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June 18, 2001

RECEIVED
JUN 18 2001
FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF THE SECRETARY

VIA HAND DELIVERY

EX PARTE

Ms. Magalie Roman Salas
Secretary
Federal Communications Commission
445 12th Street, S.W.
Washington, D.C. 20554

Re: Ex Parte Communication in ET Docket No. 98-206; RM-9147; RM-9245; Applications of Broadwave USA et al., PDC Broadband Corporation, and Satellite Receivers, Ltd., to provide a fixed service in the 12.2-12.7 GHz Band; Requests of Broadwave USA et al. (DA 99-494), PDC Broadband Corporation (DA 00-1841), and Satellite Receivers, Ltd. (DA 00-2134) for Waiver of Part 101 Rules.

Dear Ms. Salas,

On June 15, 2001, Sophia Collier and Antoinette Cook Bush of Northpoint Technology, Ltd. ("Northpoint) met with Kenneth Ferree, Chief of the Cable Services Bureau, and Thomas Horan, also of the Cable Services Bureau.

The purpose of the meeting was to discuss the pending applications of Northpoint's Broadwave USA affiliates for licenses to provide terrestrial service in the 12 GHz band. Northpoint urged the Commission to act quickly in reaching a decision regarding its applications, in order that it can begin providing service that will bring real competition to the markets for MVPD and broadband Internet access. Northpoint also pointed out, as noted in the comments it has filed in ET Docket 98-206, that several congressional enactments require prompt action by the Commission on its license applications. Furthermore, Northpoint observed that it is the only applicant proven capable, in an independent technical demonstration by the MITRE Corporation, of sharing the 12 GHz band ubiquitously with existing and planned satellite users. Accordingly, it is the only applicant qualified for a license. The attached handouts were distributed at the meeting.

Eighteen copies of this letter are enclosed – two for inclusion in each of the above-referenced files. Please contact me if you have any questions.

No. of Copies rec'd 0+18
ABCDE

Yours sincerely,

J.C. Rozendaal

attachments

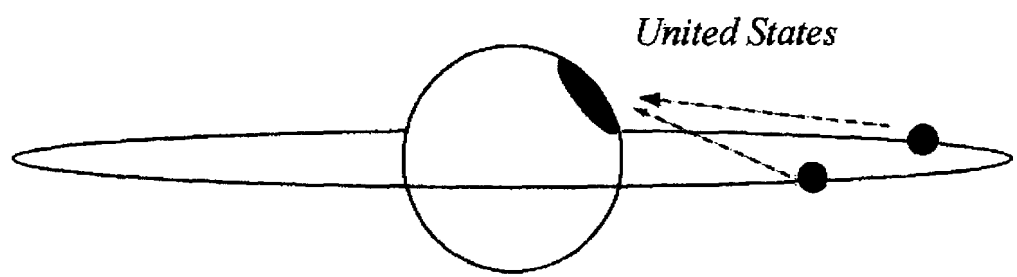
cc: W. Kenneth Ferree
Thomas Horan

Northpoint Uses Proven Spectrum Sharing Principals

- Northpoint shares spectrum with direct broadcast satellites just as DBS operators currently share with each other.

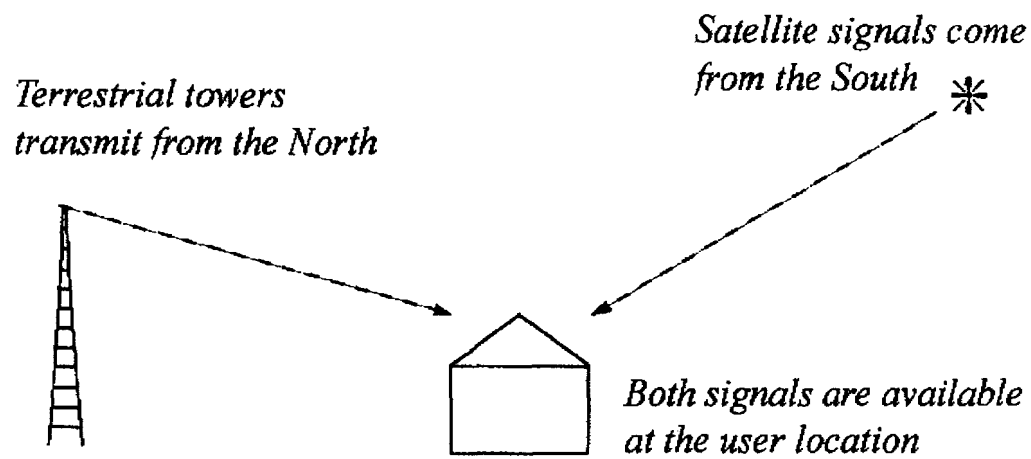
- Direct broadcast satellites operate in orbital positions over the equator.

