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FEDERAL COMMUNICATIONS COMMISSION  
OFFICE OF THE SECRETARY

Magalie Roman Salas, Secretary  
Federal Communications Commission  
445 12th Street, S.W. – Room TW-A325  
Washington, D.C. 20554

Re: **ET Docket No. 98-206, RM-9147, RM-9245; CS Docket No. 99-250,  
RM-9257; DA Nos. 99-494, 00-1841, 00-2134**

Dear Ms. Salas:

In response to the barrage of almost-daily *ex parte* meetings and filings initiated by Northpoint Technology ("Northpoint") in the past few months, DIRECTV, Inc. ("DIRECTV") and EchoStar Satellite Corporation ("EchoStar") (collectively, the "DBS Operators") wish to remind the Commission of a fundamental fact: the DBS Operators have delivered on the promise of providing vigorous multi-channel video programming distributor ("MVPD") competition to incumbent cable television systems in little more than seven years of existence. **Collectively, the DBS Operators have invested more than \$7 billion to build, insure, launch and operate state-of-the-art DBS satellites; build and operate state-of-the-art ground systems, uplink facilities and call centers; and acquire additional DBS licenses and assets, both at auction and in the aftermarket.**<sup>1</sup> In so doing, the DBS Operators have relied upon the Commission's Orders facilitating an interference-free environment in which to operate their systems.

Against this backdrop, the DBS Operators continue to view the Commission's proposal to introduce two additional ubiquitously-deployed consumer services (MVDDS and NGSO service) into the 12.2-12.7 GHz band as ill-advised and potentially extremely harmful to DBS operations. The Commission should proceed very cautiously when millions of DBS subscribers' receipt of service is at stake, and when ample suitable alternative spectrum exists for Northpoint's proposed terrestrial service, including in the Cable Antenna Television Service ("CARS") band located immediately adjacent to the DBS downlink band. In this regard, the DBS Operators respectfully request the Commission to consider the following points.

1. **Interference Threshold Issues in the DBS Downlink Band**

Northpoint has argued repeatedly for regional equivalent power flux density ("EPFD") limits for proposed MVDDS operations in the DBS downlink band that are based upon a 20 dB

<sup>1</sup> This figure does not include additional significant expenditures, such as marketing and advertising costs, etc.

C/I ratio. The DBS Operators wish to re-emphasize that EPFD limits based upon a C/I value of 20 dB simply do not even approach a level that is adequate to protect DBS operations. This point has been addressed by the DBS Operators on numerous occasions.

For example, DIRECTV has shown that an interfering MVDDS signal with a C/I value of 20 dB affects a sample DBS link in Seattle, Washington, with a 16.6% increase in unavailability, and affects a sample DBS link for Washington, D.C. with a 37% increase in unavailability.<sup>2</sup> These unavailability degradation values are much higher than the unavailability degradation allowed from *all* NGSO FSS systems combined (limited to 10%), and much higher than the 2.86% individual system limit proposed in the Further Notice in ET Docket No. 98-206, a threshold that is viewed as essential by the DBS Operators to protect their subscribers.

The Commission has recognized that it is necessary to limit impact on DBS unavailability to low levels. Thus, the Further Notice in ET Docket No. 98-206 states: "[O]ur objective in this further proceeding is to avoid unreasonable outages.... In this further proceeding, our objective is to identify an unavailability criterion for MVDDS operations that will achieve this result."<sup>3</sup> As the Commission has observed, an approach of adopting a 2.86% increase in unavailability criterion would effectively treat a proposed MVDDS system similarly to how the ITU-R assumed an individual NGSO FSS system would be treated, and therefore "should not result in increases in unavailability from MVDDS that are perceptible to any DBS subscriber."<sup>4</sup> And this is an extremely generous allowance for MVDDS insofar as it would allow a system in a secondary service to cause as much degradation in DBS system performance as a system in the co-primary NGSO FSS service.

The DBS Operators are on record in this proceeding as opposing regional EPFD limits as too imprecise, and continue to believe that site-specific EPFD limits would be preferable in protecting the DBS service. Nevertheless, if the Commission chooses to adopt regional limits, it is critical that such limits be pegged to the 2.86% increase in unavailability criterion. To this end, Attachment A is a spreadsheet that shows the derivation of the proper EPFD limits for certain representative cities, calculated in units of dBW/ m<sup>2</sup> /4kHz, as follows:

Miami, FL	-174.3
Washington, D.C.	-175.8
Chicago, IL	-176.9

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<sup>2</sup> See Reply Comments of DIRECTV, Inc., ET Docket No. 98-206 (April 5, 2001), Appendix B for tables and details of links with a proposed MVDDS C/I value of 20 dB.

<sup>3</sup> Further Notice, ET Docket No. 98-206, at ¶ 287.

<sup>4</sup> *Id.* at ¶ 268.

Los Angeles, CA	-178.2
Seattle, WA	-180.6

As line 57 of Attachment A shows, the C/I derived from these acceptable EPFD limits ranges from 27.4<sup>5</sup> dB to 30.7 dB, *i.e.*, well above the 20 dB C/I that Northpoint contends is acceptable for DBS-MVDDS sharing purposes.

