based on analog signal transmissions centered on their assigned channels. In the "hybrid" operational

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[13] *Report and Order* in GEN Docket No. 90-357, 10 FCC Rcd 2310 (1995) ("*Docket No. 90-357 R&O*") (citations omitted); *see Docket No. 90-357 MO&O*, 12 FCC Rcd at 5769.

[14] *Docket No. 90-357 R&O*, 10 FCC Rcd at 2315.

[15] *Id.*; *see Docket No. 90-357 MO&O*, 12 FCC Rcd at 5769.

[16] *Docket No. 90-357 NPRM*, 7 FCC Rcd at 7793 (Separate Statement of Commissioner Ervin S. Duggan).

[17] *Docket No. 90-357 MO&O*, 12 FCC Rcd at 5767.

[18] *Id.* at 5768-69.

[19] *See id.* at 5760; *Docket No. 90-357 R&O*, 10 FCC Rcd at 2314.

[20] *See* 47 C.F.R. §§ 73.44, 73.317.

mode, IBOC systems transmit lower power digital signal "sidebands" that are positioned on either side of the host analog signal. The digital signal waveforms are designed to conform to the current emission masks.[21] Digital signals would be interleaved: station A's upper digital sideband would be located between 1st adjacent channel station B's lower and upper digital sidebands, and adjoining station B's carrier frequency.[22] In addition, the presence of digital sidebands would reduce the separation between the host analog signal and 2nd and 3rd adjacent channel digital signals. IBOC system proponents believe that digital signal processing techniques will permit the transmission of a digital "pair" of each analog signal in the AM and FM bands, without disrupting existing analog service. Their systems purportedly will provide near CD-quality sound on FM channels and FM-quality sound on AM channels, coverage equal to or greater than that provided by analog transmission systems, and enhanced auxiliary capacity.

8. IBOC systems also have an "all-digital" mode. As a result of significant differences in the design of the USA Digital Radio, Inc. ("USADR") and Lucent Technologies, Inc. ("Lucent") all-digital systems, the transition from hybrid to all-digital operations under each system also would differ.[23] After a transition to all-digital operations, the USADR system would continue to divide the digital signal into sidebands, boost power by tenfold, and utilize the channel center formerly occupied by the host analog signal for lower-power auxiliary services. Because of the increased power of the signal sidebands, the all-digital transmissions likely would interfere with 1st adjacent channel analog signals. Accordingly, USADR proposes to restrict digital stations to hybrid operating parameters for a period of 12 years to provide a reasonable transition to an all-digital radio broadcast service. At the end of this transition period, USADR proposes a sunset on protection of analog signals, with the initiation of "all-digital" signals. In contrast, Lucent's system would largely consolidate the all-digital signal in the channel center, utilizing the 1st adjacent channel areas formerly occupied by the digital sidebands for auxiliary services. Under this system, no sunset on analog protection would be necessary because all-digital transmissions would be expected not to interfere with other stations' analog signals, and broadcasters would be able to initiate all-digital service at any time.[24]

9. *Recent IBOC DAB system developments/NRSC process*. During the mid-1990s, the National Radio Systems Committee ("NRSC")[25] established a DAB Subcommittee which, in collaboration with a Consumer Electronics Manufacturing Association ("CEMA") Digital Audio Radio Subcommittee, oversaw laboratory tests of a number of IBOC systems, ultimately concluding that none were technically viable. CEMA also oversaw laboratory and field testing of non-IBOC DAB systems, including a Eureka-147 system operating in the L-Band (1452-1492 MHz).[26] CEMA's December, 1997 Final Report ("CEMA Final Report") stated that the IBOC

[21] The IBOC FM 70-kHz digital sidebands would be positioned in the upper and lower 1st adjacent channels between +/-129 kHz and +/-199 kHz from the carrier frequency. *See Petition* at 47-48. The IBOC AM 5-kHz digital sidebands would be positioned between +/-5 kHz and +/-10 kHz from the carrier frequency. *Id.* at 70-71.

[22] *Id.* at 51.

[23] We do not have specific information regarding DRE's IBOC system; *see supra*, n. 3.

[24] *See* Comments of Lucent at 13.

[25] The NRSC is an industry group jointly sponsored by the National Association of Broadcasters ("NAB") and the Electronic Industries Association's Consumer Electronics Manufacturing Association.

[26] *See infra*, ¶ 11. The NRSC did not oversee the testing of non-IBOC systems to accommodate the concerns of radio broadcasters about "appearing to encourage [digital audio radio] implementations other than IBOC[.]" *See* Comments of CEMA, Appendix B at 1.

systems tested exhibited two major deficiencies: (1) poor digital audio performance under impaired signal conditions; and (2) incompatibility with analog FM service.[27]

10. IBOC system proponents now contend that they have made substantial progress towards developing technically viable IBOC systems. In its *Petition*, USADR describes computer model simulations demonstrating that its system design satisfies its own performance requirements, including improved performance over, and compatibility with, existing analog service.[28] USADR acknowledges that laboratory and field testing also are necessary to demonstrate the system's viability.[29] It states, however, that it expects to complete such testing before the end of the year and that "preproduction systems will be operational beginning in early 2000," with the capability of commencing commercial service later that year.[30] Likewise, Lucent states that "substantial progress has been made in 1999 toward completing our IBOC system design and having it demonstrated in the laboratory and in the field[,]" and that "[a] completely tested and ready IBOC digital system is only months away."[31] In light of the system proponents' progress, the NRSC has reactivated its DAB Subcommittee and developed model IBOC laboratory and field test guidelines.[32] The IBOC system proponents reportedly have agreed on a December 15, 1999 deadline for submission of certain test results to the NRSC. In contrast to the CEMA Final Report, which compared systems based on a number of performance objectives, this first phase of NRSC testing appears to be designed to demonstrate the technical viability of IBOC systems, that is, "to establish whether or not IBOC DAB systems are a significant improvement over existing AM and FM analog radio services[,]" as well as whether IBOC systems can operate without disrupting analog service.[33]

11. *Eureka-147 DAB systems*. DAB systems are now being implemented in Canada, Europe, and elsewhere utilizing what is referred to as "Eureka-147" technology.[34] Eureka-147 systems utilize a wide bandwidth, are capable of transmitting multiple audio channels, and can operate on various frequencies.[35] Rather than the FM band, the services that have been introduced in Europe

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[27] *See id.* at 24.

[28] *See Petition* at 61-67, 76-80; *see also* Comments of CEMA, Appendix A at 3-11 (assessing simulation results).

[29] *See* Reply Comments of USADR at 9.

[30] Comments of USADR in MM Docket No. 99-25 (August 2, 1999) at 4.

[31] Comments of Lucent in MM Docket No. 99-25 (August 2, 1999) at ii.

[32] The NRSC's laboratory test guidelines were submitted to the Commission on December 14, 1998. *Joint Letter from the NAB and the CEMA to Magalie Roman Salas, NRSC, DAB Subcommittee, IBOC DAB System Test Guidelines, Part I—Laboratory Tests* (December 3, 1998). The NRSC DAB Subcommittee also adopted field test guidelines in March, 1999 and certain evaluation guidelines in April, 1999, but neither has been submitted to the Commission.

[33] *See id.* at 2.

[34] According to the Website of the World DAB Forum, "[c]ommercial DAB receivers have now been on the market since summer 1998. . . . [A]s well as all European countries, other non-European countries including Canada, Singapore and Australia have launched operational or pilot services." *See* www.worlddab.org. The World DAB Forum describes itself as "an international non-governmental organization whose objective is to promote, harmonize and co-ordinate the implementation of Digital Radio services based on the Eureka 147 DAB system." *Id.*

[35] For example, the system tested by CEMA in its Final Report occupied a bandwidth of 1.5 MHz, was capable of transmitting five stereo channels, and was designed to operate throughout the 30-3,000 MHz

and Canada are using other frequencies, such as the "L-Band" (1452-1492 MHz) and "Band III" (around 221 MHz).[36] In the United States, however, the L-Band is allocated for the purpose of flight test telemetry,[37] and the spectrum around 221 MHz is allocated for the primary purposes of land mobile and amateur use. The CEMA Final Report found that "[o]f all the systems tested, only the Eureka[-147] system offers the audio quality and signal robustness performance that listeners would expect from a new [DAB] service in all reception environments."[38] No proponent of a Eureka-147 or other non-IBOC DAB system has filed comments in response to USADR's *Petition*. We currently are unaware of any such proponents in the United States.[39]

C. The USADR *Petition* and Comments.

12. The USADR *Petition for Rulemaking* was filed on October 7, 1998, and placed on public notice on November 6, 1998 (RM-9395). In the *Petition*, USADR urged the Commission to take the following regulatory steps:

> (1) "find[] that the public interest would be served by the introduction of DAB and that IBOC is the most appropriate means to implement DAB in the United States[;]" (2) adopt rule changes "to insure the compatibility of analog and digital radio stations[;]" (3) adopt "a transition plan that provides appropriate protection for analog radio for an interim period but also fosters the transition to an all-digital environment[;]" (4) "find[] that it will adopt a DAB transmission standard that will insure that all DAB radios are compatible with all DAB transmitters[;]" (5) "establish criteria for evaluating IBOC systems and a timetable for the submission of IBOC system information to the Commission for evaluation[;]" and (6) "select a single IBOC system to be implemented . . . and adopt a transmission standard that will allow implementation of the selected system."[40]

13. Twenty-three comments and six reply comments were filed in response to the *Petition*. Commenters expressed nearly unanimous support for the introduction of DAB. IBOC system proponents and many radio broadcasters also endorsed IBOC as the best means of implementing DAB in the United States, provided that its compatibility with existing analog service is demonstrated.[41] CEMA, National Public Radio, Inc. ("NPR") and a number of public interest

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range. Comments of CEMA, Appendix B at 3 and Attachment 1 (Further System Descriptions). CEMA tested the system at the frequency of 1470 MHz in the "L-Band" (1452-1492 MHz). *Id.* at 3.