- All of these satellites broadcast simultaneously - fully sharing the exact same 500 MHz band located at 12.2 - 12.7 GHz.



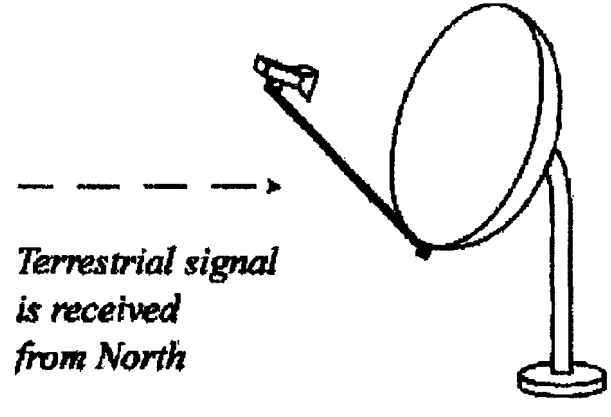
Bringing It Down to Earth

- Northpoint Technology uses this Northern resource: By combining power limitations, specialized equipment and transmissions from terrestrial towers located to the north into directional receive antennas similar to satellite dishes, frequencies can be re-harvested for new uses.



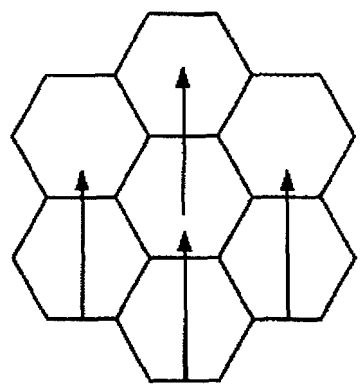
Terrestrial Services with a Small Dish

- A combination service can be offered to users or stand-alone services can also be available.

