

Before the  
Federal Communications Commission  
Washington, DC 20554

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DOMESTIC FACILITIES DIVISION  
COMMUNICATIONS BUREAU

In the Matter of }  
Satellite CD Radio, Inc. } File Nos.  
Application for Authority to }  
Construct, Launch and Operate } 49/50-DDS-P/LA-90  
a Digital Audio Radio Service } 58/59-DDS-AMEND-90  
} 44/45-DSS-AMEND-92  
}

**COMMENTS OF DIGITAL CABLE RADIO**

Digital Cable Radio ("DCR") submits these comments in opposition to the above-captioned applications of Satellite CD Radio to construct and launch a system of satellites to deliver a digital radio broadcasting service ("Application"; the Compendium of Applications and Restatement of Rulemaking Petition, submitted September 14, 1992 is cited as "Compendium").<sup>1</sup>

Summary of Position

Action on the Application is premature because a number of policy and technical decisions should be made by the Commission before it can find that the Satellite CD Radio approach serves the public interest.

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<sup>1</sup>Comments in this matter are due November 13, 1992. Public Notice Report No. DS-1244, released October 13, 1992.

Before acting on the Application, the Commission should first decide on:

- an allocation of frequencies,
- adoption of an orbital slotting plan and a channel plan,
- whether there is a need for terrestrial/satellite sharing of frequencies
- a single audio coding standard,
- adoption of public service and localism requirements, and
- whether the service should be regulated as broadcasting, common carriage or private carriage.

The Application contains a number of serious flaws. Because of the choice of technology, particularly the receiver antennas, the proposal makes inefficient use of spectrum and orbital slots. The applicant proposes to operate as a private carrier, but the spectrum is allocated for broadcasting, not private carriage. The applicant has not shown that it has an adequate source of financing. The proposed system is not designed to service the fixed home market, and therefore likely to fail in the marketplace.

Satellite CD Radio is not entitled to a pioneer's preference. It is not the first to conceive of satellite-delivered digitally-coded radio programming. Unlike others already in operation, it has not demonstrated its approach. Its proposal does not embody any innovative technology.

#### Digital Cable Radio's Interest

DCR is the leading supplier of CD quality digital radio programming service to subscribers in their homes. DCR was the first to offer such a service. This service is now available in more than 80 U.S. markets to more than 4 million subscribers. At this time, the service is

delivered to home subscribers in the U.S. over cable television systems. The service is also available in Mexico.

The DCR service consists of 19 channels of music programming, plus digital simulcast of 5 pay TV and music channels (HBO, Showtime, Cinemax, MTV and VH-1). The service is offered as a commercial-free 24-hour subscription service. The price is approximately \$10 per month.

DCR was founded in 1987. Service was launched and has operated continuously since May 21, 1990. The company is organized as a partnership between Jerrold Communications a division of General Instrument Corp., Comcast Cable Communications, Continental Cablevision, Cox Cable Communications, Adelphia Cable Communications and Times Mirror Cable Television.

Within the U.S., the DCR service is carried by domestic satellite to cable headends, where it is then received and repackaged for delivery to cable subscribers. It employs a digital coding algorithm developed by Dolby Laboratories to assure high sound quality and efficient use of the satellite and cable TV radio spectrum.

### Action on the Application is Premature

Action on the Application is premature because a number of policy and technical decisions must be made by the Commission before it can find that the Satellite CD Radio approach serves the public interest. These decisions include an allocation of frequencies, decision on terrestrial/satellite sharing of frequencies, audio coding standards, adoption of public service and localism requirements, and determination of the appropriate regulatory scheme for this service.

While the Commission has begun the reallocation process, it has deferred consideration of a number of significant issues that must be decided before any authorization can be granted to any applicant for these frequencies. These issues include regulatory policies, service rules and technical standards. Notice of Proposed Rulemaking and Further Notice of Inquiry in Docket No. 90-357, released November 6, 1992 ("Reallocation Notice") at para. 14.

### The Reallocation Decision Must be Made

The Commission has only just begun a proceeding to reallocate S-band spectrum for digital audio radio service. The Commission should not grant any construction authorizations before it has allocated spectrum and adopted policies and rules for a new digital audio radio service.

