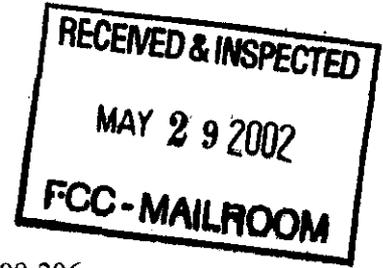


Before the
Federal Communications Commission
Washington, D.C. 20554



In the Matter of)	
)	
Amendment of Parts 2 and 25 of the Commission's)	ET Docket No. 98-206
Rules to Permit Operation of NGSO FSS Systems)	RM-9147
Co-Frequency with GSO and Terrestrial Systems in)	RM-9245
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)	
Licenses 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)	

MEMORANDUM OPINION AND ORDER AND SECOND REPORT AND ORDER

Adopted: April 11, 2002

Released: May 23, 2002

By the Commission: Chairman Powell and Commissioner Abernathy issuing a joint statement;
Commissioners Copps and Martin approving in part, dissenting in part, and issuing
separate statements.

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I. INTRODUCTION

1. In this *Memorandum Opinion and Order (MO&O)*, we address the petitions for reconsideration filed in response to the *First Report and Order and Further Notice of Proposed Rule Making* in ET Docket No. 98-206, released on December 8, 2000.¹ Our action herein encompasses all of the petitions for reconsideration but is limited to addressing the aspects that seek reconsideration of the Commission's threshold determination in the *First R&O* to authorize the new Multichannel Video Distribution and Data Service (MVDDS) under the existing primary status fixed service (FS) allocation in the 12.2-12.7 GHz (12 GHz) band. We defer consideration of the remaining issues raised by the reconsideration petitioners to a future order. We received eight petitions seeking reconsideration of various decisions that the Commission made in the *R&O*.² In addition, the parties filed six oppositions to the petitions for reconsideration and seven replies to the oppositions.

¹ *First Report and Order and Further Notice of Proposed Rule Making*, FCC 00-418, ET Docket No. 98-206, 16 FCC Rcd 4096 (2000) (*First R&O and Further Notice*).

² A list of the parties filing petitions, oppositions and replies is provided in Appendix A.

2. We conclude that the petitions for reconsideration are without merit with regard to the Commission's threshold MVDDS authorization decision.³ The petitioners request that we, in effect, reverse the Commission's decision to authorize MVDDS under the existing allocation for FS in the 12 GHz band. We believe that the Commission's allocation for MVDDS in the 12 GHz band is in the public interest and reflects a carefully crafted balance of technical and policy concerns. This balance will result in an efficient reuse of spectrum and the provision of a new service to the public while affording protection to the existing Direct Broadcast Satellite (DBS) and new non-geostationary satellite orbit (NGSO) fixed-satellite services (FSS). We also believe that this new service will facilitate the delivery of new communications services, such as video and broadband services, to a wide range of populations including those that are unserved and or underserved.

3. We also adopt a *Second Report and Order (Second R&O)* in which we establish technical and service rules for MVDDS in the 12 GHz band. This new fixed terrestrial radiocommunications service was established in the *First R&O*, wherein the Commission also allocated NGSO FSS operations in the 12 GHz band.⁴ Specifically, MVDDS providers will share the 12 GHz band with new NGSO FSS operators on a co-primary basis and on a non-harmful interference basis with incumbent Broadcast Satellite Service (BSS) providers.⁵

II. EXECUTIVE SUMMARY

4. In this *MO&O* and *Second R&O*, we make the following major determinations regarding the licensing of MVDDS in the 12 GHz band:

MO&O

- We find that the Commission provided clear notice that the Commission was considering authorizing MVDDS in the 12 GHz band in the *November 24, 1998 NPRM*⁶ as required by the *Administrative Procedure Act*.⁷
- The MVDDS authorization complies with the provisions, and fosters the goals, of the *Satellite Home Viewer Improvement Act of 1999 (SHVIA)* and the *Rural Local Broadcast Signal Act (RLBSA)*.⁸
- The technical rules and regulatory safeguards we are adopting in the *Second Report and Order* will protect the primary allocation status of incumbent DBS/BSS and the co-primary NGSO FSS operators in the 12 GHz band.
- The Commission's decision to authorize MVDDS in the 12 GHz band was carefully considered and rationally explained based upon all of the available information in the record.
- The technical rules we are establishing for MVDDS operation are technologically neutral because they do not specify a particular equipment configuration or methodology, proprietary or not, that must be used within the fixed terrestrial MVDDS service.

³ See 47 C.F.R. §§ 1.106, 1.429 regarding the legal standards for petitions for reconsideration.

⁴ See *First R&O*, 16 FCC Rcd 4160 at ¶¶ 166-167.

⁵ The BSS is also referred to as DBS. In this item, we will use the terms "BSS" and "DBS" interchangeably.

⁶ 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, ET Docket No. 98-206, *Notice of Proposed Rule Making*, ET Docket No. 98-206, 14 FCC Rcd 1131 (1998) (*November 24, 1998 NPRM*).

⁷ See 5 U.S.C. Chapter 5, *et. seq.*, *Administrative Procedure Act (APA)*.

⁸ See Pub. L. 106-113 Stat. 1501 (enacting S. 1948, including the SHVIA and the RLBSA, Titles I and II of the Intellectual Property and Communications Omnibus Reform Act of 1999).

- The Commission's decision to authorize MVDDS in the 12 GHz band does not violate International Telecommunications Union (ITU) recommendations and constitutes an appropriate exercise of domestic regulatory authority.
- We deny the petitions for reconsideration with respect to the Commission's decision to authorize MVDDS in the 12 GHz band.
- We find to be substantively without merit and dismiss on our own motion as procedurally untimely, the petition for consolidation and declaration of this proceeding which seeks to disallow MVDDS operation in the 12.2-12.7 GHz band and instead seeks consideration of alternative spectrum in the 12.7-13.25 GHz Cable Television Relay Service (CARS) band or the 2500-2690 MHz Multichannel Multipoint Distribution Service (MMDS) in the context of two other rule making proceedings.

R&O

- We will require an MVDDS operator to operate with a maximum power limit of 14 dBm per 24 megahertz Effective Isotropic Radiated Power (EIRP).
- We specify an equivalent power flux density (EPFD) limit for each of four regions across the United States. The regions and corresponding EPFD limits are: East: $-168.4 \text{ dBW/m}^2/4\text{kHz}$, Midwest: $-169.8 \text{ dBW/m}^2/4\text{kHz}$, Southwest: $-171.0 \text{ dBW/m}^2/4\text{kHz}$, and Northwest: $-172.1 \text{ dBW/m}^2/4\text{kHz}$.
- Using a prescribed methodology and a predictive model to calculate EPFD values, we used a criterion that would limit the amount of increased BSS unavailability due to the presence of MVDDS to a negligible level over a baseline level of BSS unavailability. The unavailability allowance ascribed to MVDDS is in addition to the unavailability allowance ascribed to NGSO FSS operations in the 12.2-12.7 GHz band.
- MVDDS must site and design its transmitting antennas to avoid causing harmful interference to existing DBS customers.
- We will require the MVDDS operator to ensure that the prescribed EPFD limits are not exceeded at any DBS customer of record location.⁹ If the EPFD limits are exceeded, the MVDDS operator will be required to discontinue service until such time that the limits can be met.
- We adopt a "safety valve" in which we will consider requests to adjust the EPFD for specific locations, where due to an anomalous situation, a DBS provider can demonstrate a tangible detrimental impact on DBS caused by MVDDS operations.
- To promote MVDDS and NGSO FSS band sharing, MVDDS signals shall not exceed a power flux density (PFD) of $-135 \text{ dBW/m}^2/4\text{kHz}$ measured and/or calculated at the surface of the earth at distances greater than 3 km from the MVDDS transmitting site.
- We adopt a minimum MVDDS transmitting antenna spacing of 10 km from pre-existing NGSO FSS receive antennas with the option for NGSO FSS licensee agreement to accept shorter spacing. We also conclude that NGSO FSS receivers must accept any interference from pre-existing MVDDS transmitting antennas.
- We adopt basic information sharing and coordination requirements that MVDDS and NGSO FSS operators must follow to facilitate mutual sharing of the 12 GHz band as co-primary services.
- We adopt MVDDS emission mask values for protecting NGSO FSS operations in the adjacent 11.7-12.2 GHz band and CARS and Broadcast Auxiliary Service (BAS) operations in the adjacent 12.7-13.25 GHz band from out-of-band MVDDS emissions.
- We adopt low elevation angle PFD radiation limits on NGSO FSS operations that will afford protection to MVDDS receivers from NGSO FSS interference for the portion of the non-geostationary orbital path near the horizon.
- We dismiss, without prejudice, all applications for terrestrial use of the 12 GHz band. All interested parties may reapply under the new licensing rules established in this proceeding

⁹ See footnote 221 for a definition of customer of record.

