Desired-to-Undesired Signal Ratio Required to Avoid Second Adjacent Channel Interference (dB)

Values reported are median values for all 28 radios.

80 dBu/-45 dBm	70 dBu/-55 dBm	60 dBu/-65 dBm
-17.0	-23.7	-30.5

Desired-to-Undesired Signal Ratio Required to Avoid Third Adjacent Channel Interference (dB)

Values reported are median values for all 28 radios.

80 dBu/-45 dBm	70 dBu/-55 dBm	60 dBu/-65 dBm
-26.8	-32.0	-39.7

These data illustrate that the Commission's existing –40 dB protection criteria for third adjacent channel stations is appropriate *provided the third adjacent channel interfering station is outside of the desired station's protected coverage area.* As the third adjacent channel interferer moves inside the protected contour of the desired station and closer to the desired station's transmitter, *more protection* is needed to avoid interference to the desired station.

With regard to second adjacent channel interference this data demonstrates that the Commission's existing –40 dB protection requirement for non-reserved band stations[86] does not fully protect against interference for many radios, though its -20 dB protection requirement for reserved band stations[87] does appear adequate *provided the second adjacent channel interfering station is outside of the desired station's protected coverage area.* As in the case of third adjacent channel interference, as the second adjacent channel interferer moves inside the

[86] 47 C.F.R. § 73.215 (1998).

[87] 47 C.F.R. § 73.509 (1998).

protected contour of the desired station and closer to the desired station's transmitter, more protection is needed to avoid interference to the desired station.

These data demonstrate the Commission's assumption that "[a] protected station's signal is most vulnerable to interference where it is weakest, *i.e.*, at the outer edge of the protected station's coverage area"[88] to be incorrect.

To illustrate the impact of this in terms of interference area, we have produced two tables showing the approximate radius of interference from an LP1000 station as it moves closer to a desired station (one table for second adjacent interference, and one table for third adjacent interference). In each table the "interfering contour" of the LP1000 station is equivalent to the desired station's contour plus the amount of protection needed to avoid interference. Thus, the area within the interfering contour, where the interfering station's signal is stronger than the minimum level necessary to cause interference, will receive interference from the LP1000 station.

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88 *Notice* n.59.

Estimate of Interference Caused by a Second Adjacent LP1000 Station as it Moves Toward a Desired Station

Desired Station Contour	Protection Ratio (D/U) Required*	Interfering Contour	Distance to Interfering Contour	Area Within Interfering Contour
50 dBu	-30.5 dB	80.5 dBu	2.7 miles	22.9 sq. mi.
60 dBu	-23.7 dB	83.7 dBu	2.3 miles	16.6 sq. mi.
70 dBu	-17.0 dB	87.0 dBu	1.9 miles	11.3 sq. mi.

* Earlier, to illustrate "real world" performance, we reported the protection ratios that our tests have shown to be necessary in relation to a receive antenna that is 1.5 meters above the ground (80 dBu/-45 dBm, 70 dBu/-55 dBm and 60 dBu/-65 dBm). However, because the example we are providing here requires estimates of propagation distances to be made using the Commission's F(50,10) curves, and because these curves are based on receiver antenna heights of nine meters, we are reporting our test data here in terms of a receive antenna that is nine meters above the ground (70 dBu/-45 dBm, 60 dBu/-55 dBm and 50 dBu/-65 dBm).

Estimate of Interference Caused by a Third Adjacent LP1000 Station as it Moves Toward a Desired Station

Desired Station Contour	Protection Ratio (D/U) Required*	Interfering Contour	Distance to Interfering Contour	Area Within Interfering Contour
50 dBu	-39.7 dB	89.7 dBu	1.6 miles	8.0 sq. mi.
60 dBu	-32.0 dB	92.0 dBu	1.4 miles	6.2 sq. mi.
70 dBu	-26.8 dB	96.8 dBu	1.1 miles	3.8 sq. mi.

* Earlier, to illustrate "real world" performance, we reported the protection ratios that our tests have shown to be necessary in relation to a receive antenna that is 1.5 meters above the ground (80 dBu/-45 dBm, 70 dBu/-55 dBm and 60 dBu/-65 dBm). However, because the example we are providing here requires estimates of propagation distances to be made using the Commission's F(50,10) curves, and because these curves are based on receiver antenna heights of nine meters, we are reporting our test data here in terms of a receive antenna that is nine meters above the ground (70 dBu/-45 dBm, 60 dBu/-55 dBm and 50 dBu/-65 dBm).

Clearly, while it is true that the radius of interference around an LP1000 station would shrink slightly as the LP1000 station moved closer to a second or third adjacent channel station, the degree to which the interference area would diminish is not nearly as significant as the Commission suggests in the *Notice,*[89] and the amount of interference that would result is significant.

3. The NAB test results demonstrate that the ability of receivers to reject adjacent channel interference has not improved.

Our test data clearly show that the alleged "vast improvements in receiver technology" cited by the Commission as an argument in favor of eliminating second and third adjacent channel protection criteria[90] are, in fact, a myth. The 1981 data collected by the NRSC demonstrated that a second adjacent channel protection ratio of at least -26 dB was necessary, and the NRSC recommended that a protection ratio of -25 dB be established to permit stereophonic reception with an audio signal-to-noise ratio of 50 dB in the presence of second adjacent channel stereophonic interference.[91] The just completed NAB testing demonstrates that a -23.7 dB ratio is needed to protect second adjacent channel stations at their 60 dBu contour using the Commission-assumed nine meter high receiving antenna. Clearly, there has been no improvement in this aspect of receiver performance because the just completed NAB tests show today's radios to be interfered with at slightly lower adjacent channel signal levels than the radios tested by the NRSC in 1981.

