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

In the Matter of	)	
ECHOSTAR CORPORATION	)	File No. SAT-LOA-2010_____
Application for Authority to Launch the EchoStar 15 Satellite and for Modified Authority to Operate that Satellite at 61.5° W.L.	)	

APPLICATION FOR AUTHORITY TO LAUNCH AND MODIFIED AUTHORITY TO OPERATE

Pursuant to Sections 308, 309 and 319 of the Communications Act of 1934, as amended,[1] and Part 25 of the Commission's rules,[2] EchoStar Corporation ("EchoStar") files this application for authority to launch the EchoStar 15 satellite and for modified authority to operate that satellite on the Direct Broadcast Satellite ("DBS") channels already licensed to EchoStar at the 61.5° W.L. orbital location. EchoStar 15 will operate a single large downlink broadcast beam encompassing the continental United States and Puerto Rico ("CONUS-plus beam") in the 12.2-12.7 GHz band and two uplink spot beams in the 17.3-17.8 GHz bands.[3] EchoStar 15 will specifically be located at 61.55° W.L., within the 61.5° W.L. orbital cluster.

[1] 47 U.S.C. §§ 308, 309, 319.

[2] 47 C.F.R. Part 25.

[3] EchoStar will file separately a request for Special Temporary Authority to test the satellite at 61.55º W.L. after launch and before commencement of operations.

EchoStar currently operates over all 32 DBS channels at the 61.5° W.L. orbital location. Specifically, EchoStar holds permanent authority to operate over channels 1-22 and 25-32.[4] EchoStar uses the remaining two channels, channels 23 and 24, under Special Temporary Authority ("STA").[5] The requested authority will permit EchoStar to replace the aging EchoStar 3 satellite. It will also allow the other EchoStar satellite at 61.5° W.L., EchoStar 12, to use virtually all of its power for spot beam service.[6] This will result in more and higher quality services for EchoStar's customer, the DISH Network.

EchoStar will also request an extension and modification of its current STA to operate on the two unassigned channels, as the public interest rationale for such operation will remain strong. In addition to the required technical showings for EchoStar's authorized channels, this application includes all of the technical information relevant to channels 23 and 24, too.

I. INTRODUCTION

EchoStar is a leading satellite services provider. EchoStar uses its eight owned or leased in-orbit satellites, among other things, to provide DBS and Fixed-Satellite Service capacity to its

[4] Originally, channels 2-22 (even) were licensed to DBSC. Application of Direct Broadcasting Satellite Corp., *Memorandum Opinion and Order*, 8 FCC Rcd. 7959 (1993). Those 11 channels were then assigned to EchoStar's predecessor. *See* Application of Direct Broadcasting Satellite Corp. for Assignment of Direct Broadcast Satellite Orbital Positions and Channels, *Order*, 11 FCC Rcd. 10494 (1996). Channels 1-21 (odd) were assigned to EchoStar by Rainbow DBS, and channels 25-32 were assigned by Dominion in 2006. *See* Rainbow DBS Company, LLC, *Memorandum Opinion and Order*, 20 FCC Rcd. 16868 (2005); EchoStar Satellite Operating Corporation, File No. SAT-ASG-20070608-00081 (grant stamped Sept. 27, 2007), respectively.

[5] *See* EchoStar Satellite Operating Corporation, *Order and Authorization*, 22 FCC Rcd. 2223 (2007); EchoStar Corporation, File No. SAT-STA-20090821-00092 (grant stamped Dec. 3, 2009) (STA valid until March 27, 2010).

[6] EchoStar has recently requested and received STA to move EchoStar 6 to 61.5º W.L., and has also requested operating STA for that satellite. This move is primarily intended to "back-stop" the EchoStar 3 satellite until the arrival of EchoStar 15.

sister company, DISH Network Corporation ("DISH"), which is the operator of the DISH Network television service, the nation's third largest subscription television service with over 14 million customers.

EchoStar currently operates the EchoStar 3 and EchoStar 12 satellites in the 61.5º W.L. orbital cluster. The EchoStar 3 satellite, launched in 1998, has experienced failures in a number of its traveling wave tube amplifiers ("TWTA"s). This has decreased the number of transponders available for use. The satellite is, moreover, naturally approaching the end of its useful life. EchoStar 12, on the other hand, was designed to allow access to only 13 of the frequencies at the 61.5 slot (specifically, frequencies 1-23 odd and 24 even). As the Commission is aware, EchoStar had intended to replace EchoStar 3 with the AMC-14 satellite in 2008; that satellite, however, suffered a launch failure and did not reach its intended orbit.[7] As a result, EchoStar designated EchoStar 15 as the replacement for EchoStar 3 to ensure the full utilization of the DBS spectrum at 61.5° W.L. The satellite will be owned by DISH. DISH has agreed to lease the satellite to EchoStar; EchoStar, in turn, will sublease the satellite capacity to DISH while retaining control over the satellite and responsibility for the satellite's Telemetry, Tracking and Command functions. Consequently, EchoStar seeks authority to launch and operate the EchoStar 15 satellite at the 61.55º W.L. orbital location as a replacement for EchoStar 3 and a supplement to EchoStar 12.

[7] *See* Letter from Pantelis Michalopoulos, Counsel for EchoStar Corporation, to Marlene H. Dortch, Secretary, FCC, filed in File No. SAT-STA-20070926-00133 (Mar. 25, 2008).