Grant of the applicant's construction authorization prior to finalizing the pending reallocation would require a waiver of Part 2 of the Commission's Rules. The applicant has not request such a waiver, nor has a Section 319(d) waver been requested. Rather, Satellite CD Radio has submitted a petition for rulemaking requesting a reallocation of the S-band spectrum.

It would be consistent with sound spectrum management policies to defer action on the Application until action on the reallocation is completed. Moreover, upon completion of the reallocation and adoption of technical and service rules, Satellite CD Radio and other applications must be given an opportunity to amend their applications to conform to the new policies and rules. Until those policies and rules are adopted, however, it would pre-judge final action if the pending Application were granted.

#### Terrestrial Sharing of Frequencies Must Be Considered

The Application has not given adequate consideration to the shared use of S-band frequencies with terrestrial digital radio broadcasting. The Reallocation Notice specifically proposes to include "complementary terrestrial" digital radio service in the S-band allocation (Reallocation Notice at para. 7).

However, the specific channel plan proposed by the applicant may be inconsistent with a shared allocation of spectrum for complementary terrestrial use. Permitting the immediate

construction of a satellite system, as applicant requests, would lock in that specific channel plan and pre-judge Commission action on this matter.

The Commission has proposed to reallocate the S-band frequencies for a satellite service, but it may be that these frequencies are better used for a purely terrestrial service. The radio broadcasting industry today has set its sights on an "in-band" approach to implement terrestrial digital radio broadcasting. However, it is far from clear that such an approach is technically feasible. If not, then S-band terrestrial broadcasting of digital programming may be the best use of these frequencies. However, it may be that the testing of in-band technology is not yet far enough advanced to know. We expect that information on this subject will be submitted in response to the Reallocation Notice. Until the record is more complete, the Commission should not permit the applicant to start construction of satellites with the proposed channel plan.

#### FCC Should Adopt Orbital Slots And Channel Plan

Satellite CD Radio has proposed a specific orbital slotting plan and a particular channelization plan (Compendium at p. 24). It has then sought authorization to construct satellites to operate at particular orbital slots (at 80 degrees and 110 degrees) and on particular channels (2325 MHz and 2345 MHz).

It is by no means clear that the proposed orbital slotting plan and channel plan are appropriate. The Commission has never given explicit consideration to this matter, and, unlike the video DBS case, there is no international guidance from the WARC or the CCIR.

Grant of the requested construction authorization could pre-empt FCC consideration of the best orbital slotting plan and the best channel plan for a broadcasting service. C-band and Ku-band satellites are typically constructed for optimal use at a single specified orbital location, but they must also work at any other orbital slot. It is not clear whether an S-band satellite, constructed for a particular orbital slot, would also work properly if moved to a different slot. The applicant should not be permitted to bootstrap itself into a permanent orbital slot assignment by prematurely constructing a satellite and then arguing that it will not operate optimally at other locations. Rather, a reasoned decision on orbital slot assignments should be made before any construction is permitted.

The Reallocation Notice raises, but then defers, consideration of these issues until some later time. The Commission should not permit construction of any satellites until these matters are decided.

#### Technical Standards For Audio Coding Must be Adopted

The success of a digital broadcasting service may depend on FCC adoption of a single audio coding standard. In the television broadcasting environment, the Commission has

determined that it should adopt a single coding standard for advanced (high definition) television. Digital sound broadcasting is nothing less than "high definition" audio, and it deserves the same careful attention that the Commission has paid to advanced television.

There are substantial benefits to the public if a single standard is adopted so that a listener needs only one receiver for all digital audio broadcasting services. In contrast, the Satellite CD radio proposal is clearly contrary to the public interest because, as a private carrier offering, the satellite operator would have no control over audio coding and different audio coding methods could be employed for different program services on its satellite, at the discretion of the program provider.

Choice of an audio coding standard involves complex trade-offs between sound quality and spectrum utilization. Satellite CD Radio has proposed a particular approach: use of the Dolby AC-2 or Musicam coding algorithm to carry 30 sound channels in 8 MHz. This leads to a channel plan of nine 8 MHz channels in the 2310-2360 MHz band, using cross polarization isolation to achieve frequency reuse. (Compendium at p. 24) It is not clear that this is the optimal choice in the public interest.