- We adopt geographic license service areas for MVDDS on the basis of Component Economic Areas (CEAs).¹⁰
- We adopt a channel plan consisting of one spectrum block of 500 megahertz per service area.
- We adopt our proposal to auction MVDDS licenses in conformity with the general competitive bidding rules set forth in Part 1, Subpart Q, of the Commission's Rules.
- We permit fixed one-way operations, but exclude mobile and aeronautical operations. Permissible operations include the flexibility for two-way services whereby the 12 GHz band could be used for the downstream path, and any upstream (or return) path could be located in other spectrum or over a wireline.
- We decline to adopt must-carry rules.
- We require incumbent non-public safety Private Operational Fixed Service (POFS) licensees in the 12 GHz band to protect MVDDS and NGSO FSS operations.
- We require MVDDS and NGSO FSS operations to protect incumbent traditional public safety POFS licensees in the 12 GHz band.
- We suspend the acceptance of POFS applications for new licenses, amendments to applications for new and modified licenses and major modifications to existing licenses.
- We decline to permit dominant cable operators from acquiring an attributable interest in an MVDDS license for a service area where significant overlap is present.
- We adopt a ten-year license term for MVDDS, beginning on the date of the initial authorization grant, and adopt a renewal expectancy based on the substantial service requirement.
- We restrict the placement of transmitting systems near the Canadian and Mexican borders.

III. BACKGROUND

5. On July 3, 1997, SkyBridge LLC (SkyBridge) requested modification of the Commission's Rules to permit NGSO FSS systems to operate with geostationary orbit (GSO) systems (both FSS and BSS) and terrestrial systems in certain bands, including the 12 GHz band.¹¹ On March 6, 1998, Northpoint Technology, Ltd. (Northpoint) filed a Petition for Rulemaking to allow the operation of a terrestrial service in the 12 GHz band.¹² Specifically, Northpoint requested modifications to the Commission's Rules to authorize DBS licensees and their affiliates to obtain secondary, subsidiary terrestrial communications authorizations to use the 12 GHz band to provide multichannel video distribution of local television programs and broadband digital data (e.g., high-speed Internet access).¹³

¹⁰ CEAs are based on Economic Areas delineated by the U.S. Dept. of Commerce. Each CEA consists of a single economic node and the surrounding counties that are economically related to the node. The 354 CEA service areas are based on the 348 Component Economic Areas delineated by the Regional Economic Analysis Division, Bureau of Economic Analysis, U.S. Department of Commerce February 1995, with the following six FCC-defined service area additions: American Samoa, Guam, Northern Mariana Islands, San Juan (Puerto Rico), Mayagüez/Aguadilla-Ponce (Puerto Rico), and the United States Virgin Islands.

¹¹ SkyBridge Petition for Rule Making (filed July 3, 1997) (SkyBridge Petition).

¹² Northpoint Petition for Rule Making (filed March 6, 1998) (Northpoint Petition). On March 23, 1998, the Commission invited comment on the Northpoint Petition. See *Corrected Public Notice*, Report No. 2265 (Mar. 23, 1998). Northpoint explained that the primary benefits of its proposal included reuse of existing spectrum, facilitation of localism, and more effective DBS and cable competition. *Id.*

¹³ All POF point-to-point microwave stations in the 12.2-12.7 GHz band operate on a secondary basis to DBS. Specifically, 47 C.F.R. § 101.147(p) states: *12,200-12,700 MHz*. The Commission has allocated the 12.2-12.7 GHz band for use by the broadcasting-satellite service. Private operational fixed point-to-point microwave stations authorized after September 9, 1983, have been licensed on a non-interference basis and are required to make any and all adjustments necessary to prevent interference to operating domestic broadcasting-satellite systems. Notwithstanding any other provision, no private operational fixed point-to-point microwave stations are permitted to

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6. On November 2, 1998, the Commission's International Bureau (IB) established January 8, 1999, as the final date for applicants to file applications for NGSO FSS systems in the 12 GHz band.¹⁴ On November 24, 1998, the Commission initiated a proceeding in which it proposed to permit NGSO FSS operations in certain segments of the Ku-band.¹⁵ The Commission incorporated the SkyBridge and Northpoint Petitions for Rulemaking into the *November 24, 1998 NPRM*.¹⁶

7. Subsequently, on January 8, 1999, Northpoint, through its subsidiary Broadwave Albany, L.L.C., *et al.*, (Broadwave USA),¹⁷ filed waiver requests and applications for licenses for terrestrial use of the 12 GHz band, in response to the *Ku-Band Cut-Off Notice*.¹⁸ Northpoint requested waivers of multiple provisions in Part 101 of the Commission's Rules, as well as any other rules necessary to process its applications, and asserted that its proposed service would be on a secondary, non-interfering basis to DBS services and on a co-primary basis with any new FSS, such as that proposed by SkyBridge.¹⁹ Thus, in applying for licenses as a non-DBS affiliate, Northpoint shifted its stance from its earlier Petition for Rulemaking and also expanded the scope of the suggested video offerings beyond providing local service to supplement DBS.²⁰

8. Northpoint has tested its technology in the 12 GHz band under experimental authorizations and has filed progress reports asserting that the tests demonstrate that its technology could share spectrum with incumbent DBS operations.²¹ On October 13, 1999, Northpoint (under the name of Diversified Communications Engineering, Inc.) filed a technical report summarizing the results of its experimental tests in Washington, D.C.²² On November 29, 1999, SHVIA was enacted.²³ The SHVIA legislation

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cause interference to broadcasting-satellite stations of other countries operating in accordance with the Region 2 plan for the broadcasting-satellite service established at the 1983 WARC.

¹⁴ *Public Notice, International Bureau Satellite Policy Branch Information: Cut-off Established for Additional Applications and Letters of Intent in the 12.75-13.25 GHz, 13.75-14.5 GHz, 17.3-17.8 GHz and 10.7-12.7 GHz Frequency Bands, Report No. SPB-141, 1998 WL 758449 (rel. Nov. 2, 1998) (Ku-Band Cut-Off Notice)*. See also *November 24, 1998 NPRM*, 14 FCC Rcd at 1169 ¶ 71.

¹⁵ *November 24, 1998 NPRM*, 14 FCC Rcd at 1134-42 ¶¶ 4-13. The Ku band is generally defined as frequencies in the 12-18 GHz range.

¹⁶ We received 33 comments and 24 reply comments in response to the *November 24, 1998 NPRM*.

¹⁷ Northpoint states that through its subsidiary BroadwaveUSA, Inc., it has an affiliate relationship with the 68 entities that have applied for licenses to deploy the Northpoint technology nationwide. The applicants refer to themselves as Broadwave, followed by their city of proposed service (*i.e.*, Broadwave Albany, L.L.C.). Broadwave proposed to use the technology developed by Northpoint to enable sharing of this spectrum with existing DBS, geostationary satellite, and fixed microwave services. For the purposes of this proceeding, we will consider Northpoint and Broadwave to be one and the same and will refer to them both as "Northpoint."

¹⁸ *Public Notice, Wireless Telecommunications Bureau Seeks Comment on Broadwave Albany, L.L.C., et al. Requests for Waiver of Part 101 Rules, DA 99-494, 14 FCC Rcd 3937 (1999) (Northpoint Waiver Request)*. The comment period ended on April 22, 1999.

¹⁹ *Id.*

²⁰ *Id.*

²¹ See, *e.g.*, Northpoint's December 1998, Progress Report WA2XMY; Northpoint's October 1999 Progress Report WA2XMY, Technical Annex to their Comments; and other *ex parte* filings. See also Northpoint *ex parte* filing of February 10, 2000 at 5.

