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APR 27 1998

FEDERAL COMMUNICATIONS COMMISSION
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Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C.

Amendment of Part 73 of the Rules and Regulations to Establish Event Broadcast Stations	)	RM No. 9246
Petition for a Microstation Radio Broadcasting Service	)	RM No. 9208
Proposal for Creation of the Low Power FM (LPFM) Broadcast Service	)	RM No. 9242

CONSOLIDATED COMMENTS OF
USA DIGITAL RADIO, L.P.

USA Digital Radio Partners, L.P. ("USADR"), by its attorneys, hereby files these consolidated comments concerning the above-referenced petitions for rulemaking.[1] Although they contain discreet, unrelated proposals, these three petitions all seek the same Commission action: creation of a new, low power broadcast service in the existing AM and FM radio bands. As is explained below, USADR takes no position on the merits of any of these petitions. However, it urges the Commission to defer consideration of these proposals, and any other proposals which would affect the interference environment for existing AM and FM broadcasting, until the Commission has had the opportunity to establish rules and procedures for the introduction of digital AM and FM radio. This is necessary since any changes to the interference environment in the AM and FM bands resulting from the introduction of low power

[1] These consolidated comments are filed pursuant to three recent Public Notices. Report No. 2254 (released Feb. 5, 1998); Report No. 2262 (released March 10, 1998); and Report No. 2264 (released March 18, 1998). Although comments in RM 9208 were originally due thirty days after the February 5, 1998 Public Notice, the date for comments has been extended to April 27, 1998, consistent with the deadline in the other two proceedings.

radio may impair or eliminate the possibility of introducing digital AM and FM broadcasting in the United States.

A. Introduction

USADR is a partnership of CBS Corporation and Gannett Co., Inc. formed in 1991 to develop digital AM and FM broadcasting systems. At the time of its formation, USADR was tasked with the development of systems capable of permitting the introduction of digital broadcasting without disrupting the existing analog broadcasting environment. Since its inception, USADR has been developing In-Band On-Channel ("IBOC") AM and FM systems which allow the introduction of a digital AM or FM signal using the frequency currently assigned to analog broadcasters. IBOC technology will allow each AM and FM broadcaster to simultaneously broadcast an analog and digital signal in the same channel.

Since 1991, USADR has become synonymous with IBOC technology both in the United States and abroad. USADR has already invested in excess of $20 million in its ongoing technology development program, with additional investment continuing each day. It has built prototype AM and FM IBOC systems that were used to broadcast digital AM and FM programming at various times in Cincinnati, Chicago, Las Vegas, Los Angeles and New Orleans.

During the past seven years, USADR has conducted extensive channel characterization studies to fully understand the interference environment in the AM and FM bands. Based on this analysis, USADR has designed its AM and FM IBOC systems to permit the introduction of a digital signal within the FCC's existing protection contours for analog AM and FM radio. These systems have been fully modeled, and USADR has conducted extensive simulations to determine system performance under a variety of interference conditions. Today, USADR is in the process

of implementing operational system transmitters and receivers. Laboratory and field tests are scheduled to commence in the second half of 1998.

USADR has been an active advocate of digital radio and IBOC technology in a variety of fora. USADR participated in the Commission's Digital Audio Radio Service ("DARS") rulemakings[2] and provided significant input on terrestrial digital radio. USADR representatives have participated in various working parties of the International Telecommunications Union and committees of CITEL with jurisdiction to study digital radio issues in the AM and FM bands. Moreover, USADR's technology development team has presented numerous technical papers on the USADR systems to a wide range of industry groups such as the National Radio Systems Committee, the National Association of Broadcasters, North American National Broadcasters Association, and Camara Nacional de la Industria de Radio y Television (CIRT), as well as to broadcasters in Canada, Latin America, Australia and Western Europe. USADR anticipates the submission of a petition for rulemaking to the FCC in 1998 requesting the initiation of a rulemaking proceeding to establish rules for the introduction of IBOC digital broadcasting in the United States.

The benefits of USADR's IBOC approach are self-evident. By creating a system which permits the introduction of a digital signal within emission limitations applicable to the analog AM or FM signal, USADR will be able to offer a low cost, frequency efficient and rational path for a transition from analog to digital broadcasting. IBOC systems will not require allocation of new spectrum for digital broadcasting. Simulcasting of analog and digital signals will permit listeners to continue to use existing analog radios during a transition period during which hybrid

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

(analog/digital) and eventually all-digital radios will be introduced into the marketplace. At the same time, introduction of IBOC will not require any changes in the channel position, coverage areas or program offerings of existing analog stations.

