

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

In the Matter of	)	IB Docket No. 95-91
	)	GEN Docket No. 90-357
	)	RM No. 8610
Establishment of Rules and Policies for the	)	PP-24
Digital Audio Radio Satellite Service in the	)	PP-86
2310-2360 MHz Frequency Band	)	PP-87

**REPORT AND ORDER  
MEMORANDUM OPINION AND ORDER  
AND FURTHER NOTICE OF PROPOSED RULEMAKING**

**Adopted: March 3, 1997**

**Released: March 3, 1997**

Comment Date: May 2, 1997  
Reply Comment Date: May 23, 1997

By the Commission: Chairman Hundt issuing a statement; Commissioner Ness approving in part, concurring in part, and issuing a statement; Commissioner Chong issuing a statement.

**TABLE OF CONTENTS**

	Paragraph
I. INTRODUCTION .....	1-4
II. BACKGROUND .....	5-6
III. ISSUES TO BE RESOLVED	
A. Public Interest Benefits and Economic Impact .....	7-9
1. Public Interest Benefits .....	10-17
2. Impact on Terrestrial Radio Listenership .....	18-21
3. Impact on Terrestrial Radio Advertising Revenues .....	22-25
4. Effects on Terrestrial Stations' Profitability and Viability .....	26-34
5. Related Challenge to DARS Allocation .....	35-38
B. Licensing Plan	
1. Licensing Options for Satellite DARS Spectrum .....	39-41
2. Spectrum Requirements and Economic Viability .....	42-50
3. International Coordination Obligations .....	51-58
4. Pioneer's Preference Requests .....	59-61
5. Cut-off Issues .....	62-71
6. Specific Frequency Assignments and Satellite DARS Competition ...	72-78
7. Licensing Conditions .....	79-80
C. Service Rules for Satellite DARS	
1. Classification of Service .....	81-84

2. Public Interest Obligations .....	85-93
3. Ancillary Services .....	94-96
4. Technical Qualifications	
<i>Service Area</i> .....	97-99
<i>Service Link Margin</i> .....	100-101
<i>Receiver Inter-operability</i> .....	102-107
<i>Data Compression Rates</i> .....	108-109
5. Milestone Qualifications and Reporting Requirements .....	110
6. License Term .....	111
7. Technical Rules .....	112
<i>PFD limits</i> .....	113-114
<i>Out-of-band emissions</i> .....	115-118
<i>Telemetry beacons</i> .....	119-121
<i>Cross polarization</i> .....	122-123
D. Modification of Part 87 .....	124-126
E. Satellite DARS Feederlink Networks .....	127-137
F. Further Notice of Proposed Rulemaking on Terrestrial Repeaters .....	138-142
G. Rules for Auctioning Satellite DARS Licenses .....	143
1. Authority to Conduct Auctions .....	144-152
2. Competitive Bidding Design and Bidding Procedures .....	153-162
3. Procedural and Payment Issues .....	163-169
4. Safeguards .....	170-173
5. Designated Entity Provisions .....	174-176
IV. CONCLUSION .....	177
V. ORDERING CLAUSES .....	178-189

APPENDIX A: Amendments to 47 C.F.R. Part 25 and Part 87 of the Commission's Rules

APPENDIX B: Final Regulatory Flexibility Analysis

APPENDIX C: Proposed Amendments to 47 C.F.R. Part 25 of the Commission's Rules

## I. INTRODUCTION

1. Digital Audio Radio Service by satellite (satellite DARS) promises to provide continuous nationwide radio programming with compact disc (CD) quality sound. Motorists on the highways of America may soon be able to tune in to one of many satellite DARS channels offering a particular format without interruption or fading as they travel across the United States. This new service also has the potential to increase the variety of programming available to the listening public. Providers may, for example, offer niche channels that would serve listeners with special interests. Satellite DARS has the technological potential to serve listeners in areas of the country that have been underserved. While, to some extent, DARS will compete with local radio, we anticipate that it will also complement terrestrial radio.

2. The Commission issued its Notice of Proposed Rulemaking (Notice) in this proceeding in June 1995.<sup>1</sup> After carefully reviewing the comments we have concluded that it is in the public interest to license satellite DARS. Opponents of the new service have not shown that its potential adverse impact on local radio service outweighs its potential benefits. Based on the record, we also find that an economically viable satellite DARS system will require at least 12.5 MHz of spectrum.

3. Although we originally allocated 50 MHz of spectrum for satellite DARS in the S-band (2310-2360 MHz), recently enacted legislation directed the Commission to reallocate 25 MHz of that spectrum (and an adjacent 5 MHz) for any services consistent with the allocation table and associated international agreements and to assign licenses for that 25 MHz by auction.<sup>2</sup> Accordingly, in this proceeding we will designate only two licenses for satellite DARS in the 25 MHz that remains in the part of the S-band previously allocated for satellite DARS. We will award both satellite DARS licenses using competitive bidding to resolve mutual exclusivity among the current applicants, under the auction rules we adopt today. We also adopt service rules for satellite DARS licensees, including milestone requirements. Finally, we seek further comment on the proposed use of terrestrial repeaters in conjunction with satellite DARS systems.

---

<sup>1</sup> Establishment of Rules and Policies for the Digital Audio Radio Satellite Service in the 2310-2360 MHz Frequency Band, 11 FCC Rcd 1 (1995)(Notice).

<sup>2</sup> See Omnibus Consolidated Appropriations Act, 1997, P.L. 104-208, 110 Stat. 3009 (1996) (Appropriations Act). This legislation directs that two band segments be reallocated and auctioned: 2345-2360 MHz and 2305-2330 MHz (this includes 5 MHz -- 2305-2310 MHz -- not previously allocated for DARS). The Commission adopted a Report and Order implementing this legislation on February 19, 1997. Amendment of the Commission's Rules to Establish Part 27, the Wireless Communications Service (WCS), GN Docket No. 96-228, FCC 97-50 (released February 19, 1997) (WCS Order).

4. Although three of the four DARS applicants applied for pioneer's preferences, we do not need to decide the matter. Following unanimous recommendations from a panel of satellite experts that no pioneer's preferences be granted for satellite DARS, all three applicants have withdrawn their applications.<sup>3</sup>

## II. BACKGROUND

5. We will summarize the background in this proceeding, which is described in greater detail in the Notice and in prior orders. Satellite CD Radio, Inc. (CD Radio) initiated this proceeding in 1990 by filing a petition to allocate spectrum for satellite DARS and an application to provide the service. In February 1992, the World Administrative Radio Conference (WARC-92) adopted international frequency allocations for Broadcasting Satellite Service (BSS) (sound)(the international term for satellite DARS).<sup>4</sup> Internationally, this band is also allocated on a primary basis to radiolocation services and fixed and mobile terrestrial services. In November 1992, the Commission established a proceeding to allocate satellite DARS spectrum domestically and announced a December 15, 1992 cut-off date for satellite DARS license applications to be considered with CD Radio's. Of the six license applicants that filed before the cut-off; four remain: CD Radio, Primosphere Limited Partnership (Primosphere), Digital Satellite Broadcasting Corporation (DSBC) and American Mobile Radio Corporation (AMRC). In January 1995, the Commission allocated the 2310-2360 MHz band for satellite DARS on a primary basis.<sup>5</sup>

6. In our June 1995 Notice, we posed many questions about satellite DARS. We requested detailed information on the new service's potential economic impact on terrestrial broadcasters.<sup>6</sup> The Notice asked about the most appropriate service design and regulatory classification.<sup>7</sup> We sought comment on what public interest obligations to impose<sup>8</sup> and

---

<sup>3</sup> See Public Notice, Report No. SPB-67 (released November 19, 1996); letter from CD Radio dated November 22, 1996; letter from DSBC dated December 3, 1996; letter from Primosphere dated December 5, 1996.

<sup>4</sup> International Telecommunication Union, Final Acts of the World Administrative Radio Conference (Malaga-Torremolinos, 1992). The Conference allocated the 2310-2360 MHz band to the U.S. in Region 2. See discussion in Amendment of the Commission's Rules with Regard to the Establishment and Regulation of New Digital Audio Radio Services, 10 FCC Rcd. 2310 (1995) (Allocation Order) at ¶ 26.

<sup>5</sup> Allocation Order, supra. Primary services are protected from harmful interference from secondary services and from unacceptable interference from stations that are co-primary to which frequencies may be assigned at a later date.

<sup>6</sup> Notice, ¶¶ 10-20.

<sup>7</sup> Notice, ¶¶ 21-26.

queried whether providers should be permitted to offer ancillary services.<sup>9</sup> The Notice proposed three possible licensing options and rules to allow expeditious licensing after an option was chosen.<sup>10</sup> After the Notice was released, the Appropriations Act directed the Commission to reallocate spectrum at 2305-2320 MHz and 2345-2360 MHz for all services consistent with international allocations and to award licenses in that portion of the band using competitive bidding.<sup>11</sup> As a consequence, the licenses designated pursuant to this order will be in the spectrum between 2320 and 2345 MHz.<sup>12</sup>

### III. ISSUES TO BE RESOLVED

#### A. **Public Interest Benefits of Satellite DARS and Its Economic Impact on Terrestrial Broadcaster Service.**

7. In the Notice and in prior orders, we discussed the benefits of satellite DARS proffered by the proponents. These include introduction of a new radio service to the public, a national distribution of radio programming to all areas, including underserved and unserved areas and population groups, the creation of jobs and the promotion of technological development in the satellite and receiver industries, and the improvement of U.S. competitiveness in the international economy.<sup>13</sup> We sought comment on our tentative conclusion that satellite DARS offers substantial public benefits.<sup>14</sup>

8. We also invited detailed comment and information on the economic impact of satellite DARS on existing radio broadcasters.<sup>15</sup> We acknowledge the high level of concern that terrestrial broadcasters have expressed about satellite DARS. In addition to three

---

<sup>8</sup> Notice, ¶¶ 27-28.

<sup>9</sup> Notice, ¶¶ 29-30.

<sup>10</sup> Notice, ¶¶ 31-40.

<sup>11</sup> See note 2, supra.

<sup>12</sup> See Notice of Proposed Rulemaking, Amendment of the Commission's Rules to Establish Part 27, the Wireless Communications Service (WCS Notice), WT Docket No. 96-228 (released November 12, 1996).

<sup>13</sup> Notice, ¶¶ 2,5,12; Allocation Order, ¶ 22.

<sup>14</sup> Notice, ¶ 12.

<sup>15</sup> Id., ¶¶ 11, 13-20.

associations of broadcasters, more than one hundred terrestrial radio stations owners or operators have submitted individual letters opposing satellite DARS.<sup>16</sup>

9. Recognizing the significant public value of terrestrial radio service, we must weigh the potential public interest benefits of satellite DARS against its potential adverse impact on terrestrial radio. This impact is relevant "to the extent that [it] would predictably lead to serious loss of important services to consumers, taking into account the potential for future enhancements of terrestrial broadcasting by the introduction of new technologies."<sup>17</sup> In the Notice we emphasized that, pursuant to Section 7 of the Communications Act, opponents of a new technology, such as satellite DARS, bear the burden of demonstrating that it is inconsistent with the public interest.<sup>18</sup> We have previously noted that, "The public interest in this regard is the provision of services of value to the listening public and includes the protection of competition, not competitors."<sup>19</sup>

#### 1. Public Interest Benefits

10. Satellite DARS can offer high quality radio signals to listeners who currently receive few terrestrial radio signals.<sup>20</sup> Commenters disagree concerning how many people are underserved by local radio. One respondent submitted a county-based analysis of listening diaries contending that only 6100 people in the U.S. aged 12 and over receive less than six radio signals.<sup>21</sup> However, that study defined a station as "covering" a U.S. county if even one diary recorded having received its signal. Given that AM signals travel long distances at night and that such skywave signals fluctuate significantly even when useable, we believe that such diary evidence may not accurately indicate the size of the population that receives radio signals.

---

<sup>16</sup> Entertainment Co. Inc, Mt. Wilson FM Broadcasters, Noble Broadcast Group, and Susquehanna Radio Corp. provided relatively extensive comments. Ashland Broadcasting Co., Bogue Chitto Communication Co., Coast FM Community Pacific Broadcasting Co., The Cromwell Group, Inc., Mr. Curtis of the Curtis Media Group, Hanson Communications, Knox Broadcasting Co., Paul Bunyan Broadcasting Co., Sound Broadcasters, Inc., and many others also provided comments.

<sup>17</sup> Notice, ¶ 11.

<sup>18</sup> Id.

<sup>19</sup> Id.

<sup>20</sup> The record indicates the public's interest in high quality audio. See Comments of Dolby Laboratories, p. 2; Comments of WPFW 89.3 FM; Comments of Dignet Communications Inc.

<sup>21</sup> NAB Comments, Attachment 3.

11. One study indicates that 722,102 persons (0.3% of U.S. population) are covered by no FM stations, 2.4 million persons (1.0% of U.S. population) are covered by one or fewer FM stations, and 22 million persons (8.9% of the U.S. population) are covered by five or fewer FM stations.<sup>22</sup> The NAB criticized this study, however, because it does not include AM radio stations, even though more than 40% of all radio stations are AM stations and even though AM signals often travel much further than FM signals at night.<sup>23</sup> AM signals, due to limited bandwidth and greater susceptibility to noise and interference, do not provide as high fidelity sound as FM signals.<sup>24</sup> Thus, FM signal quality may be closer to the quality of that satellite DARS would provide. While we are unable to estimate an exact figure for the number of potential radio listeners who are currently underserved, we find that the record is sufficient to indicate that a significant number of persons in the U.S. receive few high quality audio signals. Satellite DARS offers the substantial benefit of providing these persons with many additional high quality audio signals.

12. It is our view that satellite DARS will particularly benefit communities where terrestrial broadcast service is less abundant. The record shows that counties with smaller populations have fewer radio stations and that smaller markets have fewer radio formats.<sup>25</sup> The 33.2% of the U.S. population living in the top ten radio markets have access to an average of 26 formats, while the 18% of the U.S. population living in radio markets ranked 100-261 have access to an average of only 14.9 formats.<sup>26</sup> Persons living outside these 261 ranked markets are likely to have still fewer radio formats available. Given that each satellite DARS applicant proposes to provide 20 or more channels nationwide, satellite DARS would significantly reduce the proportional discrepancy in the geographic distribution of radio service.

13. Moreover, satellite DARS can provide new services that local radio inherently cannot provide. With its national reach, satellite DARS could provide continuous radio

---

<sup>22</sup> Jules Cohen study, Primosphere Comments, Exhibit 7.

<sup>23</sup> NAB Reply Comments, pp. 7-8.

<sup>24</sup> The Commission, among others, has identified these problems and made significant attempts to correct them. See, e.g., Review of the Technical Assignment Criteria for the AM Broadcast Service, MM Docket No. 87-267.

<sup>25</sup> NAB Comments, Attachments 3 and 4, and Primosphere Reply Comments, Exhibit 3.

<sup>26</sup> CD-Radio Reply, Appendix A, p. 27.

service to the long-distance motoring public,<sup>27</sup> persons living in remote areas, and may offer new forms of emergency services.<sup>28</sup>

14. Satellite DARS may also be able to foster niche programming because it can aggregate small, nationally dispersed listener groups that local radio could not profitably serve.<sup>29</sup> Commenters suggest that satellite DARS could fulfill a need for more educational programming,<sup>30</sup> rural programming,<sup>31</sup> ethnic programming,<sup>32</sup> religious programming,<sup>33</sup> and specialized musical programming.<sup>34</sup> One nationally representative survey found that 10-27% of the respondents indicated a strong interest in accessing programming formats that are not

---

<sup>27</sup> See comments from Owner-Operator Independent Drives Ass'n., Inc.; Recreational Vehicle Dealers Association; Recreational Vehicle Industry Association; and Winnebago-Itasca Travelers. Similarly, boaters involved in long-distance travel -- either away from shore or along the shore -- could receive continuous radio service from satellite DARS. See comments of J Boats Inc.

<sup>28</sup> See Digital Satellite Broadcasting Corp. Comments, p. 20; Comments of the USDA Forest Service National Weather Program; and Comments of Sat Tech Systems, Inc.

<sup>29</sup> See CD Radio Comments, p. 48; Direct Satellite Broadcasting Corp. Comments p. 25.

<sup>30</sup> See, e.g., comments of David G. Gueulette; Access Innovations Inc.; American Council on Rural Special Education; American Association for Adult and Continuing Education; Association of American Geographers; Learning System Architects; Major Broadcasting Co.

<sup>31</sup> See, e.g., comments from Maine Farm Bureau Association; Wyoming Farm Bureau Federation; NIALL Enterprises; National Parks and Conservation Association.

<sup>32</sup> See, e.g., comments from National Asian American Telecommunications Association; Fiesta Italiana; New York Chinatown Senior Citizen Center; Dialog and Confluence (Vietnamese magazine publisher); Foundation for the Advancement of Hispanic Americans; Professor Arthur Hertzberg (past president of the American Jewish Congress); Italian Industries Association; Multi-Media Computer Communications Inc. (services for Koreans).

<sup>33</sup> See, e.g., comments from American Baptist Churches; The United Church of Christ; and the Radio and Television Commission of the Southern Baptist Convention.

<sup>34</sup> See, e.g., comments from American Council for the Arts; Minnesota Public Radio; and KJAZZ Satellite Radio.

widely available.<sup>35</sup> Evidence from a survey by the National Endowment for the Arts suggests that niche marketing opportunities exist for some of the less popular radio formats.<sup>36</sup>

15. We believe that licensees will have an incentive to diversify program formats and thereby provide valuable niche programming. We recognize that satellite DARS licensees are likely to provide the programming that is most profitable.<sup>37</sup> Nonetheless, given that we anticipate each satellite DARS licensee will control more than 20 channels, each licensee will have an incentive to diversify programming so that one channel will not directly compete with another channel that the licensee itself controls.<sup>38</sup> We have noted the importance of this incentive, particularly with respect to entertainment programming, in other proceedings.<sup>39</sup>

16. In the Notice, we tentatively concluded that implementation of satellite DARS would foster the development of new technology. NAB has argued that U.S. implementation of satellite DARS is not necessary to advance satellite DARS technology.<sup>40</sup> While this may be true, we nevertheless believe that U.S. implementation, by providing large-scale market-based consumer feedback and increased economic incentives for further technological advances, would foster faster and more customer oriented development.

17. We conclude that licensing operators to provide satellite DARS will yield substantial benefits to consumers. We now evaluate whether opponents have met their burden of showing that these benefits are outweighed by the potential harm to listeners from potential loss of terrestrial service resulting from increased competition from satellite DARS.

---

<sup>35</sup> See DSBC Comments at 18-9.

<sup>36</sup> While "Mood/Easy Listening" is the favorite of 9% of respondents, only 4.4% of radio stations (excluding talk format) have that format. Similarly, Classical is the favorite of 6% and Jazz is the favorite of 5% of the persons surveyed, while only 2.7% and 1.1% of radio stations, respectively, have these formats. See Primosphere Comments, Exhibit 5 (article in American Demographics reviewing National Endowment of the Arts Survey, conducted by the U.S. Census Bureau). The format counts are based on data from the 1995 M Street Directory. These underserved consumers may be in smaller markets where, given the small listener base, it is not profitable for local stations to play those consumers' favorite formats.

<sup>37</sup> See NAB Comments at 43, and NAB Reply Comments at 3-6. See infra, ¶15.

<sup>38</sup> See CD Radio Comments at 49-50, Primosphere Comments, Confessions at 10-1.

<sup>39</sup> Review of the Commission's Regulations Governing Television Broadcasting, 10 FCC Rcd 3524, 3550-51 (1995); Revision of Radio Rules and Policies, 9 FCC Rcd 7183, 7186 (1992).

<sup>40</sup> NAB comments at 9-10.

## 2. Impact on Terrestrial Radio Listenership

18. In the Notice, we sought comment on the effect of satellite DARS on terrestrial radio listenership.<sup>41</sup> We explicitly requested commenters to consider the characteristics of satellite DARS that distinguish it from terrestrial radio. Commenters often failed to do so. Instead, several commenters implicitly assumed that satellite DARS' effect on local radio would be similar to the effect from competition generated by new local radio stations.<sup>42</sup> Given the distinguishing features of satellite DARS -- it is a national service, it will require new and relatively costly equipment, and it may be offered via paid subscription -- we find that the effect of satellite DARS on terrestrial radio is likely to be significantly smaller than the effect of additional terrestrial radio stations.

19. For example, one commenter includes a consumer survey which suggests that satellite DARS would cause a decline of 11.6% in terrestrial radio listenership.<sup>43</sup> The appropriate interpretation of this figure is not clear, however, because the survey did not take into account the potential cost to the consumer of satellite DARS equipment,<sup>44</sup> and the subscription fee included in the survey was only half of what one satellite DARS applicant (CD Radio) has proposed.<sup>45</sup> Moreover, the survey failed to consider the possible introduction of terrestrial DARS in assessing consumer interest in satellite DARS.<sup>46</sup> For these reasons we

---

<sup>41</sup> Notice, ¶ 14.

<sup>42</sup> NAB Comments, Attachment 9, Kagan Report, focused analysis on the effect of additional local stations under Docket 80-90. See also Reply Comments of Mount Wilson FM Broadcasters, Inc. (filed Oct. 12, 1995) at 3, Reply Comments of Noble Broadcast Group, Inc. (filed Oct. 13, 1995) at 2, Comments of New Jersey Broadcasters Association (filed September 15, 1995) at 2, and Comments of Bonneville International Corporation (filed September 15, 1995) at 2.

<sup>43</sup> NAB Comments, Attachment 5 "Estimating the Audience Diversion from Broadcast Radio by the Introduction of Satellite Digital Audio Radio Service (DARS)," July 1995, Research and Planning Department, National Association of Broadcasters. But see, CD Radio Reply Comments, Appendix A at 12-3.

<sup>44</sup> A satellite DARS applicant indicated that satellite DARS consumer equipment would cost \$300. See Reply Comments of CD Radio at 30. Although the basis for this estimate is not set forth, it appears to be a simple point estimate. We expect that receiver cost might fall over time as production volumes increase.

<sup>45</sup> Id.

<sup>46</sup> We acknowledge, however, that the prospects for early implementation of terrestrial digital service are problematic. See Summary of FM Band IBOC Laboratory Test Results, (Thomas Keller, Chairman DAR Testing Working Group B), NAB 50th

believe that this survey may overestimate the likely decline in terrestrial radio listenership. And yet even in this survey 80% of respondents indicated that they would not reduce the time they spend listening to terrestrial radio if satellite DARS was available. However, we realize that surveys of predicted consumer response to a new and untried service may be somewhat unreliable.

20. By analogy, the diffusion of other new services and technologies may provide valuable perspective on the time period in which satellite DARS' may affect terrestrial radio listenership. In 1994, six years after their introduction, CD players were in just 3.2 percent of all automobiles.<sup>47</sup> This experience is recent, involves high-quality audio service and roughly comparable equipment costs, and relates to automobiles, perhaps the most likely market for satellite DARS receivers. On the other hand, for the first few years after CD players' introduction there were significant technical problems with their operation in automobiles, and CD players are less convenient to operate than radios. These factors may have reduced the rate at which CD players were installed in cars. Nonetheless, CD players offer a useful example by which to evaluate the penetration profile for satellite DARS receivers. Given anticipated satellite launch dates for satellite DARS applicants (1998-1999) and the example of the diffusion of CD players, we believe it is reasonable to project that by about 2005 the over-all penetration rate of satellite DARS receivers in radio listening environments may not be significantly greater than 4%.

21. Estimating listening time diversion depends on the share of listening time allocated to satellite DARS when the listener has a choice between satellite DARS and terrestrial radio. Drawing an analogy with the diffusion of cable services indicates that established programming loses audience share relatively slowly. In 1984, about a decade after the introduction of premium cable services and the development of 24 to 36 channel cable TV systems, cable channels attracted 14% of television viewing time. After another decade, the share of cable channels in television viewing time rose to 30%.<sup>48</sup> An important weakness in this analogy is that the difference between cable programming and network programming during this period is probably significantly greater than will be the difference between satellite DARS programming and terrestrial radio programming. Nonetheless, we believe that owners of satellite DARS receivers will continue to allocate a significant share of their listening time to terrestrial radio in order to hear music or news of local interest.<sup>49</sup> Even with rapid, further

---

Annual Broadcast Engineering Conference, 1996 Proceedings.

<sup>47</sup> CD Radio Comments, Appendix A (Lilley Study), p. 5.

<sup>48</sup> See Primosphere Comments, Appendix A (MTA Study) Table 2.3, p. 50. The share of TV households that cable passed in 1984 was 70%, in 1994, 96%. Figure 2.3.

<sup>49</sup> As noted above, 80% of respondents to a national survey indicated that they would not reduce the time they spent listening to terrestrial radio if satellite DARS was available. See supra, ¶ 19.

penetration of satellite DARS receivers, we expect that satellite DARS' share of radio listening time will grow relatively slowly over decades.

### 3. Impact on Terrestrial Radio Advertising Revenues

22. In the Notice, we asked parties to consider advertising revenues that terrestrial radio might lose because of satellite DARS. The record indicates two possible causes of terrestrial radio revenue loss: competition with satellite DARS for advertising dollars and competition with satellite DARS for listeners' attention.

23. While we recognize that satellite DARS has significant competitive advantages in offering advertising to a national audience with satellite DARS receivers, several factors may limit the possible significance to terrestrial radio of such additional competition. First, at this time, only one out of the four satellite DARS applicants has indicated an intention to implement its system on a non-subscription, advertiser-supported basis.<sup>50</sup> Second, a large share of the national radio audience is not likely to have satellite DARS receivers, at least for a significant period of time.<sup>51</sup> Third, national advertising revenue amounts to only 18% of terrestrial radio advertising revenue and is on average less important for small-market stations than for large-market stations.<sup>52</sup> Local advertising revenue is much more important than national advertising revenue for terrestrial radio's viability and prevalence, and, at this time, we have no evidence that satellite DARS would be able to compete for local advertising revenue.