[36] *See id.* The World DAB Forum Website states that DAB receivers currently on the market can receive both L-Band and Band III transmissions. *See supra*, n. 34.

[37] *See Docket No. 90-357 MO&O*, 12 FCC Rcd at 5770-71; *see also* Reply Comments of Aerospace & Flight Test Radio Coordinating Council at 2-3.

[38] Comments of CEMA, Appendix B at ii.

[39] *But see* Comments of Ford Motor Company ("Ford") at 2, n. 4 ("There is a consortium of companies examining the Eureka-147 system."); *see also infra*, n. 42 and accompanying text.

[40] *Petition* at ii-v.

[41] *See* Comments of CBS, Chase Capital Partners, Clear Channel, Cumulus, Gannett, Greater Media, Inc., Heftel Broadcasting Corporation ("Heftel"), NAB, Radio One, Inc., Radio Operators Caucus, and Susquehanna Radio Corp. ("Susquehanna"). A number of commenters also urged that rapid DAB implementation is required for the radio broadcast service to remain competitive with other digital audio technologies. *See, e.g.*, Comments of Bonneville International Corporation at 3-4.

groups, however, urged the Commission to carefully consider non-IBOC DAB systems utilizing new spectrum, such as a Eureka-147 system.[42] With regard to USADR's proposed step (2), the comments reflected a broad consensus that until laboratory and field tests demonstrate the compatibility of the current generation of IBOC systems with analog service, consideration of specific rule changes to implement IBOC is premature.[43] Several commenters noted that the Commission cannot consider specific rule changes until it selects a specific DAB system.[44] Likewise, with regard to (3), the need to establish a sunset on analog signal protection may depend on the selection of an IBOC system.[45]

14. With regard to USADR's proposed step (5), many commenters agreed that the Commission has a role to play not only in the implementation of DAB, but also in fostering the further development of IBOC DAB systems. The commenters suggested various models for such Commission action, including the mandatory submission of test results that would be evaluated in the context of a notice-and-comment rulemaking proceeding and the creation of an advisory committee with open membership.[46] Finally, with regard to (4) and (6), the commenters generally agreed with USADR that a single DAB transmission standard ultimately will be required to ensure a successful transition to digital.[47]

III. DISCUSSION

A. DAB Policy Goals.

15. It has been several years since the Commission last considered terrestrial DAB issues. Accordingly, we believe it will be useful to set forth the public policy objectives that will guide our deliberations in this proceeding. We begin with the settled determination that fostering the development and implementation of terrestrial DAB is in the public interest.[48] We believe that the principles advanced by the Commission in Docket No. 90-357 regarding the terrestrial radio broadcast service remain valid, and will look to them in developing our approach to a terrestrial DAB service.[49] The goal of introducing terrestrial DAB service is most fundamentally grounded on the promise of digital technology to provide vastly improved radio service to the public. It is our goal to authorize a DAB service that permits broadcasters and listeners to realize fully the superior technical performance capabilities of this technology.

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[42] *See* Comments of Amherst Alliance, CEMA, Citizens' Media Corps., NPR, National Lawyers Guild, and Prometheus Radio Project.

[43] *See, e.g.*, Comments of Big City Radio, Inc. ("Big City"), CEMA, Cumulus, DRE, Greater Media, Inc., Lucent, NAB, NPR, Radio Operators Caucus and Susquehanna.

[44] *See, e.g.*, Comments of DRE at 2 (stating that AM analog audio bandwidth restriction proposed by USADR "is not required for other AM-band IBOC systems").

[45] *See supra*, ¶ 8.

[46] *See, e.g.*, Comments of Ford at 5; Comments of Lucent at 6-9; *see also infra*, ¶¶ 54-56.

[47] *See* Comments of CBS, CEMA, Clear Channel, Cumulus, DRE, Ford, Gannett, Greater Media, Inc., Heftel, Lucent, NAB, Radio One, Inc., Radio Operators Caucus, Susquehanna and Walt Disney Company.

[48] *See* 47 U.S.C. § 303(g) (The Commission shall "encourage the larger and more effective use of radio in the public interest.")

[49] *See supra*, ¶¶ 5-6.

16. The Commission also remains firmly committed to the related goals of "supporting a vibrant and vital terrestrial radio service for the public" and creating DAB opportunities for existing radio broadcasters.[50] We must ensure that the introduction of DAB does not weaken the vitality of our free, over-the-air radio broadcast service, which provides service to virtually all Americans through a strong, independent system of privately owned and operated stations.[51] We previously recognized the close relationship between this goal and providing digital opportunities for existing broadcast licensees in the digital television ("DTV") proceeding, where we concluded that "implement[ing DTV] within the existing framework of local television broadcasting" would be the best way to preserve the unique benefits of the local television broadcast service.[52] We also concluded that existing television broadcasters were the group best suited to introduce this new service to the public "in the quickest and most efficacious manner."[53] We believe that the same reasoning applies here. In addition, as was the case with the DTV transition,[54] we believe that it is desirable for all broadcasters to have the opportunity to provide DAB service. We recognize, however, that prior to the selection of a DAB system and spectrum, we cannot know whether this goal is feasible and what trade-offs it may require.

17. A viable DAB system must be spectrum efficient.[55] Our preference is for DAB systems that use the least spectrum. It is the Commission's obligation to ensure that the value derived from the superior transmission capabilities of DAB technology is allocated in a manner consistent with the public interest. In addition, with regard to IBOC DAB systems, we believe that a transition to an all-digital service is an appropriate public policy goal, because the spectrum efficiencies and related new service opportunities inherent in such systems can be realized fully only in an all-digital operational mode.[56]

18. Finally, it is our objective to foster a rapid and non-disruptive transition to DAB for broadcasters and listeners.[57] A viable system must minimize interference to analog AM and FM stations during that period when digital and analog service operate concurrently.[58] The Commission also will favor systems that do not require burdensome investments in new broadcast transmission equipment. Additionally, we recognize that a viable DAB model should provide broadcasters with sufficient incentives to convert to DAB so that the American public receives the benefits of this new technology as soon as possible. A non-disruptive transition for

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[50] *Docket No. 90-357 MO&O*, 12 FCC Rcd at 5769; *see Docket No. 90-357 RO&O*, 10 FCC Rcd at 2310.

[51] *See Turner Broadcasting Systems, Inc. v. FCC*, 520 U.S. 180, 181 (1996); *see also Docket No. 90-357 MO&O*, 12 FCC Rcd at 5767-68.

[52] *Advanced Television Systems and Their Impact on the Existing Television Broadcast Service, Tentative Decision and Further Notice of Inquiry* in MM Docket No. 87-268, 3 FCC Rcd 6520, 6525 (1988) ("*ATV Tentative Decision*"); *see Second Report and Order and Further Notice of Proposed Rule Making* in MM Docket No. 87-268, 7 FCC Rcd 3340, 3342 (1992).

[53] *ATV Tentative Decision*, 3 FCC Rcd at 6525.

[54] *Id.* at 6530.

[55] *See, e.g., Fifth Further Notice of Proposed Rulemaking* in MM Docket No. 87-268, 11 FCC Rcd 6235, 6236 (1990) ("*Fifth Further NPRM*"); *ATV Tentative Decision*, 3 FCC Rcd at 6521.

[56] *See infra*, ¶ 22.

[57] *See, e.g., Fifth Further NPRM*, 11 FCC Rcd at 6235.

[58] This appears to be an issue of particular concern for IBOC systems. *See infra*, ¶ 23.

consumers must protect listeners' investment in over one-half billion radio receivers.[59] Thus, a transition period of some reasonable duration appears necessary to permit the graceful obsolescence of this equipment. It is equally important that the Commission's DAB technical rules make it possible for manufacturers to produce reasonably-priced digital receivers.

