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Ms. Magalie Roman Salas, Secretary
Office of the Secretary, TW-A306
Federal Communications Commission
445 12th Street, S.W.
Washington, D.C. 20554

Re: MM Docket No. 99-25 -- Creation of a Low Power Radio Service

Dear Ms. Salas:

I support the creation of a low power radio service in order to meet the needs of an unserved audience. Detailed comments, table of contents, and a summary are attached. This service should be authorized for AM and FM broadcast frequencies. A microradio class service should be permitted.

Low power services can be accommodated within the existing spectrum without causing serious interference to existing broadcasters and without eliminating 2nd and 3rd-adjacent interference protections for existing stations. A method for accommodation on 2nd and 3rd-adjacent channels is described herein.

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Respectfully submitted,
Scott D. Fowler

Summary

A low power radio service should be created to provide information and entertainment to an audience that is unserved or underserved by commercial and public broadcasting stations. Existing stations, driven largely by economic forces, attempt to serve a larger and generalized audience within their coverage areas. There is no practical way to change this tendency in commercial and public broadcasting. Low-powered stations can better serve the smaller communities they will reach.

Low power radio will provide opportunity for new entrants into broadcasting and provide opportunity for professional broadcasters displaced by consolidations in the broadcast industry.

A broad range of classes and power levels should be permitted, including proposed microstations. Power levels up to 1000 watts will be required to serve dispersed rural communities. Power levels of 10 watts or less can be sufficient to serve small urban communities. At very low power, one frequency can be used by several microstations within a large metro area.

The Commission should reconsider its position of excluding low power AM stations. There may not be enough FM spectrum available to meet the demand for low power services, especially in urban areas; thus the use of AM channels would be in the public interest. Low power AM stations can be permitted on a secondary basis without frustrating the Commission's efforts to improve AM reception. There are over 700 low power TIS stations operating on a secondary basis in the AM band. Collectively, they have not degraded AM reception. Low

power AM stations of 100 watts or less should be considered. A lower nighttime power could be considered to minimize potential skywave interference.

Commercial low power stations should be permitted. All low power stations operating in the reserved band should be non-commercial and their licensees qualified under the same criteria as existing non-commercial licensees.

LP1000 stations should have a Class A minimum power of 100 watts. LP100 stations should have a 10-watt minimum. These ranges give applicants more flexibility. No LP1000 stations should be permitted in the reserved portion of the FM band because the existing rules already permit similar services. All LP100 and microstations should be licensed as secondary services to maximize spectral efficiency and to not limit facility changes for higher priority stations. As secondary services, these stations should be permitted to receive interference from higher priority stations and remain on the air as long as they can protect stations of higher priority from interference. New translators and boosters should have lower priority and low power stations should not be required to protect 2nd and 3rd-adjacent translators or boosters. Microstations should be licensed with the provision that they do not cause any actual interference, as specified in §74.1203(a)(3), but they should be able to remain on the air at reduced power to eliminate such interference. Microstations should be protected from interference from other microstations.

The use of minimum distance separations to establish LPFM service is simple and reasonable; however the present signal strength contour methodology would permit the most new services. Minimum distance separations may force secondary services off the air, even when

interference can be eliminated by reducing power or by using a directional antenna. Ultimately, the Commission may have to review supplemental showings and waiver requests using the signal strength contour methodology. Therefore, it may be better, in spite of the increased up-front analysis, to adopt the contour methodology for the LPFM service. Computer resources, software, and qualified engineers are available at reasonable cost to LPFM applicants.

Low power FM and AM services should be permitted within the primary coverage of 2nd and 3rd-adjacent channel stations. However, receiver induced interference caused by closely spaced strong signals could seriously degrade reception for many listeners if no limitations are retained for 2nd and 3rd-adjacent channel spacing. Instead of a yes-or-no approach to 2nd and 3rd-adjacent channel authorizations, a methodology is proposed herein that does not preclude new services, but may limit their power. The power limitation is related to the ERP of the adjacent channel station. The ERP of a new station should be limited to 10-20 dB less than an existing 2nd-adjacent channel station, depending upon the location of the new station within the adjacent channel station's service area. With respect to new 3rd-adjacent channel proposals, the ERP would be limited to 0-10 dB less than the existing adjacent channel station. The power limitations proposed will protect existing stations from significant interference within their service areas, especially for those stations operating at lower power. The greater limitation for 2nd-adjacent channel spacing will also protect future digital transmissions. Since the limited-power methodology is not preclusive, 2nd and 3rd-adjacent spacing can be permitted and a significant number of low power stations could be authorized.

If new stations are permitted on 2nd and 3rd-adjacent channels of existing stations, then the studio sites of existing stations could receive interference from a new station built nearby. The safeguards for blanketing interference may not be sufficient. Thus, studio site protection should be afforded to existing stations. Details are provided herein.

It is not necessary nor desirable to limit LPFM bandwidth. The proposed methodology herein for 2nd and 3rd-adjacent channel protection will limit interference to other stations. A reduction in bandwidth will result in an inferior signal; the public should be able to receive the same quality signal from a local low power station as they receive from other stations. An annual certification of performance should be submitted to insure compliance with emission limitations.

If ownership limits are permitted by law in the low power service, then existing commercial station owners and those with an interest in full power commercial stations should not be permitted to own low power services. However, experienced broadcasters, not owners, should be encouraged to participate to help provide the best service to the public. There should not be any ownership preferences established. Non-commercial licensees should be permitted to own low power non-commercial services and encourage student involvement. Individuals with an interest in a full power non-commercial educational service should be permitted to privately own low power services.

Existing AM stations should be given priority to trade-in their license for an LPFM station, but only if the Commission will license low power AM services too.

A one-per-market criteria should be established for ownership. A national ownership limit of 10 and individual limits of 3 for LP1000 and 5 for LP100 stations should be considered. No residency requirements should be imposed. Unlicensed operators that did not cause harmful interference should be permitted to apply for low power licenses.

A minimum local origination requirement of 10 hours per week should be required. A 50-mile radius should apply to the local origination requirement to permit licensees to share local programs of mutual interest. Low power stations should be allowed authority to simulcast full-power station programming up to 10 hours per week if the two stations serve different areas.

The rules for public interest broadcasting and service should apply to low power stations to insure accountability to the public. Minimum operating hours should be required. Time sharing should be encouraged and required, when necessary, to utilize spectrum efficiently.

Low power services should be licensed on an annual basis with a renewal expectancy. Sales of licensed stations should be permitted; construction permits should be non-transferable.

Applications for low power stations should be accepted on a first-come, first-serve basis. Mutually exclusive applications filed a day or more later than another application should be dismissed. Applicants who file mutually exclusive applications on the same day should be permitted to resolve them within six months; otherwise all such applications should be dismissed too. Lotteries and auctions should not be used to resolve mutually exclusive applications.

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Need for Low Power Radio Service

Service Issues

(MM Docket No. 99-25, III, A, §10-12)

1. The main reason to establish a low power radio service is to provide information and entertainment to an audience that is presently unserved or underserved by commercial and public broadcasting stations. The substantial public support and arguments for the creation of this service indicate that existing broadcasters have been unable to meet some of the needs of their communities. Considering the comments from RM-9242 and RM-9208, this problem appears to be widespread, which would justify a large-scale solution.

2. The deficiency of service by broadcasters is effectively forced upon broadcasters--an inherent limitation of today's commercial and public radio services. Programming is rooted in the financial aspects of broadcasting. In commercial radio, programming is chosen based on a desire to make a profit, service acquisition debt, or enhance resale value. In non-commercial radio, programming is chosen based on a desire to provide public service, but if that programming fails to provide adequate financial support for the station, it will not endure. This financial sensitivity in non-commercial radio has been increased as government subsidy of that industry has been curtailed. In summary, commercial profitability and non-commercial economic viability are the forces that shape radio programming.

3. The economic success of a program depends upon its audience size, so there is financial incentive for most radio stations to maximize their coverage. Non-commercial stations have been able to achieve economical coverage expansion by building repeater stations (licensed unstaffed

Part 73 stations acting as translator stations) and by building Part 74 translator stations beyond their service contours. The relaxation of ownership limits in the 1996 Telecommunications Act has permitted commercial station owners to expand on a much larger scale than non-commercial stations due to the greater availability of capital for profitable ventures. Some broadcast station owners are probably compelled to expand to remain competitive with other expanding station owners.

4. In a regulatory environment that fosters competition by full exposure to free-market forces such as consolidation, we have, perhaps inadvertently, decreased the value of providing unique program services to the public. Competition between broadcasters may foster better broadcasting, but beyond a certain point unique program services are lost. Ownership consolidation has accelerated the increasing cost of buying existing stations and is eliminating broadcast professionals as owners. Consequently, there are fewer stations owned by local individuals or companies who are broadcasters by profession. These owners, by their local involvement, have the understanding, capability, and desire to serve the needs of their local audiences. As stations are compelled to compete at the largest scale possible, they must acquire the maximum audience within the coverage areas of their various stations. They ignore smaller local audiences due to the risk of decreasing their potential revenue and, therefore, their profitability and resale value.