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89 *Notice* n.59.

90 *Id.* at n.57.

91 Comments of the National Radio Systems Committee in BC Docket 80-90 (filed October 16, 1981).

Although no third adjacent channel data was collected by the NRSC in 1981, the NAB testing demonstrates that it is still necessary to protect stations from third adjacent channel interference, and that more interference protection is necessary as the interfering station moves closer to the desired station.

These results are precisely in line with the conclusion of Brian Fenton in the *Stereo Review Stereo Buyer's Guide 1999*. He wrote, "in general, receiver tuners today don't work as well as those of, say, 20 years ago."[92]

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92 *Stereo Buyer's Guide 1999*, *supra* note 52, at 44.

4. Based on NAB's receiver study, substantial interference to existing stations and their listeners will result from LPFM.

All of the Commissioners have stated that they would not establish an LPFM service that would create interference to existing broadcasters.[93] The Commission asked for, and has now received, information regarding radio receiver performance. Based on this information, NAB asked Dataworld, a leading communications database and mapping service provider, to create maps that show the areas of interference from the proposed LPFM service in the same 60 markets that the FCC studied in its Spectrum Availability Analysis. An explanation of the maps

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93 *See* FCC Chairman William Kennard, Statement at Roundtable Discussion on Low Power FM (May 13, 1999) ("As FCC Chairman my job is [to] ensure that the public spectrum is used to benefit all Americans. But we must do it in a way that protects existing broadcast signals and does not impede the conversion to digital radio."); FCC Commissioner Gloria Tristani, Remarks before the New Mexico Broadcasters Association (April 30, 1999) ("To me, proven interference and hindering the transition to digital would be valid reasons not to proceed with low power."); FCC Commissioner Susan Ness, Statement in the Matter of Creation of a Low Power Radio Service (January 28, 1999) ("To me, there are three issues that will be in the forefront as we build a record: *first,* whether these services should be open only to noncommercial entities; *second,* whether and to what extent these services would adversely affect the potential transition of existing broadcasters from analog to digital through an "In Band On Channel" (IBOC) system; and *third,* whether the proposed services would create undue levels of interference to full power services."); FCC Commissioner Michael Powell, Statement on Notice of Proposed Rulemaking in MM Docket No. 99-25 Creation of a Low Power FM Radio Service (January 28, 1999) ("I will be very interested in understanding the spectral ramifications of creating low power FM radio service and I intend to consider interference questions very seriously before taking final action."); FCC Commissioner Harold W. Furchtgott-Roth, Statement on Notice of Proposed Rulemaking, Creation of a Low Power Radio Service, MM Docket No. 99-25 (January 28, 1999) ("It especially troubles me that the Commission has made *no* effort to assess, much less quantify, the effect on existing stations of eliminating these safeguards. In my opinion, weighing the "cons" of the proposal -- namely, the negative effects on existing stations and their audiences -- in addition to considering its "pros" is essential to the decision whether to move forward with these petitions for rulemaking.").

and the method used to produce them is included with the maps in Volume Three of these comments.[94]

NAB found that, conservatively, in the 60 markets, if radios perform as well as the current FCC protection ratios assume, at least 5.8 million people (for the LP1000 assignments) and 6.1 million (for the LP100 assignments) would face interference.[95] Based on our receiver study, these numbers would be much greater depending on the type of radio used. It must also be noted that the amount of interference in these markets likely is also underrepresented by our maps because LPFM allocations in adjacent areas that were not studied by the FCC would also impact reception.

To produce the maps in Volume Three, Dataworld used the FCC's computer program for "allocating" all "available" LPFM stations in each of the 60 markets. Each market was studied for LP1000 availability and for LP100 availability. For each case (LP1000 and LP100) in each market, after the LPFM stations were allocated, Dataworld plotted the areas where at least one existing full power station would receive interference from the LPFM stations based on the interference protection radios identified in the Carl T. Jones study. Once these areas were plotted, the population affected was determined.

The first set of maps in Volume Three shows the interference areas for the FCC protection ratios, and the protection ratios for the median values of the receivers examined in the

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94 *See* Mark R. Fratrik and David E. Wilson, *Interference from Low Power FM Stations to Existing Stations*, August 1999 (Attached in Volume Three of these comments) [hereinafter *Interference Report*].

95 *Id.* at 20.

categories of Home Stereo, Clock/Personal, and Portable.[96] There are two maps for each market in this set, one for LP1000s and one for LP100s.

The second set of maps in Volume Three shows the interference areas for the FCC protection ratios, and the protection ratios for the median values of the receivers examined in the categories of Home Stereo, Clock/Personal, Portable, and the "worst" radio.[97] The worst radio is a composite of two radios tested in our study, the worst performer on 2nd adjacent interference and the worst performer on 3rd adjacent interference. Essentially, it is the worst case situation from the receivers we tested.

The information regarding the worst case scenario is important because, out of the vast universe of receivers, we tested 28. There may be many others that perform worse than our composite. Thus, it is important to see how far reaching the interference could be with one such radio, keeping in mind that there may be many more people who would receive interference with radios that perform more poorly.