24. More important to terrestrial radio is possible competition with satellite DARS for listener attention because this new offering could reduce the size of the local listening audience available for terrestrial radio stations to sell. We recognize that a decrease in the audience size could lead to some reduction in terrestrial station revenues. As discussed above, however, we believe the reduction would be modest, although the record leaves room for significant uncertainty.<sup>53</sup>

---

<sup>50</sup> The Kagan Study, p. 5, provides a summary of the applicants' plans. However, nothing we do in this Report and Order limits the remaining applicants to providing only subscription service, so it is impossible to predict whether some or all applicants might eventually provide advertising supported services.

<sup>51</sup> See supra, ¶ 21.

<sup>52</sup> See Kagan Study, p.p. 7, 19.

<sup>53</sup> As we noted in the Notice, ¶ 16, an additional uncertainty is the effect of a reduction in local terrestrial radio listenership on the price of local radio advertising. Some commenters have argued that such a reduction in the supply of listeners would cause the price of local radio advertising to rise. See Comments of CD, Appendix A (Lilley Study) pp. 30-1, and Reply Comments of CD Radio, Appendix A (Peterman Study),

25. Commenters have not fully analyzed the relationship between reductions in listenership and reductions in revenue.<sup>54</sup> We do not necessarily agree with those commenters who assert that terrestrial radio station revenue will fall one-for-one with any fall in listenership. Because the price of local radio advertising may rise, the effect on local radio revenue may be smaller than the effect on listenership. However, regardless of the precise relationship, we do assume that a decrease in listenership will lead to a decrease in advertising revenues, if other variables are held constant.

#### 4. Effects on Terrestrial Stations' Profitability and Viability

26. In the Notice, we asked questions about the impact of satellite DARS on the financial viability of local broadcast stations. In general, the Commission encourages competition for the provision of telecommunications services wherever possible and removes barriers for new competitors. Commenters differ sharply on the effect of satellite DARS on the profitability of terrestrial stations, with estimates of the reduction in terrestrial stations' profitability spanning 2.1-3.5% to 52%-122%.<sup>55</sup> The wide range of these estimates do not allow us to judge the effect of satellite DARS on terrestrial stations' profitability. The Kagan Study, by focusing on historical indicators of revenue and profitability and not considering the time path for satellite DARS diffusion, likely overestimates the potential impact of satellite DARS on terrestrial stations profitability. The MTA Study's audience diversion figures are lower than what we believe, and we question the relevance of their use of the ratio of satellite DARS receiver owners to the total U.S. population, given that segments of the population, such as infants, are not potential satellite DARS owners. We also find their revenue loss projections to be unsubstantiated and unconvincing.

27. The record supports a finding that the impact of satellite DARS would likely be greater on small-market terrestrial stations than large-market terrestrial stations. This result is not surprising because it is likely that the introduction of a 30-channel satellite DARS system

---

pp. 8-10. See also TV listener/revenue example, Lilley Study, p. 6.

<sup>54</sup> See Comments of the NAB, p. 27, Attachment 1 (Strategic Policy Research Study) pp. 36-8, Attachment 5 (Audience Diversion Study), p. 11. These studies do not distinguish between a reduction in a radio station's local listenership from the introduction of new local radio stations (supply side fragmentation) and a reduction in the supply of local radio listeners to local advertisers from satellite DARS audience diversion. Comments of CD Radio, Appendix A (Lilley Study), pp. 30-1 explains why assuming that advertising revenue falls one-for-one with listenership decline is likely to significantly overstate the effect. See also TV example, Id. p. 6.

<sup>55</sup> For the first range of figures, see MTA Study, Table 1.8; for the second range of figures, see Kagan Study, Table 4.

could divert a larger share of the audience in a market with only 6 stations than in a market with 60 stations. Nonetheless, the record does not establish that any predicted reduction in station profitability would harm overall station viability.

28. In fact, the record suggests that profitability figures may be a weak indicator of radio station viability. The wide range in the audience size distribution for existing radio stations suggests that most radio stations could remain viable given plausible audience reductions due to satellite DARS.<sup>56</sup> Despite evidence that a large percentage of radio stations are experiencing losses,<sup>57</sup> there is also evidence that overall the industry is very healthy. The value of radio station purchases in 1996 was 315% higher than in 1995 and radio station values as a multiple of cash flow also rose sharply.<sup>58</sup> Factors such as debt financing and start-up costs may explain why radio stations would stay in business while reporting losses.<sup>59</sup>

29. Our concern about licensing satellite DARS focuses on its impact on the provision of locally oriented radio service. Satellite DARS proponents argue that the ability to offer local content will give terrestrial broadcasters a competitive advantage.<sup>60</sup> Terrestrial broadcasters argue that providing local content is a public service that depends, in effect, on cross-subsidization from more profitable programming.<sup>61</sup>

30. We conclude that the record lacks systematically sampled, quantitative evidence about the listening time, revenue base, and profitability of local content. Nonetheless, if local content were relatively unprofitable for every station, one would expect competition among terrestrial stations to result in minimal local programming on most stations. Yet the record indicates that such analysis is not necessarily accurate; despite vigorous competition among

---

<sup>56</sup> CD Radio Reply Comments, Appendix A (Peterman Study) at 18-21.

<sup>57</sup> See NAB Comments, Att. 14 (Miller, Kaplan, Arase) Exhibit A, showing that 49% of radio stations surveyed lost money in 1994. See also Att. 13 (Fratik), which states that in 1991, "half of all AM fulltime stand alone stations lost more than \$19,000, half of all FM stand alone stations lost more than \$10,367, and half of all AM/FM combos lost more than \$15,978. Since 1991 was a recession year, profitability in that year is likely to have been lower than in other years.

<sup>58</sup> Broadcasting and Cable, February 3, 1996 at 18-19.

<sup>59</sup> CD Radio Comments, InContext Study at 15.

<sup>60</sup> American Mobile Radio Reply at 6-7; CD Radio Reply, pp. 31-33; Digital Satellite Broadcasting Reply, pp. 29-32; Digital Satellite Broadcasting Comments, pp. 23-24.

<sup>61</sup> NAB Reply at 24; Mt. Wilson FM Broadcasters Comments; Noble Broadcast Reply Comments, p. 2; Bonneville International Corp, p. 2; WBCH Comments.

stations,<sup>62</sup> some stations provide much local programming, while others provide relatively little.<sup>63</sup> Competition from satellite DARS may create incentives for at least some terrestrial stations to increase their emphasis on local programming in order to attempt to differentiate their service from satellite DARS. It is unclear the degree to which that might affect overall station profits.

31. In sum, although healthy satellite DARS systems are likely to have some adverse impact on terrestrial radio audience size, revenues, and profits, the record does not demonstrate that licensing satellite DARS would have such a strong adverse impact that it threatens the provision of local radio service.

32. We also note that revenue of terrestrial radio is projected to grow at a real (inflation adjusted) rate of about 4% per year.<sup>64</sup> Such projected revenue should mitigate, at least to some extent, the eventual impact on terrestrial stations of satellite DARS. We also note that recently, the Commission implemented provisions of the Telecommunications Act of 1996 and repealed all terrestrial radio national ownership limits and significantly relaxed local ownership limits.<sup>65</sup> These changes should lead to reduced operating costs and increased profits for terrestrial station owners that take advantage of the new rules. We expect any possible impact of satellite DARS on terrestrial radio's revenue to be relatively small and to occur over a long period of time. We reject as unnecessary a proposed phase-in and evaluation period for satellite DARS.<sup>66</sup> We conclude that opponents of satellite DARS have not shown that its potentially adverse impact on local radio outweighs its potential benefits to the American radio listener.

---

<sup>62</sup> NAB Reply, p. 14.

<sup>63</sup> See NAB Comments, Crystal City Awards.

<sup>64</sup> From 1970 to 1994, total radio advertising revenue increased by a factor of 8, implying a 9.1% nominal growth rate. See Primosphere Comments, Statement of Clifford Burnstein, Exhibit 3. During this period the consumer price index grew on average 5.7% per year. See Economic Report of the President, 1996, Table B-56. Veronis, Suhler & Associates, in a recent "Communications Industry Report", predicted that local radio billings will rise at a compound annual rate of 7.3% over the next five years. See Primosphere Comments, Statement of Clifford Burnstein, p. 4. Over the past five years, the consumer price index has grown 3.1% per year. See Economic Report of the President 1996.

<sup>65</sup> Implementation of Sections 202(a) and 202(b)(1) of the Telecommunications Act of 1996 (Broadcast Radio Ownership), 11 FCC Rcd 12368 (1996).

<sup>66</sup> See proposal of Mt. Wilson FM Broadcasters, p. 5.

33. There is uncertainty inherent in any attempt to predict the impact of satellite DARS on the terrestrial radio industry. The technologies, structure, and regulation of the communications industry are changing dramatically. Developments in the next decade may significantly change the market for both satellite DARS and terrestrial broadcasting. Although opponents of satellite DARS have not shown that it will have a sudden and dramatic adverse impact on terrestrial broadcasting, we cannot entirely rule out the possibility of a major adverse impact. We emphasize that we remain committed to supporting a vibrant and vital terrestrial radio service for the public. Accordingly, we will continue to monitor and evaluate the potential and actual impact of satellite DARS, particularly in small radio markets, so that we will be able to take any necessary action to safeguard the important service that terrestrial radio provides.

34. In addition, we continue to support the efforts of industry committees studying technical standards that would allow terrestrial radio broadcasters to convert to digital transmissions. When it appears that a viable system has been designed, we will act expeditiously to consider changes to our rules to allow AM and FM licensees to offer digital sound. We also remain open to considering other ways to encourage the continued viability of terrestrial radio if the adverse impact of satellite DARS on terrestrial radio proves to be substantially greater than we expect.

#### 5. Related Challenge to DARS Allocation: Memorandum Opinion and Order

35. On February 17, 1995, Interep National Radio Sales, Inc. (Interep) filed a petition for reconsideration of domestic Allocation Order.<sup>67</sup> Interep claims that satellite DARS could have an adverse impact on existing radio services and that, therefore, we should not allow satellite DARS operations until terrestrial DARS is licensed. Interep also suggests a number of guidelines it believes we should adopt with respect to licensing and service rules for satellite DARS.<sup>68</sup> We deny the petition for the reasons given above. That is, the record evidence indicates that the public interest would be served by permitting an innovative new

---

<sup>67</sup> 10 FCC Rcd 2310 (1995). Interep's petition is styled as "Comments and Petition for Partial Reconsideration." Oppositions to the petition were filed by Satellite CD Radio, Inc. and the Digital Satellite Broadcasting Corporation. In addition, the National Association of Broadcasters filed brief comments in support of Interep, urging "the Commission, in its expected Notice of Proposed Rulemaking proposing DARS service and licensing rules, to notice adequately the issues and questions concerning economic harm to local stations. . . ." NAB Comments at 2.

<sup>68</sup> E.g., Interep suggests that "[n]o application for a satellite DARS service should be granted, on either a permanent or experimental basis, until the Commission is prepared to grant applications for a terrestrial DARS service." Petition at 3. It further states that "[w]hen licensing procedures are adopted, priority should be given to existing terrestrial broadcasts [sic] to apply for DARS." Petition at 4.

technology and service, satellite DARS, to become available as a competitive choice for consumers. We note that the petition does not contain any analysis which would undermine those reasons.

36. The Consumer Electronics Manufacturers Association (CEMA) argues in an ex parte submission, based on its preliminary draft report on various digital audio radio technology test results, that satellite DARS cannot be successfully provided at 2.3 GHz. Specifically, CEMA argues that "S-band operations suffer from a significant and startling level of signal blockage," that to provide satellite DARS using S-band frequencies will require hundreds or thousands of gap fillers and that satellite DARS in the S-Band has "no likelihood for nationwide commercial acceptance."<sup>69</sup>

37. We have decided nevertheless to license DARS in the S-Band. CEMA's testing of signal propagation focused on terrestrial technologies; CEMA tested only one generic satellite technology and did not test any of the system designs of the four satellite DARS applicants. Nor does CEMA comment on any of the specific proposals submitted by the four DARS applicants. In addition, CEMA offers no new relevant information. It has been widely known and discussed in the record that DARS providers will need to rely on terrestrial repeaters and gap fillers. As with all new services, the FCC cannot prove or disprove viability. Only the market place can make this determination. CEMA's assertion that satellite DARS is not commercially viable in the S-Band is belied by the interest of many DARS investors who apparently have concluded that a viable satellite DARS service can be offered in the S-Band.

38. Moreover, CEMA's recommendation that the FCC consider other spectrum options for satellite DARS, such as the L-Band, is beyond the scope of this proceeding. The 2310-2360 MHz band [S-Band] was allocated for satellite DARS internationally at WARC-92<sup>70</sup> and domestically in 1995. Frequencies in the L-Band, 1452-1492 MHz were considered and rejected. In the domestic Allocation Order the Commission noted that "commenters strongly favored [S-Band] over, for example, the 1.5 GHz band [L-Band]" in part because the U.S. Government and U.S. commercial mobile aeronautical telemetry (MAT) already operates in the L-Band and it would be very difficult for them to relocate entire operations to the S-Band.<sup>71</sup> Satellite DARS cannot share with MAT systems in the same frequency band in the same coverage area. And even if L-Band had been available, no persuasive evidence suggests

---

<sup>69</sup> The Consumer Electronics Manufacturers Association Vision For Digital Audio Radio Services, submitted as an ex parte presentation on January 29, 1997 (CEMA Ex Parte).

<sup>70</sup> See note 4 supra.

<sup>71</sup> Allocation Order, ¶ 26.

that it is significantly better spectrum in which to receive satellite DARS signals.<sup>72</sup> For the reasons stated above, we find CEMA's argument against proceeding to license satellite DARS applicants in the S-Band unpersuasive.

## B. Licensing Plan

### 1. Licensing Options for Satellite DARS Spectrum

39. In our Notice, we proposed three options for licensing satellite DARS systems.<sup>73</sup> Under Option One, we would have assigned the entire 50 MHz of spectrum allocated for satellite DARS to the four pending applicants, giving each 12.5 MHz, or 10 MHz, if we determined that the lower 10 MHz of the band should not be assigned at the time of our Order due to international coordination constraints. Option Two was to designate less than the full amount of useable spectrum for satellite DARS and to award the remaining spectrum to new applicants. Option Two proposed licensing the four applicants and assigning them each a band segment of less than 10 MHz of spectrum. If either of the two band segments (one for pre-cut off applicants and one for new applicants) could not accommodate all applicants, we would resolve mutual exclusivity via competitive bidding. Option Three was to reopen the cut-off for satellite DARS applications and allow additional applicants to file proposals for all of the useable DARS spectrum.

40. In light of the recent legislation directing the Commission to conduct an auction for use of 25 MHz of the S-band spectrum previously allocated solely to DARS, we cannot adopt any of the three licensing options exactly as proposed in the Notice. After enactment of that legislation and the ensuing WCS Order, only 25 MHz remains exclusively for DARS. The licensing plan we adopt today for that remaining spectrum is a logical outgrowth of Option Two, modified in light of the comments received in this proceeding and the recent legislation. In determining how many licenses may be awarded for use of the remaining DARS spectrum and how those licenses should be assigned, we must first determine how much spectrum each satellite DARS licensee will require to operate an economically viable satellite DARS system.

41. In the Allocation Order, the Commission found that, based on the information available at that time, satellite DARS was the best use of all of the 50 MHz of spectrum assigned to U.S. satellite DARS by WARC-92. We requested comment on a number of issues in our Notice to help us determine the best way to make individual satellite DARS frequency assignments. Specifically, we sought comment on the following: the amount of spectrum and number of channels required for a satellite DARS system to be economically viable; the

---

<sup>72</sup> See CD Radio Ex Parte filing, January 31, 1997; DSBC Ex Parte filings, February 7 1997 & February 11, 1997; Primosphere Ex Parte filing, February 3, 1997.

<sup>73</sup> Notice, ¶¶ 31-40.

number of competitors that are necessary to ensure sufficient competition in satellite DARS; the possible number of channels per MHz capable of being delivered via satellite to a mobile user; alternative band plans that could be adopted for satellite DARS; possible uses for spectrum that is not licensed for satellite DARS, and, whether our proposal to license less than 50 MHz of spectrum would create a mutually exclusive situation among the four current applicants. Based on comments we received on these specific issues, we conclude that 12.5 MHz of spectrum is necessary to offer enough channels for an economically viable satellite DARS system. In addition, in light of the recent legislation opening 25 MHz of spectrum for use by additional services, we conclude that two licenses can be awarded.

## 2. Spectrum Requirements and Economic Viability

42. While we are not sure of the optimal amount of spectrum necessary for satellite DARS, it is our goal to try to determine spectrum block sizes and geographic areas that are most closely suited to provide for efficient provision of the most likely expected use. In this case, because this is a satellite service, the license areas should be nationwide and we have evaluated the evidence about the minimum spectrum block sizes necessary to economically provide satellite DARS. We begin our analysis of determining how much spectrum a single satellite DARS provider will require by considering what the record reveals about how many channels are necessary to operate an economically viable satellite DARS system. Because satellite DARS is a new service, there is an inevitable uncertainty about what precise configuration of channels will best satisfy consumer demand. The record contains no conclusive evidence establishing a specific minimum number of channels needed for a viable DARS system. We will rely on the representations of the applicants which are based on their own market research. The record indicates that a range of channels from 19 to 44 is needed for a viable service.<sup>74</sup>

43. The applicants appear to base their estimated channel requirements on a cable television model in which operators bundle large and diverse packages of channels. The conclusion drawn from the cable television model is that no single channel attracts a large viewing audience, but subscribers value the service because they watch a few channels regularly and occasionally enjoy sampling a wider range of available programming. While the record does not show exactly how many channels a satellite DARS operator must offer to be economically viable, the cable television analogy demonstrates that some critical mass of channels is needed to provide sufficient programming diversity for consumers with diverse tastes.

44. More direct support for the satellite DARS applicants' projections can be found by examining digital audio services packaged with video services and delivered via cable or

---

<sup>74</sup> Estimated channel capacity for the applicants is: (30-40) CD Radio Comments at 8-11; (36-44) AMRC Comments at 2, 25; (19) Primosphere Comments at 17; and (35) DSBC Comments at 35-36.

satellite. Two such nationwide subscription services are Digital Music Express (DMX), offered via cable, and the Primestar direct-to-home video satellite service, a DBS service.<sup>75</sup> Those services each began with roughly 30 channels, but have chosen to increase the number of channels to 60. According to CD Radio, both are now expanding again to offer up to 120 channels.<sup>76</sup> We presume that the satellite DARS applicants would not undertake the risk and expense of implementing satellite systems if the number of channels they propose were not enough to provide a viable service.

45. The satellite DARS applicants calculate that 12.5 MHz of spectrum would be necessary to offer a range of 19 to 44 CD quality audio channels. They contend that 12.5 MHz of spectrum is necessary to support a single viable satellite DARS system.<sup>77</sup> Others commenters disagree. NAB, for instance, proposes that the satellite DARS spectrum be divided into 5 MHz band segments.<sup>78</sup> DSBC and Primosphere counter that NAB's proposed spectrum plan would support a viable satellite DARS system only if at least three or more 5 MHz blocks can be aggregated.<sup>79</sup> AMRC adds that it would be impossible to deliver enough high quality channels in 5 MHz of spectrum to attract a viable audience.<sup>80</sup>

46. A band plan introduced by Cracker Barrel in its reply comments maintains that by using Time Division Multiplexing (TDM) technology, 30 channels of CD quality audio can be accommodated in 8.32 MHz, or 32 channels of CD quality audio could be provided in 8.32 MHz using Code Division Multiplicity (CDM) technology, and thus six operators (presumably six economically viable systems) could be accommodated in the 50 MHz initially allocated for satellite DARS.<sup>81</sup> Cracker Barrel also contends that if all satellite DARS providers use the

---

<sup>75</sup> See CD Radio Comments at 8-11 and Notice, ¶ 15.

<sup>76</sup> CD Radio Comments at 9.

<sup>77</sup> See CD Radio Comments at 11, Primosphere Comments at 17, AMRC Comments at 25, and DSBC Comments at 32.

<sup>78</sup> NAB Comments at 60, n.40. Alternatively, NAB proposes that, with the use of cross-polarization, nineteen 5 MHz band segments could be licensed for satellite DARS. NAB, however, provides no calculation of the number of channels that could be provided by a satellite system in 5 MHz of spectrum and concedes that depending on the technology adopted, a satellite DARS provider might need more than 5 MHz.

<sup>79</sup> See Primosphere Reply at 26 and DSBC Reply at 47.

<sup>80</sup> AMRC Reply at 17.

<sup>81</sup> Cracker Barrel Reply at 9-10. Cracker Barrel initially commented that a standardized use of CDM technology for satellite DARS would permit licensing of more than the four pending satellite DARS applicants (Cracker Barrel Comments 8-12). In its reply

same error correction rates, then as many as eight satellite DARS licensees could be accommodated in the 50 MHz (i.e., each with a 6.25 MHz assignment) and each could offer at least 30 channels of CD quality audio.<sup>82</sup> Cracker Barrel contends that its band plan does not require use of regional spot beams or a higher order modulation constellation to gain additional channels per MHz of spectrum.<sup>83</sup> It asserts that by using 1/3 rate or 1/2 rate FEC as opposed to 1/4 rate as originally proposed by CD Radio and Primosphere, the bandwidth requirement for a 32 or 30 channel CD quality system could be reduced from 12.5 MHz to 8.32 MHz and 6.25 MHz respectively.<sup>84</sup>

47. Satellite DARS applicants assert that Cracker Barrel's assumptions used to derive spectrum requirements do not include techniques to overcome multipath fading present in a mobile environment and do not adequately address the associated limitations on satellite power, weight, launcher capacity, international coordination, or system cost.<sup>85</sup> CD Radio asserts that 12.5 MHz of bandwidth is necessary for its satellite DARS system to provide 33 channels of CD quality audio using a spatially diverse architecture, CDM, and 1/2 rate FEC, which is capable of operating at power flux-density levels that will make coordination with adjacent countries feasible.<sup>86</sup> CD Radio indicates that it has changed to CDM to provide

---

comments, however, Cracker Barrel proposes a counter-plan which would segment the satellite DARS band, apparently abandoning the concept of a standardized use of CDM technology (See Cracker Barrel Reply, Appendix A, at 2).

<sup>82</sup> See Ex Parte presentation by Cracker Barrel, dated March 22, 1996.

<sup>83</sup> Cracker Barrel maintains, however, that by using a higher order modulation constellation, such as those used by terrestrial providers in the ATV Grand Alliance (See Notice ¶ 31), the number of channels could be doubled (Cracker Barrel Reply at 10). They note, however, that terrestrial transmitters are high power and generally provide service within a 25 mile radius. Geostationary satellites which have modest transmitter power provide service from a distance of over 23,000 miles. (CD Radio Comment, Appendix B at 9).

<sup>84</sup> See Ex Parte presentation by Cracker Barrel (March 22, 1996), at 7. Cracker Barrel further assesses the trade-offs between using 1/2 and 1/4 FEC rates in its Ex Parte presentation, dated April 4, 1996.

<sup>85</sup> Primosphere Reply at 27-30 and CD Radio Reply at 41, n.115. See Primosphere Ex Parte letter, dated April 9, 1996.

<sup>86</sup> See Ex Parte filing by CD Radio, dated March 29, 1996, and discussion of use of CDM, CD Radio Comments, Appendix B at 10-11. In a spatially diverse satellite system, identical information is transmitted from two satellites with large orbital separation to mitigate the occurrences of signal blockage and multipath fading in a mobile environment.

increased resilience to fading and noise.<sup>87</sup> It concedes that, if it did not employ spatial diversity and instead used a single satellite, it would be possible to transmit approximately twice as many channels in a given amount of spectrum.<sup>88</sup> However, CD Radio maintains that spatial diversity is key to providing high quality audio in a mobile environment. CD Radio contends that abandoning the use of spatial diversity would reduce sound quality, increase fading and blockage, and prove commercially unacceptable to its consumers. While the company notes that these problems could be addressed by increasing satellite power significantly,<sup>89</sup> it points out that any such increase would only add to existing coordination difficulties with adjacent countries.

48. Primosphere maintains that, in the case of CDM technology, even though a signal is coded so that it can be selected from the other signals simultaneously sharing the channel, simultaneous channels can interfere with each other when orthogonality is lost. This sets an effective limit on the number of CDM channels that can occupy a given channel.<sup>90</sup> DSBC asserts that reducing the bandwidth from 12.5 MHz to 10 MHz, or to 8.32 MHz as proposed by Cracker Barrel, while maintaining channel capacity would require greater received signal power (at least 40% more) since the primary coding for a 10 MHz system is much less robust in correcting errors than that found in a 12.5 MHz system.<sup>91</sup> An increase in signal power would increase coordination difficulties with adjacent countries and add cost to satellite DARS receivers and space stations.<sup>92</sup>

---

<sup>87</sup> CD Radio originally contemplated using TDM with the expectation of significantly greater bandwidth being made available for its satellite DARS system (*i.e.*, 20 MHz). Using CDM in 12.5 MHz of bandwidth, however, enables CD Radio to offer 33 CD quality channels on both of its spatially diverse satellites (*i.e.*, 66 total channels). All of the channels are uniquely coded so that they do not interfere with each other even though they occupy the same spectrum at the same time. (See Ex Parte Filing by CD Radio, dated March 22, 1996).

<sup>88</sup> The number of channels per MHz calculated by CD Radio (*i.e.*, 66 channels in 12.5 MHz) is roughly the same number of channels per MHz calculated by Cracker Barrel (*i.e.*, 32 channels in 6.25 MHz). Compare CD Radio Ex Parte filing dated March 29, 1996, with Cracker Barrel Reply at 9-10 and Ex Parte presentation by Cracker Barrel dated March 22, 1996.

<sup>89</sup> Increasing satellite power would have two drawbacks according to CD Radio: an increase of power-flux density levels at the U.S. borders and a prohibitive increase in satellite cost (See CD Radio Ex Parte filing, dated March 29, 1996, at 2).

<sup>90</sup> See Primosphere Reply at 30.

<sup>91</sup> DSBC Reply at 48.

<sup>92</sup> DSBC Reply at 48 and CD Radio, Appendix B at 8-9.