The bottom line is that an EPFD approach to protect DBS should not be driven by Northpoint system parameters that have little relationship to the objectively-determined DBS system unavailability requirements recognized by the ITU and the United States in the context of examining the acceptable levels of interference into DBS systems. If terrestrial MVDDS service must be introduced into the DBS downlink band, it is reasonable to require an MVDDS operator to protect DBS service to the same 2.86% "cap" on unavailability increases to which individual NGSO systems are subject (as well as the 10% aggregate cap on increases in unavailability, regardless of source). The EPFD limits above are consistent with such an approach.

**2. Northpoint's Disingenuous Emphasis on a Lack of DBS Customer Complaints During Experimental Testing Now Has Been Contradicted As a Factual Matter**

Northpoint has continued to attribute significance to the lack of DBS subscriber complaints during various experimental tests conducted by both Northpoint and by the DBS Operators in recent years. The DBS Operators have repeatedly highlighted the absurdity of this claim, given the facts that (i) all of these tests were deliberately configured so as to minimize any impact on DBS subscribers, and (ii) even if harmful interference was experienced by consumers during these tests, the consumers would have had no reason to associate the harmful interference with the presence of a Northpoint test in their neighborhood. As DIRECTV and EchoStar have pointed out on numerous occasions, the impact of additive interference in a digital DBS broadcast link is to reduce the quality of the broadcast service over the long term. The added interference has the effect of making rain outages longer and more frequent. Over days and months of such poorer performance, a subscriber can easily become frustrated with the quality of service, but will be unable to identify the source of the problem, and will likely blame the DBS

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<sup>5</sup> All of the links shown in Attachment A are DBS links operating in high information rate mode, with the exception of Column H (Seattle, WA) which is an example of a DBS link operating in low information mode. With the exception of low information rate modes, which would require a C/I ratio of approximately 27 dB to be protected, all of the other C/Is would need to be approximately 30 dB for the links to be protected. Note, however, that regardless of whether a DBS system is using low or high information rate links, as demonstrated in Attachment B, the EPFD level needed to protect the links to a 2.86% criterion is almost exactly the same. This is why the DBS Operators have continually called for the specification of an EPFD level, and not a C/I, for protection.

system itself for the outages. In such an instance, however, there is no doubt that the subscriber has been adversely impacted.

The DBS Operators would now add that Northpoint's claim of no complaints related to MVDDS testing appears to be unsupported as a factual matter. On December 28, 2001, Chairman Powell received a harmful interference complaint from a DISH Network subscriber, who, based upon the experience of an interference event related to the testing of MVDDS service in Dallas, Texas, respectfully requested the Commission "to reject MDS America and Northpoint's claims that they do not interfere with DBS."<sup>6</sup> The DBS Operators have no doubt that this is a powerful portent of developments to come if the Commission proceeds with its ill-conceived introduction of wide-scale terrestrial operations at 12.2-12.7 GHz.

**3. MVDDS Must be Required to Post a Bond; Mitigation Actions Must Be Transparent to All DBS Customers, and An Adequate Mitigation Compensation Mechanism Must Be Developed**

Clearly, proposed MVDDS operators, as secondary licensees, must be responsible for bearing all mitigation costs associated with MVDDS system interference. MVDDS operators should be required to post a substantial bond to ensure that licensees of that service will adequately reimburse the DBS Operators for the mitigation work necessary to diminish harmful interference into DBS subscribers' satellite dishes and to preserve the primary status of DBS service. Alternatively, as EchoStar previously set forth in its comments,<sup>7</sup> the Commission could provide for mitigation costs to be funded from the MVDDS auction proceeds.<sup>8</sup>

The suggestion that interference from proposed MVDDS systems can or should be mitigated at the DBS customer's premises is an unreasonable and unworkable proposition. Northpoint, for example, has advocated a "consumer complaint" standard whereby mitigation at a DBS customer's premises would be required only when a customer complains.<sup>9</sup> Yet, such a standard is clearly unacceptable because customers will be unable to trace the source of degraded DBS system performance. They will likely blame the DBS operator for the increased outages and rain sensitivity of their DBS receivers rather than consider that the interference might be coming from a Northpoint microwave transmit horn located on a building or a tower a mile away. Most of these complaints likely will go unresolved, with the potential that customers will desert DBS for competing video distribution services. In fact, as an avowed competitor of DBS providers (at least according to the Northpoint business plan *du jour*), Northpoint has every incentive to encourage this result.

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<sup>6</sup> See Letter to Hon. Michael Powell, Chairman, Federal Communications Commission, from Harish Patel (Dec. 28, 2001).

<sup>7</sup> EchoStar Comments at 30 (March 12, 2001).

<sup>8</sup> *Id.*

<sup>9</sup> Northpoint Comments (March 12, 2001), Technical Appendix at 1.

