

DOCKET FILE COPY ORIGINAL
LAW OFFICES
HALEY BADER & POTTS P.L.C.
4350 NORTH FAIRFAX DR., SUITE 900
ARLINGTON, VIRGINIA 22203-1633
TELEPHONE (703) 841-0606
FAX (703) 841-2345
E-MAIL: haleybp@haleybp.com

ORIGINAL

JOHN CRIGLER
E-MAIL: jcrigler@haleybp.com

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Ms. Magalie R. Salas
Secretary
Federal Communications Commission
The Portals
445 Twelfth St., S.W., Room TW-A325
Washington, D.C. 20554

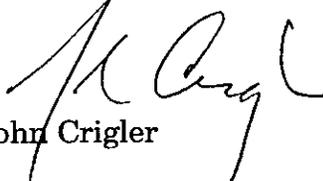
Re: LPFM
MM Docket 99-25
Comments of Station Resource Group

Dear Ms. Salas:

Transmitted herewith, on behalf of the Station Resource Group are the original and four copies of its Comments in response to the Notice of Proposed Rule Making, MM Docket 99-25, 14 FCC Rcd. 2471 (February 3, 1999), concerning the creation of a Low Power FM Service.

Please refer any questions concerning this matter directly to this office.

Respectfully submitted,


John Crigler

JC:ah
Enclosures

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

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

TO: Chief, Mass Media Bureau

COMMENTS OF STATION RESOURCE GROUP

August 2, 1999

Haley Bader & Potts P.L.C.
4350 North Fairfax Drive
Suite 900
Arlington, VA 22203

TABLE OF CONTENTS

Summary	ii
I. Introduction.....	1
II. LPFM Will Not Remedy Consolidation	2
III. Consolidation is Not an NCE Problem.....	4
IV. LPFM has been Tried and has Failed as an NCE Service	5
V. LPFM Is Not Consistent With Section 307(B) Standards.....	8
VI. LPFM Would Fail as an NCE Service.....	10
VII. The Proposed LPFM Service is Based Upon Technical Assumptions, Not Facts.	13
VIII. The Commission Underestimates the Interference that LPFM Will Cause.....	16

SUMMARY

The Commission has initiated a Notice of Proposed Rulemaking (NPRM) which proposes the creation of a new low power FM (LPFM) radio service. The NPRM is based upon laudatory, but impractical objectives. Although the Commission conceives of LPFM as an antidote to “consolidation,” there is no realistic prospect that LPFM stations can offset the loss of diversity of ownership that has occurred because of a relaxation of commercial ownership restrictions. Only a handful of LPFM stations will be possible in the major markets where the effects of consolidation are most apparent.

LPFM is an inefficient use of spectrum. In 1976, the FCC ceased authorizing new low-powered noncommercial educational (NCE) stations on grounds that low powered stations caused interference to higher powered stations and precluded the use of the spectrum to reach larger audiences. The FCC has condemned “pirate” stations on the same grounds.

LPFM is not financially viable as an NCE service. The NPRM assumes that if LPFM stations are authorized, licensees will somehow find the resources to build and operate them. By barring existing NCE licensees from holding LPFM licenses and by authorizing an LPFM service without regard to funding for capital or operational costs, the FCC virtually guarantees that the service will fail as an NCE service.

LPFM will undermine federally-supported services now delivered by NCE stations. The NPRM proposes to relax existing interference protections, but

contains no assessment of the extent or nature of the damage that would result. Studies conducted by the Consumer Electronics Manufacturers Association (CEMA) and the National Association of Broadcasters (“NAB”) indicate that in addition to the second- and third- adjacent channel interference which the Commission anticipates but makes no attempt to quantify, LPFM will create first- and second- adjacent channel interference that will significantly degrade signal quality.

The NPRM speculates that improvements in receiver technology may have made second- and third- adjacent interference and intermediate interference protections obsolete. The CEMA study clearly indicates that receiver technology has not achieved such a state and that receivers are still highly susceptible to forms of interference that the Commission proposes to disregard.

The NPRM ignores the fact that interference is a matter of perception as well as of physics. Interference which may be masked by highly processed signals may be intolerable in lightly processed signals that transmit classical music or jazz, formats heavily favored by NCE stations.

The CEMA and NAB studies are laboratory studies. While they clearly indicate the erroneous nature of the NPRM’s assumptions concerning interference, they also demonstrate the need for further field studies before any LPFM service can be contemplated.