19. One other issue warrants mention at this point. The Commission previously has noted the advantages of an IBOC DAB approach.[60] As explained in more detail below, we continue to believe that IBOC systems hold great promise. These systems may be able to facilitate a seamless transition to an all-digital radio broadcast environment by affording all broadcasters a concurrent digital and analog broadcast opportunity. Moreover, IBOC is the only approach that, to date, has attracted a substantial number of adherents. Nevertheless, this *Notice* should not be construed as the start of an IBOC rulemaking. CEMA correctly frames the issue: the Commission's challenge is to craft a terrestrial DAB service that meets both demanding performance objectives and the public's expectations.[61] We agree with NPR that at this time it is not possible to definitely settle this issue in favor of IBOC.[62]

B. Tentative Selection Criteria for a DAB System.

20. We seek to determine which DAB model and/or system would best promote our above-stated public policy objectives. In reaching this fundamental determination, we propose to apply the following evaluative criteria: (1) enhanced audio fidelity; (2) robustness to interference and other signal impairments; (3) compatibility with existing analog service; (4) spectrum efficiency; (5) flexibility, (6) auxiliary capacity; (7) extensibility; (8) accommodation for existing broadcasters; (9) coverage; and (10) implementation costs/affordability of equipment. The order of these proposed criteria is not intended to imply a hierarchy among them.

21. *(1), (2) Enhanced audio fidelity/robustness.* Consumer demand for improved audio fidelity is undeniable.[63] Access to superior digital audio technologies, such as compact discs and – in the near future – satellite DARS, and the perceived benefits of digitalization generally, fuel such demand. We believe that an important benefit of DAB will be enhanced sound quality. DAB technology should permit significant improvements in audio fidelity and robustness over our current analog service. For example, USADR and Lucent anticipate that AM hybrid IBOC DAB systems will offer sound quality comparable to today's stereo FM systems, and that FM

[59] *See Petition* at 3-4 ("It is estimated that there are over 550 million radio receivers in use today in the United States. Over 70 million new receivers are sold each year.") (citations omitted).

[60] *See Docket No. 90-357 R&O,* 10 FCC Rcd at 2315 (expressing support for the development of IBOC AM and FM systems); *Docket No. 90-357 NPRM,* 7 FCC Rcd at 7780-81 (Commission "continue(s) to support efforts to implement terrestrial in-band DARS technology").

[61] Comments of CEMA at 10.

[62] Comments of NPR at 3.

[63] *See Docket No. 90-357 NPRM,* 7 FCC Rcd at 7778 (discussing rapid consumer acceptance of new digital audio technologies). Lucent cites a consumer study it commissioned which "shows that over two-thirds of the radio buying population between the ages of 16-52 is interested in digital radios for the audio content-related innovations offered by enhanced AM and FM systems." Comments of Lucent at 5; *see also* Comments of CEMA at 4 ("Although radio continues to be a strong medium, it is clear that there is consumer demand for improved service and enhanced audio quality."); *cf. Inquiry Pursuant to Section 706 of the Telecommunications Act of 1996, Report* in CC Docket No. 98-146, 14 FCC Rcd 2398, 2400 (1999) ("Increasingly, all electronic communications are becoming digital.").

hybrid IBOC DAB systems will deliver near-CD quality sound.[64] As to robustness, DAB systems may improve reception by using techniques that protect digital signals from many forms of impairment that affect analog signals. We seek comment on these selection criteria, including the specific standards that should be used to compare competing systems.

22. IBOC systems are designed to operate in two fundamentally different RF environments. In the hybrid mode, an IBOC system must make certain trade-offs to avoid interference to in-band analog transmissions. Although the sharing of spectrum may facilitate a transition to DAB, it may also result in lesser digital performance during the transition period. Accordingly, a comparison of IBOC and new-spectrum alternatives must consider the time frame within which either system could achieve all-digital operations and the short-term performance advantages, if any, of hybrid IBOC digital systems over the current analog service. We seek comment on this issue. A related question is whether the trade-offs necessary to permit IBOC digital transmissions in the hybrid mode would extend into the all-digital world, *i.e.*, limit the potential for enhanced audio fidelity and robustness in comparison to non-IBOC alternatives. We seek comment on the appropriate ways of comparing IBOC and new-spectrum DAB alternatives under these selection criteria.

23. *(3) Compatibility.* A DAB system must be compatible with the continued operation of existing radio broadcast stations. This appears to be a criterion of relevance primarily to in-band systems.[65] Most commenters agree with NAB's position that "the implementation of an IBOC DAB service that causes significant impairment to existing analog service would raise serious questions as to the suitability of the system."[66] We tentatively conclude that IBOC systems should minimize interference to reception of host and adjacent-channel analog signals during hybrid mode operations including, for FM stations, interference to subcarriers.

24. To a significant extent, the opportunity to introduce new ancillary services in both the USADR and Lucent systems is tied to the initiation of all-digital operations. In this regard, however, it appears that the Lucent and USADR systems differ in one important respect. Unlike Lucent's, USADR's all-digital mode transmissions could interfere with an adjacent channel station transmitting an analog signal. As a result, initiation of all-digital operations under USADR's system would not be possible until a fixed analog "sunset" date, *i.e.*, a date when stations transmitting analog signals would lose their current interference protection. A system that permits stations to implement rapidly an all-digital radio service may serve the public interest better than one that delays the opportunity to fully realize the benefits of DAB until the end of what is likely to be an extended transition period. On the other hand, we recognize the potential benefit of a fixed analog "sunset" date in fostering a transition to an all-digital service.[67] We seek comment on whether, with regard to an IBOC system, all-digital compatibility with analog signals should be an evaluative criterion.

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[64] *Petition* at 13-16; Comments of Lucent at 5-6. The maximum signal rates of the digital coding schemes in USADR's and Lucent's hybrid FM and AM systems are 96 and 48 kilobytes per second ("kb/s"), respectively.

[65] We note that a new-spectrum DAB approach would be compatible with the continued operation of existing analog radio broadcast stations.

[66] Comments of NAB at 10.

[67] *See supra*, ¶ 17.

25. We also seek comment on the compatibility of IBOC systems and the proposed low power FM ("LPFM") service. In our *LPFM Notice*, we recognized the importance of taking into consideration "the implications of 2nd-adjacent channel protection for the possible conversion" to a DAB system.[68] We asked whether we should impose a 2nd adjacent channel protection requirement on LPFM stations "for the purpose of protecting a possible future digital radio technology, considering that creating opportunities for new radio service is also an important Commission goal."[69] Similarly, we ask here how a DAB system could be designed to protect a possible future LPFM service. Both Lucent and USADR expressed concern about the impact of LPFM on DAB but it appears that the possible relaxation of 3rd adjacent channel protection standards for LPFM would have no material impact on digital signal reception. "Because of the design of the USADR IBOC system, digital reception is essentially not susceptible to third adjacent channel interference; nor is IBOC likely to increase the potential for causing such interference to analog stations."[70] Specifically, we seek comment on the potential for enhancing the robustness of IBOC systems to reject undesired 2nd and 3rd adjacent channel signals, and the likely impact of such modifications.

26. *(4) Spectrum efficiency.* The Commission is committed to establishing a spectrally-efficient terrestrial DAB service. We recognize that certain basic design and regulatory trade-offs are inherent in all analog and digital systems. As Lucent observes, "there are multiple different pairings of attributes possible that would be capable of delivering digital audio in an IBOC configuration."[71] Lucent and USADR assert that IBOC is spectrum efficient in the sense of not requiring additional spectrum to implement digital transmissions. They also contend that IBOC would not encumber additional spectrum because the IBOC signal would be contained by the emission masks for the analog channels and has been developed around the existing analog interference protection criteria. However, spectrum efficiency as a selective criterion also concerns the additional value that results from the transition from an analog to a digital transmission service. In the instant context, the added value of spectrum is the product of several factors. These include the capacity of digital technologies to transmit greater amounts of data per hertz, enhanced flexibility, the ability to design digital systems that are less likely to cause interference, less susceptible to interference, and more robust with respect to multipath fading and non-radio noise sources, and the capacity to provide a listenable service at relatively low signal strength levels.

27. This proceeding also presents an opportunity to consider the spectral efficiencies that could be realized by advances in receiver technology over the decades since the analog interference standards were established. We note that analog receivers can now be designed with improved frequency selectivity to better reject potentially interfering signals on adjacent channels.[72] Although IBOC systems are based on existing analog protection criteria,[73] we wish to examine the extent to which state-of-the-art receiver technology may provide additional protection against interference, and thereby facilitate more intensive spectrum utilization. What

[68] *LPFM Notice*, 14 FCC Rcd at 2490.

[69] *Id.* at 2492.

[70] *Petition*, Appendix D at 3.

[71] Comments of Lucent at 8.

[72] *See* Comments of Ford at 8.

[73] For example, USADR states that its system is susceptible to a 2nd adjacent channel interfering signal that is 39 dB stronger than the desired IBOC signal. *See* Comments of USADR in MM Docket No. 99-25 at 7.

would be the additional cost to consumers of receivers with state-of-the-art immunity? Are there design considerations other than cost that would practically limit interference immunity?