II. PUBLIC INTEREST CONSIDERATIONS IN SUPPORT OF GRANT OF APPLICATION

Grant of this application will serve the public interest because it will allow EchoStar and its customer DISH to expand and improve the video programming services it would offer to American consumers.

This state-of-the-art satellite will permit EchoStar to utilize fully the 61.5º W.L. orbital location. It will replace EchoStar 3, and allow the power available on EchoStar 12 to be devoted exclusively to spot beam service. Competitive developments have placed a strain on the limited bandwidth available to DBS operators and have made it imperative to maximize the available capacity from licensed spectrum. DISH must provide local broadcast stations into as many local markets as feasible in order to compete with terrestrial MVPDs. This in turn triggers carry-one, carry-all requirements. In that vein, DISH is subject to a demanding High Definition ("HD") must-carry schedule imposed on satellite carriers by the Commission.[8] This means that, within a finite spectrum assignment, power must be allocated to increasing throughput. This in turn has a price: less power remains available to preserve the quality of reception and link availability that customers have come to expect. Consequently, DISH needs satellite capacity capable of providing additional power to respond to consumer demand and competitive pressures without sacrificing reception quality. EchoStar 15 will aid in the effort to achieve this result. The operation of EchoStar 15 at 61.5º W.L. may also free up EchoStar 3 for in-orbit backup missions or more efficient deployment at a different orbital location.

In doing so, the satellite also will better enable EchoStar's customer, DISH, to provide meaningful competition to terrestrial providers – both cable operators and the telephone

[8] Carriage of Digital Television Broadcast, *Memorandum Opinion and Order and Second Further Notice of Proposed Rulemaking*, 23 FCC Rcd. 5351 (2008).

companies. By increasing competition in the MVPD market, consumers will benefit through greater choice, more services, and lower rates.

III. THE APPLICATION SATISFIES ALL COMMISSION RULES

The application satisfies all applicable Commission rules. In particular, because the satellite will operate on the channels already used by EchoStar at 61.5° W.L., this application is not subject to the "freeze" on new DBS applications currently in place.[9] The technical information for the EchoStar 15 satellite that is required to be submitted pursuant to Part 25 of the Commission's Rules is set forth in the accompanying technical narrative (Attachment A), FCC Form 312, and Schedule S, all of which are incorporated into this application by reference.

IV. STATUS OF OPERATIONS

EchoStar intends to operate all the transponders on this DBS satellite on a non-broadcast, non-common carrier basis.[10] Ultimately, DISH intends to use the capacity to provide multichannel video programming services across the United States. DISH's services will be offered to consumers on a subscription basis.

V. ITU COST RECOVERY

EchoStar is aware that as a result of the actions taken at the 1998 Plenipotentiary Conference, as modified by the ITU Council in June 2001, processing fees are now charged by the ITU for satellite network filings. As a consequence, Commission applicants are responsible for any and all fees charged by the ITU. EchoStar affirms it is aware of, and unconditionally accepts, this requirement and its responsibility to pay any ITU cost recovery fees for the ITU

[9] *See* Public Notice, Direct Broadcast Satellite (DBS) Auction Nullified: Commission Sets Forth Refund Procedures for Auction No. 52 Winning Bidders and Adopts a Freeze on All New DBS Service Applications, FCC 05-213, at 2 (rel. Dec. 21, 2005).

[10] *See* 47 C.F.R. §§ 25.114(c)(11), 25.114(d)(11).

filings associated with this application. Invoices for such fees may be sent to the contact representative listed in the accompanying FCC Form 312.

VI. WAIVER PURSUANT TO SECTION 304 OF THE COMMUNICATIONS ACT

In accordance with Section 304 of the Communications Act of 1934, as amended,[11] EchoStar 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.

VII. CONCLUSION

For the foregoing reasons, EchoStar respectfully requests that the Commission promptly grant this application for launch and operating authority for the EchoStar 15 satellite as in the public interest, convenience and necessity.

Respectfully submitted,
EchoStar Corporation

/s/

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[11] 47 U.S.C. § 304.

ECHOSTAR-15

ATTACHMENT A
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 ECHOSTAR-15 satellite will operate at 61.5°W.L. (specifically at 61.55º W.L., within the 61.5°W.L. ±0.2° orbital cluster and consistent with the ITU Region 2 BSS Plan) and will provide BSS services to CONUS and Puerto Rico. A single large area coverage beam is used on the downlink with higher gain spot beams used for the feeder uplink.

EchoStar's plan is that the ECHOSTAR-15 satellite would initially operate together with three other existing EchoStar satellites in the 61.5°W.L. orbital cluster. See Section A.10.3 of this document for details of the specific positions of these EchoStar satellites.

The ECHOSTAR-15 satellite will operate 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 the channels licensed to EchoStar at the 61.5°W.L. nominal orbital location, or, with respect to the two unlicensed channels covered by an STA from the Commission. The transponder frequency plan is identical to that prescribed in the ITU's Region 2 BSS Plan.