These maps graphically show the extent of interference that could result if the Commission were to eliminate second and third adjacent channel restrictions for LPFM stations.[98] The legend on each map describes the type of receivers predicted to experience interference in each interference area. These areas are cumulative. That is, the area in which component (home stereo) receivers would experience interference includes the area marked "Home Stereo Radio" and the area marked "Existing FCC Ratios." As another example,

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96 Appendix A of Volume Three.

97 Appendix B of Volume Three.

98 Although there is no certainty regarding where the interference would occur due to the fact the Commission did not propose an allocation table for LPFM, the fact remains that interference will result with the establishment of LPFM.

portable radios (*e.g.* "boomboxes") would experience interference in the area marked "Portable Radio," in the area marked "Clock & Personal Radio," in the area marked "Home Stereo Radio," and in the area marked "Existing FCC Ratios."

The Commission has stated it will not allow LPFM to harm existing broadcast service. The results of NAB's receiver study, as graphically illustrated in these maps, show that the elimination of second and third adjacent channel protections – which the Commission concedes would be essential to establish LPFM – would result in substantial new interference to existing full service stations. Therefore, the Commission should not go forward to implement LPFM.

5. The Commission cannot relax distance criteria for LPFM stations without doing the same for full-power stations.

The Commission's proposal to eliminate second and third adjacent channel interference protections would have a far greater impact than even predicted by NAB's receiver study and analysis of the proposed LPFM allocations. If the Commission concludes, as the *Notice* suggests, that current receivers can reject second and third adjacent channel interference, it will not be possible to limit new interference to LPFM stations. Full power stations that now cannot relocate because they would be short-spaced to other stations would be able to move. The result would not only be vastly increased interference, but complete chaos in the FM band.

In the *Notice*, the Commission states that it is "disinclined to extend reduced second- and third- adjacent channel protection standards to full power FM stations."[99] The Commission asserts that this distinction is justified by the relatively low maximum power levels of the proposed LPFM stations. That distinction cannot be sustained.

First, the proposed LP1000 stations in many instances – particularly in smaller markets – would function similarly to full power stations. Second, the distinction seen by the Commission

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[99] *Notice* ¶ 50.

appears to have been based on its assumption that interference from second and third adjacent LPFM stations would only occur at the edge of existing station's protected service areas. As we explained above, the NAB receiver study demonstrates that interference from second and third adjacent stations occurs across stations' service areas. Third, the distinction posited by the Commission is irrelevant to the basis on which the Commission proposed to eliminate second and third adjacent channel restrictions; if, as the Commission supposes, modern receivers can reject second and third adjacent channel interference from low power stations, the same would presumably be true for full power stations.

While the Commission may not intend to extend the proposed changes in interference standards to full power stations, it could not justify denying a waiver of the distance separation rules to full power stations if it has abandoned second and third adjacent channel restrictions for LPFM. If that were to occur, the FM band would become consumed by interference – and the public interest would suffer as the quality of radio service declined.[100]

C. Full-Power Stations Will Face Additional Interference Beyond Their Protected Contours.

Broadcast stations provide service well beyond their protected contours. There is no brick wall that a signal hits at the 60 dBu contour that prevents listeners from receiving the signal outside of that area. In many instances, broadcasters depend on those listeners that are outside of their protected contours and the listeners depend on receiving that signal. As urban areas continue to spread and individuals have to commute and travel, there is an increasing expectation that listeners will be able to receive usable signals beyond the protected contour.

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[100] Such an environment would also dramatically increase the difficulties of establishing IBOC DAB service, since there would be no effective way for proponents to predict the levels of second adjacent channel interference that digital receivers would have to accept.

Although the Commission only protects a station's signal to the 60 dBu contour, it has acknowledged that usable service outside of the area does occur.[101] The public continues to be served in these areas; thus, the LPFM proposal threatens to create new interference in areas that now receive service, resulting in loss of service to large numbers of listeners.

The North Carolina Association of Broadcasters and Virginia Association of Broadcasters ("NCAB/VAB") have studied this issue to determine the effect on the listenership outside the protected contours. In the NCAB/VAB case studies, they found that a significant portion of listening does occur outside the protected contour and the stations would be adversely affected by the LPFM proposal.[102] The conclusions of the study apply to virtually every other radio market. Stations, and their listeners, depend on signals reaching to areas outside of the 60 dBu contour.

While no one is suggesting that the Commission now extend stations' protected contours, the *Notice* assumes that no harm would occur if new interference were created just outside of the 60 dBu contour. That assumption is clearly at odds with the facts of modern-day work and living patterns. For members of the public who now receive service from the same station where they work, where they live, and in between, the Commission's plan to add interference outside of the protected contour means that they will lose service and the value of radio to them will be less.

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101 *See* Amendment of Part 73 of the Rules to Provide for an Additional FM Station Class (Class C3) and to Increase the Maximum Transmitting Power for Class A FM Stations, Notice of Proposed Rule Making, 3 FCC Rcd 5941, 5950 (1988).

102 Comments of the North Carolina Association of Broadcasters and Virginia Association of Broadcasters in MM Docket 99-25 at 25 (filed August 2, 1999).

Before the Commission adopts LPFM, it must carefully weigh any benefits in service it foresees against the loss of service its proposals will engender.[103]

D. The Commission Has Made Little Effort to Shepherd the Radio Broadcasting Industry into the Digital Age.

1. The Commission should apply the principles developed in the digital television proceeding to the radio industry's migration to digital technology.