Furthermore, it is important for the Commission to ensure that mitigation costs are borne by proposed MVDDS operators in the phase of designing and locating their MVDDS system transmitters,<sup>10</sup> and through compliance with Commission-imposed operational limits, rather than in mitigation efforts following transmitter installation. Interference simply must not be permitted to reach the point where it requires mitigation at the DBS subscriber's premises. The suggestion, for example, that a DBS operator must swap out a customer's small DBS antenna for a "larger" one,<sup>11</sup> simply to mitigate MVDDS interference, is a nonstarter. It vitiates the very consumer and competitive benefits that the Commission has attempted to promote with respect to DBS service, and indeed, reveals the fallacy of proceeding down this path. The success of DBS in the United States has been directly related to the consumer-friendly nature of the service, and the small, unobtrusive size of its antennas. DBS subscribers cannot and should not be expected to have their service interfered with in any respect simply to accommodate secondary uses of the 12 GHz Band.

Even if co-existence at 12 GHz requires significant redesign of proposed MVDDS systems, that is the nature of being a secondary service. And given the plethora of other frequencies available for MVDDS operators to exploit, including the CARS band, there should not even be a question raised in this proceeding of a policy tradeoff. DBS subscribers must be fully protected without any changes whatsoever being performed on their premises.

#### 4. **CARS Spectrum Is a Suitable Home for Northpoint**

In a petition filed December 3, 2001, the DBS Operators pointed out that the frequency bands used for the Cable Television Relay Service ("CARS") are an excellent alternative for use by Northpoint and other MVDDS providers for their proposed services.<sup>12</sup> The DBS Operators urged the Commission to investigate the CARS frequency band as an option for licensing MVDDS systems. The use of the CARS frequency band answers all of Northpoint's purported concerns with using an alternative to the DBS frequency band while at the same time it will not jeopardize the delivery of DBS service to millions of consumers throughout the country.

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<sup>10</sup> The MITRE Corporation examined the use of certain operational measures and design changes that could possibly be used to mitigate MVDDS system interference, though the prospect for successful mitigation using most of the techniques examined is dubious. *See* Comments of DIRECTV, Inc. on the MITRE Report, ET Docket No. 98-206 (May 15, 2001); Reply Comments of DIRECTV, Inc. Regarding the MITRE Report, ET Docket No. 98-206 (May 23, 2001).

<sup>11</sup> *Id.* at 13.

<sup>12</sup> *See* Petition for Consolidation of Rulemaking Proceedings and for a Declaration that Alternative Spectrum is Suitable for the Proposed "Multichannel Video Distribution and Data Service" at 5 - 6 (Dec. 3, 2001) ("Petition").

Resorting to *ad hominem* attacks when it is short on substantive rebuttals, Northpoint has tried to portray this as an eleventh-hour ploy for delay on the part of the DBS Operators. In fact, however, EchoStar raised the suitability of the CARS band for the service proposed by Northpoint in 1999, in its comments in the CARS rulemaking. The Commission should act to consolidate the two proceedings.

The CARS spectrum satisfies Northpoint's stated needs since:

- the CARS band is immediately adjacent to the DBS spectrum and has the same propagation characteristics;
- the CARS band is enough spectrum for Northpoint's stated plans – 500 MHz compared to 500 MHz of DBS spectrum;
- the CARS band is used much more sparsely than the DBS frequencies, and only for non-ubiquitous point-to-point or point-to-multipoint services – mostly microwave transmission of programming to cable headends, as well as the Broadcast Auxiliary Service; and
- currently, the CARS band is not directly used by *millions* of consumers – a sharp contrast to DBS.

In sum, the CARS frequency band satisfies Northpoint's stated technical needs, but does not present the virtually insurmountable interference problems that the Commission has repeatedly recognized when it comes to sharing between two ubiquitous consumer services, such as DBS and MVDDS.

Neither Northpoint nor other parties active in the Commission's MVDDS proceedings have articulated a reasonable explanation as to why the CARS band is inadequate for proposed MVDDS operations:

- While ignoring the above-mentioned potential benefits to the CARS frequency band, Northpoint vaguely claims that only use of the DBS frequency bands will offer "scale economies and technical advantages," thereby making the DBS frequency bands the most "efficient" place for MVDDS.<sup>13</sup> It is not clear, however, to what economies of scale Northpoint is referring. There is no apparent reason why the equipment for a Northpoint service in the CARS frequency band would cost any more than in the DBS spectrum.<sup>14</sup>

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<sup>13</sup> See Opposition of Northpoint Technology, Ltd. and Broadwave USA, Inc. at 7 (filed Dec. 21, 2001) ("Northpoint Opposition").

<sup>14</sup> In addition, since MVDDS providers, such as Northpoint, would not have access to already-deployed DBS equipment, so MVDDS providers cannot claim economies of scale with respect to such equipment.