5. A low power service can serve local needs that cannot or should not be met by existing broadcasters. By the nature of their signal coverage, existing broadcast stations are serving a larger audience. It would be a disservice for larger stations to try to cover the many smaller

events and issues in all the communities that are served by their signals. One signal might cover dozens of political divisions and communities in multiple states. The airing of a local town meeting might be a valuable public service for the citizens of that town; however it is of limited or no value to an audience in the dozens of other towns served by that signal.

6. It is not practical to reverse the trends in commercial and public broadcasting to address the needs that a low power radio service could address. The solution might involve the break-up of radio conglomerates, a reduction in the number of competing stations in certain markets, changes in coverage areas of some stations, and a return of ownership to a local level. The opposition of the broadcasting industry would be overwhelming because the financial loss would be great. There is no practical way to change our current radio services to meet the needs that low power radio could address.

7. A low power radio service will provide additional benefits that could serve the public interest. The service will create an opportunity for new entrants into broadcasting. Most people of all backgrounds, regardless of race, gender, religious beliefs, and the many other discriminatory characterizations, are excluded from participating in direct broadcast ownership simply due to economic discrimination. An individual or group of individuals cannot acquire and own a radio station unless they are very wealthy or willing to take significant financial risk. In the most populated areas, entrants cannot obtain a new broadcast frequency because current regulations require minimum power levels that will not fit within the present allocation schemes.

8. Low power radio will also provide an opportunity for the professional broadcasters displaced by the existing broadcast industry. Many professional broadcasters, some who took the

public service aspect of their work seriously, are finding their careers are over early due to industry downsizing or are not able to make a satisfactory living at their depressed salaries. There are many professional broadcasters and capable producers of radio programming that cannot present their work to the public on the radio. In some cases, the product might be judged superior in quality to that produced by our existing broadcast stations. These professionals are a great resource and if they can own or participate at a low power radio station, they can provide the necessary leadership, guidance, and training for new entrants into the broadcasting field. Such stations could demonstrate the potential for low power radio and could become models for other low power stations to follow.

9. Low power radio will provide an opportunity to express ideas and issues that cannot be expressed on most existing stations. Because existing stations must attempt to keep the largest audience possible, they cannot tolerate much program diversity. Even if professionally produced, many programs are excluded from the marketplace because they are non-conforming to a station's specific goals, or are risky because they lack mass-appeal, or are unable to gain the backing of those in charge. Low power radio, by its smaller scale, will have fewer restrictions. The stations, due to their smaller size and service area, will tend to have broader, flexible goals and be eager for program content.

Classes of Low Power Service

(MM Docket No. 99-25, III, B, §13-14)

10. More than one class of low power radio should be considered to meet the various needs of the public. These classes can be defined by coverage area, with the lower classes being subject to interference from the higher classes and the higher classes protected from interference from the lower classes. Stations with higher power will be required to service widely distributed audiences in rural areas. In urban areas, lower powered stations can achieve the same service with much less power. Therefore, a significant range in power levels should be permitted for the low power radio service.

Spectrum Considerations

Spectrum for Low Power AM Broadcast Stations

(MM Docket No. 99-25, III, B, §15-17)

11. The Commission should reconsider its intention to exclude low power radio from the AM broadcast band. Spectrum availability on FM, particularly in urbanized areas, is very limited for low power radio. Many more low power services could be authorized by including AM broadcast channels on a secondary basis. It is possible to authorize low power AM stations on channels 2nd-adjacent or 3rd-adjacent to existing local services without creating significant interference. The existence of unique low power services on the AM band may attract more listeners to the AM band as well.

12. It is possible to authorize low power service in the AM band that would have no material impact on interference problems. Interference in the AM band is quite bad, particularly skywave interference at night. This problem, however, is a result of too many stations operating with too much power. Low power services could be introduced which would have no material impact on the problem, but could create areas of new service. The Travelers Information Service (TIS) is an example. TIS stations create areas of service, but do not appear to have a significant impact on interference. As of 6/1/98, there were 730 TIS stations. Therefore, the Commission is being inconsistent by not considering a low power AM station service while permitting low power TIS stations.

13. It is quite appropriate for the Commission to try to improve the quality of reception in the AM broadcast band. However, the argument of excluding low power AM stations because of

their serious negative impact on efforts to improve the quality of reception in the AM band is weak. It cannot be supported by the actual results of such efforts. The expanded band from 1610 to 1710 kHz will not result in a noticeable improvement for most listeners due to the limited number of stations that can migrate to the expanded band. Most improvement has been achieved by compromise. By reducing the occupied bandwidth of AM stations from 30 to 20 kHz, a reduction in 2nd adjacent channel interference was achieved. However, potential fidelity was reduced and available bandwidth for digital audio broadcasting was also reduced. However, at the same time, 2nd adjacent channel overlap ratios have been relaxed from a 2:25 and 25:2 field ratio to a 5:5 field ratio. In the past twenty years, interference on the AM broadcast band has become worse; the Commission has permitted dramatic increases in nighttime interference on the AM broadcast band. There are many places where there is no local interference free AM service available at night.

14. Low power AM stations can be authorized consistent with the Commission's efforts to improve reception on the AM band. All such stations would be secondary to existing AM stations. If a low power AM station applicant proposes a station that will protect other stations during daytime and nighttime operations, then that station should be authorized. Any such low powered stations would have to modify their facilities to accommodate any changes made by existing primary stations so that predicted interference would not occur to the primary station. If low power AM stations adhere to present interference protection criteria for co-channel and 1st-adjacent channel stations and to reasonable 2nd-adjacent and 3rd-adjacent protection limits, then the Commission's goal of improving AM quality and reception will not be compromised.

15. The Commission should also permit low power secondary AM stations on the expanded band from 1605 kHz to 1705 kHz. This spectrum is, at present, under-utilized, and the efficient use of these channels is not assured under the present restrictions on their use. Even if the Commission should require full protection of the service contours of all co-channel and adjacent channel stations, much spectrum is presently available for low power radio on a secondary basis. Many TIS stations utilize the expanded band without causing interference to existing broadcast stations.

16. In the appendix of these comments are additional comments regarding a methodology that could be applied to a low power radio service in the AM broadcast band.

Spectrum for Low Power FM Broadcast Stations
(MM Docket No. 99-25, III, B, §16)

17. There is no practical way to reserve a single FM channel for LPFM. Channel 200 could be considered a preferred channel for non-commercial LPFM stations. Presently, Channel 200 is not available to any non-commercial station except for displaced Class D FM stations. That channel could be opened to LPFM applicants if they are non-commercial. Protection requirements for existing stations would be the same as for other LPFM applicants in the reserved band. Some type of TV Channel 6 interference protection will need to be established for that channel and its use would probably be precluded within the Grade B coverage area of any TV Channel 6.

Operation on Reserved FM Channels

(MM Docket No. 99-25, III, B, §19)

18. No primary LPFM stations should be authorized in the reserved band. Since non-commercial educational FM stations may be authorized under the existing rules at power levels of 100 watts or more, there is no need to propose a parallel primary LPFM service having power levels of 100 to 1000 watts within the reserved portion of the FM band.

19. At least, as a matter of policy, secondary non-commercial educational LPFM stations should be permitted in the reserved band. Such stations should be authorized similarly as present non-commercial educational stations. Concerning the legal requirements of the applicant and the nature of the service provided, the existing requirements of §73.503(a) should apply. Individuals or groups who do not meet the requirements of §73.503(a) who may choose to operate a LPFM station on a non-commercial basis should be treated as a commercial licensee with respect to the Commission's Rules and Regulations and only permitted to operate on Channels 221-300. Regarding technical requirements, an applicant on Channels 201-220 should demonstrate channel availability by allocation study with respect to other stations operating on Channels 201-220. Any power level below 100 watts should be permitted, antenna height should have no limitation, but the distance to the 60 dBu contour of a non-commercial educational LPFM station operating in the reserved band should not exceed 6 kilometers.

20. There are many non-profit organizations that are already properly chartered to comply with the legal requirements for non-commercial educational station ownership in the reserved band. Other organizations or groups not in strict conformance to the requirements may modify

their charters to comply with the legal requirements for non-commercial educational station ownership in the reserved band or else may apply for a LPFM license on Channels 221-300.

Use of Auxiliary Services

(MM Docket No. 99-25, III, B, §20)

21. Use of auxiliary broadcast frequencies should be permitted for primary LPFM stations. Secondary LPFM stations should be permitted to use auxiliary broadcast frequencies on a secondary basis. However, the secondary LPFM station should forfeit their use if the frequency is requested by another primary station or would cause interference to the use of a desired, otherwise available, frequency by the primary station. If a secondary LPFM station can demonstrate an alternate channel in the same service is available for use by the requesting primary station, then the secondary LPFM station should not have to forfeit its use of that channel, as long as such continued use does not interfere with the alternate channel used by the primary station.

Spectrum Priority

(MM Docket No. 99-25, III, B, §21)

22. A secondary status for LPFM is the only practical way to maintain the effective and efficient use of the spectrum in the context of reaching the largest audience with the greatest number of signals. Smaller stations tend to waste spectrum by precluding larger stations that can reach a greater audience. Secondary status facilities, such as FM translators, do not waste spectrum because they do not preclude other signals. Such secondary services usually enhance spectrum efficiency because they provide service where none could be provided by a primary station.

