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Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF THE SECRETARY

In the Matter of)
)
Amendment of Parts 2 and 25 of the)
Commission's Rules to Permit Operation)
of NGSO FSS Systems Co-Frequency with)
GSO and Terrestrial Systems in the Ku-)
Band Frequency Range;)
)
Amendment of the Commission's Rules)
to Authorize Subsidiary Terrestrial Use)
of the 12.2-12.7 GHz Band by Direct)
Broadcast Satellite Licensees)
and Their Affiliates; and)
)
Applications of BroadWave USA, PDC)
Broadband Corporation, and Satellite)
Receivers, Ltd. to Provide a Fixed Service)
in the 12.2-12.7 GHz Band)

ET Docket No. 98-206
RM-9147
RM-9245

PETITION FOR RECONSIDERATION OF DIRECTV, INC.

DIRECTV, INC.

Gary M. Epstein
James H. Barker
LATHAM & WATKINS
1001 Pennsylvania Avenue, N.W.,
Suite 1300
Washington, D.C. 20004-2505
(202) 637-2200

Counsel for DIRECTV, Inc.

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PETITION FOR RECONSIDERATION OF DIRECTV, INC.

DIRECTV, Inc. ("DIRECTV")¹ hereby requests that the Commission reconsider certain of its actions and findings in connection with the Report and Order ("Order") in the above-captioned proceeding.

I. BACKGROUND & SUMMARY

DIRECTV strongly opposes the Commission's proposed creation of a new secondary terrestrial wireless point-to-multipoint service in the 12.2-12.7 GHz band (the "12 GHz Band"),

¹ DIRECTV is a wholly-owned subsidiary of DIRECTV Enterprises, Inc., a licensee in the DBS service and a wholly-owned subsidiary of Hughes Electronics Corporation.

which is the primary spectrum used by Direct Broadcast Satellite ("DBS")² operators to downlink programming to subscribers across the United States. Contrary to many unsupported conclusions in the Order regarding the feasibility of and need for such a service being introduced at 12 GHz, DIRECTV believes that, should the Commission proceed to create and license ubiquitously deployed terrestrial systems in the DBS downlink band, it will seriously threaten -- absolutely unnecessarily -- one of the Commission's great success stories, the DBS service. Millions of U.S. consumers who use and rely upon the DBS service would be adversely impacted by such action.

The primary focus of the Order at issue is the promulgation of rules governing the authorization and operation of non-geostationary satellite orbit ("NGSO") fixed-satellite service ("FSS") providers in certain segments of the Ku band. A major part of the Order deals with how these NGSO systems will coexist and share spectrum with U.S. DBS systems in the 12 GHz Band. DIRECTV previously had expressed serious concerns regarding possible interference in the 12 GHz Band by these new systems, and seeks reconsideration or clarification of certain issues related to BSS-NGSO FSS sharing below. DIRECTV nonetheless supports most of the BSS-NGSO FSS sharing rules and technical parameters that have been adopted by the Order, since they are the product of more than two years of rigorous analysis and negotiation in international fora involving the participation of proposed NGSO FSS operators, the Commission, and the BSS community.³

² DBS is known internationally as the Broadcasting-Satellite Service ("BSS") and the terms are used herein interchangeably.

³ See Order at ¶ 15.

However, the Order also takes the opportunity to make a determination regarding the introduction of a third new ubiquitously deployed service in the 12 GHz Band -- a proposed secondary terrestrial service tentatively labeled the Multichannel Video Distribution and Data Service ("MVDDS"), which is based primarily upon the proposals of Northpoint Technology, Ltd. ("Northpoint"). Specifically, the Commission makes a tentative conclusion that "a new terrestrial [MVDDS] can operate in the 12.2-12.7 GHz band on a non-harmful interference basis with incumbent [BSS], and on a co-primary basis with the NGSO FSS."⁴ In an unusual move, however, the Commission has deferred consideration of the specifics of the "engineering techniques and regulatory safeguards"⁵ that it believes make DBS-MVDDS sharing possible to a Further Notice of Proposed Rulemaking.⁶ Thus, DBS operators, who have submitted extensive evidence into the record demonstrating that their subscribers will be gravely affected by the introduction of a Northpoint service into the 12 GHz Band, are left to ponder what the technical basis for the Commission's conclusion in the Order might be.

Neither proposed NGSO FSS system operators nor the proponents of the Northpoint system have anything tangible to lose in this proceeding. By contrast, U.S. DBS operators, after a twenty year history of the Commission fostering the service's development, finally have succeeded in deploying real-world, innovative DBS systems which, in just over seven years since the launch of DIRECTV 1, the nation's first DBS satellite, have rapidly become the "principal

⁴ *Id.* at ¶ 1.

⁵ *Id.* at ¶ 215.

⁶ *Id.* at ¶ 259.

competitor to cable television service with 12,987,000 subscribers as of June 30, 2000."⁷ This emerging success of DBS has come only after a capital investment of more than a billion dollars and a continuing struggle against incumbent monopoly cable operators, who today still control 80% of the Multichannel Video Programming Distribution Market ("MVPD").⁸

Framed against this backdrop, it is critical to note that no party fully understands what the implications for the DBS service will be regarding the introduction of NGSO FSS systems alone into the 12 GHz Band. So it is hard to believe that the Commission is seriously entertaining the proposition that *three* ubiquitously deployed services, two satellite and one terrestrial, *and* residual secondary point-to-point microwave users, can *all* co-exist at 12 GHz on a non-harmful interference basis.

The Commission certainly does not have the administrative record to support this conclusion. The Order mentions but substantively ignores the extensive analyses by DBS operators of Northpoint's experimental test results and the DBS operators' own field testing of the Northpoint system, which have strongly indicated that DBS subscribers will be subjected to harmful interference if the proposed Northpoint system is deployed. The Commission in the Order does not discuss the aggregate impact of NGSO FSS and proposed MVDDS services on DBS services; does not examine multipath effects; and does not consider the effects of multiple

⁷ Annual Assessment of the Status of Competition in the Market for the Delivery of Video Programming, *Seventh Annual Report*, CS Docket No. 00-132 (Jan. 8, 2001) ("2000 MVPD Competition Report"), at ¶ 61. As of January 2001, DBS subscribership has risen to just over fifteen million consumers. See www.skyreport.com.