²² On October 29, 1999, DirecTV Inc. (Direct TV) and EchoStar Satellite Corporation (EchoStar) (collectively, DBS licensees) filed comments addressing Northpoint's experimental tests. On January 27, 2000, DirecTV filed a report and studies asserting that Northpoint's proposal would cause unacceptable interference to DBS operations. On Feb. 4, 2000, the Commission denied an application for review and petitions for reconsideration and for a cease and

(continued...)

generally seeks to place satellite carriers on equal footing with local cable operators concerning the availability of broadcast programming, and thus is intended to give consumers more and better choices in selecting a multichannel video programming distributor (MVPD).²⁴ In addition to the 1999 SHVIA legislation, Congress passed a provision entitled the Rural Local Broadcast Signal Act (RLBSA).²⁵ Among other things, this law required the Commission to make a determination by November 29, 2000, regarding licenses or other authorizations for facilities that will utilize, for delivering local broadcast television signals to satellite television subscribers in unserved and underserved local television markets, spectrum otherwise allocated to commercial use.²⁶ The RLBSA legislation also mandates that the Commission ensure that no facility licensed or authorized to deliver such local broadcast television signals "causes harmful interference to the primary users of that spectrum or to public safety spectrum use."²⁷

9. Another company, MDS America, Inc. (MDSA), a newly formed licensee for North America of MDS International S.A.R.L. (MDSI), has also tested its technology under an experimental license in an effort to demonstrate successful sharing with DBS in the 12 GHz band.²⁸ Under this experimental license, MDSA tested MDSI's HyperCable broadband wireless technology. This technology, they assert, has been successfully deployed internationally in the 12 GHz band without causing interference to DBS operations in the same frequency band.²⁹ In *ex parte* filings, Northpoint alleges that MDSA's international facilities have not caused interference to DBS operations because they rely, in large part, on band segmentation and only operate co-frequency at the DBS band edge.³⁰ Whether MDSA could

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desist order that DirecTV and EchoStar filed against Diversified's experimental license. Finally, on February 9, 2000, the Commission granted DirecTV and EchoStar experimental authorizations in Washington, D.C. and Denver, CO to test DBS sensitivity to fixed service transmissions, such as those proposed by Northpoint. On July 25, 2000, DirecTV and EchoStar filed a "Report of the Interference Impact on DBS Systems from Northpoint Transmitter Operating at Oxon Hill, MD, May 22 to June 7, 2000" for the Commission's consideration.

²³ See SHVIA, Title I of the Intellectual Property and Communications Omnibus Reform Act of 1999 (IPACORA), relating to copyright licensing and carriage of broadcast signals by satellite carriers, codified in scattered sections of 17 and 47 U.S.C.). See, generally, Implementation of the Satellite Home Viewer Improvement Act of 1999: Application of Network Nonduplication, Syndicated Exclusivity, and Sports Blackout Rules to Satellite Retransmissions, CS Docket No. 00-2, *Notice of Proposed Rule Making*, 15 FCC Rcd 434 (2000); Implementation of the Satellite Home Viewer Improvement Act of 1999, CS Docket No. 99-363, *Notice of Proposed Rule Making*, 14 FCC Rcd 21736 (1999) (*1999 SHVIA Implementation NPRM*).

²⁴ See *1999 SHVIA Implementation NPRM*, 14 FCC Rcd at 21736 ¶ 1. The MVPD definition includes cable operators, multichannel multipoint distribution service, DBS service, television receive-only satellite program distributors, video dialtone service providers, and satellite master antenna television service providers that make available for purchase, by subscribers or customers, multiple channels of video programming. See 47 C.F.R. § 76.905(d).

²⁵ Act of Nov. 29, 1999, Pub. L. 106-113, 113 Stat. 1501, 1501A-544 to 1501A-545 (enacting S. 1948, Title II of the IPACORA).

²⁶ *Id.* While this provision does not identify the 12 GHz band specifically, MVDDS is one alternative to satisfy this demand in rural and underserved local television markets. See also Letter from Senator Ted Stevens, *et al.*, Committee on Commerce, Science, and Transportation to Chairman, William E. Kennard, Federal Communications Commission, dated July 27, 2000.

²⁷ Act of Nov. 29, 1999, Pub. L. 106-113, 113 Stat. 1501, 1501A-544 to 1501A-545.

²⁸ See Experimental License Callsign WC2XPU. See also, MDSA Clewiston Phase I Test Report, (Oct. 16, 2001).

²⁹ MDSA Comments at (i), 4-5.

³⁰ See, e.g., Letter from Michael K. Kellogg, counsel for Northpoint Technology, Ltd. to Jane Mago, General Counsel, Federal Communications Commission 1 (May 9, 2001) (*May 9, 2001 Northpoint Letter*); see also Letter (continued...)

successfully deploy their technology without causing interference to DBS operations in the U.S. is being tested under their experimental authorization. Northpoint further alleges that MDSA misrepresented the number and type of MDSI installations operating overseas and thus states that the Commission should conduct an investigation and take appropriate action.³¹ We note that MDSA has submitted extensive filings in response to the Northpoint allegations.³² Based on our review of the record before us, we conclude that this issue of determining the scope and type of the MDSI foreign installations, along with the character of the overlapping DBS signals provided by other operators and the locations of the associated DBS subscribers, is a complex matter of *bona fide* dispute between MDSA and Northpoint. We thus do not consider this dispute to constitute a case that rises to the level of a possible misrepresentation before the Commission. Accordingly, on the record before us, we conclude that further action on our part based on Northpoint's allegations in connection with this rule making is not warranted.

10. On April 18, 2000, PDC Broadband Corporation (Pegasus) filed an application for authority to provide terrestrial service in the 12 GHz band to deliver data transmission, Internet services, and MVPD services. On August 25, 2000, Satellite Receivers, Ltd. (SRL) filed an application for authority to provide terrestrial television broadcast, Internet and data services in the 12 GHz band in Illinois, Indiana, Iowa, Michigan, Minnesota and Wisconsin.

11. On November 29, 2000, the Commission adopted the *First R&O and Further Notice* in the subject proceeding.³³ In the *First R&O*, the Commission concluded, among other matters, that the new fixed terrestrial MVDDS could operate in the 12 GHz band on a co-primary non-harmful interference basis with incumbent BSS providers and on a co-primary basis with NGSO FSS entities. The Commission also concluded that NGSO FSS providers could operate service downlinks in the 12 GHz band on a primary basis. Furthermore, the Commission concluded that it would define MVDDS technical rules and requirements in a later order that would protect BSS operations and that it could establish criteria that would permit MVDDS/NGSO FSS sharing. To that end, the Commission sought detailed comment in the *Further Notice* regarding the technical sharing criteria between MVDDS and BSS and NGSO FSS, and on MVDDS service, technical and licensing rules.

12. In the *Further Notice*, the Commission sought comment on technical sharing criteria between the MVDDS, BSS and NGSO FSS, and on MVDDS service, technical, and licensing rules under Part 101 of the Commission's Rules. Finally, the Commission requested comment on the disposition of the pending 12 GHz applications filed by Northpoint, Pegasus, and SRL.

13. On December 21, 2000, Congress enacted Section 1012, "Prevention of Interference to Direct Broadcast Satellite Services," of the Commerce, Justice, State and Judiciary Appropriations Act, H.R. 5548. Section 1012 requires the Commission to arrange for independent testing of "any terrestrial service technology proposed by any entity that has filed an application to provide terrestrial service" in the 12 GHz band. The Commission selected The MITRE Corp. (MITRE) to conduct this testing. MITRE filed its report detailing its testing on April 18, 2001.³⁴

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from Michael K. Kellogg, counsel for Northpoint Technology, Ltd. to Norman Goldstein, Enforcement Bureau, Federal Communications Commission (July 3, 2001).

³¹ See, e.g., *May 9, 2001 Northpoint Letter* at 5.

³² See, e.g., Letter from James W. Olson, counsel for MDSA to Jane Mago, General Counsel, Federal Communications Commission (May 21, 2001).

³³ *First R&O and Further Notice*, 16 FCC Rcd 4096.

³⁴ The MITRE Corporation, "Analysis of Potential MVDDS Interference to DBS in the 12.2-12.7 GHz Band" (filed April 18, 2001) (MITRE Report). The Commission placed the MITRE Report on public notice on April 23, 2001.

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IV. MEMORANDUM OPINION AND ORDER

A. Notice under the *Administrative Procedure Act*

14. SkyBridge contends in its petition for reconsideration that the Commission violated the *APA*³⁵ on procedural grounds by failing to give adequate notice in the *NPRM* that it was considering authorizing MVDDS in the subsequent *R&O*.³⁶ SkyBridge argues in general principle that the Commission's decision to authorize MVDDS could not be anticipated from the prior record in this proceeding. Northpoint argues in response that the subject matter the Commission discussed and the comments the Commission sought in the *NPRM* provided clear notice to interested parties that it was considering authorizing MVDDS in the 12 GHz band.³⁷

15. Section 553(b)(3) of the *APA* requires that a general notice of a proposed rule making shall include "either the terms or substance of the proposed rule or a description of the subjects and issues involved." (Emphasis added).³⁸ In the *November 24, 1998 NPRM*, the Commission sought comment, among numerous other issues, on the Northpoint Petition for Rulemaking to permit terrestrial use of the 12.2-12.7 GHz band.³⁹ In addition, the Commission sought detailed comment on whether sharing of the 12.2-12.7 GHz band by a Northpoint-type (i.e., MVDDS) terrestrial service along with BSS/DBS and NGSO FSS was feasible.⁴⁰ Furthermore, the Commission sought detailed comment on the specific technical allocation and interference considerations involved in such a spectrum-sharing plan.⁴¹ Indeed, many of the responsive comments the Commission received were predicated upon the anticipation that it would find that an MVDDS-type service could operate in the 12 GHz band. In light of the foregoing, we find that the likelihood that we would determine that MVDDS could operate under the existing FS allocation in the 12 GHz band is clearly a logical outgrowth of the comments sought and the specific issues and subject matter discussed in the *November 24, 1998 NPRM*. Furthermore, we observe that the FS allocation for the 12 GHz band, under which MVDDS would operate, already exists in our rules.⁴²

16. In the *First R&O* and *Further Notice*, the Commission concluded that the record supported a threshold determination that sharing in the 12 GHz band with a new MVDDS service was feasible.⁴³ The Commission also indicated that current trends in spectrum usage necessitate that it consider more complicated and creative sharing arrangements.⁴⁴ At the same time, the Commission's analysis showed that development of technical rules applied to MVDDS operations would require a delicate balancing of many competing interference and spectrum utilization issues. In recognition of the complexity of these issues, the Commission exercised caution and chose to defer the adoption of additional specific technical rules pending the development of a more complete record. In furtherance of that goal, the Commission

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Comments responsive to the study were due on May 15, 2001 and replies were due on May 23, 2001.