- Specifically, while the 12.2–12.7 GHz band is vital for downlinking programming to DBS customers, and DBS receiving antennas must, by their nature, operate at 12 GHz, all other components of DBS equipment used by the DBS Operators *do not operate at 12 GHz*. This fact goes to the heart of Northpoint's claim that it must use the DBS downlink band because of equipment compatibility issues. Although a DBS signal is transmitted at 12.2-12.7 GHz, only the low noise block down-converter ("LNB") portion of the typical DBS satellite dish uses 12.2–12.7 GHz frequencies. Because the LNB portion of the antenna assembly immediately down-converts the received satellite signal to the 950-1450 MHz band for distribution to set-top boxes in the home, it is evident that Northpoint could use *any* frequency band ultimately allocated for MVDDS (*e.g.*, CARS, MDS, or LMDS frequencies) and still use commercially available DBS-like equipment, provided that the Northpoint antenna uses a suitable LNB to convert the signal to 950-1450 MHz.
- On this point, it is already plain from Northpoint's system proposal that DBS subscribers will be required to add a second dish to receive the Northpoint signal, and that Northpoint will need to develop a separate LNB regardless of the frequency band utilized.<sup>15</sup> While an LNB design would be slightly different for the CARS band at 12.7-13.2 GHz, the attached letter<sup>16</sup> from a satellite products manufacturer states that (i) such a product would be "well within the realms of existing technology to meet similar specifications per the current DIRECTV LNB product" for either linear or circular polarization, (ii) the unit cost of the CARS band LNBS would be "similar to the DIRECTV LNBS, assuming similar specifications, and similar production volumes," and (iii) the manufacturer would develop the LNB *at no cost* to the customer, provided that a reasonable production order was issued for the product. Thus, any claim by Northpoint that equipment compatibility issues or alleged scale economies should be a factor in keeping MVDDS operators in the DBS downlink band, or reduce the attractiveness of the CARS band as a home for MVDDS service, is simply not credible.
- While MDS America, Incorporated ("MDS America") does not abandon its desire to continue to use the DBS frequency bands for its proposed

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<sup>15</sup> See also USSB Comments, ET Docket No. 98-206 (Mar. 2, 1999), at 5 (noting that "[a]t a minimum, a separate subscriber antenna and down-converter will be required, regardless of the frequency band used," such that "Northpoint's claim that it must use the 12.2-12.7 GHz frequency band to provide its service is without merit").

<sup>16</sup> See Letter from Robert J. Hannah, Vice President, Satellite Products, California Amplifier to David Pattillo, DIRECTV (Jan. 30, 2002), attached as Exhibit 3.

services or acknowledge the harmful interference that MVDDS operations will cause in the DBS frequency band, it does not deny outright the availability and suitability of the CARS frequency band for proposed MVDDS operations.<sup>17</sup> To the contrary, "MDS America believes that with some investment, it might eventually be possible to alter existing MVDDS reception equipment designed for the DBS band to allow it to function in the CARS band" and it further concludes that the Commission should "investigate the possible availability of additional spectrum for MVDDS in the CARS band. . . ."<sup>18</sup>

- While the National Cable & Telecommunications Association ("NCTA") predictably opposes use of the CARS band by Northpoint-type services, the NCTA letter is striking for its lukewarm defense of the band.<sup>19</sup> While NCTA claims that CARS is "vital" to ongoing operations and plays an "important role in providing cable television service," it acknowledges (as it must) that fiber increasingly is being deployed in place of using the CARS band.<sup>20</sup> Nor can the NCTA contradict the fact that the CARS band is not directly and critically used by millions of consumers as is the DBS frequency band; rather, it supports consumer cable operations, and it does so to a dramatically lesser extent than even a few years ago. Accordingly, the potential for customer disruption is vastly reduced by MVDDS use of this lightly used spectrum as opposed to use of the DBS frequency band – the lifeblood of service to DBS customers.

Importantly, neither Northpoint nor anyone else has shown that MVDDS operation in the CARS band is impossible or that it will cause harmful interference to existing CARS operations. In light of the harmful interference that tests have shown will be caused to DBS operators from proposed MVDDS operations in the DBS frequency band, the Commission should, at a minimum, take a closer look at use of the CARS band before moving forward to license any MVDDS systems in the DBS band.

#### 5. "Test Market" Approach

Because of its light use, the CARS band also lends itself for a nationwide MVDDS roll-out. In stark contrast, a national roll-out of MVDDS would be extremely reckless in the DBS

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<sup>17</sup> See Letter from Nancy Killien Spooner (Counsel, MDS America) to Magalie Roman Salas (Dec. 10, 2001) ("MDS America Letter").

<sup>18</sup> MDS America Letter at 2 - 3.

<sup>19</sup> Letter from Daniel L. Brenner (Sr. VP Law & Regulatory Policy) to Magalie Roman Salas (Jan. 11, 2002) ("NCTA Letter").

<sup>20</sup> *Id.* at 2.

band. As set forth in their previous comments,<sup>21</sup> the DBS Operators wish to remind the Commission that in crafting any licensing plan for MVDDS in the DBS band, the Commission should proceed with utmost caution. Specifically, it should not permit a nationwide roll-out of an untested service on top of an existing ubiquitous service by opening a processing window for the entire nation. To minimize the impact on DBS subscribers, the Commission should instead start with a single local market that should not be among the nation's 50 largest markets.

