

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

_____	)	
	)	
In the Matter of:	)	
	)	
<b>ECHOSTAR CORPORATION</b>	)	File No. SES-MFS _____
	)	Call Sign E080107
Application for Modification of Authority to	)	
Operate 5,000,000 receive-only earth	)	
stations in the United States to receive Direct	)	
Broadcast Satellite Service from the	)	
Canadian-licensed Nimiq 5 Satellite at the	)	
72.7° W.L. Orbital Location	)	
_____	)	

**APPLICATION**

By this Application,<sup>1</sup> EchoStar Corporation (“EchoStar”) seeks to modify its authority to operate 5,000,000 receive-only earth stations in the United States to receive Direct Broadcast Satellite (“DBS”) service from the Nimiq 5 satellite operating as a Canadian-licensed satellite on up to 32 channels at the 72.7° W.L. orbital location.<sup>2</sup>

The 72.7° W.L. orbital location has been allotted to Canada under the International Telecommunication Union’s Region 2 Plan for the Broadcasting-Satellite Service (“BSS”). Canada has authorized Telesat Canada to use the entire 12.2-12.7 GHz DBS band at the 72.7°

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<sup>1</sup> Concurrent with this application, EchoStar is filing applications to modify two earth station authorizations (E070014 and E080007) to perform feeder link operations with the Nimiq 5 satellite at 72.7° W.L.

<sup>2</sup> EchoStar is requesting a partial waiver of the processing fees payable for this application. See Attachment A.

W.L. location. Telesat plans to launch its new Nimiq 5 satellite to that location in September 2009 and has contracted to provide the use of all of the satellite's capacity to Bell ExpressVu Limited Partnership, a limited partnership organized under the laws of the Province of Ontario in Canada, acting through its General Partner, Bell ExpressVu Inc., a Canadian company. ("Bell ExpressVu"). Pursuant to the Nimiq 5 Transponder Service Agreement between EchoStar (and certain of its affiliates) and Bell ExpressVu (the "Nimiq 5 Agreement"), EchoStar will in turn subscribe for the use of up to 16 of the satellite's DBS transponders to provide service into the U.S.<sup>3</sup>

This is not the first satellite operation within the 72.7° W.L. orbital cluster to be reviewed by the Commission. In 2008, the Commission authorized EchoStar to relocate its EchoStar 6 satellite from 110° W.L. to 72.7° W.L.,<sup>4</sup> reflag it as a Canadian-licensed satellite, and provide service into the U.S.<sup>5</sup> Similarly, in 2004, 2005 and 2007, the Commission authorized service to the U.S. from three successive DIRECTV satellites operating at 72.5° W.L. – DIRECTV 5, DIRECTV 1 and DIRECTV 1R.<sup>6</sup>

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<sup>3</sup> See Nimiq 5 Transponder Service Agreement between Bell ExpressVu Limited Partnership, by its General Partner Bell ExpressVu Inc., and EchoStar Corporation, dated March 11, 2008, attached hereto as Attachment B. An unredacted version of this agreement is being submitted separately subject to a request for confidential treatment.

<sup>4</sup> File No. SAT-STA-20080512-00103 (granted July 2, 2008).

<sup>5</sup> File No. SES-LFS-20080512-00595 (granted July 28, 2008).

<sup>6</sup> See File Nos. SAT-STA-20061213-00149 (granted Mar. 8, 2007), SES-MFS-20061213-02157 (granted Mar. 9, 2007) (authorizing relocation of DIRECTV 1R to 72.5° W.L. and modifying blanket earth station license E040024 to add DIRECTV 1R as a point of communication at that location). See also *DIRECTV Enterprises, LLC*, DA 05-1890, Order and Authorization, 20 FCC Rcd 11772 (2005) (authorizing relocation of DIRECTV 1 to 72.5° W.L. and modifying blanket earth station license E040024 to substitute DIRECTV 1 for DIRECTV 5 at that location); *DIRECTV Enterprises, LLC*, DA 04-2526, Order and Authorization, 19 FCC

Consistent with EchoStar's authority to provide service from the EchoStar 6 satellite located at 72.7° W.L. and DIRECTV's prior request for use of that slot,<sup>7</sup> EchoStar is requesting authority to operate on up to 32 channels at 72.7° W.L. subject to the extent of its contractual authority. Once Nimiq 5 is operating at the 72.7° W.L. orbital location, which is expected to occur on or around October 1, 2009, and after receiving all necessary Commission approvals, EchoStar will turn off the EchoStar 6 satellite, which is currently operating over 16 of the 32 available DBS channels and maintain it as an in-orbit spare at 72.6° W.L.

For the reasons set forth herein, grant of this Application would strongly serve the public interest, would not cause any harmful interference, and would be consistent with the Commission's *DISCO II* policies.<sup>8</sup>

**I. GRANT OF THIS APPLICATION IS IN THE PUBLIC INTEREST**

The grant of this application is in the public interest because it will provide EchoStar's customer, DISH Network Corporation ("DISH Network"), with additional spectrum to offer more local-into-local, high definition, and other programming. EchoStar and DISH Network face an almost exponentially increased need for bandwidth to accommodate the transmission of high-definition programming, including the retransmission of local-into-local stations. Specifically, the digital television transition and the increased demand for high-definition programming have exacerbated dramatically the bandwidth shortage with which DBS providers

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Rcd 15529 (2004) (authorizing relocation of DIRECTV 5 to 72.5° W.L. and granting blanket earth station license E040024 to provide service to the U.S. from that satellite at 72.5° W.L.).

<sup>7</sup> See *supra* note 6.

<sup>8</sup> See *Amendment of the Commission's Policies to Allow Non-U.S. Licensed Space Stations Providing Domestic and International Service in the United States*, 12 FCC Rcd 24094 (1997) ("*DISCO II*").

have perennially struggled. Moreover, by its Order released on March 27, 2008, the Commission has imposed high definition digital carriage obligations on satellite carriers.<sup>9</sup>

While EchoStar and DISH Network benefit from the 16 channels currently available from EchoStar 6,<sup>10</sup> they will have access to 16 higher power channels with better antenna coverage over Nimiq 5 through EchoStar's agreement with Bell ExpressVu, which will allow EchoStar and DISH Network to better compete with bandwidth-rich terrestrial multichannel video programming distributors ("MVPDs").

Lastly, because EchoStar plans to maintain the EchoStar 6 satellite as an in-orbit spare at 72.6° W.L. with the potential to move the satellite to another orbital location in the future, the grant of this application will create critical spare capacity and will enable EchoStar to expand service to U.S. customers in the future. These public interest benefits will be secured without any disruption to existing EchoStar or DISH Network subscribers because programming now on EchoStar 6 will be transferred to Nimiq 5 before EchoStar 6 service is turned off.

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<sup>9</sup> *Carriage of Digital Television Broadcast Signals: Amendment of Part 76 of the Commission's Rules; Implementation of the Satellite Home Viewer Improvement Act of 1999: Local Broadcast Signal Carriage Issues and Retransmission Consent Issues*, CS Docket No. 00-96, Second Report and Order, Memorandum Opinion and Order, and Second Further Notice of Proposed Rulemaking, FCC 08-86 (rel. Mar. 27, 2008).

<sup>10</sup> Under the original Memorandum of Agreement among Telesat, EchoStar and Bell ExpressVu, effective March 11, 2008, and submitted in File No. SES-LFS-20080512-00595, EchoStar 6 was to operate on 11 DBS channels from 72.7° W.L. As a result of subsequent amendments to that agreement, the parties agreed to operate EchoStar 6 over 16 DBS channels at that location.

**II. GRANT OF THIS APPLICATION WILL NOT CAUSE HARMFUL INTERFERENCE TO OTHER SATELLITES**

The grant of this application will not present any significant risk of interference to other U.S. satellites and non-U.S. satellites, as demonstrated in the attached Technical Annex.<sup>11</sup> To the east, the closest DBS satellite is the Canadian-licensed DIRECTV 1R satellite at 72.5° W.L. That satellite, however, is operating on different (opposite polarization) DBS channels than the 16 channels that EchoStar is initially expected to use on Nimiq 5, and DIRECTV 1R will continue to operate on opposite polarization channels so as long as it is operating at the 72.5° W.L. cluster. The next closest satellites to the east are EchoStar's own satellites at the 61.5° W.L. orbital cluster, which is more than ten degrees away from 72.7° W.L. To the west, the nearest DBS satellite is the Mexican-licensed EchoStar 4 satellite at 77° W.L. and EchoStar's own satellite, EchoStar 8, operating under Special Temporary Authority at 77.15° W.L. Canadian and Mexican BSS operations at 72.7° and 77° W.L., respectively, have been fully coordinated, and the operation of the Nimiq 5 satellite from the 72.7° W.L. orbital location will be fully in conformance with current or future coordination agreements and operational agreements.

**III. GRANT OF THIS APPLICATION WOULD BE CONSISTENT WITH THE COMMISSION'S *DISCO II* POLICIES**

Under its *DISCO II* framework, the Commission evaluates whether the proposed service to be provided from the Nimiq 5 satellite at a Canadian orbital location would serve the public interest. The *DISCO II* analysis includes consideration of a number of factors, including the effect on competition in the United States, eligibility and operating requirements, spectrum availability, and national security, law enforcement, foreign policy and trade concerns.<sup>12</sup> As part

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<sup>11</sup> Attached hereto as Attachment C.

<sup>12</sup> See *DISCO II*, 12 FCC Rcd at 24107-72.

of this analysis, the Commission examines the “effective competitive opportunities” afforded to U.S. satellite operators in the home market of the foreign satellite seeking U.S. market access (the “ECO-Sat” test).<sup>13</sup> Under this test, the Commission examines “whether there are *de jure* or *de facto* barriers to entry for the provision of analogous service, and whether any such barriers would cause competitive distortions in the United States.”<sup>14</sup>

On numerous occasions since 2003, including the Commission’s decision to grant DIRECTV Enterprises LLC authority to provide service from the very same orbital location, the Commission has concluded that, while *de jure* barriers to entry into the Canadian market exist, the provision of BSS service to the United States using Canadian-licensed satellites would serve the public interest.<sup>15</sup> In this case, the public interest benefits of EchoStar’s proposed use of the newly launched Nimiq 5 satellite to provide DBS service in the United States from the Canadian 72.7° W.L. orbital slot are at least as compelling as those previously relied on by the Commission. Further, these benefits can be realized without harming any subscribers because all programming now on EchoStar 6 will be transferred to the Nimiq 5 satellite once it is operational, which is expected to occur on or around October 1, 2009.

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<sup>13</sup> *Id.* at 24098 (“For satellites licensed by non-WTO Members and for all satellites providing Direct-to-Home (DTH), Direct Broadcasting Satellite (DBS), and Digital Audio Radio Services (DARS), we will examine whether U.S. satellites have effective competitive opportunities in the relevant foreign markets to determine whether allowing the foreign-licensed satellite to serve the United States would satisfy the competition component of the public interest analysis.”).

<sup>14</sup> *DIRECTV Enterprises, LLC*, Order, 19 FCC Rcd 15529, ¶ 9 (2004).

<sup>15</sup> *See Id.* at ¶¶ 9-16. *See also Digital Broadband Applications Corp.*, Order, 18 FCC Rcd 9455 (2003); *Pegasus Development Corp.*, Order, 19 FCC Rcd 6080, 6086 (2004); *EchoStar Satellite LLC*, Order and Authorization, 20 FCC Rcd 11755 (2005); *DIRECTV Enterprises LLC*, File No. SES-MFS-20061213-02157 (granted Mar. 9, 2007).

In addition, EchoStar has demonstrated that the Commission's eligibility and operating requirements are satisfied,<sup>16</sup> and there are no spectrum availability, national security, law enforcement, foreign policy or trade concerns that would warrant treating this Application differently under the DISCO II framework from those previously granted by the Commission.

With respect to geographic service requirements applicable to DBS licensees, the Commission has previously ruled that the provision of 12.2-12.7 GHz service to Alaska and Hawaii from the 86.5° W.L. orbital location is not technically feasible because of the very low elevation angles from those states towards a satellite at that location.<sup>17</sup> A satellite at 72.7° W.L. orbital location would be even further east, resulting in a satellite that is not visible from most parts of those states or only visible at extremely low elevation angles. Thus, as demonstrated in the Technical Annex, the provision of DBS service to those states from Nimiq 5 at the 72.7° W.L. is also technically infeasible.

#### **IV. WAIVER PURSUANT TO SECTION 304 OF THE ACT**

In accordance with Section 304 of the Communications Act of 1934, as amended, 47 U.S.C. § 304, EchoStar hereby waives any claim to the use of any particular frequency or of the electromagnetic spectrum as against the regulatory power of the United States because of the previous use of the same, whether by license or otherwise.

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<sup>16</sup> See Attachment C (Technical Annex) and Schedule S.

<sup>17</sup> See *EchoStar Satellite L.L.C.*, DA 06-2440, 21 FCC Rcd 14045, at ¶ 19 (2006).

**V. CONCLUSION**

For all of these reasons, EchoStar respectfully requests the grant of this application.