28. At this preliminary stage, it is clear that the Commission needs additional information about the specific mix of DAB design attributes that could best meet the current and future needs of *all* stakeholders in our free, over-the-air broadcasting system. Therefore, we seek comment on possible DAB spectrum efficiency standards. Are any of the Eureka-147 DAB and/or satellite DARS signal bandwidth and interference protection standards relevant in establishing DAB spectrum efficiency standards for IBOC and/or non-IBOC DAB systems? What bandwidth is necessary for DAB systems to achieve CD-quality audio signals? What are the spectrum implications of recent advances in coding and multistreaming technologies on the ability to deliver CD-like audio quality? With regard to each proponent's DAB system, what are the quantifiable trade-offs between bandwidth and signal robustness? What power, interference, and bandwidth trade-offs should the Commission consider in balancing the needs of incumbents and potential new entrants? Should there be different data capacity criteria during and after the transition to all-digital operations? Would the transition to all-digital service be slowed if incumbents were assigned less bandwidth for all-digital operations than their current channel assignments? Is preserving (or expanding) current AM and FM bandwidth assignments necessary for consumers to receive the full benefits of DAB, including a rapid implementation of an all-digital DAB system?

29. *(5), (6) Flexibility/auxiliary capacity.* Flexibility is one of the principal benefits of digital technology. Many commenters believe that increasing radio broadcasters' capacity to provide auxiliary services will be an important benefit of DAB technology. The Commission is committed to encouraging a DAB system design that would permit the flexible and dynamic development of new broadcast and non-broadcast services and features and allow broadcasters to realize specific service opportunities. We currently provide broadcasters with a great deal of freedom with regard to subcarrier usage and believe that a similar approach to regulating augmented auxiliary capacity would likewise be in the public interest.[74]

30. In this regard, the Telecommunications Act of 1996 requires the Commission to permit DTV licensees to provide ancillary or supplemental services, so long as such services do not derogate the free television broadcast service, and to assess and collect a fee for such use when the licensee receives fees or other compensation from third parties.[75] We tentatively conclude that the provision of new and innovative ancillary services must not technically impair the reception of DAB programming. We seek comment on whether an analogous regulatory framework would be appropriate for the radio broadcast service and the limits, if any, we should establish for ancillary services.

31. *(7) Extensibility.* We believe that a DAB system design also must be adaptable to future technological advances. As Lucent puts it, a DAB system should be structured "with 'headroom' to allow incorporation of future technological advances."[76] We tentatively conclude that extensibility is crucial to preserving a strong and competitive free, over-the-air broadcast system

[74] *See Notice of Inquiry* in MM Docket No. 87-268, 2 FCC Rcd 5125, 5137 (1987).

[75] *See Fees for Ancillary or Supplementary Use of Digital Television Spectrum, Notice of Proposed Rule Making* in MM Docket No. 97-247, 12 FCC Rcd 22821 (1997). We note that Eureka-147 systems evidently allow broadcasters to offer subscription services such as concerts.

[76] Comments of Lucent at 15.

in a digital communications environment, and to ensuring that listeners receive the full benefits of DAB. We seek comment on this view.

32. *(8) Accommodation for existing broadcasters.* We tentatively conclude that any DAB system should, to the maximum extent possible, accommodate all existing broadcasters that desire to initiate DAB system transmissions. A digital service that permits both AM and FM stations to provide the same level of enhanced audio quality also would be of significant benefit to broadcasters and listeners. We tentatively conclude, however, that placing AM and FM broadcasters on equal footing in terms of signal quality is not an essential DAB technical requirement. A digital AM service that would provide "FM-like" audio quality would create important new format choices for AM stations and could help revitalize this service. We seek comment on these views.

33. *(9) Coverage.* Broadcasters argue that any DAB system should be capable of replicating existing coverage areas. Such coverage areas tend to be greater than the "interference-free" areas protected under the Commission's rules.[77] We recognize that preserving existing coverage areas may be an important aspect of ensuring a non-disruptive transition to DAB.[78] Nevertheless, we tentatively conclude that the public interest is best served through the development of a digital radio assignment policy that adopts current analog protected service contours for DAB. The Commission has recognized in several different contexts that stations generally provide useful service beyond their service contours in the absence of interference. However, service contours are not merely a function of the distance at which adequate reception is possible. Rather, these contours reflect a balance between providing adequate service areas and expanding the potential number of station assignments.[79] We believe that this longstanding policy is applicable here. We request comments on these views.

34. *(10) Implementation costs/affordability of transmission and receiver equipment.* Minimizing implementation costs of any DAB model and/or system is a fundamental means of ensuring a rapid and non-disruptive transition to DAB. One important benefit of an IBOC model appears to be its ability to allow broadcasters to build on the existing broadcast infrastructure in transitioning to a DAB system. With regard to affordability, the *Petition* points out that the relatively low cost of receivers contributes to the radio broadcast service's unmatched penetration.[80] We wish to consider the costs to consumers of digital receivers as well, including the trade-offs between receiver performance and cost.

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[77] The Commission's rules protect commercial FM stations from interference within specified service contours based on class maximum facilities. *See* 47 C.F.R. § 73.207. A USADR-commissioned study of the FM interference environment found that "within the protected contour the majority of stations—approximately 90 percent—lose less than 10 percent of their predicted coverage to interference . . . The median station serves approximately 60 percent of its potential noise limited coverage area [defined in the study as the predicted 44 dBu service area]." *Petition*, Appendix D at 28. Ford states that service also has been extended during the past 30 years by improvements in the sensitivity and selectivity of receivers. *See* Comments of Ford at 8.

[78] Ford and other commenters urge the Commission to take steps to protect the current radio service performance "geography" following the introduction of any new IBOC system. *See id.* at 10.

[79] *See Report and Order* in BC Docket 80-90, 94 FCC 2d at 161-163.

[80] *Petition* at 4 ("Although audiophiles can spend considerable sums on a high-end receiver, radio can also serve the listener who can only afford a basic portable or clock radio.").

35. We seek comment on all of these proposed evaluative criteria. As is the case with our public policy objectives, we recognize that these criteria conflict in certain respects, and that the Commission will be required to balance competing interests. We also recognize that the IBOC model and other possible models have specific benefits and drawbacks with regard to the various criteria. In applying these criteria, we seek to identify the DAB model or models that best would serve the public interest.

C. IBOC DAB Model.

36. Proponents contend that IBOC technology represents the best means of implementing DAB in the United States. They note its promise of superior audio fidelity, signal robustness, and new and improved ancillary services. They also contend that IBOC technology would be spectrally efficient, in that it would not require a new spectrum allocation,[81] and consequently, "administratively efficient" because this approach would not raise new spectrum allocation and licensing issues.[82] Moreover, they argue that IBOC technology would ensure a fast and seamless transition from analog to digital by providing a digital opportunity for all existing broadcasters. According to proponents, broadcasters could introduce digital service immediately without disrupting existing analog service, but also would have the flexibility to "upgrade to digital at their own pace" based on "the economic needs of local stations and local listener demand[.]"[83] Listeners would enjoy uninterrupted service with their analog receivers. IBOC proponents also contend that DAB implementation costs would be minimized because IBOC transmission systems could be integrated into the existing broadcast infrastructure in accordance with "the normal life and maintenance cycle of radio broadcasting equipment.[84] Finally, they contend that IBOC would enable stations to preserve their current frequency identities and coverage areas, service features that are important to broadcasters and would promote a non-disruptive transition to DAB service.[85]

37. We believe that these arguments have merit and that a workable IBOC system would be superior to a new-spectrum DAB system in several respects. It would not require new spectrum. It would permit a fast transition to DAB that preserves the benefits of the existing radio broadcast service while leveraging the considerable resources and expertise of the radio broadcast industry.[86] IBOC systems also may achieve certain spectrum efficiencies. They may be able to provide enhanced sound quality, permit significant expansions in station service areas, and create opportunities to introduce a broad range of ancillary services. Continuing advances in compression technology may permit even greater levels of information transmission, and thus, the

[81] *See, e.g., id.* at 19-20. USADR also contends that a migration to new spectrum "could create tremendous turmoil in the radio industry, disrupting service to the public, and impose significant administrative burden on regulatory authorities." *Id.* at 18; *see* Reply Comments of USADR at 4-6.

[82] *Petition* at 21; *see* Comments of NAB at 7.

[83] *Petition* at 20.

[84] *Id.* at 22.

[85] *See, e.g., id.* at 21 ("[IBOC] will also allow listeners to maintain their patterns of radio use; listeners will continue to find stations at their existing dial position.").