49. We conclude, based on the current record, that each DARS licensee will require at least 12.5 MHz to successfully implement an economically viable satellite DARS system. We believe that licensing less than 12.5 MHz would be insufficient to provide a critical mass of channels required for economic viability and could lead to significant power and cost constraints. We do not find the contrary assertions by NAB and Cracker Barrel persuasive. Moreover, the applicants' successful efforts to increase the spectrum efficiency of their proposals supports their estimate of 12.5 MHz as the minimum amount of spectrum needed. Comparing the channel and associated spectrum requirements of the applicants' original proposals with their existing comments, we calculate that, on average, the applicants have increased the number of channels they propose to provide by seven, despite an average decrease in proposed spectrum use of 14 MHz.<sup>93</sup> The applicants' efforts to improve their spectrum efficiency should not be treated as a detriment. DARS applicants may participate in the WCS auction to acquire additional spectrum if they desire it.

50. While we recognize that further technological advances may result in even greater increases in spectrum efficiency, none of the commenters addressing this issue have demonstrated that they can provide a more spectrum efficient, economically viable, high quality DARS system in less than 12.5 MHz and using current state-of-the-art in satellite technology. The above discussion is indicative of the trade-offs between bandwidth and power that satellite DARS applicants have weighed in their choice of transmission schemes and technology. Because each satellite DARS licensee will be limited to a bandwidth of 12.5 MHz, the trade-offs between increased power and channel capacity is particularly critical to overall satellite system design. We will not attempt to impose our judgments in this regard on the satellite DARS licensees and we will allow licensees to use the technology, channelling plans, modulation schemes, and multiple entry techniques of their choice within their 12.5 MHz band segment.

### 3. International Coordination Obligations

51. Based on the recent legislation passed by Congress directing the Commission to reallocate and auction the 2305-2320 MHz and 2345-2360 MHz bands, we are licensing only the 2320-2345 MHz portion of the 2310-2360 satellite DARS band exclusively for satellite DARS. However, before satellite DARS service can be offered to the public, we will require satellite DARS licensees to complete detailed frequency coordination with existing operations in adjacent countries to prevent the potential for unacceptable interference.<sup>94</sup> The goal of the

---

<sup>93</sup> See NAB Comments at 59-61, comparing the channel capacity and associated spectrum requirements of each of the applicants according to their original proposals and their comments to the Notice.

<sup>94</sup> Satellite DARS licensees' authority to launch and operate will be conditioned on the completion of international coordination obligations.

coordination process is to reach agreement with affected users on an operating arrangement which harmonizes the use of the radio frequency spectrum.

52. In the Notice, we discussed potential issues that might arise during coordination of U.S. satellite DARS systems with existing operations in adjacent countries.<sup>95</sup> Based on what we knew then about the relatively large number of fixed Canadian terrestrial stations licensed in the 2310-2320 MHz band, we tentatively concluded that the lowest 10 MHz in the 2310-2360 MHz band would be difficult to coordinate for satellite DARS. Indeed, one option in the Notice proposed to license only spectrum above 2320 MHz for satellite DARS "[t]o alleviate the potentially difficult and lengthy coordination" posed by the presence of the nearly 200 Canadian terrestrial stations between 2310 and 2320 MHz.<sup>96</sup> This option would seek to avoid requiring one satellite DARS licensee to be subject to coordination with a greater number of fixed terrestrial systems than other licensees. We requested comment on our tentative conclusion.

53. In the Notice we also observed that the upper portion of the 2310-2360 MHz band would likely present other potential obstacles to coordination with adjacent countries. For example, we cited a CD Radio study showing that Canada generally licenses its Mobile Aeronautical Telemetry (MAT) operations between 2350 and 2360 MHz. Despite the operation of MAT above 2350 MHz, however, certain of the satellite DARS applicants maintained that the uppermost spectrum in the DARS band should be assigned to the first licensee that met its milestone requirements.<sup>97</sup> Based on this proposal, it appeared to us that the satellite DARS applicants did not expect sharing with MAT operations of adjacent countries to be an insurmountable hurdle. We requested specific comment on whether our different assessment was correct. Although the question of whether to reserve the entire S-band (2310- 2360 MHz) exclusively for satellite DARS has been determined by the recent Congressional legislation, discussed above, we discuss below terrestrial operations in the S-band that may affect future satellite DARS coordination.

54. We initiated formal negotiations with the Canadian Administration after release of our Notice. The Commission used the information from these recent meetings to re-assess the current operating environment in the 2310-2360 MHz band. In meetings with Canada following release of the Notice, International Bureau staff learned that the number of fixed

---

<sup>95</sup> Notice, ¶ 80. Coordination with administrations other than Canada also will be necessary.

<sup>96</sup> Notice, ¶ 66. At the time our Notice was released, approximately 78% of the fixed terrestrial stations licensed in Canada in the 2130-2360 MHz band were licensed below 2320 MHz.

<sup>97</sup> See Notice, ¶ 66. See specifically, Supplemental Comments of DSBC at 10 and CD Radio at 9.

terrestrial systems in the lower portion of the band has not changed significantly since we accepted satellite DARS applications for filing.<sup>98</sup> However, Canada informed our staff that Canadian MAT systems are currently licensed and operating at frequencies throughout the S-band from 2329.25-2390 MHz.<sup>99</sup> Upon receipt of this new information from Canada, we forwarded it to the applicants and entered it into the public record so that the applicants' technical experts and others could provide comment.<sup>100</sup>

55. *The Fixed Service* The applicants recognize that detailed coordination with foreign systems is unavoidable. Coordination between satellite DARS and Fixed Service systems (FS) is required because the power levels at which the applicants propose to operate their systems to achieve sufficient quality service in a mobile environment are higher than the thresholds levels which have triggered on-going bilateral coordination with adjacent countries.<sup>101</sup> Detailed coordination would therefore be necessary with every FS station that is within the satellite DARS transmitting antenna gain contour unless the power levels of the proposed satellite DARS systems is reduced or measures are taken by the fixed terrestrial service to mitigate unacceptable interference from satellite DARS (e.g., re-pointing the receive antenna sufficiently away from the geostationary satellite orbit or upgrading receiver equipment).

56. According to the international allocation, adjacent countries are free to license additional fixed and mobile terrestrial systems on frequencies between 2300-2483.5 MHz. We have confirmed that Canada, alone, has licensed and will continue to license FS systems throughout the 2310-2360 MHz band. Currently, approximately 20% of the total number of systems licensed in Canada are above 2320 MHz.

57. *Mobile Aeronautical Telemetry* The threshold power levels necessary to protect foreign MAT systems are expected to be similar to the levels which the U.S. has established

---

<sup>98</sup> The number of fixed terrestrial stations in Canada increased from 213 in 1993 to 221 in 1994, and to 231 in 1995.

<sup>99</sup> Currently, there are eight MAT facilities licensed in Canada which operate on the following frequency assignments below 2360 MHz: 2330 MHz, 2335 MHz, 2345 MHz, 2348 MHz, 2352 MHz, 2353 MHz, 2356 MHz, and 2360 MHz.

<sup>100</sup> See letter from Satellite Engineering Branch (SEB letter), dated February 16, 1996, to representatives of CD Radio, DSBC, AMRC and Primosphere, respectively, and responses thereto that address coordination in these bands for satellite DARS.

<sup>101</sup> Information from bilateral negotiations reveals that a level of -154/-144 dB(W/m<sup>2</sup>/4kHz) would be necessary, for low/high elevation angles, to protect FS systems in adjacent countries.

in the 1435-1525 MHz band (L-band) to safeguard its MAT systems.<sup>102</sup> The U.S. quantified its need to protect its MAT systems from interference in the L-band in detailed studies which it presented to numerous International Telecommunication Union-Radiocommunication Sector Study Groups. These studies show that it would not be feasible for a satellite service to share with MAT on a co-coverage, co-frequency basis. Indeed, the U.S. has taken necessary steps to relocate its own S-band MAT operations to frequencies above 2360 MHz, recognizing that co-frequency, co-coverage operation of satellite DARS and MAT is not practical.<sup>103</sup> Many of these U.S. MAT operations were relocated entirely from S-band to L-band.<sup>104</sup>

58. We now know that some of the MAT assignments in Canada are used to control remotely piloted vehicles (RPVs) which require reception at the aircraft as well as at land based stations.<sup>105</sup> In addition, some Canadian MAT systems are operating within a hundred miles of the U.S./Canada border, making them even more susceptible to interference from U.S. satellite DARS.<sup>106</sup> Although five of the 12 MAT frequency assignments in Canada lie below 2345 MHz, we note that at least three of those assignments are repeated on center frequencies above 2345 MHz. This may indicate that there is some flexibility in the MAT operations that will help our coordination efforts in the 2320-2345 MHz band.

#### 4. Pioneer's Preference Requests

---

<sup>102</sup> Coordination threshold power levels to protect U.S. MAT systems are on the order of -181/-150 dB(W/m<sup>2</sup>/4kHz) for low/high elevation angles. If satellite transmissions exceed this threshold, coordination would be required with every MAT system.

<sup>103</sup> See Allocation Order, ¶ 16 and n. US328 to § 2.106 of the Commission's rules. See also Modification to Part 87, infra.

<sup>104</sup> Unfortunately, this has had the unintended consequence of increasing coordination challenges in the L-band between foreign terrestrial digital audio broadcasting and U.S. MAT systems.

<sup>105</sup> Two MAT frequency assignments below 2345 MHz are used to control RPVs. Such communications would be difficult to coordinate because as the aircraft maneuvers, the receiving antenna's position changes with respect to the ground base station, and the antenna could point directly toward a transmitting U.S. DARS satellite. The mobility of the receive antenna makes it harder to isolate it from the DARS satellite.

<sup>106</sup> Successful coordination on a co-coverage basis with Canadian MAT operations located near the U.S./Canada border would require satellite DARS to operate on a non-co-frequency basis.

59. In the Notice, we solicited comment on three pending requests for pioneer's preferences filed by CD Radio, DSBC, and Primosphere.<sup>107</sup> No comments were filed on any of the satellite DARS pioneer's preference requests. On September 20, 1995, in compliance with new pioneer's preference rules,<sup>108</sup> CD Radio, DSBC, and Primosphere each filed a supplement to their respective requests.

60. By letter dated August 30, 1996, the Commission's Office of Engineering and Technology and the International Bureau requested that a specially convened panel of four satellite technology experts ("Panel") review the three satellite DARS pioneer's preference requests and recommend to the Commission whether each of the requests should be granted.<sup>109</sup> In a report dated November 18, 1996, the Panel unanimously recommended that no pioneer's preference be awarded. The Panel concluded that none of the applicants had demonstrated a seamless satellite DARS service and found that no award of a pioneer's preference could be justified on technical design grounds. On November 19, 1996, the Commission issued a Public Notice, requesting comments on the Panel report by December 3, 1996.<sup>110</sup>

61. Following the release of the Panel's report, all three pioneer's preference applicants withdrew their requests.<sup>111</sup> Accordingly, we do not consider whether to award any pioneer's preferences for satellite DARS.<sup>112</sup> While we do not need to discuss the Panel's recommendations and report, we commend the members of the Panel for their remarkable dedication and hard work during the several weeks in which they volunteered their expertise.

---

<sup>107</sup> See GEN Docket No. 90-357.

<sup>108</sup> See ET Docket No. 93-266.

<sup>109</sup> The experts on the Panel were: Dr. H. Donald Messer, Broadcast Satellite Program Manager at the U.S. Information Agency's Voice of America; John T. Gilsean, Deputy Director for Radio Spectrum Policy at the U.S. Department of State; James E. Hollansworth, Telecommunications Specialist at the National Aeronautics and Space Administration; and William G. Long, Jr., a satellite expert with the Defense Information Systems Agency.

<sup>110</sup> See Report No. SPB-67, Mimeo No. 70798.

<sup>111</sup> See letter from CD Radio dated November 22, 1996; letter from DSBC dated December 3, 1996; and, letter from Primosphere dated December 5, 1996.

<sup>112</sup> Despite the withdrawal of all the pioneer's preference requests, DSBC, Primosphere, and the National Association of Broadcasters each filed comments, dated December 3, 1996, that supported the Panel's recommendations. Additionally, CD Radio filed comments on that date stating that it disagreed with the panel's recommendation regarding CD Radio's pioneer's preference request, but explaining that CD Radio had nevertheless withdrawn its request in order to expedite the provision of satellite DARS.

## 5. Cut-off Issues

62. In light of the withdrawal of each request for pioneer's preference, and having determined that each DARS licensee will require 12.5 MHz, we must now determine whether to reopen the 25 MHz of spectrum that remains allocated primarily for satellite DARS to new applicants or allow only the existing applicants to resolve their mutually exclusive applications. Commenters urging reopening the cutoff for satellite DARS applications contend that it is necessary to ensure true competition and greater program diversity.<sup>113</sup> Cracker Barrel, for example, asserts that it would be interested in filing an application advocating a different transmission technology that it claims will allow more operators in less spectrum. It states that because the cut-off was three years ago, the Commission cannot be sure it has the best proposals before it. It also claims that the satellite DARS proceeding was "out of order" because applications were accepted before service rules were established. Because of this situation, Cracker Barrel complains it did not learn of the licensing process until the June 1995 Notice and thus it missed the 1992 cut-off. Cracker Barrel argues that the Commission has discretion under the public interest standard to reopen a cut-off in a given proceeding.<sup>114</sup>

63. Similarly, NAB asserts that technology has changed since the Commission opened and closed the application window for DARS. It states that licensing multiple applicants will bring more program diversity and more business capabilities to the service. It also argues that any equities favoring the current applicants do not justify preserving the cut-off. NAB, like Cracker Barrel, argues that the available spectrum can support additional operators.

64. Others, particularly the four current applicants, argue that the cut-off should stand. CD Radio asserts that reopening would be unlawful, inequitable, and unwise. It argues that cutoffs are reopened only in extraordinary circumstances that are absent here.<sup>115</sup> CD Radio and AMRC also stress that reopening would ignore the equities favoring the current applicants, including the significant time and money invested to establish satellite DARS. Citizens for a Sound economy, a non-applicant, added that reopening the cut-off could discourage future research and development of new services by allowing new applicants a "free ride" on the current applicants' investments.<sup>116</sup>

---

<sup>113</sup> Comments of Cracker Barrel at 7-8; NAB at 54.

<sup>114</sup> Cracker Barrel Reply at 4.

<sup>115</sup> CD Radio cites *Florida Institute of Technology v FCC*, 952 F. 2d 549, 553 (D.C. Cir 1992), in support of its positions.

<sup>116</sup> Citizens for a Sound Economy at 5.

65. Primosphere argues that cut-offs are key to a successful satellite policy. They bring finality and certainty to satellite proceedings by limiting the universe of applicants, allowing them to prepare their cases against a limited set of opponents and expediting inherently complex and costly development of new services.<sup>117</sup> Similarly, DSBC argues that reopening the cutoff would contravene decades of satellite procedure. It states:

Unlike its process in other services, the Commission invites applicants for new satellite services to submit their applications prior to the adoption of the technical and operational rules and often prior to a final decision on the threshold question of whether proceeding to authorize any one in the service is in the public interest. The Commission repeatedly has concluded that the technical complexity and the extraordinary lead time required uniquely in the satellite services requires this previously unprecedented approach.<sup>118</sup>

The purpose of this approach, DSBC explains, is to guarantee long-term industry involvement in identifying the best use of spectrum and most efficient technology, thereby expediting new services. DSBC argues that satellite companies invest enormous amounts of time and money to develop new technologies and services, in reliance on the finality and certainty afforded by cutoffs and licensing rounds. Absent cutoffs, these parties would lack the incentive to risk the substantial resources required to develop and offer new satellite services to the public.<sup>119</sup>

66. We agree with those commenters that assert that the Commission has authority to reopen cut-offs and that doing so in some circumstances has several important advantages, including allowing for new competitors to emerge. But we conclude that in this case, compelling policy reasons unique to satellite services militate against reopening the cut-off for satellite DARS license applications for the two licenses available.

67. Sound satellite licensing policy and precedent, and the equities of this particular proceeding support the use of cut-offs in here. In this satellite proceeding, as in others, applicants require some measure of certainty to justify the inherently long-term investment of resources required by complex and lengthy international allocation and coordination procedures that must be completed prior to inauguration of service. This unique feature of satellite services, combined with the need to most expeditiously provide new services to the public, outweigh any benefits that would accrue from accepting additional applications. Cut-

---

<sup>117</sup> Comments of Primosphere at 9.

<sup>118</sup> Comments of DSBC at 45 citing Amendment of Parts 2, 22 & 25 of the Commissions Rules to Allocate Spectrum for and to Establish other Rules and Policies Pertaining to the Mobile Satellite Service for the Provision of Various Common Carrier Services, 6 FCC Rcd. 4900 (1991);

<sup>119</sup> Comments of DSBC at 46.

off procedures provide a greater measure of certainty.<sup>120</sup> Given these unique factors in licensing satellite services, the Commission regularly establishes cut-offs, accepts applications and creates processing groups before service rules are adopted or even before specific operating frequencies are established.<sup>121</sup> We then rely heavily on the applicants to help develop service rules that allow them to share spectrum and expeditiously develop and deliver their new services to the public. We rely heavily on applicants to assist the U.S. in international fora to obtain spectrum allocations and we expect them to participate in the time consuming process of ITU notification and coordination. All of this activity requires significant expenditure of time and money by the applicants. Once we adopt rules, we permit applicants to amend their proposals to reflect compromises. This process expedites a complex and inherently risky venture, allowing license applicants to begin construction of their facilities immediately upon our grant of a license. The assertion by those opposing cut-offs that we do not accept applications before adopting service rules in other, very different types of services, does not justify reopening the cut-off in this satellite proceeding.

68. Reopening the cut-off in this case will not necessarily advance DARS technology. There is no reason to assume that applicants will implement outmoded technology or spend hundreds of millions of dollars to construct inefficient satellite systems. Furthermore, in any satellite service rulemaking proceeding, we always give pending applicants the opportunity to amend their applications to conform to the final rules. In reviewing applications for space station facilities, we require that proposals reflect "state-of-the-art" technology at the time of license grant.<sup>122</sup> In fact, CD Radio had amended its application substantially since 1990 and will have the opportunity to do so again to reflect the adopted rules. Although Cracker Barrel claims that its proposal could use less spectrum than that proposed by CD Radio, we conclude, as discussed previously,<sup>123</sup> that its proposal would not accommodate certain innovations such as spatial diversity.

69. Since CD Radio filed its original application in 1990, steps to implement the service have been well publicized. Both the government and the private sector worked to identify appropriate spectrum for satellite DARS at WARC- 92. Shortly after WARC-92, the Commission announced its intention to allocate spectrum domestically and to accept

---

<sup>120</sup> See Mobile Satellite Services, 6 FCC Rcd. 4900 (1991); LEOSAT Corp., 8 FCC Rcd 668, 670 (1993); PanAmSat Licensee Corp, DA 96-178 (International Bureau, released February 21, 1996).

<sup>121</sup> See, e.g., Radio Determination Satellite Service, Gen Docket # 84-690; Big Leo Satellite Service, CC Docket # 92-166; Little Leo Satellite Service CC Docket # 92-76.

<sup>122</sup> See Licensing of Space Stations in the Domestic Fixed-Satellite Service, 54 Rad. Reg. 2d 577 (P&F) (1983).

<sup>123</sup> See, infra, Section B.2.

applications for operations in the S-band to be considered in conjunction with CD Radio's. Since 1992, only one entity, Cracker Barrel, has indicated interest in filing an application to provide satellite DARS.

70. Neither Cracker Barrel nor other commenters have presented compelling arguments to justify reopening the previously established cut-off for satellite DARS license applications. No commenter advocating reopening has shown any persuasive reason to depart from our satellite cut-off policy and precedent.

71. Consistent with our conclusion not to reopen the cut-off in this proceeding, we note that existing Commission rules preclude satellite DARS applicants from effecting a substantial change in beneficial ownership if they want to maintain their pre-cut-off status. Section 25.116 of the rules provides that any amended application substantially changing an applicant's ownership will be considered a newly filed application and thus would not fall within cut-off protection unless the applicant requests and is granted an exemption by the Commission.<sup>124</sup>

## 6. Specific Frequency Assignments and Satellite DARS Competition

72. We proposed in our Notice to authorize specific satellite DARS frequency assignments upon grant of satellite DARS authorizations to begin construction. There were mixed reactions to our approach. Primosphere, asserts that the Commission should initiate international coordination in conjunction with all licensed satellite DARS systems and should assign specific frequency blocks following the conclusion of this coordination.<sup>125</sup> DSBC proposes to permit licensees to select the frequency band it would like to employ at the time it certifies it has met the first milestone.<sup>126</sup> This is similar to CD Radio's initial proposal that each licensee notify the Commission of the specific frequency assignment it is using at the same time it certifies to the Commission it has met the milestone and launched its first spacecraft.<sup>127</sup> These alternative methods have one commonality; the exclusive frequency assignment for each satellite DARS licensee will not be known before and during the early stages of the coordination process. Indeed, it was necessary to initiate the coordination process with the ITU for each current satellite DARS system as though each system would operate over the entire 2310-2360 MHz band. Until specific frequency assignments are issued, coordination with adjacent countries for each satellite DARS system is burdensome for both the Commission and the licensees.

---

<sup>124</sup> 47 CFR § 25.116(c)(2).

<sup>125</sup> Primosphere Reply at 24. See also Primosphere Ex Parte statement dated September 25, 1996.

<sup>126</sup> DSBC Reply at 51.

<sup>127</sup> See Notice, ¶ 84.

73. As discussed above, there is sufficient spectrum in the S-Band to license only two satellite DARS systems. Dividing the available 25 MHz of spectrum into four equal segments among the four applicants would result in exclusive frequency assignments of only 6.25 MHz for each satellite DARS applicant. Because we have found that a viable and competitive satellite DARS service will require 12.5 MHz, we can license only two systems. The 2320-2345 MHz band that will remain allocated for satellite DARS will be divided into two equal 12.5 MHz segments (2320-2332.5 MHz and 2332.5-2345 MHz). We will award the two licenses for satellite DARS by using competitive bidding to resolve mutual exclusivity.<sup>128</sup> Satellite DARS applicants that are winning bidders will have 30 days following the conclusion of the auction in which to amend their applications to conform with the satellite DARS service rules adopted today.

74. Using the calculation methods provided in the comments, the satellite DARS licensees will be able to provide 19 to 44 channels of CD quality audio per system in the authorized 12.5 MHz of spectrum. Sufficient spectrum is available for two spatially diverse systems.<sup>129</sup> Although we decide not to reopen the processing round for satellite DARS, we are not by our action today excluding all other potential DARS providers. Indeed, it may be possible to lease channels or purchase advertising time from the licensed satellite DARS providers.<sup>130</sup>

75. CD Radio had proposed that satellite DARS system operators be permitted temporarily to occupy frequency assignments other than their own, provided that their transmissions can be reconfigured to return to and thereafter use only their own frequency assignment upon launch of the satellite operated by the licensee assigned to the temporary frequency.<sup>131</sup> DSBC objected to this proposal, arguing that while temporary use by the first operator(s) might avoid having frequencies lie fallow for a short time, prescribing temporary use may be disruptive and contrary to the public interest. It asserted that the temporary operator could be faced with reducing its services, discontinuing its service to its customers, or seeking to utilize frequencies that are rightfully assigned to another licensee once the temporary spectrum is no longer available for use.<sup>132</sup> Primosphere, supports CD Radio's original proposal to authorize interim frequency assignments.<sup>133</sup>

---

<sup>128</sup> See, infra, Section G, regarding auction rules for satellite DARS licensees.

<sup>129</sup> CD Radio and Primosphere propose to use spatial diversity in their applications for satellite DARS.

<sup>130</sup> See Primosphere Reply at 8.

<sup>131</sup> See Notice, ¶¶ 86-87.

<sup>132</sup> See Notice, ¶¶ 86-87.

<sup>133</sup> Primosphere Comments at 44.

76. Upon review of the record, we have decided not to authorize interim operations. We have concluded that 12.5 MHz is necessary to implement a viable satellite DARS service. Nothing in the comments indicates that additional spectrum, or an interim assignment, is necessary to implement a viable system. Conversely, we find that an interim assignment could be disruptive and contrary to public interest because of possible service interruption or reduction. We therefore adopt our original proposal not to authorize interim frequency assignments.

77. Although spectrum constraints limit us to licensing just two satellite DARS systems at this time, our licensing approach nonetheless provides the opportunity for a competitive DARS service. Our goal is to create as competitive a market structure as possible, while permitting each DARS provider to offer sufficient channels for a viable service. In the Notice, we pointed out that "satellite DARS will face competition from terrestrial radio services, CD players in automobiles and homes, and audio services delivered as part of cable and satellite services," and asked whether these delivery media, coupled with fewer than four DARS providers, could ensure an effectively competitive audio services market.<sup>134</sup>

78. Other audio delivery media are not, of course, perfect substitutes for satellite DARS. These media and satellite DARS all differ with respect to the programming menu (terrestrial radio can provide local programming and satellite DARS cannot), the sound quality, the cost of equipment, and the presence or absence of a subscription fee, but they all can provide music. The availability of these media, terrestrial radio in particular, varies across populated areas. Given our conclusion that satellite DARS can provide new and valuable service to the public, and given the overall competitive environment within which it will operate, we are satisfied that licensing two satellite DARS providers will serve the public interest. We agree with commenters, that there should be more than one satellite DARS license awarded.<sup>135</sup> Licensing at least two service providers will help ensure that subscription rates are competitive as well as provide for a diversity of programming voices. The two DARS licensees will compete against each other for satellite DARS customers and will face additional competitive pressure from the other aural delivery media mentioned above. Accordingly, eligible auction participants may acquire only one of the two licenses being auctioned. One license will be for the use of spectrum between 2320 and 2332.5 MHz and the other for 2332.5 through 2345 MHz.

## 7. Licensing Conditions

---

<sup>134</sup> Notice, ¶ 38.

<sup>135</sup> See Comments of CD Radio at 18-20; Reply Comments of Media Access Project at 13-15.