Satellite CD Radio proposes to provide a data rate of 128 kbit/sec for a stereo pair. So far as we understand the Dolby AC-2 and Musicam coding algorithm, data rates of 256 kbit/sec are needed to provide CD quality for a stereo channel pair. We suggest that this apparent inconsistency needs clarification.



In light of these concerns, a consideration of technical standards is essential before any authorizations are granted. While the applicant claims that its systems design would be compatible with any coding algorithm, that claim cannot be evaluated until specific coding algorithms are proposed by the Commission for adoption as a standard. It would be premature to grant an authorization until that evaluation has taken place.

#### Public Service And Localism Policies Must Be Considered

While the applicant makes references to National Public Radio, there is no promise to provide channels for public radio programming. As the Commission is aware, the Congress has recently enacted legislation that imposes public service obligations on direct broadcast satellite video services. Section 25(b) of the 1992 Cable Act requires video DBS service providers to reserve capacity for non-commercial programming. It also requires the Commission to examine the impact of video DBS services on localism.

We submit that the commission should also consider whether these public service and localism requirements are relevant to digital radio broadcasting and whether similar obligations should be imposed on digital audio broadcasting licensees.

#### Regulatory Structure and Service Rules Must Be Adopted

FCC must consider whether digital audio broadcasting service should be regulated as a

broadcasting, common carrier or private carrier service. We note that the Direct Broadcast Satellite Service for video appears to be regulated as a broadcasting service (Section 100.51 requires the use of forms used by broadcasters). The Satellite CD Radio proposal, to be regulated as a private carrier, would appear to be inconsistent with the policies adopted for video DBS. A Commission decision on the appropriate regulatory structure is needed before it can be determined whether grant of the Application is appropriate.

#### The Application Contains Serious Flaws

The Application contains a number of serious flaws. These include inefficient use of spectrum and orbital slots, the applicant's ineligibility to operate as a private carrier in these frequencies, inadequate showing of financing, and apparent inability of the system to serve the fixed home market.

#### Proposed Technical Design Precludes Efficient Use of Spectrum And Orbital Slots

The Satellite CD Radio system design would appear to make inefficient use of the orbit and spectrum resource. The proposed design assigns slots for Satellite CD Radio's satellites spaced 30 degrees apart, at 80 degrees and 110 degrees. It claims that eight satellite slots can be spread across the 70 to 120 degrees arc (Compendium at p. 65), but we fail to see how eight slots can be accommodated. Rather, it appears that there will be only two orbital slots.

The basic failure in the proposed system design is the lack of directionality in the proposed receiving antennas. The vehicular antennas are proposed to be omnidirectional, with a gain of 3 dBi. The applicant has not explained why directional antennas could not be used for this service. We call attention to the digital radio service of Sky Radio, which employs directional receive antennas to receive Ku-band satellite transmission with mobile receivers. There is nothing in the record to explain why a comparable technology could not be used at S-band. If a more directional antenna could be employed, then many more orbital slots could be used for this service.

In light of technical advances in antenna design, and the relationship between antenna directivity and orbit/spectrum efficiency, the Commission must give careful consideration to technical standards in this area before it grants construction authorizations to Satellite CD Radio or any other applicant.

#### Satellite CD Radio's Proposal Is Not Eligible For These Frequencies

The applicant has proposed to establish a new service, the Mobile Point-to-Multipoint Satellite Service (MPSS). The S-band spectrum (2310-2360 MHz) is allocated to the broadcasting-satellite service (sound).<sup>2</sup> The proposed new service is not a broadcasting service, and therefore this service is not eligible to use these frequencies.

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<sup>2</sup>Final Acts of the WARC-92, Appendix A&C, p. 20

The Commission's Rules provide that a broadcasting-satellite service must transmit signals that are "intended for direct reception by the general public" (Section 2.1 of the Commission's Rules). The applicant proposes to operate its service as a private carrier service. There has never been any regulatory determination that a private carrier's signals should be transmitted for reception by the general public. Indeed, a private carrier cannot hold itself out as offering a service for the general public, or else it risks being regulated as a common carrier. There are no video DBS licensees operating as a private carriers, and the Commission has never determined that such a regulatory structure is appropriate for S-band sound broadcasting.

