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

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In the Matter of	)	
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Creation of Low	)	EIVED
Power Radio Service	)	MM Docket No. 99-25
	)	
	)	
	)	RM-9208
	)	RM-9242

MEMORANDUM OPINION AND ORDER ON RECONSIDERATION

Adopted: September 20, 2000 **Released:** September 28, 2000

Before the Commission: Chairman Kennard and Commissioner Ness issuing separate statements; Commissioner Furchtgott-Roth dissenting and issuing a statement; and Commissioner Powell concurring in part, dissenting in part and issuing a statement.

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I. BACKGROUND

1. In January, we adopted a *Report and Order* establishing a low power FM radio service.[1] We authorized this new service to provide opportunities for new voices to be heard, while at the same time preserving the integrity and technical excellence of existing FM radio service and safeguarding its transition to a digital transmission mode. In this *Memorandum Opinion and Order on Reconsideration,* we dispose of petitions for reconsideration[2] of the *Report and Order*, make certain changes to our rules, and provide certain clarifications of our rules.[3]

2. In the *Report and Order*, the Commission authorized two new classes of FM radio service, known collectively as low power FM (LPFM). The LP100 class will consist of stations with a maximum power of 100 watts effective radiated power (ERP) at 30 meters antenna height above average terrain (HAAT), providing a signal level equivalent to the FM "protected" service (1 mV/m or 60 dBu) within a radius of approximately 3.5 miles. After a period of time sufficient to act on LP100 applications that are

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[1] *Report and Order*, MM Docket No. 99-25, 15 FCC Rcd 2205 (2000).

[2] Hereinafter the *Memorandum Opinion and Order*. The list of petitioners is attached at Appendix E.

[3] Both Amherst Alliance and Don Schellhardt filed Motions for a Decision on their respective reconsideration petitions, urging the Commission to act on their reconsideration petitions before issuing licenses. We dismiss these motions as moot. To the extent the motions raise new arguments, we dismiss them as untimely filed Petitions for Reconsideration.

filed, the Mass Media Bureau will accept applications for LP10 stations.[4] These stations will have a maximum power of 10 watts ERP at 30 meters HAAT, providing the same signal strength out to approximately 1 or 2 miles from the station's antenna. To avoid compromising existing FM radio service, given the new nature of the LPFM service, we imposed separation requirements for LPFM with respect to full power stations operating on co-, 1st - and 2nd - adjacent and intermediate frequency (IF) channels. Based on our engineers' technical analysis and careful review of other analyses submitted, we determined that 100-watt LPFM stations operating without 3rd adjacent channel separation requirements will not result in unacceptable new interference to the service of existing FM stations.[5] We decided, therefore, not to impose 3rd adjacent channel separation requirements because doing so would unnecessarily and substantially restrict the number of LPFM stations that could be authorized, particularly in higher population areas.

3. We restricted LPFM service to noncommercial operations by noncommercial educational entities and public safety radio services. With certain narrow exceptions, we decided to restrict ownership to entities that have no attributable interest in any other broadcast station or other media subject to our ownership rules. We severely restricted the number of LPFM stations that a single entity can own and limited ownership to locally-based entities for the first two years. We determined not to permit the sale of an LPFM station. To resolve mutually exclusive applications, we decided to use a point system that favors local ownership and locally-originated programming, with time-sharing and successive license terms as tie-breakers. Finally, we have minimized the regulatory burdens imposed on these stations, consistent with their size and very localized operation. For example we decided not to impose specific requirements regarding main studio staffing or location, maintenance of public files, and the filing of ownership reports.

4. In this *Memorandum Opinion and Order*, we generally affirm the decisions we reached in the *Report and Order*, although we make some changes and clarify certain aspects of our rules. As explained below, we reject arguments by petitioners proposing more stringent channel separation requirements, as well as arguments in favor of relaxing those requirements. We adopt complaint and license modification procedures to ensure that if any unexpected, significant 3rd adjacent channel interference problems are caused by the operation of a particular LPFM station, it can be resolved expeditiously. We decline to modify the permissible power levels for the service. We modify the spacing standards adopted in the *Report and Order* to require that LPFM stations operating on 3rd adjacent channels protect stations operating radio reading services and, pending further study, will not authorize an LPFM station that would not be sufficiently geographically separated from any full-service FM station on a 3rd adjacent channel that operates a radio reading service as of the date of the adoption of this *Memorandum Opinion and Order*. We also decline to alter the noncommercial nature of the service. We affirm our decision to apply our character qualifications policy with respect to former illegal broadcasters. We increase the flexibility of the ownership rules for certain specific types of applicants: government, transportation and public safety entities, and universities. We provide clarifications on

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[4] We are accepting applications for LP100 stations on a geographically staggered basis. *See* Appendix C for the filing window schedule. The initial filing window for the first region closed June 8, 2000. The initial filing window for the fifth, and last, region is expected to be opened in May 2001.

[5] *Report and Order*, 15 FCC Rcd at 2206, ¶ 2.

eligibility issues concerning Indian tribes, student stations, licensees in the Instructional Television Fixed Service (ITFS), and schools with multiple campuses. We affirm our tie-breaker criteria, with certain clarifications regarding the credit for programming that is locally originated. Finally, we address a number of questions and suggestions regarding individual elements of our rules.

II. ISSUE ANALYSIS

A. Technical Rules

1. Second and Third Adjacent Channel Protection

5. In the *Report and Order*, we determined that it was not necessary to require that LPFM stations protect other full or low power FM stations operating on 3rd adjacent channels, *i.e.*, stations +/- 600 KHz apart.[6] Our decision on this issue was based on our finding that 100-watt LPFM stations operating on 3rd adjacent channels will not result in significant new interference to the service of existing FM stations. We concluded that any small amount of interference that may occur in individual cases would be outweighed by the benefits of new low power FM service. We also determined that the risk of interference from LPFM stations on 2nd adjacent channels may be somewhat higher than that from such operations on 3rd adjacent channels and therefore chose to retain 2nd adjacent channel protection requirements for LPFM stations.

6. These decisions were based on the substantial record of information and analyses on FM receiver performance characteristics that was developed in response to the *Notice of Proposed Rulemaking* in this proceeding.[7] The record included three technical studies of FM receivers that were filed by commenting parties: 1) *FM Interference Tests, Laboratory Test Report,* Thomas B. Keller, Robert B. McCutheon, Consumer Electronics Manufacturers Association (CEMA), 1999, conducted under the auspices of National Public Radio (NPR), CEMA and the Corporation for Public Broadcasting (CPB) (CEMA study); 2) *Technical Studies and Reports* filed by the National Association of Broadcasters (NAB study); and 3) *Receiver Evaluation Project* conducted by Broadcast Signal Lab, LLP for the National Lawyers' Guild, Committee on Democratic Communications (NLG study).[8] The Commission's Office of Engineering and Technology also conducted a study of FM receivers that was placed in the record of the proceeding (OET study).[9] In addition, NAB and CEMA filed supplementary

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[6] For example, the 3rd adjacent channels to an FM station operating on 97.1 MHz are at 97.7 MHz and 96.5 MHz.

[7] The NPRM was adopted on January 28, 1999 in response to petitions for rulemaking and related comments indicating substantial interest in, and public support for, increased citizen access to the airwaves. After issuance of the NPRM, we received comments and letters from thousands of groups and individuals seeking license for new radio stations. These comments – from churches or other religious organizations, students, labor unions, community organizations and activists, musicians, and other citizens – reflect a broad interest in service from highly local radio stations strongly grounded in their communities.

[8] The NLG study was funded by NLG, UCC and several others.

[9] *See Second and Third Adjacent Interference Study of FM Broadcast Receivers*, OET Report FCC/OET TRB-99-1, prepared by William H. Inglis and David L. Means, July 1999.

technical information in their reply comments and a *Technical Analysis of the Low Power FM Service* by Theodore S. Rappaport (August 26, 1999) was submitted by the Media Access Project as part of its replies (Rappaport study).

7. *3rd Adjacent Channel Protection.* In its petition, National Public Radio, Inc. (NPR) requests that we reconsider our decision not to apply 3rd adjacent channel protection requirements to LPFM stations. NPR disagrees with our findings that any risk of interference from 100-watt LPFM stations operating on 3rd adjacent channels is small and that any such interference that does occur is, on balance, outweighed by the benefits of the new service. It argues that neither of these premises, nor our decision to reduce the existing FM interference protections, are supported by the record. To remedy its concerns, NPR requests that we revise our rules to provide additional measures to avoid and ameliorate the potential for interference by LPFM stations to the services of existing FM full service, translator and booster stations operating on 3rd adjacent channels. It states that imposition of 3rd adjacent channel protections for LPFM stations is particularly justified to protect public radio stations. It also states that, at a minimum, we should amend the rules to provide a process that permits the challenge and denial of an LPFM application on a 3rd adjacent channel that would be likely to cause harmful interference within the service area of any existing or proposed full service, translator or booster station.

8. In arguing for this request, NPR contends that we justified our decision on 3rd adjacent channel protection by disregarding those laboratory tests that demonstrated a likelihood of interference, and relying instead on our own analysis. It asserts that in so doing, the *Report and Order* fails to address "the numerous fundamental flaws in the Commission's testing and analysis."[10] It also argues that our finding that any interference that may occur would be outweighed by the benefits of new low power FM service is flawed. As discussed below, we cannot concur in NPR's arguments, and are denying its request that we amend the rules to provide protection for existing FM services against potential interference from 3rd adjacent channel LPFM operations.[11]

9. NPR asserts that we disregarded laboratory tests that demonstrated a likelihood of interference from 3rd adjacent channel LPFM operations. This is incorrect. We did, in fact, fully consider all of the receiver test data and evaluations presented in the record of this proceeding. We simply found that the test data supported different conclusions than those reached by NPR and other parties seeking to maintain 3rd adjacent channel protections for LPFM service -- specifically that licensing 100-watt and 10-watt LPFM channels on 3rd adjacent channels will not result in significant new interference to the service of existing FM stations. This is plainly evident from the *Report and Order*, which first summarizes the major FM receiver technical studies, and then explains our evaluation of the potential for interference from low power FM stations operating on 3rd adjacent channels based on this information. For example, we examined the potential for interference in the immediate vicinity of a 100-watt LPFM station using the NAB's median receiver performance test results for its three "worst" performing FM receiver categories, *i.e.*, clock, personal and portable, and found that the area where such receivers could potentially experience degradation from interference is small, generally one kilometer or less from an

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[10] NPR Petition at 4.