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

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

TO: Chief, Mass Media Bureau

COMMENTS OF STATION RESOURCE GROUP

The Station Resource Group (“SRG”) respectfully submits these Comments in response to the above-captioned Notice of Proposed Rule Making (“NPRM”), MM Docket 99-25, 14 FCC Rcd 2471 (February 3, 1999).

SRG is a membership organization of many of the nation’s leading noncommercial educational (“NCE”) broadcasters. SRG’s 47 members operate 168 public radio stations, produce the majority of public radio’s national programming, and account for one-third of public radio’s audience. Through in-depth analysis and long-term planning, SRG provides a strong voice for new models of public service and national policies that reinforce stations’ public service missions.

I. Introduction

This NPRM solicits comment on the creation of a new low power FM (“LPFM”) radio service that would consist of up to three new classes of FM stations. The LPFM stations would be interspersed with existing commercial and NCE stations and would operate exclusively on a noncommercial basis or upon a

basis determined by whether the frequency occupied is or is not reserved for noncommercial use. NPRM, ¶ 19.

The Commission's stated goals in creating the proposed service are "to address unmet needs for community-oriented radio broadcasting, foster opportunities for new radio broadcast ownership, and promote additional diversity in radio voices and program services." NPRM, ¶ 1. The NPRM responds to petitions which argue that "consolidation has made radio stations too expensive for most individuals, and that because new voices are being priced out of the market, the public is being deprived of diverse, local voices." NPRM, ¶ 8.

SRG's Comments focus on the effects the proposed LPFM service would have on NCE broadcasting.

II. LPFM Will Not Remedy Consolidation

SRG is sympathetic to complaints that "consolidation" of the commercial radio industry disserves the American public. As noted in the NPRM, the ownership restrictions that once hindered consolidation were removed by Congress in order "to enhance commercial efficiencies in the radio broadcast industry." NPRM, ¶ 59. Because consolidation involves the reduction in the number of media "voices," it almost inevitably involves a loss of "diversity." Consolidation thus also tends to result in standardization of formats, a loss in the individual character of broadcast stations, and the raising of barriers to entry. As a result of consolidation, a handful of companies now own hundreds of radio

stations nationwide, and sometimes as many as half of the stations in a local market. See 47 C.F.R. § 73.3555.

While SRG disagrees with the wisdom of the policies that have created commercial station consolidation, it recognizes that those policies have been dictated by Congress. SRG is skeptical of the Commission's argument that these policies may be circumvented by creating a new broadcast service which is not subject to the requirements of the Communications Act. See NPRM, ¶ 59. ("We tentatively believe, however, that those provisions [of the Telecommunications Act of 1996] would not apply to a service that did not exist in 1996. We also tentatively believe that Congress' intent, to enhance commercial efficiencies in the radio broadcast industry, does not sufficiently apply to the new classes of service we are contemplating.") If the Commission's logic prevailed, the Commission could routinely ignore mandates of the Communications Act simply by creating new classes of service. Congressional intent cannot simply be ignored in this fashion.

Even if it were legally possible to create a new radio service exempt from the requirements of the Communications Act, the LPFM service proposed will not remedy the ills of consolidation. Consolidation is an economically-fueled phenomenon that strives to capture the maximum number of advertising dollars in a market. Consolidation therefore occurs first in major markets, where advertising dollars are greatest.

Few LPFM stations will be possible in these markets, as the NPRM acknowledges. See NPRM, Appendix D. Thus, the LPFM service proposed will not counteract the actual effects of consolidation.

III. Consolidation is Not an NCE Problem

Consolidation can be traced to the elimination of ownership restrictions by the Telecommunications Act of 1996. Those ownership restrictions applied only to *commercial* radio stations. NCE stations are not and have never been subject to any form of ownership limitation, on either a national or a local market basis. See 47 C.F.R. § 73.3555. The NPRM contains no indication that “consolidation” has occurred among licensees for NCE stations, nor that any new service is necessary to remedy the effect of consolidation among NCE stations.

There is abundant reason to believe that there is an unsatisfied demand for new NCE stations. In addition to the expressions of interest in LPFM, hundreds of applications for new NCE stations have been filed and scores of unlicensed, “pirate” stations have sprung up. It is less clear that the stimulus for this demand is “consolidation.”