³⁵ See 5 U.S.C. Chapter 5, *et. seq.*, *Administrative Procedure Act (APA)*.

³⁶ See SkyBridge petition for reconsideration at 2.

³⁷ See Northpoint Opposition to Petitions for Reconsideration generally at 11 *et seq.*

³⁸ See 5 U.S.C. § 553(b)(3).

³⁹ *November 24, 1998 NPRM*, 14 FCC Rcd at 1177-81 ¶¶ 91-98.

⁴⁰ *Id.*

⁴¹ *Id.*

⁴² See 47 C.F.R. §§ 2.106, 101.147(p).

⁴³ See *First R&O*, 16 FCC Rcd at 4161 ¶167

⁴⁴ *First R&O*, 16 FCC Rcd at 4181 ¶ 224.

requested additional detailed comment in the *Further Notice* concerning all technical aspects of sharing in the 12 GHz band. This exercise of caution by refraining from adopting technical rules in the *First R&O* in no way alters or detracts from the fact that the Commission provided clear notice in the preceding *November 24, 1998 NPRM* that it was considering making the threshold decision to authorize MVDDS in the 12 GHz band. In view of the substance of the detailed comments sought and the specific issues and subject matter discussed in the *November 24, 1998 NPRM*, we conclude that the Commission provided clear notice that it was considering making a determination as to whether to allow MVDDS to operate in the 12 GHz band. Accordingly, the SkyBridge petition for reconsideration that asserts the Commission's decision to authorize MVDDS was improper because the Commission failed to provide adequate notice of the proposed rules as required by the *APA* is denied.

B. Compliance with SHVIA and RLBSA

17. SkyBridge argues in its petition for reconsideration that the Commission's decision to authorize MVDDS in the 12.2-12.7 GHz band violates the interference prevention provisions of the SHVIA and the RLBSA.⁴⁵ SkyBridge also argues that the Commission's decision to authorize MVDDS fails to promote the goals of SHVIA and RLBSA to the extent those goals seek to provide the delivery of local broadcast television signals to satellite subscribers in unserved and underserved local markets.⁴⁶ Northpoint asserts in response that MVDDS will not cause harmful interference to either DBS or NGSO FSS and, additionally, cites its public commitments to provide nationwide service in all 211 local television designated market areas (DMA's) within two years of licensing as evidence of the ability of MVDDS to provide service in rural areas.⁴⁷

1. MVDDS vs. NGSO FSS Interference Concerns & Legislative Intent

18. SkyBridge argues that the Commission's decision to allow MVDDS to operate in the 12.2-12.7 GHz band violates the RLBSA provision that, "[t]he Commission shall ensure that no facility licensed or authorized under [this act] causes harmful interference to the primary users of that spectrum ..."⁴⁸ Citing the legislative hearings for SHVIA and RLBSA appearing in the *Congressional Record*, SkyBridge contends that requiring NGSO FSS systems to share the 12.2-12.7 GHz band with a terrestrial service such as MVDDS inherently conflicts with the intent of the legislation. SkyBridge supports its contention with what we find herein to be the unwarranted assumption that MVDDS will cause harmful interference to co-primary NGSO FSS operations.⁴⁹ As noted above, Northpoint asserts throughout its response that MVDDS will not cause harmful interference to either DBS or NGSO FSS.

19. In light of the rules and regulatory safeguards we are adopting herein, we disagree with SkyBridge's assertion that MVDDS will cause harmful interference to NGSO FSS. In reaching this conclusion, we are confident that the rules we adopt herein will limit the interference potential from MVDDS to a level that does not rise to "harmful interference" as defined by Section 2.1 of our rules.⁵⁰ These rules will ensure that MVDDS and NGSO FSS can share the 12 GHz band while preserving the integrity of the co-primary status of both operations. Therefore, we find that SkyBridge's concern that the

⁴⁵ See SkyBridge petition for reconsideration at 11.

⁴⁶ *Id.* at 15.

⁴⁷ See Northpoint Opposition to Petitions for Reconsideration generally at 4, 10 & 14, et seq.

⁴⁸ See RLBSA, § 2002(b)(2).

⁴⁹ See SkyBridge petition for reconsideration at 10.

⁵⁰ Section 2.1 defines "harmful interference" as "interference which endangers the functioning of a radionavigation service or of other safety services or seriously degrades, obstructs, or repeatedly interrupts a radiocommunication service ..." (Emphasis added). See 47 C.F.R. § 2.1.

Commission's decision to authorize MVDDS violates the prohibition on harmful interference provisions of *SHVIA/RLBSA* is without merit.

20. Furthermore, a review of the legislative history of the *RLBSA* cited by SkyBridge indicates that it was fully anticipated by the legislators that the Commission might determine that a terrestrial service such as MVDDS could share spectrum with NGSO FSS operations. For example, the *Congressional Record* indicates, "... [the *RLBSA*] directs the FCC to consider issuing licenses, possibly in the *same bands*, for new *terrestrial* communications services ..." (Emphasis added).⁵¹ And further, that, "... this bill did not mean to interfere with the expert technical and regulatory judgment of the FCC with respect to licensing applicants ..." ⁵² We therefore find that the Commission's decision to authorize MVDDS to share the 12 GHz band complies with both the specific requirements and legislative intent of *SHVIA* and *RLBSA*. Accordingly, the SkyBridge petition for reconsideration with regard to compliance with the non-interference provisions of *SHVIA/RLBSA* is denied.

2. Local Programming Goals of *RLBSA*

21. SkyBridge also argues that the Commission's decision to authorize MVDDS in the 12 GHz band does not include measures to ensure new services in rural areas or provision of local programming in areas unserved by cable systems.⁵³ As a result, SkyBridge asserts that a primary goal of the *RLBSA* is not fulfilled.⁵⁴ Northpoint, in response, cites its public commitments to provide nationwide service in all 211 local television DMA's within two years of licensing as evidence of the ability of MVDDS to provide service in rural areas.⁵⁵

22. The *RLBSA* directs the Commission "to make a determination regarding licenses or other authorizations for facilities that will utilize, for delivering local broadcast television station signals to satellite television subscribers in unserved and underserved local television markets, spectrum otherwise allocated to commercial use."⁵⁶ From a technological perspective, a fixed terrestrial service such as MVDDS is clearly capable of providing local television station signals to satellite television subscribers in unserved and underserved local television markets. As contemplated by the *First R&O* and *Further Notice*, each fixed terrestrial MVDDS transmitter will be deployed to serve a specific geographic area. Because the individual MVDDS transmitters will be physically located in the immediate geographic area that they serve, each one will be ideally situated to rebroadcast available local television station signals to subscribers. Furthermore, MVDDS can utilize reception technology that is similar to that used by established satellite BSS/DBS operations.

23. We also observe that the inability to receive local signals from DBS operators has often been cited by consumers as negatively affecting their decision as to whether to subscribe to DBS.⁵⁷ Furthermore, as of the beginning of the year 2001, the two major DBS providers, DirectTV and EchoStar, provided "local-into-local" service in only thirty-eight and thirty-four markets respectively.⁵⁸ With

⁵¹ See Cong. Rec. 106th Cong., 1st Sess. at S-15014.

⁵² *Id.*

⁵³ See SkyBridge petition for reconsideration at 15.

⁵⁴ *Id.*

⁵⁵ See Northpoint Opposition to Petitions for Reconsideration at 14.

⁵⁶ See *RLBSA* § 2002(a).

⁵⁷ See, generally, Annual Assessment of the Status of Competition in the Market for the Delivery of Video Programming, CS Docket No. 00-132, *Seventh Annual Report*, 16 FCC Rcd. 6005 (2001) (*Seventh Annual Report*).