At the nominal 61.5°W orbital location EchoStar is licensed for a total of 30 of the 32 available channels.[1] In addition, EchoStar has an STA from the Commission conditionally permitting operations on the two remaining channels. Like other EchoStar satellites, the ECHOSTAR-15 satellite has been constructed with the capability to be operated at other EchoStar licensed DBS orbital locations, to provide operational flexibility for the future. The satellite is capable of operating on all 32 available DBS channels.[2] The ECHOSTAR-15 satellite can also be reconfigured, in orbit, to adjust its beam coverage to better optimize performance at other possible orbital locations.[3]

The ECHOSTAR-15 satellite includes 84 TWTAs, each of 150 Watt saturated power capability. When operated at the nominal 61.5°W orbital location ECHOSTAR-15 will either use up to 32 active transponders in "high power" mode (using 2 x 150 Watt TWTAs combined for each transponder) or up to 19 active transponders in "super high power" operation (using 3 x 150 Watt TWTAs combined for each transponder), producing peak EIRP levels as high as 58.1 dBW in super high power mode. Full frequency re-use will be achieved through the use of dual orthogonal polarizations, within the constraints of the channels licensed to EchoStar, or operated under STA, at 61.5°W.

EchoStar will use its two main feeder link earth station facilities with the ECHOSTAR-15 satellite. These are located in Cheyenne, WY and Gilbert, AZ.

Spacecraft TT&C functions will take place from EchoStar's fully redundant TT&C earth station and satellite control facilities located in Cheyenne, WY and Gilbert, AZ. The TT&C

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[1] EchoStar is currently licensed by the Commission at the 61.5°W orbital location for channels 1-22 and channels 25-32.

[2] The associated Schedule S for ECHOSTAR-15 describes all 32 channels.

[3] The associated Schedule S for ECHOSTAR-15 describes only the beam configuration to be used at the 61.5°W orbital location, as requested in this application. In the event that the ECHOSTAR-15 satellite is to be operated at other EchoStar licensed orbital locations in the future, the necessary details of the relevant beam configuration and performance will be provided to the FCC as part of the application requesting such operation.

transmissions will take place at the edges of the 17.3-17.8 GHz uplink band and 12.2-12.7 GHz downlink band, at all phases of the mission.

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

The ECHOSTAR-15 antenna gain contours for the receive and transmit beams, as required by §25.114(d)(3), are given in GXT format and embedded in the associated Schedule S submission.

Note that the GXT data files that form part of the ITU submission for ECHOSTAR-15 are provided as a separate attachment to this application.

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

The ECHOSTAR-15 high powered 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.

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 ECHOSTAR-15 satellite will have effective antenna diameters in the range 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

The transmissions on ECHOSTAR-15 will use various modulation and FEC coding schemes. For QPSK modulation, FEC coding schemes ranging from 3/4 to 7/8 will be used and for 8PSK modulation, FEC coding schemes ranging from 2/3 to 3/4 will be used. Therefore the associated Schedule S submission includes the following combinations of modulation and coding, which bound the transmissions to be used:

a) QPSK, DVB-S rate 3/4 inner coding

b) QPSK, DVB-S rate 7/8 inner coding

c) 8PSK, Turbo rate 2/3 inner coding

d) 8PSK, Turbo rate 3/4 inner coding

Each of these schemes has its associated bandwidth and power efficiencies as given in Section S11 of the associated Schedule S.

Representative link budgets for the above schemes, and for both high power and super high power modes of operation, 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 four modulation/coding schemes listed above, and for either “super high power” mode or “high power” mode, making for a total of eight link budget tables.

- There are six 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 UPC (Uplink Power Control) at the feeder link earth station and satellite ALC (Automatic Level Control), 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 Cheyenne feeder link earth station, as the results for the Gilbert uplink beam and uplink site are approximately the same.

- 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))

The information provided in this section complements that provided in the associated Schedule S submission.

The ECHOSTAR-15 TT&C sub-system provides for communications during pre-launch, transfer orbit and on-station operations, as well as during spacecraft emergencies. The TT&C sub-system will operate at the edges of the communications uplink and downlink frequency ranges during all phases of the mission.

During transfer orbit and on-station emergencies the TT&C signals will be received and transmitted by the satellite using a combination of antennas on the satellite that create a near omni-directional gain pattern. During normal on-station operation the TT&C signals will be received and transmitted via the standard communications antennas of the satellite.

A summary of the TT&C subsystem characteristics is given in Table A5-1.

Table A5-1: TT&C Performance Characteristics

Command Modulation	PCM/PSK
Command/Ranging Frequencies	17,791.5 MHz 17,793.5 MHz
Uplink Flux Density (Minimum)	Omni Rx antenna: > -83 dBW/m^2 (Command) -78 dBW/m^2 (Ranging) Comms Rx antenna: > -93 dBW/m^2 (Command) -87 dBW/m^2 (Ranging)
Satellite Receive Antenna Types and Modes of Operation	Omni antenna during transfer orbit and on-station emergencies, and for telecommand from earth stations other than at Cheyenne, WY and Gilbert, AZ. Communications antenna during on-normal on-station operations for telecommand from earth stations at Cheyenne, WY and Gilbert, AZ.
Polarization of Satellite Rx/Tx Antennas	RHCP for omni antenna RHCP for communications antenna
Peak Deviation (Command/Ranging)	± 400 kHz
Telemetry/Ranging Frequencies	12,692.0 MHz 12,693.0 MHz 12,694.5 MHz 12,698.5 MHz
Satellite Transmit Antenna Types and Modes of Operation	Omni antenna during transfer orbit and on-station emergencies and for telemetry to earth stations other than at Cheyenne, WY and Gilbert, AZ. Communications antenna during on-normal on-station operations for telemetry to earth stations at Cheyenne, WY and Gilbert, AZ.
Maximum Downlink EIRP	15.2 dBW (Omni antenna) 18 dBW (Communications antenna)
Telemetry/Ranging Modulation Index: 1 sub-carrier 2 sub-carriers 3 sub-carriers	 1.0 ± 0.2 rad pk 0.7± 0.2 rad pk 0.58± 0.2 rad pk