More than a decade ago, on February 13, 1987, various broadcast organizations filed a joint *Petition for Notice of Inquiry* asking the Commission to initiate a proceeding that would investigate proposed new advanced television standards for the United States. Five months later, on July 16, 1987, the Commission adopted a *Notice of Inquiry* to investigate the spectrum requirements and technical standards necessary for the implementation of advanced television service.[104] The Commission recognized that adding additional advanced television signals to the already congested spectrum might be impossible if it were to permit further congestion in many metropolitan areas. Consequently, on July 17, 1987, it issued an *Order* in which it concluded, "it is necessary to preserve sufficient broadcast spectrum to insure reasonable options relating to spectrum issues for these new technologies. Accordingly, we will temporarily freeze the TV

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103 The cost/benefit analysis of LPFM is discussed in the NAB-commissioned report from Strategic Policy Research ("SPR"), *LPFM: The Threat to Consumer Welfare* by John Haring and Harry M. Shooshan III (Attachment C to this Volume). SPR discusses the LPFM proposal as a response to the supply-side interests, as opposed to also weighing the benefits to the consumer. *See id.* at 6. SPR notes that "[t]he Communications Act, of course, simply directs the Commission to undertake to provide an efficient nationwide radio service. The end of production is consumption, not production; the relevant policy question is whether the new service will improve or, as we think more likely, detract from benefits derived by the public from radio broadcasting." *Id.* at 6 – 7.

104 In the Matter of Advanced Television Systems and Their Impact on the Existing Television Broadcast Service, *Notice of Inquiry*, MM Docket No. 87-268, 2 FCC Rcd 5125 (1987).

Table of Allotments in certain areas."[105] With this action, the Commission ensured that the trend toward increased spectrum congestion in the television bands would be temporarily suspended until important decisions were made concerning the future of advanced television. The Commission's foresight in 1987 preserved enough technical integrity in the television spectrum to eventually permit the ultimate adoption of a new digital television standard in 1996,[106] and digital channel assignments for all existing full power television broadcasters in 1997.[107]

The scenario above is in stark contrast with the Commission's efforts to facilitate the radio broadcasting industry's transition to digital transmission.[108] On October 7, 1998, USA Digital Radio Partners ("USADR") filed a *Petition for Rule Making* asking the Commission to initiate a rulemaking proceeding to amend Part 73 of the Commission's rules to permit the

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105 In the Matter of Advanced Television Systems and Their Impact on the Existing Television Broadcast Service, *Order*, RM-5811, Mimeo No. 4074, at ¶ 2 (adopted July 16, 1987).

106 *See Fourth Report and Order* in MM Docket 87-268, 11 FCC Rcd 17771 (1996).

107 *See Sixth Report and Order* in MM Docket 87-268, 12 FCC Rcd 14588 (1997).

108 *See Notice of Proposed Rule Making and Further Notice of Inquiry* in Gen. Docket No. 90-357, 7 FCC Rcd 7776, 7780 (1992) ("we are committed to continuing our work with the broadcast industry to ensure that broadcasters are able to promptly implement terrestrial DARS."); *Report and Order* in Gen. Docket No. 90-357, 10 FCC Rcd 2310, 2315 (1995)("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."); Separate Statement of Commissioner Susan Ness, *Re: Establishment of Rules and Policies for the Digital Audio Radio Satellite Service*, June 15, 1995 ("I am enthusiastic about the potential for in-band, on-channel digital AM and FM systems to better enable terrestrial broadcasters to compete in a digital world. I will do what I can to move it along as rapidly as possible."); Statement of Roy Stewart, Chief, Mass Media Bureau, Before the Subcommittee on Communications, U.S. Senate, May 19, 1998 ("The Bureau has been working closely with IBOC developers and has granted several experimental licenses to permit equipment and system testing.").

introduction of digital AM and FM radio broadcasting.[109] While the Commission responded within five months to industry requests for a proceeding to address advanced television, more than five months after the USADR petition was filed the Commission had proposed, in the instant proceeding, to abandon important interference protection criteria in the FM radio broadcast band and to further congest the already saturated FM radio spectrum in the nation's metropolitan areas. Specifically, the Commission proposed to create a new low power FM radio service that would "not be subject to certain technical rules currently applied to other classes of radio service."[110]

In reference to digital radio in the instant *Notice*, the Commission merely states that "[w]e are concerned that our understanding of future IBOC systems is preliminary and that we may not be fully aware of any negative impact or restrictions that authorization of low power radio service would have on the transition to a digital IBOC technology for FM stations."[111] The Commission should not go forward with a proposal to create a new low power FM service without understanding the impact that the proposed service would have on the radio broadcasting industry's ability to convert to digital transmission technology. In doing so, the Commission is abrogating its principal role as a spectrum manager.[112]

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109 In the Matter of Amendment of Part 73 of the Commission's Rules to Permit the Introduction of Digital Audio Broadcasting in the AM and FM Broadcast Service, *Petition for Rulemaking*, filed by USA Digital Radio, RM-9395 (1998) [hereinafter *USADR Petition*].

110 *Notice* ¶ 1.

111 *Id.* ¶ 49.

112 Although the Commission stated its intent to initiate on an IBOC proceeding this summer when it granted the second *Motion for Extension of Time* in this proceeding, it declined to wait on LPFM until after IBOC field testing is completed. *Order* in MM Docket 99-25, ¶ 6 (adopted May 20, 1999).

2. The Commission should pursue a serious analysis of IBOC DAB technology and how its implementation might be impacted by a low power FM service.