As previously demonstrated to the Commission, a controlled demonstration-phase approach is the path taken by the Commission with NGSO FSS operators, and it is a critical protection that the Commission should also implement with respect to proposed MVDDS operations at 12 GHz if they are ever introduced. The Commission states:

We will require each NGSO licensee to demonstrate that it meets the operational and additional operational limits *prior* to the NGSO FSS system being placed into service. . . . We find this demonstration is necessary prior to the NGSO FSS becoming operational because it: (1) provides the FCC assurance that the NGSO FSS system will be built in accordance with FCC rules; (2) provides incumbent operators assurance that they will not receive unacceptable interference; (3) in the case of the additional operational limits, enables the Commission to make the required commitment to the ITU-BR; and (4) reduces the likelihood that the Commission would need to apply remedial measures to bring an operational system into compliance. Moreover, we believe a comprehensive demonstration of compliance with both the operational and additional operational limits is warranted due to the infancy of NGSO FSS systems. Once the Commission and industry gain experience through actual operation of these new systems, the Commission may choose to revisit the requirement for such a detailed demonstration prior to an NGSO FSS system becoming operational.<sup>22</sup>

It would be arbitrary and capricious for the Commission not to proceed with at least the same level of caution in introducing a third ubiquitously deployed service into the 12 GHz Band, especially since that service would be secondary to DBS. The Commission has proposed and Congress has required<sup>23</sup> that no MVDDS facility licensed or authorized by the Commission can

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<sup>21</sup> See, e.g., Comments of EchoStar Satellite Corporation, ET Docket No. 98-206 (March 12, 2001), at 20; Comments of DIRECTV, Inc., ET Docket No. 98-206 (March 12, 2001), at 26.

<sup>22</sup> Further Notice at ¶ 96 (emphasis in original).

<sup>23</sup> The Commission has described the proposed MVDDS service as satisfying the goal of the Rural Local Broadcast Signal Act ("RLBSA"), which was enacted as Title II of the Intellectual Property and Communications Omnibus Reform Act of 1999, Pub.L. 106-113

cause harmful interference to the DBS service. Given the tremendous capital investment that DBS operators have made to provide effective competition to cable TV by bringing an extraordinary level of service to consumers on a nationwide basis, the stakes are far too high for the Commission to permit widescale MVDDS system deployment until the implications for millions of DBS consumers are fully understood. Furthermore, the Commission cannot introduce MVDDS systems into the 12 GHz Band without understanding the combined interactions of DBS, proposed MVDDS and NGSO FSS systems.

The "test market" approach is appropriate and consistent with the prior Commission efforts to proceed cautiously with terrestrial system deployment in certain services. The Commission adopted this approach in establishing terrestrial LMDS, which provides apt precedent for a licensing plan for MVDDS.<sup>24</sup>

As was the case with LMDS, there are practical, as well as technical, justifications for starting by licensing MVDDS in one area. From a practical perspective, this will permit the Commission to evaluate the viability of proposals such as the one presented by Northpoint. From a technical perspective, starting with one market would permit the Commission to assess in a real-life setting the severity of interference to DBS systems and corresponding effects on DBS customers that can only be predicted at this point. Therefore, caution dictates that, if the Commission licenses the services of MVDDS at all, it should start in only one market to give interested parties, as well as the Commission, an opportunity to assess the severity of disruptions.

On the other hand, the service could be rolled out nationwide much more readily in the CARS band, in light of the ease of coordination between each MVDDS licensee and the few remaining CARS links. The Commission should not contemplate a nationwide rollout except in the CARS band.

## 6. Auctions

If the Commission decides to assign licenses to operate in spectrum allocated for new MVDDS service (in whichever frequency band is chosen ultimately), the Commission should not effectively grant Northpoint a "pioneer's preference," but should instead follow its normal wireless license assignment process. That is, the Commission should open a filing window to solicit MVDDS service applications, and then utilize normal competitive bidding procedures if mutually exclusive applications are filed in accordance with 47 U.S.C. § 309(j). From a competitive bidding standpoint, Northpoint proposes a fixed wireless service that is not analytically distinguishable from the MDS, LMDS, WCS or 39 GHz services, where licenses

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Stat. 1501. However, the RLBSA requires the FCC to "ensure that no facility licensed or authorized" under the statute "causes harmful interference to the primary users of that spectrum," in this case, the DBS service. *See* RLBSA, § 2002(b)(2).

<sup>24</sup> Comments of EchoStar at 20-21.

were assigned at auction, or the services to be provided in the 24 GHz or 700 MHz spectrum, for which auctions are scheduled to occur. The new MVDDS service warrants no unique treatment in this regard.

Finally, DBS providers should be eligible to apply for MVDDS licenses. If the Commission does proceed to create secondary terrestrial licenses at 12 GHz, the DBS Operators again submit that there is no legal or policy reason to exclude them from the opportunity to acquire this spectrum to develop terrestrial operations that may be complementary to and non-interfering with the DBS service, in a fashion which could enhance further DBS competition to cable. In this regard, the Further Notice acknowledges that the relevant market for considering this issue is the MVPD market,<sup>25</sup> which includes cable operators, DBS providers, home satellite dishes, wireless cable systems, satellite master antenna television ("SMATV") systems,<sup>26</sup> and presumably, would-be MVDDS service providers.<sup>27</sup> The Commission also has concluded recently that cable firms continue to be the "dominant" MVPD providers,<sup>28</sup> and has found repeatedly that DBS providers do not possess MVPD market power.<sup>29</sup> In light of these conclusions, there is no reason to exclude DBS providers from continuing to develop innovative services at 12 GHz. DBS providers have been the primary drivers of innovation in this spectrum to date. It makes no sense to exclude them from offering proposed MVDDS services if authorized. By contrast, incumbent cable operators, which undisputedly do exercise MVPD market power, should not be permitted to bid on MVDDS licenses.