Respectfully submitted,

**EchoStar Corporation**

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March 6, 2009

\_\_\_\_\_/s/\_\_\_\_\_  
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**ATTACHMENT A**

**Fee Waiver**

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

\_\_\_\_\_ )  
In the Matter of )  
 )  
**ECHOSTAR CORPORATION** )  
 )  
Petition for Waiver of )  
Application Fees Pursuant to )  
Section 1.1117 of the Commission's Rules )  
\_\_\_\_\_ )

**To: Office of the Managing Director**

**PETITION FOR WAIVER OF APPLICATION FEES**

EchoStar Corporation (“EchoStar”) respectfully requests that, pursuant to Sections 1.3 and 1.1117 of the Commission’s Rules,<sup>1</sup> and the Communications Act of 1934, as amended (the “Act”),<sup>2</sup> the Commission waive to the extent necessary certain application fees associated with its concurrently filed application to modify its blanket receive-only earth station authority to add the Canadian-licensed Nimiq 5 satellite as a point of communication at 72.7° W.L.<sup>3</sup> The Commission’s Rules and the Act specifically provide that such fees may be waived where good cause is shown and the public interest would be served.<sup>4</sup> As demonstrated below, good cause exists for, and the public interest would be served by, waiver of fees in this case because the modification application fee would not be commensurate with the Commission’s actual costs of

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<sup>1</sup> 47 C.F.R. §§ 1.3 and 1.1117.

<sup>2</sup> 47 U.S.C. § 158(d)(2).

<sup>3</sup> See File No. SES-MFS-2009\_\_\_\_\_ (filed March 6, 2009) (“Application”). For convenience, this petition is being attached as an Attachment to this application.

<sup>4</sup> 47 C.F.R. § 1.1117; 47 U.S.C. § 158(d)(2).

processing EchoStar's Application and would represent a regulatory barrier to EchoStar's proposed provision of service. If the Commission determines that a fee is required, EchoStar requests that the Commission find that the "VSAT" modification application fee is appropriate. EchoStar has already paid the \$170 fee for such applications, to which the instant request to provide service to up to 5,000,000 receive-only dishes is similar.

## **I. BACKGROUND**

EchoStar is requesting a modification to its blanket earth station authorization to add the Canadian-licensed Nimiq 5 satellite as a point of communication so that its customer, DISH Network Corporation ("DISH Network"), can expand its provision of multichannel video services to consumers in the United States. The Commission's Rules do not designate any specific charges for the type of application being filed in the DBS service. The following schedule of charges for applications for the types of services which could be applied to EchoStar's Application include:

- Modification of License Application for a Fixed Satellite Very Small Aperture Terminal (VSAT) System = \$170 per system<sup>5</sup>
- Modification of License for a Receive-Only Earth Stations = \$170 per station<sup>6</sup>

EchoStar's proposed network of DBS earth stations is most like a VSAT system; therefore, it should be subject to at most the \$170 application fee for an application to modify a VSAT system.

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<sup>5</sup> See *International and Satellite Services Fee Filing Guide* at 13 (effective Feb. 14, 2008) ("*Fee Filing Guide*").

<sup>6</sup> *Fee Filing Guide* at 12.

EchoStar's proposed system architecture will consist of as many as 5,000,000 technically identical earth stations operating in the DBS portion of the Ku-band. This architecture is consistent with the FCC's definition of VSAT networks, which are networks of technically identical small antennas that generally communicate with a larger hub station and operate in the 12/14 GHz frequency bands.<sup>7</sup> Because EchoStar believes that its system is most like a VSAT network, it has paid the \$170.00 VSAT system modification fee. However, if the Commission determines that the \$170.00 per station fee for receive-only earth stations applies to this application, EchoStar seeks a waiver of that \$850 million application fee.

## **II. GOOD CAUSE EXISTS FOR, AND THE PUBLIC INTEREST WOULD BE SERVED BY, WAIVER OF THE RECEIVE-ONLY EARTH STATION APPLICATION FEE**

The Commission has the authority to waive application fees where -- such as here -- good cause is shown and the public interest would be served.<sup>8</sup> As demonstrated below, a fee of up to \$850 million would be prohibitively high for EchoStar, would deny competitive service offerings to the public, and would not be commensurate with FCC processing resources.

### **A. FCC Application Fees are Intended to Recover the Costs of Standard Application Processing**

The Commission's schedule of application fees is intended to reimburse the government for the work involved in providing certain regulatory services associated with processing applications. In setting the fees, the Commission has noted that "the charges represent a rough approximation of the Commission's actual cost of providing the regulatory actions listed" and

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<sup>7</sup> See *Streamlining the Commission's Rules and Regulations for Satellite Application and Licensing Procedures*, Order, 11 FCC Red. 21581, 21592 (1996).

<sup>8</sup> See *WAIT Radio v. FCC*, 418 F.2d 1153, 1157 (D.C. Cir. 1969), *aff'd*, 459 F.2d 1203 (D.C. Cir. 1972), *cert. denied*, 409 U.S. 1027 (1972).

that “the very core of this effort is to reimburse the government -- and the general public -- for the regulatory services provided to certain members of the public.”<sup>9</sup> However, in certain instances, the Commission’s schedule of filing fees may not reasonably approximate the costs involved in handling a particular application or may not otherwise serve the public interest. For this reason, the Commission’s Rules and the Act allow for parties to seek a waiver of the application fees.<sup>10</sup>

A filing fee waiver is warranted here because many of the processing activities required to issue a new system license -- the costs of which the application fees are designed to recover -- are simply not required in reviewing EchoStar’s Application. For example, the Commission need not review 5,000,000 different technical parameters to grant EchoStar’s Application. Rather, as in the case of a VSAT network, the Commission only needs to review one set of technical parameters for all of the technically identical earth stations. In similar contexts, the Commission has accepted application fees for VSAT networks.<sup>11</sup> Thus, the \$170.00 application fee paid for this Application would be consistent with past practice and fairly compensate the Commission for the costs involved in its review of the application.

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<sup>9</sup> *Establishment of a Fee Collection Program to Implement the Provisions of the Consolidated Omnibus Budget Reconciliation Act of 1985*, Report and Order, 2 FCC Rcd. 947, 948 (1987).

<sup>10</sup> *See supra* note 4.

<sup>11</sup> *See, e.g., Application of EchoStar Satellite Operating Corporation for Pro Forma Assignment of Blanket Earth Station License*, File No. SES-ASG-20070228-00278, (granted Apr. 3, 2007) (fee waiver granted in a letter from Mark Stephens, CFO, FCC, to Pantelis Michalopoulos, Counsel for EchoStar Satellite L.L.C., dated May 9, 2007); *Application of DIRECTV Enterprises, LLC*, DA 04-2526 (rel. Aug. 13, 2004) (approving application in which applicant paid VSAT application fee for 1,000,000 receive-only terminals to be used for DBS service from a Canadian satellite).

**B. The Public Interest Would Be Served by Granting the Requested Fee Waiver**

In addition to being supported by the requisite good cause, granting EchoStar's request for a waiver of application fees for its Application is also consistent with the public interest. As described in detail in the Application, grant of the authority requested by EchoStar to provide DBS services in the United States using the Nimiq 5 satellite at 72.7° W.L. will further a number of compelling public interest objectives. Among other benefits, a grant would expand and improve the DBS service that EchoStar's customer, DISH Network, can provide to the United States, and enable EchoStar to expand service to U.S. customers in the future by making the EchoStar 6 satellite available for possible future redeployment.

EchoStar should not be required to pay a \$170.00 fee for each of its 5,000,000 earth stations merely because it is providing service from a non-U.S. satellite when an operator providing an identical service using a U.S.-licensed satellite would not need to apply for licenses for each of its consumer dishes.<sup>12</sup> The result would be overtly discriminatory treatment among domestic- and foreign-licensed DBS and Direct-to-Home ("DTH") providers serving the United States. Such a result would also not be consistent with the Commission's decision to eliminate the requirement to obtain a license – or to pay a separate fee – for U.S. receive-only earth

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<sup>12</sup> Except for the fact that EchoStar will be using a Canadian orbital location, EchoStar would not have to file an application for these earth stations. *See* 47 C.F.R. § 25.131(j); *see also In the Matter of Telesat Canada Petition for Declaratory Ruling for Inclusion of ANIK F1 on the Permitted Space Station List*, Order, 16 FCC Rcd 16365, 16369 (2001) (holding that "receive-only earth stations receiving transmissions from any non-U.S. licensed satellite, regardless of whether the satellites is on the Permitted List, must be licensed.").

stations to communicate with foreign-licensed Fixed Satellite Service satellites on the Permitted Space Station List.<sup>13</sup>

### III. CONCLUSION

Under current Commission fee guidelines, EchoStar could potentially be required to pay a fee of \$170.00 for each of its 5,000,000 receive-only earth stations. That would amount to a total fee of up to \$850 million. Clearly, the imposition of such a high fee was not what Congress or the Commission intended when the fee guidelines were adopted. Such an astronomical application fee would be a barrier to any operator that desires to offer an innovative, competitive service to the public, as proposed by EchoStar.

The financial hardship that a \$850 million filing fee would impose on EchoStar, or indeed any other entity, would clearly preclude an application from being filed at all. Filing fees should reimburse the government for the costs of processing applications, not act as a regulatory barrier to entry for competitive services. For all of the aforementioned reasons, EchoStar respectfully requests that the Commission grant the requested fee waiver to the extent necessary in conjunction with its Application to provide DBS service from Nimiq 5 at 72.7° W.L.

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<sup>13</sup> See *Amendment of the Commission's Space Station Licensing Rules and Policies*, Second Report and Order in IB Docket No. 02-34, Second Report and Order in IB Docket No. 00-248, and Declaratory Order in IB Docket No. 96-111, 18 FCC Rcd 12507, 12516-17 (2003).

Respectfully submitted,

/s/

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(202) 429-3000

*Counsel for EchoStar Corporation*

Dated: March 6, 2009

cc: Anthony Dale, Managing Director, Office of the Managing Director (via hand delivery)



**ATTACHMENT B**

**Nimiq 5 Transponder Service Agreement between Bell ExpressVu  
Limited Partnership, by its General Partner Bell ExpressVu Inc.,  
and EchoStar Corporation**

**REDACTED – For Public Inspection**

**BELL EXPRESSVU LIMITED PARTNERSHIP,**

**acting through its general partner,**

**Bell ExpressVu Inc.**

**-and-**

**EHOSTAR CORPORATION**

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**NIMIQ 5 TRANSPONDER SERVICE AGREEMENT**

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**Dated as of March 11, 2008**

**CONFIDENTIAL**

**This document and all information contained in or disclosed by this document is confidential and proprietary to Bell ExpressVu Inc. and EchoStar Corporation. By accepting this document the recipient agrees that this document and all information contained herein and disclosed hereby will be treated as Proprietary Information pursuant to Section 17 of this Agreement**

## Nimiq 5 Transponder Service Agreement

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**REDACTED – For Public Inspection**

ATTACHMENTS

Attachment 1

Attachment 2



NIMIQ 5 TRANSPONDER SERVICE AGREEMENT

This NIMIQ 5 TRANSPONDER SERVICE AGREEMENT is made and entered into as of the 11th day of March, 2008 (the “Effective Date”), by and between BELL EXPRESSVU LIMITED PARTNERSHIP (“Bell ExpressVu”), a limited partnership organized and existing under the laws of the Province of Ontario with offices located at 100 Wynford Drive, Suite 300, Toronto, Ontario M3C 4B4, Canada, acting through its general partner, Bell ExpressVu Inc., on the one hand, and ECHOSTAR CORPORATION (“EchoStar”), a Nevada corporation with offices located at 90 Inverness Circle East, Englewood, Colorado 80112, U.S.A., [REDACTED]

RECITALS:

[REDACTED]

**WHEREAS**, EchoStar desires to subscribe for, and Bell ExpressVu desires to provide to EchoStar, during the Term, all in accordance with, and subject to, the terms and conditions set forth in this Agreement, the use of sixteen (16) medium power Full Period whole BSS RF Channels with a nominal 150 watts RF power operating within the 17/12 GHz Frequency Band on even numbered frequencies delivering a left hand circular polarity signal and with CONUS coverage;

**NOW, THEREFORE**, in consideration of the foregoing premises and the mutual covenants and agreements set forth in this Agreement, and for other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, intending to be legally bound, Bell ExpressVu and EchoStar hereby agree as follows:

1. **Definitions.**

1.1 **Certain Definitions.** Capitalized terms used in this Agreement (including the Recitals) and not otherwise defined herein shall have the following meanings:

“[REDACTED]” shall have the meaning ascribed thereto in Section 11.2.

“[REDACTED]” shall have the meaning ascribed thereto in Section 11.2.

“[REDACTED]” shall have the meaning ascribed thereto in Section 10.2.

**REDACTED – For Public Inspection**

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

“Affiliate” means with respect to any Person, any other Person directly or indirectly (a) controlling, controlled by, or under common control with, such Person, or (b) owning more than fifty percent (50%) of any class of voting or equity securities of such Person. A Person shall be deemed to control another Person if such Person possesses, directly or indirectly, the power to direct or cause the direction of the management and policies of the other Person, whether through the ownership of voting securities or voting interests, by contract or otherwise.

“Agreement” means this Nimiq 5 Transponder Service Agreement and all attachments to it, which are hereby incorporated by reference in their entirety; “hereof”, “hereto”, “herein” and “hereunder” and similar expressions mean and refer to this Agreement and not to any particular Article, Section or Attachment; “Article”, “Section” or “Attachment” of this Agreement followed by a number means and refers to the specified Article, Section or Attachment of this Agreement. In the event of any conflict or inconsistency between this Agreement and any Attachment to this Agreement, this Agreement shall prevail.