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

The predicted receive and transmit channel filter response performance is given in Table A6-1 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 A6-1 - Typical Receiver and Transmitter Filter Responses

Frequency offset from channel center	Gain relative to channel center frequency (dB)		Comments
	Receive	Transmit	
CF±6 MHz	0.15	0.10	In-Band Value does not exceed these p-p values
CF±7.7 MHz	0.19	0.15	
CF±9.6 MHz	0.30	0.22	
CF±12 MHz	1.00	0.38	
CF±13 MHz	2.20	0.50	
CF±16.5 MHz	-3.0		Out-of-Band Attenuation is not less than these values
CF±20.0 MHz		-3.0	
CF±27.0 MHz		-25.0	
CF±29.1 MHz	-30.0		

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 Interference Analyses (§25.214(d)(13))

The analyses of the proposed ECHOSTAR-15 satellite network with respect to the limits in Annex 1 to Appendices 30 and 30A are given in Appendices 1 and 2 to this document. The results of these analyses are discussed below.

Appendix 1 shows that the proposed ECHOSTAR-15 satellite network meets the ITU criteria in Annex 1 to Appendix 30, and so no coordination is required, except with respect to certain adjacent Region 2 BSS networks. The affected foreign administrations are Canada, the Netherlands, Russia and the UK. The results are summarized below for each of these administrations:

- The OEPM degradations to the affected Canadian networks are quite small (less than 0.3 dB) and so it is expected that coordination can be easily completed.

- The affected Netherlands network is 2.5 degrees away from USA BSS networks at 61.5°W, including USA Original Plan networks. The Netherlands is required to obtain agreement from the USA before it can implement its network. It is noted that the worst-case OEPM degradation into USA networks at 61.5°W from the Netherland's network is almost 10 dB, therefore successful coordination of the NSS-BSS 59 network with USA networks is expected to be quite difficult. This network will expire within the eight-year regulatory time period if it is not successfully coordinated, entered into the Region 2 Plan and brought into use.

- While the UK's INTELSAT KUEXT 304.5 at 55.5°W is theoretically affected by the USABSS-33 network, none of the affected beams of the UK's network has been brought into use. The INTELSAT KUEXT 304.5 beam that has been brought into use is unaffected by the USABSS-33 network.

- The UK's USAT-S5 network at 66.3°W is deemed to be affected. This network affects USA BSS networks at 61.5°W, including USA Original Plan networks. The UK is required to obtain agreement from the USA before it can implement its network. It is noted that the worst-case OEPM degradation into USA networks at 61.5°W from the USAST-S5 network is greater than 14 dB, therefore successful coordination of the UK's network with USA networks is expected to be quite difficult. This network will expire within the eight-year regulatory time period if it is not successfully coordinated, entered into the Region 2 Plan and brought into use.

- The OEPM degradations to the affected Russian network at 47.5°W are relatively small (less than 0.5 dB). It is expected that coordination can be achieved due to the small OEPM degradations coupled with the fourteen-degree orbital separation between the networks.

Appendix 2 shows that the proposed ECHOSTAR-15 satellite network meets all of the ITU criteria in Annex 1 to Appendix 30A.

The closest operational adjacent U.S. licensed co-frequency co-polar DBS satellites to the 61.5°W.L. orbital position, other than EchoStar's own satellites, are at the 101°W.L. orbital cluster. Interference into these networks will not be a problem because the peak EIRP of the ECHOSTAR-15 satellite is 58.1 dBW, which is less than the peak EIRP used in U.S. DBS satellites employing spot beams, and comparable to the peak EIRP of other U.S. DBS CONUS beam satellites.

A.9 ITU Filing for ECHOSTAR-15 (§25.114(d)(13))

All materials related to the ITU filing for ECHOSTAR-15 (to be filed as "USABSS-33" network name) will be submitted separately. These consist of the following:

- SpaceCap database file (USABSS-33 AP30&30A.mdb) containing the data required by the ITU as stated in Appendix 4 of the Radio Regulations.

- Contour data files in .gxt format for all transmit and receive beams, including both co-polar and cross-polar; diagrams of the estimated gain towards the geostationary orbit for the receive beams; and service area definitions. These are combined into a single database file (USABSS-33 Beams.mdb) that can be read by ITU software (e.g., GIMS and MSPACE).

A.10 Orbital Debris Mitigation Plan (§25.114(d)(14))

The ECHOSTAR-15 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.10.1 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 portion 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 ("EED"s) 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 had no failures. The assessment found no other sources for debris throughout the mission.

Spacecraft Hardware Design: To protect the spacecraft from small body collisions, the design of the ECHOSTAR-15 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 ECHOSTAR-15 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 towards 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.10.2 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, meaning that, at the completion of orbit raising, the pressurant will be isolated from the fuel system, thereby causing 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.10.3 Safe Flight Profiles (§25.144(d)(14)(iii))

In considering current and planned satellites that may have a station-keeping volume that overlaps the ECHOSTAR-15 satellite, EchoStar has reviewed the lists of 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 61.5° W.L. have also been reviewed. Only those networks that either operate, or are planned to operate, and have an overlapping station-keeping volume with the ECHOSTAR-15 satellite, have been taken into account in the analysis. For purposes of calculating potential station-keeping volume overlap, US satellites have been assumed to have a maximum east-west excursion of ±0.05° from their nominal location, while non-US satellite networks have been assumed to have a maximum excursion of ±0.1° from their nominal location. Also, ECHOSTAR-15 is assumed to be located at exactly 61.55°W.L. for the purpose of this analysis.