23. However, secondary status can result in potential loss of service or interference in the future. Consider AM daytime-only stations. These stations were secondary to the clear channel stations that occupied the same channel. As the daytime-only stations were permitted nighttime operation, they produced an inferior service area at night. Although the limited nighttime service was considered a net gain over no service, it was still an effective loss of service from daytime to nighttime due to the received interference from the clear channel station. The night-time operation also caused interference to reception of the clear channel station over a wide area beyond the coverage area of the former daytime-only station. So, there is a risk that secondary status for LPFM could, in the future, result in diminished service due to received interference or become grandfathered interference to another station in the future. The rules need to be very specific about what is required of a secondary LPFM station if it begins to cause interference to a primary station due to a change in the facilities of an existing primary station or due to a new primary station, including a primary LPFM station.

Technical Overview of LPFM Services

LP1000 Stations

(MM Docket No. 99-25, III, C, §24-29)

24. LP1000 stations should be open to non-commercial and commercial applicants.

Commercial operation should be permitted to allow LP1000 stations a better opportunity to raise funds to cover expenses. No non-commercial LP1000 stations should be permitted in the reserved portion of the FM band. Equivalent service in that band is already permitted by the existing rules.

25. The proposed power and height limit of 1000 watts at 60 meters is reasonable because it is significantly differentiated from a full Class A facility. The minimum required power level for a LP1000 station should be 100 watts with no minimum height specified. This is the same minimum as Class A FM stations. Since LP1000 stations will render a maximum coverage area that is smaller than a Class A FM station operating with maximum facilities, it does not seem reasonable to impose a higher minimum on LP1000 stations than is imposed on Class A FM stations. Since LP1000 stations would be considered primary, and would effectively become a subclass of Class A stations, it would be more reasonable to downgrade Class A stations that do not meet an intermediate coverage standard such as the maximum limit for LP1000 stations. Such downgraded Class A stations and all LP1000 stations could be designated Class A1 for allocation purposes. To be consistent with §73.211(a)(3), LP1000 stations should be permitted power levels below 100 watts as long as the reference distance of the 60 dBu contour is at least 6 km.

26. LP1000 stations should be given primary frequency use status. The FM broadcast band has been sufficiently developed; the introduction of smaller primary signals will not compromise spectral efficiency. If LP1000 stations are considered primary services, existing translators and boosters should not receive grandfathered interference protection from LP1000 stations. As secondary services, FM translators, FM boosters, and Class D FM stations should yield spectrum to all primary FM services.

27. LP1000 stations should be required to protect the intermediate frequencies of other primary FM stations and other LP1000 stations separated by 53 and 54 channels. Due to their lower power, the separation distances for LP1000 stations can be reduced from those of Class A stations.

28. LP1000 stations should be permitted the use of translators and boosters under the same rules as other primary stations. Non-commercial educational LP1000 stations qualified under §73.503(a) should be permitted to operate translators beyond their 60 dBu contour because such extension of non-commercial educational service has been deemed in the public interest. Other LP1000 licensees operating on a non-commercial basis should be treated as commercial licensees and should not be permitted to operate translators beyond their 60 dBu contours.

LP100 Stations

(MM Docket No. 99-25, III, C, §30-33)

29. LP100 stations should be open to non-commercial and commercial applicants.

Commercial operation should be permitted to allow LP100 stations a better opportunity to raise funds to cover expenses.

30. The proposed power and height limit of 100 watts at 30 meters is reasonable. It is significantly different from LP1000 stations, but still permits good coverage of smaller communities or portions of an urban area. The minimum required power level for a LP100 station should be 10 watts with no minimum height specified. At 30 meters HAAT, 10 watts would produce in a reference distance to the 60 dBu contour of 3.2 km. The 10-watt lower limit offers more flexibility in locating a transmitter site, particularly if contour protection studies can be used to demonstrate the lack of interference to other stations. The lower power also permits more economical operation. At the lower powers, many LP100 stations may not need an FM power amplifier and could use an FM exciter and inexpensive low-power low-pass filter to feed the antenna directly. To be consistent with §73.211(a)(3), power levels below 10 watts should be permitted as long as the reference distance of the 60 dBu contour is at least 3.2 km.

31. LP100 stations should be authorized as secondary services, but have priority over FM translator and booster facilities licensed after the creation of a low power service. LP100 stations should have priority over translators and boosters because they will originate local programming. Existing FM translators and boosters should have co-channel and 1st-adjacent protection from

LP100 services. If additional spectrum is needed in the future for low power services, then protection for existing translators and boosters should be eliminated.

32. As secondary services, LP100 stations should be permitted to receive interference within their 60 dBu contour from all other stations, but should be protected from interference within their 60 dBu contour from other LP100 stations, FM translators, FM boosters, Class D FM stations and FM microradio stations. LP100 stations should not be required to have a minimum interference-free service area. This could give an applicant reasonable flexibility to locate a low power channel and could result in more possible LP100 services.

33. Although secondary, LP100 stations should not be subject to an “actual interference” limitation as is required for FM translators and FM boosters in §74.1203(a)(3). If a LP100 station meets the required allocation rules, then any actual interference to existing signals must be accepted. However, LP100 stations should be subject to a limitation equivalent to §74.1203(a)(2) for existing TV or FM translator or booster services. A LP100 station should protect from interference the input signal to a TV or FM translator or booster station, if the translator or booster station was licensed before the creation of the low power service. A TV or FM translator or booster station licensed after the creation of the low power service should not be protected from interference to its input signal from LP100 stations.

34. LP100 stations should be required to protect the intermediate frequencies of other primary FM stations, LP1000 stations, and LP100 stations separated by 53 or 54 channels. No intermediate frequency protection should be provided for existing FM translators and boosters.

35. LP100 stations should be permitted the use of translators and boosters under the same rules as primary stations. Non-commercial educational LP100 stations qualified under §73.503(a) should be permitted to operate translators beyond their 60 dBu contour because such extension of non-commercial educational service has been deemed in the public interest. Other LP100 licensees operating on a non-commercial basis should be treated as commercial licensees and should not be permitted to operate translators beyond their 60 dBu contours.

Microradio Stations

(MM Docket No. 99-25, III, C, §34-37)

36. Microradio stations should be permitted and open to non-commercial and commercial applicants. Commercial operation should be permitted to allow microstations a better opportunity to raise funds to cover expenses. Such a service would be ideal for individuals and groups that seek to serve their immediate neighborhood, community, or small town.

37. This service would be very beneficial to student communities at educational institutions. Many colleges and universities operate non-commercial educational FM stations that serve their larger communities, but also have student operated carrier-current AM or cable FM stations serving students living on or near a college campus. The carrier-current and cable systems are expensive to build and maintain and do not reach an entire student community, especially at nearby off-campus locations. A microradio station would be an ideal way to reach this unserved audience and encourages an interest in broadcasting among students.

38. A maximum power of 10 watts and a maximum 60 dBu reference contour distance of 3.2 km should be used for any proposed operation exceeding FCC Part 15 rules for unlicensed

emissions in the 88-108 MHz spectrum. This allows an applicant some flexibility in operation, even if minimum distance separations assume 10-watt operation.

39. Microradio stations should be authorized as secondary services, but have priority over FM translator and booster facilities licensed after the creation of a low power service. Microradio stations should have priority over translators and boosters because they will originate local programming. Existing FM translators and boosters should have co-channel and 1st-adjacent protection from microradio services. If additional spectrum is needed in the future for low power services, then protection for existing translators and boosters should be eliminated.

40. As secondary services, microradio stations should be permitted to receive interference within their 60 dBu contour from all other stations, but should be protected from interference within their 60 dBu contour from other microradio stations, FM translators, FM boosters, and Class D FM stations. Microradio stations should not be required to have a minimum interference-free service area. This could create the potential to authorize more microradio stations, particularly in urban areas.

41. Due to the small coverage area of a microradio station, the “actual interference” test of §74.1203(a)(3) should apply to mitigate potential nuisance interference that microradio stations might cause by operating within dense residential neighborhoods with rooftop antennas. A microradio license might specify an ERP of “x watts or less” and the licensee could have the flexibility to reduce ERP below “x” to eliminate any nuisance interference from an existing site and remain on the air while resolving interference problems.

42. It is important to provide co-channel and 1st-adjacent interference protection to a microradio station from other microradio stations. Otherwise, it is possible that two microradio stations could occupy the same or adjacent channel in proximity to each other. Co-channel problems are particularly likely in an urban area where demand for spectrum is great and the choice of frequencies is limited.

43. The Commission might consider granting microradio stations by allocation study so that applicants can have flexibility to reuse and share frequencies. Two 10-watt stations serving a 3.2 km radius would require co-channel separation of 13.4 km; however two 1-watt stations serving a 1.8 km radius would require co-channel separation of only 7.5 km. In urban areas, the demand for neighborhood signals is likely the greatest, and the ability to reuse the same channel at several locations in a large metropolitan area may be necessary due to spectrum limitations.

44. A single microradio station channel could be granted to multiple applicants under a time-share arrangement. Through a coordinated arrangement, several microradio station applicants in a larger area can share one channel and divide the broadcast time between them. The time share arrangement could be established to increase the broadcast presence on one channel, or could be used to resolve an otherwise mutually exclusive situation among applicants.