⁸ 2000 MVPD Competition Report at ¶ 5.

Northpoint transmitters and tightly packed deployments on DBS subscribers. The Commission acknowledges the potential of the service to seriously degrade DBS margin and service availability, lengthen service outages, or directly cause them if the DBS receiver is already at threshold without the interfering signal being present.⁹ And yet, the Commission nevertheless concludes -- again with little record basis other than Northpoint assurances -- that a variety of measures can be employed to solve the DBS-MVDDS interference problem.¹⁰ These vaunted "techniques" include:

- invasive visits by secondary MVDDS operators to previously content DBS subscribers, for the purpose of re-positioning their DBS receive antennas (notwithstanding that Northpoint now touts its proposed service as a DBS competitor)¹¹;
- replacing the small 18-inch dishes that are the hallmark of DBS service with larger ones; and

⁹ See, e.g., Order at ¶ 216.

¹⁰ One would presume that a policy decision of this magnitude, which will affect millions of DBS customers, would be solidly grounded in a thorough technical justification and explanation of exactly how sharing between terrestrial and DBS systems would be possible at 12 GHz. There is no such justification presented in the Order. Instead, the Commission has simply made a conclusory decision to permit such sharing, and leaves it to a Further Notice to determine the specifics. This is arbitrary and capricious decisionmaking, as well as poor spectrum management.

¹¹ Northpoint has shown neither the technical capability nor the incentive of co-existing with DBS operations. Even when Northpoint was "pitching" its service as complementary to DBS, every high-power DBS operator providing commercial service that examined Northpoint's technology vigorously opposed the introduction of Northpoint operations into the DBS downlink band. See ET Docket No. 98-206, Comments of DIRECTV (Mar. 2, 1999), at 23-32 & Technical Appendix B; Comments of EchoStar at 8-15 & Technical Appendix B; Comments of USSB (Mar. 2, 1999), at 4-12; see also Comments of the Satellite Broadcasting and Communications Association ("SBCA") (Mar. 2, 1999), at 3-7. Now that Northpoint has re-cast itself as a DBS competitor, the idea that Northpoint will operate in the DBS downlink band as a "good citizen" on a non-interference basis is untenable.

- employing planar antennas that the DBS operators have been aware of and studied for years, and have rejected as providing inferior service.¹²

Respectfully, these suggestions are incomprehensible; they affirmatively degrade and dismantle the quality and user-friendliness of the DBS service without even considering the interference actually generated by Northpoint's system. The notion that these are the measures that the Commission seriously believes will facilitate the co-existence of ubiquitous DBS and terrestrial services is chilling. Furthermore, such measures simply cannot be reconciled with the primary status of DBS services relative to secondary proposed MVDDS operations. As a primary service, by definition, DBS operators and subscribers cannot and should not be required to change the nature of their service to accommodate secondary operations.¹³

DIRECTV has no objection to the Commission authorizing another terrestrial wireless point-to-multipoint service if that service is located in a frequency band other than the 12 GHz Band. Indeed, on this score, the Commission also has not explained in the Order why frequency bands that have been expressly allocated for functionally identical terrestrial wireless services, such as LMDS, MDS, DEMS or 39 GHz, cannot provide a home for Northpoint's proposed service. Northpoint itself touts its technology as suitable for these bands.¹⁴ And contrary to terse

¹² *See id.*

¹³ By definition, secondary status at 12 GHz means that a terrestrial licensee (i) "shall not cause harmful interference to primary or permitted services to which frequencies are already assigned," *i.e.*, DBS; and (ii) "cannot claim protection from harmful interference from stations of a primary or permitted service." 47 C.F.R. § 2.104(d)(i),(ii).

¹⁴ *See* www.northpointtechnology.com/html/spectrum_planning.html (advocating that Northpoint technology be used in a number of different frequency bands). *See also* Comments of Northpoint Technology, Ltd. and BroadWave USA, Inc. (Mar. 12, 2001), Declaration of Thomas W. Hazlett at 18 (asserting that Northpoint technology "accommodates additional providers in this – and other – bands").

and (again) unsupported statements in the Order,¹⁵ there are no "economies of scale" in the 12 GHz Band relative to these other frequency bands that argue for a proposed secondary MVDDS service being created there. The majority of equipment used by DBS operators is neither band-specific nor unique to DBS. Nor does the 12 GHz Band offer general advantages over the bands already allocated for point-to-multipoint video and data distribution in terms of overall bandwidth, encumbrance by existing services, or propagation difficulties.¹⁶

The 12 GHz Band is the primary, mission-critical frequency band used by DBS operators -- a ubiquitous mass-market consumer service, deployed on a nationwide basis, which today is offering tremendous benefits to American consumers in the form of competition to incumbent cable television operators. DBS providers differentiate themselves in the MVPD marketplace by offering higher quality service than cable operators and greater service reliability relative to cable television service.¹⁷ These important customer benefits are now in serious and wholly unnecessary jeopardy.

¹⁵ See, e.g., Order at ¶ 168.

¹⁶ *Id.*

¹⁷ In the a recent report prepared by the Yankee Group for the Satellite Broadcasting & Communications Association, 66% of recent DBS subscribers said their desire "to get a clearer picture and sound" contributed to their decision to subscribe to satellite TV and 9% said it was the most important reason for subscribing. Out of nine reasons presented in the survey, this differentiating factor placed a close third just behind "to get more channels" (at 79%) and "for a greater movie selection" (at 69%) as the reasons that contributed to these subscribers' purchase of satellite television. See Yankee Group/SBCA, "2000 Satellite Consumer Market Research Studies: DBS Subscriber Study." See also Annual Assessment of the Status of Competition in Markets for the Delivery of Video Programming, *Sixth Annual Report*, CS Docket No. 99-230 (rel. Jan. 14, 2000), at ¶ 72 (according to survey of DBS subscribers, primary advantages of DBS over cable include "digital quality picture").