At the time of launch of the ECHOSTAR-15 satellites it is expected that there will be three other operational EchoStar satellites in the vicinity of 61.5° W.L., as follows [4]:

- ECHOSTAR-3 at 61.45°W.L.
- ECHOSTAR-6 at 61.65°W.L.
- ECHOSTAR-12 at 61.35°W.L.

[4] Subject to EchoStar separately seeking and obtaining appropriate Commission authorization for the relocation of these other EchoStar satellites.

By locating the ECHOSTAR-15 satellite at 61.55°W.L., and maintaining an east-west station-keeping tolerance of ±0.05° on all four EchoStar satellites, there will be no overlap in the station-keeping volume of any of these satellites, and so no risk of collision.

There are no pending applications before the Commission for additional satellites to be located at an orbital location in the immediate vicinity of 61.5°W.L. There are no FSS networks within ±0.15 degrees of 61.5°W.L.

Based on the preceding, EchoStar concludes there is no requirement to physically coordinate the ECHOSTAR-15 satellite with another satellite operator at the present time.

A.10.4 Post Mission Disposal Plan (§25.144(d)(14)(iv))

At the end of the operational life of the ECHOSTAR-15 satellite, EchoStar will maneuver the satellite to a disposal orbit with a minimum perigee of 330 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 is as follows:

Total Solar Pressure Area "A" = 110 m^2
(includes area of solar array, satellite body and deployed antennas)
"M" = Dry Mass of Satellite = 2479 kg
"C_R" = Solar Pressure Radiation Coefficient (worst case) = 2

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

= 36,021 km + 1000 x C_R x A/M
= 36,021 km + 1000 x 2 x 110/2479

= 36,110 km

= 324 km above GSO (35,786 km)

Adequate margin has already been accounted for in the calculation of the designed disposal orbit of 330 km above GSO, which includes margin relative to the above calculation. Attaining the altitude of 330 km above the GSO orbit will require approximately 15.6 kg of propellant, which will be reserved, taking account of all fuel measurement uncertainties, to perform the final orbit raising maneuvers.

A.11 Additional Information Concerning Certain Data in the Associated Schedule S

Owing to limitations in the permitted data for certain fields in the Schedule S software, it has not been possible to enter the correct values in a small number of cases, as follows:

- In S7 (Space Station Antenna Beam Characteristics), column "n", the Schedule S software does not accept a noise temperature higher than approximately 32,000K, and so this value has been entered in the Schedule S. For beams TCOS1 and TCOS2, because of the input attenuator, the correct value for T is 63,096K.

- In S7 (Space Station Antenna Beam Characteristics) of the Schedule S there is a 4th row entry that is not required (beam called "NA"). Owing to a glitch in the Schedule S software, it is not possible to delete this row.

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/_____

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Appendix 1 to
Attachment A (Technical Information to Supplement Schedule S)
(ECHOSTAR-15)

Analysis of ANNEX 1 of Appendix 30 for USABSS-33

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

Does not apply to the Region 2 Plan.

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[28] 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 MSPACE analysis was performed utilizing the Region 2 BSS Plan as contained in IFIC 2661. The results of the analysis for foreign networks are contained in Annex 1 to this Appendix. As shown the affected foreign administrations are Canada, the Netherlands, Russia and the UK. The results are summarized below for each of these administrations:

- The OEPM degradations to the affected Canadian networks are quite small (less than 0.3 dB) and so it is expected that coordination can be easily completed.
- The affected Netherlands network is 2.5 degrees away from USA BSS networks at 61.5°W, including USA Original Plan networks. The Netherlands is required to obtain agreement from the USA before it can implement its network. It is

[28] For the definition of the overall equivalent protection margin, see § 1.11 of Annex 5.

noted that the worst-case OEPM degradation into USA networks at 61.5°W from the Netherland's network is almost 10 dB, therefore successful coordination of the NSS-BSS 59 network with USA networks is expected to be quite difficult. This network will expire within the 8-year regulatory time period if it is not successfully coordinated, entered into the Region 2 Plan and brought into use.

- The UK's INTELSAT KUEXT 304.5 at 55.5°W is affected by the USABSS-33 network. None of the affected beams of the UK's network have been brought into use. The INTELSAT KUEXT 304.5 beam that has been brought into use is unaffected by the USABSS-33 network.
- The UK's USAT-S5 network at 66.3°W is deemed to be affected. This network affects USA BSS networks at 61.5°W, including USA Original Plan networks. The UK is required to obtain agreement from the USA before it can implement its network. It is noted that the worst-case OEPM degradation into USA networks at 61.5°W from the USAST-S5 network is greater than 14 dB, therefore successful coordination of the UK's network with USA networks is expected to be quite difficult. This network will expire within the 8-year regulatory time period if it is not successfully coordinated, entered into the Region 2 Plan and brought into use.
- The OEPM degradations to the affected Russian network at 47.5°W are relatively small (less than 0.5 dB). It is expected that coordination can be achieved due to the small OEPM degradations coupled with the fourteen-degree orbital separation between the networks.