“[REDACTED]” shall have the meaning ascribed thereto in Article 20.

“[REDACTED]” shall have the meaning ascribed thereto in Section 14.2(b)(i).

“Authorization” means any authorization, order, permit, approval, forbearance decision, grant, license, consent, right, franchise, privilege or certificate of any Governmental Entity of competent jurisdiction, whether or not having the force of law.

“Bell ExpressVu” shall have the meaning ascribed thereto in the introductory paragraph of this Agreement.

“[REDACTED]” shall have the meaning ascribed thereto in Section 9.10.

“[REDACTED]” shall have the meaning ascribed thereto in Section 11.3.

“BSS” means the Broadcasting-Satellite Service, as defined by the Radio Regulations of the ITU.

“Business Day” means any day other than a Saturday, Sunday or a day on which banking institutions in Colorado, U.S.A. or Toronto, Ontario are required or authorized to be closed.

“Channel” means a path for signal transmission.

**REDACTED – For Public Inspection**

“**[REDACTED]**” shall have the meaning ascribed thereto in Section 14.2(b)(i).

“CONUS” means the continental United States.

[REDACTED]

“DBS” means Direct Broadcast Satellite.

“DBS Spectrum License” means the Approval in Principle granted on 17 December 2003 (as amended on 28 December 2006) by Industry Canada pursuant to the *Radiocommunication Act* (Canada) and any Radio Authorizations associated therewith which authorize Telesat to operate a direct broadcast satellite at the Orbital Position.

[REDACTED]

“Disclosing Party” shall have the meaning ascribed thereto in Section 17.1.

“**[REDACTED]**” shall have the meaning ascribed thereto in Section 13.1(c).

“EchoStar” shall have the meaning ascribed thereto in the introductory paragraph of this Agreement.

“EchoStar Channel Service” means the use of an individual medium power Full Period whole BSS RF Channel with a nominal 150 watts RF power operating within the 17/12 GHz Frequency Band on an even numbered frequency delivering a left hand circular polarity signal and with CONUS coverage that is provided to EchoStar on the Satellite pursuant to the terms of this Agreement and “EchoStar Channel Services” means the use of sixteen (16) medium power Full Period whole BSS RF Channels, each with a nominal 150 watts RF power operating within the 17/12 GHz Frequency Band on even numbered frequencies delivering a left hand circular polarity signal and with CONUS coverage that are provided to EchoStar on the Satellite pursuant to the terms of this Agreement

[REDACTED]

**REDACTED – For Public Inspection**

9.11. “**[REDACTED]**” shall have the meaning ascribed thereto in Section

“**[REDACTED]**” shall have the meaning ascribed thereto in Section 11.4.

“Effective Date” shall have the meaning ascribed thereto in the introductory paragraph of this Agreement.

“EIRP” means equivalent isotropic radiated power.

“EOL” means the permanent removal from service of the Satellite.

“**[REDACTED]**” shall have the meaning ascribed thereto in Section 13.1(c)(ii).

“FCC” means the United States Federal Communications Commission or any successor agency thereto, and includes a bureau or other subdivision thereof acting under delegated authority.

“FCC Approval” means the FCC authorization required for EchoStar to (a) uplink from the United States to, and downlink into the United States from, the Satellite at the Orbital Position, and (b) use the EchoStar Channel Services for the Intended Purpose.

“Force Majeure Event” means any acts of God, meteors, fire, flood, weather, sun outages; other catastrophes (including launch failure and catastrophic failure of the Satellite) and circumstances in the space environment, in each of the foregoing cases that are beyond the control of Bell ExpressVu, Telesat and EchoStar; any laws of any Governmental Entity, national emergencies, acts of terrorism, insurrections, riots, embargoes, wars, or strikes, lockouts, work stoppages or other labour difficulties over which none of Bell ExpressVu, Telesat or EchoStar have control.

“Frequency Band” means the operating range, measured in gigahertz (GHz), in which a microwave signal can be carried; signals in the nominal 17/12 GHz frequency band or BSS band are received by the Nimiq 5 Satellite in the range of 17.3 to 17.8 GHz, amplified and retransmitted by the Nimiq 5 Satellite in the range of 12.2 to 12.7 GHz.

“Frequency Coordination Limits” means the coordination status of the BSS frequencies at the Orbital Position (including without limitation, the applicable power level operational parameters) on the Effective Date (as the same may be amended, restated, supplemented or replaced from time to time in compliance with the procedures set forth in Section 9.1 of this Agreement).

“Full Period” means twenty-four (24) hours per day, seven (7) days per week.

“Governmental Entity” means any (a) multinational, federal, provincial, state, municipal, local or other government, governmental or public department, central bank, court, commission, board, bureau, agency or instrumentality, domestic or foreign; (b) any subdivision, agent, commission, board, or authority of any of the foregoing; or (c) any quasi-governmental or



**REDACTED – For Public Inspection**

private body validly exercising any regulatory, expropriation or taxing authority under or for the account of any of the foregoing, in each case in the proper exercise of its governmental authority.

“[REDACTED]” shall have the meaning ascribed thereto in Section 14.2(a).

“[REDACTED]” shall have the meaning ascribed thereto in Section 3.1.

“Initial Term” shall have the meaning ascribed thereto in Article 5.

“Intended Purpose” means the use of the EchoStar Channel Services at the Orbital Position to provide direct-to-home video, audio and data services and two-way broadband Internet and data services into the United States.

[REDACTED]

“[REDACTED]” shall have the meaning ascribed thereto in Section 3.1(b).

“Laws” means all valid, duly enacted or promulgated statutes, codes, ordinances, decrees, rules, regulations, municipal by-laws, judicial or arbitral or administrative or ministerial or departmental or regulatory judgments, orders, decisions, rulings or awards, policies having the force of law or any provisions of the foregoing, including general principles of common and civil law and equity, binding on the Person referred to in the context in which such word is used; and “Law” means any one of foregoing.

“[REDACTED]” shall have the meaning ascribed thereto in Section 14.2(a).

“[REDACTED]” shall have the meaning ascribed thereto in Section 13.1(a)(i).

“MOA” means the Memorandum of Agreement made and effective as of March 11, 2008 by and among Telesat, EchoStar, [REDACTED] and Bell ExpressVu.

“[REDACTED]” shall have the meaning ascribed thereto in Section 3.2.

“[REDACTED]” shall have the meaning ascribed thereto in the first recital of this Agreement.

“Nimiq 5 Satellite” shall have the meaning ascribed thereto in the first recital of this Agreement.

“[REDACTED]” shall have the meaning ascribed thereto in Section 10.1.

**REDACTED – For Public Inspection**

“Non-U.S. Authorizations” means all Authorizations, including without limitation the DBS Spectrum License, the Radio Authorizations, and any and all other notifications, licenses, permits, authorizations, approvals and consents of other Persons (excluding United States Authorizations) now or hereafter required for (a) Telesat and Bell ExpressVu to provide the EchoStar Channel Services to EchoStar under the terms and conditions of this Agreement, and (b) EchoStar to (i) uplink from the United States to, and downlink into the United States from, the Satellite at the Orbital Position, and (ii) use the EchoStar Channel Services for the Intended Purpose.

“[REDACTED]” shall have the meaning ascribed thereto in Section 11.3.

“[REDACTED]” shall have the meaning ascribed thereto in Section 11.4.

“Orbital Position” means the geostationary orbital position at 72.7° West Longitude.

“Party” means, individually, each of Bell ExpressVu and EchoStar and “Parties” means, collectively, EchoStar and Bell ExpressVu.

[REDACTED]

“Person” means an individual, partnership, limited liability company, corporation, joint stock company, trust, unincorporated association, joint venture or any other entity or organization or Governmental Entity and pronouns have similarly extended meaning.

“[REDACTED]” shall have the meaning ascribed thereto in Section 9.7(b)(i)(E).

“[REDACTED]” shall have the meaning ascribed thereto in Section 3.1(a).

“Proprietary Information” means all information that is disclosed by either Bell ExpressVu or EchoStar, including any technical specifications, system designs, data or material which contains proprietary information and which is either:

- (a) in written form clearly labeled as “Proprietary”, “Confidential” or similar designation; or
- (b) if disclosed orally, is identified as confidential at the time of oral disclosure.

“Radio Authorizations” means all authorizations of the Minister of Industry (Canada) pursuant to the *Radiocommunication Act* (Canada) required to operate the Satellite at the Orbital Position.

**REDACTED – For Public Inspection**

“Receiving Party” shall have the meaning ascribed thereto in Section 17.1.

“[REDACTED]” shall have the meaning ascribed thereto in Section 10.2.

“[REDACTED]” shall have the meaning ascribed thereto in Section 11.2.

“[REDACTED]” shall have the meaning ascribed thereto in Section 11.2.

“Required Authorizations” means, with respect to each Party, all Authorizations and other notifications, licenses, permits, authorizations, approvals and consents of other Persons required for such Party to consummate the transactions contemplated by, and to perform its obligations under, this Agreement.

“RF Channel” means an assigned portion of the Nimiq 5 Satellite total repeater Channel capacity that is capable of receiving and re-transmitting Telecommunications Traffic.

“Satellite” shall have the meaning ascribed thereto in the first recital of this Agreement.

[REDACTED]

“Satellite Manufacturer” shall have the meaning ascribed thereto in the first recital of this Agreement.

[REDACTED]

“Satellite Relocation” shall have the meaning ascribed thereto in Section 11.1.

“Service Commencement Date” means the date on which Bell ExpressVu provides notice in writing to EchoStar that Telesat has conducted an acceptance inspection of the Satellite and is satisfied in its reasonable judgment that: (a) the Satellite has been delivered to the Orbital Position; (b) [REDACTED]

[REDACTED]; and (c) [REDACTED].

“[REDACTED]” shall have the meaning ascribed thereto in Section 3.1(c).

“[REDACTED]” shall have the meaning ascribed thereto in Section 13.4(b).

“Subject Matters” shall have the meaning ascribed thereto in Section 6.9.

**REDACTED – For Public Inspection**

[REDACTED]

“Telesat” shall have the meaning ascribed thereto in the first recital of this Agreement.

“[REDACTED]” shall have the meaning ascribed thereto in Section 13.1(c).

“Telecommunications Traffic” means signs, signals, writing, images, sounds or intelligence of any nature capable of being received and retransmitted by the Satellite.

“Term” shall have the meaning ascribed thereto in Article 5.

“[REDACTED]” shall have the meaning ascribed thereto in Section 13.2(c).

“[REDACTED]” shall have the meaning ascribed thereto in Section 13.2(a).

[REDACTED]

“Treaty” means (a) any applicable convention or treaty (i) between the government of the United States of America and the government of Canada, and (ii) for the avoidance of double taxation and the prevention of fiscal evasion with respect to taxes on income, and (b) any amendments, regulations and protocols to such convention or treaty and replacement thereof.

“TWTA” shall have the meaning ascribed thereto in Section 9.7(b)(i)(A).

“United States Authorizations” means all Authorizations, including without limitation FCC Approval, now or hereafter required from United States Governmental Entities for EchoStar to (a) uplink from the United States to, and downlink into the United States from, the Satellite at the Orbital Position, and (b) use the EchoStar Channel Services for the Intended Purpose.

1.2 Other Defined Terms; Interpretation. Other capitalized terms used in this Agreement and not otherwise defined in Section 1.1 shall have the meanings ascribed thereto elsewhere in this Agreement. Unless otherwise indicated to the contrary herein by the context or use thereof: (a) the word “including” means “including but not limited to”; (b) the masculine gender shall also include the feminine and neutral genders, and vice versa; and (c) words importing the singular shall also include the plural, and vice versa.

**REDACTED – For Public Inspection**

2. **Provision of Service.** In accordance with, and subject to, the terms and conditions set forth in this Agreement, Bell ExpressVu hereby agrees to provide to EchoStar the EchoStar Channel Services, [REDACTED], during the Term (defined below) of this Agreement.