Interference Protection Criteria

Interference Protection Methodology (MM Docket No. 99-25, III, D, §38-41)

45. The use of minimum distance separations to establish LPFM service would be appropriate except for LPFM service proposed in the reserved band. In the reserved band, the present signal strength contour methodology should be used. Intermediate frequency spacing and spacing with respect to Channels 221, 222, and 223 for stations in the reserved band could continue to use the method of minimum distance separations.

46. The use of signal strength contour methodology, as used for translators and boosters, would ultimately create the most LP1000, LP100, and microradio services. The minimum distance separation methodology cannot completely account for the allowance that secondary stations of equal or lesser class can receive interference from stations of greater class. This limitation becomes important for secondary services that become short-spaced to new or modified stations with higher spectrum priority. The minimum mileage separation methodology is a hard yes-or-no criterion that would shut down an established secondary service. Only by contour study can a secondary service demonstrate no caused interference to a station with higher spectrum priority. In some cases where a secondary service begins to cause interference to a station with higher spectrum priority, the licensee of the secondary service might be able eliminate the interference by reducing the power radiated towards the other station. If so, the licensee should be permitted to continue operating with modified facilities.

47. Although the minimum distance separation methodology is simpler, and it would be easier for the Commission to administer, it appears that the contour overlap methodology will still be required as a supplement to defend secondary services and address interference issues. If the Commission will permit secondary services to receive interference, then the signal strength contour methodology should be permitted to demonstrate that no interference is caused to other stations. Contour overlap analysis studies will probably become the basis for numerous waiver requests of received interference. The Commission should consider if this mixture of methodology should be employed. The signal strength contour methodology using the existing propagation curves has its limitations, but is a much more flexible way to authorize services that can be expected to have varied operating powers, as is the present case in the reserved band. The signal strength contour methodology also produces the tangible yes-or-no interference determination that is ultimately required to protect primary services. The availability of computer resources and software for contour studies makes the use of the method available to LPFM applicants at a reasonable cost.

2nd-adjacent and 3rd-adjacent Interference Protection Criteria
(MM Docket No. 99-25, III, D, §42-50)

48. There should be 2nd-adjacent and 3rd-adjacent interference protection requirements for LPFM services to protect the service areas and studio sites of existing and future stations, particularly low powered primary and low power services. The protection requirements should not be preclusive to 2nd-adjacent or 3rd-adjacent channel operation within the protected service contour of an existing station. They should limit the ERP of a LPFM station, depending upon the

power of the affected adjacent channel station and the location where potential interference may be caused. Tables 1 and 2 summarizes the details discussed in paragraphs 49-65.

Table 1. Proposed 2nd and 3rd Adjacent Channel Protection Requirements for LPFM Stations.

For...	if the following contour of an existing primary station is...	and overlaps the following contour of the proposed LPFM station...	then, the ERP of the LPFM station must be less than the existing station's ERP by....
2nd-adjacent channels,	54 dBu (Class B)	74 dBu	10 dB ²
	57 dBu (Class B1)	77 dBu	10 dB ²
	60 dBu (other classes) ¹	80 dBu	10 dB ²
	70 dBu (all classes) ¹	70 dBu	20 dB
3rd-adjacent channels,	54 dBu (Class B)	94 dBu	0 dB ²
	57 dBu (Class B1)	97 dBu	0 dB ²
	60 dBu (other classes) ¹	100 dBu	0 dB ²
	70 dBu (All Classes) ¹	70 dBu	10 dB

¹ For limitations on LP100 and microstations, include existing LP100 stations. No protection required for FM translators, boosters or microradio stations.

² No limitation if no population or public right-of-way exists in predicted interference area based on a 1:10 ratio desired to undesired signal strength for 2nd-adjacent channels and 1:100 ratio for 3rd-adjacent channels.

Table 2. Proposed 2nd and 3rd Adjacent Channel Studio Site Protection Requirements for LPFM Stations.^{1,2,3}

For...	if the predicted signal strength “x” at the studio site of the existing station is...	then the predicted signal strength from the proposed LPFM station at that site is limited to	...or is limited to the following contour, whichever is greater:
2nd-adjacent channel studio sites,	“x” less than 70 dBu	(no limitation)	(no limitation)
	“x” greater than 70 dBu	74 dBu (Class B) 77 dBu (Class B1) 80 dBu (other classes)	“x” “x” “x”
3rd-adjacent channel studio sites,	“x” less than 70 dBu	(no limitation)	(no limitation)
	“x” greater than 70 dBu	94 dBu (Class B) 97 dBu (Class B1) 100 dBu (other classes)	“x” + 20 dB “x” + 20 dB “x” + 20 dB

¹Applies to LP1000, LP100, and microradio facilities.

²Protection limited to existing station studios within their 70 dBu service contour.

³LP1000 facilities are not required to protect LP100 and microradio studios; LP100 facilities are not required to protect microradio studios. Mutual protection for microradio stations required.

49. There has been a tendency for the Commission to grant second-adjacent and third-adjacent overlap in the instances where the overlap is at the edge of the service area of another station and the two stations serve substantially different areas. Such grants have recognized the limited impact of second-adjacent and third-adjacent interference. Second-adjacent and third-adjacent overlap has been permitted well within a station’s coverage area in some cases where the interfering station is operating at relatively low power. The latter situation has been permitted for translators and some non-commercial educational applicants where they can demonstrate the

predicted area of interference to the affected second-adjacent and third-adjacent station contains no population or there is very negligible loss of service to an existing station.

50. The proposed LPFM service contemplates 2nd-adjacent and 3rd-adjacent overlaps at significant power levels, up to 1000 watts, well within the service contour of 2nd-adjacent and 3rd-adjacent stations. There is evidence that 3rd-adjacent overlaps at this power level may be acceptable when the existing station operates at a significantly higher power and if the two stations are co-located. In Philadelphia, PA a Class A station on 103.9 licensed to Jenkintown, PA operates with 340 watts from the same antenna farm as another Class B station on 104.5 operating at 16,000 watts. This is a difference in power of 16.7 dB. No impairment of the Class B station occurs; however reception of the Class A station on some radios is troublesome, possibly due to the presence of the stronger 3rd-adjacent Class B station on 104.5 and other Class B stations at the same site. However, the Class B station licensed to Philadelphia appears adequately protected from interference from the Jenkintown signal.

51. However, consider reversed roles where a primary station is low power, perhaps a non-commercial Class A educational station operating at 100 watts. If an LP1000 station went on the air in the same community on a 2nd-adjacent or 3rd-adjacent channel with a signal 10 dB stronger than the primary station, and was also not co-located to provide a constant 10 dB ratio between the signals in all areas, then the amount of interference could be significant within the service area and community of license of the primary Class A station.

52. In some circumstances, limiting the power of 2nd-adjacent or 3rd-adjacent LPFM station inside the coverage area of another station may not be sufficient. An illustration of the

problem of closely spaced strong carriers in one community can be found in Philadelphia, PA where two stations licensed to Philadelphia are on 2nd-adjacent channels. One station operates on 88.5 MHz at 5,000 watts and another operates as a Class D station on 88.1 MHz at only 2 watts. There is also a TV Channel 6 licensed to the same community with an aural carrier on 87.74 MHz. In spite of the contour ratio analysis, which predicts little interference to the Class B 88.5 MHz station from the Class D 88.1 MHz station, the 88.5 MHz station periodically has problems monitoring its signal due to interference from the 88.1 MHz station. The problem arises from the fact that the 88.1 MHz station moved its transmitter site to within 1/2 kilometer of the studio site of the 88.5 MHz station. The 88.5 MHz station is not co-located with its transmitter site, but is within its own 80 dBu predicted contour. The receive path for reception of the 88.5 MHz station's signal at its studio passes through the 88.1 MHz station's transmitter site, so antenna discrimination cannot be used to effectively eliminate interference. Although the interference is possibly receiver induced, due to intermodulation of three or more strong signals at the 88.5 MHz studio site, this problem did not exist before the 88.1 MHz station's transmitter relocation to its present site. This type of problem extended beyond an area that contour ratio analysis would suggest.

53. Therefore, there needs to be a way to distinguish between interference conditions near the edge of a protected service area where the stations serve substantially different communities and interference conditions well within the protected service area of a station, especially within the same community of license. The extrapolation of the contour ratio method for predicting interference near the edge of a protected service area to predicting interference well within the protected service area of 2nd-adjacent and 3rd-adjacent stations is not strictly valid and cannot be

used to safely protect stations. The contour ratio method predicts that much more power can be tolerated without predicted interference than is possible within the protected service area of 2nd-adjacent and 3rd-adjacent stations. This has potential negative implications on receiver performance and IBOC digital services, particularly in locations where the band is congested. The presence of powerful FM stations four channels apart in a single market already creates intermodulation problems within many receivers near antenna sites and often prevents interference free reception of other, otherwise receivable, signals. The potential impact on reception by reducing this spacing of strong signals to three or two channels serving the same community could be serious.

54. A solution to these problems is possible by imposing power limitations on LPFM stations operating well within the primary coverage area of 2nd-adjacent and 3rd-adjacent channel stations. The use of contour ratio protection criteria for predicting interference should be limited to areas closer to the edge of a protected service area. To quantify this distinction, the 70 dBu contour of the station predicted to receive interference can be used as a boundary to define the limits of applicability of the contour ratio protection method. The present non-commercial contour ratios should be retained to predict interference beyond the 70 dBu contour of a protected service area. For second-adjacent stations, the ratio is 1:10 desired to undesired field strength. For third-adjacent stations, the ratio is 1:100. If an applicant can demonstrate no predicted interference to existing second-adjacent and third-adjacent stations due to the absence of population or public right-of-way, then second-adjacent and third-adjacent channel interference requirements should be considered satisfied. Although there are compelling arguments for using a

1:100 ratio for both 2nd-adjacent and 3rd-adjacent channels, the 1:10 ratio for second-adjacent channel stations offers greater protection of existing stations for IBOC digital service.