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:

-147 dB(W/(m^2 · 27 MHz))	for $0° \le \theta < 0.23°$
$-135.7 + 17.74 \log \theta$ dB(W/(m^2 · 27 MHz))	for $0.23° \le \theta < 2.0°$
$-136.7 + 1.66\ \theta^2$ dB(W/(m^2 · 27 MHz))	for $2.0° \le \theta < 3.59°$
$-129.2 + 25 \log \theta$ dB(W/(m^2 · 27 MHz))	for $3.59° \le \theta < 10.57°$
-103.6 dB(W/(m^2 · 27 MHz))	for $10.57° \le \theta$

where θ 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)*

The closest Regions 1 and 3 BSS network is the Russian INTERSPUTNIK-47.5W-B network at 47.5°W, which is greater tha 10.57 degrees from the USABSS-33 network, therefore the –103.6 dB(W/(m^2 . 27 MHz)) PFD level applies for this network and all other Regions 1 and 3 networks. The GIMs Appendix 30 pfd tool was used to assess compliance with this Section. Using the antenna gain contours and power levels of the beams the GIMS pfd tool showed that no administrations are affected. Therefore the USABSS-33 network is compliant with this Section.

4 Limits to the power flux-density to protect the terrestrial services of other administrations[29, 30, 31]

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:

$$-148 \quad dB(W/(m^2 \cdot 4\ kHz)) \qquad for \quad \theta \le 5°$$

$$-148 + 0.5\,(\theta - 5)\ dB(W(m^2 \cdot 4\ kHz) \qquad for \quad 5° < \theta \le 25°$$

$$-138 \quad dB(W/(m^2 \cdot 4\ kHz)) \qquad for \quad 25° < \theta \le 90°$$

where θ represents the angle of arrival. *(WRC-03)*

The GIMS pfd tool was used to determine the administrations whose terrestrial services may be affected by the USABSS-33 modification to the Region 2 Plan. Using this tool, the results show that the pfd limit is exceeded in Canada only. However, 4.2.3 d) of Article 4 of Appendix 30 states that the above pfd limits apply to countries not having frequency assignments in the broadcasting-satellite service in the channel concerned. Since Canada is assigned all 32 channels in the Plan, and therefore will not be deploying co-frequency terrestrial services, these limits do not need to be met on its territory.

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[29] See § 3.18 of Annex 5.

[30] In the band 12.5-12.7 GHz in Region 1, these limits are applicable only to the territory of administrations mentioned in Nos. **5.494** and **5.496**.

[31] See Resolution **34**.

5 (Not used.)

6 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[32] 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 § 4.2.3 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, 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:

$$-186.5 \quad dB(W/(m^2 \cdot 40\ kHz)) \qquad for \quad 0° \le \theta < 0.054°$$

$$-164.0 + 17.74 \log \theta \quad dB(W/(m^2 \cdot 40\ kHz)) \qquad for \quad 0.054° \le \theta < 2.0°$$

$$-165.0 + 1.66\ \theta^2 \quad dB(W/(m^2 \cdot 40\ kHz)) \qquad for \quad 2.0° \quad \le \theta < 3.59°$$

$$-157.5 + 25 \log \theta \quad dB(W/(m^2 \cdot 40\ kHz)) \qquad for \quad 3.59° \le \theta < 10.57°$$

$$-131.9 \quad dB(W/(m^2 \cdot 40\ kHz)) \qquad for \quad 10.57° \le \theta$$

where θ 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.

The USABSS-33 network causes lower PFD levels over all territories in Regions 1 and 3 than those caused by USA Original Plan networks at 61.5°W and therefore the network is compliant with this Section.

[32] Including assignments operating under No. **5.485**.

7 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 ΔT/T resulting from the proposed modification is greater than the value of ΔT/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 ΔT/T resulting from the proposed modification exceeds 6%,*

using the method of Appendix 8 (Case II). *(WRC-03)*

From a review of the available ITU space network databases there are no assignments registered in the Earth-to-space direction in the frequency band 12.5-12.7 GHz. Therefore no Region 1 space station can be affected and the USABSS-33 network is compliant with this Section.