3. [REDACTED]

3.1 [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

3.2

[REDACTED]

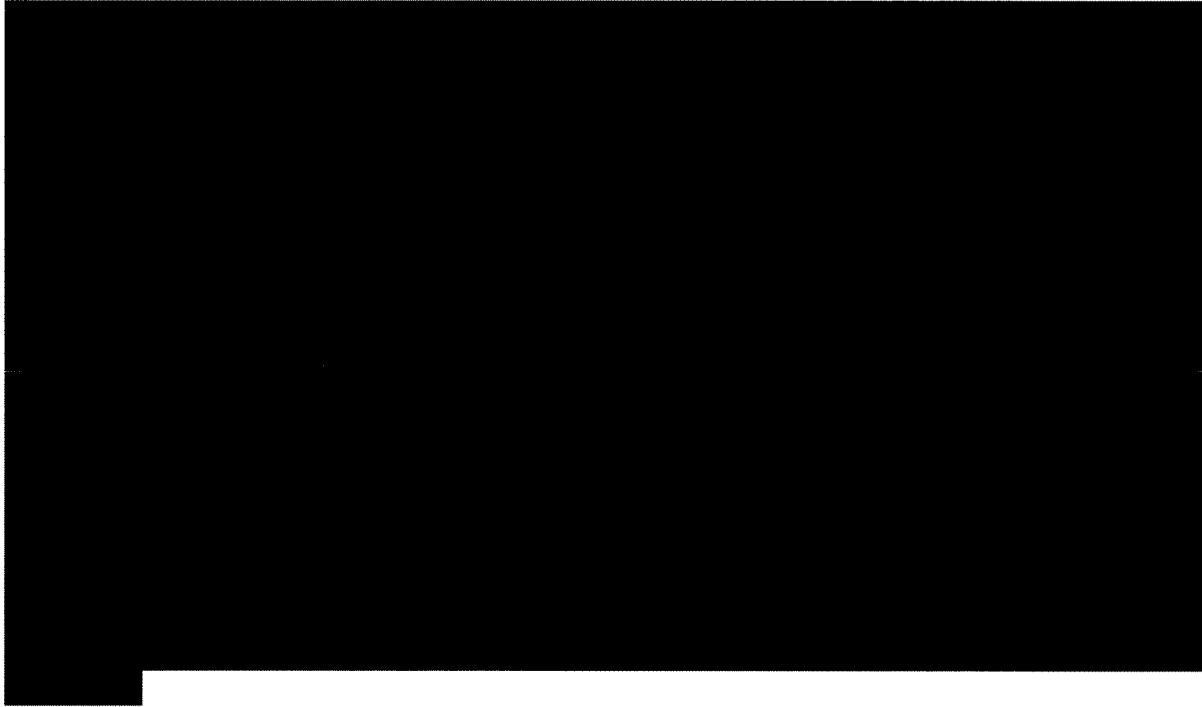
3.3

[REDACTED]

3.4

[REDACTED]

**REDACTED – For Public Inspection**



**REDACTED – For Public Inspection**

4. [REDACTED]

4.1 [REDACTED]

4.2 [REDACTED]

4.3 [REDACTED]



[REDACTED]

[REDACTED]

4.4

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

5. **Term of Agreement.** The term of this Agreement shall commence upon the Effective Date hereof and shall expire on the fifteenth (15<sup>th</sup>) anniversary of the Service Commencement Date, unless earlier terminated in accordance with the terms hereof (the “Initial Term”).

[REDACTED]

6. **Bell ExpressVu Representations, Warranties and Covenants.** Bell ExpressVu hereby represents, warrants and covenants to EchoStar as follows:

6.1

[REDACTED]

**REDACTED – For Public Inspection**

[REDACTED]

6.2

[REDACTED]

6.3

[REDACTED]

6.4

[REDACTED]

6.5 Compliance with Laws. In connection with Bell ExpressVu's performance under this Agreement, Bell ExpressVu shall comply in all material respects with all applicable laws, regulations and orders of Governmental Entities that apply to it.

6.6 Required Authorizations. Bell ExpressVu agrees, [REDACTED], to use commercially reasonable efforts to cause Telesat to obtain and/or maintain in full force and effect the Radio Authorization, the DBS Spectrum License and all other Required Authorizations for the provision of telemetry, tracking and command services for the Satellite. Bell ExpressVu further agrees, [REDACTED], to use commercially reasonable efforts to obtain and/or maintain (or to use commercially reasonable efforts to cause Telesat to obtain and maintain) all Non-U.S. Authorizations, including without limitation the Radio Authorization and the DBS Spectrum License. Bell ExpressVu further agrees to obtain (or to use commercially reasonable efforts to cause Telesat to obtain) all Non-U.S. Authorizations as soon as reasonably practicable after the Effective Date. In accordance with requests made and instructions given by Bell ExpressVu, EchoStar shall use commercially reasonable efforts, [REDACTED]

**REDACTED – For Public Inspection**

[REDACTED], to support the efforts of Telesat and Bell ExpressVu to obtain and maintain all Non-U.S. Authorizations.

6.7

[REDACTED]

6.8 No Brokers. Bell ExpressVu has not retained or authorized anyone to represent it as a broker or finder in connection with this Agreement.

6.9

[REDACTED]

7. EchoStar Representations, Warranties and Covenants. EchoStar hereby represents, warrants and covenants to Bell ExpressVu as follows:

7.1

[REDACTED]

7.2

[REDACTED]

7.3

[REDACTED]

**REDACTED – For Public Inspection**

[REDACTED]

7.4

[REDACTED]

7.5 Compliance with Laws. In connection with EchoStar’s performance under this Agreement, EchoStar shall comply in all material respects with all applicable laws, regulations and orders of Governmental Entities that apply to it.

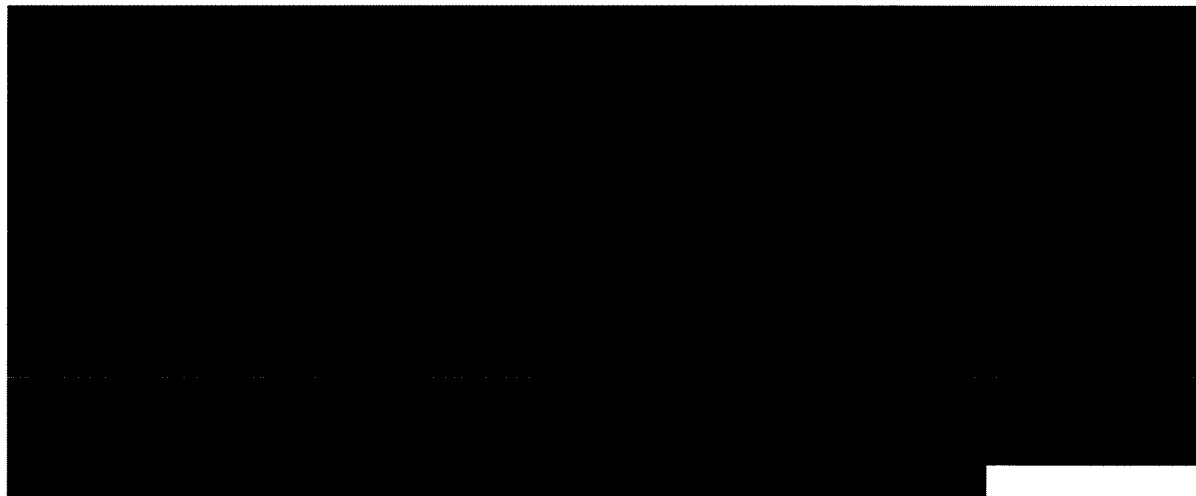
7.6 Required Authorizations. EchoStar agrees, [REDACTED], to obtain and maintain all United States Authorizations, including but not limited to FCC Approval. EchoStar further agrees to file for all United States Authorizations as soon as reasonably practicable after the Effective Date. In accordance with requests made and instructions given by EchoStar, Bell ExpressVu shall use commercially reasonable efforts to support (and to cause Telesat to support), [REDACTED], EchoStar’s efforts to obtain and maintain all United States Authorizations.

7.7 No Brokers. EchoStar has not retained or authorized anyone to represent it as a broker or finder in connection with this Agreement.

8. Use Restrictions. EchoStar transmissions to and from the Satellite and its use of the EchoStar Channel Services shall comply with all applicable laws, rules and regulations and [REDACTED]. EchoStar shall not use, and shall not authorize or permit any other Person (including its successors, subcontractors or transferees) to use, the EchoStar Channel Services for any unlawful purpose, to transmit unlawful communications of any nature or otherwise in violation of applicable law. If any EchoStar non-compliance with the preceding two sentences causes or threatens, or other circumstances arise from EchoStar’s use of the EchoStar Channel Services which cause or threaten, damage to the Satellite, or if EchoStar’s use of the EchoStar Channel Services may reasonably result in the institution of criminal proceedings, or administrative proceedings that may reasonably result in sanctions or other non-monetary remedies, against Bell ExpressVu or any of its Affiliates, Bell ExpressVu may take actions ([REDACTED]) reasonably necessary to ensure EchoStar’s compliance with the Access Requirements or Bell ExpressVu’s compliance with law. [REDACTED]

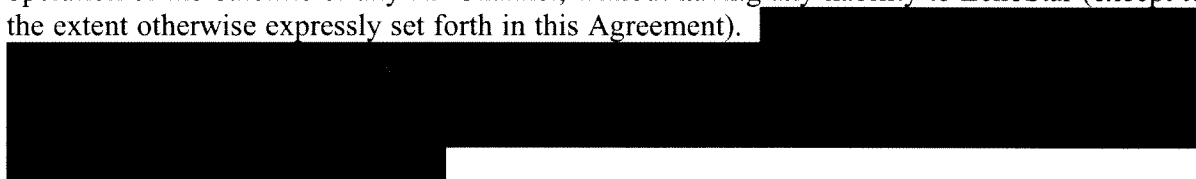
9. Operational Matters; Satellite Construction and Launch.

9.1 Transmission Parameters and Frequency Coordination Limits. All satellite access specifications and operating procedures are set forth in the Access Requirements. EchoStar agrees to conform all its transmissions to the Satellite to, and otherwise comply with, the Access Requirements. EchoStar shall not interfere with the use of the RF Channels ( [REDACTED] ) by others on the Satellite or any adjacent satellite; provided that, notwithstanding the foregoing, EchoStar shall in all cases be entitled to utilize the EchoStar Channel Services to the maximum extent contemplated by the Performance Specifications, subject to such utilization being consistent with the Frequency Coordination Limits. EchoStar shall not cause physical harm to any RF Channels on the Satellite (including the EchoStar Channel Services) or to the Satellite. EchoStar will not use the EchoStar Channel Services, or any portion thereof, in a manner which would or could reasonably be expected to, under standard engineering practice, harm the RF Channels or harm any portion of the Satellite from which the EchoStar Channel Services are provided, the Satellite, or any other in-orbit satellite. EchoStar will comply with all relevant Frequency Coordination Limits and the Access Requirements and will not use the EchoStar Channel Services, or any portion thereof, in a manner which would or could reasonably be expected to, under standard engineering practice, interfere with the use of any portion of the Satellite from which the EchoStar Channel Services are provided ( [REDACTED] ), the Satellite, or any other in-orbit satellite; provided that, notwithstanding the foregoing, EchoStar shall in all cases be entitled to utilize the EchoStar Channel Services to the maximum extent contemplated by the Performance Specifications, subject to such utilization being consistent with the Frequency Coordination Limits and EchoStar's compliance with the Access Requirements. [REDACTED]

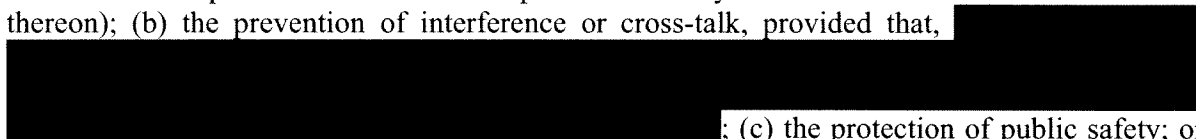


9.2 Transmit Facilities. EchoStar shall configure, equip and operate all equipment and facilities used to transmit signals to the Satellite in conformance with the applicable requirements set forth in the Access Requirements.

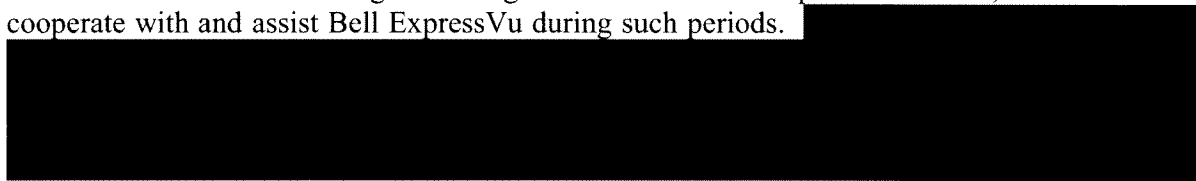
9.3 Action to Protect Satellite. Provided that Bell ExpressVu has a reasonable basis to conclude that the use by EchoStar of the EchoStar Channel Services creates an unreasonable risk to the Satellite, Bell ExpressVu shall have the right to take any action it reasonably believes necessary to protect such Satellite, including discontinuance or suspension of operation of the Satellite or any RF Channel, without having any liability to EchoStar (except to the extent otherwise expressly set forth in this Agreement).



9.4 Suspension of Service. The Parties agree and acknowledge that Bell ExpressVu may suspend service to EchoStar hereunder on the Satellite on such notice as is reasonable under the circumstances for technical or safety reason(s), which shall include: (a) the protection of the overall health or performance of a Satellite (including testing in connection with a failure or suspected failure of a component or subsystem of the Satellite or RF Channel thereon); (b) the prevention of interference or cross-talk, provided that,



; (c) the protection of public safety; or (d) compliance with an order from any Governmental Entity, including Industry Canada or the FCC. EchoStar acknowledges and agrees that if such suspension occurs, EchoStar shall cooperate with and assist Bell ExpressVu during such periods.



**REDACTED – For Public Inspection**

[REDACTED]

9.5 Cooperation. EchoStar shall make commercially reasonable efforts to cooperate with Bell ExpressVu in order to facilitate the provision of the EchoStar Channel Services on a continuous basis.

[REDACTED]

9.6 Frequency Plans. EchoStar agrees to take all necessary precautions to ensure that its use of the EchoStar Channel Services is in all other respects consistent with the Access Requirements.

9.7 General Limitations.

(a) EchoStar agrees and recognizes that in order to assess and protect the overall performance of the Satellite, Bell ExpressVu and/or Telesat will periodically interrupt use of the EchoStar Channel Services for either of the following:

- (i) to carry out scheduled periodic tests on the RF Channels; or
- (ii) in unusual or abnormal situations or conditions.