Since 1995, the FCC has not had in place any mechanism for resolving mutually exclusive applications for full-service NCE frequencies. As a result, the Commission has found that as of October 1998 there were 699 applications in 252 separate proceedings competing for NCE radio channels, and that in 1998 approximately 750 NCE radio applications would be filed, of which approximately 500 would be mutually exclusive. *See Reexamination of the Comparative*

Standards for Noncommercial Educational Applicants, DA 98-2489 (Released December 3, 1998) (“Comparative Criteria NPRM”). SRG’s comments in that proceeding show that the Commission’s failure to establish an effective means of resolving mx’d applications for NCE frequencies has led to manipulations of the FCC’s rules that have brought grant of construction permits for new NCE stations to a standstill.

Adoption and rapid implementation of a point system, such as that recommended by SRG, would quickly create hundreds of new NCE stations and encourage other bona fide applicants to apply for new full-service NCE facilities. Moreover, by adopting an appropriate point system, the Commission could award construction permits to those applicants who will best provide diversity of ownership, bring service to unserved and underserved areas and assure that needs of local communities are served. By contrast, the NPRM proposes to resolve mutually exclusive applications between commercial applicants by auction, and proposes no methodology for resolving mutually exclusive applications between NCE applicants or between commercial and NCE applicants although it suggests a lottery might be appropriate. NPRM, ¶¶ 103-108.

IV. LPFM has Been Tried and has Failed as an NCE Service

In March, 1976, in response to a petition from the Corporation for Public Broadcasting (“CPB”), the Commission initiated Docket 20735 to explore issues relating to the most efficient use of NCE FM radio channels. At that time, the FCC authorized low power NCE FM stations, quite similar to the LPFM stations

now proposed. Like LPFM 100 and microradio stations, Class D stations served high school and college campuses, neighborhoods and small communities. Also like LPFM 100 and microradio stations, Class D stations were excused from a number of regulatory requirements, such as maintenance of a minimum operating schedule.

The “central question” considered in Docket 20735 was “efficiency of channel use,” *Second Report and Order*, 44 RR 2d 235, 238 (1978), which required a balancing of “competing equities.” 44 RR 2d at 244. The Commission did not dispute that 10-watt stations had value. Such stations served small towns, offered local programs and provided training in the use of the broadcast medium. The Commission nonetheless concluded that “these low power operations cannot be permitted to function in a manner which defeats the opportunity for other more efficient operations which could serve larger areas and bring effective noncommercial educational radio service to many who now lack it.” 44 RR 2d at 244.

The Commission also gave weight to arguments by CPB that funding 10-watt stations was an ineffective use of federal investment. CPB emphasized the fact that higher powered stations “could serve larger areas, and bring effective noncommercial educational radio service to many who lack it.” 44 RR 2d at 244.

In light of these factors, the FCC concluded that it would no longer accept for filing any additional 10-watt applications, that it would grant license renewal applications for Class D stations only on a secondary basis, and that it would encourage Class D stations to migrate to non-reserved channels.

Like Docket 20735, the Commission's LPFM proposal again squarely raises the issue of spectrum efficiency. LPFM, like Class D stations in the past, would, in some instances, provide a valuable local service. As in Docket 20735, the question is whether low power stations result in the most efficient use of scarce broadcast spectrum.

As discussed below, there is a direct correlation between the creation of an LPFM service and the competing use of the spectrum by full-service NCE stations. LPFM cannot be created without depriving listeners of the NCE service they now receive or without precluding the creation or expansion of full-service NCE stations. If, as discussed below, the Commission relaxes existing second and third-adjacent channel interference protections, it must also decide whether the additional spectrum made available would be better used in authorizing new or expanded full-service stations or in creating new classes of small LPFM stations.

The NPRM is remarkably reticent to discuss these important issues and, in fact, suggests that these issues should automatically be decided in favor of LPFM services.

The paucity of major market LPFM spectrum under our current rules testifies to the aggressive efforts of existing broadcasters to maximize service. Principally for this reason, we are disinclined to extend reduced second- and third-adjacent channel protection standards to full-power FM stations. We believe that the relatively low maximum power levels of the LPFM stations under consideration here support this distinction. Such stations could create only very limited areas of harmful interference, especially if we impose additional technical modifications to reduce their interference potential. We also note that if we were to take this step, opportunities for low power stations would diminish as existing broadcasters move quickly to improve their own facilities. NPRM, ¶ 50.