[86] *See ATV Tentative Decision*, 3 FCC Rcd at 6525 ("initiating an advanced television system within the existing framework of local broadcasting will uniquely benefit the public and may be necessary to preserve the benefits of the existing system. Also, we believe that the benefits of these new technological developments will be made available to the public in the quickest and most efficacious manner if existing broadcasters are permitted to implement ATV.").

introduction of new broadcaster services. Moreover, if proponents' claims are correct, the enhanced robustness of IBOC systems could help eliminate or ameliorate interference now experienced by grandfathered short-spaced radio stations and the other types of signal degradation suffered by many stations operating in difficult or congested RF environments. To ensure the smooth initiation of DAB service by existing broadcasters, we tentatively conclude that if IBOC is adopted, IBOC DAB licenses will not count as distinct authorizations for purposes of our local radio ownership restrictions. We seek comment on these views.

38. However, an IBOC approach also raises spectrum efficiency concerns. Current IBOC system designs are premised on doubling the bandwidth licensed to AM and FM stations to 20 kHz and 400 kHz, respectively, spectrum which is currently included under current "emission masks." We recognize that the additional bandwidth for digital sidebands is an inherent feature of the IBOC hybrid mode. However, the IBOC system proponents envision that AM and FM stations would retain the additional bandwidth in an all-digital operating environment.[87] A permanent expansion of the channel bandwidth might constitute a fundamental change in spectrum assignment principles. We note that, on the other hand, current use of the frequencies to be occupied by the digital sidebands is effectively precluded by analog transmission technology and radio receivers now in service. We seek comment on the spectrum efficiency of the current IBOC system designs generally and, in particular, on using 400-kHz FM and 20-kHz AM channel bandwidths in the all-digital IBOC mode. We also seek comment as to whether a signal architecture that shifts audio carriage from sidebands to a center band in an all-digital environment is inherently more spectrally efficient than one which continues to operate on the basis of sidebands. We invite the IBOC system proponents to comment on the need for the sidebands in the all-digital mode.[88] We also seek comment on whether spectrum may be returned at the end of the licensees' IBOC transition to all-digital broadcasting.

39. The claimed advantages of the IBOC technology—to maintain coverage at lower power levels, to permit significant power increases when all-digital operations are initiated, and to provide substantially enhanced robustness from interference and signal degradation—create possibilities for existing broadcasters to increase service areas significantly and for new station opportunities which are not possible within the current analog technical and regulatory framework. We recognize that the current IBOC model may provide incumbent broadcasters with a strong incentive for a rapid transition to all-digital service. We seek comment on this model. How do we balance the need to provide broadcasters with sufficient incentives to transition rapidly to DAB with the need to respond to the unmet demand for new entrants? We seek analyses of the minimum power levels that would preserve service within protected service areas in an all-digital environment, and alternatively, the levels that would not result in significant disruptions to current listening patterns. Commenters should consider the different implications of an IBOC approach over the short-term transition period, when hybrid transmissions require greater bandwidth, and the long-term, when the absence of analog transmissions could open up spectrum for new entrants.

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[87] The USADR all-digital system would use the middle 200 kHz of each channel for low-power auxiliary signals. *See supra*, ¶ 8. USADR concedes that these signals would be susceptible to interference from higher power adjacent channel sidebands, and thus would serve smaller areas than the sideband signals. *Petition* at 54.

[88] *See id.* at 50. USADR states, among other things, that the split sidebands will help overcome multipath fading and interference and, "as a natural extension of the hybrid mode," will facilitate receiver design.

D. Alternative DAB Model Utilizing New Spectrum.

40. In GEN Docket No. 90-357, we also considered the potential for allocating new spectrum for terrestrial digital audio broadcasting. We stated that while we wished to encourage technical innovation and the development of new services, such as DAB, we must weigh these factors against competing demands for use of the spectrum.[89] We further stated that we must judge the benefits of DAB service against the needs of other existing and proposed new services. We indicated that we intended to consider whether a new frequency allocation should be provided for terrestrial DAB and specifically whether to use a portion of the existing television band for this service. At that time, however, we also raised the concern about whether such a DAB allocation would impact our desire to accommodate the implementation of digital television services. Now, with the completion of the plan for the introduction of DTV, we believe that it may be possible to use a portion of the television spectrum for DAB.

41. We therefore request comment on whether the six megahertz of spectrum at 82-88 MHz, currently used for TV Channel 6, could be reallocated to DAB service at the end of the DTV transition. We seek comment on whether this spectrum could be reallocated without adversely affecting the broadcast television service. We also recognize, however, that a Channel 6 allocation could significantly delay the introduction of DAB. The earliest this spectrum will be available in many areas is 2007. However, the exact date of spectrum availability, which is tied to the end of the DTV transition period, could be significantly later.[90] Thus, it appears that proven IBOC systems could be operational significantly sooner than an approach which relies on the availability of spectrum at 82-88 MHz. We request comment on all aspects of this new-spectrum DAB approach and ask interested parties whether there are other frequency bands that might be more desirable for new DAB spectrum. We note that the IBOC and new-spectrum DAB options need not be mutually exclusive and, in fact, could be complementary.

42. The new spectrum approach would permit the use of a DAB system that is completely independent of the existing analog AM and FM radio systems. We request comment on whether independence from existing AM and FM radio systems would provide greater flexibility in planning and implementing DAB service. An independent DAB transmission system might

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[89] *See Notice of Inquiry* in GEN Docket No. 90-357, 5 FCC Rcd at 5237.

[90] Under the provisions of the Balanced Budget Act of 1997 ("Act"), the DTV transition is currently scheduled to be completed on December 31, 2006. At that time, all analog broadcast television service will end and all broadcast television service will be DTV. However, provisions of the Act also provide for extending the date for terminating analog service for any television station that requests such an extension in any television market if the Commission finds that: (*i*) one or more of the stations in such market that are licensed to or affiliated with one of the four largest national television networks are not broadcasting a DTV service signal, and the Commission finds that each such station has exercised due diligence and satisfies the conditions for an extension of the Commission's applicable construction deadlines for DTV service in that market; (*ii*) digital-to-analog converter technology is not generally available in such market; or (*iii*) in any market in which an extension is not available under clause (*i*) or (*ii*), 15 percent or more of the television households in such market (*I*) do not subscribe to a multichannel video programming distributor that carries one of the DTV service programming channels of each of the television stations broadcasting such a channel in such market, and (*II*) do not have either (*a*) at least one television receiver capable of receiving the DTV service signals of the television stations in such market, or (*b*) at least one television receiver of analog television service signals equipped with digital-to-analog converter technology capable of receiving the DTV service signals of the television stations licensed in such market. *See* Balanced Budget Act of 1997, Pub. L. No. 105-33, 111 Stat. 251, § 3003, as codified in the Communications Act of 1934, as amended, 47 U.S.C. § 309(j)(14)(B).

operate at a higher data rate and thereby support higher audio quality and enhanced ancillary services as compared to an IBOC system operating in hybrid mode. We seek comment on these matters.[91]

43. Any reallocation of the 82-88 MHz band for DAB service should facilitate the transition to a final DAB spectrum plan that would include the existing FM radio spectrum. For example, when DAB is accepted by consumers and proves successful, the existing adjacent FM spectrum at 88-108 MHz could be converted to DAB. Under such a plan, all existing analog FM stations would be permitted to switch their operations to digital service on their existing channels. However, such a transition could result in significant service disruptions. It would require broadcasters to choose between serving listeners with analog receivers or listeners with digital receivers. Significant listener dislocations could occur at the point of a "hard" transition to digital transmissions unless everyone has acquired a digital radio, which in turn depends on the cost-effective manufacture of digital receivers and widespread consumer acceptance of these devices. We seek comment on these transition issues.

44. We note that the DTV Table of Allotments includes only one Channel 6 allotment for the United States.[92] There are 57 existing analog television stations on Channel 6. These analog stations are scheduled to cease operation after 2006 or the end of the DTV transition period. We seek comment on whether this reallocation would adversely impact DTV implementation or broadcast television service in general.[93]

45. We request comment on the appropriate bandwidth for DAB channels in a new spectrum context. Should any new spectrum assignments reflect the same channel assignment scheme currently used with the FM service? Would using the FM channel plan facilitate the eventual conversion of the existing FM stations to DAB operation, and a common FM/DAB radio receiver design across the entire 26 MHz of spectrum from 82-108 MHz? We also seek comment on whether a common FM/DAB channel scheme and receiver design would facilitate a transition plan in which existing FM stations could determine on their own when to switch to digital operation without regulatory intervention. We also invite interested parties' suggestions for alternative DAB channel plans.

46. If we adopt a new-spectrum option, should we adopt a service area approach that would follow the plan of the existing classes of FM stations, *i.e.*, Class A, B1, B, C3, C2, C1, and C, or should all DAB stations be provided a common service area? Parties favoring different size services areas are also requested to comment on how channels should be apportioned among the various classes.

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[91] Reallocation of the 82-88 MHz band to radio broadcasting would also address concerns that have been raised over the years by NPR and other noncommercial FM broadcast interests about potential interference and requirements for protection of television services on Channel 6. *See Memorandum Opinion and Order on Reconsideration of Sixth Report and Order* in MM Docket No. 87-268, 13 FCC Rcd 7418, 7435 (1998).