The National Radio Systems Committee ("NRSC") DAB Subcommittee was reactivated on January 10, 1998, to study IBOC DAB systems currently being developed by several companies. Since its reactivation, the Subcommittee has been developing test guidelines that the developers of IBOC DAB technology may follow when collecting system performance data. The Subcommittee approved its system test guidelines for laboratory tests on December 3, 1998, [113] its system test guidelines for field tests on March 4, 1999, and its revised guidelines for evaluating the test results on May 25, 1999. At the DAB Subcommittee's April 18, 1999, meeting all three IBOC DAB system developers agreed to submit test data for their systems to the Subcommittee by December 15, 1999.[114]

The Commission is well aware of the Subcommittee's progress, and of the system developers' anticipated schedule for completing system testing because six Commission staff members receive all NRSC meeting notices and minutes, and several of them regularly attend NRSC meetings.[115] Furthermore, in addition to the NRSC's established timelines, USADR's *Petition for Rule Making* asked the Commission to establish a timeline for evaluating DAB systems in which the IBOC DAB system developers would submit comprehensive design and performance information for their systems to the Commission by December 15, 1999.[116]

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113 NAB and CEMA submitted the DAB Subcommittee Laboratory Test Guidelines to the Commission in RM-9395 on December 14, 1998.

114 *See* NAB and CEMA, *Date Agreed to for IBOC DAB Test Results,* Joint Press Release, April 18, 1999.

115 All NRSC mailings are sent to the following Commission staff members: Dale Bickel, Keith Larson, Frank Lucia, Larry Olson, John Reiser, and Steve Selwyn.

116 *See USADR Petition* at 103.

Despite all of the activities surrounding IBOC DAB development, the Commission notes that it "has yet to formally advance any specific proposals"[117] for converting existing analog radio broadcast services to digital, and it asks a series of questions related to the protection criteria necessary to avoid interference in an IBOC environment. Because the Commission has not yet begun a proceeding to address radio broadcasting's conversion to digital, there is no record upon which commenters can base any judgments about the adjacent channel protection criteria that would be necessary in an IBOC environment. The only "evidence" available is theoretical computer simulations submitted by USADR in its petition for rule making. While the USADR simulations are informative, they provide no evidence to show how well – or even if – its system works when subjected to second adjacent channel interference greater than now experienced by FM stations. The only way anyone will be able to draw any sound conclusions about IBOC performance in the presence of much greater second adjacent channel interference will be to see and hear the results of laboratory and field tests designed to examine this performance.

Clearly the Commission should take no action that would modify any technical interference standards for the AM or FM broadcast bands until it has adopted an IBOC DAB standard. The Commission should, as requested by multiple parties in comments filed in response to the USADR *Petition*,[118] launch a proceeding on terrestrial digital radio service, and it should delay any consideration of an LPFM service until after an IBOC DAB standard has been adopted and implemented.

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117 *Notice* ¶ 47.

118 *See e.g.* Comments of the Consumer Electronics Manufacturers Association in RM-9395 at 15; Comments of Clear Channel, Inc. in RM-9395 at 2; Comments of Cumulus Media, Inc. in RM-9395 at 10.

3. The Commission's early allocation procedures must be kept in mind as the transition to IBOC DAB begins.

As noted earlier in these comments, the 1940s experience with FM allocation procedures must not repeated with the emergence of IBOC DAB service. Before the Commission can make any changes to the way that FM stations are allotted it must first have identified the IBOC DAB standard to be used in the United States, and it must have performed comprehensive tests on IBOC DAB receivers.

Dealing with the grandfathered short-spaced stations that already exist due to the Commission's 1940s allocations policies likely is already a tremendous challenge for IBOC DAB systems.[119] The Commission must not further aggravate this situation by relaxing its interference protection criteria before the performance capabilities of IBOC DAB receivers are known.

E. The Federal Aviation Administration ("FAA") is on Record Regarding Its Concerns on the LPFM Proposal.

In a letter filed on June 1, 1999, the FAA expressed its concern regarding the Commission's proposals because the proposed antenna heights for LPFM would escape FAA notification requirements.[120] The FAA claims that it has experienced numerous cases of radio interference from FM broadcasts to air navigation. In addition, it states that many of the antennas authorized under the proposal would be located near airports or other FAA facilities.

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119 *USADR Petition* Appendix D.

120 Letter from Gerald Markey, Program Director for Spectrum Policy and Management, Federal Aviation Administration, to Magalie Roman Salas, Secretary, Federal Communications Commission, June 1, 1999 (on file with the FCC in MM Docket 99-25) (stating that under 14 C.F.R. Part 77, the FAA must be given notice of any antenna over 200 feet in order to analyze any potential interference before the antenna is erected). The maximum antenna height proposed in the Commission's proposal is 197 feet. *See Notice* ¶ 23.

The FAA objects to the LPFM proposal because "allowing new stations to go on the air with no review by the FAA is an invitation to trouble."[121] Moreover, in several instances, the FAA has complained to the Commission about spurious emissions from pirate broadcasters.[122] This pattern of interference to air navigation frequencies from unlicensed broadcasters should give the Commission considerable pause before it authorizes similar service. In particular, the concerns raised by the FAA show why the FCC cannot authorize LPFM without developing a plan and obtaining new resources to enforce its rules with LPFM operators. It also provides a strong basis for the Commission to require type accepted standards for LPFM equipment and detailed engineering showings for LPFM applicants. Again, it appears in the rush to establish the LPFM service at a bare minimum cost to the applicants, the Commission has not considered the total impact of its proposals.

F. There is No Rational Basis to Deviate from the Commission's Long Standing Policy that Low Power Services are an Inefficient Use of the Spectrum.