The MVDDS proposal under consideration is guaranteed to undermine the service quality and reliability of the DBS service. The Commission's tentative decision as to the feasibility of sharing the 12 GHz Band among *three* ubiquitously deployed services is ill-considered and ill-advised. DIRECTV urges the Commission to reconsider its decision for the reasons described herein. DIRECTV also raises certain NGSO sharing issues for reconsideration or clarification.

II. THE COMMISSION MUST RECONSIDER THE FEASIBILITY OF INTRODUCING A UBIQUITOUSLY DEPLOYED TERRESTRIAL SERVICE INTO THE DBS DOWNLINK BAND

A. The DBS Operators Have Shown That Harmful Interference Will Occur To Primary DBS Operations If Terrestrial Wireless Services Are Deployed At 12 GHz

It is undisputed that the Commission cannot create a secondary fixed service in the 12 GHz Band that causes harmful interference to DBS service. The Commission's rules prohibit it¹⁸ and Congress recently reiterated the point in unequivocal language.¹⁹

The extensive record in this proceeding has established that Northpoint's proposed terrestrial system, to the extent that it is representative of proposed MVDDS systems, will have at least two separate harmful interference effects on DBS operators.

The first type of harmful interference effect is the direct interruption of DBS subscribers' reception of satellite signals, regardless of weather conditions. Sufficiently high levels of interference can cause very high bit error rates in the receiver, which, at a minimum, will disrupt

¹⁸ See Order at ¶ 6 n.21 (*citing* 47 C.F.R. § 2.106, footnote 844 and 47 C.F.R. § 101.147(p)).

¹⁹ The Commission has described the proposed MVDDS service as satisfying the goal of the recently-enacted 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 Stat. 1501. However, the RLBSA requires the FCC to "ensure that no

the video and audio decoder circuits in the DBS set-top box and can prevent the demodulator²⁰ from locking onto the satellite signal altogether. Such high interfering signal levels are likely to be suffered by DBS receivers in the immediate vicinity of the Northpoint transmitters, or by a DBS receiver experiencing multipath effects in any part of the Northpoint service area.

The second type of harmful interference problem is less obvious, but is more pervasive and no less destructive over time to the reliability of DBS service. Because of the substantial "clear weather" signal margins necessary to help DBS operators ensure high-quality service, Northpoint signals may not always cause visible disruption to DIRECTV digital signals. However, if the Northpoint system is actually deployed, the interference that it will create in the 12 GHz Band over time will lower these clear weather margins and will significantly increase the number and length of downlink rain outages.

The Order seems to acknowledge these harmful interference effects.²¹ Inexplicably, however, the Commission sidesteps with little discussion the extensive analyses and data provided by the DBS operators that document the degradation to DBS service that proposed MVDDS operations will cause.²² Instead, the Order states over and over again with confidence

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).

²⁰ The demodulator is that part of the DBS set-top box that directly translates the received signal from the DBS satellite to a digital bit stream. This digital bit stream is then further processed by the set-top box to produce video, audio, and other program information along with program control information.

²¹ *See* Order at ¶ 214.

²² *See, e.g.*, ET Docket No. 98-206, DIRECTV and EchoStar, *ex parte* letter (Nov. 16, 2000); DIRECTV and EchoStar, "Rebuttal to Northpoint's Analysis of DBS-Terrestrial Compatibility Testing at Oxon Hill, MD" (Sept. 20, 2000); DIRECTV, "Further Response to Northpoint Ex Parte Filings" (Sept. 2000); DIRECTV and EchoStar, "Report of Interference Impact on DBS Systems from Northpoint Transmitter Operating at Oxon

that sharing will be possible between the services because the Commission will be able to develop "operating requirements," "technical parameters," "engineering techniques" and "regulatory safeguards,"²³ but cites no data, evidence or analyses to support its prediction that such measures will be either effective or acceptable.

The Commission must sometimes make predictive judgments regarding spectrum management issues. But these judgments must be reasoned and adequately supported, especially when the stakes for consumers are so high. Northpoint has *never* shown in this proceeding that it can operate in the 12 GHz Band even on a secondary basis. The calculations of the DBS operators have shown repeatedly that harmful interference will occur at *any* of the C/I levels proposed by Northpoint²⁴ -- and yet, the Commission offers nothing more than speculative

Hill, MD" (July 25, 2000); DIRECTV, "Conclusions to Date Regarding Harmful Interference From a Proposed Northpoint Technology Terrestrial System Operating in the DBS Downlink Band, 12.2-12.7 GHz" (Jan. 27, 2000); Reply Comments of DIRECTV (filed Apr. 14, 1999); Comments of DIRECTV, Inc. (Mar. 2, 1999). *See also* Comments of Pegasus Communications Corporation, ET Docket No. 98-206 (Dec. 29, 1999); EchoStar Preliminary Report on the Impact of Northpoint on the Direct Broadcast Satellite Service Based Upon Testing Performed to Date (Oct. 29, 1999); Application of DIRECTV, Inc. For Expedited Review and Request for Immediate Suspension of Testing, In the Matter of Diversified Communication Engineering, Inc., Experimental Special Temporary Authorization, File No. 0094-EX-ST-1999, Call Sign WA2XMY (June 25, 1999). For ease of administration, DIRECTV hereby incorporates these submissions herein by reference.

²³ *Id.* at ¶¶ 213-215.

²⁴ For example, Northpoint has proffered various purportedly acceptable Northpoint/BSS interference protection values, expressed as a C/I ratio in dB, that range from 5 dB to 20 dB. Serious degradations in service quality and repeated interruptions of signal reception are absolutely guaranteed to occur if a C/I criterion of 5 dB is used, since this reduces the link margin to zero. In other words, a C/I of 5 dB eliminates the possibility of the operation of a DBS service, even under clear sky conditions. There is no accommodation for any link degradations, no accommodation for weather or atmospheric fading effects, and no accommodation for multipath effects of the interfering signal. Indeed, the typical DBS link will not even "close" with a C/I ratio of 5 dB, meaning that the DBS subscriber will receive no picture at all. Similarly, at a C/I criterion of 9 dB, static and temporal

measures to be fleshed out in a pending proceeding as the sole basis for concluding that sharing between ubiquitously deployed DBS receivers and proposed ubiquitously deployed MVDDS systems is possible.