[92] The only DTV Channel 6 allotment is at New Haven, Connecticut. We believe that in the process of identifying final DTV channels for existing broadcasters in the post-transition period, it will be possible to identify a new channel for this station. This process will be carried out under our DTV two-year reviews. *See Fifth Report and Order* in MM Docket 87-268, 12 FCC Rcd 12809, 12856-57 (1997).

[93] Although analog television licensees that received a "paired" DTV channel assignment may elect to keep their existing analog channel when they convert to all-digital service, this election is subject to Commission review and approval. If we pursue a DAB service at 82-88 MHz, we would, clearly, not permit Channel 6 television licensees to make such an election.

47. Should all AM and FM broadcasters be eligible for a DAB license in any new spectrum made available? Should we exclude DAB licenses in the new spectrum from the local ownership limits that apply to analog stations? To what extent should new channels be reserved for educational use and new entrants? Should we limit each applicant to a maximum number of DAB licenses in each market? How would the issuance of these licenses implicate our statutory requirements with respect to auctions?[94]

48. We also request comment on what approach or approaches could be used to specify the initial DAB channel allotments under a new spectrum approach. One approach could be to allot DAB channels to communities in proportion to the number of AM and FM channels operating in each community using allotment software similar to that used in creating the initial DTV channel allotments.[95] Another approach could be to allot DAB channels to communities based on an initial expression of interest by applicants. We seek comment on whether these approaches would be consistent with the requirement for the fair, efficient and equitable distribution of radio service in Section 307(b) of the Communications Act, as amended.[96] We also request comment with regard to how to assess the technical acceptability of new DAB allotments and modifications of DAB allotments. Specifically, we request comment on whether to use an approach that uses minimum geographic spacing distances similar to what is now used for FM stations[97] or an approach that that uses engineering criteria to show that an allotment does not cause additional interference to other allotments.

49. As a further alternative, we seek comment on whether Channel 6 spectrum should be used to ensure adequate new entrant DAB opportunities. We seek comment on whether we may give preferences to LPFM licensees in assigning this Channel 6 spectrum, and if so, whether we should do so in the event we authorize an LPFM service. As we stated above,[98] we are concerned about the interrelation between DAB and the proposed LPFM service, including a DAB system that utilizes Channel 6. Although we "do not intend to create a low power radio service on any spectrum beyond that which is currently allocated for FM use,"[99] we seek comment on the extent to which a DAB system established on Channel 6 could ensure adequate new entrant opportunities. We note that the Channel 6 LPFM and IBOC proposals could be treated as complementary digital transition strategies.

E. Standards and Testing.

1. DAB Transmission Standard.

50. In its *Petition*, USADR asked the Commission to adopt a DAB transmission standard, and submitted a report arguing both that there is a need for such a standard and that the radio broadcast industry is unlikely to be able to develop one on its own.[100] Most commenters agreed

[94] *See* 47 U.S.C. § 309(j).

[95] *See Sixth Report and Order* in MM Docket No. 87-268, 12 FCC Rcd 14588 (1997).

[96] *See* 47 U.S.C. § 307(b).

[97] *See* 47 CFR § 73.207.

[98] *See supra*, ¶ 25.

[99] *LPFM Notice*, 14 FCC Rcd at 2477.

[100] *See Petition* at 92-101 and Appendix B.

that a single standard is necessary and that the Commission has a critical role in establishing one.[101] Among other things, commenters argued that a single standard is necessary to provide the certainty that consumers, licensees and equipment manufacturers would need to justify their investment in DAB technology.[102] They also predicted that industry attempts to reach a consensus on a voluntary standard would be impeded by the number of parties involved and their differing interests and agendas.[103] Several pointed to the AM stereo experience as an example where similar circumstances prevented the implementation of a single, voluntary standard.[104] In addition, a number of commenters cited the Commission's adoption of a DTV transmission standard as precedent for a similar action in this proceeding.

51. In the DTV proceeding, we observed that the traditional rationale for mandating a standard arises when two conditions are met: first, there would be a substantial public benefit from a standard; second, private industry either will not, or cannot, achieve a standard because the private costs of participating in the standard-setting process outweigh the private benefits, or a number of different standards have been developed and private industry cannot reach consensus on a single standard.[105] The Commission, in fact, did identify the same kind of considerations in support of adopting a mandatory DTV standard that commenters now argue support the adoption of a mandatory DAB transmission standard. We noted that mandated standards might provide needed certainty to consumers, licensees, and equipment manufacturers, particularly where the launch of a new technology is involved.[106] Moreover, we reasoned that standard-setting would help obviate the "chicken and egg" dilemma that can impede the introduction and acceptance of new technology and impose additional costs on consumers. We also recognized, however, that mandatory standards can have drawbacks, including potential deterrence of technical innovation—particularly where a technology is new and further development can reasonably be anticipated to occur—and curtailment of some forms of competition.[107]

52. We tentatively conclude, as we previously found in the DTV proceeding, that the public interest compels a Commission role in the development of DAB transmission standards, "with the advice and involvement of all sectors of the industry."[108] We lack sufficient information at this time, however, to conclude that a Commission-mandated DAB transmission standard is necessary. With regard to the first of the above-stated conditions for establishing a standard, the Commission seeks further comment on the desirability of a single DAB transmission standard. For example, it may be the case that there is a high degree of compatibility among the several DAB systems. Thus, there may be little public benefit derived from a mandated standard. In addition, developments in digital signal processors ("DSPs") may have obviated the need for a

[101] *See supra*, n. 44 and accompanying text.

[102] *See, e.g.*, Comments of CBS at 8 and 11; Comments of CEMA at 11-12; Comments of NAB at 8-9. CEMA notes that broadcasters do not operate on a subscription basis where the service provider may supply reception equipment, making certainty and reliability more significant in broadcasting than it would be in other, subscription-based services. Comments of CEMA at 12.

[103] *See, e.g.*, Comments of CBS at 12; Comments of Cumulus at 8; Comments of Ford at 4.

[104] *See, e.g.*, Comments of CBS at 9-10; Comments of Greater Media, Inc. at 9.

[105] *Fifth Further NPRM*, 11 FCC Rcd at 6247.

[106] *Id.* at 6247-48.

[107] *Id.* at 6248-49.

[108] *ATV Tentative Decision*, 3 FCC Rcd at 6534.

DAB standard or may justify a voluntary or technically narrower approach. We seek comment on these matters. Is an "open architecture" approach feasible? What technical and economic impacts would such an approach have on the development and manufacture of DAB receivers? Have advances in DSP chip technology made a standard unnecessary?

53. With regard to the second of the above-stated conditions, it is too early to predict whether private industry can or will be able to achieve a voluntary DAB transmission standard. Nevertheless, this *Notice* identifies numerous public policy issues concerning both terrestrial DAB and its potential impact on our vital radio broadcast service. Again, we seek further comment on this issue. How likely is the broadcast industry to establish a *de facto* standard in the absence of Commission action? Can the Commission take actions short of mandating a standard in order to help the industry establish a standard, for example by conferring benefits to licensees utilizing the standard? Furthermore, should we decide that a Commission-mandated standard is necessary, what should be the constituent elements of such a standard?

2. Decision-Making Models for DAB System Testing, Evaluation and Transmission Standard Selection.

54. In response to the USADR *Petition*, commenters suggested a number of models for DAB system testing, evaluation and transmission standard selection. The NAB, for example, proposed an industry-based model, whereby the NRSC would test and evaluate competing IBOC systems, select a transmission standard based on industry consensus, and make recommendations for the Commission to adopt.[109] Lucent argued that the Commission must actively participate to ensure a fair and unbiased decision-making process.[110] Ford proposed the creation of a public-private committee with open membership, which would achieve consensus and even recommend a specific transmission standard for adoption by the Commission.[111] Ford argued that this model would enable the Commission to conserve its own resources and utilize private sector expertise.

55. A committee similar to that proposed by Ford played an important role in the adoption of a DTV standard in Docket No. 87-268.[112] The Advisory Committee on Advanced Television Service ("ACATS") was established to assist the Commission "in considering the issues surrounding the introduction of advanced television service in the United States[,]" and its charter specified that it would "recommend policies, standards and regulations that would facilitate the orderly and timely introduction of advanced television services."[113] We relied heavily on the ACATS to test and evaluate competing advanced television ("ATV") systems in the first instance. It also proved to be effective in facilitating participation by a broad range of stakeholders and achieving industry consensus on a transmission standard. There are important differences between Docket No. 87-268 and this proceeding, however, that must be considered in connection

[109] *See* Comments of NAB at 8. The NAB's comments, like those of a number of commenters who firmly supported an IBOC DAB model, pertained solely to IBOC system testing, evaluation, and standard selection.

[110] *See* Comments of Lucent at 6-8 and Appendix; *see also* Comments of CEMA at 13-14; Comments of NPR at 6.

[111] Comments of Ford at 5-6.