The flexibility and efficiency that only IBOC digital radio can offer, however, is not easily achieved. USADR has carefully engineered its system to maximize the potential for digital transmissions based on the existing analog broadcasting regulations. By closely adhering to the emission limitations and protection contours in place for analog broadcasting, USADR has been able, in essence, to extract all the remaining capacity out of the AM and FM bands. Any change in the existing interference environment, broadcasting parameters or protection requirements may render USADR's systems inoperable or require a lengthy and costly redesign effort. Due to the extremely high public interest in the prompt introduction of digital AM and FM broadcasting, USADR currently opposes any proposals that would change the interference environment for the AM or FM broadcasting bands until the FCC decides how digital radio will be introduced in the United States.

B. The Petitions

The three petitions before the Commission all advocate the creation of a new FM broadcast service which would introduce potentially thousands of new stations in the existing FM band.[3] These proposals discuss systems with transmitters ranging from 1 watt to 3 kilowatts. Although the petitioners discuss very small service areas, a detailed reading of the proposals

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[3] Although the Petitions in RM Nos. 9246 and 9208 advocate low power systems in both the AM and FM bands, the Mass Media Bureau has focused the discussion on low power FM systems. All of USADR's comments concerning the impact these systems would have on implementation of digital FM stations are equally applicable to AM.

reveals that the petitioners contemplate coverage of many miles in order to reach significant portions of or an entire community.

The Petition in RM 9242 explicitly calls for elimination of second-adjacent and third-adjacent interference restrictions in order to create a means to establish these new stations which could not comply with the full range of existing interference restrictions. The other two petitions seek access to dedicated AM and FM spectrum for this new service. Those petitions do not address compatibility with incumbent users.

C. USADR Opposes the Introduction of New Sources of Interference Caused By Low Power Radio in These Bands at This Time.

Until the parameters for digital radio are defined by the Commission, USADR opposes the introduction of new sources of interference caused by low power radio in the AM and FM band. Otherwise these new low power interferers may eliminate or delay the introduction of digital broadcasting in the United States. USADR has carefully engineered its systems to operate within the existing interference environment established by the Commission's Rules. Nonetheless, USADR acknowledges that until the Commission establishes interference criteria for IBOC radio, it is impossible to predict with certainty the interference environment which will exist during a transition period with simultaneous digital and analog broadcasting (hybrid) or in a subsequent all-digital era. Absent a definitive understanding of the interference environment and Commission adoption of technical rules for digital radio, it would be inappropriate for the Commission to authorize the introduction of low power radio into the AM and FM bands.

1. The Public Interest is Served by Promoting Digital Radio.

The introduction of digital AM and FM radio will serve the public interest and should be given the highest priority. As early as 1992, the Commission expressed its support for a transition to digital broadcasting.

> We continue to support efforts to implement terrestrial in-band [Digital Audio Radio Service] technology. We believe that existing radio broadcasters can and should have an opportunity to take advantage of new digital radio technologies.[4]

These views were based on the reality that other audio systems had embraced or were moving toward a digital medium. The introduction of compact discs and CD-ROM systems has changed the public's perception of the importance of digital. Since 1993, the FCC has implemented a transition plan for conversion to digital television and has licensed two satellite DARS proponents. Consumers have the opportunity to obtain digital audio over cable systems and on the Internet. In light of these developments, the need to upgrade AM and FM to ensure the continued viability of broadcast radio is more urgent today than five years ago.

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[4] *Amendment of the Commission's Rules with regard to the Establishment and Regulation of New Digital Audio Radio Services*, 7 FCC Rcd 7776, 7778 (1993).

2. <u>The Elimination of Second-Adjacent Channel Protection Requirements Will Prevent the Introduction of IBOC Digital Radio</u>.

USADR's systems are designed to provide digital service within the existing technical parameters set out in Part 73 of the Commission's rules. The USADR system designs reflect a balance between the need to provide robustness of the digital signal and a requirement of compatibility with existing analog services. To provide robustness, USADR engineered the system to ensure the digital signal can survive interference from existing analog broadcasts. At the same time USADR had to protect analog broadcasting, at least for a reasonable transition period.

To achieve the appropriate balance, USADR's system places low power digital carriers in the upper and lower sidebands of the analog transmissions. Figure 1 depicts the placement of the analog and digital signals in relation to the Part 73 emission limitation mask.

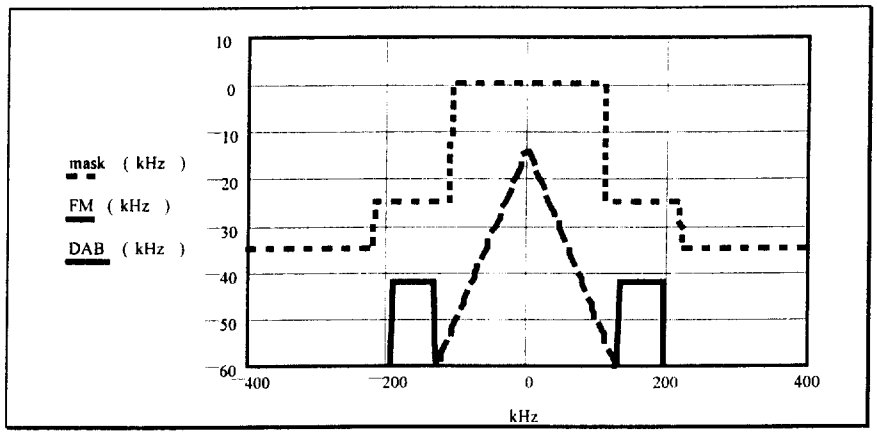

Figure 1. USADR FM System

The power of these digital carriers is set to provide the highest quality digital service without causing interference to the analog signal. This requirement to use low power levels leaves the digital signal vulnerable if there is interference that goes beyond the existing Part 73 emission limits, as would be the case under these three proposals.