Annex 1 to Appendix 1 to Technical Annex

ECHOSTAR-15

MSPACE Results

Adm. Symbol	Orbital Position (degrees E)	Sat.Network Id.	Beam Name	Affected Channels	Max. EPM Degradation (dB)
CAN	-129.00	CAN-BSS4	00010028	2,4,6,8,10,12,14,16	0.262
CAN	-72.70	CAN-BSS3	00008452	2,4,6,8,10,12,14,16	0.265
G	-66.30	USAT-S5	00009466	1,3,5,7,9,11,13,15,17,19,21,23,25,27,29,31	0.952
G	-66.30	USAT-S5	00009467	1,3,5,7,9,11,13,15,17,19,21,23,25,27,29,31	1.138
G	-66.30	USAT-S5	00009468	1,3,5,7,9,11,13,15,17,19,21,23,25,27,29,31	1.445
G	-66.30	USAT-S5	00009469	3,5,7,9,11,13,15,17,19,21,23,25,27,29,31	0.711
G	-66.30	USAT-S5	00009470	1,3,5,7,9,11,13,15,17,19,21,23,25,27,29,31	0.952
G	-66.30	USAT-S5	00009471	1,3,5,7,9,11,13,15,17,19,21,23,25,27,29,31	1.138
G	-66.30	USAT-S5	00009472	1,3,5,7,9,11,13,15,17,19,21,23,25,27,29,31	1.446
G	-66.30	USAT-S5	00009473	3,5,7,9,11,13,15,17,19,21,23,25,27,29,31	0.712
G	-66.30	USAT-S5	00009474	1,3,5,7,9,11,13,15,17,19,21,23,25,27,29,31	0.952
G	-66.30	USAT-S5	00009475	1,3,5,7,9,11,13,15,17,19,21,23,25,27,29,31	1.137
G	-66.30	USAT-S5	00009476	1,3,5,7,9,11,13,15,17,19,21,23,25,27,29,31	1.445
G	-66.30	USAT-S5	00009477	3,5,7,9,11,13,15,17,19,21,23,25,27,29,31	0.713
G	-66.30	USAT-S5	00009478	2,4,6,8,10,12,14,16,18,20,22,24,26,28,30,32	1.043
G	-66.30	USAT-S5	00009479	2,4,6,8,10,12,14,16,18,20,22,24,26,28,30,32	1.205
G	-66.30	USAT-S5	00009480	2,4,6,8,10,12,14,16,18,20,22,24,26,28,30,32	1.482
G	-66.30	USAT-S5	00009481	2,4,6,8,10,12,14,16,18,20,22,24,26,28,30	0.602
G	-66.30	USAT-S5	00009482	2,4,6,8,10,12,14,16,18,20,22,24,26,28,30,32	1.043
G	-66.30	USAT-S5	00009483	2,4,6,8,10,12,14,16,18,20,22,24,26,28,30,32	1.204
G	-66.30	USAT-S5	00009484	2,4,6,8,10,12,14,16,18,20,22,24,26,28,30,32	1.482
G	-66.30	USAT-S5	00009485	2,4,6,8,10,12,14,16,18,20,22,24,26,28,30	0.603
G	-66.30	USAT-S5	00009486	2,4,6,8,10,12,14,16,18,20,22,24,26,28,30,32	1.043
G	-66.30	USAT-S5	00009487	2,4,6,8,10,12,14,16,18,20,22,24,26,28,30,32	1.205
G	-66.30	USAT-S5	00009488	2,4,6,8,10,12,14,16,18,20,22,24,26,28,30,32	1.481
G	-66.30	USAT-S5	00009489	2,4,6,8,10,12,14,16,18,20,22,24,26,28,30	0.604
G	-66.30	USAT-S5	00009490	1,3,5,7,9,11,13,15,17,19,21,23,25,27,29,31	0.619
G	-66.30	USAT-S5	00009491	1,3,5,7,9,11,13,15,17,19,21,23,25,27,29,31	0.725
G	-66.30	USAT-S5	00009492	1,3,5,7,9,11,13,15,17,19,21,23,25,27,29,31	0.949
G	-66.30	USAT-S5	00009493	3,5,7,9,11,13,15,17,19,21,23,25,27,29,31	0.725
G	-66.30	USAT-S5	00009494	1,3,5,7,9,11,13,15,17,19,21,23,25,27,29,31	0.619
G	-66.30	USAT-S5	00009495	1,3,5,7,9,11,13,15,17,19,21,23,25,27,29,31	0.726
G	-66.30	USAT-S5	00009496	1,3,5,7,9,11,13,15,17,19,21,23,25,27,29,31	0.949

G	-66.30	USAT-S5	00009497	3,5,7,9,11,13,15,17,19,21,23,25,27,29,31	0.725
G	-66.30	USAT-S5	00009498	1,3,5,7,9,11,13,15,17,19,21,23,25,27,29,31	0.620
G	-66.30	USAT-S5	00009499	1,3,5,7,9,11,13,15,17,19,21,23,25,27,29,31	0.726
G	-66.30	USAT-S5	00009500	1,3,5,7,9,11,13,15,17,19,21,23,25,27,29,31	0.949
G	-66.30	USAT-S5	00009501	3,5,7,9,11,13,15,17,19,21,23,25,27,29,31	0.724
G	-66.30	USAT-S5	00009502	2,4,6,8,10,12,14,16,18,20,22,24,26,28,30,32	0.610
G	-66.30	USAT-S5	00009503	2,4,6,8,10,12,14,16,18,20,22,24,26,28,30,32	0.718
G	-66.30	USAT-S5	00009504	2,4,6,8,10,12,14,16,18,20,22,24,26,28,30,32	0.869
G	-66.30	USAT-S5	00009505	2,4,6,8,10,12,14,16,18,20,22,24,26,28,30,32	0.652
G	-66.30	USAT-S5	00009506	2,4,6,8,10,12,14,16,18,20,22,24,26,28,30,32	0.610
G	-66.30	USAT-S5	00009507	2,4,6,8,10,12,14,16,18,20,22,24,26,28,30,32	0.718
G	-66.30	USAT-S5	00009508	2,4,6,8,10,12,14,16,18,20,22,24,26,28,30,32	0.869
G	-66.30	USAT-S5	00009509	2,4,6,8,10,12,14,16,18,20,22,24,26,28,30,32	0.651
G	-66.30	USAT-S5	00009510	2,4,6,8,10,12,14,16,18,20,22,24,26,28,30,32	0.610
G	-66.30	USAT-S5	00009511	2,4,6,8,10,12,14,16,18,20,22,24,26,28,30,32	0.718
G	-66.30	USAT-S5	00009512	2,4,6,8,10,12,14,16,18,20,22,24,26,28,30,32	0.869
G	-66.30	USAT-S5	00009513	2,4,6,8,10,12,14,16,18,20,22,24,26,28,30,32	0.651
G	-55.50	INTELSAT KUEXT 304.5	10010450	22,24,26,28,30	0.302
G	-55.50	INTELSAT KUEXT 304.5	10010451	21,23,25,27,29,31	0.400
G	-55.50	INTELSAT KUEXT 304.5	10010452	22,24,26,28,30,32	0.460
G	-55.50	INTELSAT KUEXT 304.5	10010453	21,23,25,27,29,31	0.703
G	-55.50	INTELSAT KUEXT 304.5	10010456	22,24,26,28,30,32	0.730
G	-55.50	INTELSAT KUEXT 304.5	10010457	21,23,25,27,29,31	1.641
G	-55.50	INTELSAT KUEXT 304.5	10010460	22,24,26,28,30	0.394
G	-55.50	INTELSAT KUEXT 304.5	10010461	21,23,25,27,29,31	0.477
HOL	-59.00	NSS-BSS 59W	10010548	1,3,5,7,9,11,13,15,17,19,21,23,25,27,29,31	1.236
HOL	-59.00	NSS-BSS 59W	10010549	3,5,7,9,11,13,15,17,19,21,23,25,27,29,31	0.665
HOL	-59.00	NSS-BSS 59W	10010552	1,3,5,7,9,11,13,15,17,19,21,23,25,27,29,31	1.236
HOL	-59.00	NSS-BSS 59W	10010553	3,5,7,9,11,13,15,17,19,21,23,25,27,29,31	0.664
HOL	-59.00	NSS-BSS 59W	10010556	1,3,5,7,9,11,13,15,17,19,21,23,25,27,29,31	1.236
HOL	-59.00	NSS-BSS 59W	10010557	3,5,7,9,11,13,15,17,19,21,23,25,27,29,31	0.664
HOL	-59.00	NSS-BSS 59W	10010560	2,4,6,8,10,12,14,16,18,20,22,24,26,28,30,32	1.059
HOL	-59.00	NSS-BSS 59W	10010561	2,4,6,8,10,12,14,16,18,20,22,24,26,28,30	0.495
HOL	-59.00	NSS-BSS 59W	10010564	2,4,6,8,10,12,14,16,18,20,22,24,26,28,30,32	1.058
HOL	-59.00	NSS-BSS 59W	10010565	2,4,6,8,10,12,14,16,18,20,22,24,26,28,30	0.496
HOL	-59.00	NSS-BSS 59W	10010568	2,4,6,8,10,12,14,16,18,20,22,24,26,28,30,32	1.058