[11] We do, however, as discussed in detail below, ¶¶57-67, adopt a 3rd adjacent channel complaint and license modification procedure that will better protect stations from unacceptable 3rd adjacent channel interference.

LPFM antenna site.[12]

10. NPR next contends that there are three fundamental flaws in the testing and analysis underlying our decision on the 3rd adjacent channel protection issue. It first argues that we established no benchmark against which to determine what, if any, new interference might be acceptable. NPR contends that it is not enough to simply critique the internationally accepted benchmark, *i.e.*, ITU-R Recommendation 641, proposed by others, *i.e.*, NAB and CEMA, as we did in the *Report and Order*. It submits that without a point of reference of acceptability, it is meaningless to say that any new interference is acceptable. Consistent with our longstanding policy of allowing market forces to determine the performance capabilities of FM receivers, we chose not to use a benchmark standard for evaluating the acceptability of new FM interference. We believe it is better to refrain from specifying standards for interference rejection capabilities, and as stated by UCC in its reply comments, instead allow the market to identify the level of interference rejection performance consumers find to be acceptable for different types of FM radios.

11. The data from the several receiver studies indicate that there is, in fact, considerable variation in the immunity of FM radios to interference across different categories of receivers, and to some extent, across models of receivers in the same class. These differences reflect manufacturers' response to the demand for receivers that meet varying needs, such as for automobile installations, high fidelity listening, and non-critical listening, a wide range of price points, and other design considerations. As indicated in the *Report and Order*, we believe that consumers understand that there are performance differences among the classes of radios and that they accept the fact that lower cost radios may provide more limited service capabilities. It also appears that market forces are providing FM receivers with levels of interference immunity that adequately meet consumers needs. We therefore believe that a benchmark immunity standard is unnecessary and could, in fact, be detrimental to consumer interests. Instead, we compared receiver performance to the same desired-to-undesired (D/U) protection ratios that we have traditionally used in managing interference between FM stations.[13] We continue to believe that this is an appropriate approach for assessing the interference potential of low power FM stations.

12. In evaluating receiver performance, we did, however, find that the ITU-R Recommendation 641 50 dB S/N criterion used by NAB and the 45 dB S/N criterion used by CEMA were not appropriate criteria for today's FM radio service. In making this determination, we observed that the majority of the radios tested by NAB did not meet its 50 dB criterion with *no* interference present and with the strongest level of desired signal. Similarly, none of the radios tested by CEMA came close to meeting its target 45

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12 *Report and Order*, 15 FCC Rcd at 2245-46, ¶¶ 101-103.

13 The existing FM interference protections, which are provided through spacing standards, are based on the following ratios: 20 dB co-channel D/U; 6 dB 1st adjacent channel D/U; -40 dB 2nd adjacent channel D/U for commercial FM stations and –20dB for noncommercial stations operating in the reserved FM band; -40 dB 3rd adjacent channel D/U. Receivers with the ability to reject interference at these ratios could be expected to provide interference free service within a station's 60 dBu contour service area. (Such radios might not, however, be able to receive service at all locations within that contour if they did not have sufficient sensitivity to receive signals at the 60 dBu level even in the absence of any interference.) Receivers with lower capabilities might experience interference within a station's service area, while those with higher capabilities might be able to reject interference at greater distances.

dB S/N criterion at the 20 dB D/U standard for co-channel interference used in the rules. We further noted that while the 20 dB co-channel D/U standard yields a *monophonic* S/N level of about 50 dB according to an earlier study by NAB, for the *stereophonic* operation used by FM stations today, the 20 dB protection ratio yields an audio S/N of only about 30 dB.[14]

13. NPR next argues that we failed to include any "Category I" radios, *i.e.*, clock radios, shower radios, and other small, inexpensive radios with internal antennas, in our testing, and thereby did not consider the likelihood of interference to what are among the most inexpensive and commonly used radio receivers. Contrary to NPR's assertions and as UCC observes in its reply comments, we did consider data submitted on Category I radios by commenters in this proceeding. While our own initial study did not test inexpensive receivers with integral antennas because of the difficulty of providing test signals at accurately controlled levels to this type of device, we did rely on test data for these radios submitted by NAB, NPR/CEMA and NLG.[15] As indicated above and in the *Report and Order*, we considered the results from all of the receivers tested in the studies in this proceeding, including the "Category I" radios tested by others, in our decision on 3rd adjacent channel interference. For example, in the *Report and Order*, we calculated the radii of LPFM potential interference based on test data submitted by NAB for Category I radios. The results of those tests show that the area in which these receivers would experience any degradation in performance from interference from a 3rd adjacent channel LPFM station would be small, generally 1 km or less from the LPFM antenna site.[16]

14. Third, NPR argues that our examination of receiver issues was an interim study. It contends that while we recognized that our study was limited in both the size of the sample of receivers tested and in the range of tests performed, we conducted no further laboratory tests and no field tests of potential interference issues prior to the *Report and Order*.[17] As explained in the OET Study, that phase of the FCC Laboratory's examination of FM receivers was limited to the issues of 2nd and 3rd adjacent channel interference performance of analog FM receivers with respect to analog FM interferers and was limited in size to a fairly small sample of 21 receivers. Additional research was anticipated to expand the study sample as well as to broaden the scope to include digital interference issues. Neither of these planned extensions of the OET study was essential to our decision on application of 2nd and 3rd adjacent channel interference protections for LPFM service. Additional data on receiver performance was, in fact, provided through the NAB, CEMA, and NLG studies. By using the data from the three additional

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[14] *See* National Association of Broadcasters, "Subjective Evaluation of Audio Degraded by Noise and Undesired FM Signals," Laurence C. Middlekamp, November 17, 1982.

[15] *See* OET Study at 3. In addition, we did perform additional measurements on two "Walkman" type and two other radios (a clock radio and a portable "boom-box" unit) with integral antennas at our Laboratory. These tests were performed using a GTEM cell that does not require the radio under test to be modified. One of the radios tested was supplied by CEMA and was included in its testing. Our test of this radio produced results similar to those found by CEMA, confirming the NPR/CEMA results for that radio. However, our tests did find that this radio performed somewhat better than reported with the DX/LO switch in the opposite position from that tested by CEMA.

[16] *Report and Order*, 15 FCC Rcd at 2245-46, ¶¶101-102.

[17] NPR indicates that to help clarify the interference issues, it is conducting field tests that it expected to complete by July. To date, we have not received the results of NPR's field testing.

studies, we were able to evaluate information on a total of 75 different radio receivers. We believed that this additional data provided a sufficient basis, *in the aggregate*, for evaluating interference issues, even if each of the studies individually may have tested a relatively small sample of receivers. Thus, we found no need to expand the size of the receiver sample. We therefore do not find that the limits of the OET study impaired our ability to decide the 2nd and 3rd adjacent channel protection issues in this proceeding.[18]

15. We also do not find it necessary to include field test information in our decision. The interference issues involved in this matter relate to receiver performance, qualities which are best examined through laboratory testing of a sample of receivers.[19] There have been no questions raised in this proceeding that require new information on the propagation qualities of FM signals, and thus there was no reason to conduct field tests. Moreover, it would be difficult and costly to meaningfully conduct field tests for a sample of receivers, and we have no reason to believe that such tests would yield data on interference potential that would differ from that of the various laboratory studies. We therefore find no basis for delaying our decision on the 3rd adjacent channel protection issue to conduct field tests ourselves or to await the results of field tests conducted by others.

16. With regard to our finding that any interference that may occur would be outweighed by the benefits of new low power FM service, NPR argues that we did not actually balance costs and benefits. Rather, it argues that we simply asserted that LPFM will be beneficial and then strove to minimize the technical evidence of countervailing interference costs. NPR then argues that we failed to account for the significant harm that is likely to occur to existing radio services, and, in particular, to public radio services, whether in individual cases or the aggregate.

17. We disagree with NPR that we did not balance the costs of any new interference expected

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[18] The Commission's concerns regarding interference to digital operations were also resolved based on the record in the proceeding. *See* ¶ 55-56.

[19] We continue to believe that the principal issue is receiver performance, i.e. the ability of modern FM radios to reject unwanted 3rd adjacent channel signals. Laboratory tests allow examination of individual receiver performance under controlled conditions. This permits precise control of both desired and interfering signals so that the interference performance of individual receivers can be accurately determined. Field testing, on the other hand, is generally used to confirm models or estimates of how both desired and interfering signals propagate to individual locations. For example, in the case of FM radio, estimates of desired field strength are based on the F(50, 50) field strength chart contained in Section 73.333 of the rules, 47 CFR § 73.333, while estimates of interference are based on the F(50, 10) field strength chart in that Section. These charts shows the distances from their respective transmitters at which the desired signal strength is predicted to exceed a given level at 50 percent of the locations 50 percent of the time and at which the interfering signal strength is predicted to exceed a given level at 50 percent of the locations 10 percent of the time. In simple terms, this approach assumes that the desired signal is at an average level while the interfering signal is at a much stronger level, i.e., a "worse case" interference situation. These propagation and interference models have been used for many years for the FM radio and other services, and are independent of receiver performance. No questions have been raised by any of the parties in this proceeding regarding the propagation and interference models used for FM radio. Further, it is unclear as to what additional information, if any, field tests, would reveal about receiver performance, which is the principal technical issue in this matter affecting 3rd adjacent channel interference. Field test data, in our opinion, would merely assess the accuracy of our propagation predictions, rather than reveal information on receiver performance.

from low power FM stations with the benefits these stations will provide. In the *Report and Order*, we indicated that low power radio stations will serve the public interest by providing opportunities for new voices to be heard, and in particular will enhance opportunities for locally focused community-oriented radio broadcasting.[20] We observed that the comments in this proceeding -- from churches and other religious organizations, students, labor unions, community organizations and activists, musicians, and other citizens -- reflected a broad interest in the establishment of highly local radio stations strongly grounded in their communities, providing locally-based programming for listeners in those communities. We therefore believe that the low power FM service will provide substantial and important benefits to local radio audiences. We expect that LPFM stations will be technically able to serve significant local audiences, even in the presence of interfering signals from full-service FM stations. The 60 dBu service contour of a 100-watt LPFM station with an antenna height of 30 meters above average terrain (HAAT) extends 5.6 kilometers from the transmitting antenna site and encloses an area of 98.5 square kilometers. Without interference or other impairments to its signal, the non-directional LPFM facility could be expected to provide satisfactory signal coverage throughout this area. LPFM stations must be sufficiently geographically separated from full-service FM radio stations to prevent interference to any area within the FM station's protected service contour. For example, a separation of 67 kilometers is required to protect a Class A FM station at maximum permissible facilities; this distance includes the 20 kilometer interference buffer. LPFM stations, however, are not protected against receiving interference from existing or future FM stations.[21] A separation of 92 kilometers from a Class A FM station (which does not include a buffer distance) is necessary to prevent interference within an LP100 station's 60 dBu contour. Thus, an LP100 station located at the minimum required separation to protect the Class A FM station would be predicted to receive some interference within its 5.6 kilometer service contour. On average, the interference-free distance from the LP100 antenna site would be reduced to approximately 4 kilometers from the transmitting antenna site and the corresponding interference-free service area would be reduced to about 50 square kilometers. Thus, even in this worst-case example, the LP100 station could be expected to provide interference-free service within half of the area within its 60 dBu contour, an area that might well be large enough to include the station's intended audience, such as residents of a college campus, local school district, or a neighborhood.