The Commission does not have the record before it to demonstrate that it is not making a major spectrum management mistake. This is especially true when one considers, as discussed below, the fact that ubiquitous and untested NGSO FSS operations are also being introduced at 12 GHz, together with the assumption that untested mitigation techniques will constitute a panacea for a clear and documented harmful interference problem.

B. The Prospect Of Deploying Three Ubiquitous Services In The 12 GHz Band Is Unprecedented And Ill-Considered

In this proceeding, the Commission has authorized the co-primary downlink operations of NGSO FSS systems in the 12 GHz Band -- a decision that in itself is a monumental one and a product of more than two years of rigorous analysis by U.S. BSS operators, the Commission and potential NGSO FSS providers in international fora. Northpoint-like operations would add yet a third sharing overlay to the mix when it is not even known what the full implications of DBS-NGSO FSS sharing will be.

multipath effects are certain to cause repeated interruption in service for most DBS subscribers. Indeed, a C/I ratio of 9 dB would result in an increase in outage for DIRECTV customers ranging from 600% (outage duration increase of 6 times) to 2000% (outage duration increase of 20 times) -- a condition that would be true across the United States, and not merely in rainy areas of the country. *See Reply Comments of DIRECTV, Inc., ET Docket No. 98-206 (Apr. 14, 1999), at 11-12.* C/I ratios of 20 dB are also clearly inadequate; as shown in Tables B and C of Appendix I to the Comments of DIRECTV filed last week in response to the Further Notice portion of the Order, C/I ratios on the order of 25 dB are required to protect these sample DBS link budgets to the appropriate protection criteria. *See ET Docket No. 98-206, Comments of DIRECTV, Inc. (Mar. 12, 2001), at Appendix I, Tables B and C.*

The Commission has consistently concluded that ubiquitously deployed satellite and terrestrial services *cannot* feasibly share the same spectrum.²⁵ Indeed, in this very proceeding, the Further Notice concludes with respect to the DBS uplink band (17.3-17.7 GHz), which is also allocated for future DBS downlinks, that the sharing of ubiquitous BSS downlinks with NGSO FSS uplink earth stations is not feasible because it would be "very difficult" and "*overly restrictive on ubiquitous BSS receivers.*"²⁶

The Commission's contrary conclusion with respect to the proposed Northpoint service at 12 GHz is inexplicable. Indeed, there is not a single factor identified in the Order, or a single aspect of Northpoint's technology cited by the agency, which suggests why the Commission has

²⁵ See, e.g., In the Matter of Rulemaking to Amend Parts 1, 2, 21, and 25 of the Commission's Rules to Redesignate the 27.5-29.5 GHz Frequency Band, to Reallocate the 29.5 and 30.0 GHz Frequency Band, to Establish Rules and Policies for Local Multipoint Distribution Service and for Fixed Satellite Services, *First Report and Order and Fourth Notice of Proposed Rulemaking*, 11 FCC Rcd 19005 (1996), at ¶ 26 (concluding that "co-frequency sharing between GSO FSS or NGSO FSS ubiquitously deployed terminals and LMDS with its ubiquitously deployed subscriber terminals, is not feasible at this time"). The Commission reached similar conclusions at 18 GHz, In the Matter of Redesignation of the 17.7-19.7 GHz Frequency Band, Blanket Licensing of Satellite Earth Stations in the 17.7-20.2 GHz and 27.5-30.0 GHz Frequency Bands, and the Allocation of Additional Spectrum in the 17.3-17.8 GHz and 24.75-25.25 GHz Frequency Bands for Broadcast Satellite-Service Use, *Report and Order*, IB Docket No. 98-172 (rel. June 22, 2000), at ¶ 17 ("The vast majority of the commenters agreed with our tentative conclusion that co-frequency sharing between terrestrial fixed service and ubiquitously deployed FSS earth stations in the 18 GHz band is not feasible. . . We continue to believe that separation of these operations into different dedicated sub-bands is an effective frequency management technique to resolve problems of coordinating terrestrial fixed service links with ubiquitously deployed satellite earth stations."), and 39 GHz. See In the Matter of Amend of the Commission's Rules Regarding the 37.0-38.6 GHz and 38.6-40.0 GHz Bands, 12 FCC Rcd 18,600 (1997) (noting "wide support for the premise that the types of fixed and satellite services likely to be offered in spectrum above 36 GHz will not be able to share the same spectrum blocks").

²⁶ Further Notice at ¶ 158.

deviated from the conclusions it has consistently reached in other proceedings that co-frequency sharing between ubiquitous satellite and terrestrial services is not feasible.

In the final analysis, there simply is no material difference between the instant proceeding and other terrestrial-satellite sharing situations that the Commission has confronted. The Commission has done a complete and unsupported about-face on conclusions that it has reached with respect to GSO satellite sharing with LMDS, 39 GHz and other fixed wireless services.²⁷ If there were any merit to Northpoint's proposed sharing solution here, it surely would have been considered in the context of those expansive proceedings. As EchoStar recently observed:

In most of the proceedings [mentioned], the Commission concluded that a ubiquitous terrestrial service cannot share the spectrum with service from (or to) geostationary satellites located in a southerly direction above the Equator, just like DBS satellites. If there was any validity to Northpoint's simplistic notion that the northerly origin of its transmissions would avoid harmful interference into DBS, that notion would have been valid in those cases too. In other words, if Northpoint's theory were valid the Commission doubtless would have concluded in all of these proceedings that sharing between point-to-multipoint terrestrial and GSO services is feasible because GSO satellites are located approximately in a southerly direction and terrestrial towers can be sited approximately in a northerly direction. Instead, the Commission concluded invariably that sharing was infeasible.²⁸

That is the same conclusion that the Commission should reach here, especially given the failure of the Order to consider the interplay between DBS systems, NGSO FSS systems and proposed MVDDS systems (not to mention existing point-to-point microwave operations) all operating in the 12 GHz Band. The Order purports to address DBS-NGSO FSS, DBS-MVDDS,

²⁷ See, e.g., *supra* note 20.