For reasons that it does not explain, the Commission denigrates what it has traditionally encouraged, “the aggressive efforts of existing broadcasters to maximize services” to the public. NPRM, ¶ 50.

The issue of spectrum efficiency cannot be avoided. If the Commission concludes that second- and third-adjacent channel protections standards should be relaxed for FM stations, then it must once again consider the “competing equities” and explain why it proposes to depart from long-established policy to favor services that use scarce spectrum in a less efficient manner.

V. LPFM is not Consistent with Section 307(b) Standards

The Commission’s preference for the efficient use of spectrum is not merely a historic policy, but a mandate of the Communications Act. Section 307(b) of the Communications Act of 1934, as amended, 47 USC § 307(b), requires the FCC to insure a “fair, efficient, and equitable distribution of radio service” in the United States. This mandate, which pervades the FCC’s earlier decisions concerning Class D stations, was recently invoked by the Commission as a rationale for assessing a forfeiture for the operation of unlicensed low power stations. *Application for Review of Steven Paul Dunifer*, 1 CR 798 (1995) (*Dunifer*). After rebutting Mr. Dunifer’s claims that Commission’s rules prohibit all low power services by pointing out that existing rules provide for FM translator and booster stations which transmit at powers well below the 100 watt minimum for full-service NCE stations, the Commission revisited Docket 20735 to emphasize factors it

considered in raising the minimum operating power of NCE stations. These factors included:

The public's interest in greater access to broadcast service and the more efficient use of the spectrum, and . . . the particular interest of rural or distant communities in obtaining access to noncommercial, educational programming. . . . The Commission's public interest determination to provide for increased power for these facilities was based on its goal of providing, on a nation-wide basis, a stable, efficient and diverse radio communications service. 1 CR at 802.

The Commission then articulated a number of interference-related reasons that low power operations should not be allowed:

[A] low power station could not co-exist with a nearby high power station; the interference received would be too destructive. However, at the edge of the high power station's protected service contour, where its signal is weakened by distance, a low power station could operate because the interference received by the low power station would be tolerable for a secondary operation. But this is unacceptable from a public interest standpoint because the low power station would cause objectionable interference to the reception by the audience of the primary station's signal. Such interference to the primary station would be difficult to identify and correct, and would serve to lower the quality of the FM broadcasting service. 1 CR at 803.

Interference was not the only factor to be considered. "In addition to general concerns about spectrum efficiency, there is the matter of preclusion." 1 CR at 804. To illustrate the effects of preclusion, the Commission compared a hypothetical low power station operating at 10 watts and a Class A station operating at 6 kilowatts. It concluded that:

While the preclusive effect of a Class A station is 24% greater than the 10-watt station. . . the service radius of a Class A station is almost 500% greater than the smaller station. . . . Although the preclusive effect of a station increases with power,

as we would expect, the service radius (and area) increases at a much faster rate. If we treat preclusion as a cost and service as a benefit, the cost/benefit ratio improves with power (but the ratio is very poor for low power stations.)

After weighing both interference and preclusion effects, the Commission concluded that new authorization of low power stations would be contrary to the principles embodied in Section 307(b).

The LPFM service proposed by the FCC raises the same issues considered in *Dunifer*. LPFM will cause interference to existing stations, will result in the loss of existing service, will have highly undesirable preclusive effects, and will consequently be an inefficient use of FM spectrum. In light of these facts, LPFM is not consistent with the mandate of Section 307(b) of the Communications Act.

VI. LPFM Would Fail as an NCE Service

The Commission prophesies that LPFM stations could provide “a service for an ethnic community dispersed throughout an entire city, as a supplementary commercial or a noncommercial service, or simply as a low cost community service used principally to convey information to listeners, without concern for financial support.” NPRM, ¶ 11.

This prophesy is based on highly idealistic assumptions. The Commission’s general lack of “concern for financial support” is particularly startling. For example, the Commission theorizes that a class of LPFM 1000 stations would have numerous advantages.

Authorizing these as primary stations could provide stability that could enable licensees to obtain necessary funding to equip stations of this size and operate them in a manner that could

more effectively serve the community; for example, perhaps the station could secure the resources to provide live coverage of high school sporting events or local civic or community meetings or events. At the same time, with a relatively small operating budget and a relatively small coverage area, such LPFM stations might be able to offer a very localized exposure attractive to local businesses that could not otherwise afford radio advertising.