⁵⁸ *Id.*

current growth rates, it appears possible that smaller markets and rural areas may not be provided with "local-into-local" service from DBS for the foreseeable future. The combination of these factors lead us to believe that a terrestrial service, such as MVDDS, could include transmitters sited in rural areas and thus can fill this void. At the same time, as just one example, we note that Northpoint has indicated its desire to provide nationwide service in over two hundred markets as a prospective MVDDS operator.⁵⁹ Therefore, we find that MVDDS is well suited to provide local television station signals to satellite television subscribers. However, we are not requiring MVDDS to provide local broadcast television service nor are we requiring MVDDS to serve satellite subscribers.

24. The fact that we have not proposed programming content rules for MVDDS does not detract from the fact that, among other capabilities, MVDDS is technologically well suited for fulfilling the local signal delivery goals of *RLBSA*. In the future, if we perceive it to be necessary and appropriate, we could give consideration to additional measures that might be warranted to meet the local programming goals of *RLBSA* in light of the particular facts and circumstances that prevail at the time. However, it would be both beyond the scope of this proceeding and premature to propose content-oriented rules for MVDDS operations at this time. We therefore find SkyBridge's arguments to be without merit and conclude that we have complied with the directives of *RLBSA*. Accordingly, the SkyBridge petition for reconsideration as to compliance with the local programming goals of *RLBSA* is denied.

C. Allocation Status of BSS/DBS and NGSO FSS vs. MVDDS, and Related Interference Matters

25. SkyBridge asserts in its petition for reconsideration that the co-primary authorization for NGSO FSS in the 12.2-12.7 GHz band is effectively rendered secondary by the alleged interference SkyBridge anticipates MVDDS will cause to NGSO FSS operators in the 12 GHz band.⁶⁰ Similarly, DirecTV, EchoStar, the Boeing Company (Boeing) and other reconsideration petitioners generally assert that the primary allocation status of BSS/DBS is undermined by the interference they claim will be caused to DBS operators in the 12 GHz band.⁶¹ EchoStar argues that the Commission's decision to authorize MVDDS is inconsistent with the "rights and reasonable reliance interests" of DBS operators created by our licensing regime.⁶² Some of the petitioners also generally contend that any MVDDS interference mitigation performed upon either DBS or NGSO FSS subscriber equipment would be in derogation of the primary or co-primary status of each service.⁶³ The petitioners further generally assert that the Commission failed to justify its decision to authorize MVDDS in the 12 GHz band in the face of alleged potential interference problems, that mitigation techniques will be either unsuccessful or objectionable, that other less harmful options such as use of other frequency bands were not considered, and that the Commission ignored the evidence in the record in reaching its decision.⁶⁴ Northpoint argues in response that MVDDS will not cause harmful interference to either DBS or NGSO FSS and that the Commission carefully considered all the alternative options in reaching its decision.⁶⁵

26. MVDDS is authorized on a co-primary, non-harmful interference basis as to BSS/DBS and on a purely co-primary basis to NGSO FSS. Each scenario requires somewhat differing approaches for addressing interference protection priorities. The interference protection rules and technical limits we are

⁵⁹ See Northpoint Opposition to Petitions for Reconsideration at 14.

⁶⁰ See SkyBridge petition for reconsideration at 6.

⁶¹ See, e.g., petitions for reconsideration of DirecTV at 5, 6 & 14-17, and EchoStar at 9 *et seq.*

⁶² See EchoStar petition for reconsideration at 22.

⁶³ *Id.*

⁶⁴ See, generally, petitions for reconsideration of SkyBridge, DirecTV, SBCA, EchoStar, and Boeing.

⁶⁵ See, generally, Northpoint Opposition to Petitions for Reconsideration.

adopting herein will limit the DBS and NGSO FSS interference potential from MVDDS and avoid "harmful interference" as defined by Section 2.1 of our rules. The technical rules we adopt in the *Second R&O* are stringent. Under the DBS-related operating limits we adopt for MVDDS, any interference caused to DBS would not likely approach a level that could be considered harmful interference. Further, the rules we adopt herein, require an MVDDS licensee to discontinue service from a transmitting antenna if it causes harmful interference to DBS customers of record.⁶⁶ In the case of NGSO FSS, the MVDDS PFD will be limited and stations will be required to locate a sufficient distance from pre-existing NGSO FSS receivers to ensure their protection. In the absence of harmful interference from MVDDS, the primary or co-primary status of either DBS or NGSO operations will not derogated.

27. In light of the approach described above, we find that all of the objections raised by the reconsideration petitioners in regard to the Commission's decision to authorize MVDDS in the 12 GHz are without merit. They begin from the incorrect assumption that harmful interference will be caused to DBS and NGSO FSS services by MVDDS operations.

28. We also find that the reconsideration petitioners are incorrect in their assertion that MVDDS is purely "secondary" to DBS. Rather, MVDDS is authorized under the existing fixed allocation in the 12 GHz band to operate on a co-primary, albeit non-harmful interference, basis with DBS. The Table of Frequency Allocations appearing in our rules further supports the Commission's conclusion that MVDDS, as part of the fixed service, is not "secondary" to DBS.⁶⁷ Specifically, the fixed service allocation in the Table of Frequency Allocations for the 12.2-12.7 GHz band appears in capital letters and is, therefore, considered to be a "primary" allocation.⁶⁸ Therefore, it is appropriate for MVDDS to be allocated on a primary basis. To put this conclusion in perspective, we note that, in the early 1980's, the Commission adopted a non-harmful interference requirement on incumbent fixed point-to-point operations in this band and encouraged them to relocate to other spectrum⁶⁹ because these operations were generally incompatible with the BSS allocation that was made. Specifically, the point-to-point operations were high powered (up to 316,228 watts EIRP), two-way links that could transmit in any direction. These characteristics require that such fixed links coordinate with other uses on a case-by-case basis, which is not possible with ubiquitous BSS operations. In comparison, in this proceeding we would permit fixed service operations that are low-power (up to 0.025 watts EIRP) one-way transmissions specifically designed to share spectrum with BSS operations. As discussed below, each transmitting system would be designed to minimize impact on ubiquitous BSS receivers. However, because MVDDS and DBS would be competitors, we are mindful of the desire of the DBS licensees to limit an MVDDS operator's ability to access their customers. To that end, we adopt rules in the *Second Report and Order* which require MVDDS licensees to meet specified EPFD levels at each DBS subscriber location.⁷⁰

29. We further observe that NGSO FSS and MVDDS are authorized on a purely co-primary basis. We conclude that standard mitigation techniques will not be appropriate or sufficiently effective in this situation due to the particular interference mechanisms involved when, for example, an NGSO FSS receiver points directly at an MVDDS transmitting antenna. Instead of mitigation requirements, we

⁶⁶ See para. 88 and note 221, *infra*.

⁶⁷ See 47 C.F.R. § 2.106 (Table of Frequency Allocations).

⁶⁸ See 47 C.F.R. § 2.105(c)(1)(i) which states, "[s]ervices, the names of which are printed in "capitals" [example: FIXED]; these are called "primary" services;" Compare with 47 C.F.R. § 2.105(c)(1)(ii) which specifies that, "[s]ervices, the names of which are printed in "normal characters" [example: Mobile]; these are called "secondary" services."

⁶⁹ While there were over 10,000 incumbent fixed point-to-point links originally in the band, approximately 370 licensees remain on a non-harmful interference basis because they are in locations that have not caused a problem for BSS deployment.

⁷⁰ See para. 90, *infra*.

conclude elsewhere herein that specifying a minimum MVDDS transmitting antenna spacing from pre-existing NGSO FSS receivers⁷¹ and carefully selecting maximum MVDDS PFD limits⁷² can provide similar protection without placing undue burdens upon NGSO FSS operators or requiring mitigation to be performed on any NGSO FSS receiver. In that light, we find that there is no basis for the petitioners' objection to mitigation that they believe might be performed on NGSO FSS equipment by an MVDDS provider because we are not requiring mitigation on these services.

30. We find that the Commission's decision to authorize MVDDS in the 12 GHz band subject to the technical restrictions adopted herein do not undermine the allocation status of either DBS or NGSO FSS. Therefore, we also conclude that the petitions for reconsideration are without merit concerning the alleged interference, allocation status and mitigation issues raised therein. Accordingly, the petitions for reconsideration in those respects are denied.