Satellite CD Radio's regulatory structure is better suited for spectrum allocated for the fixed-satellite service. Both private carrier and common carrier service offerings are permissible in spectrum allocated for that use. Indeed, the digital audio services offered by DCR, by Digital Music Express and by Sky Radio are all provided on satellites using fixed-satellite spectrum allocations.

#### Applicant Has Not Shown Adequate Financing

As the Commission is aware, any new satellite service is economically risky. For example, Geostar, a previous venture quite familiar to Satellite CD Radio's management team, failed in the marketplace and the company was liquidated. The Commission allowed Geostar to proceed into operation without having adequate financing to carry through its ambitious

plans. More recently, the Commission has given more careful consideration to these issues, and has nullified authorizations granted to National Exchange Satellite, Inc. partially in light of that applicant's inability to arrange financing. See Memorandum Opinion and Order in File No. 4/5-DSS-EXT-90, released March 20, 1992.

Satellite CD Radio has not shown that it has a reasonable expectation of achieving an adequate level of financing for its project. The Commission should not grant the Application until such a showing has been made.

#### Design Is Unable To Service Fixed Home Market

The specific design proposed by Satellite CD Radio does not appear to be capable of serving indoor home radio receivers. The service is intended for mobile and portable receivers, not fixed receivers (Compendium, p. 18). It is designed and marketed for vehicle use (Compendium, p. 39). The link budget is based on vehicular reception (Compendium, Table 1 following p. 51). Indeed, the link budget does not appear to be able to support reception within a building.

There is substantial doubt that a service limited to the vehicular market can succeed in the marketplace, in light of the high costs of establishing any satellite system. This doubt is expressed most clearly in the applicant's own submission. "We are equally convinced that a satellite only system for mobile listeners, particularly in urban environments, has low

probability of success." (Manufacturing DAB Automobile Receivers, by J. L. McComas et al. of Delco Electronics Corporation, at p. 237 of Proceedings of First International Symposium on DAB-1992, attached to Compendium).

In light of applicant's inability to provide service to a significant part of the United States' public, it would be contrary to the public interest to assign valuable frequencies to serve such a limited market.

#### Satellite CD Radio Is Not Entitled To A Pioneer's Preference

Satellite CD Radio is not entitled to a pioneer's preference. It is not the first to conceive of satellite-delivered digitally-coded radio programming. It has not demonstrated that its approach is feasible, particularly with respect to mobile reception of its service. It has merely submitted a proposal that does not embody any innovative technology.

Digital Cable Radio was the first to demonstrate and implement a satellite-delivered digital radio service. DCR has been in continuous operation since 1990, delivering digitally-coded radio programming by satellite to fixed locations. The DCR service is not a broadcasting service, but then neither is the proposal from Satellite CD Radio.

The Satellite CD Radio proposal does not meet the high standard that the Commission has established for a pioneer's preference. To receive a pioneer's preference, an applicant's

proposal must constitute a significant communications innovation; the applicant must make a significant contribution to develop that innovation; and the innovation must lead to a new service or substantially enhance an existing service. (See Tentative Decision and Memorandum Opinion and Order in Docket No. 90-314, released November 6, 1992, at para. 4)

Satellite CD Radio's proposal satisfies none of these requirements. It contains no innovation, but is merely a compilation of existing communications technology. The applicant has made no contribution to develop that innovation. The existence of DCR and Sky Radio show that the proposal would not constitute any new type of service. Indeed, the Commission recognizes that it "is clear that a digital audio radio service is technically feasible" without any need for additional innovation (Reallocation Notice at para. 6). Consequently, the request for a pioneer's preference should be rejected.

### Conclusion

In light of the above considerations, action on the Application is premature. The Commission should first make a number of policy and technical decisions in its rulemaking proceeding to reallocate spectrum, and some of these decisions have already been deferred to a later round in the proceeding. Then the Commission should weigh the details of the

Application against those policy and technical decisions. When it does, we believe that the Application will be found wanting in a number of areas. Finally, the request for pioneer's preference should be denied, since the proposed technology is not innovative and the applicant is not the first to propose and provide a satellite-delivered radio broadcasting service.

Respectfully submitted,

A handwritten signature in black ink, appearing to read 'David J. Del Beccaro', written over a horizontal line.

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