55. In cases where 2nd-adjacent or 3rd-adjacent interference is predicted in areas where there is population or public right-of-way, and the 70 dBu contour of the proposed station does not overlap the 70 dBu contour of the other station, the following limits should be considered for the new station: A new station's ERP should be limited to the same ERP as an affected 3rd-adjacent channel station and to 10 dB below the ERP of an affected 2nd-adjacent channel station.

56. If the 70 dBu contour of the proposed station will overlap the 70 dBu contour of the other station, the proposed station should be limited to 10 dB less than the ERP of the 3rd-adjacent channel station and limited to 20 dB less than the ERP of the 2nd-adjacent channel station as suggested in Table 1. These power limitations protect lower powered 2nd-adjacent and 3rd-adjacent channel stations by reducing the area where receiver induced reception problems may occur due to the presence of two strong closely spaced carriers. If more than one 2nd-adjacent or 3rd-adjacent channel station is involved, the greatest limitation shall apply. These power limitations do afford necessary protection to existing FM stations, particularly lower powered stations and affords them of 2nd-adjacent and 3rd-adjacent channel interference free reception over most of their service areas. In some cases, a new LP1000 may not be possible or might be limited, but a LP100 or microstation will still be possible.

57. If the 70 dBu contour of a non-commercial educational FM station does not cover any or all of the entire community of license, then for the purpose of establishing overlap and power limitations to a LPFM station, the portion of the community of license of the non-commercial

educational FM station receiving at least a 60 dBu signal should be considered to receive a signal strength of at least 70 dBu from the non-commercial educational FM station. This additional limitation accounts for the fact that non-commercial educational FM stations do not have to provide 70 dBu signal strength within their community of license.

58. The 2nd-adjacent and 3rd-adjacent channel interference criteria should also consider that many FM stations do not operate co-located transmitter and studio sites. It is very reasonable for stations to expect interference-free reception of their signals for monitoring purposes, specifically if the studios are within their own predicted 70 dBu contour. If no protection is afforded stations from 2nd-adjacent and 3rd-adjacent channel interference, then it is possible to have a 2nd-adjacent or 3rd-adjacent channel stations disrupt reception of another station by locating its transmitter next to the affected station's studio, as discussed in paragraph 52. If the affected station's studio is beyond the blanketing contour of a LP1000 or LP100 station, then there would be no legal relief for the affected station. To prevent this type of interference, including interference that is receiver induced, the existing 2nd-adjacent station's studio site should be protected from interference if that site is within its own 70 dBu contour.

59. The studio site of an existing station could be considered adequately protected from 2nd-adjacent channel interference if the 2nd-adjacent channel station's predicted signal strength is less than 20 dB above the affected station's protected contour or is less than the predicted signal strength of the affected station's signal at its studio site (1:1 desired to undesired field ratio), whichever is the greater value. Example: An existing Class B station has its studio located inside the 70 dBu contour. The protected contour for a Class B station is 54 dBu. Thus, the studio site

is protected from an interfering 2nd-adjacent station with a signal strength 20 dB above 54 dBu, or 74 dBu. If the predicted signal strength of the Class B station at its studio site is 71 dBu, then that studio site would be protected from a signal greater than 74 dBu from the 2nd-adjacent channel station. If the predicted signal strength of the Class B station at its studio site is 81 dBu, then that studio site would be protected from a signal greater than 81 dBu from the 2nd-adjacent channel station. The Class B station's studio site would receive no protection from the 2nd-adjacent channel station if it was not located inside its 70 dBu contour.

60. A studio site could be considered adequately protected from 3rd-adjacent channel interference if the 3rd-adjacent station's predicted signal strength is less than 40 dB above the affected station's protected contour or less than 20 dB above the predicted signal strength of the affected station's signal at its studio site (1:10 desired to undesired field ratio), whichever is the greater value. For example, an existing Class B1 station with its studio located inside the 70 dBu contour would be protected from a signal greater than 97 dBu from the 3rd-adjacent channel station. If the predicted signal strength of the Class B1 station at its studio site is 80 dBu, then that studio site would be protected from a signal greater than 100 dBu from the 3rd-adjacent channel station. The Class B1 station's studio site would receive no protection from the 3rd-adjacent channel station if it was not located inside its 70 dBu contour. See Table 2.

61. To summarize, primary stations should be protected from 2nd-adjacent and 3rd-adjacent channel interference from LPFM stations by limiting the power level of a LPFM station. Absence of 2nd-adjacent and 3rd-adjacent predicted interference from a LPFM station by the contour ratio method can only be used if the proposed station's 70 dBu contour does not overlap

the existing station's 70 dBu contour. In such cases, no power limitations apply to the proposed station if no population or public right-of-way is predicted to receive interference. However, if predicted interference occurs, then power limitations based on the ERP of the affected adjacent station should apply. If overlap of the 70 dBu contours of both stations occurs, then, regardless of any interference predictions by any methodology, the power of the proposed LPFM station is further limited based on the ERP of the affected adjacent station and based on protecting an existing station's studio site from interference.

62. LP1000, LP100, and microradio stations should protect other LP1000 stations and studio sites on 2nd adjacent and 3rd adjacent channels using the same methodology in Tables 1 and 2. LP100 and microradio stations should protect other LP100 stations. Microradio stations, with respect to each other, should only need to protect other microradio station studio sites according to Table 2. No 2nd adjacent or 3rd adjacent channel protection should be needed between microradio stations. Existing stations, including other microradio stations, can be adequately protected from interference from microradio stations by imposing the rule of no "actual interference" under §74.1203(a)(3). Microradio stations would also have the flexibility to eliminate interference on a case-by-case basis if only a few listeners are affected, yet other broadcasters would have a legal entitlement to interference protection regardless of any contour analysis.

63. No 2nd-adjacent or 3rd-adjacent channel protection of existing FM translators and boosters should be required for the LPFM service. Since the LPFM service will provide a local service, it should have priority over FM translators and FM boosters that simulcast other stations.

The gain in local service from a low power station at the cost of some loss of service caused by 2nd-adjacent or 3rd-adjacent interference to an FM translator or booster would serve the public interest. In the case of microradio stations, 2nd-adjacent or 3rd-adjacent interference to FM translators and boosters should also be exempt from the “actual interference” requirement. See also paragraph 39.

64. An LPFM applicant will have an incentive to locate their site carefully, since sites located under a “no population” showing may be able to operate with more power. Microradio stations operating under the rule of no “actual interference” under §74.1203(a)(3) will also need to follow similar precautions. The criteria of no population or public right-of-way may work in urban areas for only some lower powered stations. Rural or suburban stations may have more site options due to the lower population density. An added benefit to careful siting is that the LPFM station will also be less likely to produce blanketing interference. Applicants should be permitted and encouraged to employ antenna vertical plane directivity to reduce radio frequency radiation hazards, eliminate predicted 2nd and 3rd adjacent channel interference, minimize blanketing interference, and minimize possible interference to other broadcast services.

65. If 2nd-adjacent or 3rd-adjacent channel protections are relaxed or eliminated for the proposed LP1000 stations, then the same relaxation should be applied to commercial and non-commercial Class A stations operating at 1000 watts or less. It would be unreasonable to permit a new primary 1000-watt service to afford less adjacent channel protection than an existing 1000-watt service. Such affected Class A stations and all LP1000 stations could be designated as a new class.

LPFM Emissions and Bandwidth

LPFM Emissions

(MM Docket No. 99-25, III, E, §51-54)

66. LPFM stations should comply with the emission limitations of §73.317. A demonstrated compliance with §73.317, possibly on an annual basis, along with ERP limitations as proposed in paragraph 48, is probably needed. The use of certified transmitters may mitigate the potential harm of spurious radiation to aviation and other services; however it is unlikely that certified transmitters will protect 2nd-adjacent and 3rd-adjacent channel stations from the excessive emissions caused by overmodulation.

67. Overmodulation is probably the single most likely cause of interference to other FM services. Most FM exciters and solid-state amplifiers are wide-band designs capable of modulation well beyond 75 kHz deviation. To prevent overmodulation, any certified transmitter with built-in modulation limits would require at least a built-in composite clipper. By design, these units should have calibration adjustment for proper alignment. So, any modulation control on these units could be defeated.

68. The use of certified transmitters for LPFM will reduce, but not eliminate, the interference risk associated with the use of older or non-certified equipment; thus an annual proof of performance should be considered part of the LPFM licensing process. It may be reasonable to impose an annual performance proof on low power services to discourage technical neglect because the cost for starting a LPFM station and maintaining technical compliance is probably much greater than most advocates of this service realize. If such a proof is required, it would be

reasonable to allow LPFM operators an option to have their equipment configurations certified to demonstrate compliance annually with §73.317, §73.319, and §73.322 of the Rules.