The Commission does not offer any rational basis as to why this LPFM proposal is a technically more efficient use of the spectrum than the same type of low power stations that were found to be "inefficient" 20 years ago.

The LP1000 level should not be considered a low power station in the first place. If any such allotments are available, they should be applied for and allocated in the same manner as a full-power station. The alleged lower cost of building such a station does not have any real relevance to the fact that these stations are virtually the same as full-power stations, and they should be treated as such.

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121 Letter from Gerald Markey to Magalie Roman Salas, *supra* note 120.

122 *See, e.g.,* FCC News Release, *Unlicensed Radio Operation in Puerto Rico Endangering Air Safety Communications at San Juan International Airport Shut Down By FCC,* February 6, 1998.

The LP100 level and the microradio level are inherently inefficient based on the longstanding policy of the Commission. As far back as 1963, the Commission grappled with the efficiency issue. In the early 1960's, the Commission proposed and adopted an FM allocation scheme based on distance separation. As part of this proceeding, the Commission was faced with determining separation criteria that would provide for optimum efficiency. It described one "extreme" as seeing "thousands of small stations, each interfering with many other stations and interfered with in turn, so that the average protected service area would extend only a few miles from the station's transmitter site."[123] It concluded that this extreme (and the opposite extreme of very large stations) would be inefficient "from a strictly engineering point of view and, quite clearly, neither represents a desirable plan as a matter of non-engineering policy."[124]

NAB pointed out the inefficient spectrum use issue in comments filed on the *Petitions for Rule Making*. As noted in our comments there, the Commission again faced this issue in the late 1970's when it weighed the value of low power stations against the more efficient channel use of full-power stations.[125] In 1995, the Commission reiterated its policy in the *Stephen Dunifer* case.[126] The Commission pointed out that its policy against low power stations was reasonable based on preclusion versus service factors. The Commission concluded that the cost/benefit ratio was very poor for low powered stations if preclusion is treated as a cost and service as a

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123 In the Matter of FM Broadcast Rules, *Third Report and Order*, Docket 14185, ¶ 15 (adopted July 25, 1963) [hereinafter *Third Report and Order*].

124 *Id.*

125 *See* Comments of NAB in RM-9208, 9242 & 9246 at 7 (filed Apr. 27, 1998).

126 *See Stephen Paul Dunifer*, 11 FCC Rcd 718, 725 (1995).

benefit.[127] Thus, the service radius of a larger station is more desirable from a technical point of view, since more people obtain a variety of services.

Now, just a few years later, the Commission is proposing to wholly disregard its policy. In addition to the interference issues discussed previously, LP100 stations and microradio stations of 10 watts or less are inefficient and must not be allocated. These conclusions are valid today because as the Commission noted in 1963, "[a]bout these general truisms there can be little debate."[128]

Although "[r]egulatory agencies do not establish rules . . . to last forever,"[129] the D.C. Circuit accordingly has recognized that "[a]n agency's view of what is in the public interest may change."[130]

> "But an agency changing its course must supply a reasoned analysis indicating that prior policies and standards are being deliberately changed, not casually ignored, and if an agency glosses over or swerves from prior precedents without discussion it may cross the line from the tolerably terse to the intolerably mute."[131]

For more than 30 years, the Commission consistently held the view that low power radio stations are an inefficient use of scarce spectrum resources. Without even recognizing these longstanding policies, or attempting to explain why the Commission no longer believes that its earlier decisions are valid, the *Notice* proposes to abandon these spectrum decisions. If the reasons the Commission for decades opposed low power radio service are no longer valid (and we do not

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127 *See id.*

128 *Third Report and Order, supra* note 123, ¶ 15.

129 American Trucking Association v. Atchison, T. & S.F.R. Co., 387 U.S. 397, 416 (1967).

130 Greater Boston Television Corp. v. FCC, 444 F.2d 841, 852 (D.C. Cir. 1970).

131 *Id. (footnotes omitted)*; *see* Motor Vehicle Manufacturers Association v. State Farm Mutual Insurance Co., 463 U.S. 29, 57 (1983).

believe there would be any basis to so conclude), the Commission must explain its analysis before adopting LPFM rules, or face the sure conclusion that its decision is arbitrary and capricious.

IV. THE LPFM PROPOSAL THREATENS TO UNDERMINE THE ABILITY OF STATIONS TO SERVE THE PUBLIC.

A. The Commission's Proposal Will Repeat the Error of Docket 80-90.

As the Commission should be aware, solving diversity problems by dropping in hundreds of new stations is ineffective. There are many similarities between this LPFM proposal and the Commission's decisions in Docket 80-90.

First, the reasoning behind the LPFM proposal is strikingly similar to the reasoning the Commission had for Docket 80-90. In 1983, the Commission sought to provide underserved communities with new FM allotments based on its belief that a substantial demand existed that could not be served under the then-existing rules.[132] In this proceeding, the Commission strives to provide new opportunities for individuals it believes are not served by the rules today.

Next, in Docket 80-90, the Commission added three new classes of stations to provide the 4,000 additional radio stations it saw as necessary.[133] In the LPFM *Notice*, although the Commission notes that finding room for LPFM stations will require eliminating some interference protections, its proposals could drop in hundreds – if not thousands – of low power stations.[134]

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132 *Docket 80-90* ¶ 23.

133 *Id.* ¶ 19.

134 *Notice* Appendix D.