²⁸ Comments of EchoStar Satellite Corporation (Mar. 12, 2001), at 6.

and NGSO FSS-MVDDS sharing issues separately, but never bothers to consider -- let alone try to predict -- what the aggregate effect of three ubiquitously deployed services at 12 GHz might be. And while NGSO FSS systems and MVDDS systems are still in the design phase with no deployed systems and no customers, the real-world service of millions of DBS subscribers will be directly affected by the answer to this question.

The Commission should not compound the complex issues attending DBS-NGSO FSS sharing by injecting a secondary terrestrial service into the equation. For two decades, the Commission sought to foster the success of DBS by transitioning terrestrial operations *out* of the 12 GHz band,²⁹ in acknowledgement of the interference problems such operations pose for ubiquitously deployed DBS receiving equipment. Those were discrete, point-to-point microwave systems. The Commission's proposal to re-introduce terrestrial operations into the DBS downlink band on a ubiquitous, massive scale will have disastrous consequences. If there is a need for a new MVDDS service, it can and should be accommodated in one of the several frequency bands already designated for this type of service.

C. The Commission's Cannot Rely On The Prospect Of Interference "Mitigation" Techniques To Support the Proposition That DBS-MVDDS Sharing Is Feasible

One of the most disturbing and objectionable aspects of the Order is the Commission's inordinate emphasis on mitigation options at a DBS subscriber's premises to support the agency's

²⁹ See Public Notice, *Initiation of Direct Broadcast Satellite -- Effect on 12 GHz Terrestrial Point-to-Point Licensees in the Private Operational Fixed Service*, 10 FCC Rcd 1211 (1994) (Relocation "of existing 12 GHz [terrestrial] users was deemed necessary because of the likelihood of interference that terrestrial use would cause to DBS service if both were operating in the same geographic area"); *Inquiry into the development of regulatory policy in regard to Direct Satellites for the period following the 1983 Regional Administrative Radio Conference*, 90 FCC 2d 676 (1982).

conclusion that DBS-MVDDS sharing is feasible.³⁰ The Commission even goes so far as to suggest that DBS subscriber antennas can be shielded, relocated or "upgraded" in order to accommodate this new, purportedly secondary, service. Incredibly, after the DBS industry has invested hundreds of millions of dollars to ensure that subscriber antennas are efficient, small and unobtrusive, some of the "upgrades" that the Commission has in mind include: (i) using planar antennas that DBS operators have examined and rejected as offering an inferior quality of service, and (even more outrageously) (ii) replacing smaller DBS receive antennas with larger ones!³¹ The Commission also suggests that sharing can be facilitated by DBS subscribers being subjected to visits by proposed MVDDS operators to shield their antennas or move them around in an effort to mitigate harmful interference.

These proposals, the Commission asserts, are bases for concluding that there will be no problems of co-existence between DBS and MVDDS operations. The Commission's logic here is not apparent.

As a threshold matter, Northpoint's current business model is one that trumpets its intention to "bring needed competition to cable and DBS in the markets for [MVPD] and broadband Internet access."³² Therefore, an expectation that Northpoint has any incentive to

³⁰ See, e.g., Order at ¶ 216.

³¹ *Id.*

³² See, e.g., Comments of Northpoint Technology, Ltd. and BroadWave USA, Inc. (Mar. 12, 2001), at 26; www.northpointtechnology.com/html/cable_competition.html.

achieve meaningful interference mitigation at a subscriber's residence -- short of offering up Northpoint service as a DBS substitute -- is fanciful. As a direct competitor to DIRECTV, Northpoint will have every incentive to dispute claims of harmful interference by its system with DBS operations, notwithstanding Northpoint's secondary status in the 12 GHz band. Indeed, Northpoint's most preferred "mitigation" option will simply be to offer Northpoint service as a DBS substitute to previously-content DBS subscribers whose service quality has been diminished by Northpoint-caused interference.

Moreover, mitigation at a DBS customer's premises to accommodate a secondary service, which by definition is obligated *not* to harm subscribers' receipt of the primary service, simply cannot be required by the Commission. DBS subscribers in many instances already must use careful placement of their receive antennas to ensure a clear line of sight to DBS satellites. Adding another parameter to this placement process in order to avoid harmful MVDDS interference will necessarily mean that a certain percentage of DBS subscribers must choose between tolerating harmful interference into their DBS service or receiving no DBS service at all. That is an outrageous Hobbesian choice to which DBS customers should never be put in the first instance. Making it more difficult for DBS subscribers to receive DBS services by requiring changes in their receiving equipment or the placement of their existing equipment at their premises will turn existing, happy DBS consumers into unhappy ones. And if DBS gains a reputation for diminished quality, user-friendliness or reliability, it will chill DBS service sales over time as potential customers (most of them served by cable companies) simply choose not to subscribe -- thereby weakening the best competitive alternative that has yet emerged to incumbent cable operations.

Finally, the nature of the Northpoint interference with DBS service to consumers is such that the customer site mitigation measures advocated by Northpoint will effectively do little to reduce the number of subscribers affected adversely by the interference. The prospects for successful mitigation of this kind of harmful interference from a secondary interference source such as Northpoint on a subscriber-by-subscriber basis are next to nothing, because the source of the problem (the Northpoint transmissions) will be virtually impossible for such subscribers to identify with specificity. The subscriber will experience poorer performance, in the sense that he or she will notice that his or her receiver seems more sensitive to rain than it once was, but the subscriber will not be able to identify the true cause of the interference. The subscriber will naturally assume that the DBS operator has voluntarily reduced the reliability and quality of its DBS service. As a consequence, the subscriber may well simply cease subscribing to DBS service, and "spread the word" among potential subscribers that DBS service is of poor quality.

It is arbitrary and capricious for the Commission to rely on this type of mitigation as a basis for a finding that proposed MVDDS sharing with the DBS service is feasible. The Commission must reconsider its conclusion.