18. In deciding to authorize LPFM stations, we also affirmed our intention to preserve the integrity and technical excellence of the existing FM service and not to impede its transition to a digital future.[22] To this end, we carefully considered the interference potential of LPFM operations to both existing FM stations and their future digital operations and adopted appropriate technical rules to minimize such interference. In the case of 3rd adjacent channel interference, we found that any interference that would occur from a low power station to an existing station's service would be limited to areas very close to the low power stations transmitter.[23] In addition, the required minimum spacings between low power stations will greatly limit the maximum number of such stations that can operate

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[20] *Report and Order*, 15 FCC Rcd at 2206-07, ¶¶ 2 - 3.

[21] For informational purposes, Section 73.807 provides minimum distance separations necessary for an LPFM station to receive no interference from the various classes of FM stations. 47 C.F.R. § 73.807.

[22] *Report and Order*, 15 FCC Rcd at 2206 ¶ 2.

[23] *Id.* at 2245-46, ¶¶ 102 – 104.

within an existing station's service area on the 3rd adjacent channel. Thus, the level of new interference from LPFM stations will be very small. Accordingly, we have found, and continue to maintain, that the benefits of this new service outweigh the costs of any small amounts of interference that may occur.

19. We also disagree with NPR that interference from LPFM stations will be particularly harmful to public radio stations. NPR contends that we failed to account for the particular susceptibility of public radio stations to interference, especially in the case of reserved-spectrum stations. It submits that public radio stations are more likely to be affected by LPFM interference for a number of reasons. NPR first argues that stations in the reserved spectrum are more tightly "packed" together, and that our LPFM rules do not adequately address this congestion.[24] However, NPR provides no specific information in support of its contention. Our conclusion that LPFM stations would not create unacceptable interference to existing full power stations is in no way undermined by the differing allocation methodologies used in the reserved and non-reserved bands. Since the minimum LPFM distance separation requirements are applied uniformly throughout the entire FM band, a full power station that operates in a crowded portion of the reserved band would be no more likely to receive interference from an LPFM station than would a station operating in the non-reserved band. Furthermore, the plan is conservative in that LPFM station separation requirements are based on the assumption that full-service stations operate with the maximum permissible facilities for their station class. In any event, as noted by UCC, our plan for authorizing low power FM service automatically mitigates any such differential effect on public stations by allowing fewer low power stations where existing stations are more closely spaced. In other words, fewer low power stations will fit into the reserved band in areas where noncommercial stations are more tightly packed.

20. NPR next argues that public radio stations are particularly vulnerable to interference because their signals typically use minimum "loudness" processing to preserve the natural dynamic range of the programming. It states that the heavy processing used with Top 40 stations limits the dynamic range to emphasize loudness and that this processing tends to mask the effect of interfering signals. We recognize that many public broadcasting stations minimize their use of loudness processing in order to provide quality service to their listeners. At the same time, we observe that it is generally necessary to use a higher quality receiver, such as a home stereo system, in order to actually experience the broader dynamic range audio provided by these stations. As indicated by the various receiver tests, home stereo receivers, car radios, and other high fidelity FM receivers generally are also able to adequately reject signals on 3rd adjacent channels at the levels to be transmitted by LPFM stations. We conclude that the audio experience of public radio station listeners generally will not be degraded by the operation of LPFM stations.

21. NPR further argues that we failed to address the potential harm of LPFM operations to statewide radio networks. Individual stations in a statewide network are typically sited to achieve

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[24] Stations on noncommercial reserved FM channels (channels 201-220, in the band 88-92 MHz) are authorized based on contour overlap, rather than the minimum spacing standards used for commercial stations. *See* section 73.509 of the rules, 47 C.F.R. § 73.509. The contour overlap standards for noncommercial stations are the same as the D/U ratios on which the spacing standards for commercial stations are based, with one exception. The exception is that the D/U ratio for 2nd adjacent channel protection for noncommercial stations is –20 dB, whereas the 2nd adjacent channel spacing standard for commercial stations is based on the less stringent D/U ratio of –40 dB.

maximum signal coverage to the maximum population based on actual receipt of a quality signal, rather than a predicted contour overlap. NPR contends that LPFM stations are likely to pose a significant threat to such operations. As indicated above, our plan for the LPFM service will tend to limit the number of LPFM operations in locations where noncommercial stations are more closely spaced. In such locations, to the extent that a small amount of interference would occur, in many instances the programming provided by the noncommercial station would be available from another station in the network. We therefore do not believe that LPFM stations on 3rd adjacent channels will have harmful consequences for statewide radio networks.

22. Finally, NPR states that interference from television service on TV channel 6 and the need to avoid interference to such service reduces the amount of reserved FM-band spectrum that might otherwise be available. It contends that the new LPFM rules introduce new sources of interference in a portion of the FM spectrum that is already significantly compromised. We believe that channel 6 operations will limit the opportunities for low power stations in that area. In addition, we recently expanded the opportunities for allocating additional reserved channels in the non-reserved portion of the FM band in areas where there are TV channel 6 transmissions.[25] We therefore find that allowing 3rd adjacent channel LPFM stations to operate in areas where noncommercial stations must be concerned with TV channel 6 signals will not have any significant effect on the amount of reserved FM-band spectrum that is otherwise available.

23. *Radio Reading Services.* In its petition, NPR requests that we provide additional interference protection for FM stations that operate radio reading services. Radio reading services, which provide access to printed news and other information sources for blind or print-disabled persons, are transmitted via FM station subcarrier (SCA) facilities. NPR asserts that the majority of these services are provided on public radio stations. Special radios that tune subcarrier signals are used to receive these services. NPR states that radio reading services are threatened by the new rules because subcarrier receivers are more vulnerable to interference than mass marketed receivers. It indicates that this is because subcarrier receivers are designed for wide-band reception, which makes them less selective in rejecting adjacent channel signals. It further states that because these receivers are designed to be modest in cost to meet the needs of the disabled constituency, their manufacture necessarily uses components that offer limited overload rejection and IF selectivity. It therefore asks that we revise the rules to apply the existing 3rd adjacent channel protection to those radio stations that offer radio reading services.

24. Like NPR, the Commission is concerned about the differential vulnerability of radio reading service receivers to 3rd adjacent channel interference. In this regard, we recognize the important and unique services that radio reading operations provide to blind and other print-disabled persons and the unique role of each radio reading service in its community. Accordingly, we are continuing to study how to best protect these services while preserving LPFM opportunities for as many applicants as is

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[25] *See* Report and Order in MM Docket No. 95-31 (Reexamination of the Competitive Standards for Noncommercial Educational Applicants), FCC 00-120 (released April 24, 2000), at ¶¶ 114-115. In that action, we indicated that, in addition to considering interference from TV Channel 6 (radio only) and foreign stations (radio only), we would also provide a needs test for future rule making requests that ask that non-reserved channels not already in the FM or TV Table of Allotments be added and reserved for noncommercial educational use. Under this test the noncommercial educational proponent would have to demonstrate that the need for a noncommercial educational station is greater than the need for a commercial station.

practical. For the immediate future we will require that LPFM stations operating on 3rd adjacent channels protect the SCA operations of stations operating radio reading services. Until our studies are completed, we will not authorize an LPFM station that would not be sufficiently geographically separated from any full-service FM station on a 3rd adjacent channel that operated a radio reading service as of the date of adoption of this *Memorandum Opinion and Order*.[26] If the studies determine that these receivers are uniquely vulnerable to 3rd adjacent channel interference, prior to the second round of 100 watt filing windows we will protect stations that have added a radio reading service after the effective date of this *Memorandum Opinion and Order* and LPFM applications filed thereafter will be required to provide 3rd adjacent channel protection to those stations. In this regard, we will apply the minimum distance separations used for interference protection from LPFM stations on the 2nd adjacent channel, which is based on a desired-to-undesired signal strength ratio of –40 dB. This protection ratio also underlies station separation requirements between full-service NCE stations on 3rd adjacent channels. We believe that this approach will adequately protect existing radio reading services while we confirm whether radio reading service receivers are uniquely vulnerable to 3rd adjacent channel interference.

25. *2nd Adjacent Channel Operation.* J. Rodger Skinner and UCC request that we reconsider our decision to apply 2nd adjacent channel protection requirements to LPFM stations and revise the rules to allow operation of LPFM stations without regard to 2nd adjacent channel separation. They argue that maintaining 2nd adjacent channel protections for LPFM service will preclude the establishment of hundreds of new LPFM stations, mostly in major markets where they are needed. Skinner submits that our recent receiver tests, and the fact that no interference has been reported during the many years when short-spaced grandfathered full service stations were allowed to relocate without regard to 2nd or 3rd adjacent channel restrictions, are indicative that low power stations could operate on such channels without causing interference. UCC submits that, based on the findings of the Rappaport study, we could have relaxed 2nd adjacent channel protections for stations of 100 watts or less.