79. Satellite DARS licensees' authority to operate will be conditioned upon completion of their international coordination obligations. As discussed above,<sup>136</sup> and as we indicated in the Notice, both Canada and Mexico have allocated the 1452-1492 MHz frequency band (L-band) for DARS. Since U.S. satellite DARS systems will operate exclusively in the 2320-2345 MHz frequency band (S-band), coordination between U.S. satellite DARS and Digital Audio Broadcasting systems of adjacent countries is not necessary. We indicated in our Notice that the L-band is used extensively for U.S. Government and commercial mobile aeronautical telemetry operations. Coordination between Canadian terrestrial DARS and U.S. mobile aeronautical telemetry systems at L-band has proven to be challenging.

80. Adjacent countries do, as discussed above, operate terrestrial fixed point-to-point, fixed point-to-multipoint, and mobile aeronautical telemetry systems throughout the S-band. U.S. satellite DARS systems will be required to coordinate with these terrestrial systems currently operating in the 2320-2345 MHz band. Satellite DARS licensees must submit appropriate Appendix 3 material according to the International Radio Regulations to formally complete the international coordination process. This Appendix 3 material will contain the final configurations of the satellite DARS systems.

### C. Service Rules for Satellite DARS in the 2320-2345 MHz Band

#### 1. Classification of Service

81. In the Notice, the Commission sought comment on whether satellite DARS licensees should have the flexibility to determine their own regulatory classification depending on the service they are providing or whether there are reasons to justify mandating a particular type of service. We tentatively concluded that there was no reason to require that satellite DARS providers be licensed as common carriers or as broadcasters.<sup>137</sup> We raised a related question, pursuant to a suggestion by the NAB, whether we should require that all licensees offer subscription service and asked for comment on the legal, policy and practical implications of such a requirement.<sup>138</sup>

82. Commenters addressing these questions fall into two general groups. Those supporting implementation of satellite DARS, including the incumbent applicants, advocate that licensees be permitted to determine their own regulatory classification in order to tailor

---

<sup>136</sup> See Section 3, supra.

<sup>137</sup> Notice, ¶¶ 23-4.

<sup>138</sup> Notice, ¶ 25.

services to meet customer requirements and to respond to market demands.<sup>139</sup> These commenters also emphasize the extremely high costs of constructing and launching a satellite system and state that licensees cannot afford to be restricted to purely subscription service. They state that they must be allowed to choose their own mix of subscription and advertising.<sup>140</sup> One commenter suggests that satellite DARS licensees be limited to national advertising and be prohibited from accepting local or regional ads.<sup>141</sup> Media Access Project argues that satellite DARS should be classified as broadcasting because the providers use public spectrum and thus should be subject to public interest requirements.<sup>142</sup>

83. Commenters opposing satellite DARS argue that the service should be required to operate on a subscription only basis. NAB, for example, states that although satellite DARS would not be common carriage or broadcasting,<sup>143</sup> providers should be required to restrict their service to subscription offerings in order to lessen the potential adverse impact on terrestrial broadcasters.<sup>144</sup> NAB recognizes that DBS operators have been given the option to offer service as a broadcaster or by subscription but argues that treating satellite DARS like DBS in this regard is not warranted because the services operate in different competitive markets, with DBS subject to much more competition and not able to affect broadcasters as significantly as DARS.<sup>145</sup>

84. The record supports a conclusion that satellite DARS licensees should be able to tailor their services to meet customer needs and that mandating a particular regulatory classification is unwarranted. There is no compelling evidence in the record that would militate in favor of requiring a broadcast classification and in fact it appears that the current applicants favor subscription service. Nor does satellite DARS appear to be a common carrier

---

<sup>139</sup> Comments of DSBC at 51-52. See Comments of AMRC at 21; CD Radio at 78-82 (stating that satellite DARS is not common carriage or broadcasting); and Primosphere at 32-33.

<sup>140</sup> Reply Comments of AMRC at 19; Primosphere indicates that it intends to offer non-subscription, advertiser-supported programming.

<sup>141</sup> Comments of Robert T. Wertime at 5.

<sup>142</sup> Comments of Media Access Project at 4.

<sup>143</sup> Comments of NAB at 45-46. Cf. Comments of Media Access Project at 13-15 (arguing that satellite DARS providers should be regulated as broadcasters); Minority Media & Telecommunications Council at 3-5 (contending that the service should be classified as common carrier with public interest obligations imposed).

<sup>144</sup> Comments of NAB at 49.

<sup>145</sup> Accord, Comments of New Jersey Broadcasters Ass'n. at 1; The Cromwell Group.

service because much of the programming offered would be subject to the editorial control of the provider. The services proposed by three of the applicants will be neither broadcast or common carrier. Flexibility for licensees to meet market demands is crucial and it may be that the viability of a satellite DARS service will depend on offering a mix of advertiser supported and subscription service. We find that a requirement that satellite DARS be entirely subscription is unwarranted. Mandating that providers charge for their services is not in the public interest and raises significant legal questions if done for the purpose of economic protectionism as advocated by several commenters.<sup>146</sup>

## 2. Public Interest Obligations

85. The Commission's Notice requested comment on a wide variety of questions regarding the advisability of public interest obligations in the context of this service.<sup>147</sup> We asked, for example, if all satellite DARS providers, including those not operating as broadcasters, should be subject to similar requirements. We solicited comment on the Commission's authority to impose such obligations on non-broadcasters. We requested information on the cost of complying with public interest obligations, and on whether the costs could be so significant as to hamper implementation of the service. Finally, we asked about the types of obligations that apply to terrestrial broadcasters, which offerings would not be included by service providers in an unregulated environment, and whether these requirements increased or decreased profitability.

86. Commenters were divided on whether the Commission should adopt public interest programming obligations for satellite DARS providers. In general, pending satellite DARS applicants proposing non-broadcast service cautioned against imposing obligations.<sup>148</sup> For example, DSBC states that public interest programming obligations are not necessary to ensure diverse public oriented programming.<sup>149</sup> It asserts that the economic and distribution structure of satellite DARS makes it good business to offer programming that regular broadcasters would not offer absent incentives. AMRC also expresses concern that many of the suggested service rules would not result in better service to the public but instead would make service impossible.<sup>150</sup> Primosphere, the only applicant clearly proposing to operate as a broadcaster, states the Commission should strike a balance between ensuring that the public

---

<sup>146</sup> See National Ass'n of Broadcasters v. FCC, 740 F 2d 1190 (D.C. Cir. 1984).

<sup>147</sup> Notice, ¶¶ 27-8.

<sup>148</sup> See Comments of AMRC, DSBC, and CD Radio.

<sup>149</sup> DSBC Comments at 45.

<sup>150</sup> Reply comments of AMRC at 22.

interest is served and assuring that timely introduction of service is not impeded.<sup>151</sup> A non-applicant states that the Commission is not in a position to determine which services should be offered in light of rapidly changing technology and potential consumer services.<sup>152</sup> Although arguing against mandatory offerings, many of the current applicants state that they plan to include public interest programming in their services.

87. Media Access Project ("MAP") urges that the Commission classify satellite DARS as broadcasting to trigger defined statutory public service obligations.<sup>153</sup> In the absence of such a classification, MAP argues that broadcasters' obligations are appropriate. NAB states that imposing public interest obligations on DARS providers will, to some extent, compensate for the loss in local programming that it claims will inevitably result from implementing the service.<sup>154</sup> Individual broadcasters assert that DARS providers will not keep their promises to provide niche programming but instead will offer mainstream services that will compete directly with terrestrial offerings.<sup>155</sup>

88. In response to our request for proposals for possible public service rules, NAB suggested that satellite DARS licensees be held to a "promises v. performance" standard, similar to that formerly required of terrestrial broadcasters. Under this concept, operators would provide the Commission with a list of programming they propose to offer and to specifically describe ethnic or niche offerings included. They would then be subject to a periodic public interest review to determine if they have made good on their promises and to justify any substantial variations from their proposals.<sup>156</sup>

89. Bonneville International Corp., a company holding broadcast licenses, advocates requiring that music programmed channels carry news, information, public service announcements and public service programming. Several commenters urge that satellite

---

<sup>151</sup> Comments of Primosphere at 35. Primosphere states that it intends to donate one music quality channel to public broadcasting, one voice quality channel to a visually impaired reading service and one music channel to children's programming.

<sup>152</sup> Comments of Citizens for a Sound Economy Foundation.

<sup>153</sup> Media Access Project Comments at 13-21. See further discussion of Media Access proposals infra.

<sup>154</sup> Comments of NAB at 51.

<sup>155</sup> Comments of WEMP, WAZZ-FM, WJY Radio, WMUS AM/FM WQDR, WTON.

<sup>156</sup> Comments of NAB at 52.

DARS providers be required to comply with Equal Employment Opportunity requirements.<sup>157</sup> National Public Radio advocates either a specific reservation of channel capacity for noncommercial or educational programming or a commitment to provide a minimum amount of educational cultural, and informational programming to unserved or underserved areas.<sup>158</sup> The suggestion is supported by the Minority Media and Telecommunications Council which states that satellite DARS licensees should be required to set aside channels for noncommercial public access and for minority entrepreneurial access. One commenter, a terrestrial radio station operator advocated that satellite DARS meet certain requirements for each different programming signal offered and for each different community served.<sup>159</sup> NAB points out that there are certain types of local public interest programming that a national service like satellite DARS can neither provide nor replace.<sup>160</sup> Entertainment Communications advocates a requirement that satellite DARS licensees serve "niche" audiences.

90. As explained above, in allocating spectrum and adopting service rules for the satellite DARS service, we have relied on the representations of satellite DARS applicants that they will provide audio programming to audiences that may be unserved or underserved by currently available audio programming. Thus, applicants have proposed new choices in audio programming which may be beneficial for the mobile public and for unserved and underserved communities, particularly in rural or remote areas. We also have considered whether it is appropriate to apply to DARS public interest requirements similar or analogous to those that govern terrestrial radio broadcasters.

91. With regard to non-programming obligations, we conclude that satellite DARS licensees must comply with the Commission's equal employment opportunity requirements. The rationale behind these requirements is a belief that a licensee can better fulfill the needs of the community, whether local or national, if it makes an effort to hire a diverse staff, including minorities and women.<sup>161</sup> This rationale applies with equal force to satellite DARS. We note that no commenters opposed the imposition of EEO requirements. The Commission has a pending rulemaking proposing revision to its EEO rules.<sup>162</sup> Licensees in this service will be required to comply with the current rule and with any changes adopted when the rulemaking is completed.

---

<sup>157</sup> Comments of Minority Media and Telecommunications Council, Bonneville International Corp., WNNJ.

<sup>158</sup> Comments of NPR at 4.

<sup>159</sup> Comments of WNNJ.

<sup>160</sup> Comments of NAB at 50.

<sup>161</sup> Streamlining Broadcast EEO Rules and Policies, 11 FCC Rcd 5154 (1996).

<sup>162</sup> Id.

92. With regard to programming obligations, we agree with some of the commenters that satellite DARS service is likely to provide a new forum for political debate in this country. To ensure that there is fair treatment of federal political candidates that may seek to use this new forum, we believe that satellite DARS licensees, whether they operate on a broadcast or subscription basis, should comply with the same substantive political debate provisions as broadcasters.<sup>163</sup> These provisions are the federal candidate access provision, Section 312(a)(7), and the equal opportunities provision, Section 315. As the Supreme Court stated in upholding Section 312(a)(7) against constitutional attack, these political broadcast provisions "make a significant contribution to freedom of expression by enhancing the ability of candidates to present, and the public to receive, information necessary for the effective operation of the democratic process."<sup>164</sup>

93. While we are not adopting additional public interest programming obligations at this time, we reserve the right to do so. Licensees are specifically on notice that the Commission may adopt public interest requirements at a later date. If additional public interest obligations are found to be warranted, one option would be to adopt rules similar to those Congress enacted for DBS providers, including a 4-7% set-aside of capacity for noncommercial educational and informational programming.<sup>165</sup> Another option would be to hold satellite DARS licensees to a 'promise vs. performance' standard.<sup>166</sup>

### 3. Ancillary Services

94. In the Notice, we discussed the possibility of satellite DARS providers offering non-DARS, or ancillary, services. We sought comment on what restrictions, if any, should apply to such services and on how to monitor compliance with any restrictions.<sup>167</sup> In response, commenters favored allowing provision of ancillary services. Current satellite DARS applicants urged that the Commission allow flexibility to provide such services.<sup>168</sup> Other commenters stated that allowing ancillary services will promote full and efficient use of

---

<sup>163</sup> See 47 U.S.C. 309(a), 307(a); see also 47 U.S.C. 154(i), 303(b), 303(r).

<sup>164</sup> CBS v. FCC, 453 U.S. 367, 396 (1981).

<sup>165</sup> See 47 U.S.C. § 335.

<sup>166</sup> See Comments of NAB at 54-56.

<sup>167</sup> See Notice, ¶¶ 29-30. Examples of ancillary services envisioned for satellite DARS include high speed broadcast data, location based geographic information, electronic graphic/visual information, voice mail and alpha-numeric messages.

<sup>168</sup> See Comments of CD Radio at 85-87; Comments of DSBC at 52-53.

the spectrum and could lower the price of DARS service, particularly in the early stages as satellite DARS is established.<sup>169</sup>

95. Some commenters suggested particular services that would be complementary. For example, Ford Motor Co. suggested allowing data services.<sup>170</sup> Radio Order Corp. urges us to allow song related voice messaging that would permit the listener to access information on a particular song during the uninterrupted music.<sup>171</sup> The USDA/Forest Service National Weather Program suggests that satellite DARS providers could dedicate a channel to broadcasting potentially life-saving forest fire and emergency information.<sup>172</sup>

96. The applicants have proposed a mix of ancillary services. We agree with the commenters who argue that allowing flexibility consistent with the allocation will allow providers to tailor service offerings to meet consumer needs. Because the United States successfully obtained an international allocation for satellite DARS at WARC-92, we would be concerned about any use of the spectrum that is inconsistent with the international allocation.<sup>173</sup>

#### 4. Technical Qualifications

##### *Service Area*

97. The Notice contained no specific proposal for satellite DARS service area requirements. It did, however, ask whether to require satellite DARS systems to provide 50-state coverage or 50-state plus Puerto Rico/Virgin Islands coverage, as we do in the fixed-satellite service. We noted that two satellite DARS applications propose service solely to the 48 contiguous states of the United States (CONUS). Two other applicants propose coverage of the CONUS, Alaska, Hawaii, Puerto Rico and the Virgin Islands.

---

<sup>169</sup> Comments of Orbital Sciences Corp. at 3-4.

<sup>170</sup> Comments of Ford Motor Corp.

<sup>171</sup> Comments of Radio Order Corp. at 2. We note that voice synthesized audio would be considered part of the audio programming offered by a satellite DARS licensee. See Ex Parte letter from Radio Order Corporation, dated April 3, 1996.

<sup>172</sup> Comments of USDA Forest Service.

<sup>173</sup> See Final Acts; 47 C.F.R. sections 2.1, 2.106. See also, Allocation Order, 10 FCC Rcd 2310.

98. CD Radio and Primosphere assert that the Commission should not mandate that first generation satellite DARS systems provide service beyond the CONUS.<sup>174</sup> Primosphere adds that requiring full 50-state coverage would require the use of satellite spot beams and additional spacecraft power. Primosphere also noted that most 12-14 GHz (Ku-band) and DBS licensees provide CONUS only coverage. CD Radio asserted that the service area is market-driven and that other applicants propose to serve Alaska, Hawaii, Puerto Rico, and the Virgin Islands CD Radio indicates also that its second generation design will include an expanded service area.

99. One benefit of a satellite system is its ability to provide nation-wide service. We recognize that 50-state coverage is not mandatory for all satellite services and a service area requirement beyond full CONUS coverage may not be practical for first generation satellite DARS systems. All of the pending applications for satellite DARS propose at least full CONUS coverage, however, and there appears to be support for such a minimum requirement. Accordingly, we conclude that satellite DARS licensees' systems must provide, at a minimum, full CONUS coverage. We strongly encourage coverage to other areas or territories of the United States where practical to do so for first generation systems.

#### *Service Link Margin*

100. A concern identified in the Notice was that satellite DARS signals be available to listeners, especially mobile ones, at every location nationwide. We noted the service link margin is related to the percentage of service availability.<sup>175</sup> We also noted that there was significant comment on the pending satellite DARS applications which questioned the appropriate service link margin necessary for reception in a mobile environment. We therefore proposed in our Notice that satellite DARS applicants be required to identify the service link margin for their systems and demonstrate that their systems are capable of providing that service link margin in a mobile environment, under clear sky conditions, to the geographic areas they will serve.<sup>176</sup> We also sought comment on whether a specific value should be used to define an adequate service link margin for the specified service areas in urban and suburban environments and, if so, what that value is and analysis to support that value. Technical analyses were not included in initial comments to demonstrate that a particular service link margin would be necessary for mobile reception in urban and suburban environments.

---

<sup>174</sup> CD Radio Comments at 89 and Primosphere Comments at 38, n.80.

<sup>175</sup> See Notice, ¶ 44. Service link margin identifies the amount of excess received power available to the end user receiver to reproduce the information transmitted by the satellite.

<sup>176</sup> Notice, ¶ 46.

101. Pending applicants assert that satellite DARS operators will have an incentive to provide sufficient margin to deliver the highest quality audio and still permit low-cost manufacture of receiver equipment.<sup>177</sup> Noting also that the amount of service link margin chosen by satellite operators is affected by a variety of factors, such as use of modulation and access techniques, satellite diversity, transmission schemes, intended audience, and use of terrestrial repeaters,<sup>178</sup> it would be difficult for satellite operators to define one specific value that should be used. We therefore will not require that satellite DARS licensees be capable of providing a specific value of service link margin for a given geographic area and we withdraw our proposal regarding service link margin. We will only require satellite DARS applicants to provide the information on their service link budgets that is already required by Section 25.114(c)(9) of our rules.

### *Receiver Inter-operability*

102. In general, it is our policy to avoid mandating the use of one form of technology. We conclude it is appropriate to follow that policy here because it will allow flexibility for satellite DARS licensees in designing their satellite DARS systems, and will promote innovative system designs. Indeed, in the Notice, we proposed to allow licensees to use the channelling plans, modulation schemes and multiple entry techniques of their choice.<sup>179</sup> One of the underlying reasons for proposing a band segment approach to licensing the satellite DARS spectrum was to avoid imposing complex sharing arrangements among satellite DARS licensees that may result due to the diversity in the proposed satellite DARS designs. The diverse modulation and channelling techniques proposed in the pending satellite DARS applications, however, led us to seek comment in the Notice on the issue of receiver inter-operability and standards for satellite and terrestrial DARS.<sup>180</sup>

103. We indicated our concern that licensing diverse satellite DARS systems could increase the cost of manufacturing a receiver that is compatible with all competing satellite DARS technologies and terrestrial formats.<sup>181</sup> We therefore proposed that each applicant demonstrate that its satellite DARS system is capable of remotely tuning its individual mobile,

---

<sup>177</sup> See CD Radio Reply at 54.

<sup>178</sup> See Primosphere Comments at 39 and AMRC Comments at 24.

<sup>179</sup> Notice, ¶ 80.

<sup>180</sup> Notice, ¶ 51.

<sup>181</sup> Notice, ¶ 49.

fixed, and/or portable receivers across the allocated bandwidth 2310-2360 MHz.<sup>182</sup> This rule would have been necessary if we were to license more than one band segment to a particular satellite DARS licensee, (whether as an interim assignment or in the event that a license is dismissed and the spectrum is re-divided pro-rata<sup>183</sup>) but in view of our conclusion to license only two satellite DARS systems through competitive bidding, and not to permit interim frequency assignments, such a provision is no longer required. We adopt, however, the principle behind our proposed rule that satellite DARS licensees are required to design a receiver which would accommodate all satellite DARS providers. By promoting receiver inter-operability for satellite DARS, we are encouraging consumer investment in satellite DARS equipment and creating the economies of scale necessary to make satellite DARS receiving equipment affordable. This rule also will promote competition by reducing transaction costs and enhancing consumers' ability to switch between competing DARS providers. We decline to adopt a specific standard for satellite DARS receiver designs, though. This will allow licensees the flexibility to determine the most cost effective way to meet our receiver-interoperability requirements. We do not mandate that satellite DARS receivers be capable of receiving terrestrial broadcasting formats. Terrestrial and satellite DARS are at different developmental stages and we do not want to impede implementation of either service.

104. Parties contend that Commission adoption of a single, industry-developed transmission standard for satellite DARS will keep receiver costs down, minimize design complexity, and encourage competition in the marketing of receivers.<sup>184</sup> The Electronic Industry Association (EIA) maintains further that satellite DARS receivers should be designed so that consumers can seamlessly switch between satellite and terrestrial based DARS systems.<sup>185</sup>

105. Satellite DARS applicants share different views regarding the Commission's role in the process of receiver development. CD Radio asserts that receiver inter-operability is in the clear economic interests of all satellite DARS providers and it expects that its receiver will be fully tunable in the sense that the consumer can select the service provider of

---

<sup>182</sup> We also proposed that a satellite DARS applicant demonstrate how it will implement the forward signalling command for its receivers to select and tune to any center frequency(ies) in the allocated bandwidth. See Notice, Appendix I, Proposed Section 25.144(2)(ii).

<sup>183</sup> See Notice, ¶ 79.

<sup>184</sup> See Ford Comments at 3 and EIA Reply at 9. See also Ex Parte presentation by CEMA to International Bureau staff on September 18, 1996.

<sup>185</sup> See EIA Comments at 7.

their choice.<sup>186</sup> AMRC contends that creation of a common receiver capable of tuning in the entire DARS band is important in promoting consumer acceptance of the technology.<sup>187</sup> Given the market incentive for receiver compatibility, DSBC asserts that it is likely that a compatible receiver standard for satellite DARS will be developed without regulatory intervention.<sup>188</sup> Primosphere adds that it is committed to working with the appropriate industry organizations to develop a common receiver standard and therefore Commission action is not necessary.<sup>189</sup> In a related matter, CD Radio seeks confirmation from the Commission that consumers may rely on the authorization of a satellite DARS provider and need not obtain any additional license or registration for receive-only earth stations used to obtain the service.<sup>190</sup>

106. As an alternative to this Commission mandating standards we will require that a satellite DARS applicant, in its application, certify that its satellite DARS system will include a receiver design that will permit users to access all licensed DARS systems that are operational or under construction. Satellite DARS licensees, during the construction of their satellite systems, will have an opportunity to work among themselves toward a final receiver design. We agree with commenters that it is in the interest of the satellite DARS licensees, and consumers, for the licensees to come to agreement on a single DARS receiver design. We also agree with commenters that, alternatively, a single transmission standard would be in the interest of the satellite DARS providers and consumers, independent of whether it is developed by the Commission or by industry, but we will not mandate use of a certain technology.<sup>191</sup> If satellite DARS licensees redesign their systems to use conforming transmission technology, receiver complexity would be minimized and receiver costs would be lowered correspondingly. We believe that, at the very least, consumers should be able to access the services from all licensed satellite DARS systems and our rule on receiver interoperability accomplishes this. We also agree with CD Radio that it is unnecessary for satellite DARS consumers to file for a license for their receive-only terminals. Indeed, the

---

<sup>186</sup> See CD Radio Comments at 90.

<sup>187</sup> See AMRC Comments at 20.

<sup>188</sup> DSBC Comments at 48.

<sup>189</sup> Primosphere Reply at 24-25.

<sup>190</sup> See CD Radio Reply at 53, n.146. CD Radio notes that licensing of receiver-only earth stations is not required by the Commission (referencing Part 25 of the Commission's rules, Section 25.131(b)).

<sup>191</sup> We conclude that the satellite DARS licensees are in the best position to make necessary trade-offs between use of different technologies to implement their satellite systems. See discussion of design trade-offs in Spectrum Requirements and Economic Viability, supra, Section B.2.

Commission has not licensed receive-only earth stations for years in an effort to deregulate such operations.<sup>192</sup>

107. Terrestrial broadcast and satellite DARS services are at different stages of development, however, and we do not intend to add delay to the progress of the satellite service with further regulatory intervention by requiring that receivers be tunable to terrestrial broadcast signals. Testing and evaluation of proposed digital audio radio technologies has been on-going since 1991.<sup>193</sup> We urge satellite DARS licensees to take this information into account before they finalize their system and receiver designs. The comments indicate that satellite DARS licensees will continue to participate in the industry groups related to their service and we have good reason to believe that this is sufficient to facilitate the design of a state-of-the-art satellite DARS receiver.

#### *Data Compression Rates*

108. The applicants propose various coding rates to produce near compact disc (CD) quality audio.<sup>194</sup> Some applicants propose to use variable data rates to transmit a mix of audio formats where the bandwidth necessary to produce one CD quality channel, for example, would be used to provide several high quality channels at data rates which are lower than those necessary to produce CD quality.<sup>195</sup> We tentatively concluded that the use of variable data rates would promote efficient use of the spectrum and that satellite DARS licensees should be permitted to implement a mix of programming formats at variable data rates. We reflected this in our proposal to require satellite DARS licensees to identify which coding scheme and coding rate(s) they plan to implement on their satellite DARS systems and require those satellite DARS systems which intend to offer audio formats other than CD quality to be capable of transmitting lower quality audio at lower data rates. We proposed to refrain from requiring a particular level of audio quality or other quality for satellite DARS and we sought comment on our tentative conclusions. We adopt, today, a rule that is consistent with our proposal for variable data rates.

---

<sup>192</sup> See 47 CFR § 25.131.

<sup>193</sup> See Notice, ¶ 48. The Electronic Industry Association (EIA) has been instrumental in evaluating and testing terrestrial and satellite DARS technologies. Indeed, the EIA expects to complete the technical evaluation of DARS technologies and issue a Report to the Commission, including recommendations, in the near future. See EIA Comments at 10.

<sup>194</sup> See Notice, ¶ 52.

<sup>195</sup> These high quality channels would be comparable to FM stereo or FM monaural and could be used to provide less demanding radio formats such as talk radio, sports and news. See Notice, ¶ 53, n.53.