D. The Commission Has Utterly Failed To Justify Why the Proposed MVDDS Service Must Be Located at 12 GHz to the Detriment of Millions of U.S. DBS Consumers

1. The Commission has failed to explain why the vast amounts of spectrum that it has allocated for fixed wireless services cannot accommodate the fixed point-to-multipoint service it has proposed to label "MVDDS"

DIRECTV challenges any suggestion that the proposed Northpoint service is innovative or warrants the definition of a new service. Like LMDS, the proposed MVDDS should not be thought of as unique for broadband or video service provision: it "is neither a 'specific' service nor a specific technology." It is merely another name for the use of spectrum that, "in theory,

can be used to provide, or assist in the provision of consumer services such as video, voice, data, and broadband telecommunications services generally.”³³ Thus considered, the “new” proposed MVDDS service is nothing more than another proposed fixed wireless point-to-multipoint service offering video and broadband capabilities.

As elaborated upon below, there is no reason that the MVDDS service cannot be accommodated in other frequency bands, such as 2.5 GHz (MDS/MMDS/ITFS), 24 GHz (DEMS), 28 GHz (LMDS), or 39 GHz -- spectrum expressly allocated for uses *functionally identical* to those that Northpoint proposes. In dismissing these other bands for proposed MVDDS use, the Commission cites four criteria to judge the bands' "attractiveness" relative to the 12 GHz Band:

- sufficient spectrum to permit a service that can compete with cable and DBS;
- the degree of encumbrance by existing operations;
- relative equipment costs; and
- relative propagation constraints.³⁴

³³ Rulemaking to Amend Parts 1, 2, 21, and 25 of the Commission's Rules to Redesignate the 27.5-29.5 GHz Frequency Band, to Reallocate the 29.5-30.0 GHz Frequency Band, to Establish Rules and Policies for Local Multipoint Distribution Service and for Fixed Satellite Services, *Third Report and Order and Memorandum Opinion and Order*, 15 FCC Rcd 11857 (2000), at ¶ 26.

³⁴ Order at ¶ 168. Furthermore, in suggesting that the other bands compare unfavorably with 12 GHz against one or more of these criteria, the Commission mentions only the MMDS and LMDS bands, and gives associated band limits that may be misleading with regard to the available bandwidth they offer. For example, the MMDS allocation cited by the Commission represents only about one-quarter of the spectrum allocated to, or available for, fixed point-to-multipoint wireless video and data distribution near 2.5 GHz. The total bandwidth actually available for such “wireless cable” applications is 196 MHz and includes the spectrum allocated to the Multipoint Distribution Service (MDS) and the Instructional Television Fixed Service (ITFS), as well as to MMDS. The LMDS allocation, on the other hand, includes a total 1300 MHz divided among the bands 27.50-

Considering the first of these "criteria," there is no issue regarding the availability of spectrum alternative to the 12 GHz Band that is capable of offering competitive terrestrial wireless MVDDS-type services. Indeed, the LMDS and 39 GHz bands offer nearly *three times* the bandwidth capacity of the 12 GHz Band. Even the MDS/MMDS/ITFS band, which provides only forty percent of the bandwidth of the 12 GHz Band, is now beginning to be used to compete with cable, not only in the United States, but also in Latin America and Europe.³⁵ Indeed, given the growing use of 64 QAM digital modulation in this band, the number of video program channels can equal or exceed the number proposed by Northpoint using QPSK modulation.

With regard to the extent to which the MDS/MMDS/ITFS, LMDS, and 39 GHz bands are encumbered by existing operations, DIRECTV notes that all three bands have been the subject of successful spectrum auctions; the market therefore has not noted any encumbrances that would be prohibitive in terms of offering fixed wireless services of the type that Northpoint proposes. Indeed, except for wireless cable in certain parts of the United States, actual service deployment in all of these bands has been extremely limited.

In point of fact, the only band that is truly encumbered is the 12 GHz band. Insofar as secondary MVDDS sharing spectrum with existing primary 12 GHz operations is concerned, the

28.35, 29.10-29.25, and 31.075-31.225 GHz, rather than the entire 3800 MHz between 27.5 and 31.3 GHz. As for the other two bands allocated for point-to-point and point-to-multipoint fixed wireless operations, the DEMS (Digital Electronic Messaging Service) band offers 40 MHz of bandwidth in the frequency ranges 24.25-24.45 and 25.05-25.25 GHz, and the 39 GHz band provides 1400 MHz of bandwidth in the 38.6-40.0 GHz band. Moreover, consideration is being given to augmenting the latter band through the addition of 1600 MHz in the adjacent, but little-used, 37.0-38.6 GHz band.

³⁵ "MMDS, A Low-cost Infrastructure for video, voice and data" Bruce Carruthers, Steve Czarnecki, George Mandanis, *Telecommunications (International Edition)*, v.30, no. 3 (Mar. 1999), at 103-104; "Big Bang Trigger: The Fixed-Wireless Factor," Fred Dawson, *Phone & International*, v.4, no. 3 (Mar. 15, 2001), at 56-64.

presence of more than 15 million DBS subscriber receiving installations distributed throughout the country is a far greater encumbrance than would exist in the any of the four bands mentioned that are allocated for fixed wireless point-to-multipoint operations.

As for equipment costs relative to the 12 GHz band, the question of economies of scale is dealt with in the following section. As noted there, the principal economies realized for receiving installations in the 12 GHz band are not specific to that band. In addition, the number of installations in the 2.5 GHz wireless cable band is large enough to fully realize economies of scale for transmitting as well as receiving equipment, despite the use of different modulation methods.

The fourth criterion suggested by the Commission for judging the attractiveness of the various bands relative to each other and to the 12 GHz DBS band was radiowave propagation considerations. To begin with, let it be noted (since the Order does not) that there are a number of frequency-dependent phenomena to be compared. These include spreading losses, attenuation and signal de-polarization by rain, atmospheric absorption, attenuation by foliage, blockage by structures, diffraction and reflection by obstacles and by terrain along and near the line-of-sight between transmitter and receiver, and the accompanying multiple propagation paths (multipath propagation). All of the bands considered here are subject to these phenomena.