26. Skinner and UCC petitioners have not provided any new information on the 2nd adjacent channel issue that we did not have available and consider in deciding to retain 2nd adjacent channel protections for LPFM service. As we observed in the *Report and Order*, the receiver test data for 2nd adjacent channel interference rejection performance was generally on the order of 8-10 dB poorer than for 3rd adjacent channel performance. We therefore indicated that it appears that the risk of interference from 2nd adjacent channel LPFM operation may be somewhat higher. While the Rappaport study generally argues that elimination of 2nd and 3rd adjacent channel protections would result in a small potential for interference and therefore affect few FM listeners, the study's simulation results do indicate that in many situations there would be increased interference if 2nd adjacent channel protections were eliminated.[27] In addition, applying 2nd adjacent channel protection requirements to LPFM stations will preserve flexibility for the development of in-band, on-channel (IBOC) digital audio systems for FM stations, as discussed in paragraphs 55-56. Accordingly, we are denying the petitioners' request that we eliminate 2nd adjacent channel protection requirements for LPFM stations.

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[26] A partial list of existing stations operating radio reading services is set forth in Appendix D. This information was provided by National Public Radio and the International Association of Audio Information Services.

[27] *See* Appendix D to Rappaport study.

Regulatory Status of LPFM Stations

27. We decided in the *Report and Order* to require LPFM stations to protect existing full-power FM stations, translator, boosters, and vacant allotments, according to the separation requirements adopted, and not to protect LPFM stations from interference introduced by new or modified FM stations. We also decided that LPFM stations will be required to cease operation if they cause interference within the 3.16 mV/m contour of a subsequently authorized or modified FM station.

28. The general manager of a student radio station at the University of Wisconsin (Black), urges us to reconsider this status for LPFM stations, arguing that it will discourage investment in LPFM stations, as their signals can be subsequently overpowered by full-power FM stations.[28] We decline to reconsider our decision on this issue. One of our paramount goals in introducing LPFM service was that it not interfere with existing service.[29] We continue to believe that the rules we adopted strike a reasonable balance between the need to foster new service and our responsibility both to maintain the integrity of existing FM service and to allow for its expansion to better serve the public.

29. For the same reasons, we will not adopt the proposal in the Amherst Petition that we use a "modified primary" status for LPFM or that we establish "endangered species" or "demonstration" stations.[30] Each of these proposals would diminish interference protection to existing stations in the interest of creating more LPFM stations than would be allowed under our current rules. Amherst proposed that we establish "endangered species" exemptions where LPFM stations are few in number and face a high risk of displacement. This exception would, under Amherst's proposal, automatically be extended to an LPFM applicant who applied for an LP10 license and who seeks that license where no more than three LPFM licenses are available. Amherst's proposed demonstration stations would be permitted where there is no room for any LPFM stations under the current rules; they would be sited without 2nd adjacent channel separations and provide actual experience with such LPFM operations. "Modified primary status" would, like the other two proposals, diminish the protection we have granted to existing stations. We remain convinced that our analysis in the *Report & Order* struck an appropriate balance between the interest of new entrants and the importance of protection of existing broadcasters, and we decline to modify that balance.

30. *Translators*. FM translator stations may not continue to operate if any interference occurs in areas where a full service FM station has a "regularly used" signal, including locations beyond the full service station's applicable protected contour.[31] However, LPFM stations are only required to protect subsequently authorized full service FM stations if interference is created within the full service station's

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28 Black Petition at 1.

29 *Report and Order*, 15 FCC Rcd at 2206, ¶ 2, at 2209, ¶ 6, at 2230, ¶¶ 62-63, at 2282, ¶ 198.

30 Amherst Alliance Petition at 7.

31 47 C.F.R. § 74.1203(a)(3).

70 dBu principal community contour.[32] The Commission's decision permitting LPFM stations to continue operation if overlap occurs in an FM station's service area outside its 70 dBu contour was an attempt to balance the service needs of full service stations with the need for stability in the LPFM service. FM translators provide full service FM stations with a means of supplementing signal coverage made deficient due to terrain or other transmission issues, while LPFM stations will provide a new program origination service. Given the differing purposes of the LPFM and FM translator services we do not feel that it is necessary for both services to have identical interference protection requirements.

2. Modulation

31. In order to minimize the potential for interference from LPFM stations, the Commission concluded that LPFM stations would be required to meet current FM transmission standards. Additionally, in order to ensure that these standards are met, the *Report and Order* restricted LPFM stations to the use of FCC "type certified" transmitters.[33]

32. Craig L. Fox (Fox) argues that the rules adopted by the Commission are not sufficient to avoid the creation of interference via improper operation.[34] Specifically, Fox argues that the adopted rules do not address the problem of overmodulation caused by a high audio feed. Fox states that overmodulation was a common problem among "unlicensed operators" and that excessive frequency deviation in the signals of these stations resulted in additional interference. Accordingly, Fox concludes that the Commission should require LPFM stations to use calibrated modulation monitors. We believe this additional safeguard is unwarranted. We do not believe that unsupported anecdotal evidence regarding unauthorized broadcasters is a sufficient justification for placing additional burdens on legitimate LPFM licensees. Thus, we find Fox's arguments unpersuasive and do not modify our prior determination to require full service and LPFM stations to meet the same transmission standards.

3. Cut-Off Date for Protection of Full Service Stations

33. The *Report and Order* adopted a nationwide filing window for LP100 applications and tentatively set the first window for May 2000. The Commission directed the Mass Media Bureau to announce by Public Notice the opening of the first national window and to release this notice at least 30 days in advance. Subsequently, the Mass Media Bureau decided to accept LPFM applications in five

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[32] On reconsideration, we are expanding this protection to include the community of license of commercial FM stations and the community of license of NCE FM stations provided that community is within the station's 60 dBu contour. *See* ¶ 52.

[33] "In most cases, these standards will be met through the use of certified equipment without need for further adjustment by the LPFM licensee. LPFM stations will be required to adhere to the 200 kHz channel bandwidth applicable to full service stations, as well as the out-of-channel signal attenuation requirements in 47 C.F.R. § 73.317 [via reference in § 73.508], the center frequency drift limits in 47 C.F.R. 73.1545(b), and the limits on modulation in 47 C.F.R. § 73.1570 (a) and (b)." *Report and Order,* 15 FCC Rcd at 2248, ¶109. In this regard, we note that one of the rules modified in the *Report and Order*, 47 C.F.R. § 73.1660, inadvertently specified verification rather than certification procedures for LPFM stations. We are correcting the rules accordingly to correspond to our decisions in the *Report and Order.*

[34] Fox Petition.

separate filing windows to "ensure the expeditious implementation of the LPFM service and to promote the efficient use of Commission resources."[35] The *Report and Order* also established protection rights for both full service and low power stations. LPFM applications must protect all full service FM station applications on file as of the date of the public notice in accordance with the minimum distance separation requirements adopted in the *Report and Order.* Full service FM applications filed on or after the public notice date would be protected only to the extent that the applicant's 3.16 mV/m contour is affected by an LPFM facility.[36]

34. Amherst Alliance concurs with our decision that LPFM applications must protect full service station applications on file as of a certain filing date. However, it disagrees with the date selected by the Commission. Specifically, Amherst argues that existing broadcasters will attempt to "warehouse" the spectrum by filing applications for the sole purpose of blocking LPFM applicants. Accordingly, Amherst suggests we change the "grandfathered" date to either February 26, 1999, the date the Commission required unlicensed broadcasters to cease operation if they wished to retain filing eligibility or, alternatively, January 20, 2000, the date of the adoption of the *Report and Order.*[37] We decline to adopt a different "cut-off" date based on Amherst's speculative spectrum warehousing contention. We believe that we have adequate remedies to ensure that there will not be warehousing of spectrum.[38] We have seen no evidence that broadcasters have chosen to circumvent Commission rules and policies by warehousing spectrum. Moreover, we conclude that imposing an extended freeze on full service applications would result in significant hardships to many stations without any countervailing benefits. We therefore reject this Amherst proposal.

35. However, in light of our decision to use multiple filing windows to implement the LPFM service, we clarify our LPFM cut-off rules. We will use the release date of each public notice announcing the opening of the next LP100 window as the "cut-off" date for protection of pending full service FM applications. Thus, LPFM applicants in subsequent filing windows will be required to protect all full service applications on file as of the date of the public notice for their particular window. This includes applications that may not have been protected in previous windows.

4. Protection of Cable Television Headend

36. NPR argues that the Commission should revise the LPFM rules to require that LPFM stations correct any interference that may occur in the vicinity of a cable television headend as a result of LPFM broadcasts. Of major concern to NPR are listeners that receive radio programming, including radio reading services which are typically transmitted on a radio station's subcarrier frequency, as part of

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35 *See Public Notice* entitled "FCC Announces Five-Stage National Filing Window for Low Power FM Broadcast Station Applications," released March 17, 2000, DA 00-621. *See also* the discussion in ¶ 52 of this *Memorandum Opinion & Order.*

36 *Report and Order*, 15 FCC Rcd at 2256-57, ¶¶ 130-133.

37 Amherst Alliance Petition at 11-15.

38 *Report and Order* in MM Docket No. 98-43, 13 FCC Rcd. 23056 (1998); *Memorandum Opinion and Order* in MM Docket No. 98-43, 14 FCC Rcd. 17525 (1999).

their cable service.[39] In the *Report and Order*, the Commission made LPFM stations subject to the existing full service station requirements regarding the amelioration of blanketing interference.[40] Cable headends are among the facilities covered by this rule. To the extent NPR refers to off-air reception problems caused by interference other than blanketing, we note that cable headend facilities receive no such specific protection from full service FM or FM translator stations. We are not persuaded that LPFM stations should be subject to more stringent requirements in this regard than other FM stations.

5. Translators

37. As part of its overall plan to protect FM stations from interference, the Commission adopted FM translator/booster-LPFM station minimum distance separation requirements. Because FM translator and booster stations generally do not have specific class limitations, the separation requirements were determined by analyzing the 60 dBu contours of authorized stations and grouping them into three cohorts based on station power and height. Additionally, we also amended Part 74 rules to require that FM translator and booster stations protect the 1 mV/m contour of LP100 stations.[41]

38. NPR complains that the Commission has adopted rules that have rendered FM translators "secondary" to LPFM stations. NPR cites the numerous federal Public Telecommunications Facilities Program (PTFP) grants awarded to FM translator licensees each year as evidence of the recognized public interest benefits of translator service. According to NPR, this funding is provided because in many instances a translator station is the only source of public radio service in a given area.[42] NPR argues that FM translator applicants that receive PTFP funding should not be required to protect LPFM stations. Additionally, NPR argues that LPFM station protection requirements may limit the ability of translators to relocate or change output frequencies when displaced by full service FM stations. It objects to this policy, contending that it could result in the potential loss of FM translator service. NPR requests that FM translators in this situation be allowed to make modifications that may result in interference to authorized LPFM stations.