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<sup>25</sup> Further Notice at ¶ 298.

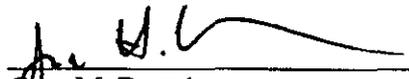
<sup>26</sup> See, e.g., Annual Assessment of the Status of Competition in the Market for the Delivery of Video Programming, *Eighth Annual Report*, CS Docket No. 01-129 (rel. Jan. 14, 2002) ("2001 Competition Report"), at ¶ 3.

<sup>27</sup> As the DBS Operators have pointed out on many occasions, Northpoint has changed the characterization of its service from a complementary technology that it hoped would be embraced by DBS providers to offer local service, see, e.g., Further Notice at ¶ 208, to a standalone MVPD competitor to cable and DBS.

<sup>28</sup> Further Notice at ¶ 298; see also 2001 Competition Report at ¶ 5.

<sup>29</sup> See, e.g., MCI Telecommunications Corp. and EchoStar 110 Corp., *Order and Authorization*, 15 Comm. Reg. (P&F) 1038 (1999), at ¶ 14 (finding that "DBS operators . . . do not have enough subscribers to give them market power in the acquisition of video programming, nor are they dominant distributors of such programming").

Respectfully submitted,



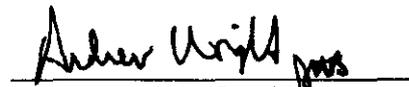
Gary M. Epstein  
James H. Barker  
LATHAM & WATKINS  
555 Eleventh Street, N.W.  
Suite 1000  
Washington, D.C. 20004  
(202) 637-2200

Counsel for DIRECTV, Inc.



Pantelis Michalopoulos  
Rhonda M. Bolton  
STEPTOE & JOHNSON  
1330 Connecticut Avenue, N.W.  
Washington, D.C. 20036  
(202) 429-6494

Counsel for EchoStar Communications Corporation



Andrew Wright, President  
Satellite Broadcasting & Communications  
Association  
225 Reinekers Lane  
Suite 600  
Alexandria, VA 22314-2872  
(703) 549-6990

# **ATTACHMENT A**

1	B	C	D	E	F	G	H
2	Link Description	Units					
3	Operator		DIRECTV	DIRECTV	DIRECTV	DIRECTV	DIRECTV
4	Satellite longitude	°	101	101	101	101	101
5	Modulation Type		QPSK 8/7	QPSK 8/7	QPSK 8/7	QPSK 8/7	QPSK 2/3
6	Earth Station Location		Miami	Washington DC	Chicago	Los Angeles	Seattle, WA
7	Earth Station Reference Antenna Pattern (Horizon Plane)		45 cm Classic	45 cm Classic	45 cm Classic	45cm Classic	45cm Classic
8	<b>Inputs</b>						
9	Earth station latitude	°	25.8	38.9	41.8	33.9	47.6
10	Earth station longitude	°	80.2	77.0	87.6	118.2	122.3
11	Earth station altitude above mean sea level	km	0	0.01	0	0	0.01
12	Satellite e.i.r.p. in the direction of the earth station	dBW	57.24	56.8	54.04	52.94	48
13	Frequency	GHz	12.224	12.224	12.224	12.224	12.224
14	C/N+H required at operating threshold	dB	7.6	7.6	7.6	7.6	7.6
15	Receiver noise bandwidth	MHz	24	24	24	24	24
16	On-axis antenna gain at receiver input (Per Reference Antenna Pattern)	cm	34	34	34	34	34
17	Earth station antenna pointing loss toward satellite	dB	0.5	0.5	0.5	0.5	0.5
18	Clear sky earth station antenna system noise temperature	degrees K	125	125	125	125	125
19	Atmospheric absorption	dB	0.2	0.2	0.2	0.2	0.2
20	Cross-Polarization Isolation	dB	22.9	22.9	22.9	22.9	22.9