31. EchoStar also argues that the Commission's decision to authorize MVDDS is inconsistent with the "rights and reasonable reliance interests" of DBS operators created by our licensing regime.⁷³ They assert that DBS licensees have designed their systems to maintain a certain degree of reliability for DBS customers based upon reasonable expectations about certain amounts of interference protection and the range of technological options for which the spectrum might be developed.⁷⁴ EchoStar concludes that, "DBS licensees acquired the right to be the primary service providers in the 12.2-12.7 GHz band, and consequently, reasonably expected that the Commission would not authorize any other service in that band that would create *harmful* interference to DBS service in accordance with the Commission's rules." (Emphasis added).⁷⁵

32. To whatever extent we might, *arguendo*, accept EchoStar's characterization of the asserted rights and reliance interests of DBS operators, we note that even by EchoStar's own terms there would need to be a finding that harmful interference has been suffered by DBS for those interests to be compromised.⁷⁶ Consequently, we believe that this argument, similar to the other petitioner's concerns addressed immediately above, is dependent upon the incorrect assumption that MVDDS operation will cause *harmful* interference to the DBS service. As a fundamental matter, we believe that the rules we adopt in this proceeding will prevent harmful interference to DBS. In the absence of harmful interference to DBS, no cognizable interest of DBS licensees will be undermined. Stated in slightly different terms, the relatively small theoretical changes in DBS unavailability or system link budget margins that might result from MVDDS operations under the rules we adopt herein simply do not rise to a level that can be considered harmful interference under our rules. This result is consistent with past Commission actions wherein the Commission has found that impacting some existing customers of a service to an extent that did not rise to the level of harmful interference was outweighed by the benefits of adding new services or capabilities to a frequency band.⁷⁷ Therefore, we conclude that EchoStar's petition for reconsideration is

⁷¹ See para. 123, *infra*.

⁷² See para. 112, *infra*.

⁷³ See EchoStar petition for reconsideration at 22.

⁷⁴ *Id.* at 23.

⁷⁵ *Id.* at 23-24.

⁷⁶ See note 43, *supra*, for a definition of harmful interference.

⁷⁷ This was done, for example, in the case of DTV where we balanced new interference to existing TV service against new digital TV capabilities. See Advanced Television Systems and Their Impact Upon The Existing Television Broadcast Service, MM Docket No. 87-268, *Sixth Report and Order*, 12 FCC Rcd 14,588 (1997). Similarly, for the Location and Monitoring Service (LMS) in the 902-928 MHz band, we conditioned operation of certain stations upon the licensee's ability to demonstrate that their systems do not cause unacceptable levels of interference to 47 C.F.R. Part 15 devices. See 47 C.F.R. § 90.353(d). Also, we have allowed automated maritime

(continued....)

without merit with regard to the allegation that the Commission's decision to authorize MVDDS is inconsistent with the "rights and reasonable reliance interests" of DBS operators. Accordingly, EchoStar's petition for reconsideration in that respect is denied.

33. We also find that the various assertions made by the petitioners that the Commission failed to explain its decision, failed to explore other alternatives, or ignored evidence in the record are without merit. Contrary to petitioners' assertions, the Commission carefully articulated reasons for its basic threshold decision to authorize MVDDS in the 12 GHz band. For example, the Commission explained that factors such as propagation constraints in various frequency bands, the degree of encumbrance by existing operations, relative equipment costs, and whether a particular frequency band would provide sufficient spectrum to permit competition with cable and DBS operations were central to its decision.⁷⁸

34. At the same time, the Commission has made it abundantly clear that it wished to further develop the record before proposing final rules and protection criteria to govern MVDDS operation. In that context, the Commission utilized the vehicle of the *Further Notice* to solicit additional relevant comments from all interested parties concerning 12 GHz band sharing so that it could fully explore the specific technical considerations before proposing final rules governing MVDDS. Accordingly, the petitions for reconsideration insofar as they assert that the Commission failed to explain its decision, failed to explore other alternatives, or ignored evidence in the record are denied.

35. Finally, we disagree with the assertions of DirecTV, the Satellite Broadcasting and Communications Association (SBCA), EchoStar and others that the Commission's decision to authorize MVDDS in the 12 GHz band cannot be reconciled with its past findings that sharing between ubiquitous satellite and terrestrial services is not feasible. Northpoint argues in response that there is no inconsistency with the Commission's previous decisions and describes distinguishing factors that it contends supports the Commission's decision.⁷⁹ The Commission, as petitioners observe, has previously been reluctant to authorize multiple satellite and terrestrial services in the same bands due to the extremely complex engineering and interference concerns involved. However, the Commission noted in the *First R&O & Further Notice* the increasing demand for spectrum access necessitates that it consider more complicated and creative sharing arrangements.⁸⁰

36. In this instance, we note that we have the benefit of the extensive analytic record derived from the MITRE Report as well as the experimental MVDDS test operations in the 12 GHz band. The results support the Commission's conclusion that sharing is feasible in the 12 GHz band. Moreover, we find that the 12 GHz band is well suited for the nature of the service to be provided by MVDDS in light of the present use of this band. Taking all these factors together, we find that sharing of the 12 GHz band presents a unique situation that, while technically challenging, has the potential for significant benefit to the public in the provision of a new service. Therefore, we find that the Commission's decision to authorize MVDDS in the 12 GHz band is consistent with its continuing effort to find the highest and most efficient use of spectrum that is supported by the record in a given proceeding. Accordingly, the petitions for reconsideration of SkyBridge, DirecTV, EchoStar, SBCA, and Boeing with respect to the Commission's decision to allocate MVDDS in the 12 GHz band are hereby denied.

(...continued from previous page)

telecommunication systems (AMTS) on frequencies near TV channels 10 and 13 and required the licensee to make such adjustments as may be necessary to fix any interference to household TV receivers. *See* 47 C.F.R. § 80.215(h).

⁷⁸ *See, e.g., First R&O*, 16 FCC Rcd at 4161 ¶ 168.

⁷⁹ *See Northpoint Opposition to Petitions for Reconsideration* at 13.

⁸⁰ *First R&O*, 16 FCC Rcd at 4181 ¶ 224.

D. Technology Neutrality and Patent Issues

37. Boeing argues that allowing MVDDS in the 12 GHz band violates the Commission's practice of not basing new services on patented technologies.⁸¹ Boeing cites references by Northpoint that its antenna designs and equipment incorporate patented technology.⁸² SkyTower, the proponent of a novel solar-powered aircraft (or "stratospheric platform") delivery system, opines that the decision to allow the MVDDS terrestrial service in the band is not "technologically neutral" because it excludes new, non-terrestrial technologies such as that which it proposes.⁸³

38. As discussed more fully in the attached *Second R&O*,⁸⁴ we conclude that the rules we adopt effectively define and encompass a family of terrestrial service technology – some particular implementations of which may or may not be subject to patents or, possibly, not yet even developed or envisioned – that, consistent with the MITRE test results, are capable of operation without causing harmful interference. These rules do not constrain MVDDS to any particular equipment configurations or methodologies to deliver the service so long as they comply with the technological operating requirements we adopt herein. In other words, we distinguish the definition of MVDDS "technology" in this context (as it relates to patent, statutory and "technology neutrality" issues) from the use of the term by petitioners to casually refer in shorthand fashion to just one of potentially many methods or configurations of equipment. Thus, we find that the rules we adopt in the *Second R&O* define a set of technical operating parameters (a family of terrestrial service technology) to which prospective MVDDS providers must conform independent of the particular equipment or implementation method employed.

39. Consequently, while prospective MVDDS providers, such as Northpoint, might choose to utilize proprietary methods or equipment in their own systems to deliver the new service, it is clear from the rules we have adopted in the *Second Report and Order* that we do not require them to do so. However, due to the interference concerns described elsewhere herein, we conclude that the 12.2-12.7 GHz band may not be used for aeronautical and mobile operations.⁸⁵ Accordingly, the Boeing and SkyTower petitions for reconsideration as to the patent and technology neutrality issues raised therein are hereby denied.

E. Applicability of ITU Recommended NGSO FSS Criteria to MVDDS

40. EchoStar, SkyBridge and SBCA argue in their petitions for reconsideration that the Commission's decision to authorize MVDDS in the 12 GHz band violates ITU recommendations regarding international protection concerns for NGSO FSS.⁸⁶ Petitioners cite the ITU recommendation that specifies a ten percent cap on the increase in unavailability caused by NGSO FSS systems to GSO BSS systems.⁸⁷ They argue that the ITU recommendation does not contemplate the addition of any new sources of interference to GSO BSS beyond the ten percent attributable to NGSO FSS. From this interpretation, petitioners aver that the ITU recommendations prohibit the addition of another service, such as MVDDS, that would further increase the unavailability of GSO BSS systems. As a consequence,

⁸¹ See Boeing petition for reconsideration at 20.

⁸² *Id.* at 21.

⁸³ See SkyTower petition for reconsideration at 2.

⁸⁴ See "Independent Testing" at para. 229 *et. seq. infra*.

⁸⁵ See "Permissible Operations for MVDDS" at para. 136 *infra*.

⁸⁶ See Petitions for Reconsideration of EchoStar at 12-19; SBCA at 7-9; and SkyBridge at 6-7.