Generally speaking, the severity of the effects increases directly with higher frequencies. As a result, the 2.5 GHz band is in some respects the most attractive from a propagation standpoint. In this connection, it should be noted that the frequency of the 12 GHz band is about five times higher than that of the 2.5 GHz band, whereas the frequency of the LMDS band is only a little more than twice that of the 12 GHz band. Even the frequency of the 39 GHz band is only three times higher than the 12 GHz band. Without entering into a detailed analysis of the

frequency dependence of each of the listed propagation phenomena and their impact on point-to-multipoint system design in the various bands, it should suffice to note that an exhaustive European study of experimental LMDS-type systems in the 40.5-42.5 GHz band demonstrated the technical, operational, and economic feasibility of operations in that band.³⁶

The Commission has presented no evidence to show that, using its own criteria, Northpoint would be disadvantaged by using one of the several bands already allocated for fixed wireless point-to-multipoint systems instead of the 12 GHz Band. To the contrary, Northpoint technology will have access to more and less encumbered spectrum. Given that *Northpoint itself* advocates its technology as suitable for deployment in a variety of other frequency bands,³⁷ there is absolutely no reason for the Commission to expose DBS consumers to the harmful interference that will result from the deployment of terrestrial point-to-multipoint systems in the 12 GHz Band.

2. There has been no evidence presented that "economies of scale" exist for Northpoint at 12 GHz

Also in wholly conclusory fashion, the Order states that the 12.2-12.7 GHz band is "particularly attractive" because "MVDDS equipment can take advantage of economies of scale that already exist for electronics and antennas that use this band."³⁸ This assertion is wholly unsupported, and untrue. While the 12 GHz band is vital for downlinking programming to DBS

³⁶ See "Specification of Next-Generation of LMDS Architecture," Report D2PIB on ACTS Project Number AC215, Cellular Radio Across for Broadband Services (CRABS), Edited by H. Loktu(TEL), (Feb. 2, 1999) at 96; "User and Service Aspects of LMDS," Report D1P2 on ACTS Project Number AC215, Cellular Radio Access for Broadband Services (CRABS), Edited by R. Ling (TELNOR) (Jan. 15, 1999), at 36.

³⁷ See www.northpointtechnology.com/html/spectrum_planning.html (advocating that Northpoint technology be used in a number of different frequency bands).

³⁸ Order at ¶ 168.

customers, and DBS receiving antennas must, by their nature, operate at 12 GHz, all other components of DBS equipment used by the various DBS service providers *do not operate at 12 GHz*.

This fact goes to the heart of Northpoint's claim – evidently accepted uncritically by the Commission -- that it must use the 12 GHz 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 18-inch satellite dish uses 12 GHz frequencies. 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. This is done so that existing distribution components can be used in the installation. Therefore, it is evident that Northpoint can use *any* frequency band for the type of service it proposes (*e.g.*, MDS, LMDS, or 38 GHz) already allocated by the Commission and still use commercially available DBS-like equipment, provided that the Northpoint antenna uses a suitable down-converter to convert the signal to 950-1450 MHz.

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 Northpoint will need to develop a separate down-converter regardless of the frequency band utilized.³⁹ Northpoint can and should use spectrum that has been expressly set aside for the precise fixed wireless operations it proposes. It should not be permitted to use the DBS downlink band.

³⁹ 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").

III. ISSUES REGARDING THE CO-EXISTENCE OF BSS AND NGSO FSS SERVICES

In addition to the issues raised in this petition regarding the proposed MVDDS service, DIRECTV has also identified certain issues in the Order pertaining to DBS-NGSO FSS sharing that should be clarified or reconsidered.

A. Ninety Days Is Not Long Enough to Ensure NGSO FSS System Compliance With Operational/Additional Operational EPFD Limits

The Order requires NGSO FSS system licensees to demonstrate compliance with operational and additional operational FSS and BSS epfd limits ninety days prior to the NGSO FSS system's initiation of service.⁴⁰ While DIRECTV agrees that it is critical for NGSO FSS systems to demonstrate that they can meet the operational/additional operational epfd limits before they initiate service, the 90-day timeframe implemented in the new rules is simply too short to accomplish this purpose.

First, DIRECTV notes that the Commission must submit information for an NGSO FSS system to the ITU years before the system initiates service, and will need commit to the ITU that the system meets the additional operational epfd limits.⁴¹ The Commission's 90-day time period is

⁴⁰ See Order at ¶¶ 96-98 (FSS), ¶ 195 (BSS). See also new Order, Appendix A, new Rule 25.146(b).

⁴¹ Under ITU requirements, information regarding proposed systems should be filed by administrations not earlier than 5 years but preferably not later than 2 years prior to bringing into use ("BIU").

not consistent with this need, and so it is not clear how the United States would make such a commitment.

Second, the statement in the Commission's rule that a comprehensive technical demonstration of epfd limit compliance is required "[n]inety days prior to the initiation of service to the public"⁴² implies that a nearly operational NGSO FSS system constellation is already in orbit before the NGSO FSS operator is required to supply the needed technical showing of compliance. Although the Order states that non-compliant NGSO FSS systems will be required to "apply all mitigation techniques necessary, including any changes necessary to their system design,"⁴³ waiting until a nearly full operational NGSO FSS constellation is in orbit will, as a practical matter, make it much more difficult for the NGSO FSS operator to make modifications to its system. Additionally, the Commission will be under tremendous pressure to allow the NGSO FSS system to begin operation, given the large amount of financial resources expended by the operator.

It is also not clear in the rule how or if the Commission will place the technical information supplied by the NGSO FSS system licensee on public notice for interested parties to review and comment. DIRECTV requests that the Commission amend the rule so that this is the case. In any event, however, given that the comprehensive technical showing by the NGSO FSS licensee must be reviewed by the Commission in detail (including analysis of software code), and that the NGSO FSS system must be carefully analyzed, a 90-day timeframe is simply insufficient.