Finally, after nearly 2,500 FM stations were added from 1983 to 1991 under Docket 80-90, the Commission was forced to modify its ownership rules to provide increased efficiencies to heal the fragmented radio marketplace.[135] Congress provided further deregulation in the Telecommunications Act of 1996, which brings us back full circle. The Commission is now concerned with the outcome of the 1996 Act provisions and is proposing to add more stations to combat it.

There is no shortage of comments concerning how disastrous Docket 80-90 was for the industry as a whole. Former FCC Chairman Jim Quello stated in 1993, that Docket 80-90 "led to such a proliferation of stations that for many it created only the opportunity to go broke."[136] During consideration of the 1996 Act, Senator Burns stated his concern about oversaturating radio markets. He stated, "[I]n the 1980's we had an explosion ... of licenses granted to stations when really there was no market analysis done that the market could even handle another radio station."[137] The question still remains, if it was such a bad idea before, why is the Commission insisting on doing it again?

The Commission failed to consider any economic ramifications of its proposal. NAB asked the communications and policy research firm, Strategic Policy Research ("SPR"), to

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135 *See* Revision of Radio Rules and Policies in MM Docket 91-140, 7 FCC Rcd 2755 (April 10, 1992) [hereinafter *MM Docket 91-140*].

136 Chairman James H. Quello, Remarks Before the NAB/RAB National Association of Broadcasters Convention (April 19, 1993).

137 141 CONG. REC. S8424 (daily ed. June 15, 1995) (Statement of Sen. Burns).

provide an economic analysis of the LPFM proposal.[138] Docket 80-90 and its aftermath provided a backdrop in determining how the Commission's proposals would affect existing stations.

In its study, SPR reports that Docket 80-90 had the effect of "devolving" station economics to the point where it became impossible for stations to address local programming needs effectively.[139] Ultimately, it was the Commission's policy decisions that were harming localism because stations were unable to survive economically.[140]

SPR determines that even in light of Docket 80-90, "the government has, at least heretofore, evidenced greater understanding of the difficult challenges the radio industry confronts in meeting its public interest obligations."[141] However, it concludes that with the Commission's LPFM proposal, a significant step backward has been taken.[142] The Commission failed to consider any economic impact before proposing the LPFM service.

The Commission has noted in the past that "the industry's ability to function in the 'public interest, convenience and necessity' is fundamentally premised on its economic viability."[143] Thus, the Commission must not forget history, lest it is doomed to repeat it.

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138 John Haring and Harry M. Shooshan III, Strategic Policy Research, LPFM: THE THREAT TO CONSUMER WELFARE, July 1999. (Attachment C to this Volume) [hereinafter *SPR Report*].

139 *Id.* at 13.

140 *Id.*

141 *Id.*

142 *See id.* at 15.

143 *MM Docket 91-140* ¶ 10.

B. The Commission's Proposal Will Adversely Affect Smaller Radio Markets, Resulting in Decreased Service to the Public That Cannot Be Adequately Replaced.

In reviewing Appendix D of the *Notice*, what becomes abundantly clear is that there are very few available stations of either proposed class in large urban markets. As the market size decreases, the number of available assignments increases. However, it is these markets where dropping in new stations – regardless of their size – can adversely affect the ability of all stations to provide the quality service that the public depends on.

As documented in the record in this proceeding, many full-power broadcasters have filed comments relaying their current experiences in the industry and how the proposal will affect their livelihood. A few are highlighted below:

> "The impact of such a proposal to us small market broadcasters could be the end of most of us. Financially we even now barely survive." Comments of Verl D. Wheeler, President/CEO, Wheeler Broadcasting, Inc., to Federal Communications Commission, MM Docket No. 99-25 (1999).

> "If we lose advertising to these new cheapie radio stations, our survival is threatened because we won't be able to meet operating expenses." Letter from Ada E. Gollub, General Manager, WMJS Radio, to Senator Barbara Mikulski (March 24, 1996).

> "If LPFM is created, the interference caused in a substantial portion of that Metro will result in the loss of many of our present listeners. The lower ratings will cause revenue losses we simply cannot afford." Letter from Dudley Waller, Waller Broadcasting, Inc., to Federal Communications Commission (June 15, 1999).

> "[W]hen micro stations go into effect and the small and medium market stations start feeling the "pinch" economically, what happens next? In my case, I will not have the time to spend on public service programming and production." Letter from Sandi Ursey Bergman, President/General Manager, Bergman Broadcasting Company, Inc., to Susan Ness, Commissioner, Federal Communications Commission (March 20, 1999).
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> "[T]o again "tilt" the playing field with microradio means that small market stations with a commitment to local service may no longer be able to afford to provide it." Letter from Steve Stewart, General Manager, WJON Broadcasting Company, to William Kennard, Chairman, Federal Communications Commission (April 2, 1999).

Furthermore, former Commissioner Ervin Duggan commented in 1992, that broadcast stations that "can't stay above water economically can't serve their communities."[144] SPR also notes that "[t]he operation of new stations will have adverse economic as well as adverse technical consequences for existing stations and will thus affect the *quality* of the programming undertaken by existing stations, including, relevantly, the amount of *local service* programming produced."[145] This effect likely will be particularly pronounced in small markets where opportunities for economizing through consolidation are limited. Thus, SPR concludes, that "[f]ar from presenting greater local service, the likely effect of the Commission's proposal will be to undermine the economic ability of existing full-service stations to meet the needs of local audiences."[146]

It is also very unlikely that any of the proposed LPFM stations would be able to provide any reasonable amount of service to even small portions of the local communities. As already discussed, even the small service areas predicted by the Commission for these LPFM stations

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144 Ervin S. Duggan, Is Localism Tied to the Tracks?, Remarks Before the Mississippi Association of Broadcasters (June 27, 1992).