39. We do not agree with NPR's characterization that the separation requirements adopted in the *Report and Order* make FM translators "secondary" to LPFM stations. The interference protections that were added to the translator and LPFM service rules place LPFM stations and FM translators on essentially equal footing in providing reciprocal interference protection. LPFM stations must meet FM translator distance separation minimums and FM translators must protect the 60 dBu contour of LP100 stations. We wish to clarify the application of 47 C.F.R. § 74.1204(a)(4), the rule section requiring FM translators to protect the 60 dBu contour of co- and 1st adjacent channel LP100 stations. In issuing LPFM construction permits we will specify an acceptable range of ERP based on the proposed antenna HAAT. Any subsequently filed license authorization will include a specific operating ERP. An FM translator application must protect the maximum facility authorized in an LP100 construction permit until the LP100 station is licensed. In fact, some aspects of the rules provide greater protections for FM

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39 NPR Petition at 16-17.

40 *Report and Order*, 15 FCC Rcd at 2249, ¶ 113.

41 *Id.* at 2233-34, ¶¶ 70-71.

42 NPR Petition at 17-19

translator stations. For example, FM translators were divided into three broad categories based upon coverage area, with the same LPFM spacing applied to the smallest and largest facility in each category. Thus, with the exception of the largest authorized FM translator facilities, the spacing rules adopted for LPFM stations will usually result in an FM translator receiving more protection than an LP100 station which receives protection based on its actual contours. Additionally, FM translator stations are not required to protect LP10 stations. We believe that NPR's proposal to make LPFM stations secondary to translators is fundamentally contrary to current Commission policy, which treats translators as a secondary service. "The proper role of FM translators among aural services to the public is to provide secondary service to areas in which direct reception of signals from FM broadcast stations is unsatisfactory due to distance or intervening terrain obstructions."[43] We acknowledge that FM translators have provided useful service to unserved or underserved areas, but we believe that our LPFM rules adequately protect operating translator stations. We are not persuaded that our technical rules should be modified to eliminate the protections afforded LP100 stations – essentially rendering LPFM stations "secondary" to translators – either with respect to subsequently filed FM translator applications generally or with respect to the narrower class of translator stations that receive PTFP funding.

40. Nonetheless, we agree with NPR that maintaining translator-based delivery of broadcast programming is an important objective. We invite parties concerned with this issue to submit suggested improvements in these areas to the staff of the Mass Media Bureau's Audio Service Division, so that we can facilitate relocation of displaced translators when necessary. Based on the comments received the Bureau is authorized to reexamine our rules, filing procedures and processing standards and to suggest what steps the Commission can take to increase the flexibility accorded to displaced translator licensees seeking replacement facilities, if necessary.

41. NPR and the National Translator Association (NTA) state that the Commission should modify its rules to protect the input signals of FM translators that receive the signal of their primary stations via direct off-air reception.[44] NPR is particularly concerned about the effects upon translator network "chains" in which each translator station output signal provides the input signal to the next. In this regard, we concur with the petitioners that protecting the input signals of FM translator stations is an important component of our overall policy goal of developing LPFM technical rules that protect existing FM translator service. We conclude that we should follow the procedures currently used to resolve allegations of interference caused by one FM translator to the input signal of another FM translator to resolve such interference caused by an LPFM station.[45] However, contrary to NTA's suggestion, we will not make such interference a routine consideration prior to the grant of an application. Where a translator station demonstrates that an LPFM station is interfering with the translator station's input signal in use at the time the LPFM station is authorized, the LPFM station will be required immediately to cease operation until appropriate remedial actions have been taken.

42. *Protection of Class A TV, Low Power Television and Television Translator Stations*

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[43] *See In the Matter of Amendment of the Commission's Rules Concerning FM Translator Stations,* 5 FCC Rcd at 7219, ¶ 48 (1990).

[44] NPR Petition at 21; NTA Petition at 3 .

[45] *See* 47 C.F.R. § 74.1203(a)(2).

Operating on TV Channel 6. In order to protect TV Channel 6 stations from LPFM station interference, we adopted a rule (47 C.F.R. § 73.825) requiring LPFM stations proposing operation in the NCE portion of the FM Band (Channels 201-220) to meet minimum distance separation requirements with respect to TV Channel 6 stations.[46] Section 73.825 does not specifically address Class A TV, low power television (LPTV) and television translator stations operating on TV Channel 6. Accordingly, we will amend § 73.825 to include additional minimum distance separation requirements which we believe will be adequate to protect the service provided by the Class A TV, LPTV and television translator facilities.[47]

6. Spacing Table.

43. An anomaly in the minimum distance separation requirements of 47 C.F.R. § 73.807(g) has come to our attention. Specifically, the tables specify greater 2nd adjacent channel spacing requirements to Canadian stations from LP10 stations than from LP100 stations. When considering low-powered facilities at very high signal strengths, the Commission's F(50,50) curves often must be used instead of its F(50,10) curves. However, in some cases the staff must utilize the "free space equation" formula to determine contour distances. "In those cases where the distance calculated from the free space equation is greater than 5280 feet [one mile], but the F(50,50) curves show a distance of less than one mile, we use a distance of one mile."[48] Although the staff properly used the treaty-required +20 dBu undesired-to-desired signal radio to determine 2nd adjacent channel interfering contours near the Canadian border area, the staff failed to account for the fact that, in cases where the free space equation yields a result greater than 1.6 kilometers (one mile), 1.6 kilometers must be used as the contour distance. We have recalculated the minimum separation distances for 2nd adjacent channel LP10 stations near the Canadian border and are amending § 73.807 accordingly.[49] For the same reason, we are also amending the IF

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[46] *Report and Order,* 15 FCC Rcd at 2249-50, ¶ 114.

[47] The current distance requirements listed in § 73.825 are premised upon a TV Channel 6 station operating with 100 kW ERP at 610 meters HAAT and the interference ratios proscribed by 47 C.F.R. § 73.525. However, these requirements overstated the potential for interference created by LP10 and LP100 stations. Accordingly, we are amending § 73.825 to eliminate this discrepancy. The requirements we are adopting for Class A TV, LPTV and television translator protection are based upon these stations operating with 3 kW ERP at 610 meters HAAT and the appropriate ratios of § 73.525 and are thus much less restrictive than the requirements for protection of full service TV Channel 6 stations

[48] "And, if the distances involved are below one mile, it is necessary to use the free space equation to determine the signal strength of the undesired signal. The free space equation which we use is derived from 'Radio Propagation at Frequencies above 30 Megacycles,' by Kenneth Bullington, Proceeding of the I.R.E., page 1122, October 1947. After taking into account the fact that FM broadcast antenna effective radiated power is referenced to half-wave dipole, rather than an isotropic antenna, we have:

$$\text{Distance (feet)} = \frac{23 \text{ Square Root (effective radiated power in watts)}}{\text{Field Strength (V/m)}}$$"

In re Application of City College of New York, 47 RR 2d 1095 (1980).

[49] When conducting our review of the minimum separation requirements within the Canadian border zone we became aware of a miscalculation in the requirements with respect to co- and 1st- adjacent channel Canadian Class C (continued....)

frequency separation requirements for Class LP100 stations with respect to Class A and Class D stations, and Class B stations in Puerto Rico and the US Virgin Islands.

44. In addition to the anomaly in 47 C.F.R. § 73.807(g), we have determined that low power FM stations within Canada and Mexico[50] had not been specifically protected from new domestic LPFM stations in the *Report and Order*. While these stations are protected by treaty, the *Report and Order* failed to include spacing tables explicitly protecting Canadian and Mexican low power FM Stations. To eliminate any uncertainty with respect to Canadian and Mexican stations, we are supplementing the international spacing tables specified in 47 C.F.R. § 73.807 to include specific distance separation requirements. To determine the spacings, we took the maximum facilities allowed for Canadian and Mexican FM translator stations, calculated the distance to the F(50,50) protected contour, and added the distance to the F(50,10) interfering curve from the domestic LPFM station required to protect those stations. In doing so, we determined that Canadian low power FM stations should receive the same protections provided to Canadian Class A1 facilities. Therefore, the Class A1 spacings in 47 C.F.R. §§ 73.807(g)(1) & (g)(3) will also be used for protecting Canadian low power FM Stations. However, due to the differences in treaty requirements, Mexican low power FM stations require unique spacing distances, and 47 C.F.R. §§ 73.807(g)(2) & (g)(4) are amended accordingly.

7. Directional Antennas

45. In the *Report and Order* we determined not to authorize directional antennas for LPFM stations.[51] We concluded that directional antennas are unnecessary due to our reliance on a minimum distance separation methodology for interference protection, which assumes the use of a non-directional antenna. We also reasoned that authorizing only nondirectional antennas would simplify the preparation and processing of applications, thereby facilitating the expeditious implementation of the service.

46. The New York State Thruway Authority (NYSTA) and the consulting engineering firm of Lohnes and Culver request that LPFM stations be permitted to operate with directional antennas.[52] They contend that directional antennas are useful engineering tools for enhancing a station's ability to avoid interference and for allowing more efficient operation by not wasting signal energy over unpopulated areas or areas where service is not intended. As suggested by Lohnes and Culver, use of a higher gain directional antenna to achieve a station's effective radiated power could reduce station costs by permitting the use of a lower power transmitter. NYSTA asserts that use of directional antennas would enable more opportunities for LPFM service, and that a blanket prohibition against directional antennas

(Continued from previous page)

stations. Accordingly we are modifying 73.807(g)(1) and (g)(3) to reflect the correct values. Additionally, we are clarifying 73.807(g)(6) to acknowledge the Commission's responsibility to coordinate with the appropriate government in all cases where such coordination is necessary to maintain compliance with existing international agreements.

[50] The Treaties between the United States and Canada and the United States and Mexico refer to secondary facilities as "Low Power FM Stations." Low power FM Stations are authorized on a secondary basis in both Canada and Mexico, just as FM Translator stations are authorized in the United States.