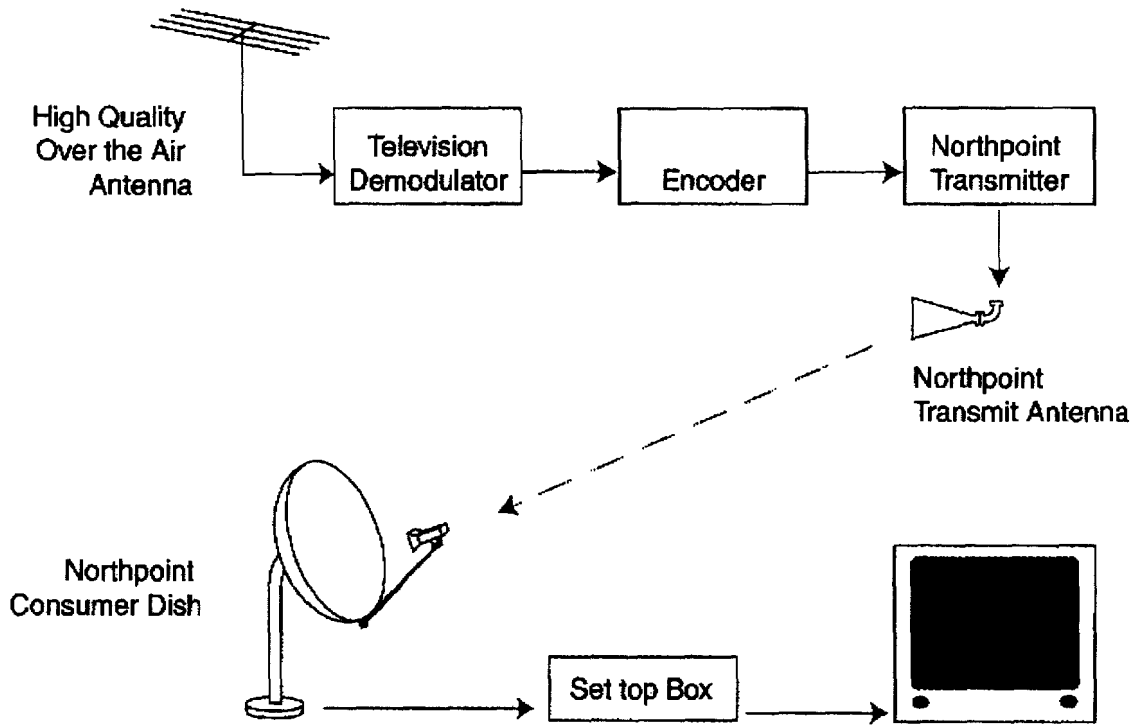


Cascading Cell Architecture

- To ensure good reception throughout the service area, the terrestrial signals will be transmitted over a series of cascading repeater cells, each approximately 100 square miles in size.



HOW NORTHPOINT TECHNOLOGY CREATES DIGITAL TELEVISION



Business Plan & Status of Applications

- Northpoint services will be sold through a network of local companies operating under the trade name Broadwave.
- The Broadwave affiliate network applied for licenses in January 1999 in the same filing window as Skybridge and other Non Geo-Stationary Satellite Operators ("NGSO").
- In November 2000, the FCC issued an order allocating spectrum for terrestrial services and NGSO and issuing a Further Notice of Proposed Rulemaking ("FNPRM").
- In April 2001 "MITRE" testing was completed.
  - FNPRM and MITRE public Comments and Reply Comments cycles are now complete.

Competition to Cable & DBS

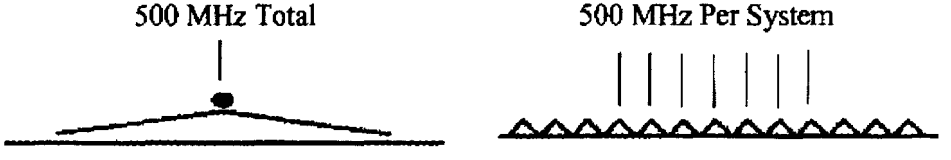
- Our Goal: Create a new, nationwide, high quality, digital multi-channel video and high-speed Internet service and compete effectively with both cable & DBS.
- According to current FCC information:
  - Fewer than 300 out of 33,000 communities have "effective" cable competition
  - Only 5% of all homes have a high speed data service
- Cable prices increased 5.8% in 2000 (Associated Press)
- *New sources of competition are needed*

Our Competitive Advantages Over Cable

- Digital from Day One
  - High quality picture for all subscribers
- Cost and pricing advantage
  - Cable spends $10 – 15 per month on cable infrastructure; our infrastructure will be much less expensive allowing us to price our services $8 – 10 lower and earn the same net revenue per customer.
- Strong customer service
  - As a new national company with a local presence and devotion to high quality service, we will gain customers who are dissatisfied with cable service.

Our Competitive Advantages Over DBS

- Capacity advantage
  - DBS infrastructure has a very low capacity. *Each* Broadwave market area will have a greater capacity than *all* of DirecTV or Echostar.



DBS - Single satellite beam serves the whole country

Broadwave – Each market would have its own 500 MHz

"Satellite Home Viewer" Issue Looming

- DBS is headed for a crisis when the "carry one – carry all" mandates of the Satellite Home Viewer Improvement Act ("SHIVA") legislation become effective on January 1, 2002.
- This legislation requires that DBS carry *all* local television stations in any market where it carries one station.
  - DBS currently provides fewer than 180 local television channels in 41 local markets - out of 1,600 stations in 210 markets.
  - Full SHVIA compliance would require carriage of approximately 575 stations.
  - Likely result: Dozens of markets will lose local programming on New Year's Day.