109. Comments generally support the Commission proposal to allow use of variable data rates depending on the programming being offered and not to define a particular level of quality for DARS based on data rates.<sup>196</sup> CD Radio asserts that satellite DARS licensees should be permitted to rely on market preferences to determine the data rates to use for particular formats and to determine the quality of the service.<sup>197</sup> AMRC agrees with the Commission proposal because it intends to include some non-CD quality channels in its system.<sup>198</sup> In this respect, CD Radio proposed a modification to our original proposal that would require a satellite DARS applicant to identify the compression rate it will use to transmit audio programming whether CD or other quality.<sup>199</sup> We adopt this proposal and extend it to require licensees to identify the compression rates used for non-audio formats.

### 5. Milestone Qualifications and Reporting Requirements

110. In the Notice, we proposed to adopt financial qualifications and milestone requirements for satellite DARS licensees.<sup>200</sup> Because of our decision to auction licenses, financial qualifications are unnecessary.<sup>201</sup> However, we believe that strict adherence to satellite construction and operational milestones will assure that licensees are proceeding with their proposals and spectrum is used efficiently. Because of the long lead time necessary for satellite construction, we proposed that satellite DARS licensees begin construction of their space stations within one year, launch and begin operating their first satellite within four years, and begin operating their entire system within six years. We also proposed that licensees file annual reports on the status of their systems. The current applicants support the rules proposed in the Notice.<sup>202</sup> Accordingly, we adopt the requirements as proposed.

### 6. License Term

---

<sup>196</sup> See CD Radio Comments at 93, Primosphere Comments at 40, and DSBC Comments at 48.

<sup>197</sup> See CD Radio Comments at 93.

<sup>198</sup> AMRC Comments at 25.

<sup>199</sup> CD Radio Comments, Appendix E, at 6.

<sup>200</sup> Notice, ¶¶ 88-93.

<sup>201</sup> Id., ¶ 93.

<sup>202</sup> Joint Comments of Applicants at 4.

111. In the Notice, we proposed that licenses for satellite DARS space segment facilities would be issued for ten years.<sup>203</sup> We also noted that licensees choosing to operate as broadcasters would be limited by statute to a shorter term.<sup>204</sup> Adoption of our original proposal would place DARS licensees that choose to be broadcasters at a disadvantage by giving them a shorter term. In addition, two different terms could cause confusion if an operator decided to change the mix of services it offered and might hamper the flexibility we intended that licensees should have in choosing formats.<sup>205</sup> Accordingly, because the Communications Act limits broadcast license terms to eight years,<sup>206</sup> we have determined that all satellite DARS license terms should be eight years. The license term will commence when each satellite is launched and put into operation. In addition, as proposed in the Notice,<sup>207</sup> individual satellite DARS receivers will not be licensed.

## 7. Technical Rules

112. As one of the pending satellite DARS applicants indicates, satellite systems are a collection of technical trade-offs between satellite power, number of channels, data rates, service link margin and bandwidth.<sup>208</sup> Therefore, the greater the flexibility in our technical rules, the greater the flexibility satellite DARS licensees will have in designing their systems in such a way as to meet their business plans and marketing goals. The technical rules adopted today will offer satellite DARS licensees sufficient flexibility to make necessary trade-offs and to implement systems that are viable and competitive.

### *Power Flux-Density Limits*

113. We proposed in the Notice not to apply power flux-density (pfd) limits on satellite DARS networks and we believe the record supports our tentative decision.<sup>209</sup> While initially CD Radio maintained that coordination of satellite DARS systems with adjacent countries would be facilitated if all systems were required to meet a pfd level at the Earth's surface of -139 dB(W/m<sup>2</sup>/4 kHz), CD Radio now contends that it is not necessary for the

---

<sup>203</sup> Notice, ¶ 116.

<sup>204</sup> At the time the Notice was adopted, that term was seven years but has since been changed to eight. 47 U.S.C. §307(c)(1).

<sup>205</sup> See, supra, ¶ 82.

<sup>206</sup> 47 U.S.C. § 307(c)(1).

<sup>207</sup> Id.

<sup>208</sup> Reply Comments of AMRC at 17.

<sup>209</sup> See Notice, ¶ 65.

Commission to re-open the issue of required pfd limits since it will be part of the coordination process.<sup>210</sup> Others agree. DSBC, for instance, maintains that experience has shown that the flexibility in the international coordination process is far superior to the rigidity of pfd limits.<sup>211</sup> Accordingly, Satellite DARS licenses will be conditioned on the completion of international coordination with adjacent countries.

114. It is clear that each satellite DARS licensee will need to operate its satellite(s) at a pfd level that is high enough to provide sufficient service availability and yet low enough to coordinate with terrestrial services in adjacent countries. Coordination with adjacent countries becomes an important issue because the pfd values characteristic of proposed satellite DARS systems exceed the threshold levels that have been identified by foreign administrations to protect their existing terrestrial services. Our discussion of coordination, above, provides satellite DARS applicants with a detailed understanding of the coordination issues in the 2320-2345 MHz band.<sup>212</sup> The applicants are in a better position than the Commission to make necessary power trade-offs to implement their satellite DARS systems. Moreover, since we are licensing satellite DARS providers in two separate frequency assignments, the failure of one licensee to complete coordination with adjacent countries in a timely fashion will not delay the coordination of the other licensee's system. In light of the above, we believe that adoption of a specific pfd limit is unnecessary. Satellite DARS applicants are reminded, however, that they are required to identify in their modified satellite DARS system applications the pfd at the Earth's surface from their spacecraft according to Section 25.114 (c)(11) of the Commission's rules.

#### *Out-of-Band Emissions*

115. Satellite licensees are required to suppress out-of-band and spurious emissions<sup>213</sup> from their space stations to the levels specified in Section 25.202(f) of the Commission's Rules. We indicated in the Notice that techniques such as spectral shaping, coding, offset quadrature modulation and filtering, would be useful in mitigating out-of-band

---

<sup>210</sup> See Comments of CD Radio at 97.

<sup>211</sup> DSBC comments at 50.

<sup>212</sup> See, supra, Section B.3.

<sup>213</sup> An out-of-band emission is radio frequency energy on a frequency or frequencies immediately outside of the necessary bandwidth which results from the modulation process, but excluding spurious emissions. A spurious emission is radio frequency energy on a frequency or frequencies which are outside the necessary bandwidth and the level of which may be reduced without affecting the corresponding transmission of information. Spurious emissions exclude out-of-band emissions.

emissions.<sup>214</sup> We sought comment, however, on whether the out-of-band emission limits in Section 25.202(f) would be sufficient to protect radiocommunication services in bands adjacent to the 2310-2360 MHz band, particularly deep space operations below 2310 MHz and U.S. MAT operations above 2360 MHz.

116. Cornell University asserts in its comments that the Arecibo Observatory in Puerto Rico, which it operates for the National Science Foundation in the 2370-2390 MHz band, would require greater protection from satellite DARS than that which is currently required by Section 25.202(f).<sup>215</sup> Specifically, Cornell requests that, as a minimum, the Commission require the out-of-band emission limits of Section 25.202(f)(3) for satellite DARS emissions beyond the 2370 MHz band edge. It requests that a rule for spurious emissions, consistent with those being considered by ITU-R Task Group 1/3<sup>216</sup> be applied to satellite DARS as well. This would require an additional 9 dB of attenuation below the out-of-band emission limits required by Section 25.202(f).<sup>217</sup>

117. Cornell's calculations assume that a satellite DARS licensee will be authorized to operate at a center frequency of 2355 MHz with a bandwidth of 8 MHz. Considering that satellite DARS systems will be licensed below 2345 MHz, and that we are not requiring the provision of satellite DARS to Puerto Rico and the Virgin Islands, which offers further protection to the Arecibo Observatory, attenuation of out-of-band emissions beyond the limits already required by Section 25.202(f) may not be necessary. It would be premature for the Commission to require satellite DARS licensees to meet the spurious emission limits which are currently in place as "design guidelines" and which may be reviewed again by ITU-R Study Groups. The TG 1/3 Recommendation that Cornell cites in its comments is a draft Recommendation and the issue of spurious emissions will not be finalized until the 1999 international Radiocommunication Assembly.

118. We therefore will only require satellite DARS licensees to meet out-of-band and spurious emission limits which are contained in Section 25.202(f) of our Rules. Satellite DARS licensees should, however, take cognizance of the TG 1/3 "design guidelines" and the Arecibo deep space operations in the 2370-2390 MHz when designing, constructing and

---

<sup>214</sup> See Notice, ¶ 69, n.69.

<sup>215</sup> See Ex Parte Presentation of Cornell University (Cornell) and the Arecibo Observatory, dated March 20, 1996.

<sup>216</sup> ITU-R Task Group 1/3 (TG 1/3) is responsible for developing spurious emission limits to protect the Radio Astronomy service. TG 1/3 completed its work in November 1996.

<sup>217</sup> See Cornell Ex Parte presentation. Cornell indicates that the Arecibo planetary radar system has harmful interference thresholds similar to the levels necessary to protect Radio Astronomy.

operating their space stations. In a related matter, the pending satellite DARS applicants assert that they can each operate without causing harmful interference to one another.<sup>218</sup> Since the pending satellite DARS applicants propose a band segment licensing approach, we presume that the out-of-band emission limits of Section 25.202(f) would provide for interference-free, intra-service satellite DARS operation. The issue of out-of-band emission limits to protect satellite DARS receivers is addressed in the Wireless Communication Services proceeding.<sup>219</sup>

### *Telemetry Beacons*

119. We sought comment in the Notice on a suitable location for satellite DARS telemetry beacons. We proposed in the Notice that each system operator reduce its bandwidth occupancy by 0.1 MHz to create two 0.2 MHz assignments adjacent to the edges of the satellite DARS band for location of telemetry beacons.<sup>220</sup> We also proposed an alternative location for all satellite DARS telemetry beacons at the lower edge of the 2310-2360 MHz band, considering our tentative conclusion not to immediately license the lower 10 MHz for satellite DARS. Our alternative proposal would put fewer constraints on the satellite DARS licensees (*i.e.*, they would no longer have to reduce their bandwidth occupancy to accommodate telemetry beacons), but we indicated that further constraints would be placed on any future licensee of the lower portion of the band. We requested comment on our proposals for satellite DARS telemetry beacons and we requested comment on alternative locations.

120. In its comments, DSBC suggests that, alternatively, the 3697-3699 MHz band would be suitable for satellite DARS telemetry beacons.<sup>221</sup> It contends that the 3697-3699 MHz band could readily be coordinated for satellite DARS telemetry beacons thereby retaining the total DARS band for service links. CD Radio, in its comments, proposes a modification to the satellite DARS telemetry beacon proposal in the Notice. According to CD Radio's proposal, satellite DARS licensees *may* reduce their assigned bandwidth occupancy to provide telemetry beacons.<sup>222</sup> No other alternatives were identified for the location of satellite DARS telemetry beacons.

---

<sup>218</sup> See Joint Comments of Applicants at ¶ 2.

<sup>219</sup> See WCS Order, ¶¶ 123-144.

<sup>220</sup> See Notice, ¶ 82.

<sup>221</sup> See DSBC comments at 53. As DSBC correctly indicates the use of the band by the FSS is limited to International, inter-Continental systems, and subject to case-by-case electromagnetic compatibility analysis according to footnote US245 in Section 2.106 of our Rules. DSBC fails to indicate, however, that the band is also shared with Radiolocation and Aeronautical Radionavigation services on a primary basis.

<sup>222</sup> See CD Radio Comments, Appendix E, at 9 (emphasis added).

121. We adopt our original proposal to locate telemetry beacons for satellite DARS in the satellite DARS band, with minor modification. No parties supported the proposal made by DSBC. Further, DSBC provided no supporting information in its comments to assess the impact of satellite DARS telemetry beacons in the 3697-3699 MHz band on the Radiolocation and Aeronautical Radionavigation users of the band. DSBC indicates that Intelsat and Inmarsat and numerous other non-U.S. satellite systems make use of all or large portions of this band. These satellite systems, however, are not located in the geostationary orbit between 80° and 110° W.L., where the satellite DARS applicants propose to locate their satellites. CD Radio, on the other hand, supports the operation of satellite DARS telemetry beacons within the satellite DARS service link spectrum. CD Radio's proposal is more flexible than the proposal in our Notice because it does not mandate an amount of spectrum by which each satellite DARS licensee must reduce its bandwidth to accommodate telemetry beacons (i.e., 0.1 MHz). We therefore modify our original proposal to require satellite DARS licensees to accommodate telemetry beacons for their systems within their exclusively licensed bandwidth but allow each licensee the flexibility to determine the appropriate amount of spectrum necessary for its telemetry beacons.

### *Cross Polarization*

122. Cross polarized signals are orthogonal signals as seen by the receiver.<sup>223</sup> This technique is used extensively in the fixed-satellite service because it facilitates reuse of frequencies to accommodate multiple signals, thereby promoting efficient use of the spectrum. In the Notice we indicated that the record was insufficient for us to analyze the benefits of potential capacity increases, if any, that may result from use of cross-polarized transmissions for satellite DARS.<sup>224</sup> We proposed, however, that satellite DARS licensees be permitted to reach agreement with other satellite DARS licensees to transmit on cross polarized frequencies in frequency assignments of other licensees.<sup>225</sup> The parties who reach such agreements would be required to apply to the Commission for approval of the agreement. Commission approval would be conditioned on the outcome of coordination with other administrations.<sup>226</sup>

---

<sup>223</sup> Two signals which are orthogonal can occupy the same frequency. The cross polarization isolation achievable between two signals determines the practicality of two signals occupying the same bandwidth.

<sup>224</sup> Notice, ¶ 59. We noted that it was not clear whether optimum cross-polarization isolation would be available to allow use of this technique for multiple entry in a mobile environment. Id. Indeed, CD Radio continues to test the feasibility of cross polarization and it asserts that it will not use this reuse technique if it proves unworkable. See CD Radio Reply Comments at 49.

<sup>225</sup> See proposed section 25.214, Notice, Appendix I.

<sup>226</sup> Notice, ¶ 59.

123. The satellite DARS applicants generally support this proposal.<sup>227</sup> CD Radio asserts that a licensee should at least be permitted to transmit cross-polarized signals within its own frequency assignment.<sup>228</sup> AMRC contends that the use of cross polarization techniques is still untested in the S-band and the availability of such techniques for DARS licensees should not be assumed. However, to the extent that cross polarization techniques become feasible, the Commission should allow its use to expand program offerings.<sup>229</sup> We believe that our proposed rule for cross polarization leaves open the possibility for satellite DARS operators to use this technique, when proven feasible, to meet future market demands for their service. We received no comment in opposition to our proposal for use of cross-polarized frequencies and we adopt our original proposal, without modification.

#### D. Modification of Part 87

124. In our Notice we indicated that modification to Part 87 of our rules (Aviation Services) would be consequential to the licensing of satellite DARS systems in the 2310-2360 MHz band. We recognized that the mobile and radiolocation services are currently allocated on a primary basis in the 2310-2360 MHz band until January 1, 1997 or until the first broadcasting-satellite (sound) system is operating and affecting or be affected by the mobile and radiolocation services in those service areas, whichever date is later.<sup>230</sup> Further, our Allocation Order warned that the BSS(sound) and complementary terrestrial broadcasting service, during their implementation, should take cognizance of the expendable and reusable launch vehicle frequencies 2312.5, 2332.5 and 2352.5 MHz to minimize the impact on this mobile service use to the extent possible.

125. We proposed modification of Section 87.303, in Appendix II of our Notice, to align Part 87 with Parts 2 and 25 of our Rules. We recommended authorization of new primary assignments for mobile telemetry and telecommand operations, pursuant to Section 87.303, above 2360 MHz. Our Notice indicated that there was support from the aeronautical community to reaccommodate existing aeronautical telemetry users of the 2310-2390 MHz band to the 2360-2390 MHz band.<sup>231</sup> We proposed modification to Section 87.303 to assign telemetry and associated telecommand operations in fully operational or expendable and reusable launch vehicles above 2360 MHz. Moreover, we suggested that any other telemetry use of the band 2310-2390 MHz would be secondary to launch vehicle use.

---

<sup>227</sup> See DSBC Comments at 50, CD Radio Comments at 96, and Primosphere Comments at 42.

<sup>228</sup> CD Radio Comments at 96.

<sup>229</sup> AMRC Reply at 16, n.15.

<sup>230</sup> Notice, ¶ 61. See Commissions Rules, Part 2, Section 2.106, fn. US328.

<sup>231</sup> Notice, ¶ 61.

126. As discussed, supra, co-frequency, co-coverage operation of satellite DARS and MAT is not possible and it would not be practical to license MAT systems in the satellite DARS band on a co-primary basis. There was no opposition to our proposal to modify Section 87.303. Only DSBC and AFTRCC commented with modifications to our proposal to clarify the status of telemetry use of the 2310-2390 MHz band.<sup>232</sup> Consistent with our original proposal, footnote US328 to Part 2 of our Rules, and the developments in the remainder of the 2310-2360 MHz band,<sup>233</sup> we modify Section 87.303 as it pertains to the 2320-2345 MHz band.<sup>234</sup> We therefore adopt the modified Section 87.303 contained in the Appendix.

#### E. Satellite DARS Feeder Link Networks

127. In addition to satellite DARS space stations providing service downlinks in the 2320-2345 MHz band, feeder link earth stations for each satellite DARS system will be required to uplink programming information to the space station(s). We recognized in the Notice that feeder link networks are essential to deliver service to the end user and that ample contiguous spectrum is necessary to implement a viable satellite DARS system.<sup>235</sup> We also recognized that satellite DARS feeder link earth stations will be few in number (i.e. one, or possibly two for redundancy, per licensee) and will operate at fixed locations. Therefore, we will authorize satellite DARS feeder link networks in fixed-satellite service (FSS) frequency allocations.

128. We indicated, however, that we would not authorize satellite DARS feeder link networks in the conventional FSS 4/6 GHz (C-band) and 12/14 GHz (Ku-band) frequency bands which are already congested with U.S. fixed-satellite service networks. We tentatively concluded that this would not be an efficient use of the FSS spectrum or the geostationary orbit.<sup>236</sup> Additionally, we recognized in the Notice that the pending satellite DARS applicants propose feeder link operations in FSS bands other than the conventional 4/6 and 12/14 GHz bands. This is consistent with our tentative conclusion. Moreover, we understand that feeder link requirements for each satellite DARS system may increase or decrease depending on the amount of satellite DARS service link spectrum that is exclusively licensed to each applicant,

---

<sup>232</sup> DSBC Comments at 54. See also AFTRCC Ex Parte statement dated December 16, 1996.

<sup>233</sup> We note that the WCS Notice proposes a new footnote USYYY to Part 2, Section 2.106 to assign MAT operations in the 2310-2320 MHz and 2345-2360 MHz bands on a secondary basis to WCS.

<sup>234</sup> See discussion of domestic re-allocation of spectrum in our WCS Notice, supra.

<sup>235</sup> Notice, ¶ 70.

<sup>236</sup> See Notice, ¶ 71.

and on the final configuration of the satellite DARS systems. For these reasons we sought comment on possible alternative non-congested FSS frequency bands that would be suitable for satellite DARS feeder link operations in the event that the frequency bands originally proposed by the applicants are not available.<sup>237</sup>

129. Licensing service link spectrum in the 2320-2345 MHz band without designating spectrum for feeder link networks would result in the Commission licensing an incomplete satellite DARS system. The satellite DARS systems cannot operate without sufficient feeder link spectrum. We therefore will permit satellite DARS feeder link networks in the FSS frequency bands 7025-7075 MHz and 6725-7025 MHz (101° W.L. orbital location only), consistent with the requirements identified in the current applications. We will license satellite DARS feeder link Earth stations according to existing regulations for FSS Earth stations.

130. According to the proposals in the pending applications, the feeder link spectrum requirements for three of the four applicants can be accommodated in the 7025-7075 MHz band. Since satellite DARS systems will be operating space stations in the geostationary orbit, this 50 MHz of spectrum can be reused by satellite DARS licensees in the uplink direction, given sufficient orbital separation between the space stations. We believe that an orbital separation of at least two degrees between satellite DARS space stations is obtainable.<sup>238</sup> Primosphere and CD Radio propose in their applications to use the 7025-7075 MHz band.<sup>239</sup> Though AMRC proposes to use the 6530-6545 MHz band for its feeder links, it proposed no alternative bands. We believe that AMRC's feeder link spectrum requirements, too, can be accommodated in the 7025-7075 MHz band.

131. The fourth applicant, DSBC, proposes in its application to use the 6500-6855 MHz band for its feeder links. DSBC has a greater spectrum requirement than the other applicants because it proposes a system which uses multiple spot beams. Spot beams allow for greater frequency reuse of the service link spectrum but the amount of feeder link

---

<sup>237</sup> Notice, ¶ 74.

<sup>238</sup> According to its application, Primosphere proposes to use the 80° and 110° W.L. orbital locations which are the same locations proposed by CD Radio. Primosphere recognizes, however, that slight variations from its proposed orbital locations may be necessary to provide sufficient orbital separation in the feeder link band. See Primosphere Application at Appendix 1, pg 5.

<sup>239</sup> Following its application for satellite DARS, CD Radio submitted a request to use center frequencies 6715 MHz and 6725 MHz for its feeder link transmissions. Its request was dismissed without prejudice, however, by the Commission on August 3, 1993, as being prematurely filed since its space station application had not yet been granted.

spectrum required is proportionately greater. We note also that DSBC has requested the 101° W.L. orbital position which is allocated to the U.S. in accordance with the international FSS allotment plan.<sup>240</sup> The spectrum in the 6725-7025 MHz allotment band is contiguous with the 7025-7075 MHz band. By combining the 300 MHz of spectrum from the allotment plan with the 50 MHz between 7025-7075 MHz, 350 MHz of spectrum could be available to implement a satellite DARS system at 101° W.L. which uses a multiple spot beam configuration. Moreover, this proposal would be a more efficient use of the FSS allotment plan by using it to its fullest.

132. The 6725-7025 MHz allotment and 7025-7075 MHz bands are currently lightly used in the U.S. by the fixed-satellite service, in contrast to the conventional 4/6 GHz and 12/14 GHz bands. Indeed, the WRC-95 designated these frequency bands for NGSO MSS feeder link use because, globally, they are currently lightly used by the FSS. Though NGSO MSS feeder link networks are planned to operate in these frequency bands and these bands are used in the U.S. for broadcast auxiliary and Electronic News Gathering (ENG), we believe, for the reasons stated herein, that satellite DARS feeder links can share the 6725-7025 MHz allotment and 7025-7075 MHz bands with existing and planned co-primary users.

133. Regarding the sharing situation in the U.S. with broadcast auxiliary and ENG use of the bands, we identified in the Notice the sharing issues that satellite DARS operators would have to address. Initially, commenters maintained that bands allocated for broadcast auxiliary are heavily used for ENG, inter-city relays and studio-to-transmitter links, and that use of the 7 GHz band for satellite DARS feeder link operations would not be feasible.<sup>241</sup> Joint Comments from broadcasters assert, however, that satellite DARS feeder links could share the 7 GHz band with broadcast operations under certain conditions.<sup>242</sup> The National Association of Broadcasters (NAB) maintains that satellite DARS feeder link use of the 7 GHz band would be possible only in small markets, noting that ENG may move from the 2 GHz band to the 7 GHz band thereby crowding the 7 GHz band.<sup>243</sup> CD Radio contends that, even in light of the mobile nature of ENG operations in the 7 GHz band, a carefully engineered and coordinated satellite DARS uplink may well be able to co-exist with these broadcast facilities.<sup>244</sup>

---

<sup>240</sup> See International Radio Regulation RR No. 792A.

<sup>241</sup> See Notice, ¶ 72.

<sup>242</sup> See Joint Comments of SBE, Capital Cities, Association of Maximum Service Television, and NBC at 3.

<sup>243</sup> See NAB Comments at 61-62.

<sup>244</sup> See CD Radio Comments at 98. See also CD Radio Comments, Appendix F, for an example satellite DARS feeder link Earth station coordination.

134. Most of the conditions for sharing the 7 GHz band identified by the broadcasters in their Joint Comments are typically negotiated during the domestic licensing process between satellite licensees and broadcasters. The results of this domestic coordination would be reflected in the satellite DARS earth station application to demonstrate that Earth station operations would not affect other co-primary users of the band.<sup>245</sup> Satellite DARS feeder link networks will be authorized as a fixed-satellite service in the 6725-7025 MHz allotment and 7025-7075 MHz bands on a co-primary basis, but Earth station operations are expected to be coordinated with pre-existing users of the spectrum before they will be licensed to operate. The Commission will authorize satellite DARS feeder link Earth stations only after the applicant demonstrates that coordination with potentially affected users in the band, including co-primary broadcast users, has been successfully completed.<sup>246</sup>

135. Certain of the conditions proposed by the broadcasters would not be imposed on satellite DARS operators after the earth station licensing process is completed. For instance, satellite DARS feeder links would not be required to accept interference received from existing and planned TV broadcast auxiliary stations once the earth stations are licensed.<sup>247</sup> Moreover it would be premature for the Commission to identify and adopt "keep out zones" for satellite DARS earth stations, for example in areas near major sporting arenas and around existing 7 GHz television broadcast auxiliary receive sites, as proposed by broadcasters in their comments. This detailed frequency coordination exercise will be conducted between the satellite DARS licensees and broadcasters during the domestic licensing process and in parallel with the construction and deployment of the satellite DARS systems. Nevertheless, the fact that the Joint Commenters identified conditions that would facilitate sharing in the 7 GHz band is an indication that a workable solution can be realized for satellite DARS feeder link networks to operate in the bands shared with broadcast facilities.

136. We also identified the sharing issues regarding satellite DARS feeder links and planned feeder link networks for NGSO MSS systems in the Notice.<sup>248</sup> NGSO MSS feeder link networks will be transmitting in the downlink direction in the 7 GHz band while satellite DARS feeder links will be transmitting in the uplink direction in the same band (i.e. NGSO MSS feeder links will be operating "reverse band"). Coordination between the transmitting satellite DARS earth stations and receiving NGSO MSS feeder link earth stations, and between receiving DARS space stations and transmitting NGSO MSS space stations is

---

<sup>245</sup> See Part 25, Section 25.130(b). See also Section 25.151 for procedures to process satellite Earth station applications.

<sup>246</sup> See Part 74, Sections 74.604(b) - (d) for procedures to avoid and resolve interference that may be caused to existing broadcast auxiliary users.