[51] *Report and Order*, 15 FCC Rcd at 2248, ¶ 108.

[52] NYSTA Petition at 2-4; Lohnes and Culver Petition at 2.

is not sufficiently justified on the ground that it would simplify application requirements.

47. As we stated in the *Report and Order*, there are compelling needs for the services that will be provided by LPFM stations. As part of a streamlined application process to expedite the authorization and implementation of the service, we prohibited the use of directional antennas by LPFM stations. We continue to believe that given the low power levels in the LPFM service, authorizing stations to limit power in particular directions would not generally yield benefits sufficient to offset our concerns about the complexities of directional antenna authorizations. As noted by NYSTA, applicants seeking directional full service FM radio facilities are subject to strict requirements involving radiation pattern and antenna installation.[53] Authorization of directional antennas entails the submission and staff evaluation of radiation patterns and related information. Applicants for directional FM station licenses are required to submit measurement data to verify the radiation characteristics of directional antennas, as installed. Station proposals involving non-directional antennas can be authorized more quickly and with much less information from applicants. Such antennas will also facilitate uniform signal coverage within an LPFM station's service contour. Moreover, the conservative distance separation requirements established for LPFM stations will ensure that other stations are adequately protected against interference without the use of directional antennas. For these reasons, we generally affirm our determination not to authorize directional antennas for LPFM stations.

48. As noted by the petitioners, however, we recognize that there could be tangible benefits to allowing the use of directional antennas, particularly for licensees whose service is generally tailored to directional signal paths. NYSTA notes that it, as well as transportation agencies of other states, operates a Traveler's Information Service (TIS) that provides travel advisory and public safety information to motorists. TIS systems include numerous stations strategically located to provide signal coverage along roadways. NYSTA seeks to replace AM radio TIS facilities with LPFM stations. According to NYSTA, use of directional antennas would "focus coverage along the Thruway's right-of-way, thereby minimizing the stations' coverage contours and potential for interference, while still allowing the Thruway to ensure that its public safety information reaches the motorists using the roadway."[54] As suggested by Lohnes and Culver, directional antennas in such systems could reduce system costs and minimize environmental impact.[55]

49. For these reasons, we will make a limited exception to the prohibition of LPFM directional antennas and permit such antennas to be used only by public safety and transportation entities in connection with the operation of TIS services.[56] However, under no circumstances will a specific

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[53] These requirements, given in 47 C.F.R. § 73.316, include the submission of measurements of directional antenna relative field patterns to ensure the accuracy of radiated emissions. The determination and verification of directional antenna radiation characteristics can be exceedingly complicated, particularly for composite antenna systems comprised of multiple antennas.

[54] NYSTA Petition at 1-3.

[55] Lohnes and Culver Petition at 3.

[56] To enable such systems in the FM radio band, we are also providing a conditional exemption to government, public safety and transportation organizations to apply for multiple LPFM station licenses. *See* the discussion of National Ownership Limit at ¶ 77.

antenna pattern be considered when determining compliance with our LPFM interference requirements with respect to other stations. Thus, we affirm that all such applicants must propose LPFM locations that comply with the LPFM distance separation requirements; requirements which assume use of a nondirectional antenna. Additionally, the use of a directional antenna will not affect a licensee's obligation to operate at its authorized ERP and will therefore not result in any extension of predicted coverage. Use of a high gain directional antenna will require a corresponding transmitter output power and transmission line loss that produces the authorized ERP.

50. TIS applicants wishing to utilize directional antennas will be limited to the use of a single "off-the-shelf" antenna with pattern characteristics pre-set by the manufacturer. A composite antenna consisting of more than one antenna mounted together may not be utilized. Nor will we permit multiple directional antennas and transmitters to be used from a single licensed facility. When filing an application for license to cover a construction permit (FCC Form 319), permittees will be required to certify that the gain of the specified antenna and transmitter power output (TPO), coupled with the necessary transmission line, produces the licensed ERP.[57] For the purposes of station authorizations and our engineering database, all LPFM stations, including those of TIS stations, will be considered "non-directional." Thus, we will not require applicants for station licenses to submit any data beyond antenna make and model. We will expect all licensees to install their antennas in accordance with the manufacturer's specifications.

8. Service Area Issues

51. In order to avoid the creation of interference to existing FM broadcast stations, the *Report and Order* adopted minimum distance separation requirements that were premised on the lack of prohibited overlap to each station class' maximum protected contour.[58] In addition, in an effort to account for modifications to existing full service stations, and minimize interference, an additional 20 kilometer "buffer" was added to the co- and 1st adjacent channel separation requirements. Greater protection still was given to several superpowered stations operating within the reserved portion of the FM band.[59] Finally, although a full service station proposing a facility modification could potentially be required to accept some interference from an operating LPFM station, the rules require that LPFM stations fully protect FM station modifications to their principal community (70 dBu) contours.[60]

52. Alan W. Jurison (Jurison) and NPR allege that the rules adopted by the Commission do not adequately protect the service areas of full service licensees.[61] Both petitioners state that the

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57 Applicants for LPFM construction permits are not required to specify antenna information on FCC Form 318.

58 The 1 mV/m contour for Class A, C3, C2, C1 and C stations; the .7 mV/m contour for Class B1 stations; and the .5 mV/m contour for Class B stations.

59 *Report and Order,* 15 FCC Rcd at 2233, ¶ 70.

60 *Id.* at 2231-32, ¶¶ 65-67.

61 Jurison Petition at 3; NPR Petition at 6.

modification rule that requires LPFM stations to protect the 70 dBu contour of full power station modifications from interference appears to fall short of the Commission's stated intention of protecting the service areas of existing stations.[62] We do not believe that reconsideration of these complementary policies is warranted. New LPFM station separation requirements and the protection afforded to full service modifications are intended to serve different aspects of our overall interference policy. The spacing rules require the full protection of all full power authorizations and prior-filed applications in order to minimize the potential for interference that could result from an initial LPFM station authorization. The Commission adopted a different approach to subsequently-filed modifications of full service stations in order to provide a degree of stability for the new and untested LPFM service while providing maximum technical flexibility for full power stations to initiate or enhance service. The Commission has long recognized the importance of preserving existing broadcast services. As a result, we believe the qualified cut-off protection that LPFM stations enjoy *vis-a-vis* subsequently filed full power proposals is warranted, especially when the role of LPFM stations in providing new outlets for community-based organizations is taken into account. We note that our decision to protect full power stations to maximum facilities and to require that new LPFM stations meet an additional buffer zone protection requirement should substantially limit the number of cases where a site relocation results in interference received by a full power station.[63]

53. NPR questions the use of the 70 dBu contour as a benchmark for protecting the community of license of noncommercial educational FM stations. Specifically, NPR argues that NCE FM stations operating within the reserved band are not required to cover their communities of license with a 70 dBu strength signal. Thus, under the LPFM rules as originally adopted, a full service NCE FM station could receive interference from an LPFM station within those portions of its community of license that it serves with less than a city grade strength signal. We concur that this result does not serve our intended goal of protecting service within each station's community of license.[64] Accordingly, we will revise the pertinent rule sections to require that LPFM stations not cause interference within the community of license of an NCE FM station, provided that the community is within the 60 dBu contour of the affected NCE FM station. Extending this protection to stations with communities of license located beyond the 60 dBu contour is not warranted since such stations are already potentially subject to interference from other full service stations within their communities of license. Commercial FM stations are deemed to "substantially comply" with the community of license coverage requirements if at least 80% of the community of license is located within the 70 dBu contour.[65] Accordingly, we will also protect the

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62 *See* 47 C.F.R. § 73.209(c) (*Protection from interference);* § 73.514 (*Protection from interference);* and § 73.809 (*Interference Protection for full service FM stations).*

63 We wish to clarify 47 C.F.R. § 73.809 as it relates to determining interference caused by LPFM stations to full service stations operating on IF frequency channels. That section states that interference will be shown by demonstrating contour overlap based upon the interference ratios of 47 C.F.R. § 73.215. However, § 73.215 does not apply to IF frequency channel stations. Accordingly, we are amending § 73.809 to state that IF frequency channel interference will be determined via overlap of the 91 dBu F(50,50) (36 mV/m) contours. This contour was utilized to calculate the LPFM IF frequency channel spacing requirements.

64 *See In the Matter of 1998 Biennial Regulatory Review – Streamlining of Radio Technical rules in parts 73 and 74 of the Commission's Rules,* (13 FCC Rcd 14849, 14875-76, ¶¶ 57-58 (1998)).

65 *See John R. Hughes*, 50 Fed. Reg. 5679 (1985).

community of license of commercial FM stations, even in instances where a portion is located outside the 70 dBu contour.

54. NPR has expressed additional concerns about the service areas of NCE FM stations. NPR is concerned that, although the Commission indicated that the distance separation requirements often result in greater protection to stations operating with less than maximum class facilities, stations operating at maximum class facilities do not receive any "additional" protection.[66] We do not share NPR's concern in this regard. The "additional protection" referred to by NPR is simply a consequence of using a minimum distance separation methodology based upon maximum class facilities instead of a contour overlap methodology based upon actual authorized facilities.[67] Additionally, NPR expresses concern that stations operating in statewide networks are vulnerable to interference because "[i]ndividual stations in a statewide network are typically sited to achieve maximum population based upon the receipt of a quality signal rather than predicted contour overlap."[68] With the exception of the 20 kilometer "buffer" added to the co- and 1st adjacent channel spacing requirements, the Commission did not provide for protections beyond stations' service areas based on maximum facilities for the station class. More generally, it is axiomatic that our technical rules protect NCE stations only to their "protected" contours and not some undefined otherwise unprotected contour relating to the location of a desired station audience. Requiring greater protection could unduly limit LPFM licensing opportunities and is at odds with protections provided in the full power service. We conclude that this fundamental departure from our license assignment policies is unwarranted.

55. Jurison also expressed concern about existing grandfathered superpowered FM stations operating in the non-reserved band.[69] Specifically, Jurison states that the Commission did not explain why non-reserved band superpowered stations were not granted the additional protections provided for reserved band superpowered stations.[70] Under current Commission rules, superpowered stations operating within the non-reserved band are protected not on the basis of their actual facilities but on the basis of the station's maximum class facilities.[71] In contrast, full service superpowered stations operating within the reserved band are protected on the basis of their authorized facilities, which exceed the maximum facilities for the station class.[72] Jurison has not established sufficient justification for requiring LPFM stations to provide non-reserved band superpowered stations with greater protection than that currently provided by existing full service stations. Jurison also expresses concern that LPFM stations

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66 NPR Petition at 9.