69. If an annual certification or proof of performance is required for LPFM stations, it will create a significant market for cost-effective engineering services that can certify proof of performance. Competitive pricing for these services will result. Some LPFM stations, particularly non-profit stations, will probably be able to have such services donated or provided at a discount. LPFM stations who avail themselves of these services could operate without sophisticated modulation monitors and other test equipment typically required to assure technical compliance. If no annual certification is required for LPFM stations, then modulation monitors, at a minimum, should be required since overmodulation is the most likely cause of interference from LPFM stations that are otherwise technically compliant. Since a modulation monitor can cost \$ 5000 and requires a periodic calibration every few years that can cost \$ 750, the cost of an annual certification can be offset by the savings on monitoring equipment.

Bandwidth Limits

(MM Docket No. 99-25, III, E, §55-56)

70. No bandwidth limitations beyond those of §73.317 should be imposed on LPFM services. Further reduction on bandwidth will have very limited benefit beyond the 1st-adjacent channel. Most interference due to 2nd-adjacent or 3rd-adjacent services is likely to be receiver-induced due to the proximity of the two carriers and sidebands. This type of interference can only be mitigated by improved receiver performance or by power limitations on LPFM stations as proposed in paragraph 48.

71. Bandwidth limitations can be best achieved by reducing the modulation index of the FM signal. This will result in a noticeably inferior LPFM service compared to primary FM stations. Due to the low power of LPFM services, maximum modulation is necessary to overcome noise and maximize coverage. The public should expect to receive the same quality signal from a local LPFM station as they receive from primary services. A LPFM station should have the option to transmit stereophonic programming as well as subcarriers. Most stations will probably transmit stereophonic programming because it is expected by the public. Although the use of subcarriers will probably not be common for LPFM stations due to the small coverage area, such ability may provide an economic opportunity for some LPFM stations.

Ownership and Eligibility

Local and Cross Ownership

(MM Docket No. 99-25, III, F, §57-59)

72. It does not appear consistent with the Telecommunications Act of 1996 to impose strict local and cross ownership limits on low power radio stations. It is questionable that such ownership restrictions would withstand legal scrutiny. Although such restrictions may help create opportunity for entry, enhanced diversity, and new program services, these goals can be achieved through the regulation of service requirements for the low power service.

73. If unique local and cross ownership rules are applied to the low power service, then a person or entity with an attributable interest in a full power commercial broadcast station should not be permitted to own a low power service. Experienced broadcaster involvement will enhance the viability and usefulness of a low power service; however this does not require broadcast station owners to own low power services. There will be many experienced broadcasters who have no commercial broadcast ownership interest who could and should be permitted to own, operate or participate in low power services.

74. Existing non-commercial educational licensees should be permitted to own low power non-commercial services. The proposed limits on ownership for low power services should be intended to limit the loss of program diversity caused by consolidation in the commercial sector of broadcasting. The non-commercial sector is more responsive to the needs of its community because it must rely on that community for financial support. Educational institutions, some already operating a full power noncommercial educational station, could operate a low power

service to target the students in their local community and provide a training ground for those students interested in broadcasting careers, as discussed in paragraph 37. Such services may not be possible without the financial support of educational institutions. Since many educational institutions maintain several campuses across a large region, each campus could benefit from a low power service.

75. Individuals with an attributable interest in a full power non-commercial educational broadcast station should not be restricted from ownership in commercial or non-commercial low power services that are independent of the individual's non-profit corporation affiliation. Such individuals may have valuable broadcast and community service experience that will be needed in the low power service. Due to the nature of the non-commercial educational service and the strict licensing requirements, individuals, with an attributable interest in a full power non-commercial educational broadcast station, are as likely to act in the public interest as any other non-broadcast individual or organization interested in the low power service. Therefore, the same ownership restrictions for non-broadcast individuals or organizations should also apply to any individuals with an attributable interest in a full power non-commercial educational broadcast station.

76. AM station licensees should be given a priority option to trade their current station license for a low power station license, but only if low power services are also permitted in the AM band. The AM licensee should agree to either return the existing AM license back to the Commission for cancellation, or sell the AM license to another entity under the condition that the AM facility is modified to meet current allocation standards as a full-time full-power station or as a low power station. If the AM station cannot be downgraded to meet the allocation

requirements, then it must be shut down upon startup of the new low power station and the license returned to the Commission for cancellation. This will serve to further the Commission's effort to improve the AM service and provide relief for some AM licensees.

77. LPFM ownership should be generally limited to one per market, if this is legally consistent with the Telecommunications Act of 1996. To define the market, a station's 60 dBu coverage contour should be used. Thus, an applicant cannot own two LPFM signals with any overlapping 60 dBu coverage contours. If AM low power services are also permitted, then the prohibited overlapping contours should be 0.5 mV/m for those stations. A LPFM owner could hold one AM and FM low power service that covers the same area.

National Ownership

(MM Docket No. 99-25, III, F, §60)

78. It does not appear consistent with the Telecommunications Act of 1996 to impose national ownership limits on low power radio stations. It is questionable that such ownership restrictions would withstand legal scrutiny. Although such restrictions may help create opportunity for entry, enhanced diversity, and new program services, these goals can be achieved through the regulation of service requirements for the low power service. A combined limit of 10, with a limit of 3 LP1000 stations, and 5 LP100 stations should be considered for low power licensees if national ownership limits can be imposed. A licensee may own any combination of LP1000, LP100 and microstations as long as the individual and combined limits are met. If low power AM stations are permitted, then the combined limits should apply to all AM and FM low power stations. The tighter limits on the higher-powered stations may help to prevent ownership concentration, and consequential loss of ownership diversity among the higher-powered stations.

Residency Requirements

(MM Docket No. 99-25, III, F, §61-63)

79. Owner residency within the coverage area of a low power service should not be required. There is no compelling reason why a resident would necessarily serve the public interest better than a non-resident. There is also no compelling reason why the public would be less well served by stations not managed by their owners.

Charter Qualifications and Unauthorized Broadcasters

(MM Docket No. 99-25, III, F, §64-67)

80. Unlicensed operators who have caused harmful interference or have continued operation after being advised of an enforcement action should be deemed per se unqualified to hold a low power license. Unlicensed operators who have not caused harmful interference, but ceased operation when advised by the Commission to do so, should be permitted to apply for a low power license. Those operators may have violated the law for various reasons; however, there was no victim nor any damage demonstrated. This should be considered a gracious reconciliatory gesture by the Commission to move forward with the real issue, which is to provide service to an underserved public via public airwaves.

Service Characteristics

Local Programming

(MM Docket No. 99-25, III, G, §68)

79. A minimum local programming requirement should be considered for the low power radio service. This may help to insure that the purpose of this service is not frustrated by economic forces to consolidate and generalize programming to a larger audience. This is particularly necessary if it is unlawful to restrict ownership of low power services; otherwise there is potential for large satellite networks of low power stations to form. A minimum local origination requirement for each station of 10 hours per week between 6 am and midnight should be considered. This would help insure that licensees address issues of importance to their communities on a regular basis without imposing an excessive economic burden on a licensee. To permit some economic efficiency and operational flexibility, local origination should include some ability to simulcast a program to multiple low power stations. The program could count towards the local origination requirement for any group of low-power stations in a 50-mile radius of the originating station. Low power licensees should have the option to coordinate and share such programming.

80. A low power station should be permitted limited authority to retransmit the programming of a full-power station, up to 10 hours per week between 6 am and midnight, either immediately, as if it were a translator, or as a time-shifted program. A low power station should be permitted unlimited authority to retransmit the programming of another low power station. Such ability can serve the public interest by increasing the distribution of unique programming produced and aired by others. A low power station's service contour cannot overlap the

interference-free service area of the full-power station being simulcast. No simulcast limitations should apply from 12 am to 6 am.

Commercial Programming

(MM Docket No. 99-25, III, G, §69)

81. Low power radio stations should be permitted to operate as non-commercial or commercial stations. Low power radio stations authorized in the reserved band should be limited to non-commercial operation. All low power stations will need revenue to cover capital and operating costs. Operating on a non-commercial basis, most low power stations will have difficulty meeting their operating expenses unless affiliated with a licensee of a full-powered non-commercial educational station or unless subsidized by a sponsoring organization.

Public Interest Programming

(MM Docket No. 99-25, III, G, §70-72)

82. LP1000, LP100, and microradio station licensees should adhere to the same Part 73 requirements regarding public interest broadcasting as apply to full power FM licensees. The spectrum availability for LP100 licenses, particularly in urban areas, is quite limited. Demand in such areas for microradio stations might be considerable. An LP100 station and possibly a 10-watt microradio station can serve an entire small community. To assure that the public interest is being met by these stations, accountability must be maintained. There is no assurance that the low-power nature of LP100 and microradio stations will ensure that they serve the public. An individual or group may be able to operate a low power station very inexpensively, not needing

public support. The station may be operated as a hobby, or used to promote a self-serving agenda. It could be a serious mistake to exempt any broadcaster from a public interest showing.

Other Service Rules

(MM Docket No. 99-25, III, G, §73-75)

83. LP1000, LP100, and microradio station licensees should adhere to similar service rules. If one of the purposes of low power radio is to permit new entrants into broadcasting, then those entrants should learn to adhere to the same service rules as other broadcasters. This is not an unreasonable burden. All licensees should know the rules under which they are supposed to operate, or else they are not qualified to hold a license. The smaller stations will have less information to track and be able to meet the reporting requirements more easily. If some types of service rules are not imposed, low power broadcasters will have no more accountability to the public than a citizen band station.