21	C/I due to other GSO BSS networks	dB	20.7	20.7	20.7	20.7	20.7
22	Clear sky feeder link C/N+H	dB	27.7	27.7	27.7	27.7	27.7
23	Boltzman's constant		-228.6	-228.6	-228.6	-228.6	-228.6
24	<b>Calculate Link Parameters</b>						
25	Slant path	km	36962	37860	37801	37313	38500
26	Free space loss	dB	205.5	206.8	205.7	205.6	206.9
27	Clear sky G/T	dB/K	13.0	13.0	13	13.0	13.0
28	<b>Calculate Clear Sky C/(N+H) Ratios without MVDDS</b>						
29	Clear Sky Downlink C/N	dB	18.83	17.17	15.44	14.45	9.23
30	Clear Sky Downlink C/(N+H)	dB	15.73	14.84	13.74	13.05	8.76
31	Clear Sky Total Link C/(N+H)	dB	16.46	14.62	13.67	12.90	8.71
32	Clear Sky Link Margin above operating threshold	dB	7.86	7.02	5.97	5.30	3.71
33	<b>Calculate Rain Faded C/(N+H) Ratios Without MVDDS</b>						
34	Faded Downlink C/N	dB	8.00	8.00	8.00	8.00	5.22
35	Faded Downlink C/(N+H)	dB	7.64	7.64	7.64	7.64	5.02
36	Faded Total downlink C/(N+H)	dB	7.60	7.60	7.60	7.60	5.00
37	Faded Link Margin	dB	0.00	0.00	0.00	0.00	0.00
38	<b>Calculate Availability Performance Without MVDDS</b>						
39	Rain attenuation for availability percentage of time (ITU 618-5 unless specified)	dB	6.38	5.03	3.744	3.07	1.64
40	Noise increase due to rain for availability percentage of time	dB	4.45	4.14	3.69	3.38	2.38
41	Satellite link unavailability due to rain	%	0.132	0.094	0.067	0.017	0.054
42	Calculated link availability	%	99.868	99.906	99.933	99.9827	99.946
43	<b>Calculate allowed degradation in availability Performance</b>						
44	Maximum increase in unavailability due to MVDDS interference	%	2.86	2.86	2.86	2.86	2.86
45	Allowed unavailability due to rain and MVDDS interference	%	0.1361	0.0960	0.0693	0.0178	0.0556
46	Allowed availability performance with MVDDS interference	%	99.8639	99.9060	99.9307	99.9822	99.9444
47	Rain attenuation for availability percentage of time with MVDDS interference	dB	6.26	4.97	3.70	3.03	1.62
48	Noise increase due to rain for availability percentage of time with MVDDS interference	dB	4.43	4.12	3.67	3.36	2.36
49	<b>Calculate Rain Faded C/(N+H) Ratios With MVDDS</b>						
50	Faded Downlink C/N	dB	8.10	8.08	8.07	8.06	5.25
51	MVDDS Minimum C(faded)/(unfaded) Ratio	dB	24.4	25.6	26.2	27.1	25.8
52	Faded Downlink C/(N+H)	dB	7.64	7.64	7.64	7.64	5.02
53	Faded Total downlink C/(N+H)	dB	7.60	7.60	7.60	7.60	5.00
54	Faded Link Margin	dB	0.00	0.00	0.00	0.00	0.00
55	<b>Calculate corresponding spfd level</b>						
56	Carrier power flux density in clear sky	dBW/m <sup>2</sup> /24 MHz	-106.8	-107.6	-109.2	-110.2	-115.4
57	MVDDS Minimum C(unfaded)/(unfaded) Ratio	dB	30.7	30.5	29.9	30.2	27.4
58	MVDDS interference maximum equivalent power flux density in 24 MHz	dBW/m <sup>2</sup> /24 MHz	-136.5	-138.0	-139.1	-140.4	-142.8
59	MVDDS interference maximum equivalent power flux density in 40 kHz	dBW/m <sup>2</sup> /40 kHz	-164.3	-165.8	-166.9	-168.2	-170.6
60	MVDDS interference maximum equivalent power flux density in 4 kHz	dBW/m <sup>2</sup> /4 kHz	-174.3	-175.8	-176.9	-178.2	-180.6