67 *Report and Order*, 15 FCC Rcd at 2228, ¶ 58.

68 NPR Petition at 10.

69 "Superpowered" FM stations have been authorized to operate with facilities that exceed the ERP/HAAT limitations of §73.211 or §73.511 for their specific class of station.

70 Jurison Petition at 2-3.

71 All full service stations operating in the non-reserved band, regardless of facilities, must be protected under the provisions of 47 C.F.R. § 73.207 (distance separations based upon maximum class facilities) or § 73.215 (lesser separation requirements based upon the lack of contour overlap with maximum class facilities).

72 *See* 47 C.F.R. § 73.509.

would receive excessive interference from superpowered stations, despite being located at distances where our rules[73] state that there would be "no interference received." While this situation may occur in some instances, we do not believe that it warrants increasing the LPFM minimum separation requirements toward all superpowered stations. LPFM minimum distance separation requirements may permit stations to operate in areas where they may be subject to received interference. To the extent that the "no interference received" values may be misleading in some instances, we will change the tables to read "For No Interference Received From Maximum Class Facility." It will be the LPFM applicant's responsibility to consider the facilities of nearby superpowered stations when considering its choices for site and/or frequency.

9. Digital Audio Broadcasting

56. The Commission's decision to retain 2nd adjacent channel LPFM protection requirements but eliminate 3rd adjacent channel standards was designed, in part, to ensure that the introduction of the LPFM service did not impede the development of in-band on-channel (IBOC) digital audio broadcasting (DAB) technologies. Both USA Digital Radio Partners, L.P. (USADR) and Lucent Digital Radio (LDR) have expressed concerned about the robustness of their technologies with respect to 2nd adjacent channel signals, including LPFM signals. However, neither proponent raised concerns about 3rd adjacent channel operations and USADR has stated that "digital reception is essentially not susceptible to 3rd adjacent channel interference."[74] On this basis, the Commission concluded that the LPFM operations on 3rd adjacent channels will not have an adverse impact on digital IBOC signals.[75]

57. Neither USADR nor LDR seeks reconsideration of our decision not to establish 3rd adjacent channel protection standards for LPFM stations. NPR, however, argues that the technical standards adopted in the *Report and Order* fail adequately to assure the compatibility of LPFM and a future DAB service. It urges the Commission to retain full service 3rd adjacent channel interference protections or to authorize LPFM stations "on a secondary basis to all full power, translator, and booster stations operating pursuant to a DAB authorization."[76] We believe that such additional restrictions on LPFM licensing are unwarranted. The *Report and Order* takes a technically conservative approach to minimize potential impacts on terrestrial digital radio services. The retention of 2nd adjacent channel protections, the additional 20-kilometer buffer zone protection afforded all full service stations operating on co- and 1st adjacent channels, and the decision not to create a 1000-watt class of LPFM stations collectively demonstrate the Commission's commitment to ensuring a smooth transition to DAB. We believe that we have incorporated sufficient protections into our LPFM technical rules and, therefore, reaffirm our prior conclusion that LPFM is very unlikely to impede the development of a DAB service or cause interference in particular cases to digital IBOC signals.

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73 47 C.F.R. § 73.807.

74 *Report and Order*, 15 FCC Rcd at n.145.

75 *Report and Order*, 15 FCC Rcd at 2241, ¶ 93.

76 NPR Petition at 25.

B. Third Adjacent Channel Complaint and License Modification Procedure

58. Based on the Commission's technical analyses and its review of several independent studies submitted in this proceeding we decided not to require LPFM stations to provide 3rd adjacent channel protection to full power stations. As discussed above, no issues have been raised on reconsideration that have persuaded us to reconsider our findings and conclusions on this matter.[77] We continue to believe that the risk of interference from LPFM stations is small, and that the interference that may occur in individual cases would be vastly outweighed by the benefits of initiating a new service that will create new outlets for locally based community-oriented voices.

59. National Public Radio (NPR) urges the Commission to adopt an expedited process for the review of complaints of alleged interference to full power stations caused by LPFM stations operating on third adjacent channels. NPR proposes a pre-license complaint procedure, stating that "the Commission should implement a process that permits the challenge and denial of an LPFM application on a 3rd adjacent channel at the initial processing stage..."[78] In the alternative, however, NPR proposes that the Commission adopt rules that would allow a "licensee of a full power, translator, or booster station to file an interference complaint at any time after final licensing of the facility LPFM operation."[79]

60. As a preliminary matter, we reject NPR's pre-license predicted interference complaint procedure because it is in fundamental conflict with our conclusion that the benefits of this new service far outweigh the isolated instances of interference that may occur. We continue to adhere to this policy judgment. Our studies establish that FM receiver performance varies widely. Many receivers are highly immune to 3rd adjacent channel interference while poorer quality receivers may experience some additional interference from the operation of LPFM stations. Moreover, as noted in the *Report and Order*, any interference would most likely occur in a small area in the immediate vicinity of the LPFM transmission facility that is, itself, located at the outer edge of a full power FM station's service area. Listeners using low-end receivers are unlikely to experience "actual interference" in such a situation because in locations at the outer edge of a station's service area those receivers probably are not able to receive that station.

61. We concluded in the *Report and Order* that the licensing of LPFM stations on 3rd adjacent channels would not result in significant new interference to existing FM stations, *i.e.* that very few listeners would be able to detect additional interference as a result of commencement of LPFM service on a 3rd adjacent channel. Although we expect it to be the rare case where an LPFM station operating on a 3rd adjacent channel causes more than a *de minimis* level of interference within the service area of a full power station protected by the distance separation requirements for other channel relationships, such a result would be unacceptable if it were to occur. Accordingly, we conclude on reconsideration that it would be prudent to establish procedures that would encourage cooperation between the parties and permit the Commission to take prompt remedial action where a significant level of interference can be traced to the commencement of broadcasts by a new LPFM station. As a result of these new procedures,

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77 *See* discussion in ¶ 5-18.

78 NPR Petition at 13.

79 *Id.*

there may be circumstances where, contrary to what we said in the Report and Order,[80] an LPFM station will be required to take steps to resolve complaints that its signal is interfering with the reception of a full power FM station even though the LPFM station is operating in accordance with the relevant rules.

62. This marks the first time that the Commission has departed from a purely "predicted interference" approach for an aural service that has program origination authority and that enjoys certain protections generally thought of as "primary" stations rights. Our willingness to do so is based on a unique combination of factors. Most importantly, we are confident about the technical conclusions we have reached in the proceeding. Specifically, we continue to believe that it is unlikely that more than a few listeners will detect any additional interference to the reception of an existing FM station at locations that would be entitled to protection under our full power third adjacent channel interference methodology. Thus, the post-construction "actual interference" complaint procedure we are establishing should not pose a significant threat to the viability or stability of the LPFM service.

63. Moreover, an efficient complaint procedure will promote the fullest interference-free use of the FM broadcast spectrum. At this time there are few, if any, full power FM station opportunities in most of the highly populated areas of the country. In fact, staff studies in this proceeding establish that there are no available FM channels for LP100 stations in a number of major markets. In many communities broadcasters have fully taken advantage of the Commission's policy of licensing efficient high-power stations that serve wide areas with limited technical preclusiveness. As a result, most Americans enjoy abundant radio service. LPFM is not, as some argue, in conflict with these principles. Rather it is a complementary way to serve the needs of communities within a mature broadcast service. It is grounded on the success of the Commission's licensing policies and is designed to efficiently match the little spectrum that remains with the demonstrable demand for locally based programming. We conclude that an efficient, limited complaint procedure fairly balances the interests of incumbent broadcasters against the benefits of fostering a new and different kind of radio service.

64. For purposes of the complaint process we will consider interference to occur whenever reception of a full power station is impaired by the operation of an LPFM station operating on a third adjacent channel station. We believe that it is unnecessary to adopt a more technically objective standard for determining whether a listener is experiencing "actual" interference. The "any impairment" standard has worked successfully over the past decade in the FM translator context.[81] A particular listener's perception of signal impairment is dependent on many factors, including the receiver used, the programming, listener sound quality expectations, and listener auditory discrimination capabilities. As a result, we are reluctant to adopt a single "objectionable interference" standard. We are also concerned that this approach could add a level of factual complexity to the complaint process set forth below without any clear public interest justification.

65. The complaint process may be invoked where an LPFM station's transmission facilities are located inside the predicted 60 dBu contour of an existing full power FM station operating on a 3rd

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80 *Report and Order*, 15 FCC Rcd at 2282, ¶ 64.

81 *See* 47 C.F.R. § 74.1203.

adjacent channel[82]; that is, the 60 dBu contour corresponding to the station facilities that existed at the time construction of the LPFM station was authorized.[83] Complaints will be limited to receivers located at fixed, identifiable locations within the full power station's 60 dBu contour that are not more than one kilometer from the LPFM transmitter site. This geographic limitation is intended to address broadcasters' specific concern about the lack of LPFM station 3rd adjacent channel interference protection requirements. An LPFM station's interfering contour would extend slightly less than one kilometer from the LPFM transmitter site.[84] The fixed receiver requirement is based on our desire to put in place a manageable and efficient complaint procedure. Mobile receiver complaints are generally much more difficult to identify and resolve. A mobile receiver, such as a car or portable radio, will encounter constantly varying signal strengths from various stations, resulting in a continuously variable potential for interference.[85] The complaint must be received by either the LPFM or full power station within one year of the date on which the LPFM station commenced operation. This time frame is necessary to limit uncertainty regarding the potential modification or cancellation of an LPFM station's license and such station's financial obligation to resolve interference complaints. Any interference caused by the LPFM station should be detectable within one year after it commences operation. The one-year cure period is similar to the technical requirement that each FM permittee resolve at its sole expense all blanketing interference complaints for a one-year period beginning with the commencement of program tests.[86] The Commission will consider the modification of a station's license, including its cancellation, where as a result of the process described below, *bona fide* complaints from at least one percent of the households or thirty households, whichever is less, within the specified complaint area remain unresolved.[87] We do not

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82 Predicted 60 dBu contours must be calculated in accordance with 47 C.F.R. § 73.313(a).