HOL	-59.00	NSS-BSS 59W	10010569	2,4,6,8,10,12,14,16,18,20,22,24,26,28,30	0.496
RUS	-47.50	INTERSPUTNIK-47.5W-B	10013209	1,3,5,7,9,11,13,15,17,19	0.468
RUS	-47.50	INTERSPUTNIK-47.5W-B	10013210	2,4,6,8,10,12,14,16,18	0.496

Appendix 2 to
Attachment A (Technical Information to Supplement Schedule S)
(ECHOSTAR-15)

Analysis of ANNEX 1 of Appendix 30A for USABSS-33

1 (SUP - WRC-2000)

2 (SUP - WRC-2000)

3 **Limits to the change in the overall equivalent protection margin with respect to frequency assignments in conformity with the Region 2 feeder-link Plan**[33] (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[34] 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 Appendix 30 Annex 1 Analysis.

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[33] With respect to § 3 the limit specified relates to the overall equivalent protection margin calculated in accordance with § 1.12 of Annex 3.

[34] For the definition of the overall equivalent protection margin, see § 1.11 of Annex 5 to Appendix **30**.

4 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)

Does not apply to the Region 2 Plan.

5 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 ΔT/T corresponding to 6%, where ΔT/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)

The following Table calculates the Δ T / T for the closest Regions 1 and 3 feeder link space stations, based on the Region 1 and 3 List. As shown the Δ T / T's are well below the allowed 6% level. Therefore USABSS-33 is in conformity with this Section.

Closest Region 1 or 3 Feeder Link Space Station			E/S Lat (°N)	E/S Long (°E)	Range (km)	E/S Gain towards Victim Satellite (dBi)	Victim Satellite Rx System Noise Temp (K)	Calculated ΔT/T (%)
Network Name	Orbital Position	Peak Receive Antenna Gain (dBi)						
INTERSPUTNIK-47.5W-B	-47.5	37	33.3	-111.8	40296	-0.2	600	0.11%
MCO-BSS-40.5W	-40.5	35.9	33.3	-111.8	40921	-4.6	600	0.03%
IRL21100	-37.2	48.08	33.3	-111.8	41222	-6.1	600	0.35%
NGR11500	-37.2	38.47	33.3	-111.8	41222	-6.1	600	0.04%
DBL-G4-37.2W	-37.2	35	33.3	-111.8	41222	-6.1	300	0.03%
AND34100	-37	48.88	33.3	-111.8	41241	-6.2	600	0.42%
GMB30200	-37	47.69	33.3	-111.8	41241	-6.2	600	0.32%
GUI19200	-37	42.29	33.3	-111.8	41241	-6.2	600	0.09%
POR__100	-37	47.17	33.3	-111.8	41241	-6.2	600	0.28%
MTN__100	-36.8	37.55	33.3	-111.8	41259	-6.3	600	0.03%
SMR31100	-36.8	48.88	33.3	-111.8	41259	-6.3	600	0.41%

6 Limits applicable to protect a frequency assignment in the band 17.8-8.1 GHz (Region 2) to a receiving feeder-link space station in the fixed-satellite service (Earth-to-space) (WRC-03)

Does not apply to the Region 2 Plan.