FCC FILINGS IN SUPPORT OF NORTHPOINT

(Contained in FCC Comments and Reply Comments -- ET Docket No. 98-206)

Broadcasters:

National Association of Broadcasters (NAB)
National Association of Black Owned Broadcasters (NABOB)
Local Broadcast Station Owners (130 stations):
- Joint Comments:
  - Benedek Broadcasting Corporation
  - Corridor Television, LLP
  - Eagle III Broadcasting, LLC
  - Granite Broadcasting Corporation
  - Lin Television Corporation
- Separate Comments:
  - Gray Communications Systems
  - Paxson Communications Corporation
  - Second Generation of Iowa

Consumer and Minority Advocacy Groups:

Consumers Union, *et. al.*
- Center for Media Education
- Consumer Federation of America
- Consumers Union
- Leadership Conference on Civil Rights
- League of United Latin American Citizens
- Media Access Project

Minority Media and Telecommunications Council (MMTC)
National Indian Telecommunications Institute (NITI)

Others:

Tom Hazlett (Economist)
*Virtual Geosatellite, LLC (NGSO)

*Comments support spectrum sharing

Northpoint Solves Impending Satellite Must Carry Crisis

A Must Carry Showdown Is Just Months Away

- On January 1, 2002, the Satellite Home Viewer Improvement Act requires DBS carriers to serve local communities with a full set of local signals. No longer can they cherry pick and instead must abide by the rule: "carry one, carry all." Congress extended cable's must carry rule to DBS because local stations provide valuable news, weather and other community-oriented programming, and offer local businesses an effective way to advertise.

Satellites Lack Capacity To Satisfy Must Carry Obligation

- DBS carriers lack capacity to carry all 1,600 local TV stations. DirecTV and EchoStar now carry 183 stations in 42 markets – not even *one* station for each of the 210 local markets! They have generally opted to carry only affiliates of the top four networks (ABC, CBS, FOX, NBC). In these markets, non-carried independent stations and affiliates of UPN, WB and PAX face a significant marketplace disadvantage. Thus, in addition to being unable to deliver *any* local channels to the smaller markets, DBS operators appear ill-equipped to satisfy a must carry requirement in the larger markets they now serve by January 1, 2002.

- ***To free up capacity, DBS will have to drop some national channels and/or scale back the number of markets to which they provide local signals.***

Lacking Technical Solution, DBS Seeks To Overturn Must Carry Law

- On September 20, 2000, the DBS carriers filed a lawsuit contesting the constitutionality of the must carry law. The suit betrays their support for passage of the law and reveals a woeful disregard for local communities and TV stations – describing most programming as "of limited interest and viewership, duplicative of other programming . . . or otherwise not in harmony" with DBS objectives.

- Many will recall the deluge of letters and calls from DBS subscribers who decried the court-ordered cutoff of illegally provisioned network signals. A similar torrent of complaints will undoubtedly hit Washington after DBS carriers inform their subscribers they must turn off channels in order to fulfill their statutory obligation.

Northpoint Technology Can Satisfy Must Carry – And At Low Cost

- Northpoint Technology, an innovative locally based, high-capacity technology, is committed to deliver *all* local signals in *all* 210 markets on the first day it begins operations. It will provide subscribers with all local signals, plus other multi-channel video programming for just $20/month – plus optional high speed Internet service for only another $20. Ironically, Northpoint's system could help the DBS carriers satisfy their own must carry obligation by enabling their customers to obtain local signals via a complementary Northpoint feed, which would simply require installation of a separate antenna.

Northpoint Technology
An Innovative New Competitor to Cable and DBS

- Northpoint Technology, Ltd. and its local Broadwave affiliates seek to compete with cable and DBS offering multi-channel video programming via locally based wireless networks enabled by Northpoint innovative patented technology. This new service will also provide low cost broadband Internet service in urban and rural areas.

- This new wireless terrestrial technology offers effective, non-regulatory, solutions to a number of policy challenges:

    - *Industry Competition:* Because Northpoint's wireless network can be deployed at a low cost; consumers will be billed at a correspondingly low monthly fee of less than $20/month for 96 channels of digital television.
    - *Local-into-Local:* Northpoint and its Broadwave affiliates will carry *all* local television stations in the United States, thus ensuring that consumers in even the most rural markets will have access to their local TV stations.
    - *Broadband:* In addition to providing video programming, Northpoint's system will also provide broadband Internet access, which will be particularly beneficial in remote areas not served by cable or DSL.
    - *Service to Rural Areas:* Since Northpoint is a low cost, high capacity technology is it uniquely suited to service rural areas.