(A)

[REDACTED]

(B)

[REDACTED]

[REDACTED]

(b)

[REDACTED]

(i)

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]



[REDACTED]

[REDACTED]

[REDACTED]

(ii) For the avoidance of doubt, nothing in this Section shall be construed to limit EchoStar’s rights and remedies under this Agreement at law, except as otherwise contemplated herein, in equity or otherwise (all of which are hereby expressly reserved).

(c) Notwithstanding the wording of any Section or Article herein, EchoStar will acquire only services from Bell ExpressVu and not acquire any implied right, interest or title to or in the use of RF Channels, the Satellite or other Bell ExpressVu facilities or any part thereof.

[REDACTED]

9.8 Construction of Satellite.

(a) [REDACTED]

[REDACTED]

(b)

[REDACTED]

9.9

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

9.10

[REDACTED]

9.11

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

9.12 Power Modes. The EchoStar Channel Services shall be operated in medium power mode at a nominal 150 watts RF power [REDACTED]. A pair of RF Channels operating in medium power mode may be banded together to provide one (1) EchoStar Channel Service operating in high power mode at a nominal 300 watts RF power. [REDACTED]

[REDACTED]

10. [REDACTED]

10.1 [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

10.2

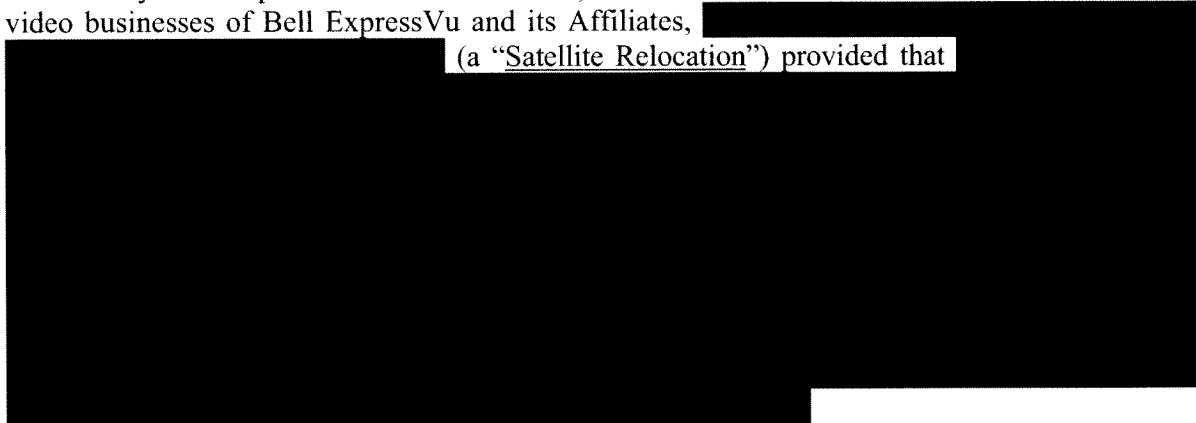
[REDACTED]



11. Satellite Relocation. [REDACTED]

11.1 Satellite Relocation. During the Term hereof, Bell ExpressVu reserves the right to relocate the Satellite, one or more times, to any other geostationary orbital position licensed for DBS services at the time, for emergency restoration service or for service capacity management purposes upon the occurrence of an anomaly or series of anomalies affecting the Bell ExpressVu fleet (which shall include any and all satellites owned, operated, controlled, leased or otherwise accessed by Bell ExpressVu and its Affiliates) that has or have a material adverse effect on the video businesses of Bell ExpressVu and its Affiliates, [REDACTED]

(a “Satellite Relocation”) provided that



11.2 [REDACTED]



[REDACTED]

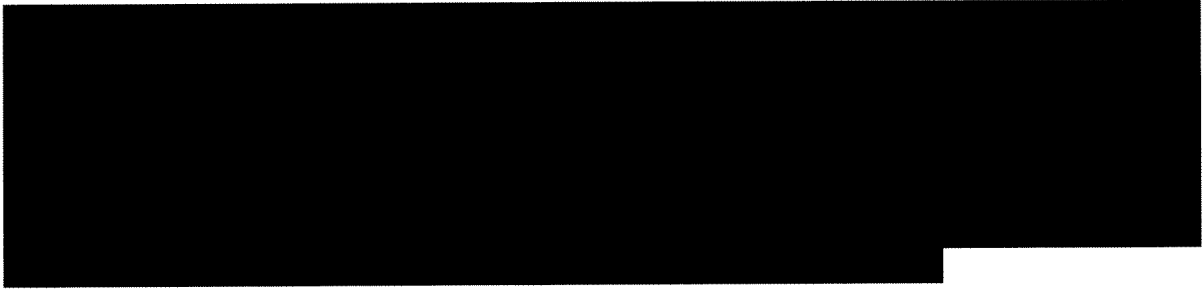
[REDACTED]

[REDACTED]

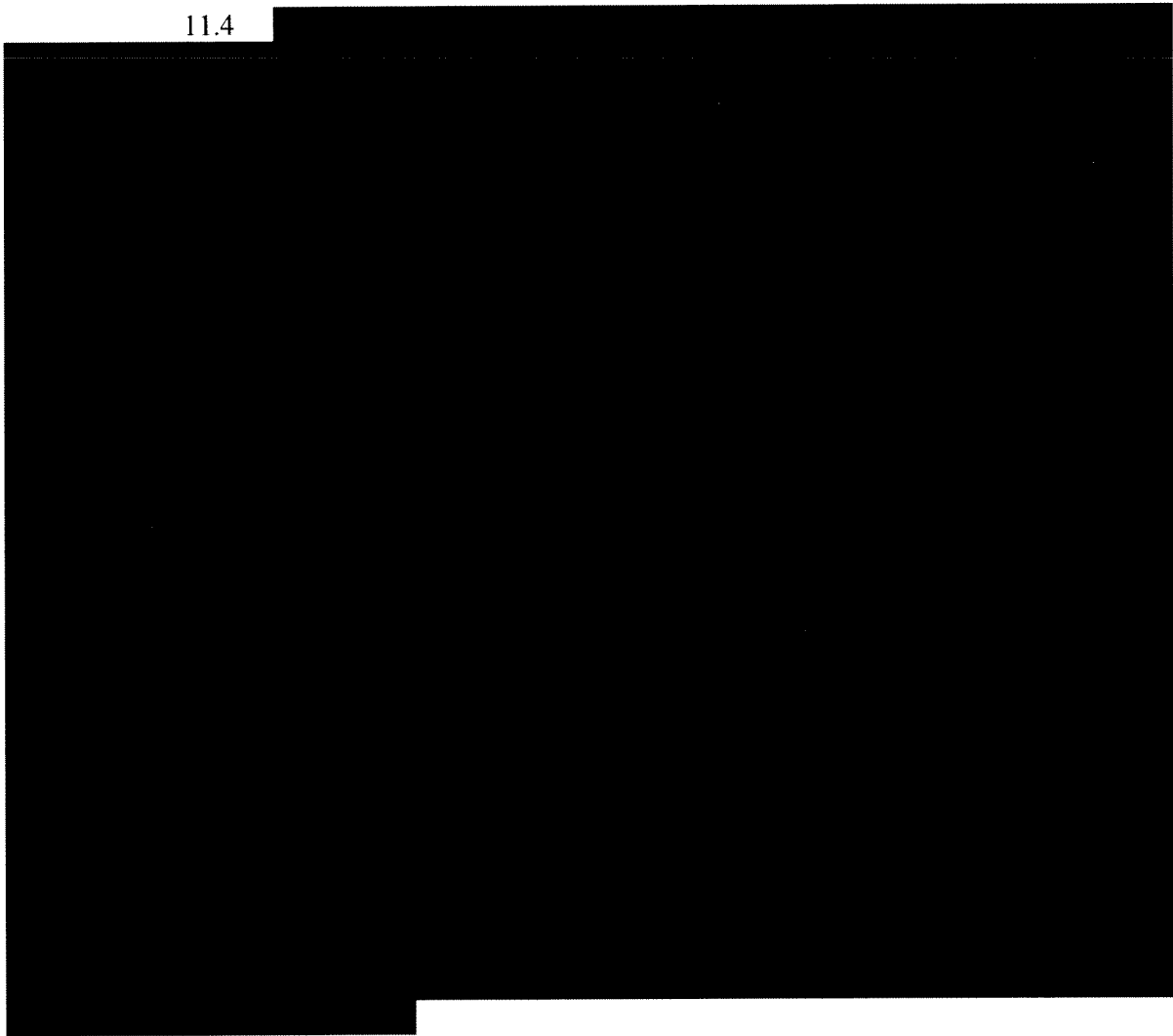
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11.3

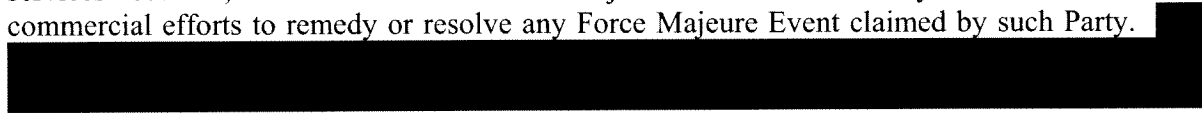
[REDACTED]



11.4



12. **Force Majeure**. Neither Party shall be held liable or deemed to be in default under this Agreement, save and except with respect to EchoStar’s obligation of payment for services received, in the event of a Force Majeure Event. Each Party shall use reasonable commercial efforts to remedy or resolve any Force Majeure Event claimed by such Party.





[REDACTED] It is understood and agreed that, upon the occurrence of a Force Majeure Event and the termination or suspension of the EchoStar Channel Services hereunder as a result thereof,

[REDACTED]

**13. Termination Rights.**

13.1 [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

13.2

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

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[REDACTED]

[REDACTED]

[REDACTED]

**REDACTED – For Public Inspection**

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

13.4 [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]



[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

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[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

13.5

[REDACTED]

13.6

[REDACTED]

13.7

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

14. Limitation of Liability [REDACTED]

14.1 [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

(d) BELL EXPRESSVU AND EHOSTAR EXPRESSLY ACKNOWLEDGE AND AGREE THAT THE LIMITATIONS AND EXCLUSIONS CONTAINED HEREIN REPRESENT THE PARTIES' AGREEMENT AS TO THE ALLOCATION OF RISK BETWEEN THE PARTIES IN CONNECTION WITH BELL EXPRESSVU'S OBLIGATIONS UNDER THIS AGREEMENT.

[REDACTED]

(e) The provisions of this Section 14.1 shall survive the expiration or termination of this Agreement.

14.2 [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]



14.3

**15. Relationship of the Parties.** Nothing herein shall establish any partnership, joint venture or agency relationship between EchoStar and Bell ExpressVu and neither Party shall have the authority, either express or implied, to make any commitment or representation on behalf of the other.

**16. Assignments.** Neither Party may assign this Agreement or any of its rights, interests or obligations under this Agreement without the prior written approval of the other Party. This Agreement shall be binding upon and shall inure to the benefit of the Parties and their respective successors and permitted assigns. Notwithstanding the foregoing, Bell ExpressVu and EchoStar may assign their respective rights under this Agreement as security and otherwise grant security interests in their respective rights hereunder to their guarantors and lenders that provide financing to Bell ExpressVu (or its Affiliates) or EchoStar (or its Affiliates), as applicable, and the other Party agrees to consent to such assignment in a form reasonably requested by the first Party and any guarantors, lenders and/or investors providing financing to the first Party (or its Affiliates). Notwithstanding the foregoing,

**17. Confidentiality/Non-disclosure.**

17.1 Except as set forth in Section 17.2 below, a Party receiving Proprietary Information of the other Party pursuant hereto (the “Receiving Party”) will keep such Proprietary Information confidential, and will not, without the prior written consent of the Party disclosing such information (the “Disclosing Party”), use any portion of such Proprietary Information for any purpose other than to perform this Agreement, or disclose any portion of such Proprietary Information to any Persons other than the employees, contractors, subcontractors, agents and consultants of the Receiving Party who have a genuine need to have access to the Proprietary Information in order to perform this Agreement and who are required to maintain such information in confidence pursuant to the terms of a confidentiality or nondisclosure agreement, the terms of which shall be at least as protective of such information as the terms set forth in this

**REDACTED – For Public Inspection**

Section 17. The Receiving Party shall be liable for any breach of any of the obligations under this Section 17.1 by the Receiving Party's employees, contractors, subcontractors, agents and consultants. Notwithstanding the foregoing, EchoStar may disclose to its third-party customers making use of the EchoStar Channel Services (which, for clarification purposes, shall include prospective third-party customers considering use of an EchoStar Channel Service) the Performance Specifications relating to the Ku-Band payload for the United States

[REDACTED], provided that each such third-party customer has executed a non-disclosure agreement that is consistent with the terms of this Agreement and names Bell ExpressVu and Telesat as third-party beneficiaries.