As the qualifications in this statement indicate, the Commission's vision of LPFM stations that would exist "without concern for financial support" is highly speculative: The coverage "*could*" enable licensees to obtain "*necessary funding.*" "*Perhaps*" the station could secure the resources to cover local events. LPFM stations "*might be*" able to afford advertising at rates lower than existing stations. The Commission's vision of LPFM takes no account of practical matters such as how licensees will pay necessary capital costs, such as studio equipment, transmitters, and antennas, or operating costs, such as studio space, tower space, utility bills, and salaries. In this field of dreams, sufficient revenues will somehow come if LPFMs are authorized.

Such illusions should not be fostered. The NCE-FM service is a fragile industry that would not exist in its present form without support from federal funding agencies. The majority of NCE-FM stations depend upon operational funds from CPB and/or capital funds from the National Telecommunications and Information Administration. These institutions have developed a variety of programs for cultivating and sustaining full-service NCE stations. Without such grants, many existing, full-service NCE stations would have difficulty surviving, particularly in smaller, more remote communities. Most, if not all, of the proposed

LPFM stations would not qualify for support through these funding programs, substantially diminishing their prospects for sustainability and meaningful service.

The availability of such support is not an arbitrary matter. The Corporation for Public Broadcasting, in particular, has created several targeted grant programs to support services to small and rural markets and to aid stations controlled by minority groups. CPB is also about to launch a major initiative aimed at extending public radio's service to rural listeners. These grant programs have carefully scrutinized minimum operating levels necessary to sustain significant public service and balanced the public interest in supporting a diversity of services with the need to assure an effective and efficient investment of public resources.

As distinguished from Docket 20735, which was initiated by CPB, the instant proceeding takes no cognizance of the importance and criteria of federal funding and, in fact, conceives of an LPFM service without regard to whether LPFM licensees would qualify for existing grant programs. LPFM stations would also be isolated from existing NCE stations by proposed ownership restrictions that would prohibit current NCE licensees from holding an LPFM station. NPRM, ¶ 57.¹

¹ The only exception to this prohibition is the Commission's invitation of comment on "possible cooperative arrangements (short of attributable interests such as discussed in paragraph 0, above) among LPFM licensees that might facilitate the new service's development without unduly diluting its benefits." NPRM, ¶ 59. It is unclear precisely what sort of "cooperative arrangements" the Commission has in mind.

Orphaned from the rest of the NCE community and ineligible to receive federal funding from traditional sources, an NCE LPFM service would face a future as speculative as the Commission imagines. “Perhaps these stations will secure the funding necessary to survive.” NPRM, ¶ 11. Perhaps not.

VII. The Proposed LPFM Service is Based Upon Technical Assumptions, Not Facts.

The FCC has proposed three classes of LPFM stations: (1) LPFM1000, which will function as a fully protected, primary station with a maximum effective radiated power (“ERP”) of 1000 watts at an antenna height above average terrain (“HAAT”) of 60 meters; (2) LP100, which will operate with maximum facilities of 100 watts ERP and 30 meters HAAT; and (3) “microradio” which would operate with an ERP from 1 to 10 watts at a maximum HAAT of 30 meters. In order to “find” sufficient spectrum for these stations, NPRM, ¶ 44, the FCC has proposed to eliminate the second-adjacent and third-adjacent channel protections that are now afforded existing broadcast stations. The FCC has invited comment and analysis on the question of whether it should “consider lower interference standards for the LPFM service.”

SRG strongly objects to the formulation of this issue. Although the Commission concludes that “On balance, we believe that creating opportunities for new LPFM service should outweigh any small risk of interference to and from LP1000 and LP100 stations,” NPRM, ¶ 45, the Commission provides no basis for reaching that conclusion. The only analysis of the relationship between LPFM

stations and existing stations is contained in Appendix D to the NPRM. That Appendix does not purport to show the wide-spread effects of interference, but the number of LPFM stations that will be made possible in “sample” markets.

SRG agrees with Commissioner Furchtgott-Roth that the Commission’s approach to the issue of interference is irresponsible:

In order to create any substantial amount of new service, protection standards have to be loosened so far as to eliminate third and even second-adjacent channel safeguards. This is a severe incursion on the rights of current licenseholders, as well as on the value of their licenses, which will be drastically undercut in the market if these proposals are adopted. This proposal also potentially impairs the ability of current licensees to serve their listeners, who must not be forgotten; while new people may be able to broadcast, others may lose their ability to receive and listen to existing stations due to interference. It especially troubles me that the Commission has made no *effort* to assess, much less quantify, the effect on existing stations of eliminating these safeguards.