- Northpoint's terrestrial network shares spectrum with direct broadcast services (DBS) and uses a small dish antenna for reception. Northpoint service operates on a co-primary basis with other users but has agreed to avoid causing harmful interference to incumbent DBS users.

- Northpoint has operated successfully under three FCC experimental licenses: Kingsville, TX (1997); Austin, TX (1998); and Washington, DC (1999). Independent firms, including Lucent Technologies participated in the design and performance of each of the tests and issued independent analyses verifying the results.

- Northpoint first brought its technology to the FCC in 1994 and since that time has been diligently working for FCC approval. In November 2000, the FCC issued an Order verifying that Northpoint's technology can be used and sought comments on licensing options.

- All of the Broadwave affiliates stand ready to deploy their networks, once they secure regulatory approval from the FCC. The first systems can be operational in 6 months, with nationwide coverage completed within 2 years.

Lucent Technologies, Bell Labs
Advance Technology Center of Excellence
Wireless and Multimedia System Development Group, Arlington VA

On Northpoint Field Trial in Washington DC Sept – Oct 1999

Habib Riazi
Lucent Technologies, Bell Labs

Abstract:

Northpoint is proposing to provide terrestrial digital multichannel TV and wideband forward link Internet services using the 12.2-12.7 GHz spectrum that is currently used by Satellite Direct Broadcasting Services (DBS). Northpoint transmission is based on a patented approach similar to Space Division Multiplex (SDM) using directional antennas. There has been an interest on part of FCC as well as, DBS providers, Northpoint, and Lucent Technologies Bell Labs to get a precise understanding of the potential interference to DBS customers located at relatively close ranges to the Northpoint transmitter. During the months of August and September, Northpoint conducted a series of field tests in Washington DC area that provided useful data for this study. In this memorandum, we have provided some insight into the representative real world effects on the operation of the DBS customers at close ranges[1] including one at 0.17 Km from Northpoint transmitter. This analysis shows that for the site located at 0.17 Km from Northpoint Transmitter, measured degradation of received Eb/No for a DBS receiver is less than 0.23 dB with 95% confidence. Further, this reduction corresponds to a C/I of 24 dB under the test conditions. For general applicability, these figures can be scaled to other link conditions in conjunction with the DBS link budget and interpreted with respect to the link availability in terms of percentage of time and places. It is our opinion that for this level of interference the impact on the DBS services is negligible in all weather conditions.

[1] Due to the signal attenuation, the interference at locations beyond a few miles is not a concern.

THE BOTTOM LINE

"MITRE believes that with implementation of the licensing process described in Section 6.3 and the other policy recommendations outlined above, spectrum sharing between DBS and MVDDS[1] services in the 12.2–12.7 GHz band is feasible."

Conclusion of MITRE Executive Summary
Analysis of Potential MVDDS Interference to DBS in the 12.2–12.7 GHz Band, MITRE Corporation 4/23/01 (page xxi)

[1] MVDDS is the acronym for Multichannel Video Distribution and Data Service, a new terrestrial service proposed by the FCC in November of 2000. Northpoint Technology was the only company to provide equipment and technology to MITRE for evaluation in order to offer the new service.

Northpoint Technology

Annotated Version of
MITRE Technical Report – Abstract and Executive Summary

Analysis of Potential MVDDS Interference to DBS in the 12.2-12.7 GHz Band

April 25, 2001

MTR 01W0000024
MITRE TECHNICAL REPORT

Analysis of Potential MVDDS Interference to DBS in the 12.2–12.7 GHz Band

April 2001

MITRE

Text boxes indicate Northpoint comments.
Emphasis added by Northpoint.

Abstract

Bottomline:

MITRE recommends licensing of new service.