84. The same environmental rules should apply to low power stations, including microradio stations. It is unlikely that an LP100 or microradio station will propose a facility that represents an environmental impact; however all applicants should be familiar with the restrictions and certify that their stations comply with the law. Many low power stations will be able to comply easily with the requirements for limiting exposure to radio frequency radiation.

Operating Hours

(MM Docket No. 99-25, III, G, §76-77)

85. LP1000 and LP100 stations. LP1000 stations, as primary stations, should comply with existing requirements for operating hours. LP100 stations should be subject to a lesser standard. Due to the limited spectrum available and the number of possible applicants per channel, it would be very ineffective to authorize an LP100 station and not have such a station maintain a regular or minimum schedule. A combination of minimum hours and short license periods, as discussed in paragraphs 89-90, for LP100 stations will ensure that spectrum is adequately utilized. For commercial LP100 stations, §73.1740(a)(1) should apply and be modified to specify a minimum daily schedule for LP100 stations of one-half of the total hours they are authorized to operate between 6 a.m. and midnight, local time, each day of the week except Sunday. For noncommercial LP100 stations, §73.561(a) should apply and be modified to specify a minimum schedule for LP100 stations of at least 20 hours per week, consisting of at least 2 hours of operation per day on at least 6 days of the week; however, stations licensed to educational institutions are not required to operate on Saturday or Sunday or to observe the minimum operating requirements during those days designated on the official school calendar as vacation or recess periods. All LP100 stations, including commercial LP100 stations should be subject to the time-share provisions of §73.561(b). LP100 stations failing to operate 12 hours per day every day would be subject to time-sharing. Several LP100 licensees should be permitted to share one frequency, and possibly one transmission facility, reducing the burden of providing programming by each licensee. The short licensing periods proposed in paragraphs 89-90 would make underutilized spectrum by an LP100 licensee readily available to others.

86. Microradio stations. Commercial and non-commercial microradio stations should also be subject to minimum operating requirements and time-sharing. Microradio stations should be subject to similar, but lesser standards than LP100 stations. For commercial microradio stations, a minimum schedule of 18 hours per week is suggested. For noncommercial LP100 stations, §73.561(a) should be modified to specify a minimum schedule for microradio stations of at least 10 hours per week; however, stations licensed to educational institutions are not required to operate on Saturday or Sunday or to observe the minimum operating requirements during those days designated on the official school calendar as vacation or recess periods. All microradio stations, including commercial microradio stations should be subject to the time-share provisions of §73.561(b) with minor modification. Microstations failing to operate 12 hours per day every day, or 50% of the time they are authorized to operate, whichever is the lesser amount, would be subject to time-sharing. The addition of the 50% requirement in §73.561(b) would permit additional fragmentation of time-shared spectrum. Due to the low minimum operating requirements, a simple two-station time share between microradio stations may still underutilized spectrum if both stations only broadcast a combined total of 20 hours per week. The short licensing periods proposed in paragraphs 89-90 would make underutilized spectrum readily available to others.

87. All LP100 and microradio stations should be exempt from any operating hours requirement for the first six months of operation. It may take some time for the low power secondary services to become established and provide regular program service. A six month grace period allows licensees to establish themselves in their communities and meet their minimum operating requirements.

Construction, License Terms, Sales, and Renewals

(MM Docket No. 99-25, III, G, §78-86)

88. Construction. The proposed construction permit period for LP1000 stations should be consistent with the period for full-power radio stations. The proposed 18-month period for LP100 stations and 12-month period for microstations is reasonable. Construction permits for LP100 and microstations should not be transferable nor renewable under the provisions of §73.3598.

89. License Terms. LP1000 stations, because they are considered primary services, should follow the Part 73 rules applicable to full-power radio stations concerning the length of their license terms and renewal procedures. LP100 and microradio stations should have license terms of one year, but should be renewable. All broadcast stations should have a renewal expectancy if they follow the terms of their license and serve the public.

90. Renewals. The one-year license renewal provides the opportunity for periodic scrutiny by the Commission, other broadcasters, and the public of the technical and service compliance of the low power station. A special renewal form should be created for low power stations that requires a low power licensee to demonstrate technical compliance and certify that the station has met its service requirements. Stations not able to meet their commitments should be placed on a 6-month probational short license cycle. If they fail to meet their commitments again, then they should be subject to license cancellation or time-sharing with other licensees. This would protect other broadcasters from potential interference and weed out low power licensees who have been unable to serve the public. If a low power station is required to submit a proof of technical

performance annually with its renewal, then this would serve to address interference concerns due to improperly operated stations. If a low power station is required to certify that it has met its service requirements to the public, then this would serve to insure the public is being served and spectrum is being utilized. The form could ask a licensee about minimum operating schedule, multiple ownership, hours of local programming, and hours of simulcasting. These questions would be used to determine compliance with the appropriate rules for low power stations and require that low power stations maintain records of accountability, including a public file. The annual review offers an opportunity for other broadcasters, potential licensees, and the public to bring forth evidence that the low power licensee is not operating properly. Low power stations that cease operations would simply not file for renewal and the frequency would become available to others very quickly.

91. Sales. Low power station licenses should be salable to other qualified owners of low power stations. The public interest is served by permitting sales because sales will probably result in less loss of on-air service than allowing a license to expire and then have a new applicant apply for it. Unlike construction permits, an established low power station indicates that an owner has invested significant resources into it to build and operate it. A low power station is a small business, even those operating as non-commercial stations. Their owners may need to sell their stations for various reasons and should be entitled to a fair market value for it.

92. Emergency Alert System (EAS). LP1000 stations should be required to maintain EAS equipment. LP100 stations should also be required to maintain EAS equipment. These stations will serve entire communities or a large part of an urban community; therefore the public interest

is served by participating in the EAS. Microradio stations, due to their limited coverage area, should be exempt from maintaining EAS equipment, but could choose to participate in the EAS. The more limited public interest benefit for microradio stations maintaining EAS equipment does not justify the expense of maintaining EAS compliance.

93. Station Identification. The same call sign system for full-power stations should apply to low power stations. A different system would be confusing to the public and does not provide any benefit to the public or the licensee.

94. Inspection by the Commission and Compliance with its Rules. §73.1225 should apply to all low power stations. This requirement, combined with an annual renewal requirement demonstrating compliance with certain Rules, would be reasonable and serve the public interest. The applicability of the “actual interference” test of §74.1203(a)(3) should not be applied to LP1000 or LP100 stations, but should be applied to microstations (see paragraph 33, 41, 62, and 64).

Applications

Electronic Filing

(MM Docket No. 99-25, III, H, §91-95)

95. Electronic form filing is a reasonable approach for station applications, if all the technical information required by the Commission can be submitted this way. If the mileage separation methodology is applied to low power stations instead of the contour protection methodology, then electronic filing would be easier. The Commission ultimately may have to contend with many applications using the contour protection methodology (see paragraphs 45-47). Also, the mileage separation methodology is not appropriate for the reserved portion of the FM band, so applicants must use the contour protection methodology for proposed stations in that portion of the band. Some non-commercial educational applicants will also need to demonstrate protection to TV Channel 6. In all cases, the Commission must still be able to confirm that a proposed antenna's radiation center is specified at the correct geographical coordinates and elevation. Additional information such as ERP and antenna horizontal plane pattern tabulations could be submitted on an electronic form, and supplemental information, where required, could be requested on paper by the Commission.

Filing Windows and Mutual Exclusivity

(MM Docket No. 99-25, III, H, §96-102)

96. The problem of mutually exclusive applications in the low power service can be reduced using a first-come, first-serve procedure. This should also reduce the problem of an overwhelming number of applications within a filing window, except for possibly the first window. Each day is a filing window. All applications tendered on the same day, found acceptable for filing, and mutually exclusive with each other would need to be resolved.

However, any applications filed that are mutually exclusive with an application filed on an earlier date would be dismissed. There would be no benefit to file a mutually exclusive application.

97. Since it is impossible to know if you may be filing a mutually exclusive application subject to dismissal, applicants are at some risk of filing an application that can be rejected. This may encourage many applicants to file on the first open filing date. So, the first two weeks should be considered the first filing window and all applications filed in the two-week period would be deemed filed on the last day of the two-week period.

98. If applications for low power services become backlogged, applicants should be required to renew their applications annually, on a date no earlier than 3 months before expiration of their application and by the anniversary date their original application was filed. Thus, an application would have a lifetime of one year and become automatically dismissed if no renewal is received by the anniversary date of the application.

Resolving Mutually Exclusive Applications
(MM Docket No. 99-25, III, H, §103-108)

99. Mutually exclusive applicants should be notified and given the opportunity to resolve their mutual exclusivity. One or more proposals could be withdrawn or modified so that some applicants can receive a construction permit. If mutually exclusive applications cannot be resolved among the applicants within a reasonable period, perhaps six months after notification by the Commission, then those applications should be automatically dismissed. To provide other applicants the opportunity to apply for a similar facility, the dismissed applicants could not reapply

for facilities within the same coverage area of their dismissed applications for 30 days after dismissal.