NPRM, Dissenting Statement of Commissioner Harold W. Furchtgott-Roth.

The Commission’s failure to analyze the interference issues leaves SRG and most other NCE licensees in a quandary. The task of analyzing the effects of such interference accurately is a daunting one, since it not only involves complex interference studies, but an assessment of the quality of existing radio receivers available to the public.

A similarly complex question arises with respect to interference to the relationship between LPFM and terrestrial digital radio, and in particular the in-band on-channel (“IBOC”) systems now in development. Although the Commission expresses concern that its “understanding of future IBOC systems is preliminary and that we may not be fully aware of any negative impact or restrictions that

authorization of low power radio service would have on the transition to a digital IBOC technology for FM stations,” NPRM, ¶ 49, the Commission provides no factual analysis upon which to resolve those concerns. Instead, the Commission simply asks for “comment.” NPRM, ¶ 49. The fact that the Commission has not yet adopted an IBOC standard and that testing is still incomplete on proposals still under development makes it virtually impossible to comment intelligently.

Equally as frustrating as the identified but unanswerable questions, are questions that the Commission has ignored. The mileage separation system proposed by the Commission would protect existing stations only within their theoretical service contours. Yet, it is a well accepted fact that existing broadcast stations serve listeners beyond the stations’ predicted service area contour. Section 74.1204(f) of the Commission’s Rules recognizes this fact by protecting regularly used, off-the-air signals of broadcast stations from interference against proposed co-channel, first-, second- or third-adjacent channel translators. The theory underlying this rule is that listeners are entitled to protection even if they are outside of the predicted contour of the station to which they listen. Compare Section 74.1203(a)(1) of the Commission’s Rules. The Commission makes no attempt to assess the loss of actual service to listeners of existing stations if LPFM is instituted. Without having some notion of the actual harm that would be caused to listeners, it is impossible to agree with the Commission that “on balance” the advantages of creating an LPFM service outweigh any disadvantages.

VIII. The Commission Underestimates the Interference That LPFM Will Cause

a. The CEMA and NAB Studies

Through the generosity of National Public Radio (“NPR”) and the Corporation for Public Broadcasting (“CPB”) and the National Association of Broadcasting (“NAB”), SRG was given access to two separate technical studies that examine the effects of the proposed LPFM service. Each study concludes that LPFM will cause devastating levels of harmful interference to existing full-power FM stations.

NPR joined with CPB and the Consumer Electronics Manufacturers Association in conducting a study of the interference that would be caused by the proposed LPFM service (the “CEMA Study”). The CEMA Study used 16 FM receivers, divided into three categories: automotive, portable and home HiFi. CEMA conducted the following tests: (a) Laboratory Calibration and Receiver Certification; (b) Interference; (c) Post-Detection Noise; (d) IF Taboo and Local Oscillator Interference; (e) Reduced Undesired Modulation; (f) Performance in On-Air Environment; and (g) Intermodulation with 800 KHz Spacing. The CEMA study is accompanied by compact discs that illustrate the effects of interference.

NAB’s Receiver Study Report was conducted by the Carl T. Jones Company. The test used 28 FM receivers, divided into five categories: (1) automobile; (2) clock/table; (3) component; (4) portable; and (5) walkman. Six of the 28 receivers tested were monoaural. The NAB Study focuses primarily on the interference from second and third adjacent channels.

A detailed analysis of the CEMA and NAB study will be presented in the comments of NPR, CPB and NAB. Rather than replicate that analysis, SRG will simply highlight Commission assumptions concerning interference from LPFM and corresponding findings of the CEMA and NAB studies that show why the Commission assumptions are wrong.

b. The Commission's Assumptions about Interference will Not Withstand Scrutiny.

The Commission hypothesizes that, by being inserted into the interstices of existing FM stations and operating at relatively low power, LPFM will create harmful interference in "only very limited areas." NPRM, ¶ 50. Interference is more pervasive and more complex than the Commission indicates, and the harm caused to existing stations and their listeners will be more severe. One overarching conclusion to be drawn from the CEMA and NAB Studies is that interference is not a simple, unitary phenomenon, but complex and multifarious.