⁴² See Order, Appendix A, new Rule 25.146(b). See also Order at ¶ 195.

⁴³ *Id.* at ¶ 195.

The information required for demonstration of operational and additional operational limits is summarized in paragraph 98 of the Order. The list includes NGSO FSS satellite antenna performance, expected satellite/earth station resource allocation scheme, and the spacecraft antenna switching algorithm.⁴⁴ DIRECTV notes that these items may not be available at the early space station licensing stage of the NGSO FSS system, but they will certainly be available far earlier than 90 days before the initiation of service.

Accordingly, DIRECTV proposes a rule modification requiring the preliminary demonstration by the NGSO FSS licensee of compliance with operational and additional epfd limits -- and the submission of the comprehensive information required by the new rule -- once its first satellite, or a small fraction of its operational constellation, is launched. The preliminary demonstration will provide confidence that the eventual complete system will comply with the operational limits. Subsequently, a second demonstration would be undertaken by the NGSO system licensee once the system is fully deployed to verify the preliminary demonstration and take into account subsequent mandatory or voluntary technical changes, if any, implemented by the NGSO FSS system operator. The result of this demonstration should be incorporated into an additional showing required by the rules, which would be submitted by the NGSO system licensee 90 days prior to the initiation of service to the public.

B. The Commission Must Require a Demonstration That NGSO FSS Systems Can Meet Aggregate epfd Limits

The Commission agrees with the importance of NGSO FSS systems meeting aggregate epfd limits for FSS and BSS systems.⁴⁵ The Commission appropriately adopts these aggregate

⁴⁴ *Id.* at ¶ 98.

⁴⁵ Order at ¶¶ 106-108, 198.

limits in its rules. However, it does not require any demonstration of compliance by NGSO FSS systems. The Commission suggests that it may address this point in the NGSO FSS-to-NGSO FSS rulemaking or in the context of specific NGSO FSS authorizations.⁴⁶

The Commission is responsible for ensuring that aggregate epfd limits are not exceeded, and it should be clear on this point. Therefore, DIRECTV strongly urges that compliance with aggregate BSS epfd limits be made an express condition on the licenses of NGSO FSS systems and any Commission authorization of foreign NGSO FSS systems. Individual NGSO FSS systems must be cognizant of the need to comply with aggregate epfd limits in addition to single entry epfd limits.

C. The ITU-BR Software Should be Used On Test Points Representing Worst-Case Long-Term and Worst-Case Short-Term Interference

The Order refers to testing that will be performed by the ITU-BR on "validation" epfd limits that will be used to ensure the appropriate protection of smaller BSS earth station antennas ranging from 30 cm to 120 cm in diameter.⁴⁷ The Commission will be relying on the ITU-BR software (as described in ITU-R Recommendation BO.1503) to verify that an NGSO FSS

⁴⁶ *Id.*

⁴⁷ *Id.* at ¶ 179; *see id.* ¶ 171 n.365.

network meets the specified epfd limits. The ITU-BR software will evaluate the interference epfd levels at geographic test points that are provided either by the notifying administration or generated by the BR staff. While DIRECTV generally supports this approach, it has the following reservation about the selection of test points.

For interference into relatively large victim receive antennas, the ITU-BR software will search across a given geographic area and identify the points of highest short-term interference. It will then compute the full epfd (down) vs. time curve for those locations. This technique is acceptable for large victim antenna diameters where short-term interference is the most significant concern. However, for smaller antenna sizes, such as those used in the BSS, long term interference is as much of a concern. Geographic points exhibiting high long-term interference levels will not necessarily coincide with points exhibiting high short-term interference levels. Long-term interference levels can have a much larger impact on unavailability performance than short-term interference levels, and as such, care must be taken to also select these high long-term interference test points.

In the Order, the Commission specifies that the NGSO FSS operator must demonstrate compliance to the epfd limits at "three worst case test points within the United States."⁴⁸ This is an insufficient number of test points, and it is unclear whether these test points exhibit worst case short-term or long-term interference. (Again, these conditions do not typically occur at the same geographic location).

To ensure that high long-term interference levels are taken into account, DIRECTV requests that each DBS operator be allowed to define for the Commission at least 30 test points

⁴⁸ Order at ¶ 98.

across its coverage area. The ITU-BR software can then be used to evaluate actual epfd performance at each of these test points against the epfd limits. This process should provide a reasonable overall evaluation of an NGSO FSS system's performance.

IV. CONCLUSION

For the foregoing reasons, the Order should be reconsidered. The Commission should not introduce a secondary point-to-multipoint service into the 12 GHz Band. There is powerful evidence that ubiquitously deployed terrestrial operations will cause harmful interference to DBS operations and DBS subscribers' receipt of service. This is the conclusion that the Commission has reached in similar recent proceedings involving GSO satellite-terrestrial service sharing questions, and those proceedings did not involve the interaction of yet a *third* ubiquitously deployed NGSO FSS service that is also present here. Furthermore, a finding that sharing is "feasible" at 12 GHz cannot be predicated on so-called "mitigation" techniques at the customer's premises or elsewhere that have not even been defined by the Commission.

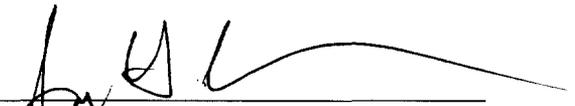
There is no reason for the Commission to threaten millions of DBS subscribers with harmful interference problems. Terrestrial fixed wireless services such as those that Northpoint proposes to offer in fact can and should be accommodated in other frequency bands specifically allocated for such uses, and the Order is wrong to dismiss this option out of hand in a single sentence.

Finally, the Commission should implement certain changes to its BSS-NGSO FSS sharing regime, as described herein.

For the reasons set forth above, DIRECTV requests that the Order be reconsidered and the Commission's rules revised in accordance with this petition.

Respectfully submitted,

DIRECTV, INC.

By: 

Gary M. Epstein
James H. Barker
LATHAM & WATKINS
1001 Pennsylvania Avenue, N.W.,
Suite 1300
Washington, D.C. 20004-2505
(202) 637-2200

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