⁸⁷ See Recommendation ITU-R BO.1444, "Protection of The BSS In The 12 GHz Band And Associated Feeder Links In The 17 GHz Band from Interference Caused by Non-GSO FSS Systems."

petitioners argue that the Commission's decision to authorize MVDDS is in contravention of the ITU recommendations.⁸⁸

41. We do not agree. As an initial matter, we observe that recommendations resulting from ITU-R deliberations are not necessarily binding for purely domestic allocation decisions such as are involved with the terrestrial-based MVDDS service. As the Commission stated in the *First Report and Order*, "... ITU-R deliberations are based on the technical input of many Administrations that often have different domestic spectrum uses than those in the United States. Thus, while the conclusions of the CPM ["Conference Preparatory Meeting"], the ITU-R study groups, and WRC-2000 may have general technical applicability, based upon each Administration's input and the resultant compromise, they may not adequately address specific, domestic sharing conditions such as those prevalent in the U.S."⁸⁹

42. Furthermore, we disagree with the petitioner's interpretation of the cited ITU recommendation. We find that the cited ITU recommendation is not applicable to the terrestrial-based MVDDS. This conclusion is supported by the fact that the cited ITU recommendation explicitly states that the ten percent cap on the increase in baseline unavailability applies to NGSO FSS.⁹⁰ There is nothing in the ITU recommendation that indicates the cap is applicable to any service other than the satellite-based NGSO FSS. EchoStar itself acknowledges that the ten percent cap was determined specifically upon the occasion of interference from NGSO systems into DBS.⁹¹

43. Petitioners hinge their argument largely upon out-of-context quotations from the cited ITU recommendation to the effect that all contributions to DBS unavailability should be limited. We do not find fault with the proposition that the ITU recommendation reflects the position that it is desirable that the unavailability contributions of all systems affecting DBS should be quantified and limited in some manner. Indeed, we are establishing very conservative limits on MVDDS elsewhere herein. However, it is equally clear from a plain reading of the ITU recommendation that the ten percent cap refers only to the contribution attributable to NGSO FSS systems. Beyond that, the ITU recommendation simply does not purport to address, or to exclude from possible future consideration, whatever link budgets might be appropriate for systems other than NGSO FSS.

44. As even SkyBridge and SBCA concede, all the relevant agreements and recommendations clearly limit their consideration to the interference contribution of NGSO FSS alone, and that no conclusions were reached regarding MVDDS or other such services.⁹² We agree with Northpoint that to suggest that the ten percent cap applies to every other possible source of interference - despite explicit qualifying language limiting the cap to NGSO FSS - is unwarranted and misreads the ITU proceedings.⁹³ Consequently, we conclude that the cited ITU recommendation must be narrowly construed by its own terms, namely, that the ten percent cap applies to NGSO FSS alone.

⁸⁸ To the extent that the petitioners' arguments on reconsideration rely on proposals that were raised in the *Further Notice* and not the *First R&O*, our decision on reconsideration does not go to the merits of their arguments on the unavailability criteria. Those issues are properly addressed in the *Second R&O*.

⁸⁹ See *First Report and Order*, 16 FCC Rcd at 4107 ¶ 15.

⁹⁰ See Recommendation *ITU-R BO.1444* at "recommends" 1 and 1.1 that reads, in part, "... [the] emissions of all non-GSO FSS satellite networks operating in the same frequency band, should: be responsible for at most ten percent of the time allowance(s) for unavailability ..." (Emphasis added).

⁹¹ See EchoStar petition for reconsideration at 13.

⁹² See petitions for reconsideration of SkyBridge at 6 and SBCA at 7.

⁹³ See Northpoint Opposition to Petitions for Reconsideration at 5.

45. Therefore, we conclude that the Commission's decision to authorize MVDDS in the 12 MHz band reflects an appropriate exercise of its regulatory authority to tailor interference standards to particular domestic requirements. We further conclude that the Commission's decision is not inconsistent with the ITU recommendations cited by petitioners. Accordingly, to the extent that EchoStar, SBCA and SkyBridge allege that the the Commission's decision to authorize MVDDS in the 12 GHz band is inconsistent with or violates ITU agreements and recommendations, the petitions for reconsideration are denied.

F. DBS Petition for Consolidation and Declaration

46. Subsequent to the deadline for filing petitions for reconsideration of the *First R&O*, DirecTV and EchoStar submitted a petition⁹⁴ that seeks consolidation of this proceeding with dockets CS 99-250⁹⁵ and ET 00-258.⁹⁶ The petitioners also urge the Commission to declare that either the 12.7-13.2 GHz segment of the CARS band or, alternatively, the 2500-2690 MHz segment of the MMDS band, is available to MVDDS instead of the 12 GHz band.⁹⁷

47. Northpoint opposes the DBS Petition for Consolidation and Declaration on procedural grounds because of the lateness of filing, and on the merits because Northpoint argues that neither of the proposed alternative spectrum options are technically suitable for MVDDS.⁹⁸ The National Cable Television Association (NCTA) points out that the petition to declare spectrum in the CARS band for MVDDS runs counter to Section 308 of the Communications Act of 1934 (the Act) which provides, in part, that the *applicant* for a license must specify the desired frequency of operation.⁹⁹ NCTA also argues that the petition should be rejected because, by requesting a declaration that alternative spectrum is available in other frequency bands, it seeks a change to the Commission's Table of Frequency Allocations in a manner that conflicts with basic notice and comment rule making procedures.¹⁰⁰ MDS America argues that the petition raises issues that are beyond the scope of this proceeding, and that MDS America would only support an effort to identify additional, but not replacement, spectrum for MVDDS and, then, only if licensing of MVDDS in the 12 GHz band were not delayed.¹⁰¹

48. We find the DBS Petition for Consolidation and Declaration to be untimely and without merit. Although styled as a petition for consolidation of three rulemaking proceedings and for a declaration that other frequencies are suitable for MVDDS, the petition essentially asks the Commission to reconsider its threshold decision to authorize MVDDS in the 12 GHz band. The deadline for filing

⁹⁴ 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," received Dec. 3, 2001 (DBS Petition for Consolidation and Declaration).

⁹⁵ See Petition for Rulemaking to Amend Eligibility Requirements in Part 78 Regarding 12 GHz Cable Television Relay Service, CS Docket No. 99-250; RM-9257.

⁹⁶ See Amendment of Part 2 of the Commission's Rules to Allocate Spectrum Below 3 GHz for Mobile and Fixed Services to Support the Introduction of New Advanced Wireless Services, Including Third Generation Wireless System, ET Docket No. 00-258.

⁹⁷ See DBS Petition for Consolidation and Declaration at 5 et seq.

⁹⁸ See Opposition of Northpoint Technology, Ltd., and Broadwave USA, Inc., to DBS Petition for Consolidation and for Declaration that Planned Terrestrial Services in the 12.2-12.7 GHz Band Should be Moved to Alternate Spectrum, received Dec. 21, 2001.

⁹⁹ See Letter from NCTA to Magalie R. Salas, Secretary, Federal Communications Commission (FCC), dated Jan. 11, 2002.

¹⁰⁰ *Id.*

¹⁰¹ See MDSA, *Ex Parte* FCC, letter to Secretary Magalie Roman Salas, FCC, dated Dec. 10, 2001.

petitions for reconsideration of the Commission's *First R&O* lapsed in March 2001. Therefore, we find that the petition for consolidation and declaration is untimely and it is hereby dismissed on that ground.

49. Notwithstanding that we dismiss the petition as untimely, we will briefly discuss the merits on our own motion. We do so because we wish to forestall further delays to the implementation of MVDDS.

50. As an initial consideration, we observe that NCTA is correct in noting that Section 308 of the Act provides, in part, that the *applicant* for a license must specify the desired frequency of operation.¹⁰² Furthermore, by requesting a "declaration that alternative spectrum is suitable," the petition appears to seek a change in our Table of Frequency Allocations without the benefit to interested parties that is afforded by basic administrative notice and comment rule making procedures. As NCTA aptly points out, in taking both of these considerations into account, it is implicit that the applicant must be satisfied that the available frequencies are suitable for the intended service. No indication exists that this is the case here. In fact, quite the opposite appears to be true inasmuch as Northpoint has made it very clear in the record that it does not perceive alternate frequencies outside the 12 GHz band to be desirable. Therefore, we conclude that it would not serve the public interest at this late point in time to engage in a further search for alternative spectrum that we know, *a priori*, is not deemed satisfactory by prospective MVDDS licensees merely to appease the petitioners' objection to the Commission's original 12 GHz decision.

51. We also note that DirecTV and EchoStar plainly do not agree with the Commission's threshold decision or rationale for authorizing MVDDS in the 12 GHz band. Earlier in this *MO&O* and in the *First R&O*, the Commission enumerated some of the spectrum efficiency and public interest considerations that were balanced in deciding to authorize MVDDS in the 12 GHz band.¹⁰³ Those considerations include, *inter alia*, the degree of encumbrance by existing operations and other related factors. We also affirmed above in this *MO&O* our conclusion that those considerations warranted denying the petitions for reconsideration of that decision. The same considerations apply here. DirecTV and EchoStar desire that we identify yet other spectrum - namely segments of the CARS and MMDS bands - to which we should relegate MVDDS. Their arguments are repetitive of the same arguments made in their original reconsideration petitions that we have already addressed in this *MO&O* and have found to be unpersuasive.