The Commission assumes that LPFM will have no effect on existing co-channel stations. NPRM, ¶ 42. This assumption is erroneous. Although the NPRM does not propose to alter the existing standards for co-channel interference, it does not follow that LPFM stations will cause no interference to co-channel stations. The CEMA Study demonstrates that if the LPFM service is introduced as proposed, co-channel interference will be increased and the signal quality of existing stations significantly degraded.

The Commission similarly assumes that existing protection criteria will prevent stations from receiving harmful interference from first-adjacent LPFM

stations. NPRM, ¶ 42. The CEMA Study demonstrates that this assumption is also erroneous. At the Commission's existing 6 dB protection contour, the average S/N is 35 dB -- a significantly degraded signal quality.

The CEMA Study also demonstrates that subcarrier performance may be affected by first-adjacent interference. Even within the 6 dB protection contour, the baseband noise caused by the mixing of the first adjacent channel signal with the desired channel's program audio causes an increase in noise that adversely affects subcarrier frequencies. Many NCE stations use their subcarrier frequencies to advance further their public service mission. The most notable NCE use of subcarrier frequencies is to provide radio reading services for the visually impaired, which Commission policy stipulates has first claim on NCE stations' subcarrier channels.

The Commission proposes to permit LPFM stations to locate "without regard to second-adjacent channel spacing." NPRM, ¶ 46. The NAB Study shows that existing protection requirements for non-reserved band stations do not provide sufficient interference protection, and that the protection requirements for reserved band stations are adequate only if the second- adjacent channel interfering station is outside of the desired station's protected coverage area. More protection is needed as a second adjacent LPFM station moves closer to a full-power station's transmitter.

Similarly, the CEMA Study shows that two receivers in the sample could not meet the Commission's existing protection ratio and that the average target ratio achieved in the tests was only 4 dB away from the minimum protected ratio.

These results demonstrate the need for continuation, not elimination, of second-adjacent channel protections. The Commission's assumption that LPFM stations can be located "without regard" to second-adjacent channel spacing is then erroneous.

The Commission "believes" that authorizing LPFM service without imposing any third-adjacent channel protection requirements would entail little risk of interference to existing radio service. NPRM, ¶ 43. The CEMA Study does not support the Commission's belief that third-adjacent channel interference is innocuous. The CEMA Study shows that noise increases with the undesired signal, and in some cases, receivers subject to third-adjacent channel interference simply stop working. Using an S/N of 20 dB for the failure point, the CEMA Study concludes that several receivers fail at higher D/U ratios. In the majority of receivers, levels of interference increase with increases in third adjacent interference.

Similarly, the NAB Study demonstrates that at higher desired signal strengths within the protected service contour of the desired station, interference from third adjacent channel stations will occur at higher D/U ratios, resulting in substantially greater predicted interference areas than allowed by the Commission's current ratio protection.

Both the NAB and CEMA studies thus refute the Commission's assumption that third-adjacent channel interference can be ignored.

The Commission expresses concern that its understanding of digital in-band on-channel ("IBOC") technology is "preliminary," and that it "may not be fully

aware of any negative impact or restrictions that authorization of low power radio service would have on the transition to a digital IBOC technology for FM stations.” NPRM, ¶ 49. The Commission’s concerns are well-founded. Because proposed IBOC signals share half of the first adjacent spectrum, a first-adjacent analog signal that exceeds the level of the digital signal will affect digital performance. In cases where an upper and lower first-adjacent analog signal are present, IBOC performance will be more severely affected. At current levels of protection, the undesired analog signal will be 25 dBu above one of the IBOC digital sidebands. Thus, absent strict new standards concerning first-adjacent channel interference, LPFM will severely affect the transition to a digital transmission system.

c. Interference Varies with the Characteristics of Radio Receivers.

In the interest of administrative “simplicity,” the Commission proposes a mileage separation system that will protect existing stations only from co-channel and first-adjacent channel interference. The Commission apparently conducted no studies to determine if radio receivers were, in fact, immune to interference, as it hypothesizes. See NPRM, ¶ 46.

The Commission’s approach is dangerously simplistic. Interference is a function not only of theoretical factors such as the relative power, proximity and frequency relationship between stations, but also of such practical factors as the design of radio receivers. Both the CEMA and NAB studies conclude that the effect of interference varies widely --- and often unpredictably --- with the nature of radio receivers. Sophisticated receivers are sometimes more susceptible to

interference, sometimes more resistant. Thus, consumers cannot counteract the interference caused by LPFM and preserve a high quality FM signal simply by purchasing a more expensive receiver.

d. Interference Is More Apparent in Stereo Signals.