<sup>247</sup> See Primosphere Reply at 30-31.

<sup>248</sup> Notice, ¶ 75.

therefore required. Primosphere asserts that because satellite DARS feeder link earth stations do not have significant geographic limitations on where they can be located, it is not expected that coordinated use of the 7 GHz band with NGSO MSS feeder link earth stations will be difficult.<sup>249</sup> DSBC adds that there are no apparent problems with satellite DARS feeder link band proposals even in light of WRC-95 proposals for NGSO MSS feeder links.<sup>250</sup>

137. Loral Qualcomm Partnership (LQP) asserts that any satellite DARS feeder link assignment in the 7 GHz band should be required to operate within the sharing criteria adopted at WRC-95 for sharing between GSO FSS and NGSO MSS feeder link networks. We expect satellite DARS feeder link networks, and NGSO MSS feeder link networks, to operate according to WRC-95 decisions. We believe that, based on WRC-95 decisions, geostationary satellite DARS feeder links and NGSO MSS feeder links can co-exist in the 7 GHz band. There will be relatively few feeder link earth stations for both services and sufficient distance can be maintained between the transmitting feeder link earth stations for satellite DARS and the receiving earth stations of NGSO MSS feeder links networks. Additionally, according to WRC-95 decisions, transmitting NGSO MSS feeder link space stations must meet power flux density limits at the geostationary orbit to protect receiving space stations in the 7 GHz band. The domestic coordination process, in accordance with Section 25.130 of our Rules, will facilitate feeder link Earth station licensing of both satellite DARS and NGSO MSS systems.

#### **F. Further Notice of Proposed Rulemaking on Terrestrial Repeaters**

138. As discussed above, we are not mandating a specific service link margin that satellite DARS operators must provide in a given geographic area, such as urban areas. It is important, however, for the satellite DARS systems to maintain sufficient service link margin to reproduce the original information transmitted by the satellite. In the Notice, we noted that some satellite DARS applicants intend to implement, as necessary, terrestrial repeaters, or "gap-fillers", in urban canyons and other areas where it may be difficult to receive DARS signals transmitted by a satellite. These terrestrial gap-fillers would re-transmit the information from the satellite to overcome the effects of signal blockage and multipath interference. Since we had no information in the record on the specifics of operation of these terrestrial gap-fillers, we sought comment on their operation to determine what rules should govern their use.<sup>251</sup>

---

<sup>249</sup> See Primosphere Reply at 30, n. 47. In particular, Primosphere sees no impediment to coordinating with LQP reverse band feeder link networks.

<sup>250</sup> DSBC Comments at 51.

<sup>251</sup> See Notice, ¶¶ 55-56.

139. Some commenters expressed concern about use of terrestrial repeaters to complement satellite DARS. Tichenor Media Systems, for example, contends that satellite DARS should not be permitted to originate local programming through the use of terrestrial repeaters.<sup>252</sup> Similarly, NAB and WFAN express concern that the use of terrestrial gap fillers would transform satellite DARS into a terrestrial based service.<sup>253</sup> Indeed, in the Notice we proposed to prohibit the operation of terrestrial gap-fillers except in conjunction with an operating satellite DARS system to ensure its complementary nature and so that there would be no transformation of satellite DARS into an independent terrestrial DARS network.<sup>254</sup>

140. Satellite DARS applicants provided additional information on how terrestrial gap-fillers will be used with their satellite DARS systems. The commenters agree that terrestrial repeaters would be used to improve satellite DARS service in the authorized satellite coverage areas only and on the same frequencies, and that they would not be used to extend the satellite coverage area or be used to originate programming. CD Radio and DSBC maintain that terrestrial gap-fillers will only be complementary to the satellite DARS systems because they will operate on the same frequency as the satellite transmission and only re-transmit the signals of operating satellite DARS space stations to improve service link margin in difficult propagation environments, especially in urban areas.<sup>255</sup> Additional spectrum is therefore unnecessary for satellite DARS gap-fillers. Primosphere asserts further that no commercial inserts or local programming would be permitted over terrestrial gap-fillers.<sup>256</sup> Furthermore, terrestrial gap-fillers will not extend satellite DARS coverage outside of the systems' already authorized service area. AMRC asserts that they will be used only to fill in coverage gaps within the authorized service area caused by various signal obstructions.<sup>257</sup> Terrestrial gap-fillers will also be transparent to the end users because the receiver will automatically select the stronger of the satellite or repeater signal.

141. Several commenters suggest that regulation of terrestrial gap-fillers be as unrestrictive as possible. CD Radio favors rules to permit flexible deployment of terrestrial gap fillers without prior Commission approval or notification.<sup>258</sup> Primosphere contends that it

---

<sup>252</sup> See Tichenor Media Systems Reply Comments.

<sup>253</sup> See NAB Comments at 61 and WFAN Comments at 1.

<sup>254</sup> See Notice, ¶ 56.

<sup>255</sup> CD Radio Reply at 54-56 and DSBC Comments at 48-49 and 51.

<sup>256</sup> See Primosphere Comments at 42.

<sup>257</sup> See AMRC Reply at 21.

<sup>258</sup> See CD Radio Comments at 94-96 and CD Radio Comments, Appendix E.

will be important for the Commission to provide a flexible scheme to implement terrestrial gap-fillers without the necessity to seek separate licenses.<sup>259</sup> DSBC notes that the use of terrestrial gap-fillers for satellite DARS comports with the Commission's authorization of "boosters" as defined in Part 22 of the Commission's rules.<sup>260</sup> The comments of all applicants appear to be reflected in a proposal by CD Radio, seen for the first time in its Comments to our Notice.

142. We did not set forth a specific proposal for authorizing terrestrial repeaters in the Notice. We now seek comment on our proposal to permit deployment of satellite DARS gap-fillers, on an as-needed basis by satellite DARS licensees to meet their service requirements. To accomplish the following important objectives, we seek comment on whether to adopt rules for terrestrial repeaters based on CD Radio's proposals, as set forth in Appendix C. We agree that it would be burdensome for both the Commission and the licensees if licensees were to seek separate authorization for each terrestrial repeater. To this end, we seek comment on whether to adopt a regulatory structure for satellite DARS terrestrial repeaters similar to the blanket authorizations used for mobile earth stations of other services. At the same time, the Commission must consider and address any potential impact that the operation of these repeaters would have on services of adjacent countries, any potential effects of radio frequency emissions to the public, and must determine how to ensure any use of terrestrial repeaters is complementary to the DARS service and is only for retransmission of signals received from the satellite. We also seek comment on our tentative conclusion to prohibit the use of terrestrial repeaters to transmit locally originated programming which would be inconsistent with the allocation of this spectrum.

#### G. Rules for Auctioning DARS Licenses

143. Two 12.5 MHz DARS licenses will be granted for use of the spectrum at 2320-2332.5 MHz, and 2332.5-2345 MHz, respectively. As discussed above, since we are not opening the filing cut-off, the four applicants are the only eligible parties for these licenses.<sup>261</sup> Accordingly, as all four applicants' proposals cannot be accommodated,<sup>262</sup> we adopt rules to assign the licenses to two of these applicants through use of competitive bidding.

---

<sup>259</sup> See Primosphere Comments at 41-42.

<sup>260</sup> See DSBC Comments at 48-49 noting Commission's Amendment of Parts 22, 90 and 94 of the Commission's rules to permit Routine Use of Signal Boosters, Notice of Proposed Rulemaking (released June 22, 1995), FCC 95-204, 60 FR 33782. "Boosters" as proposed by the Commission, would be a stationary device that automatically re-radiates signals from base transmitters without channel translation for the purpose of providing service in weak signal areas.

<sup>261</sup> See, infra, ¶ 67.

<sup>262</sup> See, infra, ¶¶ 69-70.

## 1. Authority to Conduct Auctions

144. *Background.* The Commission has authority under Section 309(j) of the Communications Act of 1934, as amended ("Communications Act"), to employ auctions to choose among mutually exclusive applications for initial licenses where the principal use of the spectrum is likely to involve the licensee receiving compensation from subscribers.<sup>263</sup> Specifically, the Communications Act permits auctions where: (1) mutually exclusive applications for initial license or construction permits are accepted for filing by the Commission; (2) the principal use of the spectrum will involve, or is reasonably likely to involve, the receipt by the licensee of compensation from subscribers in return for enabling those subscribers to receive or transmit communication signals utilizing the licensed frequencies; and (3) the public interest objectives of Section 309(j) would be served by subjecting mutually exclusive applications in the service to competitive bidding.<sup>264</sup>

145. In the Notice, we recognized that mutual exclusivity could arise if we decided not to make the entire 50 MHz of allocated spectrum available for satellite DARS licensing.<sup>265</sup> We also tentatively concluded that the principal use of the spectrum will be to provide subscription-based services.<sup>266</sup> We further concluded that using competitive bidding to assign DARS licenses would fulfill the public interest obligations mandated by statute.<sup>267</sup>

146. *Discussion.* Some commenters contend that the Commission is not authorized to auction DARS licenses because they believe the applications on file are not mutually exclusive.<sup>268</sup> The pending applicants argue that the Commission has a statutory obligation to avoid mutual exclusivity, citing Section 309(j)(6)(E) of the Communications Act.<sup>269</sup> CD Radio and American Mobile Radio Corporation (AMRC) also allege that the use of auctions to resolve applications filed before the Commission was granted competitive bidding authority is not warranted.<sup>270</sup>

---

<sup>263</sup> 47 U.S.C. § 309(j).

<sup>264</sup> Id.

<sup>265</sup> Notice, ¶¶ 31, 36, 40, 95.

<sup>266</sup> Notice, ¶ 93.

<sup>267</sup> Id., ¶ 97.

<sup>268</sup> See, e.g., AMRC Comments at 16; DSBC Comments at 38-42.

<sup>269</sup> See, e.g., AMRC Comments at 3; CD Radio Comments at 34-45; DSBC Comments at 38-42.

<sup>270</sup> CD Radio Comments at 36-42; AMRC Comments at 15-17.

147. Based upon a review of the record in this proceeding, we disagree with these commenters. As we stated in the Notice, with respect to the "principal use" requirement of Section 309(j), auctions are authorized if at least a majority of the use of the spectrum is likely to be for subscription-based services. In making this determination, we look to classes of licenses and permits rather than individual licenses.<sup>271</sup> Given that three of the four current applicants propose to provide subscription-based service,<sup>272</sup> we conclude that the principal use of the satellite DARS spectrum is likely to involve the licensee receiving compensation from subscribers. We note, however, that our "principal use" determination does not in any way preclude satellite DARS licensees from providing any amount of non-subscription service, and they are not precluded from recovering auction costs, as well as the costs of construction, launch, and operation from sources other than subscribers, such as advertising.

148. We also expect that the amended applications to be filed for the satellite DARS licenses will raise mutual exclusivity. While eligibility for this license is limited to the four existing applicants, we expect that each of these applicants will file amended applications to participate in the auction for the two licenses in view of their continued interest, as expressed in this proceeding, in providing satellite DARS. In the event the Commission receives only one acceptable amended application for each of the licenses, the Wireless Telecommunications Bureau will issue a public notice cancelling the auction and establishing a date for the filing of an amended long-form application that complies with the service and technical rules adopted herein.<sup>273</sup>

149. We turn now to the issue of whether using competitive bidding to assign the satellite DARS licenses will promote the public interest objectives set forth in Section 309(j)(3) of the Communications Act.<sup>274</sup> These objectives are:

- (A) the development and rapid deployment of new technologies, products, and services for the benefit of the public, including those residing in rural areas, without administrative or judicial delays;
- (B) promoting economic opportunity and competition and ensuring that new and innovative technologies are readily accessible to the American people by avoiding excessive concentration of licenses and by disseminating licenses

---

<sup>271</sup> Notice, ¶ 96 (citing Implementation of Section 309(j) of the Communications Act -- Competitive Bidding, Second Report and Order, PP Docket No. 93-253, 9 FCC Rcd 2348, 2354 (1994) (Competitive Bidding Second Report and Order)).

<sup>272</sup> See Notice, ¶¶ 24-25.

<sup>273</sup> See Competitive Bidding Second Report and Order, 9 FCC Rcd at 2360.

<sup>274</sup> 47 U.S.C. § 309(j)(3).

among a wide variety of applicants, including small businesses, rural telephone companies, and businesses owned by members of minority groups and women;

(C) recovery for the public of a portion of the value of the public spectrum made available for commercial use and avoidance of unjust enrichment through the methods employed to award uses of that resource; and

(D) efficient and intensive use of the electromagnetic spectrum.

We conclude that using competitive bidding procedures to award the DARS licenses will further these objectives. Using competitive bidding for satellite DARS, a new national satellite service, does not present the same complexities and difficulties inherent in any consideration of using auctions for transnational systems. The complex and difficult issues involved in using competitive bidding to award licenses for global systems are described in the Commission's recent Little LEO NPRM.<sup>275</sup> Satellite DARS is a domestic service. In fact, other countries will use different frequency bands for satellite DARS service. This unique situation offers us the opportunity to provide the public with the advantages of competitive bidding without the significant disadvantages involved in using auctions to license transnational services.

150. In general, paying for spectrum provides incentives for the licensee to construct quickly in order to obtain a return on its investment. We therefore conclude that, in this particular set of circumstances, an auction for the satellite DARS licenses is likely to promote the rapid deployment of service because the party that is in the best position to deploy satellite DARS technologies and services is also likely to be the highest bidder. We further believe that adopting competitive bidding procedures to award satellite DARS licenses is the most efficient mechanism for ensuring that satellite DARS is offered to the public in the most expeditious manner possible. Use of competitive bidding, as compared to other licensing methods, will speed the development and deployment of satellite DARS service to the public with minimal administrative or judicial delays, and encourage efficient use of the spectrum as required by Section 309(j)(3)(A) and (D) of the Communications Act.<sup>276</sup> Based on our experience with DBS, for example, we believe that the satellite DARS auction could be concluded in a matter of days and the Commission could move forward expeditiously with licensing. Additionally, competitive bidding will recover a portion of the value of the spectrum, as envisioned in Section 309(j)(3)(C).

---

<sup>275</sup> Amendment of Part 25 of the Commission's Rules to Establish Rules and Policies Pertaining to the Second Processing Round of the Non-voice, Non-geostationary Mobile Satellite Service, NPRM, IB Docket No. 96-220 (released Oct. 29, 1996).

<sup>276</sup> See Competitive Bidding Second Report and Order, 9 FCC Rcd at 2358.

151. As discussed infra, we have not adopted special provisions for small businesses and other designated entities because of the extremely high implementation costs associated with satellite-based services and the lack of sufficient evidence in the current record to support the adoption of designated entity provisions. However, this does not mean either that we have ignored Congress' mandate to offer designated entities the opportunity to participate in competitive bidding, that designated entities will be unable to participate in the DARS industry or that auctions of DARS spectrum will not promote many of the objectives of Section 309(j).<sup>277</sup> Based upon our experience with respect to other satellite-based services, it is likely that a wide variety of businesses, including designated entities, will be involved in various sectors of this industry as non-licensed operators, programmers, and equipment suppliers.

152. Moreover, we disagree with commenters' arguments that it is inappropriate to use competitive bidding procedures to select from mutually exclusive applications that were filed before the Commission was granted competitive bidding authority. We observe that Section 6002 of the Omnibus Budget Reconciliation Act of 1993 ("1993 Budget Act") specifically grants the Commission the discretion to decide whether to employ either lotteries or auctions to choose between mutually exclusive applications filed before July 26, 1993. In this regard, we believe that, in balancing the advantages and disadvantages of using a lottery or an auction to award the DARS licenses, the public interest is best served by our use of competitive bidding. As discussed supra, we believe that an auction will ensure that the licenses are awarded to the party that values it most highly, thereby maximizing efficient use of the spectrum and facilitating the expeditious delivery of service to the public. This is especially true with regard to nationwide licenses because the winning bidders at the auction will likely be the parties that have made the greatest commitment to satellite DARS and are best prepared to begin construction of a nationwide system. Finally, use of auctions to assign the DARS licenses will advance the goals of Section 309(j)(3)(C) of the Communications Act by enabling us to recover for the public a portion of the value of the spectrum and avoid unjust enrichment to license winners.

153. In sum, we conclude that the Commission has the authority to award DARS licenses by means of competitive bidding. We further conclude that the use of competitive bidding to assign DARS spectrum will promote the rapid deployment of DARS and the efficient use of DARS spectrum most effectively. We will therefore award two 12.5 MHz DARS licenses by means of competitive bidding.

---

<sup>277</sup>

In our recent DBS auction, we also declined to adopt special provisions for designated entities due to the capital requirements necessary to build-out a nationwide satellite-based service. Revision of Rules and Policies for the Direct Broadcast Satellite Service, Report and Order, FCC 95-507, IB Docket No. 95-168, PP Docket No. 93-253 (released Dec. 15, 1995) (DBS Report and Order) at ¶ 217.

## 2. Competitive Bidding Design and Bidding Procedures

154. *Background.* In the Notice, we proposed that a simultaneous multiple round auction be used to award DARS licenses if the Commission determined that competitive bidding procedures should be implemented.<sup>278</sup> In a simultaneous multiple round auction, in every round, a bidder may bid on any of the licenses for which it is eligible. The auction does not close until bidding has ceased on all licenses. In the Competitive Bidding Second Report and Order, the Commission concluded that this method ensures that interdependent licenses will be awarded to the bidders who value them most highly by generating the most information about license values and providing bidders with the greatest degree of flexibility to pursue back-up strategies.<sup>279</sup> In the Notice, we said that if we employ competitive bidding for DARS licensing, we would conduct it "pursuant to the general framework adopted in the Second Report and Order, the Commission's rules, and consistent with other Commission proceedings where auctions have been employed."<sup>280</sup> There were no comments on our proposed auction design or bidding procedures for DARS.

155. *Discussion.* In view of the fact that the two DARS licenses are substitutable and these licenses will be significantly interdependent, we conclude that a simultaneous multiple round auction design is the appropriate auction methodology. This auction methodology will generate valuable information about the licenses during the course of the auction. In addition, as noted below, consistent with our rules for other auctionable services, we adopt bidding procedures to ensure that the auction proceeds at a rapid pace.

156. *Multiple Round Electronic Auction Design.* We observe that a multiple round electronic auction generally will provide bidders useful information about other bidders' valuations. Bidders will be able to observe who is willing to bid on a license at each announced price. Providing this information may enable bidders to refine their estimates of the license value, thereby reducing the tendency of bidders for licenses with uncertain value to shade down their bids to avoid the "winner's curse." Because of the Commission's discretion to adjust the length of bidding rounds in an electronic auction and the other auction design features described below, we expect the auction to proceed rapidly. We will provide for on-site electronic bidding because of the limited number of eligible participants and the anticipated rapid auction pace. We reserve the option, however, to offer remote bidding where bidders can place their bids by computer from any location.

157. *Bid Increments and Tie Bids.* Consistent with the rules we have adopted in other services, we conclude that the Wireless Telecommunications Bureau should have

---

<sup>278</sup> Notice, ¶ 103.

<sup>279</sup> Competitive Bidding Second Report and Order, 9 FCC Rcd at 2366.

<sup>280</sup> Notice, ¶ 100.

discretion to establish, raise and lower minimum bid increments during the course of the DARS auction.<sup>281</sup> We believe that this discretion over minimum bid increments is necessary to ensure that the Commission can efficiently control the pace of the auction. We anticipate using larger percentage minimum bid increments early in the auction and reducing the minimum increment percentage as bidding activity falls. We also believe that the efficiency of the auction may be enhanced by limiting jump bidding, *i.e.*, bidding above the minimum accepted bids. Therefore, the Wireless Telecommunications Bureau will announce by Public Notice prior to auction the specific bid increment that generally will be used, and will also retain the discretion to establish and change maximum bid increments during the course of the auction. Where a tie bid occurs, the high bidder will be determined by the order in which the bids were received by the Commission.

158. *Activity Rules.* To maximize the amount of information generated during the course of an auction and to ensure that the auction closes in a reasonable amount of time, we will require a bidder to be active on one license in each round of the auction or use an activity rule waiver, as defined below. To be active in the current round, a bidder must submit an acceptable bid in the current round or have the high bid from the previous round. A bidder who is not active in a round and has no remaining activity rule waivers will no longer be eligible to bid on the license being auctioned. Bidders will not be permitted to be active on more than one license in a single round. We see no efficiency-enhancing reason to permit such bidding because the service rules allow only one license to be acquired per bidder. Moreover, experience in previous auctions has raised concerns that such bidding could be used to signal or engage in other forms of anticompetitive strategic bidding. The Commission delegates to the Wireless Telecommunications Bureau the authority to determine and announce by Public Notice bid withdrawal procedures for the DARS auction.

159. *Minimum Opening Bid.* We conclude that a minimum opening bid would help ensure that the auction proceeds quickly and would increase the likelihood that the public receives fair market value for the spectrum. We will therefore establish a minimum opening bid for this spectrum, the amount of which will be announced by the Wireless Telecommunications Bureau by Public Notice. We observe that this approach is consistent with our approach in the DBS context.<sup>282</sup> The Wireless Telecommunications Bureau will determine the amount of the minimum opening bid using all available information and taking into consideration the uncertainty as to the value of the spectrum.

160. *Activity Rule Waivers.* To make allowance for unusual circumstances that might delay a bidder's bid preparation or submission in a particular round, we will provide bidders with a limited number of waivers of the above-described activity rule. We believe

---

<sup>281</sup> See Competitive Bidding Second Report and Order, 9 FCC Rcd at 2369.

<sup>282</sup> DBS Report and Order at ¶ 186.

that some waiver procedure is needed because the Commission does not wish to end a bidder's participation due to an accidental act or circumstances not under the bidder's control.<sup>283</sup> We will provide bidders with three activity rule waivers that may be used in any round during the course of the auction.<sup>284</sup> A waiver will preserve eligibility in the next round.<sup>285</sup> Waivers may be applied automatically by the Commission or invoked proactively by bidders. If a bidder is not active in a round, a waiver will be applied automatically. An automatic waiver applied in a round in which there are no new valid bids will not keep the auction open. A proactive activity rule waiver is a waiver invoked by a bidder during the bid submission period.<sup>286</sup> If a bidder submits a proactive waiver in a round in which no other bidding activity occurs, the auction will remain open.

161. The Commission will retain the discretion to issue additional waivers during the course of an auction for circumstances beyond a bidder's control or in the event of a bid withdrawal, as discussed below. We will also retain the flexibility to adjust, by Public Notice prior to an auction, the number of waivers permitted.

162. *Stopping Rules.* A stopping rule specifies when an auction is over. The auction will close after one round passes in which no new valid bids or proactive activity rule waivers are submitted. The Commission retains the discretion, however, to keep the auction open even if no new valid bids and no proactive waivers are submitted. In the event that the Commission exercises this discretion, the effect will be the same as if a bidder had submitted a proactive waiver. This will help ensure that the auction is completed within a reasonable period of time, because it will enable the Commission to utilize larger bid increments, which speed the pace of the auction, without risking premature closing of the auction.<sup>287</sup>

### 3. Procedural and Payment Issues

163. *Background.* In the Notice, we proposed to adopt the short-form application procedures, upfront payment requirements, public notice procedures, and default and disqualification provisions set forth in Subpart Q of Part 1 of the Commission's rules.<sup>288</sup>

---

<sup>283</sup> See Competitive Bidding Second Report and Order, 9 FCC Rcd at 2372.

<sup>284</sup> See id. at 2373.

<sup>285</sup> An activity rule waiver cannot be used to correct an error in the amount bid.

<sup>286</sup> Thus, a "proactive" waiver, as distinguished from the automatic waiver described above, is one requested by the bidder.

<sup>287</sup> See Implementation of Section 309(j) of the Communications Act -- Competitive Bidding, Memorandum Opinion and Order, 9 FCC Rcd 7684, 7685 (1994).

<sup>288</sup> Notice, ¶ 104 (citing 47 C.F.R. Part 1, Subpart Q).

164. *Discussion.* We received no comments addressing these proposals.<sup>289</sup> Because there only are four applicants eligible in this auction, all of whom previously filed applications for DARS licenses, we will not use our short-form application requirement (FCC Form 175) and adopt a new rule for the DARS auction. Specifically, we will require these applicants to supplement their previously-filed applications within five days of the publication of this Report & Order in the Federal Register. The supplemental information must be certified and include the following: 1. Applicant's name; 2. Mailing Address (no Post Office boxes); 3. City; 4. State; 5. ZIP Code; 6. Auction Number 15; 7. FCC Account Number; 8. Person(s) authorized to make or withdraw a bid (list up to three individuals); 9. Certifications and name and title of person certifying the information provided; 10. Applicant's contact person and such person's telephone number, E-mail address and FAX number.; 11. Signature and date. In keeping with our previous practice, we also retain discretion to implement or modify certain other procedures prior to the DARS auction, including rules governing the payment requirements.<sup>290</sup>

165. As discussed below, we will require applicants to submit to the Commission an upfront payment prior to commencement of the DARS auction. In addition, each auction winner will be required to submit an amount sufficient to bring its total deposit up to 20 percent of its winning bid within ten (10) business days of the announcement of the winning bidder. The winning bidder also will be required to supplement its application in accordance with Part 25 of the Commission's Rules. This procedure will constitute the "long-form application" process referred to in our general auction rules. The winning bidder will be required to file such information by a date specified by Public Notice, generally within 30 business days after the close of bidding. After receiving the winning bidder's long-form application and verifying receipt of the bidder's 20 percent down payment, the Commission will announce the application's acceptance for filing, thus triggering the filing window for petitions to deny. If, pursuant to Section 309(d) of the Communications Act, the Commission dismisses or denies any and all petitions to deny, the Commission will issue an announcement to this effect, and the winning bidder will then have ten (10) business days to submit the balance of its winning bid. If the bidder fails to submit the balance of the winning bid or the license is otherwise denied, we will assess a default payment as set forth below and re-auction the license among the other existing applicants. If no petitions to deny are filed, we will issue a public notice conditionally granting the licenses pending final payment.

166. *Upfront Payment Background.* In the Notice we proposed an upfront payment requirement of \$0.02 per MHz-pop to ensure that only serious, qualified bidders participate at

---

<sup>289</sup> See, *supra*, ¶ 156.