17.2 The Receiving Party will not be liable for disclosure of Proprietary Information of the Disclosing Party, or any part thereof, if the Receiving Party can demonstrate that such Proprietary Information: (a) was in the public domain at the time it was received or subsequently entered the public domain through no fault of the Receiving Party; (b) was known to or in the possession of the Receiving Party at the time of receipt from the Disclosing Party; (c) became known to the Receiving Party from a source other than the Disclosing Party without breach of an obligation of confidentiality; or (d) is at any time lawfully developed by the Receiving Party completely independently of any such disclosure or disclosures from the Disclosing Party. If the Receiving Party or any of its agents, representatives or Affiliates is legally compelled to disclose any Proprietary Information of the Disclosing Party, such Receiving Party (or its agent, representative or Affiliate, as applicable) shall promptly notify the Disclosing Party in writing of such requirement so that the Disclosing Party may seek a protective order or other appropriate remedy and/or waive compliance with the provisions hereof. If, in the absence of a protective order or a waiver hereunder, the Receiving Party (or its agent, representative or Affiliate, as applicable) is, in the opinion of its counsel, compelled to disclose any such Proprietary Information to any court, tribunal or agency or else stand liable for contempt or suffer other censure or penalty, the Receiving Party (or its agent, representative or Affiliate, as applicable) may disclose such Proprietary Information without liability; provided, however, that the Receiving Party (or its agent, representative or Affiliate, as applicable) further agrees that if the Disclosing Party is not successful in precluding the requesting legal body from requiring the disclosure of the Proprietary Information, it will furnish only that portion of the Proprietary Information which is legally required and that, prior to such disclosure, it will exercise commercially reasonable efforts to obtain reliable assurances that confidential treatment will be accorded the Proprietary Information. Except in connection with any failure to discharge its responsibilities under the preceding two sentences, the Receiving Party will not be liable for any disclosure pursuant to court order.

17.3 Ownership; Return. Proprietary Information of the Disclosing Party will remain the property of the Disclosing Party and will, at the Disclosing Party's request and after it is no longer needed for performance of this Agreement or upon expiration or termination of this Agreement for any reason, whichever occurs first, promptly be returned to the Disclosing Party or, in the alternative, at the Receiving Party's option be destroyed, together with all copies made by the Receiving Party and by anyone to whom such Proprietary Information has been made available by the Receiving Party in accordance with the provisions of this Section 17.

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17.4 Survival. The provisions of this Section 17 shall survive expiration or termination of this Agreement.

18. Press Releases. Neither Party shall, without the prior written consent of the other Party, make any public announcement, denial or confirmation concerning this Agreement, except as required by law; provided however, that neither Party will unreasonably withhold consent to a joint press release announcing the existence and general nature of the relationship.

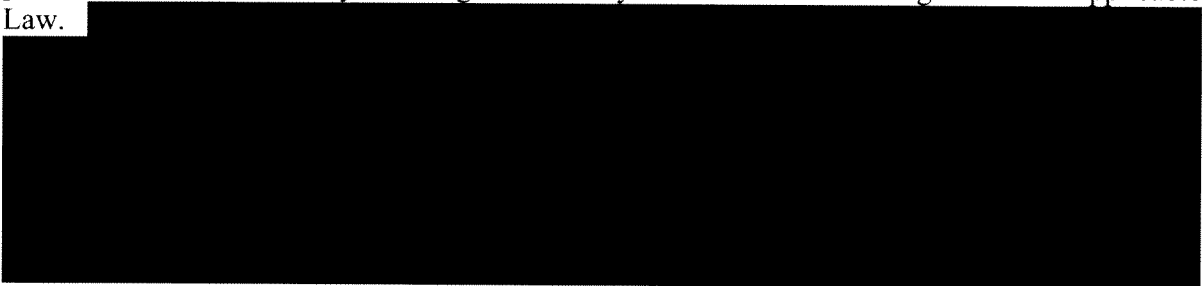
19. Miscellaneous.

19.1 U.S. Export Control Restrictions. The Parties agree and acknowledge that in connection with their respective obligations under this Agreement, they shall at all times comply with the laws, rules and regulations of the United States regarding export restrictions, including, without limitation, the International Traffic in Arms Regulations, 22 CFR §§ 120-130. This Section shall survive the expiration or termination of this Agreement.

19.2 Severability. If any of the provisions or any portion of the provisions of this Agreement shall be held invalid or unenforceable, such invalidity or unenforceability will not invalidate or render unenforceable the entire Agreement, but rather the entire Agreement will be construed as if not containing the particular invalid or unenforceable provisions or portion thereof, and the rights and obligations of the Parties hereto will be construed and enforced accordingly.

19.3 No Third Party Beneficiary. The provisions of this Agreement are for the benefit only of Bell ExpressVu and EchoStar and no third party may seek to enforce or benefit from these provisions.

19.4 No Waiver; Remedies Cumulative. No failure or delay on the part of either Party to notify the other Party of any breach or noncompliance hereunder, and no failure or delay on the part of either Party to exercise its rights hereunder with respect thereto, shall prejudice any remedy for that specific breach or noncompliance or any subsequent breach or noncompliance, and any waiver (which must be in writing in order to be binding) by either Party of any breach or noncompliance with any term or condition of this Agreement shall be limited to the particular instance and shall not operate or be deemed to waive any future breaches or noncompliance with any term or condition. All rights and remedies of each of the Parties under this Agreement will be cumulative, and the exercise of one or more rights or remedies will not preclude the exercise of any other right or remedy available under this Agreement or applicable Law.





19.5 Notices.

(a) Telephone Notices. For the purpose of receiving notices from Bell ExpressVu regarding preemption, interference or other technical problems, EchoStar shall maintain at each EchoStar-operated hub earth station transmitting signals to the Satellite a telephone that is continuously staffed at all times during which EchoStar is transmitting signals to the Satellite and an automatic facsimile machine in operation and capable of receiving messages from EchoStar at all times. Bell ExpressVu shall also maintain a telephone that is continuously staffed for the purposes of receiving notices regarding the matters identified above. All such notices shall be made in English and shall be effective upon the placement of a telephone call from one Party to the other. Each Party shall promptly confirm all telephone notices that may be given under this Agreement in writing in accordance with this Agreement.

(b) General Notices. All notices and other communications from either Party to the other, except as otherwise stated in this Agreement, shall be in English writing and shall be deemed received upon actual delivery or successfully transmitted facsimile addressed to the other Party as follows:

To Bell ExpressVu:

100 Wynford Drive  
Suite 300  
Toronto, Ontario M3C 4B4  
Attention: [REDACTED]  
Fax No.: (416) 383-6269

With a copy to

[REDACTED]  
Bell Canada  
100 Wynford Drive  
Suite 300  
Toronto, Ontario M3C 4B4  
Fax No.: (416) 383-6269

To EchoStar:

EchoStar Corporation  
90 Inverness Circle East  
Englewood, Colorado 80112  
Attn: [REDACTED]  
Fax No.: (303) 723-1699

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[REDACTED]

Each Party will advise the other of any change in the address, designated representative or telephone or facsimile number.

19.6 Counterparts. This Agreement may be executed by facsimile and/or in several counterparts, each of which shall be deemed an original, and all such counterparts together shall constitute but one and the same instrument.

19.7 Governing Law. This Agreement, the rights and obligations of the Parties hereunder, and any claims or disputes relating to any of the foregoing, shall be governed by and construed in accordance with the laws of the Province of Ontario and the laws of Canada applicable therein.

19.8 Entire Agreement. This Agreement, including the Attachments hereto, together with the MOA, constitutes the entire agreement between the Parties with respect to the subject matter hereof, and supersedes all previous understandings, commitments and representations, warranties and covenants pertaining thereto.

19.9 Amendments. This Agreement may not be amended or modified in any way, and none of its provisions may be waived, except by a prior writing signed by an authorized officer of each Party.

19.10 [REDACTED]

[REDACTED]

[REDACTED]

**REDACTED – For Public Inspection**

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

19.11 Incorporation of Attachments. The Attachments attached hereto shall for all purposes hereof form an integral part of this Agreement and are hereby incorporated by reference in their entirety.

19.12 Currency. Unless otherwise noted, all dollar amounts referred to in this Agreement are expressed in the currency of the United States of America.

19.13 Survival. Neither Party shall have any further obligations or liability to the other under this Agreement in the event of the termination or expiration of this Agreement, except for any obligations or liability (a) arising prior to such termination or expiration, (b)

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expressly arising upon or as a result of such termination or expiration, (c) expressly described in this Agreement as surviving such expiration or termination, or (d) that logically would be expected to survive termination or expiration.

20.



**REDACTED – For Public Inspection**

**IN WITNESS WHEREOF**, the Parties hereto have caused their duly authorized representatives to execute and deliver this Agreement as of the day and year first above written.

**BELL EXPRESSVU LIMITED  
PARTNERSHIP,  
acting through its general partner,  
BELL EXPRESSVU INC.**

By: \_\_\_\_\_  
Name:  
Title:

**ECHOSTAR CORPORATION**

By: \_\_\_\_\_  
Name:  
Title:



By: \_\_\_\_\_  
Name:  
Title:



**REDACTED – For Public Inspection**

**ATTACHMENT 1**



**REDACTED – For Public Inspection**

**ATTACHMENT 2**

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**ATTACHMENT C**

**Technical Annex**

## **NIMIQ 5**

### **ATTACHMENT C**

#### **Technical Information to Supplement Schedule S**

##### **A.1 Scope**

This attachment contains the information required by §25.114(c) and other sections of the FCC Part 25 rules that cannot be captured by the Schedule S software.

##### **A.2 General Description of Overall System Facilities, Operations and Services (§25.114(d)(1))**

The NIMIQ 5 satellite will be operated by Telesat at the 72.7°W.L. orbital location, which is allotted to Canada for BSS and associated FSS services by the International Telecommunication Union (ITU). Although the satellite is equipped with both Canadian and CONUS downlink beams, only the CONUS beam will be used by EchoStar. EchoStar will specifically use this downlink beam to provide BSS services to CONUS. The NIMIQ 5 satellite uses a single North American receive beam that permits uplink signals to be received from large parts of Canada and the USA, including EchoStar's two main feeder link earth station sites at Cheyenne, WY, and Gilbert, AZ, which will be used for the services that are the subject of this application.

The NIMIQ 5 satellite operates in the 17.3-17.8 GHz BSS feeder uplink band (ITU Appendix 30A) and the 12.2-12.7 GHz BSS downlink band (ITU Appendix 30), using all 32 channels allotted to Canada at that orbital location. The transponder frequency plan is identical to that prescribed in the ITU's Region 2 BSS Plan.

The NIMIQ 5 satellite includes 44 Traveling Wave Tube Antennas (TWTAs), each capable of 150 Watt saturated power. These TWTAs and associated payload equipment are configured such that simultaneous operation of all 32 channels is possible using one TWTA per channel, producing a beam peak EIRP level of approximately 55.5 dBW per channel when downlinking

into the CONUS beam.<sup>1,2</sup> Full frequency re-use is achieved through the use of dual orthogonal polarizations, with 16 channels operating in right hand circular (RHC) polarization, and 16 channels in left hand circular (LHC) polarization.

Spacecraft TT&C functions will be performed from Telesat's satellite control facility located in Allan Park, Ontario, Canada. Telesat will use its TT&C earth stations located in Allan Park, Ontario and Edmonton, Alberta, both in Canada. The TT&C transmissions will use the edges of the 17.3-17.8 GHz uplink band and 12.2-12.7 GHz downlink band.

### **A.3 Predicted Space Station Antenna Gain Contours (§25.114(d)(3))**

The NIMIQ 5 antenna gain contours for the receive and transmit beams, as required by §25.114(d)(3), are provided in GXT format and embedded in the associated Schedule S submission.

### **A.4 Services to be Provided (§25.114(d)(4))**

The NIMIQ 5 satellite will provide a range of DBS services to millions of small and inexpensive subscriber receive-only earth terminals.

There will be one wideband digitally modulated signal transmitted in each of the active transponders, supporting a range of information data rates depending on the order of the modulation (e.g., QPSK, 8PSK) and the type and degree of FEC coding used.

---

<sup>1</sup> Each channel can be individually switched to transmit into either the Canadian downlink beam or the CONUS downlink beam. As EchoStar will only be using the CONUS downlink beam, this technical annex and the associated Schedule S provide data only for the CONUS downlink beam mode of operation and not the Canadian downlink beam.

<sup>2</sup> The NIMIQ 5 satellite payload is also capable of being reconfigured to provide higher downlink EIRP ("boost mode") in a limited number of channels. In this case two 150 Watt TWTAs are connected to each downlink channel, producing a net increase in downlink EIRP of approximately 2.6 dB relative to the normal mode of operation. Only a maximum of 16 channels can be simultaneously operated in such boost mode. EchoStar does not currently plan to utilize this boost mode of operation and so this technical annex and the associated Schedule S for NIMIQ 5 describe only the normal mode of operation of the NIMIQ 5 satellite payload.

Representative link budgets, which include details of the transmission characteristics, performance objectives and earth station characteristics, are provided in the associated Schedule S submission, and further described in Section A.4.2 below.

#### **A.4.1 Earth Stations**

The subscriber receive-only earth stations to be used with the NIMIQ 5 satellite will have effective antenna diameters in the range of 45 to 90 cm, depending on a variety of factors such as rain zone, availability requirements, and location in the coverage area. There will be millions of these types of terminals across the service area. The feeder uplink earth stations (main and back-up) will typically use a 13 meter antenna.

#### **A.4.2 Link Budgets**

Three representative modulation/coding schemes are provided in the associated Schedule S submission, as follows:

- a) QPSK, DVB-S rate 3/4 inner coding
- b) QPSK, DVB-S rate 5/6 inner coding
- c) 8PSK, Turbo rate 2/3 inner coding

Each of these schemes has its associated bandwidth and power efficiencies as given in the Schedule S.