The introduction of potentially numerous new second-adjacent interference sources surrounding an IBOC transmitter may have a devastating impact on digital radio. Pulse shaping of the digital waveforms reduces out-of-band emissions. Spectral regrowth, however, generated by non-linearities of transmitters, produces out-of-band emissions. The combined effects of pulse shaping and spectral regrowth produce out-of-band emissions at a level low enough for the digital signal to survive in the presence of up to 40 dB undesired to desired signal ratio. At ratios greater than 40 dB, out of band emissions will cause a loss of one of the digital sidebands. Loss of one digital sideband translates into significantly lost robustness and may make digital radio unviable in a number of instances. In the case of interference to both digital sidebands, the entire digital signal is lost.

Acceptance of the low power FM proposals based on eliminating second-adjacent interference protection will create the potential for total loss of the digital signal in a manner that will not happen under the existing rules. If such a rule change were implemented, IBOC digital radio would not be economically viable and digital radio may be preempted.

3. New Secondary Services Will Complicate a Transition to Digital Radio.

The low power AM and FM services being proposed are analogous to the low power television ("LPTV") service, which has secondary service status. In the case of television, the Commission has repeatedly recognized the transition to digital television will displace existing

LPTV licensees.[5] Due to their incumbent status, however, LPTV licensees have been able to request accommodation in the transition to digital television. For example, the Commission has allowed displaced LPTV licensees to apply for alternative channels.

The creation of low power AM or FM stations during the transition to digital radio will create similar complications for AM and FM services. As incumbent licensees, low power radio operators may have to be accommodated in some fashion. This will place administrative demands on the Commission's resources and delay the development of rules for digital radio broadcasting. The prudent alternative is to freeze consideration of low power AM and FM until the Commission can analyze the interference environment that will exist with digital radio.

D. A Freeze on New Low Power AM and FM Stations is Consistent with Past Practice.

FCC imposition of a freeze on the introduction of a new service for low power AM and FM stations would be consistent with past practice involving broadcast regulation. In conjunction with the development of High Definition Television ("HDTV"), the Commission imposed several freezes intended to ease the transition to HDTV. A similar approach is appropriate for radio.

In 1987, the Commission imposed a freeze on amendments to the TV Table of Allotments for the 30 largest TV markets in order to "preserve the future possibility" of allotting spectrum for digital TV.[6] This was later extended to impose a freeze on all proposed amendments to the

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5 *See e.g. In the Matter of Advanced Television Systems and Their Impact Upon the Existing Television Broadcast Service*, MM Docket No. 87-268, *Memorandum Opinion and Order on Reconsideration of the Sixth Report and Order* (Feb. 17, 1998).

6 52 Fed. Reg. 28346 (July 29, 1987).

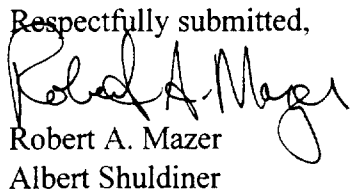
TV Table of Allotments and applications for new NTSC stations.[7] The Commission explained these steps were necessary "to preserve the available spectrum for use by new DTV stations" during a transition from analog to digital broadcasting.[8] The freeze USADR is advocating for radio will have the same benefits for the public interest.

E. Conclusion

USADR is advocating a freeze on consideration of the low power AM and FM service in order to advance the development of digital radio and preserve the interference environment required to introduce IBOC. The net result will be to put off the creation of a new service for which the Commission has not yet made a finding of public interest benefit. This is a much less intrusive step than the freezes imposed in other services such as that imposed on incumbent licensees to accommodate the introduction of digital television.

For the foregoing reasons, USA Digital Radio, L.P. requests that the Commission refrain from instituting a rulemaking proceeding on low power FM services at this time.

Respectfully submitted,



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Dated: April 27, 1998

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7 *In the Matter of Advanced Television Systems and Their Impact Upon the Existing Television Broadcast Service*, 11 FCC Rcd 10968 (1996).

8 *Id.* at para. 62.

CERTIFICATE OF SERVICE

I hereby certify that a true and correct copy of the foregoing Consolidated Comments of USA Digital Radio, L.P. was sent by first-class mail, postage prepaid, this 27th day of April, 1998, to each of the following:

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