<sup>290</sup> DBS Report and Order, ¶ 191.

auction.<sup>291</sup> Initially, the commenters did not address our proposed upfront payment provisions. In various recent *ex parte* filings, however, the eligible applicants claim that an upfront payment based on \$0.02 per MHz-pop is too high and is not needed to ensure that only serious, qualified bidders participate at auction.<sup>292</sup> We conclude that our proposed upfront payment of \$0.02 per MHz-pop may be too high here. We observe that the eligible applicants in this auction have demonstrated a continued interest in providing DARS and have already expended significant resources towards this end. Accordingly, we believe a more modest upfront payment for the auction of the DARS licenses is appropriate. We believe that a payment that takes into consideration the valuation of similarly auctioned satellite spectrum (such as DBS) would be appropriate<sup>293</sup>. We therefore delegate authority to the Wireless Telecommunications Bureau and the International Bureau to determine an appropriate calculation for the upfront payment and announce it by Public Notice.<sup>294</sup>

167. *Bid Withdrawal, Default and Disqualification.* In the Competitive Bidding Second Report and Order, the Commission determined that bid withdrawal, default and disqualification provisions were needed to discourage insincere bidding.<sup>295</sup> The Commission observed that insincere bidding, whether frivolous or strategic, distorts the price information generated by the auction process and reduces its efficiency.<sup>296</sup> Accordingly, we adopt the bid withdrawal, default and disqualification provisions as set forth in Sections 1.2104(g) and 1.2109 of the Commission's rules. Pursuant to these rules, any bidder who withdraws a high bid during an auction before we declare bidding closed will be required to reimburse the Commission in the amount of the difference between its high bid and the amount of the winning bid the next time the license is offered by the Commission, if this subsequent

---

<sup>291</sup> Id.

<sup>292</sup> For example, CD Radio contends that the upfront payment should be between \$1 million and \$5 million. Letter to William Caton, Acting Secretary from Carl R. Frank, Esq. and Eric W. DeSilva, Esq., Wiley, Rein & Fielding dated December 13, 1996 ("CD Radio Letter"); Letter to William Caton, Acting Secretary from Douglas J. Minster, Vice President, Corporate Development Digital Satellite Broadcasting Corporation, (no more than \$10 million) dated December 20, 1996 ("DSBC Letter").

<sup>293</sup> We note that the upfront payment in the DBS auction was \$10 million.

<sup>294</sup> See, e.g., Competitive Bidding MDS Report and Order, 10 FCC Rcd. at 9650.

<sup>295</sup> See Competitive Bidding Second Report and Order, 9 FCC Rcd at 2373.

<sup>296</sup> Id.

winning bid is lower than the withdrawn bid.<sup>297</sup> If a license is reoffered by auction, the "winning bid" refers to the high bid in the auction in which the license is reoffered. If a license is reoffered in the same auction, the winning bid refers to the high bid amount in that auction, made subsequent to the withdrawal. If the subsequent high bidder also withdraws its bid, that bidder will be required to pay an amount equal to the difference between its withdrawn bid and the amount of the subsequent winning bid the next time the license is offered by the Commission. If a license which is the subject of withdrawal or default is not re-auctioned, but is instead offered to the highest losing bidders in the initial auction, the "winning bid" refers to the bid of the highest bidder who accepts the offer. Losing bidders would not be required to accept the offer, *i.e.*, they may decline without additional payment. We wish to encourage losing bidders in simultaneous multiple round auctions to bid on other licenses, and therefore we will not hold them to their losing bids on license for which another bidder has withdrawn a bid or on which another bidder has defaulted.

168. After bidding closes, a defaulting auction winner (*i.e.*, a winner who fails to remit the required down payment within the prescribed time, fails to pay for a license, or is otherwise disqualified) will be assessed the difference between its high bid and the amount of the winning bid the next time the license is offered by the Commission, if this subsequent winning bid is lower than the high bid, plus an additional payment of three percent of the subsequent winning bid or three percent of the amount of the defaulting bid, if the defaulting bid was less.<sup>298</sup> The additional three percent payment is designed to encourage bidders who wish to withdraw their bids to do so before bidding ceases. We believe that these additional payments will adequately discourage default and ensure that bidders have adequate financing and that they meet all eligibility and qualification requirements.

169. In addition, if withdrawal, default or disqualification involves gross misconduct, misrepresentation or bad faith by an applicant, we retain the option to declare the applicant and its principals ineligible to bid in future auctions, or to take any other action we deem

---

<sup>297</sup> Recently, in Atlanta Trunking Associates, Inc. and Map Wireless, L.L.C., Requests to Waive Bid Withdrawal Provisions, FCC 96-203 (rel. May 3, 1996), we decided to partially waive these provisions with respect to individual requests for waiver of withdrawal payments as a result of mistaken bids. We fashioned guidelines to address these situations based upon the premise that the appropriate bid withdrawal payment is one that takes into consideration the round and stage in which the mistaken bid is withdrawn. In general, this approach is designed to eliminate the strategic benefit of purposely submitting mistaken bids. Petitions for reconsideration of this Order are pending.

<sup>298</sup> See 47 C.F.R. §§ 1.2104(g) and 1.2109.

necessary, including institution of proceedings to revoke any existing licenses held by the applicant.<sup>299</sup>

#### 4. Safeguards

170. *Transfers.* We note that DARS licensees, like other satellite licensees, will be subject to rule 25.118, which prohibits transfers or assignments of licenses except upon application to the Commission and upon a finding by the Commission that the public interest would be served thereby.<sup>300</sup> Even after DARS licenses are granted, one licensee will not be permitted to acquire control of the other remaining satellite DARS license. This prohibition on transfer of control will help assure sufficient continuing competition in the provision of satellite DARS service.

171. *Rules Prohibiting Collusion.* As we stated in the Notice, we believe that it is necessary to adopt a rule prohibiting collusive conduct in connection with the satellite DARS auction. However, we believe that a modified rule is warranted because there are a limited number of identified eligible participants for the satellite DARS action and thus the additional safeguards associated with an auction with many more bidders are absent here. Specifically, we will not adopt any exceptions to the general anti-collusion rule. As noted above, in lieu of short-form applications, the eligible DARS applicants will be required to supplement their pending applications with certain information within five days of the publication date of this Order. At that time, all applicants will be prohibited from cooperating, collaborating, discussing or disclosing in any manner the substance of their bids or bidding strategies, or discussing or negotiating settlement agreements with other bidders.

172. Due to the fact that this is a closed auction with a fixed number of eligible applicants, we have determined that none of the three exceptions to our general collusion rules prohibiting discussions with other applicants will apply. Therefore, the applicants will not be permitted to enter into consortia or any type of joint bidding arrangement at any time since cooperation and collaboration are prohibited under the anti-collusion rule. Nor will they be able to enter into settlement arrangements following the filing of their supplemental information. Given the limited number of applicants (four) and available licenses (two), this is not the type of situation we contemplated when we expressed our desire to preserve "efficiency enhancing bidding consortia" so as to possibly reduce entry barriers for smaller firms. The universe of bidders here is already established and very small. In this situation,

---

<sup>299</sup> See Competitive Bidding Second Report and Order, 9 FCC Rcd at 2383.

<sup>300</sup> By adopting this rule, we do not intend to preclude licensees from proposing widely dispersed equity offerings to raise capital. See, e.g., Satellite CD Radio Inc., 9 FCC Rcd 2569 (Common Carrier Bureau 1994).

we believe that allowing any joint bidding arrangements among this limited group will merely serve to undercut the competitiveness of the auction process and limit the number of bidders for each license. In this vein, we also conclude that the other exceptions to the collusion rule designed to allow bidders to combine or obtain additional capital from one another during an auction are inapplicable or unnecessary here. These applicants have been preparing and developing this service for years, and this will be a very short auction. Thus, any additional capitalization requirements are likely to already have been met, or should be after the auction. We believe that the five-day window is sufficient to enable the applicants to conclude any settlement discussions, given the fact that the parties have had significant time prior to the adoption of this Order to reach a settlement. After this five-day period, all negotiations (if any) must cease. This rule is both fair to the four applicants, who had time to negotiate settlements and raise capital, while helping to ensure the competitiveness of the auction and the post-auction market. All applicants will be prohibited from cooperating, collaborating, discussing or disclosing in any manner the substance of their bids or bidding strategies with other bidders five days after publication of this report and order in the Federal Register.

173. Finally, in adopting these rules for the DARS auction, we also remind the eligible bidders that allegations of collusion may be investigated by the Commission or referred to the U.S. Department of Justice for investigation. Bidders who are found to have violated the antitrust laws or the Commission's Rules while participating in an auction may be subject to forfeiture of their down payment or their full bid amount, as well as revocation of their license, and may be prohibited from participating in future auctions.<sup>301</sup>

## 5. Designated Entity Provisions

174. *Background.* In the Notice, we asked commenters to discuss whether special provisions should be adopted to enable small businesses, businesses owned by minorities and women, and rural telephone companies (rural telcos) (collectively referred to as "designated entities") to participate at auction and in the provision of DARS.<sup>302</sup>

175. *Discussion.* We received no comments addressing this issue. In an ex parte filing, CD Radio proposes that entrepreneurs and small businesses (as defined in the rules for broadband PCS C and F blocks) be afforded an installment payment plan. CD Radio claims, among other things, that failure to adopt such financing incentives would put pressure on the small business applicants to sell their "place in line" to large companies and encourage

---

<sup>301</sup> See Fourth Memorandum Opinion and Order, 9 FCC Rcd at 6869, n.134; 47 C.F.R. § 1.2109(d).

<sup>302</sup> Notice, ¶ 105-106.

transfers and possible unjust enrichment of speculative applicants.<sup>303</sup> We first note that the legislative history of the designated entity provisions shows that Congress did not necessarily intend for special measures in services such as DARS, as demonstrated by the following reference: "[t]he characteristics of some services are inherently national in scope, and are therefore ill-suited for small businesses."<sup>304</sup> Moreover, we previously concluded that, because of the extremely high implementation costs associated with satellite-based services, no special provisions for designated entities would be made.<sup>305</sup> In part, this conclusion was reached because it was unclear whether small businesses could attract the capital necessary to implement and provide satellite-based services.<sup>306</sup> Second, pursuant to Section 309(j), the purpose of such provisions is to attract the participation of a wide variety of small business applicants. In view of the fact that this is a closed auction with a fixed number of eligible applicants, this purpose of attracting a wide-array of applicants will not be served here. Third, the record is lacking in support for what the appropriate small business threshold is in the DARS context and whether any of the four applicants, including CD Radio, would qualify as a small business. In the DBS context, we did not provide for designated entity provisions, primarily due to the high implementation costs and the lack of interest expressed by the potential beneficiaries, *i.e.*, small businesses, businesses owned by minorities and women, and rural telcos. In this connection, we note that CD Radio's proposal is not supported by the *ex parte* filings of other potential applicants who arguably would fall within the definitions of entrepreneur and small business proposed by CD Radio. In contrast to CD Radio's proposal, in its *ex parte* filing, DSBC states that, "[s]o long as the auction is limited to the four pending applicants, the Commission need not employ bidding credits or installment payments, or identify designated entities, to level the playing field among this group of potential licensees."<sup>307</sup> Likewise, in its *ex parte* filing, Primosphere similarly states that "[t]here should be no bidding preferences" and "[a]ll four applicants should be treated equally."<sup>308</sup>

176. We are, therefore, not convinced that in order to promote the objectives of Section 309(j)(3)(B) ensuring that new and innovative technologies are readily accessible to the American people and the dissemination of licenses among a wide variety of applicants,

---

<sup>303</sup> CD Radio Letter at 2.

<sup>304</sup> H.R. Rep. No. 103-111, 103rd Cong., 1st Sess., at 254.

<sup>305</sup> DBS Report and Order, ¶ 211.

<sup>306</sup> DBS Report and Order, ¶ 216.

<sup>307</sup> DBSC Letter at 2, n.2.

<sup>308</sup> Letter to William Caton, Acting Secretary from Howard M. Liberman, Esq. dated December 19, 1996 on behalf of Primosphere Limited Partnership.

including small businesses, we need to provide designated entity provisions, such as the financial incentives requested by CD Radio. Moreover, we conclude that the present record is insufficient to support either race-based rules under the strict scrutiny standard, or to support gender-based rules under the intermediate scrutiny standard that currently applies to those rules.<sup>309</sup> Accordingly, we are not adopting designated entity provisions for DARS.

---

<sup>309</sup> See Adarand Constructors, Inc. v. Peña, 115 S. Ct. 2097 (1995); United States v. Commonwealth of Virginia, 44 F.3d 1229 (4th Cir. 1995), cert. granted, 116 S.Ct 281 (1995).

#### IV. CONCLUSION

177. We believe that the foregoing decision and licensing plan best serves the public interest in assuring that the spectrum in question is most efficiently utilized while allowing the implementation of new, innovative services.

#### V. ORDERING CLAUSES

178. Accordingly, IT IS ORDERED that Part 25 of the Commissions rules are hereby amended as set out in Appendix A.

179. Accordingly, IT IS ORDERED that Parts 25 and 87 of the Commissions rules are hereby AMENDED as set out in Appendix A and SHALL BECOME EFFECTIVE thirty (30) days after publication in the Federal Register, except that the rules in new Subpart F of Part 25 SHALL BECOME EFFECTIVE upon publication in the Federal Register. We find good cause to make the auction rules for satellite DARS (Subpart F of Part 25) effective immediately upon publication in the Federal Register.<sup>310</sup> These rules will allow the four pending applicants to amend their applications, which have been pending for more than four years, and to participate in the auction for this new service, for which spectrum was allocated two years ago. Immediate application of the rules governing the auction procedures will therefore expedite the DARS auction and the introduction of service to the public, including those residing in rural areas, in accordance with Section 309(j)(3)(A) of the Communications Act.<sup>311</sup> In addition, we note that the pending applicants have made substantial financial investment in anticipation of the licensing of DARS.<sup>312</sup> Finally, it is important that the DARS auction take place prior to the Wireless Communications Service ("WCS") auction, which Congress had mandated begin no later than April 15, 1997. According to the applicants, their several years of planning and financial investment would be undermined if a WCS auction

---

<sup>310</sup> 5 U.S.C. § 553(d)(3).

<sup>311</sup> 47 U.S.C. § 309(j)(3)(A) (Commission's competitive bidding rules shall promote "the development and rapid deployment of new technologies, products, and services for the benefit of the public, including those residing in rural areas, without administrative . . . delays"); see also 47 U.S.C. § 157.

<sup>312</sup> See Omnipoint Corporation v. FCC, 78 F.3d 620 (D.C. 1996) (upholding Commission decision to make rules effective immediately upon publication, finding "good cause" existed because of the precarious nature of bidders' investments, the Congressional deadline placed on the Commission to take quick action, and the fact that a delayed auction would undermine the public interest by delaying service).

winner were to enter the DARS market first.<sup>313</sup> The DARS applicants also contend that they may need WCS spectrum for auxiliary support of DARS operations, that they need time to assess these auxiliary needs, but that their efforts will be frustrated if WCS is auctioned first. Accordingly, we find that further deferral of the DARS auction and licensing procedures by a delay in the effective date, for purposes of providing adequate notice to the affected parties, would be impracticable, unnecessary and contrary to the public interest.

180. The analysis required pursuant to the Regulatory Flexibility Act, 5 U.S.C. § 604, is contained in Appendix B attached.

181. The Paperwork Reduction Act does not apply to the rules adopted herein as such rules apply to less than ten persons.<sup>314</sup>

182. IT IT FURTHER ORDERED that pursuant to the Communications Act of 1934, 47 U.S.C. §§ 151, 154, 303(r), 309(j), 403, and 405, NOTICE IS HEREBY GIVEN and COMMENT IS SOUGHT regarding the proposals, discussion, and statement of issues in the Further Notice of Proposed Rulemaking.

183. This is a non-restricted notice and comment rulemaking proceeding. Ex parte presentations are permitted, except during the Sunshine Agenda period, provided they are disclosed as provided in Commission rules. See generally 47 C.F.R. §§ 1.202, 1.203, and 1.1206(a).

184. We certify that the proposed rules relating to the authorization of terrestrial repeaters will not have a significant economic impact on a substantial number of small entities.<sup>315</sup> These rules, if adopted, would permit but not require the use of such repeaters to assist in providing higher quality service and should not significantly increase the cost of the systems.

185. Pursuant to applicable procedures set forth in sections 1.415 and 1.419 of the Commission's rules, 47 C.F.R. §§ 1.415 and 1.419, interested parties may file comments on or before May 2, 1997 and reply comments on or before May 23, 1997. To file formally in

---

<sup>313</sup> See In the Matter of Amendment of the Commission's Rules to Establish Part 27, the Wireless Communications Service, GN Docket No. 96-228, Reply Comments of Satellite CD Radio at 2-3; Reply Comments of Digital Satellite Broadcasting Corporation at 5-6; DSBC Ex Parte Letter at 2, n.1; Comments of Primosphere Limited Partnership at 2-3; Reply Comments of Primosphere at 14.

<sup>314</sup> See 44 U.S.C. § 3502(3)(a)(i).

<sup>315</sup> See 5 U.S.C. § 605(B).

this proceeding, you must file an original and five copies of all comments, reply comments, and supporting comments. If you want each Commissioner to receive a personal copy of your comments, you must file an original plus nine copies. You should send comments and reply comments to Office of the Secretary, Federal Communications Commission, Washington, D.C. 20554. Comments and reply comments will be available for public inspection during regular business hours in the FCC Reference Center of the Federal Communications Commission, Room 239, 1919 M Street, N.W., Washington, D.C. 20554.

186. IT IS FURTHER ORDERED that, pursuant to 47 U.S.C. § 155(c), the Chiefs, Wireless Telecommunications Bureau and International Bureau, ARE DELEGATED AUTHORITY to implement and modify auction procedures in the DARS service, including the general design and timing of an auction, the manner of submitting bids, minimum opening bids and bid increments, activity and stopping rules, and application and payment requirements.

187. IT IS FURTHER ORDERED that the requests for pioneer's preference filed by Satellite CD Radio, Inc., Digital Satellite Broadcasting Corporation, and Primosphere Limited Partnership -- PP-24, PP-86 and PP-87, respectively, in GEN Docket No. 90-357 -- ARE DISMISSED.

188. IT IS FURTHER ORDERED that the petition for reconsideration filed on February 17, 1995 by Interep National Radio Sales, Inc. IS DENIED.

189. This action is taken pursuant to Sections 1, 4(i), 4(j), 7, 303(r) and 309(j) of the Communications Act of 1934, as amended, 47 U.S.C. §§ 151, 154 (i), 154 (j), 157, 303(r) and 309 (j).

FEDERAL COMMUNICATIONS COMMISSION

William F. Caton  
Acting Secretary

**APPENDIX A****Amendments to  
47 C.F.R. Part 25 and Part 87 of the Commission's Rules**

1. The Table of Contents for Part 25 is revised to read as follows:

**PART 25 - SATELLITE  
COMMUNICATIONS****Subpart A - General**

Sec.	
25.101	Basis and Scope.
25.102	Station authorization required.
25.103	Definitions.
25.104	Preemption of local zoning of earth stations.
25.105-25.108	[Reserved]
25.109	Cross-reference.

**Subpart B - Applications and Licenses**

25.110	Filing of applications, fees, and number of copies.
25.111	Additional information.
25.112	Defective applications.
25.113	Construction permits.
25.114	Applications for space station authorizations.
25.115	Applications for earth station authorizations.
25.116	Amendments to applications.
25.117	Modification of station license.
25.118	Assignment or transfer of control of station authorization.
25.119	Application for special temporary authorization.
25.120	License term and renewals.

**EARTH STATIONS**

25.130	Filing requirements for transmitting earth stations.
25.131	Filing requirements for receive-only earth stations.
25.132	Verification of earth station antenna performance standards.
25.133	Period of construction; certification of commencement of operation.
25.134	Licensing provision of very small aperture terminal (VSAT) networks.

- 25.135 Licensing provisions for earth station networks in the non-voice, non-geostationary mobile-satellite service.
- 25.136 Operating provisions for earth station networks in the 1.6/2.4 GHz mobile-satellite service.

### SPACE STATIONS

- 25.140 Qualifications of domestic fixed-satellite space station licensees.
- 25.141 Licensing provisions for the radiodetermination satellite service
- 25.142 Licensing provisions for the non-voice, non-geostationary mobile-satellite service.
- 25.143 Licensing provisions for the 1.6/2.4 GHz mobile-satellite service.
- 25.144 Licensing provisions for the 2.3 GHz satellite digital audio radio service.

### PROCESSING OF APPLICATIONS

- 25.150 Receipt of applications.
- 25.151 Public notice period.
- 25.152 Dismissal and return of applications.
- 25.153 Repetitious applications.
- 25.154 Opposition to applications and other pleadings.
- 25.155 Mutually exclusive applications.
- 25.156 Consideration of applications.

### FORFEITURE, TERMINATION, AND REINSTATEMENT OF STATION AUTHORIZATION

- 25.160 Administrative sanctions.
- 25.161 Automatic termination of station authorization.
- 25.162 Cause for termination of interference protection.
- 25.163 Reinstatement.

### Subpart C - Technical Standards

- 25.201 Definitions.
- 25.202 Frequencies, frequency tolerance and emission limitations.
- 25.203 Choice of sites and frequencies.
- 25.204 Power limits.
- 25.205 Minimum angle of antenna elevation.
- 25.206 Station identification.
- 25.207 Cessation of emissions.
- 25.208 Power flux density limits.

- 25.209 Antenna performance standards.
- 25.210 Technical requirements for space stations in the Fixed-Satellite Service.
- 25.211 Video transmissions in the Domestic Fixed-Satellite Service.
- 25.212 Narrowband transmission in the Fixed-Satellite Service.
- 25.213 Inter-service coordination requirements for the 1.6/2.4 GHz Mobile-Satellite Service.
- 25.214 Technical requirements for space stations in the satellite digital audio radio service.
- 25.251 Special requirements for coordination.
- 25.252 Maximum permissible interference power.
- 25.253 Determination of coordination distance for near great circle propagation mechanisms.
- 25.254 Computation of coordination distance contours for propagation modes associated with precipitation scatter.
- 25.255 Guidelines for performing interference analyses for near great circle propagation mechanisms.
- 25.256 Guidelines for performing interference analyses for precipitation scatter modes.

#### **Subpart D - Technical Operations**

- 25.271 Control of transmitting stations.
- 25.272 General inter-system coordination procedures.
- 25.273 Duties regarding space communications transmissions.
- 25.274 Procedures to be followed in the event of interference.
- 25.275 Particulars of operation.
- 25.276 Points of communication.
- 25.277 Temporary fixed earth station operations.
- 25.278 Additional coordination obligations for non-geostationary and geostationary satellite systems in frequencies allocated to the Fixed-Satellite Service.
- 25.279 Inter-Satellite Service

#### **Subpart E - Developmental Operations**

- 25.300 Developmental operation.
- 25.308 Automatic Transmitter Identification System (ATIS).

#### **Subpart F - Competitive Bidding Procedures for DARS**

- 25.401 DARS subject to competitive bidding.
- 25.402 Competitive bidding mechanisms.
- 25.403 Withdrawal, default and disqualification payments.
- 25.404 Bidding application and certification procedures

- 25.405 Submission of down payment and filing of long-form applications.  
25.406 Prohibition of Collusion

**Subpart G -- [Reserved]**

**Subpart H - Authorization to own stock in  
the Communications Satellite Corporation**

- 25.501 Scope of this sub-part.  
25.502 Definitions.  
25.503-25.504 [Reserved]  
25.505 Persons requiring authorization.  
25.506-25.514 [Reserved]  
25.515 Method of securing authorization.  
25.516-25.519 [Reserved]  
25.520 Contents of application.  
25.521 Who may sign applications.  
25.522 Full disclosures.  
25.523 Form of application, number of copies, fees, etc.  
25.524 [Reserved]  
25.525 Action upon applications.  
25.526 Amendments.  
25.527 Defective applications.  
25.528-25.529 [Reserved]  
25.530 Scope of authorization.  
25.531 Revocation of authorization.

**Subpart I -- Equal Employment Opportunities**

- 25.601 Equal employment opportunity requirement.

2. The authority citation for Part 25 is modified to read as follows:

**AUTHORITY:** Sections. 101-404, 76 Stat. 419-427; 47 U.S.C. 701-744, Sec. 4, 48 Stat. 1066, as amended; 47 U.S.C. 154. Interprets or applies sec. 303, 48 Stat. 1082, as amended; 47 U.S.C. 303. 47 U.S.C. sections 154, 301, 302, 303, 307, 309 and 332, unless otherwise noted.

3. A new Section 25.144 is added to read as follows:

**§ 25.144 Licensing provisions for the 2.3 GHz satellite digital audio radio service.****(a) Qualification Requirements:**

(1) Satellite CD Radio, Primosphere Limited Partnership, Digital Satellite Broadcasting Corporation, and American Mobile Radio Corporation are the applicants eligible for licensing in the satellite digital audio radio service.

(2) **General Requirements:** Each application for a system authorization in the satellite digital audio radio service in the 2310-2360 MHz band shall describe in detail the proposed satellite digital audio radio system, setting forth all pertinent technical and operational aspects of the system, and the technical, legal, and financial qualifications of the applicant. In particular, applicants must file information demonstrating compliance with § 25.114 and all of the requirements of this section.

(3) **Technical Qualifications:** In addition to the information specified in paragraph (a)(1) of this section, each applicant shall:

(i) demonstrate that its system will, at a minimum, service the 48 contiguous states of the United States (full CONUS);

(ii) certify that its satellite DARS system includes a receiver that will permit end users to access all licensed satellite DARS systems that are operational or under construction; and/or

(iii) identify the compression rate it will use to transmit audio programming. If applicable, the applicant shall identify the compression rate it will use to transmit services that are ancillary to satellite DARS.