83 That contour, which encompasses the area that would have been protected had a 3rd adjacent channel distance separation requirement been applied to LPFM stations, will bound the complaint area. With regard to LPFM protection of subsequently modified, upgraded, or new full-service FM stations, we will conform 3rd adjacent channel protection responsibilities to the generally applicable provisions in ¶ 66 of the *Report and Order* and as codified in 47 C.F.R. § 73.809. In this manner, operating LPFM stations will be permitted to interfere within the 60 dBu contour of a new or subsequently modified FM station, but not within such a station's 70 dBu "city grade" signal contour or principal community of license, as applicable (*see* discussion of service area issues, above).

84 Under the Commission's interference methodology for FM stations, 3rd adjacent channel interference is predicted where the undesired signal is more than 40 dB stronger than the desired signal level , *e.g.,* where the 3rd adjacent channel station's 100 dBu contour overlaps the desired signal level. *See, e.g.,* 47 C.F.R. § 73.509. The predicted 100 dBu contour of an LPFM station operating at maximum facilities would extend slightly less than one kilometer from the LPFM's transmitter site.

85 Because of these complexities, the Commission generally does not hold an FM radio station responsible for alleviating interference problems caused to mobile receivers.

86 *See* 47 C.F.R. § 73.318.

87 The exact number of complaints necessary to satisfy this one-percent threshold can only be calculated on the basis of a specific antenna location of an allegedly interfering LPFM station. Assuming uniform population distribution within a community of license, the number of complaints necessary to reach this threshold would be, for example, approximately 19 in Charlottesville, Virginia, 29 in Minneapolis, Minnesota, and 12 in Frederick, Maryland. As noted above, in no event would this procedure require more than 30 *bona fide* complaints.

anticipate this level of interference as a result of licensing LPFM stations on 3rd adjacent channels and will not consider it *de minimis*.

66. The first stage of the complaint process is designed to facilitate cooperative efforts between LPFM and full power FM licensees to identify and resolve *bona fide* interference complaints. A listener who believes that an LPFM station signal is interfering with the reception of a full power station may initiate the complaint procedure by providing the full power station an affidavit that describes the nature and location of the alleged interference. LPFM stations receiving complaints directly from listeners will be required to forward promptly such complaints to the affected full power FM stations. The full power FM station will be required to identify those complainants who reside at locations covered by these procedures, and provide copies of all such *bona fide* complaints to the LPFM station. Initially, an LPFM station will have the opportunity to resolve individual interference complaints. For example, an LPFM station may agree to provide new receivers to impacted listeners or to install filters at the receiver site. The LPFM station also may wish to consider a power reduction or other facility modification to alleviate the interference. We expect the LPFM station to make serious and diligent efforts to resolve each *bona fide* complaint received.

67. In the event that the LPFM station concludes that it is not the source of the interference and the number of unresolved complaints equals at least one percent of households or 30 households -- whichever is less -- in the complaint area, the LPFM and full power stations must cooperate in an "on-off test" to determine whether the interference is traceable to the LPFM station. To the extent necessary and where practical, we instruct our Enforcement Bureau field personnel to assist the parties in determining the source of the interference and identifying possible solutions. The Commission will consider a complaint resolved if the complainant does not reasonably cooperate with the LPFM station's investigatory and remedial efforts. If the licensees fail to reach agreement and the requisite number of complaints remain unresolved, the full power FM station licensee may request that the Commission initiate a proceeding to consider whether the LPFM station's license should be modified or cancelled. To expedite this process, LPFM licenses will include a condition permitting the Commission to modify or cancel such licenses where the Commission determines that the LPFM station is causing more than *de minimis* levels of 3rd adjacent channel interference to the reception of a full power FM station in the complaint area, *i.e.*, where the number of *bona fide* complaints meets or exceeds the one-percent-of-households or thirty-households threshold set forth above. This modification procedure will be conducted pursuant to 47 U.S.C. § 316 and any such modification proceeding will be completed within 90 days of the filing of the complaint with the Commission, provided that the parties may seek extensions of this deadline consistent with our procedural rules.

68. An LPFM station may stay this procedure by voluntarily ceasing operations and filing a "displacement" application on Form 318 within twenty days of the commencement of this modification procedure. A displacement application may propose a station relocation and/or channel change to any available channel. It will be treated as a "minor" change that is not subject to competing applications, provided that a requested LP100 station site change is not greater than 2 kilometers or, in the case of an LP10 station, 1 kilometer.

C. Classes of Service

69. The *Report and Order* established two classes of LPFM stations. LP100 stations will be authorized to operate with maximum facilities of 100 watts effective radiated power (ERP) at 30 meters (100 feet) antenna height above average terrain (HAAT). LP10 stations will be licensed with the

equivalent of 10 watts ERP at 30 meters HAAT. The Commission declined to create a 1000 watt class of low power stations because of potential interference concerns, and because it determined that LP100 and LP10 stations would create more opportunities for community-oriented service.[88]

70. Skinner urges us to reconsider our decision not to authorize 1000 watt stations, because he believes that restricting LPFM stations to lower power operation will adversely affect their economic viability. He argues that 1000 watt stations should be allowed in areas where it could be shown that operation would be possible without the creation of prohibited contour overlap.[89] We continue to believe for the reasons stated in the *Report and Order* that the combination of LP100 and LP10 stations will best promote the goals of a community-based radio service.[90] Moreover, we believe that our reasons for rejecting a contour protection methodology for protecting stations from interference[91] is even more compelling with regard to higher power LPFM stations. Skinner has not provided any additional information that would lead us to reconsider these conclusions.

71. Our conclusion that licensing these two classes of service at this time would serve the public interest is warranted by changes in the radio industry. In the past we have struck the balance in favor of licensing higher powered stations to ensure that large audiences were served.[92] Now, when radio service is widely available throughout the country and very little spectrum remains available for new full-powered stations, we conclude that licensing very low powered stations will fill in the gaps in the spectrum that would otherwise go unused. This will maximize the use of the available spectrum, rather than create the inefficiencies we sought to avoid in the past.[93] Consistent with this approach, we are licensing LP100 stations before LP10 stations. As we stated in the *Report and Order*, [w]e adopt this sequential process in order to provide the larger (100 watt) stations with their greater service areas the first opportunity to become established. Given that some LP10 stations can be sited where LP100 stations cannot, we expect that opportunities will remain for LP10 stations after the initial demand for LP100 stations has been accommodated. Additionally, our own resources will be better spent *first* advancing services to relatively greater areas."[94] Our decision to begin licensing low power FM radio

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88 *Report and Order,* 15 FCC Rcd at 2211, ¶ 11.

89 Skinner Petition at 7.

90 *Report and Order,* 15 FCC Rcd at 2211, ¶ 12.

91 *Id.* at 2233, ¶ 70.

92 *In re Revision of FM Broadcast Rules*, 21 RR 1655 ¶ 7 (1961); *In re Revision of FM Broadcast Rules*, 23 RR 1859, ¶ 19-20 (1963); *In re Changes in the Rules Relating to Noncommercial Educational FM Broadcast Stations*, 69 FCC 2d 240, ¶ 23-24 (1978).

93 In the past, we have declined to authorize low power FM radio broadcast stations because of our concern that they would "preclude the establishment of more efficient, stable, full powered stations." *Dunifer*, 11 FCC Rcd 718, ¶ 15 (1995). At this time, however, we are creating an LPFM service that is designed to allow small stations to operate where full powered stations cannot. Moreover, we have adopted rules to ensure that the operation of LPFM stations does not undermine the technical integrity of the existing FM radio service.

94 *Report and Order*, 15 FCC Rcd at 2211, ¶ 11 (emphasis added).

stations at this time is also in response to the dramatic changes in the radio industry during the last four years since our radio multiple ownership limits were relaxed pursuant to the 1996 Act.[95] Given the substantial consolidation of radio station ownership in recent years, the need for adding diverse voices to the airwaves has grown. Because we have concluded that taking this step will not undermine our spectrum efficiency goals, we affirm our decision to create these two new classes of FM radio service.

D. Noncommercial Nature of LPFM Service

72. In the *Report and Order*, we determined that only noncommercial educational entities would be eligible to hold LPFM licenses. Skinner argues that restricting the service to noncommercial service reduces LPFM stations' economic viability and eliminates a potential advertising medium for small businesses.[96]

73. Our goals in establishing the LPFM service were to create opportunities for new voices on the airwaves and to allow local groups, including schools, churches, and other community-based organizations, to provide programming responsive to local community needs and interests.[97] As discussed extensively in the *Report and Order*, although we considered the entrepreneurial opportunities a commercial LPFM service would create, we concluded that a noncommercial service would best serve the Commission's goals in this proceeding. Skinner has not persuaded us to alter that decision.

74. Amherst Alliance requests that the Commission clarify that "entertainment"[98] programming can qualify as "educational" under the Commission's rules.[99] As discussed in the *Report and Order*, we have not required that programming be exclusively educational for an entity to qualify as an NCE entity eligible for non-commercial licenses.[100] In 1998 the Commission stated with regard to full power NCE stations that "NCE stations must promote a primarily educational purpose and not air commercials. Within those limits, there are many programming choices on NCE stations, such as instructional programs, programming selected by students, bible study, cultural programming, in-depth news coverage,

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[95] The 1996 Act eliminated the Commission's national ownership limits and relaxed the local radio ownership limits. In response, the radio industry has consolidated ownership during the past four years, with the number of radio owners declining by approximately 1000. In 1996, the largest radio group owner had fewer than 40 radio stations nationwide. In March 2000, the two largest radio group owners each have over 440 radio stations, and there are several radio owners with more than 100 radio stations. Approximately two-thirds of all commercial radio stations are owned as a part of radio groups. *FCC Staff Analysis of BIA Master Access*, BIA research, Inc., March 2000.

[96] Skinner Petition at 7.

[97] *Report and Order* at 2213, ¶ 17.

[98] Amherst Alliance Petition at 9-11.

[99] *Report and Order,* at 2213-14, ¶¶ 17-20.

[100] *Id.* at 2214, ¶ 20 ("it is not necessary that the proposed programming be exclusively educational," citing *Memorandum Opinion and Order*, In re Application of Lower Cape Communications, Inc., FCC 80-453, 47 RR 2d 1577, 1579 (1980)).