The frequency band between 12.2 and 12.7 gigahertz (GHz) is allocated to Fixed and Broadcasting-Satellite radio services on a co-primary basis. In the United States, this band is widely used for direct broadcast satellite (DBS) services. Terrestrial radiocommunication services are also permitted, provided that these do not interfere with the satellite services. In 1999, Broadwave USA, a subsidiary of Northpoint Technologies, filed a petition with the Federal Communications Commission (FCC) seeking an authorization to operate terrestrial stations delivering Multichannel Video Distribution and Data Service (MVDDS) in the 12.2–12.7 GHz band. Since that time, numerous concerns have been raised about the extent and impact of potential interference of MVDDS transmissions on the existing DBS service. This report provides a thorough assessment of MVDDS interference into DBS receivers. It is based on a comprehensive analysis that included extensive laboratory and field measurements. The analysis also made use of modeling and simulation techniques to validate published and measured performance results. Special attention was given to the degradation of system availability in the presence of rain losses. The report also discusses possible interference-mitigation approaches, recommends a process for licensing MVDDS transmitters, and addresses key policy issues.

KEYWORDS: Spectrum sharing, MVDDS, DBS, interference, broadcast satellite, EchoStar, DIRECTV, Dish TV, Northpoint, video quality.

Text boxes indicate Northpoint comments.
Emphasis added by Northpoint.

Executive Summary

The frequency band between 12.2 and 12.7 gigahertz (GHz) is allocated to the Fixed and Broadcasting-Satellite radio services on a co-primary basis. International Telecommunications Union (ITU) Footnote S5.490 permits the operation of stations that provide "terrestrial radiocommunication services" in the same band, subject to the restriction that they "shall not cause harmful interference to the space services operating in conformity with the broadcasting satellite Plan for Region 2 contained in Appendix S30." CFR 47, Part 100 codifies U.S. regulations for Direct Broadcast Satellite (DBS) service in this band.

In 1999, Broadwave USA, a subsidiary of Northpoint Technologies, Inc., filed a petition with the Federal Communications Commission (FCC) seeking an authorization to operate terrestrial stations delivering Multichannel Video Distribution and Data Service (MVDDS) in the 12.2–12.7 GHz band. Subsequently, two other companies, PDC Broadband Corporation and Satellite Receivers, Ltd. filed similar applications with the FCC.

The FCC issued a Notice of Proposed Rulemaking on 24 November 1998, and a First Report and Order (R&O) and a Further Notice of Proposed Rulemaking (NPRM) as ET Docket 98-206 on 8 December 2000. These documents address the issues associated with permitting MVDDS in the band, and conclude that sharing the band between MVDDS and DBS systems is possible, subject to certain precautions that must be taken to prevent interference to DBS systems.

MITRE Report had two goals:

1- **Analyzing general issues of sharing between MVDDS and DBS**

2- **Demonstration of specific technologies of Northpoint, Pegasus and Satellite Receivers using equipment provided by the specific company.**

The FCC's Fiscal Year (FY) 2001 budget authorization contains a requirement that the FCC select an independent engineering firm to perform an analysis to determine whether these two services can share the band without harmful interference to DBS systems. The FCC selected The MITRE Corporation to perform this work. The 19 January 2001 Statement of Work for the project says that "The objective of the tasks is to perform a technical demonstration or analysis of any terrestrial service technology proposed by any entity that has filed an application to provide terrestrial service in the direct broadcast satellite frequency band to determine whether the terrestrial service technology proposed to be provided by that entity will cause harmful interference to any direct broadcast satellite service."

MITRE's effort was divided into tasks in the following areas:

- Equipment measurements
- Satellite receiver simulation
- Propagation and rain-attenuation modeling
- Interference predictions

All measurements for the project were conducted at MITRE's laboratories in Bedford,

Massachusetts. MITRE measured the radiation patterns of three DBS antennas and two MVDDS antennas in its anechoic chamber, which has been extensively used to make measurements of critical defense systems for several years. DBS receiver susceptibility to MVDDS interference was measured in the laboratory by connecting an MVDDS transmitter to a DBS receiver through an attenuator, and varying the MVDDS signal level to generate a set of susceptibility curves. The DBS receiver was operating with a live signal from the satellite at the time of these measurements. Limited field measurements of the MVDDS signal level at the terminals of the DBS antenna were also made for a variety of DBS antenna orientations. Appendix A contains a detailed description of measurement procedures.