Representative link budgets for all of the above schemes are provided as attachments embedded in the Schedule S. The following notes provide additional explanation of these link budgets:

- Each link budget table is for one of the three modulation/coding schemes listed above, making a total of three link budget tables.
- There are three columns in each link budget table showing different example link budgets for various locations in the downlink beam.
- Each column shows the link performance under both clear sky and rain-faded downlink conditions.

- The uplink is operated with both Uplink Power Control (UPC) at the feeder link earth station and satellite Automatic Level Control (ALC), so the effects of any uplink rain fade are minimized. Also, the link budgets are all shown for the case of an uplink from the Gilbert, AZ feeder link earth station, as the results for the Cheyenne, WY uplink beam and uplink site are approximately the same and the satellite receive performance towards Cheyenne is approximately 3 dB better (higher) than towards Gilbert.
- Subscriber earth terminals with effective antenna diameters in the range 45 cm (~18 inches) to 90 cm (~36 inches) are shown in the representative link budgets.

**A.5 TT&C Characteristics**  
**(§25.114(c)(4)(i) and §25.114(c)(9))**

No information is being provided concerning the TT&C transmissions for the NIMIQ 5 satellite because the satellite is operating as a Canadian-registered space station at the ITU and the TT&C earth stations will be operated by Telesat Canada and are located in Canadian territory.

**A.6 Satellite Transponder Frequency Responses**  
**(§25.114(c)(4)(vii))**

The predicted worst case receive and transmit channel filter response performance is given in Table A.6-1 below. The receive response is measured from the satellite receive antenna up to the input of the TWTA. The transmit response is measured from the input of the TWTA to the satellite transmit antenna.

**Table A.6-1 - Typical Receiver and Transmitter Filter Responses**

Frequency offset from channel center	Gain relative to channel center frequency (dB)		Comments
	Receive	Transmit	
CF±5 MHz	0.5	0.45	<u>In-Band</u> Value does not exceed these p-p values
CF±7 MHz	0.7	0.55	
CF±9 MHz	1.05	0.9	
CF±11 MHz	1.45	1.1	

CF±12 MHz	1.9	1.1	<u>Out-of-Band</u> Attenuation is not less than these values
CF±17.5 MHz	-17.0	-0.5	
CF±20.2 MHz	-37.0	-2.0	
CF±27.2 MHz	-45.0	-15.0	

**A.7 Cessation of Emissions**  
**(§25.207)**

Each active satellite transmission chain (channel amplifiers and associated TWTA) can be individually turned on and off by ground telecommand, thereby causing cessation of emissions from the satellite, as required.

**A.8 ITU Filing and Coordination Situation for NIMIQ 5**  
**(§25.114(d)(13))**

The Canadian administration is responsible for coordinating the operation of the NIMIQ 5 satellite in accordance with ITU procedures. These procedures are contained in Appendices 30 and 30A of the ITU Radio Regulations. They require that the Canadian administration obtain the agreement of any administration that is affected by the operation of the proposed satellite.

The NIMIQ 5 satellite will be operated under the CAN-BSS6 ITU network filing at 72.7°W. This filing was first published (“Part A”) in IFIC 2530 as AP30-30A/E/324 on October 19, 2004. That publication listed the potentially affected BSS networks of other administrations, which are summarized below together with an assessment of the coordination situation:

- Mexican networks at 69.2°W, 76.8°W, 77.2°W, 77.8°W and 78.2°W. Coordination with all necessary Mexican networks has been completed;
- USA networks spaced 11° and greater away from 72.7°W. Coordination with such wide orbital separation will be straightforward;
- UK networks spaced 13.8° and greater away from 72.7°W. Coordination with such wide orbital separation will be straightforward;



- A French network spaced 19.5° away from 72.7°W. Coordination with such wide orbital separation will be straightforward;
- DIRECTV 1R is operating at 72.5° W.L. on different (opposite polarization) DBS channels than the 16 channels that EchoStar is initially expected to use on Nimiq 5, and DIRECTV 1R will continue to operate on opposite polarization channels so as long as it is operating at the 72.5° W.L. cluster.

Based on the above there will be no unacceptable interference caused by the operation of the NIMIQ 5 satellite.

#### **A.9 Orbital Debris Mitigation Plan (§25.114(d)(14))**

This section addresses requirements contained in the §25.114(d)(14)(i)-(iv) of the Commission's rules.

The NIMIQ 5 satellite has been designed and built by Space Systems/Loral ("Loral") using its FS-1300 spacecraft bus. The information provided below concerning the orbital debris mitigation plan has therefore been provided by Loral.

##### **A.9.1 Debris Release Assessment (§25.144(d)(14)(i))**

Loral has assessed the launch, orbit raising, deployment and normal operations portions of the mission and determined that no debris will be released by the spacecraft except during deployment -- the only stage of the mission in which portions of the spacecraft are separated from the main spacecraft body. Separation and deployment mechanisms are intended to contain the debris generated when activated. There are several reflector deployment hold-down electro explosive devices (EEDs) that have the potential to expel a small amount of debris - up to 3mg of titanium debris from the hold-down and 2mg of "soot" per firing. These EEDs have flown on over 35 spacecraft and have had no failures. The assessment found no other sources for debris throughout the mission.

Spacecraft Hardware Design: To protect from small body collisions, the design of the NIMIQ 5 spacecraft allows for individual faults without losing the entire spacecraft. All critical components (i.e., computers and control devices) are built within the structure and shielded from external influences. Items that cannot be built within the spacecraft nor shielded (like antennas) are redundant and/or are able to withstand impact. The NIMIQ 5 spacecraft can be controlled through both the normal payload antennas and wide angle antennas. The likelihood of both being damaged during a small body collision is minimal. The wide angle antennas on this spacecraft are basically open waveguides that point toward the Earth (there is one set on each side of the spacecraft; either set could be used to successfully de-orbit the spacecraft). These wide angle antennas would continue to operate even if struck and bent.

#### **A.9.2 Accidental Explosion Assessment**

##### **(§25.144(d)(14)(ii))**

Loral has reviewed failure modes for all equipment to assess the possibility of an accidental explosion onboard the spacecraft. In order to ensure that the spacecraft does not explode on orbit the satellite controller will take specific precautions. All batteries and fuel tanks are monitored for pressure or temperature variations. Alarms in the Satellite Control Center (SCC) inform controllers of any variations. Additionally, long term trending analysis will be performed to monitor for any unexpected trends.

Operationally, batteries will be operated utilizing the manufacturer's automatic recharging scheme. Doing so will ensure that charging terminates normally without building up additional heat and pressure. As this process occurs wholly within the spacecraft, it also affords protection from command link failures (on the ground).

In order to protect the propulsion system, fuel tanks will all be operated in a blow down mode. At the completion of orbit raising, the pressurant will be isolated from the fuel system. This will cause the pressure in the tanks to decrease over the life of the spacecraft. This will also protect against a pressure valve failure causing the fuel tanks to become over-pressurized.

In order to ensure that the spacecraft has no explosive risk after it has been successfully de-orbited, all stored energy onboard the spacecraft will be removed. Upon successful de-orbit of

the spacecraft, all propulsion lines and latch valves will be vented and left open. All battery chargers will be turned off and batteries will be left in a permanent discharge state. These steps will ensure that no buildup of energy can occur resulting in an explosion in the years after the spacecraft is de-orbited.

### **A.9.3 Safe Flight Profiles**

#### **(§25.144(d)(14)(iii))**

In considering current and planned satellites that may have a station-keeping volume that overlaps the NIMIQ 5 satellite, EchoStar has reviewed the FCC licensed satellite networks, as well as those that are currently under consideration by the FCC. In addition, non-USA networks for which a request for coordination has been submitted to the ITU in the vicinity of 72.7° W have also been reviewed.

For purposes of calculating potential station-keeping volume overlap, US satellites have been assumed to have a maximum east-west excursion of  $\pm 0.05^\circ$  from their nominal location, while non-US satellite networks have been assumed to have a maximum excursion of  $\pm 0.1^\circ$  from their nominal location. Also, NIMIQ 5 is assumed to be located at exactly 72.7°W for the purpose of this analysis.

The results of this research have concluded that the only satellites that have to be considered here are the two US satellites operating under the Canadian network filings at 72.5°W / 72.7°W. These are the DIRECTV 1R satellite, currently located at 72.5°W with a  $\pm 0.05^\circ$  east-west station-keeping tolerance, and the ECHOSTAR-6 satellite currently operating at 72.7°W with a  $\pm 0.05^\circ$  east-west station-keeping tolerance. Before the NIMIQ 5 satellite arrives on-station and subject to any necessary authority, the ECHOSTAR-6 satellite will be moved to 72.6°W (and still maintained with a  $\pm 0.05^\circ$  east-west station-keeping tolerance), and the NIMIQ 5 satellite will be located at 72.7°W with a  $\pm 0.05^\circ$  east-west station-keeping tolerance. The three satellites will then be located nominally 0.1° apart from each other and their  $\pm 0.05^\circ$  east-west station-keeping tolerance will ensure that there is no risk of physical collision between any of them.

**A.9.4 Post Mission Disposal Plan**  
**(§25.144(d)(14)(iv))**

At the end of the operational life of the NIMIQ 5 satellite, Telesat will maneuver the satellite to a disposal orbit with a minimum perigee of ~300 km above the normal GSO operational orbit. This proposed disposal orbit altitude exceeds the minimum required by §25.283, which is calculated below.

The input data required for the calculation are as follows:

Solar Pressure Area/Mass ratio “A/M” = 0.036 m<sup>2</sup>/kg  
(includes area of solar array, satellite body and deployed antennas)  
“C<sub>R</sub>” = Solar Pressure Radiation Coefficient (worst case) = 1.6

Using the formula given in §25.283, the Minimum Disposal Orbit Perigee Altitude is calculated as follows:

$$\begin{aligned} &= 36,021 \text{ km} + 1000 \times C_R \times A/M \\ &= 36,021 \text{ km} + 1000 \times 1.6 \times 0.036 \\ &= 36,078.6 \text{ km} \\ &= 292.6 \text{ km above GSO (35,786 km)} \end{aligned}$$

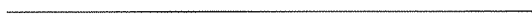
Thus, the designed disposal orbit of 300 km above GSO exceeds the required minimum by a margin of 7.4 km. Maneuvering the satellite to the disposal orbit will require 9.3 kg of propellant, and this quantity of fuel, taking account of all fuel measurement uncertainties, will be reserved to perform the final orbit raising maneuvers.

Propellant tracking is accomplished using a bookkeeping method. Using this method, the ground control station tracks the number of jet seconds utilized for station keeping, momentum control and other attitude control events. From jet seconds, the amount of fuel used is determined. This process has been calibrated using data collected from thruster tests conducted on the ground and has been found to be accurate to within a few months of life on the spacecraft.

One year from the end of life of the spacecraft, a Propellant Gauging System (PGS) test is to be performed. This test uses heaters and heat transfer curves to determine the actual fuel still

aboard the spacecraft. As the amount of fuel in the tanks decrease, the accuracy of the test results increases. Operationally, the test is scheduled to be performed one year before end of life as it provides more than adequate margin to compensate for any bookkeeping uncertainty as well as maximum accuracy for fuel remaining.

The PGS test is also conducted periodically while the satellite is on-orbit to confirm the amount of fuel used and to verify the results of the bookkeeping method. Only at the final year mark is it used as the mechanism to determine the amount of remaining fuel.



**CERTIFICATION OF PERSON RESPONSIBLE FOR PREPARING  
ENGINEERING INFORMATION**

I hereby certify that I am the technically qualified person responsible for preparation of the engineering information contained in this application, that I am familiar with Part 25 of the Commission's rules, that I have either prepared or reviewed the engineering information submitted in this application and that it is complete and accurate to the best of my knowledge and belief.

\_\_\_\_\_/s/\_\_\_\_\_  
\_\_\_\_\_

Richard J. Barnett, PhD, BSc  
Telecomm Strategies Inc.  
6404 Highland Drive  
Chevy Chase, MD 20815  
(301) 656-8969

March 6, 2009

## Appendix 1 to Attachment C (Technical Information to Supplement Schedule S)

### Analysis of ANNEX 1 of Appendix 30

#### **1 Limits for the interference into frequency assignments in conformity with the Regions 1 and 3 Plan or with the Regions 1 and 3 List or into new or modified assignments in the Regions 1 and 3 List**

Not Applicable to Region 2.

#### **2 Limits to the change in the overall equivalent protection margin for frequency assignments in conformity with the Region 2 plan**

*With respect to § 4.2.3 c) of Article 4, an administration in Region 2 is considered as being affected if the overall equivalent protection margin corresponding to a test point of its entry in the Region 2 Plan, including the cumulative effect of any previous modification to that Plan or any previous agreement, falls more than 0.25 dB below 0 dB, or, if already negative, more than 0.25 dB below the value resulting from:*

- the Region 2 Plan as established by the 1983 Conference; or*
- a modification of the assignment in accordance with this Appendix; or*
- a new entry in the Region 2 Plan under Article 4; or*
- any agreement reached in accordance with this Appendix. (WRC-03)*

The NIMIQ-5 satellite will operate under Canada's CAN-BSS6 network filing. The Administration of Canada is responsible for coordination of this network. The CAN-BSS6 network is a modification to the Region 2 BSS Plan and was published in AP30-30A/E/324. The results of the MSPACE analysis for this filed network, as published in AP30-30A/E/324, are contained in Annex 1 to this Appendix.