[112] The Advisory Committee on Advanced Television Service was created pursuant to the Federal Advisory Committee Act, 86 Stat. 770, as amended, 5 U.S.C. App. 2 § 1, *et seq.* (1982 ed. and Supp. V) ("FACA"). Ford suggested that its proposed committee would not be subject to FACA. *See* Comments of Ford at 5.

[113] *Notice*, 52 Fed. Reg. 38523 (October 16, 1987).

with the possible establishment of an advisory committee. Docket 87-268 considered a wide array of ATV technologies, including DTV, in their early stages of development. In contrast, DAB systems now are being deployed in Europe and Canada, and IBOC systems, according to proponents, are in the final stages of development. Moreover, it may be possible to implement DAB service much more rapidly than DTV service, due to IBOC systems' promised compatibility with existing analog signals. Thus, there may be a question as to whether an advisory committee would be capable of acting with due speed in the context of this proceeding.

56. With regard to the narrower issue of IBOC DAB system testing, USADR and Lucent have asserted in recent *ex parte* meetings with staff and in written submissions that the Commission should establish certain procedures immediately. They disagree, however, as to the specifics of such procedures. USADR urges us to endorse the NRSC testing program and to request that proponents file their NRSC test reports with the Commission on the NRSC deadline of December 15, 1999. USADR contends that the reports will enable us to identify the field of proponents and address threshold performance questions such as improved audio quality, compatibility with existing analog service and equal coverage. Lucent, on the other hand, criticizes the NRSC testing program as potentially subject to manipulation because of the lack of a common testing platform, and argues that the data it yields will be insufficient to meaningfully evaluate the performance of different system designs. Lucent proposes that the Commission convene a meeting of USADR, Lucent and DRE (the three known IBOC system proponents) to facilitate agreement on a revised testing program that, in Lucent's view, should be conducted by a common entity, observed by the Commission staff, and sufficient to permit us to comprehensively evaluate the proponent systems in the context of this proceeding. In short, rather than a multi-step process, Lucent envisions a single round of tests sufficient to enable us not only to determine the viability of IBOC systems but to select a superior system. However, Lucent reportedly has reached an agreement with the NRSC recently which provides for a second stage of comparative testing of each IBOC system on a common testing platform.

57. In GEN Docket No. 90-357, the Commission relied on the NRSC and CEMA to test IBOC and other DAB systems. This proved to be a wise course: tests proved that IBOC technology was not yet viable, so that Commission action would have been premature. We applaud the recent efforts of these groups to develop testing guidelines, and will continue to rely on them to facilitate and evaluate the development of IBOC DAB systems. We anticipate that the first stage of the NRSC's current program will serve a useful, if limited, purpose. We request each proponent to submit a copy of its test reports to the Commission as part of the record in this proceeding. We emphasize that all test data relevant to our evaluation of IBOC and/or other DAB systems will be subject to public comment and close staff scrutiny. We also see merit in a second stage of comparative testing of IBOC systems on a common testing platform.

58. We believe that it is necessary and appropriate to rely to some degree on the expertise of the private sector for DAB system evaluations and, ultimately, recommendations for a transmission standard. Each of the testing models discussed above would help facilitate broad participation in this process. However, we conclude that it is premature to commit ourselves to any particular approach. This decision is based on both the limited information we have on the performance capabilities of the competing systems and the fact that system proponents appear to be actively working toward a consensus on comparative testing issues. Nevertheless, we note that the NRSC brings substantial experience, expertise, and credibility to the testing process. Their current initiatives may provide the best opportunity for the rapid introduction of DAB. Moreover, the Commission would give great weight to any industry compromise the NRSC may achieve. We plan to monitor this testing process closely for fairness, thoroughness, and timeliness. While we are encouraged by the NRSC's efforts to date, we will act promptly to provide an alternative

mechanism if subsequent events undermine our confidence in the current testing process. In this regard, we expect to revisit the effectiveness and appropriateness of the NRSC approach once the Commission has reviewed the NRSC report regarding IBOC tests, which we expect to be some time in the first quarter of 2000. In the meantime, we wish to develop a complete record on these issues in order to be in a position to take informed and expeditious action at the proper time. We therefore seek comment on the evaluative models discussed above and any others that may merit consideration.

IV. ADMINISTRATIVE MATTERS

59. *Filing of Comments and Reply Comments.* Pursuant to Sections 1.415 and 1.419 of the Commission's Rules,[114] interested parties may file comments within seventy-five (75) days of the date of publication of this *Notice* in the Federal Register, and reply comments within one hundred and five (105) days of the date of publication of this *Notice* in the Federal Register. Comments may be filed using the Commission's Electronic Comment Filing System ("ECFS") or by filing paper copies.[115]

60. Comments filed through the ECFS can be sent as an electronic file via the Internet to <http://www.fcc.gov/e-file/ecfs.html>. In completing the transmittal screen, commenters should include their full name, postal service mailing address, and the applicable docket or rulemaking number. Parties may also submit an electronic comment by Internet e-mail. To get filing instructions for e-mail comments, commenters should send an e-mail to ecfs@fcc.gov, and should include the following words in the body of the message, "get form <your e-mail address." A sample form and directions will be sent in reply.

61. Parties who choose to file by paper must file an original and four copies of each filing. If you want each Commissioner to receive a personal copy of your comments, you must file an original plus eleven copies. All filings must be sent to the Commission's Secretary, Magalie Roman Salas, Office of the Secretary, TW-A306, Federal Communications Commission, 445 12th Street, S.W., Washington, D.C. 20554. The Mass Media Bureau contacts for this proceeding are Peter Doyle and William J. Scher at (202) 418-2780 or pdoyle@fcc.gov and wscher@fcc.gov. Parties who choose to file by paper should also submit their comments on diskette. These diskettes should be submitted to: William J. Scher, Federal Communications Commission, 445 12th Street, S.W., Room 2-A445, Washington, DC 20554. Such submissions should be on a 3.5 inch diskette formatted in an IBM-compatible format using Microsoft Word or compatible software. The diskette should be accompanied by a cover letter and should be submitted in "read only" mode. The diskette should be clearly labeled with the commenter's name, proceeding (including the docket number), type of pleading (comment or reply comment), date of submission, and the name of the electronic file on the diskette. The label should also include the following phrase "Disk Copy - Not an Original." Each diskette should contain only one party's pleadings, preferably in a single electronic file. In addition, commenters must send diskette copies to the Commission's copy contractor, International Transcription Service, Inc., 1231 20th Street, N.W., Washington, D.C. 20036.

62. Comments and reply comments will be available for public inspection during regular business hours in the FCC Reference Center, 445 12th Street, S.W., Washington, D.C. 20554. Written comments by the public on the proposed and/or modified information collections are due

[114] 47 C.F.R. §§ 1.415 and 1.419.

[115] *See Electronic Filing of Documents in Rulemaking Proceedings*, 63 Fed. Reg. 24121 (1998).

on or before 75 days of the date of publication of this *Notice* in the Federal Register. Written comments must be submitted by the Office of Management and Budget ("OMB") on the proposed and/or modified information collections on or before 75 days of the date of publication of this Notice in the Federal Register. In addition to filing comments with the Secretary, a copy of any comments on the information collections contained herein should be submitted to Judy Boley, Federal Communications Commission, Room C-1804, 445 12th Street, S.W., Washington, D.C. 20554, or via the Internet to jboley@fcc.gov and to Virginia Huth, OMB Desk Officer, 725 17th Street, NW, Room 10236, NEOB, Washington, DC 20503, or via the Internet to vhuth@omb.eop.gov.

63. *Initial Paperwork Reduction Act of 1995 Analysis. Initial Paperwork Reduction Act of 1995 Analysis.* This *Notice* considers alternative approaches to introducing digital audio broadcasting service to the American public. The implementation of digital audio broadcasting service may involve an information collection requirement. As part of our continuing effort to reduce paperwork burdens, we invite the general public and OMB to take this opportunity to comment on the information collection contained in this *Notice*, as required by the Paperwork Reduction Act of 1995, Pub. L. No. 104-13. Public and agency comments are due at the same time as other comments in this *Notice* (on or before 75 days of the date of publication of this *Notice* in the Federal Register); OMB comments also are due at that time. Comments should address: (a) whether the proposed collection of information is necessary for the proper performance of the functions of the Commission, including whether the information shall have practical utility; (b) the accuracy of the Commission's burden estimates; (c) ways to enhance the quality, utility and clarity of the information collected; and (d) ways to minimize the burden of the collection of information on the respondents, including the use of automated collection techniques or other forms of information technology. In addition to filing comments with the Secretary, a copy of any comments on the information collections contained herein should be submitted to Judy Boley, Federal Communications Commission, Room C-1804, 445 12th Street, S.W., Washington, DC 20554, or via the Internet to jboley@fcc.gov and to Virginia Huth, OMB Desk Officer, 725 17th Street, NW, Room 10236, NEOB, Washington, DC 20503, or via the Internet to vhuth@omb.eop.gov.