Example Link Budgets; DIRECTV, 101 °W

# **ATTACHMENT B**

1	B	C	E	E
2	Link Description	Units		
3	Operator		DIRECTV	DIRECTV
4	Satellite longitude	°	101	101
5	Modulation Type		QPSK 6/7	QPSK 2/3
6	Earth Station Location		Washington DC	Washington DC
7	Earth Station Reference Antenna Pattern (Horizon Plane)		45 cm Classic	45 cm Classic
8	Inputs			
9	Earth station latitude	°	38.9	38.9
10	Earth station longitude	°	77.0	77.0
11	Earth station altitude above mean sea level	km	0.01	0.01
12	Satellite e.i.r.p. in the direction of the earth station	dBW	55.8	52.8
13	Frequency	GHz	12.224	12.224
14	C/N+1 required at operating threshold	dB	7.8	5.0
15	Receiver noise bandwidth	MHz	24	24
16	On-axis antenna gain at receiver input (Per Reference Antenna Pattern)	cm	34	34
17	Earth station antenna pointing loss toward satellite	dB	0.5	0.5
18	Clear sky earth station antenna system noise temperature	degrees K	125	125
19	Atmospheric absorption	dB	0.2	0.2
20	Cross-Polarization Isolation	dB	22.9	22.9
21	C/I due to other GSO BSS networks	dB	20.7	20.7
22	Clear sky feeder link C/N+1	dB	27.7	27.7
23	Boltzman's constant		-228.6	-228.6
24	Calculate Link Parameters			
25	Slant path	km	37990	37990
26	Free space loss	dB	205.8	205.8
27	Clear sky G/T	dBK	13.0	13.0
28	Calculate Clear Sky C/(N+1) Ratios without MVDDS			
29	Clear Sky Downlink C/N	dB	17.17	14.17
30	Clear Sky Downlink C/(N+1)	dB	14.84	12.85
31	Clear Sky Total Link C/(N+1)	dB	14.62	12.71
32	Clear Sky Link Margin above operating threshold	dB	7.02	7.71
33	Calculate Rain Faded C/(N+1) Ratios Without MVDDS			
34	Faded Downlink C/N	dB	8.00	5.22
35	Faded Downlink C/(N+1)	dB	7.64	5.02
36	Faded Total downlink C/(N+1)	dB	7.60	5.00
37	Faded Link Margin	dB	0.00	0.00
38	Calculate Availability Performance Without MVDDS			
39	Rain attenuation for availability percentage of time (ITU 618-5 unless specified)	dB	5.03	4.87
40	Noise increase due to rain for availability percentage of time	dB	4.14	4.09
41	Satellite link unavailability due to rain	%	0.034	0.037
42	Calculated link availability	%	99.966	99.963
43	Calculate allowed degradation in availability Performance			
44	Maximum increase in unavailability due to MVDDS interference	%	2.86	2.86
45	Allowed unavailability due to rain and MVDDS interference	%	0.0360	0.0379
46	Allowed availability performance with MVDDS interference	%	99.9650	99.9621
47	Rain attenuation for availability percentage of time with MVDDS interference	dB	4.97	4.81
48	Noise increase due to rain for availability percentage of time with MVDDS interference	dB	4.12	4.07
49	Calculate Rain Faded C/(N+1) Ratios With MVDDS			
50	Faded Downlink C/N	dB	8.08	5.28
51	MVDDS Minimum C(faded)/C(unfaded) Ratio	dB	25.6	22.9
52	Faded Downlink C/(N+1)	dB	7.64	5.02
53	Faded Total downlink C/(N+1)	dB	7.60	5.00
54	Faded Link Margin	dB	0.00	0.00
55	Calculate corresponding epfd level			
56	Carrier power flux density in clear sky	dBW/m <sup>2</sup> 24 MHz	-107.5	-110.5
57	MVDDS Minimum C(faded)/C(unfaded) Ratio	dB	36.5	27.7
58	MVDDS interference maximum equivalent power flux density in 24 MHz	dBW/m <sup>2</sup> 24 MHz	-138.0	-138.1
59	MVDDS interference maximum equivalent power flux density in 40 kHz	dBW/m <sup>2</sup> 40 kHz	-165.8	-165.9
60	MVDDS interference maximum equivalent power flux density in 4 kHz	dBW/m <sup>2</sup> 4 kHz	-175.8	-175.9

Example Link Budgets; DIRECTV, 101 W

The table above illustrates the MVDDS epfd level needed to protect two DBS links into Washington DC, where one link is operated in the DIRECTV high information rate mode, and the other in the DIRECTV low information rate mode. The table shows that, although the required C/I values of the two links are different, the maximum allowed MVDDS epfd level to protect each link is almost exactly the same.

First, Line 5 describes the modulation type, and Column D represents a link operating in the high information rate mode and Column E represents a link operating in the information rate mode. The modulation type for high information rate is QPSK 6/7, and the modulation type for low information rate is QPSK 2/3.

Note that operation in either mode must be protected because operation in either mode is both possible and likely. DIRECTV currently operates the majority of its links in the high information rate mode, but operation in either mode is possible depending on operational and back-up needs.

The satellite transmit power must be higher in the high information rate mode to provide the same availability performance as the low information rate mode. Line 12 illustrates this difference. Line 14 shows the corresponding difference in operating threshold.

The required C/I ratios to protect each link are given in Line 57. Note that the high information rate mode requires a C/I ratio of about 30 dB, and the low information rate mode requires about a 27 dB C/I ratio. In general, the high information rate mode requires a 30 dB C/I ratio across the country, and the low information rate mode requires about a 27 dB C/I ratio across the country.

Line 60 calculates the required epfd level that corresponds with each of the C/I ratios and modes. Note here that the epfd levels at Washington DC are almost exactly the same for each link, demonstrating that a single epfd level is sufficient to protect both links at this location. If a C/I ratio were to be used as an interference limit parameter, then two separate values would be needed depending on the operating mode. This is both confusing and unnecessary if epfd levels are used as the interference limit parameter for a given location.

# **ATTACHMENT C**

Robert J. Hannah  
Vice President  
Satellite Products



Mr. David Pattillo  
DIRECTV  
2230 East Imperial Hwy  
El Segundo, CA 90245

30 January 2002

Dear Mr. Pattillo:

Further to our discussion regarding development costs and pricing for Ku-Band LNBs in the 12.7-13.2 GHz band, I am pleased to respond as follows:

This product would be very similar to the product we manufacture today for the DIRECTV systems. There would have to be slight modifications to the product design (feed, probes, local oscillator frequency), but well within the realms of existing technology to meet similar specifications per the current DIRECTV LNB product. This would be true for linear or circular polarization.

Regarding production volume and pricing, the unit cost of the 12.7-13.2 GHz LNBs would be similar to the DIRECTV LNBs, assuming similar specifications, and similar production volumes. California Amplifier would undertake the development of this product with no NRE charges, i.e., at no cost to the customer, provided that a reasonable production order was issued for the product.

Hopefully this answers your questions. Please let me know if you require any additional information.

Yours sincerely,

A handwritten signature in black ink that reads "R. Hannah".

Robert J. Hannah  
Vice President  
Satellite Products

California Amplifier, Inc.  
480 Calle San Pablo  
Camarillo, California  
93012 USA  
Phone: (805) 987-9000  
Fax : (805) 388-2827