**(b) Milestone Requirements.**

Each applicant for system authorization in the satellite digital audio radio service must demonstrate within 10 days after a required implementation milestone as specified in the system authorization, and on the basis of the documentation contained in its application, certify to the Commission by affidavit that the milestone has been met or notify the Commission by letter that it has not been met. At its discretion, the Commission may require the submission of additional information (supported by affidavit of a person or

persons with knowledge thereof) to demonstrate that the milestone has been met. This showing shall include all information described in § 25.140 (c), (d) and (e). The satellite DARS milestones are as follows, based on the date of authorization:

- (1) One year: Complete contracting for construction of first space station or begin space station construction;
- (2) Two years: If applied for, complete contracting for construction of second space station or begin second space station construction;
- (3) Four years: In orbit operation of at least one space station; and/or
- (4) Six years: Full operation of the satellite system.

(c) Reporting requirements. All licensees of satellite digital audio radio service systems shall, on June 30 of each year, file a report with the International Bureau and the Commission's Laurel, Maryland field office containing the following information:

- (1) Status of space station construction and anticipated launch date, including any major problems or delay encountered;
- (2) A listing of any non-scheduled space station outages for more than thirty minutes and the cause(s) of such outages; and/or
- (3) Identification of any space station(s) not available for service or otherwise not performing to specifications, the cause(s) of these difficulties, and the date any space station was taken out of service or the malfunction identified.

(d) The license term for each digital audio radio service satellite shall commence when the satellite is launched and put into operation and the term will run for eight years.

4. A new paragraph is added, in alphabetical order Section 25.201 to read as follows (addition of this paragraph to Section 2.1 is consequential):

**§ 25.201 Definitions**

\* \* \* \* \*

*Satellite Digital Audio Radio Service ("DARS").* A radiocommunication service in which audio programming is digitally transmitted by one or more space stations directly to fixed, mobile, and/or portable stations, and which may involve complementary repeating terrestrial transmitters, telemetry, tracking and control facilities.

\* \* \* \* \*

5. Section 25.202 is amended by adding a new paragraph (a)(6) to read as follows:

**§ 25.202. Frequencies, frequency tolerance and emission limitations.**

(a)(1) \* \* \*

- (6) The following spectrum is available for exclusive use by the satellite digital audio radio service:

2320-2345 MHz: space-to-Earth (primary)

\* \* \* \* \*

6. A new Section 25.214 is added to read as follows:

**§ 25.214 Technical requirements for space stations in the satellite digital audio radio service.**

(a) Definitions

(1) "Allocated bandwidth." The term "allocated bandwidth" refers to the entry in the Table of Frequency Allocations of a given frequency band for the purpose of its use by one or more terrestrial or space radiocommunication services under specified conditions. This term shall be applied to the 2310-2360 MHz band for satellite DARS.

(2) "Frequency Assignment." The term "frequency assignment" refers to the authorization given by the Commission for a radio station to use a radio frequency or radio frequency channel under specified conditions. This term

shall be applied to the two frequency bands (A) 2320.0 - 2332.5 MHz and (B) 2332.5 - 2340.0 MHz for satellite DARS.

(b) Each system authorized under this section will be conditioned upon construction, launch and operation milestones as outlined in Section 25.144(b). The failure to meet any of the milestones contained in an authorization will result in its cancellation, unless such failure is due to circumstances beyond the licensee's control or unless otherwise determined by the Commission upon proper showing by the licensee in any particular case.

(c) Frequency assignments will be made for each satellite DARS system as follows:

(1) Exclusive satellite DARS licenses are limited to the 2320-2345 MHz band segment of the allocated bandwidth for satellite DARS;

(2) Two, 12.5 MHz frequency assignments are available for satellite DARS: 2320.0-2332.5 MHz and 2332.5-2345.0 MHz;

(3) Satellite DARS licensees may reduce their assigned bandwidth occupancy to provide telemetry beacons in their exclusive frequency assignments;

(4) Each licensee may employ cross polarization within its exclusive frequency assignment and/or may employ cross polarized transmissions in frequency assignments of other satellite DARS licensees under mutual agreement with those licensees. Licensees who come to mutual agreement to use cross-polarized transmissions shall apply to the Commission for approval of the agreement before coordination is initiated with other administrations by the licensee of the exclusive frequency assignment; and/or

(5) Feeder uplink networks are permitted in the following Fixed-Satellite Service frequency bands: 7025-7075 MHz and 6725-7025 MHz (101° W.L. orbital location only).

7. A new subpart F consisting of sections 25.401 through 25.406 is added to Part 25 to read as follows:

#### **Subpart F -- Competitive Bidding Procedures for DARS**

**§ 25.401 Satellite DARS applications subject to competitive bidding.**

Mutually exclusive initial applications filed by Satellite CD Radio, Primosphere Limited Partnership, Digital Satellite Broadcasting Corporation, and American Mobile Radio Corporation, to provide DARS service are subject to competitive bidding procedures. The procedures set forth in Part 1, Subpart Q of this chapter will apply unless otherwise specified in this subpart.

**§ 25.402 Competitive bidding mechanisms.**

(a) Tie Bids. Where a tie bid occurs, the high bidder will be determined by the order in which the bids were received by the Commission.

(b) Maximum Bid Increments. The Commission may, by announcement before or during the auction, establish maximum bid increments in dollar or percentage terms.

(c) Minimum Opening Bid. The Commission will establish a minimum opening bid for the DARS spectrum, and the amount of which will be announced by Public Notice prior to the auction.

(d) Activity rules. The Commission will establish activity rules which require a minimum amount of bidding activity. Bidders will be entitled to request and be granted waivers of such rule. The Commission will specify the number of waivers permitted in an auction, the frequency with which they may be exercised, and the method of operation of waivers by Public Notice prior to the auction.

**§ 25.403 Bidding application and certification procedures.**

Submission of Supplemental Application Information. In order to be eligible to bid, each pending applicant must timely submit certain supplemental information. All supplemental information shall be filed by the applicant five days after publication of these rules in the Federal Register. The supplemental information must be certified and include the following:

- a) Applicant's name;
- b) Mailing Address (no Post Office boxes);
- c) City;
- d) State;

- e) ZIP Code.
- f) Auction Number 15;
- g) FCC Account Number;
- h) Person(s) authorized to make or withdraw a bid (list up to three individuals);
- i) Certifications and name and title of person certifying the information provided;
- j) Applicant's contact person and such person's telephone number, E-mail address and FAX number; and
- k) Signature and date.

**§ 25.404 Submission of down payment and filing of long-form applications.**

(a) After bidding has ended, the Commission will identify and notify the high bidder and declare the bidding closed.

(b) Within ten (10) business days of a Public Notice announcing the high bidder on a particular license(s), a high bidder must submit to the Commission's lockbox bank such additional funds (the "down payment") as are necessary to bring its total deposits (not including upfront payments applied to satisfy bid withdrawal or default payments) up to twenty (20) percent of its high bid(s). This down payment must be made by wire transfer or cashier's check drawn in U.S. dollars from a financial institution whose deposits are insured by the Federal Deposit Insurance Corporation and must be made payable to the Federal Communications Commission. Down payments will be held by the Commission until the high bidder has been awarded the license and has paid the remaining balance due on the license, in which case it will not be returned, or until the winning bidder is found unqualified to be a licensee or has defaulted, in which case it will be returned, less applicable payments. No interest on any down payment will be paid to a bidder.

(c) A high bidder that meets its down payment obligations in a timely manner must, within thirty (30) business days after being notified that it is a high bidder, submit an amendment to its pending application to provide the information required by § 25.144.

**§ 25.405 Prohibition of collusion.**

Upon the deadline for filing the supplemental information required by §25.403, all applicants are prohibited from cooperating, collaborating, discussing or disclosing in any manner the substance of their bids or bidding strategies, or discussing or negotiating settlement

agreements, with other applicants until after the high bidder makes the required down payment.

**§ 25.406 License Grant, Denial, Default, and Disqualification.**

(a) Unless otherwise specified in these rules, auction winners are required to pay the balance of their winning bids in a lump sum within ten (10) business days following public notice by the Commission that it is prepared to award the licenses. Grant of the license will be conditioned on full and timely payment of the winning bid.

(b) If a winning bidder withdraws its bid after the Commission has declared competitive bidding closed or fails to remit the required down payment within ten (10) business days after the Commission has declared competitive bidding closed, the bidder will be deemed to have defaulted, its application will be dismissed, and it will be liable for the default payment specified in §1.2104(g)(2). In such event, the Commission may either re-auction the license to existing or new applicants or offer it to the other highest bidders (in descending order) at their final bids. The down payment obligations set forth in 25.404(b) will apply.

(c) A winning bidder who is found unqualified to be a licensee, fails to remit the balance of its winning bid in a timely manner, or defaults or is disqualified for any reason after having made the required down payment, will be deemed to have defaulted and will be liable for the penalty set forth in §1.2104(g)(2). In such event, the Commission will conduct another auction for the license, affording new parties an opportunity to file an application for the license.

(d) Bidders who are found to have violated the antitrust laws or the Commission's rules in connection with their participation in the competitive bidding process may be subject, in addition to any other applicable sanctions, to forfeiture of their up front payment, down payment or full bid amount, and may be prohibited from participating in future auctions.

**PART 87 -- AVIATION SERVICES**

The authority citation in Part 87 continues to read as follows:

**AUTHORITY:** 48 Stat. 1066, 1082, as amended; 47 U.S.C. 154, 303, unless otherwise noted. Interpret or apply 48 Stat. 1064-1068, 1081-1105, as amended; 47 U.S.C. 151-156, 301-609.

2. Paragraph (d)(1) of Section 87.303 is revised to read as follows:

## PART 87 -- AVIATION SERVICES

\* \* \* \* \*

## Subpart J -- Flight Test Stations

**§ 87.303 Frequencies.**

\* \* \* \* \*

(d)(1) Frequencies in the bands 1435-1525 MHz and 2360-2390 MHz are assigned primarily for telemetry and telecommand operations associated with the flight testing of manned or unmanned aircraft and missiles, or their major components. The band 1525-1535 MHz is also available for these purposes on a secondary basis. In the band 2320-2345 MHz, the mobile and radiolocation services are allocated on a primary basis until a Broadcast-Satellite (sound) service has been brought into use in such a manner as to affect or be affected by the mobile and radiolocation services in those service areas. Permissible uses of these bands include telemetry and telecommand transmissions associated with the launching and reentry into the earth's atmosphere as well as any incidental orbiting prior to reentry of manned or unmanned objects undergoing flight tests. In the 1435-1530 MHz band, the following frequencies are shared with flight telemetry mobile stations: 1444.5, 1453.5, 1501.5, 1515.5, 1524.5 and 1525.5 MHz. In the 2320-2345 MHz and 2360-2390 MHz bands, the following frequencies may be assigned on a co-equal basis for telemetry and associated telecommand operations in fully operational or expendable and re-usable launch vehicles whether or not such operations involve flight testing: 2332.5, 2364.5, 2370.5 and 2382.5 MHz. In the 2360-2390 MHz band, all other telemetry and telecommand uses are secondary to the above stated launch vehicle uses.

\* \* \* \* \*

## APPENDIX B

**Final Regulatory Flexibility Analysis of  
Report and Order and Memorandum Opinion and Order**

As required by Section 603 of the Regulatory Flexibility Act (RFA), 5 U.S.C. § 603 , we incorporated and sought comment on an Initial Regulatory Flexibility Analysis (IRFA) in Establishment of Rules and Policies for the Digital Audio Radio Satellite Service in the 2310-2360 MHz Frequency Band, 11 FCC Rcd 1 (1995)( Notice). The Commission's Final Regulatory Flexibility Analysis (FRFA) in this Report and Order and Memorandum Opinion and Order (Order) conforms to the RFA, as amended by the Small Business Regulatory Enforcement and Fairness Act of 1996 (SBREFA).<sup>316</sup>

**I. Need for and Purpose of this Action:**

In this Order, the Commission promulgates rules and assigns licenses for satellite Digital Audio Radio Service (DARS). Our objective in this proceeding is to help establish a new service to provide continuous nationwide radio programming with compact disc quality sound. This new service has the potential to increase the variety of programming available to the listening public by offering new niche channels. Satellite DARS also promises to serve listeners in areas of the country that have been underserved by terrestrial radio.

**II. Summary of Issues Raised by the Public Comments in Response to the Initial Regulatory Flexibility Analysis:**

No comments were filed in direct response to the IRFA. We received numerous comments on the wide variety of licensing and other issues raised by the Notice, none of which were directly related to the treatment of small entities. Although not directed to the IRFA, three entities proposing to provide satellite DARS have filed ex parte comments concerning the issue of whether the Commission should employ special auction provisions to aid small businesses. These comments are addressed in Section V of this analysis.

**III. Description and Estimate of the Small Entities Subject to the Rules:**

The Commission has not developed its own definition of "small entity" for purposes of licensing satellite delivered services. Accordingly, we rely on the definition of "small entity" provided under the Small Business Administration (SBA) rules applicable to Communications

---

<sup>316</sup> SBREFA was enacted as Subtitle II of the Contract With America Advancement Act of 1996, Pub. L. No. 104-121, 110 Stat. 847 (1996) (CWAAA).

Services, Not Elsewhere Classified.<sup>317</sup> A "small entity" under these SBA rules is defined as an entity with \$11.0 million or less in annual receipts. Based on the record in this proceeding, we find that the four current satellite DARS applicants are all "small entities" under the SBA definition. Because of spectrum limitations, we do not foresee that there will be capacity for additional systems in the frequency band exclusively allocated for satellite DARS.

**IV. Summary of Projected Reporting, Record Keeping and Other Compliance Requirements:**

Satellite DARS licensees will be required to begin construction of their space stations within one year of license grant, launch and begin operating their first satellite within four years, and begin operating their entire system within six years. They will be required to file annual reports on the status of their progress. Entities will require knowledge of satellite operations in order to prepare these reports.

**V. Significant Alternatives and Steps Taken By Agency to Minimize Significant Economic Impact on a Substantial Number of Small Entities Consistent with Stated Objectives:**

The Notice proposed three possible licensing options for satellite DARS: 1) to license the available spectrum to the current four applicants; 2) to license less than the total available spectrum to the four applicants and auction the remainder; or, 3) to accept new applications and auction all licenses.

After the Notice was released, the Omnibus Consolidated Appropriations Act, 1997, P.L. 104-208, 110 Stat. 3009 (1996) (Appropriations Act) directed the Commission to reallocate spectrum at 2305-2320 MHz and 2345-2360 MHz for all services consistent with international allocations and to award licenses in that portion of the band using competitive bidding. As a consequence, the licenses designated pursuant to this Order will authorize satellite DARS operation in the spectrum between 2320 and 2345 MHz. Because the record indicates that 12.5 MHz is necessary for a licensee to provide a viable satellite DARS service and because only 25 MHz remains as an exclusive DARS allocation, we will award two licenses and use competitive bidding to resolve mutual exclusivity among the four current applicants. These applicants are CD Radio, Inc., Digital Satellite Broadcasting Corp., Primosphere Limited Partnership, and American Mobile Radio Corp.

In deciding how to proceed, we had two alternatives-either to reopen the filing window and accept additional applications or to limit eligibility to the four applicants that filed before

---

<sup>317</sup> 1987 Standard Industrial Classification Manual; 13 CFR Part 121.

our 1993 cut-off date. Because we are not permitting additional applications, the four applicants who filed applications in 1990 and 1993, all of which are small entities, are the only parties eligible to participate in the satellite DARS auction, and only two of these applicants will receive operating licenses. No other entities, including any small entities, will be able to participate in the subsequent auctions, or ultimately receive operating licenses. Our decision to not reopen the filing cut-off is based on sound satellite licensing policy and precedent and the equities of this particular proceeding. In this satellite proceeding, as in others, applicants require some measure of certainty to justify the inherently long-term investment of resources required by complex and lengthy international allocation and coordination procedures that must be completed prior to inauguration of service. This unique feature of satellite services, combined with the need to most expeditiously provide new services to the public, outweighs any benefits that would accrue from accepting additional applications.<sup>318</sup>

Although one current applicant argues that special auction provisions are necessary,<sup>319</sup> two others state that as long as the auction is limited to the four applicants, the Commission should not employ bidding credits or installment payments.<sup>320</sup> As we have explained,<sup>321</sup> we have not adopted special auction provisions for small businesses. We note, however, that the proposal adopted herein will promote the principal objectives of Section 309(j) because all those participating in the bidding for these licenses are small businesses under the SBA definition.

---

<sup>318</sup> See, infra, Report and Order at Section B.5.

<sup>319</sup> Letter from Counsel for CD Radio, December 13, 1996.

<sup>320</sup> Letter from Counsel for Digital Satellite Broadcasting Corporation, December 20, 1996; Letter from Counsel for Primosphere Limited Partnership, December 19, 1996.

<sup>321</sup> Report and Order, infra at Section G.5.

## APPENDIX C

**Proposed Rules and Regulations to Add to  
47 C.F.R. Part 25 of the Commission's Rules**

[1. A new Section is proposed to be added to 25.144 to read as follows:

**§ 25.144 Licensing provisions for the 2.3 GHz satellite digital audio radio service.**

\* \* \* \* \*

(e) Licensing of satellite DARS complementary terrestrial repeaters. Satellite DARS licensees may construct and operate terrestrial transmitters to retransmit signals received from their operating DARS satellite(s) on the exclusive frequency assignment of the licensee and for use of the same bandwidth as the satellite space station(s). Terrestrial gap-fillers shall not be used to originate programming or transmit signals other than those received from the authorized DARS satellite. Nor shall terrestrial gap fillers be used to extend satellite DARS coverage outside of the satellite systems' authorized service area. Terrestrial gap-fillers may be implemented by a satellite DARS licensee only after obtaining prior Commission authorization and the licensee demonstrates the following:

- (1) International coordination. Satellite DARS licensee must demonstrate that its repeating transmitter is located at a distance sufficiently away from the Canadian and Mexican borders or otherwise obtain prior coordination with adjacent country co-frequency systems;
- (2) Antenna structure clearance required. Satellite DARS licensees shall demonstrate that its repeating transmitter construction or alteration will comply with the requirements of Section 17.4 of the Commission's Rules;
- (3) Environmental. Satellite DARS licensee shall demonstrate that its repeating transmitter(s) comply with the Commission's Rules for environmental effects as defined by Sections 1.1301 through 1.1319 of the Commission's Rules.

\* \* \* \* \*

2. The definition of satellite digital audio radio service is proposed to be amended in Section 25.201 to read as follows (amendment of this paragraph to Section 2.1 is consequential):

**§ 25.201 Definitions**

\* \* \* \*

*Satellite Digital Audio Radio Service ("satellite DARS").* A radiocommunication service in which audio programming is digitally transmitted by one or more space stations directly to fixed, mobile, and/or portable stations, and which may involve complementary repeating terrestrial transmitters.

Statement  
of  
Chairman Reed E. Hundt

*Establishment of Rules and Policies for the Digital Audio Radio Satellite Service,*  
IB Docket No. 95-91, GEN Docket No. 90-357, RM No. 8610

The Commission today sets rules for licensing the digital audio radio service (DARS). With one exception, we are unanimous on the new rules. The Commission unanimously applies to DARS licensees the candidate-access rules of Sections 312 and 315 of the Communications Act and it puts DARS licensees on clear and explicit notice that the Commission may adopt additional public interest obligations, including the 4-7 percent educational set-aside that applies to Direct Broadcast Satellite operators.

To my dismay, however, the Commission lacks a majority to allow any company that believes it can make a business of DARS to participate in the upcoming auction. The Commission is deadlocked two-to-two over whether the auction for two 12.5 MHz DARS licenses will be limited to the four companies that submitted applications five years ago. Because I do not want to delay the launch of DARS, I very reluctantly have voted to allow the item to move forward with that limitation.

In the three and one-half years I have been at the FCC I have dissented three times. In each case I disagreed with a Commission decision to reject the possibility of assigning spectrum by open auction. For the reasons well described in the Spectrum Policy Paper issued last month, auctions are by far the best way to assign spectrum licenses. They are fast, fair and efficient, and they recover for the public fair value for the use of their property.

On each past occasion, the Commission majority offered a demonstrably flawed rationale for its decision. For example, in the cellular unserved proceeding, the majority was of the view that an auction would be pointless because there was little or no valuable spectrum available.<sup>1</sup> Based on a staff analysis, it is now clear that the Commission gave away licenses that could have been auctioned for approximately \$22 million.

In this proceeding the fundamental reasons for my disagreement with my colleagues are the same: I would prefer to assign spectrum licenses through an auction open to all. Closing the auction is the wrong result. In view of the amount of time that has passed since the window for applications closed in 1992, there is no guarantee that the four applicants are the companies that have or can develop the best plans for making DARS a success. If other companies value the spectrum more but are arbitrarily excluded from the auction, it is safe to predict that the auction winners will simply sell their licenses to those companies. We have, however, rightly rejected the idea that private auctions of the public's spectrum are a suitable

---

<sup>1</sup>Commissioners Ness and Chong did not participate in the cellular unserved decision.

replacement for public auctions.

If companies other than the fortunate four are interested in becoming DARS providers, we should not exclude them from the auction. We could hold such an auction as early as May. New applicants would bring additional competition to the service, with all the associated benefits to consumers. The decision to keep the auction door closed may needlessly cost the public millions of dollars.

This is not a criticism of the existing DARS applicants. They may well be the businesses that value the DARS spectrum the most. If so, however, there is no cost to opening the auction, except the cost to the public.

Fortunately, the decision against reopening the application window is of no precedential value because it does not have the support of a majority of the Commission. In addition, the rationale of the decision of my two colleagues is limited to the unique circumstances of satellite licensing and, indeed, the unique circumstances of this service.

**Approving in Part, Concurring in Part  
Statement  
of  
Commissioner Susan Ness**

*Re: Digital Audio Radio Service*

*The adoption today of this Report and Order for the rules governing a new, satellite-delivered digital audio radio (DARS) service enables the Commission finally to proceed to auction two nationwide licenses in the S-band. This completes the process begun at the 1992 World Administrative Radio Conference. There, together with industry, we successfully fought for this spectrum allocation for the United States, because the L-band, allocated world-wide for DARS, was unavailable for commercial use in this country.*

*It is now high time that the DARS service succeed or fail in the marketplace.*

***Opening the Auction to All Qualified Candidates***

*The rules we adopt provide for the four existing applicants to compete at auction for the two licenses available. As I noted at the NPRM stage, I would have strongly preferred that we hold an open auction, where any potential bidder would compete for the two licenses. The four applications were filed several years ago, before we had allocated spectrum or adopted service rules governing its use. Others might now wish to compete in the auction to provide a different package of DARS services to consumers. They should be allowed to do so.*

*But, because two of my colleagues firmly disagree on allowing all qualified applicants to bid for satellite DARS licenses, I reluctantly concur in the result for the sole reason that I do not wish to further delay the launch of DARS.*

***Public Interest Obligations***

Throughout our proceedings, I have endeavored to ensure that the rules we adopt will maximize the unique public benefits of satellite DARS, yet minimize the potential for harm to locally-licensed, free, over-the-air AM and FM broadcast on which consumers rely for news and information. Each applicant has pledged to use the inherent ability of satellite to aggregate small audiences nationwide to address the special needs of under-served populations.

We have allowed licensees a measure of flexibility to supplement their offerings with ancillary services, provided that the service generally is consistent with the international

allocation for DARS satellite. Licensees will be subject to our Equal Employment Opportunity (EEO) and political broadcasting rules.

Because licenses for this nascent service are being auctioned, I have declined at this time to take an over-regulatory approach and impose additional, explicit public interest requirements, such as a capacity set-aside. I prefer to give the competitive marketplace -- without government intervention -- a chance to provide programming that is in the public interest. However, applicants are on notice that the Commission may revisit this issue at a later time.

### ***Terrestrial Broadcasting***

As we pave the way for DARS service, I note that terrestrial broadcasters have not yet found a viable way to convert from analog to digital transmission. I believe that competition within the existing AM and FM terrestrial radio services would be enhanced by such a conversion.

In 1990, when we initiated our proceeding on digital radio, we addressed both terrestrial and satellite services. If engineers working on in-band digital technologies cannot fashion an acceptable transmission system, we need to explore other options. While I prefer to use the existing bands, it remains to be seen how terrestrial radio broadcasters will get to a digital world if a satisfactory solution is not derived.

SEPARATE STATEMENT OF  
COMMISSIONER RACHELLE B. CHONG

*Re: Amendment of the Commission's Rules with Regard to the Establishment and Regulation of New Digital Audio Radio Services, IB Docket No. 95-91, GEN Docket No. 90-357, RM No. 8610*

It is with great pleasure that I support the Commission's decision to move forward with the auction and licensing of Satellite Digital Audio Radio Service ("DARS"). I believe that licensing this service will help to fulfill the mandate of Section 151 of the Communications Act of 1934 that this Commission make available a rapid, efficient, nation-wide communications service.

As we have explained in the order, we anticipate that many benefits will flow from this new satellite radio service. Digital technology will produce better quality sound for listeners and make more efficient use of the spectrum. Moreover, satellite delivery of radio programming will provide service to areas that are unserved or underserved. In short, DARS will provide better service for the public. The public deserves the opportunity to receive this service.

I write separately to clarify two aspects of this decision. First, with regard to public interest programming obligations for the eventual DARS licensees, my colleagues and I chose not to impose quantified programming obligations. In my view, such regulation would improperly place the heavy hand of government on the programming decisions of the DARS providers.

While we have put the licensees on notice that the FCC could in the future decide to initiate a proceeding to consider imposing programming obligations, I wish to emphasize that such a proceeding is not imminent. I believe that the Commission should think long and hard before deciding to embark on such a highly regulatory course. At this time, we do not know which of the DARS applicants will win a license, nor do we know whether the service will be subscription or advertiser supported. Moreover, Congress has not directed the Commission to impose such obligations and I see no evidence of a compelling need to do so.

Second, with regard to reopening of the application window before auctioning the two satellite DARS slots, I have voted to go forward immediately to auction among the four existing applicants. As we explain in the item, it would be inequitable to reopen the application process at this time. These applicants have been ready and willing to move forward for some time. They have expended considerable resources in developing this technology. The first of these applications was filed seven years ago. Our decision to allocate the spectrum for satellite DARS was more than two years ago. These applicants have been the victims of regulatory delay and that delay should not continue. In my view, reopening would not bring any benefit to consumers, but would only create new

uncertainty and undermine the likelihood that this service will become a reality.