The NPRM does not consider the question of whether interference will vary with operation in a monophonic or stereophonic mode. The CEMA Study demonstrates that the majority of receivers tested are more sensitive to first-, second- and third-adjacent channel interference when the signal is in stereo. In one test, the home receiver that had the best HiFi or portable performance had the greatest loss when using the omni-directional receiving antenna. Except for one of the six receivers tested, all the other receivers encountered a reduction in performance using the omni-directional antenna.

The NPRM speculates that the state of receiver technology may now permit receivers to operate satisfactorily in the absence of second-and third-adjacent channel protection. NPRM, ¶ 46. The NAB and CEMA studies show that, contrary to the Commission's speculation, current receiver technology does not warrant relaxation of existing interference standards.

e. The Effects of Interference Vary with Programming.

The NPRM assumes that interference is simply a matter of physics, not perception. In fact, interference is a subjective as well as an objective phenomenon. As the CDs accompanying the CEMA study illustrate, interference is dramatically more noticeable in lightly processed signals than in highly processed, densely modulated signals. Interference will thus have a greater impact on some

formats, such as jazz and classical music. Interference that might be undetectable in popular music will be gratingly apparent in a Mozart sonata or Art Tatum improvisation.

Public radio stations heavily favor jazz and classical formats and in many markets may be the only source of such programming. CPB reports that classical music accounts for more than one-third of all hours of programming presented by the nation's 664 public radio stations. Jazz programming accounts for another 15 percent. In total, more than four of every five public radio stations broadcast one or both of these music formats. NCE stations will thus be particularly affected by the interference caused by LPFM.

f. Interference May Cancel as well as Degrade other Signals.

The NPRM theorizes that the interference created by LPFM will have effects that "might well be insignificant." NPRM, ¶ 45. The CEMA study indicates that this theory is erroneous and that interference not only degrades signal quality, but can stop some receivers from operating at listenable levels. The CEMA Study shows that some receivers simply fail when D/U ratios reach certain levels. Far from causing insignificant degradations, new LPFM stations may thus cancel reception of full-service stations altogether.

g. LPFM May Create New Forms of Interference.

The NPRM is based upon the assumption that co-channel and first-adjacent channel interference are the only forms of interference from which existing stations should be protected. NPRM, ¶ 42. As discussed above, this assumption is unwarranted. The CEMA and NAB studies clearly indicate that multiple forms of

interference to which full-service stations are currently subject will result from LPFM stations as well, and that these forms of interference cannot simply be ignored in order to “find” spectrum for LPFM. NPRM, ¶ 44.

The CEMA study also indicates that LPFM may create new forms of interference. By crowding the FM band with new stations, the Commission will create a form of intermodulation (“IM”) interference among triads of equally spaced stations. Although the CEMA Study collected data only on stations spaced at 800 kHz, it predicts that IM interference may arise where the signal level of any one of three evenly spaced stations is more than 15 dB below either of the other two stations in the desired station’s protected coverage area.

h. The CEMA and NAB Studies Understate the Likely Effects of Interference.

Both the CEMA and NAB studies were conducted in the laboratory, not the field. They study ratios of carefully controlled “desired” and “undesired” signals. While real world conditions will, of course, bear some resemblance to laboratory conditions, they cannot be expected to be identical. In reality, “desired” signals are affected by a wide range of factors that attenuate signal strength and increase their vulnerability to interference. The CEMA and NAB studies thus tend to understate the effects of interference that will be caused by the proposed LPFM service.

i. No LPFM Service can be Considered Without Further Technical Study

The CEMA and NAB studies also indicate the necessity of future study before any LPFM service can be considered. As noted above, virtually all of the

assumptions about interference upon which the NPRM is based are inaccurate. Initiation of an LPFM service based upon these assumptions would seriously degrade signal quality throughout the FM band and would have a particular effect on NCE service. SRG therefore urges the Commission not only to re-examine its conclusion that an LPFM service based upon these assumptions is desirable, but to refrain from initiating any service until its assumptions can be tested by field studies that reflect the objective and subjective conditions under which listeners actually listen to FM radio.

Respectfully submitted,

STATION RESOURCE GROUP

By: 

John Crigler
Its Attorney

HALEY BADER & POTTS P.L.C.
Suite 900
4350 North Fairfax Drive
Arlington, VA 22203-1633
703/841-0606

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