64. *Ex Parte Rules.* This proceeding will be treated as a "permit-but-disclose" proceeding subject to the "permit-but-disclose" requirements under Section 1.1206(b) of the Commission's rules.[116] Ex parte presentations are permissible if disclosed in accordance with Commission rules, except during the Sunshine Agenda period when presentations, ex parte or otherwise, are generally prohibited. Persons making oral ex parte presentations are reminded that a memorandum summarizing a presentation must contain a summary of the substance of the presentation and not merely a listing of the subjects discussed. More than a one- or two-sentence description of the views and arguments presented is generally required.[117] Additional rules pertaining to oral and written presentations are set forth in Section 1.1206(b).

65. *Initial Regulatory Flexibility Analysis.* With respect to this Notice, an Initial Regulatory Flexibility Analysis ("IRFA") under the Regulatory Flexibility Act[118] is contained in Appendix A. Written public comments are requested on the IRFA, and must be filed in accordance with the same filing deadlines as comments on the *Notice*, with a distinct heading designating them as

[116] 47 C.F.R. § 1.1206(b), as revised.

[117] *See id.* at § 1.1206(b)(2).

[118] *See* 5 U.S.C. § 603.

responses to the IRFA. The Commission will send a copy of this *Notice*, including the IRFA, to the Chief Counsel for Advocacy of the Small Business Administration.

66. Accordingly, IT IS ORDERED, That pursuant to the authority contained in Sections 1, 4(i) and 303 of the Communications Act of 1934, as amended, 47 U.S.C. §§ 151, 154(i), 303, this *Notice of Proposed Rule Making* IS ADOPTED.

67. IT IS FURTHER ORDERED, That the Commission's Office of Public Affairs, Reference Operations Division, SHALL SEND a copy of this *Notice*, including the Initial Regulatory Flexibility Analysis, to the Chief Counsel for Advocacy of the Small Business Administration

68. Additional Information. For additional information on this proceeding, please contact Peter Doyle or William J. Scher, Audio Services Division, Mass Media Bureau at (202) 418-2780 or pdoyle@fcc.gov or wscher@fcc.gov.

FEDERAL COMMUNICATIONS COMMISSION

Magalie Roman Salas

Magalie Roman Salas
Secretary

Appendix A
Initial Regulatory Flexibility Analysis (IRFA)

As required by the Regulatory Flexibility Act ("RFA"),[119] the Commission has prepared the present Initial Regulatory Flexibility Analysis ("IRFA") of the possible significant economic impact on small entities by the policies and rules proposed in this *Notice of Proposed Rule Making* ("*Notice*"). Written and electronically-filed public comments are requested on this IRFA. Comments must be identified as responses to the IRFA and must be filed by the deadlines for comments set forth in paragraph 61 of the *Notice*. The Commission will send a copy of the *Notice*, including this IRFA, to the Chief Counsel for Advocacy of the Small Business Administration. *See* 5 U.S.C. § 603(a). In addition, the *Notice* and IRFA (or summaries thereof) will be published in the Federal Register. *See id.*

I. Need For and Objectives of the Proposed Rules:

This rulemaking proceeding is initiated to obtain comments concerning the Commission's proposals to foster the development and implementation of terrestrial digital audio broadcasting ("DAB"). In the *Notice*, the Commission (1) reaffirms its commitment to providing radio broadcasters with the opportunity to take advantage of DAB technology; (2) identifies Commission public policy objectives for the introduction of DAB service; (3) proposes criteria for the evaluation of DAB models and systems; (4) evaluates IBOC and new-spectrum DAB models; (5) inquires as to the need for a mandatory DAB transmission standard; and (6) considers certain DAB system testing, evaluation and standard selection issues.

II. Legal Basis:

Authority for the actions proposed in this *Notice* may be found in Sections 1, 4(i) and 303 of the Communications Act of 1934, as amended, 47 U.S.C. §§ 151, 154(i), 303.

III. Description and Estimate of the Number of Small Entities to Which the Proposed Rules Will Apply:

The RFA generally defines the term "small entity " as having the same meaning as the terms "small business," "small organization," and "small governmental jurisdiction."[120] In addition, the term "small business" has the same meaning as the term "small business concern" under the Small Business Act.[121] A small business concern is one which: (1) is independently owned and operated; (2) is not dominant in its field of operation; and (3) satisfies any additional criteria established by the Small Business Administration ("SBA").[122] A small organization is generally

[119] *See* 5 U.S.C. § 603. The RFA, *see id.* at § 601 et. seq., has been amended by the Contract with America Advancement Act of 1996, Pub. L. No. 194-12, 110 Stat. 848 (1996) ("CWAA"). Title II of the CWAA is the Small Business Regulatory Enforcement Fairness Act of 1996 ("SBREFA").

[120] *Id.* at § 601(6).

[121] 5 U.S.C. § 601(3) (incorporating by reference the definition of "small business concern" in 15 U.S.C. § 632). Pursuant to the RFA, the statutory definition of a small business applies "unless an agency, after consultation with the Office of Advocacy of the Small Business Administration and after opportunity for public comment, establishes one or more definitions of such term which are appropriate to the activities of the agency and publishes such definition(s) in the Federal Register." 5 U.S.C. § 601(3).

[122] Small Business Act, 15 U.S.C. § 632 (1996).

"any not-for-profit enterprise which is independently owned and operated and is not dominant in its field."[123] Nationwide, as of 1992, there were approximately 275,801 small organizations.[124] "Small governmental jurisdiction" generally means "governments of cities, counties, towns, townships, villages, school districts, or special districts, with a population of less than 50,000."[125] As of 1992, there were approximately 85,006 such jurisdictions in the United States.[126] This number includes 38,978 counties, cities, and towns; of these, 37,566, or 96 percent, have populations of fewer than 50,000.[127] The Census Bureau estimates that this ratio is approximately accurate for all governmental entities. Thus, of the 85,006 governmental entities, we estimate that 81,600 (91 percent) are small entities.

The proposed rules and policies potentially will apply to all AM and FM radio broadcasting licensees and potential licensees. The SBA defines a radio broadcasting station that has no more than $5 million in annual receipts as a small business.[128] A radio broadcasting station is an establishment primarily engaged in broadcasting aural programs by radio to the public.[129] Included in this industry are commercial, religious, educational, and other radio stations.[130] Radio broadcasting stations which primarily are engaged in radio broadcasting and which produce radio program materials are similarly included.[131] However, radio stations which are separate establishments and are primarily engaged in producing radio program material are classified under another SIC number.[132] The 1992 Census indicates that 96 percent (5,861 of 6,127) of radio station establishments produced less than $5 million in revenue in 1992.[133] Official Commission records indicate that 11,334 individual radio stations were operating in 1992.[134] As of December 31, 1998, official Commission records indicate that 12,472 radio stations were operating, of which 4,793 were AM stations.[135] Thus, the proposed rules will affect 12,472 radio stations, 11,973 of which are small businesses.[136] These estimates may overstate the number of small entities since the revenue figures on which they are based do not include or aggregate revenues from non-radio affiliated

[123] 5 U.S.C. § 601(4).

[124] 1992 Economic Census, U.S. Bureau of the Census, Table 6 (special tabulation of data under contract to Office of Advocacy of the U.S. Small Business Administration).

[125] 5 U.S.C. § 601(5).

[126] U.S. Dept. of Commerce, Bureau of the Census, "1992 Census of Governments."

[127] Id.

[128] 13 C.F.R. § 121.201, SIC 4832.

[129] Executive Office of the President, Office of Management and Budget, Standard Industrial Classification Manual (1987), SIC 4832.

[130] *Id.*

[131] *Id.*

[132] *Id.*

[133] The Census Bureau counts radio stations located at the same facility as one establishment. Therefore, each co-located AM/FM combination counts as one establishment.

[134] FCC News Release No. 31327, Jan. 13, 1993.

[135] FCC News Release No. 85488, "Broadcast Station Totals as of September 11, 1998."

[136] We use the 96% figure of radio station establishments with less than $5 million revenue from the Census data and apply it to the 1916 radio stations using directional antennas to arrive at 1839 individual AM stations as small businesses.

companies. In addition to owners of operating radio stations, any entity that seeks or desires to obtain a DAB license may be affected by the proposals contained in this item. The number of entities that may seek to obtain a DAB radio broadcast license is unknown. We invite comment as to such number.

IV. Description of Projected Recording, Recordkeeping, and Other Compliance Requirements:

None.

V. Steps Taken to Minimize Significant Economic Impact on Small Entities and Significant Alternatives Considered:

The *Notice* sets forth policy objectives and proposes criteria for the selection of alternative DAB models and/or systems that will promote the interests of small entities and minimize the economic impact on such entities of a transition to DAB service. For example, the *Notice* sets forth as a policy objective a non-disruptive transition to DAB service that does not require burdensome investments in new broadcast transmission equipment. Proposed selection criteria include minimization of implementation costs and affordability of transmission and receiver equipment.

VI. Federal Rules that Overlap, Duplicate, or Conflict with the Proposed Rules:

None.