145 *SPR Report*, *supra* note 138, at 3.

146 *Id.* at 8.

will be curtailed due to interference caused by existing stations. Moreover, these stations operating at significantly smaller scales will not be in the position to make investments in their programming. As SPR concludes:

> "LPFM stations, contrary to the Commission's stated 'beliefs,' actually represent quite uneconomic means of distributing broadcast programming and would provide only the most meager of economic foundations for program funding – it is called 'broadcasting' for a reason."[147]

The Commission itself acknowledged the difficulties smaller stations face when it revised the FM allocation procedure in 1963. There it stated:

> "A station providing interference-free coverage for a radius of only ten or fifteen miles is seldom able to provide service to enough people interested in limited appeal programming to survive."[148]

This would be most applicable in the current situation where the proposed coverage areas for the LPFM stations are very limited. SPR points out that the Commission's belief that LPFM stations will be able to provide distinct programming to local "sub-populations" is a presumption that likely is false. SPR notes its field studies in central California, which showed that demands for distinct programming are better addressed by regional station operations that can aggregate audiences.[149] Thus, the LPFM proposal would not accomplish the goals of the Commission to provide specialized programming.

The Commission must consider all ramifications of its proposals before diving head first off that cliff. In the words of SPR, "the Commission has engaged in the pursuit of an

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147 *Id.* at 19.

148 *Third Report and Order* ¶ 20.

149 *SPR Report* at n.34.

economically ill-advised radio broadcast initiative on the basis of a faulty, Panglossian analysis."[150] The Commission has set out goals that cannot be met by the instant proposal.

C. The Proposal Threatens the Existence of Reading Services for the Blind That Are Carried On Subcarriers of Full-Power Stations.

The Commission has overlooked another service that also will be adversely impacted. Across the nation, many groups provide radio reading services for the blind or visually impaired. These services typically use the subcarriers of existing FM stations to send their signals to special receivers. This service is essential for many disabled individuals.

The Detroit Radio Information Service ("DRIS"),[151] Sun Sounds Radio Reading Service ("Sun Sounds")[152] and the National Association of Radio Reading Services ("NARRS")[153] have all filed comments in this proceeding. According to comments filed by these organizations, the Commission's LPFM proposal will negatively impact their ability to continue to provide this service. They point out the current fragile nature of their subcarrier signals and how adjacent channel stations will cause interference to hundreds of people that use the service on special subcarrier receivers.[154] The Commission cannot take steps that will disenfranchise hundreds of disabled individuals who depend on these subcarrier signals.

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150 *Id.* at 2.

151 Comments of Detroit Radio Information Services in MM Docket 99-25, filed May 28, 1999 [hereinafter *Comments of DRIS*].

152 Comments of Sun Sounds Radio Reading Service in MM Docket 99-25, filed May 19, 1999 [hereinafter *Comments of Sun Sounds*].

153 Comments of the National Association of Radio Reading Services in MM Docket 99-25, filed May 3, 1999 [hereinafter *Comments of NARRS*].

154 *See Comments of Sun Sounds* at 2; *Comments of DRIS* at 3; *Comments of NARRS* at 1.

D. The LPFM Proposal Threatens the Existence of Many Translators That Provide Service to Otherwise Unserved Areas.

1. If the Commission insists on establishing an LP1000 class, existing translators and boosters must be protected regardless of the LPFM station's primary status.

The Commission proposes to establish the LP1000 level of stations as a primary service.[155] The Commission asks for comment whether FM translators and boosters should receive "grandfathered" interference protection from LP1000 stations.[156]

The Commission must provide protection to translators and boosters if it decides to go forward with the proposed LP1000 class. Without "grandfathered" status, the spectrum priority for LP1000s will allow them to displace existing translator stations because translators are a secondary service. Although secondary, translators and boosters play an important role in providing service to the population.

Allowing LP1000 stations primary status over existing translators will greatly harm existing service to areas that may otherwise be unserved. If an LP1000 station is allowed to displace one translator that operates as one station in a series, as is the case with many public radio networks, the entire series can be wiped out in one swoop. Also, existing stations rely on translators and boosters in rocky terrains and sparsely populated areas.

Although the Commission asks for comment on whether translators and boosters should be "grandfathered," it did not take that possibility into consideration for LP1000 stations when it did its Spectrum Availability Analysis.[157] In Appendix D of the *Notice*, the Commission conducted a study where *LP100* stations were restricted from causing or receiving interference

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155 *See Notice* ¶ 27.

156 *Id.* ¶ 29.

157 *See id.* Appendix D.

with respect to FM translators.[158] Naturally, in the resulting charts, the number of *LP100* "availabilities" were drastically reduced when translators were "grandfathered" and provided protection against *LP100* stations.[159]

However, the Commission failed to provide such a chart for the LP1000 class of service. There is no information from the Commission regarding the available LP1000 stations if translators and boosters are protected or "grandfathered." NAB used the Commission's computer program to estimate how many LP1000 stations could be available in the 60 markets the Commission studied if translators were protected. With translators protected, the potential for LP1000 stations in these markets is virtually eliminated. Only 19 LP1000 stations in the 60 markets would be available. The following chart compares the number of "available" LP1000 stations in the 60 markets studied if translators are protected.

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158 *Id.*

159 *Id.*