100. Lotteries and auctions should not be used to resolve mutually exclusive applications, if possible. The grant of a low power license should not be a game of chance, nor should the economic resources of an applicant be an advantage. If the amended Section 309(j) of the Communications Act will require auctions for mutually exclusive commercial low power stations, then paragraph 99 should be applied to non-commercial applicants.

Appendix

Suggested Allocation Rules for Low Power AM Stations

Power Limitations

A1. The transmitter power output should not exceed 100 watts.¹ Low power AM stations may specify full-time or daytime-only facilities. No spilt frequency operations daytime and nighttime should be authorized. Low power AM stations operating with power levels greater than 10 watts should be classified as LP100 stations. Low power AM stations operating with power levels of 10 watts or less should be classified as microradio stations.

Antenna Requirements

A2. The antenna system shall consist of one or more vertical radiators that may be series, shunt, or top loaded. No minimum inverse field values are required. A directional antenna array may be employed to provide gain or contour protection.² The maximum gain over non-directional mode shall be limited so that the actual effective field in any direction from the directional antenna cannot exceed 121 mV/m. This is the minimum effective field intensity that would be required for a 250-watt Class C station, pursuant to § 73.189(b)(2)(i). Consequently, coverage from the array would never exceed the equivalent of a 250-watt non-directional station in any direction. For contour protection purposes, the

¹A maximum power level in the range of 10-250 watts should be considered. Practical low power service is possible in some locations with only 10 watts of power. One means of addressing skywave interference concerns at night is to specify different daytime and nighttime power limits. A possible nighttime limit could be 6 to 10 dB below the daytime limit.

²At least initially, low power AM stations could be required to operate non-directional to reduce the engineering burden on the Commission. This would not pose a serious limitation on low

power AM stations in urban areas where it would be difficult to build and proof a directional array. maximum gain reduction over non-directional mode will not be considered to be greater than 10 dB, even if additional gain reduction is achieved. This limitation will preclude the use of critical directional antenna systems for contour protection; thereby reducing the risk of a low power secondary AM station causing interference to a primary AM station. However, the use of directional antennas will permit some flexibility in site location within or near a proposed community of service.

Daytime Contour Protection Requirements

A3. Low power AM stations should not be required to provide interference-free service to the 0.5 mV/m contour. However, they should protect all co-channel Class A stations to their 0.1 mV/m contour. First-adjacent channel Class A stations should have extended protection to their 0.1 mV/m contour from Low Power AM stations due to the limited service area a low power AM station can provide. All other co-channel and 1st-adjacent channel stations, including other low power AM stations should be protected to their 0.5 mV/m contour, as specified in §73.37(a). These protection requirements should apply, even if the protected station does not provide interference free service to its protected contour due to interference from other stations.

A4. Due to the low power nature of secondary AM stations, second and third adjacent channel interference will be very small, confined to an area around the transmitting antenna of the secondary AM station. Actual interference within this area depends to a great degree on the characteristics of the receiver used. However, there should be 2nd-adjacent and 3rd-adjacent interference protection requirements for low power AM services to protect the service areas of

existing and future stations, particularly low powered services. The protection requirements should not be preclusive. They should limit the transmitted power of a low power AM station, depending upon the power of the affected adjacent channel station and the location where potential interference may be caused. The proposed protection for 2nd-adjacent and 3rd-adjacent channel stations is shown in Tables 3 and 4.

Table 3. Proposed 2nd and 3rd Adjacent Channel Protection Requirements for Low Power AM Stations.

	If the following contour of an Existing Station is....	and overlaps the following contour of the proposed Low Power AM Station...	Then, power of Low Power AM Station is limited to below the Existing Station Power by....
2nd-adjacent channels,	0.5 mV/m	5 mV/m	10 dB ¹
	5 mV/m	5 mV/m ²	20 dB
3rd-adjacent channels	0.5 mV/m	50 mV/m	0 dB ¹
	5 mV/m	5 mV/m ²	10 dB

¹ No limitation if no population or public right-of-way exists in predicted interference area based on a 1:10 ratio desired to undesired signal strength for 2nd-adjacent channels and 1:100 ratio for 3rd-adjacent channels.

²For the purpose of determining power limitations on low power AM stations, if the 5 mV/m contour of the proposed low power AM station covers any part of the community of license of an existing 2nd-adjacent or 3rd-adjacent AM station, 5 mV/m overlap with the adjacent station's 5 mV/m contour will be considered to exist.

Table 4. Proposed 2nd and 3rd Adjacent Channel Studio Site Protection Requirements for low power AM Stations. ^{1,2,3}

For...	if the predicted signal strength “x” at the studio site of the existing station is...	then the predicted signal strength from the proposed LPFM station at that site is limited to	...or is limited to the following contour, whichever is greater:
2nd-adjacent channel studio sites,	“x” less than 5 mV/m 5 mV/m < “x” < 25 mV/m “x” greater than 25 mV/m	(no limitation) 5 mV/m 25 mV/m	(no limitation) “x” (not applicable)
3rd-adjacent channel studio sites,	“x” less than 5 mV/m “x” greater than 5 mV/m	(no limitation) 50 mV/m	(no limitation) (not applicable)

¹Should apply to all low power AM station facilities.

²Protection should be limited to existing AM station studios within their 5 mV/m service contour.

³LP100 AM facilities should not be required to protect AM microradio studios.

A5. Contour interference ratios could be established between 2nd and 3rd adjacent AM stations. An earlier version of § 73.37 limited 2nd adjacent overlap of a new station's 25 mV/m contour to an existing station's 2 mV/m contour. A minimum interference ratio of 12.5 to 1 can be inferred from this overlap limitation. For 3rd adjacent stations, each 25 mV/m contour could not overlap. Another 12.5 fold difference in field ratio between 2nd to 3rd adjacent channels can be inferred from this overlap limitation. A contour overlap ratio of 10:1 for 2nd adjacent AM stations and a ratio of 100:1 for 3rd adjacent AM stations may be reasonable figures for contour ratio protection by rounding each 12.5 ratio to a value of 10. These figures are used in Table 1 to predict interference to AM stations within their service contour, but beyond the 5 mV/m contour.

A6. Interference may still result if contour ratios are used for authorizing second-adjacent and third-adjacent channel stations well inside the 5 mV/m service contour of existing stations. The contour ratios do not account for the potential to cause receiver-induced interference problems due to the frequency proximity of two strong carriers. Thus, additional power limitations need to be imposed on low power stations in such cases.

A7. Under the proposed limitations in Table 1, 3rd-adjacent stations operating with less than 1000 watts would be afforded additional protection from low power AM interference within their 5 mV/m contour. Second-adjacent stations operating with less than 10,000 watts would be afforded additional protection from low power AM interference within their 5 mV/m contour.

A8. Since low power AM stations would be permitted well within the primary coverage of existing stations, some protection of an existing station's studio site should be provided. This would insure that stations are able to monitor their signals. Table 2 proposes studio site

protection for existing stations for studios located within the 5 mV/m contour. The 2nd-adjacent interference limit is based on a threshold interference ratio of 10:1 undesired to desired field strength, with a 20 dB margin of protection added and maximum 2nd-adjacent signal strength limited to 25 mV/m. The 3rd-adjacent interference limit is based on a threshold interference ratio of 100:1, with a 20 dB margin of protected added and a maximum 3rd-adjacent signal strength limited to 50 mV/m.

A9. The following example illustrates a possible worst-case for an existing 2nd-adjacent station. A proposed non-directional low power AM station will result in 5 mV/m contour overlap within the community of license of an existing 2nd-adjacent station operating at 1000 watts. Under the power limitations in Table 1, the low power AM station's power is limited to 20 dB below 1000 watts, or 10 watts. The worst-case area of interference to the existing AM station would be within the 25 mV/m contour of the proposed low power AM station, where receiver-induced problems may begin to manifest. At 10 watts non-directional, the effective field of the station would not be greater than 12.1 mV/m at 1 km. The distance to the 25 mV/m contour would be 500 meters, so interference would result in a small vicinity around the low power station, within 500 meters of the antenna.

Nighttime Contour Protection Requirements

A10. Low power AM stations should protect all co-channel Class A stations to their 0.5 mV/m 50% skywave contour and protect all co-channel Alaskan Class A stations to their 0.1 mV/m 50% skywave contour. All other stations should be protected from interference from low power AM stations to their 0.5 mV/m groundwave contour. However, other low power AM

stations should be protected only from groundwave interference from other low power AM stations. The protection ratios in §73.182(r) should be used to calculate co-channel and 1st-adjacent channel interference.

A11. The same protection requirements for 2nd-adjacent and 3rd-adjacent stations should apply for nighttime groundwave protection. No skywave protection requirements should apply for 2nd-adjacent and 3rd-adjacent stations. Class A stations operate at 10 kW or more power, so the power limitations for 2nd-adjacent and 3rd-adjacent skywave protection, if imposed, would have no material limitation on the power of a low power AM station.

A12. The proposed protection of other stations from low power AM stations at night is significantly greater than the existing requirements. Therefore, it is reasonable that spectrum integrity can be maintained. Low power AM stations should be able to calculate the potential for interference to other stations on a single-signal non-RSS basis.

Critical Hours Protection Requirements

A13. The limitation of §73.187(a)(1) should be applied to LPFM stations operating co-channel with US Class A stations.