52. We find that neither the CARS nor the MMDS bands would be more advantageous for MVDDS operations as compared with the spectrum efficiency and public interest benefits of the 12 GHz band. Both the CARS and MMDS bands are widely used by different services. Beyond asserting purported benefits to MVDDS of using these two bands, DirecTV and EchoStar fail to offer any specific technical information as to how to resolve potential interference and coordination issues that would inevitably arise from sharing these bands with MVDDS. We also find that DirecTV and EchoStar's simplified characterization of the present use of these two bands greatly underestimates the potential problems were MVDDS to be authorized to share that spectrum. The CARS band currently supports four radio services.¹⁰⁴ The most active user of the band is CARS with over 121,000 links. The second most active user is the BAS with 4,900 links, followed by Fixed Service point-to-point operations with 1,300 links and the Fixed-Satellite Service with 130 earth station uplinks. Also, the Commission recently decided in the *First R&O* in this proceeding to authorize NGSO FSS earth stations in this band. Unlike the current DBS usage in the 12 GHz band, where sharing is enabled by DBS receive antennas that point generally southwards and upwards toward the geostationary arc, the antennas in the CARS band point in

¹⁰² See 47 U.S.C. § 308(b). "All applications for station licenses ... shall set forth such facts as ... the *frequencies and power desired to be used* ..." Emphasis added).

¹⁰³ See, e.g., *First R&O*, 16 *FCC Rcd* at 4161 ¶ 168.

¹⁰⁴ CARS, BAS, FS, and FSS uplinks.

many different directions. Furthermore, BAS licensees in particular are authorized to use this band, *inter alia*, for itinerant, mobile operations over wide ranging and constantly changing geographic areas across the entire nation for such purposes as electronic news gathering (ENG) and broadcast event production purposes. Taking all of these services together, we conclude that coordination of MVDDS in that band is likely to be far more complicated in many locations than is the case in the 12 GHz band. In short, we find that the CARS band is currently so encumbered by a multitude of different services, including two-way and itinerant area-wide operations, that authorizing MVDDS in that band appears to present significantly complex sharing issues at this time. Similarly, we note that while the MMDS band already has some wide-area video transmitters that provide direct service to consumers, the band is being changed to two-way broadband use. In addition, the band also is extensively used for Instructional Television Fixed Service (ITFS). For example, ITFS makes pervasive use of the spectrum to provide formal classroom instruction, distance learning, and videoconferencing capability to a wide variety of educational users throughout the nation. Therefore, we also find that the MMDS band is so encumbered by existing services that it too appears to present significantly complex sharing issues. Accordingly, we find the substance of the petition for consolidation and declaration to be without merit.

V. SECOND REPORT AND ORDER

A. Technical Criteria for Sharing and Operations in the 12.2-12.7 GHz Band

53. In this *Second Report and Order*, we adopt technical criteria for MVDDS that enable a new terrestrial service to be deployed in the 12.2-12.7 GHz band while protecting the operations of incumbent BSS and new NGSO FSS. In reaching our decision, we have carefully considered the extensive record in this proceeding, and we believe that the technical criteria we are adopting are a reasonable balance of the parties' competing interests. Our decision recognizes that successful sharing of spectrum in this case requires each service to make some accommodation for the other services in the band. We conclude that any impacts on incumbent BSS or new NGSO FSS to accommodate MVDDS in this band are outweighed by the potential benefit to the public of providing for a new potential competitor in the multichannel video and data markets.

1. MVDDS/BSS Sharing

a. Technical Criteria for MVDDS/BSS Sharing

54. Background. In the *Further Notice*, the Commission sought comment on the technical criteria needed to deploy MVDDS so that the 12.2-12.7 GHz band can be shared successfully with incumbent BSS operations.¹⁰⁵ Specifically, the 12.2-12.7 GHz band is allocated to the fixed service on a co-primary basis; however, the service is prohibited from causing harmful interference to BSS.¹⁰⁶ The Commission tentatively concluded in the *Further Notice* that this could be accomplished through careful MVDDS system design and the use of mitigation techniques. The Commission proposed a regulatory structure for MVDDS similar to that adopted to protect BSS from NGSO FSS operations in this band. For NGSO FSS systems, we adopted EPFD limits based on limiting the maximum amount of increased DBS service unavailability over a baseline level of service unavailability due to the presence of the new service. This approach was taken to ensure a *de minimis* impact to DBS operations that would not be perceptible to customers nor hinder DBS operations.¹⁰⁷ Accordingly, we proposed that MVDDS also be held to limits

¹⁰⁵ See *Further Notice*, 16 FCC Rcd at 4196 ¶¶ 267-268.

¹⁰⁶ See 47 C.F.R. § 2.106, footnote S5.490. See also *First R&O*, 16 FCC Rcd at 4177 ¶ 213.

¹⁰⁷ DBS reception in any given geographic area is dependent on the satellite downlink power budget and the frequency, duration, and intensity of rain. During a period of significant rain, the presence of interference from a terrestrial fixed service could advance the onset of picture loss and could cause the duration of this picture loss to last longer than experienced from rain alone.

designed for a similar result. Specifically, the Commission stated that it intended to adopt technical limits for MVDDS that would keep the increased DBS unavailability below a permissible level. This permissible level would not approach a level that could be considered harmful interference under our rules.¹⁰⁸ Several options for technical limits were discussed in the *Further Notice* including, allowing MVDDS to cause an increase in DBS outage equal to a percentage of DBS's baseline outage, allowing MVDDS to cause an increase in DBS outage equal to a fixed number of minutes over DBS's baseline outage, and establishing a DBS carrier to MVDDS interference (C/I) ratio.¹⁰⁹ As an alternative to setting specific interference criteria, the *Further Notice* sought comment on whether an MVDDS provider should simply respond to and provide remedies for DBS consumers who complain of interference.

55. In addition to the central issue of defining interference criteria, the *Further Notice* proposed to define an analytical model for calculating the baseline outage of a DBS system and the increased outage due to the presence of an MVDDS system.¹¹⁰ Regardless of the criteria selected, most parties to this proceeding recognize that there will likely be an area surrounding the MVDDS transmitting antenna where the interference criteria may not be met without some form of mitigation being performed.¹¹¹ Therefore, the Commission also proposed a model for calculating this mitigation zone. These models were proposed to ensure that parties use consistent methods to analyze potential interference. The Commission sought comment on the validity of its model and asked commenters to suggest modifications or alternative models. The Commission also proposed and sought comment on procedures for identifying and mitigating interference to DBS customers.

56. The record in this proceeding regarding the potential for MVDDS to successfully share the 12.2-12.7 GHz band with DBS has been supplemented by a Congressionally mandated study performed by MITRE.¹¹² Generally, the MITRE Report concluded that terrestrial use of the 12.2-12.7 GHz band could pose a significant interference threat to DBS, but that the interference could be mitigated to allow spectrum sharing within the band. In addition, MITRE made several recommendations regarding how such band sharing could be accomplished.

57. MITRE's recommendations were based on its performance of the following tasks: measurement of DBS and MVDDS equipment, including antennas and receivers; simulation of satellite receivers; propagation and rain attenuation modeling; and interference predictions. More specifically, MITRE used an anechoic chamber to measure antenna gain patterns of various MVDDS transmit and DBS receive antennas.¹¹³ With respect to DBS receivers, MITRE used signal processing software tools to model the characteristics of DirecTV and EchoStar's signals and the performance of DBS receivers both with and without an MVDDS signal being present.¹¹⁴ Through this effort, MITRE developed

¹⁰⁸ See *First R&O*, 16 FCC Rcd at 4177 ¶ 213.

¹⁰⁹ See *Further Notice*, 16 FCC Rcd at 4196-98 ¶¶ 268-271.

¹¹⁰ See *Further Notice*, 16 FCC Rcd at 4198 ¶ 272 and Appendix H.

¹¹¹ See, e.g., Northpoint Comments at Technical Appendix, p. 7; Pegasus Reply Comments at 7. Northpoint proposes a plan in which it would be required to mitigate interference on a customer complaint basis in the first eighteen months after deployment within a mitigation zone based on an EPFD contour. See also, EchoStar Comments at 20; DirecTV Reply Comments at 18. EchoStar and DirecTV assert that shielding or relocation of the MVDDS transmitter is the only acceptable mitigation to protect DBS subscribers.

¹¹² See para. 13, *supra*.

¹¹³ Pictorial representations of the antenna patterns can be found in the MITRE Report, Section 4. The measured data, in a format suitable for use in a simulation, is available on the FCC's web site at <http://www.fcc.gov/oet/info/mitrereport/>.

¹¹⁴ See MITRE Report at Section 3.