#### **3 Limits to the change in the power flux-density to protect the broadcasting-satellite service in Regions 1 and 2 in the band 12.2-12.5 GHz and in Region 3 in the band 12.5-12.7 GHz**

*With respect to § 4.2.3 a), 4.2.3 b) or 4.2.3 f) of Article 4, as appropriate, an administration in Region 1 or 3 is considered as being affected if the proposed modification to the Region 2 Plan*

would result in exceeding the following power flux-density values, at any test point in the service area of its overlapping frequency assignments:

$$\begin{array}{ll}
 -147 \text{ dB}(W/(m^2 \cdot 27 \text{ MHz})) & \text{for } 0^\circ \leq \theta < 0.23^\circ \\
 -135.7 + 17.74 \log \theta \text{ dB}(W/(m^2 \cdot 27 \text{ MHz})) & \text{for } 0.23^\circ \leq \theta < 2.0^\circ \\
 -136.7 + 1.66 \theta^2 \text{ dB}(W/(m^2 \cdot 27 \text{ MHz})) & \text{for } 2.0^\circ \leq \theta < 3.59^\circ \\
 -129.2 + 25 \log \theta \text{ dB}(W/(m^2 \cdot 27 \text{ MHz})) & \text{for } 3.59^\circ \leq \theta < 10.57^\circ \\
 -103.6 \text{ dB}(W/(m^2 \cdot 27 \text{ MHz})) & \text{for } 10.57^\circ \leq \theta
 \end{array}$$

where  $\theta$  is the minimum geocentric orbital separation in degrees between the wanted and interfering space stations, taking into account the respective East-West station-keeping accuracies. (WRC-03)

No networks in the Regions 1 and 3 Plans will be affected, as demonstrated by the CAN-BSS6 publication (AP30-30A/E/324).

#### **4 Limits to the power flux-density to protect the terrestrial services of other administrations**

*With respect to § 4.1.1 d) of Article 4, an administration in Region 1, 2 or 3 is considered as being affected if the consequence of the proposed modified assignment in the Regions 1 and 3 List is to increase the power flux-density arriving on any part of the territory of that administration by more than 0.25 dB over that resulting from that frequency assignment in the Plan or List for Regions 1 and 3 as established by WRC-2000. The same administration is considered as not being affected if the value of the power flux-density anywhere in its territory does not exceed the limits expressed below.*

*With respect to § 4.2.3 d) of Article 4, an administration in Region 1, 2 or 3 is considered as being affected if the consequence of the proposed modification to an existing assignment in the*



*Region 2 Plan is to increase the power flux-density arriving on any part of the territory of that administration by more than 0.25 dB over that resulting from that frequency assignment in the Region 2 Plan at the time of entry into force of the Final Acts of the 1985 Conference. The same administration is considered as not being affected if the value of the power flux-density anywhere in its territory does not exceed the limits expressed below.*

*With respect to § 4.1.1 d) or § 4.2.3 d) of Article 4, an administration in Region 1, 2 or 3 is considered as being affected if the proposed new assignment in the Regions 1 and 3 List, or if the proposed new frequency assignment in the Region 2 Plan, would result in exceeding a power flux-density, for any angle of arrival, at any point on its territory, of:*

$$\begin{aligned}
 & -148 \text{ dB}(W/(m^2 \cdot 4 \text{ kHz})) && \text{for } \theta \leq 5^\circ \\
 & -148 + 0.5 (\theta - 5) \text{ dB}(W/(m^2 \cdot 4 \text{ kHz})) && \text{for } 5^\circ < \theta \leq 25^\circ \\
 & -138 \text{ dB}(W/(m^2 \cdot 4 \text{ kHz})) && \text{for } 25^\circ < \theta \leq 90^\circ
 \end{aligned}$$

*where  $\theta$  represents the angle of arrival. (WRC-03)*

No administrations in Regions 1, 2 and 3 will be affected, as demonstrated by the CAN-BSS6 publication (AP30-30A/E/324).

**5 Limits to the change in the power flux-density of assignments in the Regions 1 and 3 Plan or List to protect the fixed-satellite service (space-to-Earth) in the band 11.7-12.2 GHz in Region 2 or in the band 12.2-12.5 GHz in Region 3, and of assignments in the Region 2 Plan to protect the fixed-satellite service (space-to-Earth) in the band 12.5-12.7 GHz in Region 1 and in the band 12.2-12.7 GHz in Region 3**

*With respect to § 4.1.1 e) of Article 4, an administration is considered as being affected if the proposed new or modified assignment in the Regions 1 and 3 List would result in an increase in the power flux-density over any portion of the service area of its overlapping frequency assignments in the fixed-satellite service in Region 2 or Region 3 of 0.25 dB or more above that resulting from the frequency assignments in the Plan or List for Regions 1 and 3 as established by WRC-2000.*

*With respect to § 4.2.3 e), an administration is considered as being affected if the proposed modification to the Region 2 Plan would result in an increase in the power flux-density over any portion of the service area of its overlapping frequency assignments in the fixed-satellite service in Region 1 or 3 of 0.25 dB or more above that resulting from the frequency assignments in the Region 2 Plan at the time of entry into force of the Final Acts of the 1985 Conference.*

*With respect to § 4.1.1 e) or 4.2.3 e) of Article 4, with the exception of cases covered by Note 1 below, an administration is considered as not being affected if the proposed new or modified assignment in the Regions 1 and 3 List, or if a proposed modification to the Region 2 Plan, gives a power flux-density anywhere over any portion of the service area of its overlapping frequency assignments in the fixed-satellite service in Region 1, 2 or 3 of less than:*

$$\begin{array}{ll}
 -186.5 \text{ dB}(W/(m^2 \cdot 40 \text{ kHz})) & \text{for } 0^\circ \leq \theta < 0.054^\circ \\
 -164.0 + 17.74 \log \theta \text{ dB}(W/(m^2 \cdot 40 \text{ kHz})) & \text{for } 0.054^\circ \leq \theta < 2.0^\circ \\
 -165.0 + 1.66 \theta^2 \text{ dB}(W/(m^2 \cdot 40 \text{ kHz})) & \text{for } 2.0^\circ \leq \theta < 3.59^\circ \\
 -157.5 + 25 \log \theta \text{ dB}(W/(m^2 \cdot 40 \text{ kHz})) & \text{for } 3.59^\circ \leq \theta < 10.57^\circ \\
 -131.9 \text{ dB}(W/(m^2 \cdot 40 \text{ kHz})) & \text{for } 10.57^\circ \leq \theta
 \end{array}$$

*where  $\theta$  is the minimum geocentric orbital separation in degrees between the wanted and interfering space stations, taking into account the respective East-West station-keeping accuracies.*

As demonstrated by the CAN-BSS6 publication (AP30-30A/E/324), the EUTELSAT 3-64W network was identified as being affected, however this network has since been suppressed.

**6 Limits to the change in equivalent noise temperature to protect the fixed-satellite service (Earth-to-space) in Region 1 from modifications to the Region 2 Plan in the band 12.5-12.7 GHz**

*With respect to § 4.2.3 e) of Article 4, an administration of Region 1 is considered as being affected if the proposed modification to the Region 2 Plan would result in:*

- *the value of  $\Delta T / T$  resulting from the proposed modification is greater than the value of  $\Delta T / T$  resulting from the assignment in the Region 2 Plan as of the date of entry into force of the Final Acts of the 1985 Conference; and*
- *the value of  $\Delta T / T$  resulting from the proposed modification exceeds 6%, using the method of Appendix 8 (Case II). (WRC-03)*

No administrations in Region 1 will be affected, as demonstrated by the CAN-BSS6 publication (AP30-30A/E/324).

**Annex 1 to Appendix 1 to Attachment C**

**CAN-BSS6 MSPACE Results**

Notifying Admin	Network Name	Id. No.	Orbital Location (°W)	Max EPM/OEPM Degradation
CAN	CAN01606	86550069	70.7	13.086
	CAN01606	86550070	70.3	11.794
	CAN03606	86550095	70.7	12.739
	CAN03606	86550096	70.3	11.998
	CAN-BSS1	96555002	82	3.618
	CAN-BSS2	96555003	91.1	1.418
	CAN-BSS4A	96555007	129.2	0.274
	CAN-BSS4B	96555008	128.8	0.281
	CAN-BSS5A	96555014	138.2	0.338
	CAN-BSS5B	96555015	137.8	0.338
F	SPMFRAN3	86550160	53.2	0.469
G	INTELSAT KUEXT 304.5	96555016	55.5	0.434
	INTELSAT KUEXT 310E	96555012	50	0.771
	USAT-S3	103555003	86.5	0.582
	USAT-S3 MOD-A	103555005	86.5	0.315
MEX	MEX0INTE	86550140	78.2	2.314

	MEX01NTE	86550141	77.8	2.677
	MEX01SUR	86550142	69.2	3.01
	MEX-TDH1A	96555004	77.2	6.385
	MEX-TDH1B	96555005	76.8	7.622
	MEX-TDH2A	97555004	69.2	5.116
USA	USABSS-1	95555003	101.2	0.282
	USABSS-13	101555003	101.2	0.364
	USABSS-15	102555004	110	0.325
	USABSS-17	102555002	61.5	12.176
	USABSS-1R	99555001	101.2	0.79
	USABSS-2	95555004	100.8	0.254
	USABSS-2A	95555005	100.85	0.255
	USABSS-3	98555006	119.2	0.257
	USABSS-3	99555003	119.2	0.257
	USABSS-4	98555007	118.8	0.256
	USABSS-4	99555004	118.8	0.256
	USABSS-5	97555001	109.8	0.339
	USABSS-6	97555002	110.2	0.328
	USABSS-7A	101555001	119	0.336
	USABSS-8	98555001	61.5	4.214
	USABSS-9	98555002	148	0.328

USAEH001	86550165	61.7	1.198
USAEH001	86550166	61.3	1.198

## Appendix 2 to Attachment C (Technical Information to Supplement Schedule S)

### Analysis of ANNEX 1 of Appendix 30A

#### **1 Limits to the change in the overall equivalent protection margin with respect to frequency assignments in conformity with the Region 2 feeder-link Plan (WRC-2000)**

*With respect to the modification to the Region 2 feeder-link Plan and when it is necessary under this Appendix to seek the agreement of any other administration of Region 2, except in cases covered by Resolution 42 (Rev.WRC-03), an administration is considered as being affected if the overall equivalent protection margin corresponding to a test point of its entry in that Plan, including the cumulative effect of any previous modification to that Plan or any previous agreement, falls more than 0.25 dB below 0 dB, or, if already negative, more than 0.25 dB below the value resulting from:*

- the feeder-link Plan as established by the 1983 Conference; or*
- a modification of the assignment in accordance with this Appendix; or*
- a new entry in the feeder-link Plan under Article 4; or*
- any agreement reached in accordance with this Appendix except for Resolution 42 (Rev.WRC-03). (WRC-03)*

See the results described under Section 2 of the Appendix 30 Annex 1 Analysis.

#### **2 Limits to the interference into frequency assignments in conformity with the Regions 1 and 3 feeder-link Plan or with the Regions 1 and 3 feeder-link List or proposed new or modified assignments in the Regions 1 and 3 feeder-link List (WRC-03)**

Not Applicable to Region 2.

#### **3 Limits applicable to protect a frequency assignment in the bands 17.3-18.1 GHz (Regions 1 and 3) and 17.3-17.8 GHz (Region 2) to a receiving space station in the fixed-satellite service (Earth-to-space)**

*An administration in Region 1 or 3 is considered as being affected by a proposed modification in Region 2, with respect to § 4.2.2 a) or 4.2.2 b) of Article 4, or an administration in Region 2 is considered as being affected by a proposed new or modified assignment in the Regions 1 and 3*

*feeder-link List, with respect to § 4.1.1 c) of Article 4, when the power flux-density arriving at the receiving space station of a broadcasting-satellite feeder-link would cause an increase in the noise temperature of the feeder-link space station which exceeds the threshold value of  $\Delta T/T$  corresponding to 6%, where  $\Delta T/T$  is calculated in accordance with the method given in Appendix 8, except that the maximum power densities per hertz averaged over the worst 1 MHz are replaced by power densities per hertz averaged over the necessary bandwidth of the feeder-link carriers. (WRC-03)*

No administrations in Regions 1 and 3 will be affected, as demonstrated by the CAN-BSS6 publication (AP30-30A/E/324).

**4 Limits applicable to protect a frequency assignment in the band 17.8-18.1 GHz (Region 2) to a receiving feeder-link space station in the fixed-satellite service (Earth-to-space) (WRC-03)**

*With respect to § 4.1.1 d) of Article 4, an administration is considered affected by a proposed new or modified assignment in the Regions 1 and 3 feeder-link List when the power flux-density arriving at the receiving space station of a broadcasting-satellite feeder-link in Region 2 of that administration would cause an increase in the noise temperature of the receiving feeder-link space station which exceeds the threshold value of  $\Delta T/T$  corresponding to 6%, where  $\Delta T/T$  is calculated in accordance with the method given in Appendix 8, except that the maximum power densities per hertz averaged over the worst 1 MHz are replaced by power densities per hertz averaged over the necessary bandwidth of the feeder-link carriers. (WRC-03)*

Not Applicable to Region 2.