MITRE's Fort Monmouth, New Jersey laboratory used the Signal Processing Workstation (SPW™) software package to model the DBS/MVDDS interference environment in order to provide an independent verification of the laboratory measurements. Runs were made for the combinations of code rate, interleaver length and Reed-Solomon error correction that are in use by DBS vendors. The simulations produced results that were consistent with those derived from the laboratory and field measurements. Details of the simulation can be found in Section 3.1.

The primary propagation mechanism of interest in this analysis is the attenuation of DBS signals by rain, which is the most significant variable in the computation of downlink availability. The amount of attenuation is a function of rain rate, which varies with geographic location. Section 2 provides a discussion of the rain model used in this analysis.

To quantify the effect that MVDDS systems would have on DBS reception, a model was developed that incorporates the measured and simulated susceptibility data, the rain attenuation statistics, and the equipment parameters of the two systems. This model was run for ten locations throughout the contiguous United States to assess the impact of MVDDS operations on DBS reception. The locations were selected to cover the full range of climatic regions and DBS elevation angles. The model produced plots showing areas where the interference-impact criterion (change in unavailability) was exceeded. From these plots, it was possible to determine the feasibility of MVDDS deployment in the band.

Conclusions

The analysis and testing performed by MITRE and described elsewhere in this report have demonstrated that:

"Generic" MVDDS can pose an interference threat.

- MVDDS sharing of the 12.2–12.7 GHz band currently reserved for DBS poses a significant interference threat to DBS operation in many realistic operational situations.

Text boxes indicate Northpoint comments.
Emphasis added by Northpoint.

Interference can be reduced or eliminated by technology: "mitigation techniques."

- However, a wide variety of mitigation techniques exists that, if properly applied under appropriate circumstances, can greatly reduce, or eliminate, the geographical extent of the regions of potential MVDDS interference impact upon DBS.

- MVDDS/DBS bandsharing appears feasible if and only if suitable mitigation measures are applied. Different combinations of measures are likely to prove "best" for different locales and situations.

The question remains: do the potential costs of applying the necessary mitigatory measures, together with the impact of the residual MVDDS-to-DBS interference that might remain after applying such measures, outweigh the benefits that would accrue from allowing MVDDS to coexist with DBS in this band? To facilitate the FCC's decision, we have assessed the probable effectiveness of available mitigation techniques in reducing the potential impact and geographical extent of MVDDS interference upon DBS operations.

Techniques for preventing or reducing MVDDS interference in DBS receivers fall into three general categories:

- Selection of MVDDS operational parameters
- Possible MVDDS system-design changes
- Corrective measures at DBS receiver locations

Mitigatory techniques in each of these three categories are discussed in detail in Section 6.2. The most important operational parameters that can be adjusted to control interference in existing MVDDS system designs are transmitter power, frequency offset, tower height, elevation tilt, and azimuthal orientation.

Northpoint holds patent on this technique and demonstrated it to MITRE as shown in Appendix A.

- *Keeping MVDDS transmitter power as low as possible* without sacrificing coverage requirements is the most basic and obvious means for controlling interference to DBS.

Northpoint demonstrated second technique to MITRE, Appendix A.

- The use of a *7-MHz frequency offset* between the MVDDS and DBS carriers has been shown through MITRE's testing to reduce effective interference levels by 1.7 dB, and noticeably shrinks the areas in which DBS receivers are potentially affected by MVDDS interference.

Northpoint demonstrated this technique in its Washington DC test.

- *Increasing the MVDDS transmitting antenna height* reduces the sizes of the areas susceptible to a given level of interference. However, the simulations of pages B-11 through B-15 indicate that substantial benefits may not accrue unless the tower height is at least 100, or perhaps even 200, meters above the level of the DBS receiving antennas in the surrounding area.

This is a valuable method in some cases. Demonstrated to MITRE by Northpoint.

- *Adjusting the elevation tilt* of the MVDDS transmitting antenna may not be particularly effective. Tilting the antenna up 5 reduces the interference-impact area

CERTIFICATE OF SERVICE

I, Shannon Thrash, hereby certify that on this 18th day of June, 2001, copies of the foregoing were served by hand delivery* or first class United States mail, postage prepaid, on the following:

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