



December 17, 2009

BY ELECTRONIC FILING

Marlene H. Dortch
Secretary
Federal Communications Commission
445 Twelfth Street, S.W.
Washington, DC 20554

Re: *IBFS File Nos. SAT-STA-20091202-00136 (S2796) and
SES-STA-20091202-01525 (E090173)*

Dear Ms. Dortch:

DIRECTV Enterprises, LLC (“DIRECTV”) hereby submits additional information of the above referenced requests for special temporary authority (“STA”) to conduct in-orbit testing (“IOT”) of the DIRECTV RB-2A 17/24 GHz BSS payload that is part of the DIRECTV 12 satellite scheduled to be launched later this month, using its Northwest Uplink Facility (“NWUF”) located in Moxee, WA. As discussed in these STA requests, IOT of the spacecraft will involve the use of unmodulated CW carriers operated at transmit powers generally consistent with the DIRECTV RB-2A application, except for short periods of time during gain transfer measurements when the maximum transmit power could exceed that value by up to 8.4 dB.¹ As a result, during those short periods of maximum power, DIRECTV RB-2A would exceed the power flux-density (“PFD”) limit in Section 25.208(w)(3) of the Commission’s rules for the 17.3-17.7 GHz band. Nonetheless, for the reasons discussed below, DIRECTV submits that the requested STA will not cause harmful interference to any co-primary user of the band.

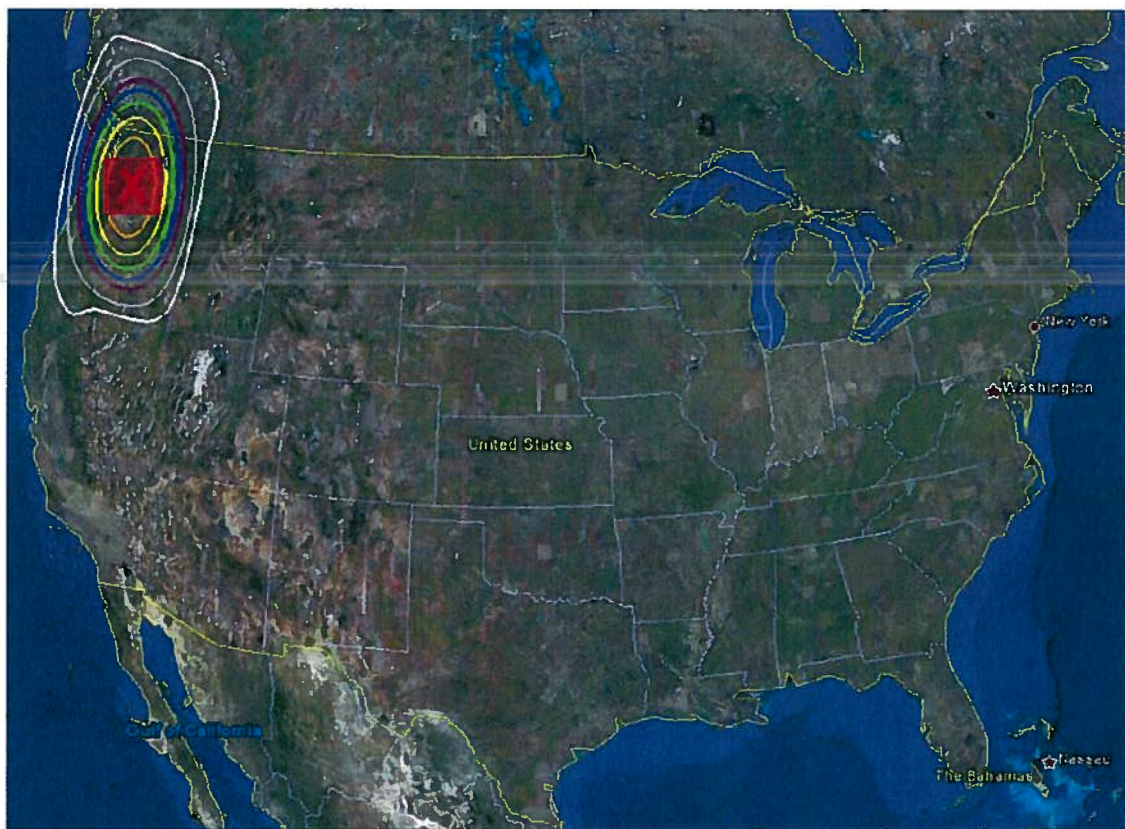
The DIRECTV RB-2A operations in the relevant band consist of four spot beams supporting satellite channels in the 17.3-17.7 GHz frequency range. During IOT, the tested beam will be positioned over DIRECTV’s NWUF location. The transmit power of the beam will be increased with the transponder in linear (as opposed to automatic level control) mode in order to achieve full saturation. Due to the CW carrier operation, and the fact that the maximum satellite EIRP will exceed that in the original application, the downlink PFD will exceed the PFD limit in Section 25.208(w)(3) for a period of time during the test on the order of 2-3 minutes. Thus, over the course of the IOT, the PFD limit will be exceeded for a minimal amount of time.

A representative view of a spot beam positioned over DIRECTV’s NWUF is shown below, including antenna gain contours out to the -20 dB contour. As can be seen in this diagram, the geographical extent of the area in which the PFD limit will be exceeded is quite

¹ Note that maximum EIRP in DIRECTV RB-2A Schedule S was 55.6 dBW and maximum EIRP during IOT could be as high as 64 dBW.

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limited. In addition, it is worth noting that the sole purpose of the PFD limit in Section 25.208(w)(3) is to protect adjacent 17/24 GHz BSS systems from each other.² Given that there are no other such systems in operation, exceeding this PFD limit during DIRECTV RB-2A IOT will have no material effect whatsoever on any other party.³



As regards the potential for space path interference from DIRECTV RB-2A operations at 76° W.L. affecting DBS operations at 77° W.L., a simple worst case analysis (shown below) demonstrates that the proposed IOT presents no issue. EchoStar operates the EchoStar 1, EchoStar 4 and EchoStar 8 DBS satellites at 77° W.L. While the issue of space path interference between 17/24 GHz BSS and DBS satellites is still pending, the Commission has proposed (based on an analysis presented by EchoStar) to adopt a PFD value of $-93 \text{ dBW/m}^2/\text{MHz}$ as a “coordination trigger” between 17/24 GHz BSS and DBS systems.⁴ Under that proposal, any

² See *Establishment of Policies and Service Rules for the Broadcasting Satellite Service at the 17.3-17.7 GHz Frequency Band and at the 17.7-17.8 GHz Frequency Band Internationally, and at the 24.75-25.25 GHz Frequency Band for Fixed Satellite Services Providing Feeder Links to the Broadcasting-Satellite Service and for the Broadcasting Satellite Service Operating Bi-directionally in the 17.3-17.7 GHz Frequency Band*, 22 FCC Rcd. 8842, ¶¶ 97-101 (2007) (“BSS R&O”) (discussing PFD limits to address intra-system interference).

³ We also note that this earth station is located far outside of the exclusion zones specified in footnote US 402 to the Table of Frequency Allocations in Section 2.106 of the Commission’s rules.

⁴ See BSS R&O, ¶¶ 183-84.

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17/24 GHz BSS system meeting the coordination trigger value would be deemed coordinated. As can be seen in the analysis below, the worst case PFD at 77° W.L. from DIRECTV RB-2A operations at 76° W.L. would be on the order of 17 dB below the proposed coordination trigger value.⁵

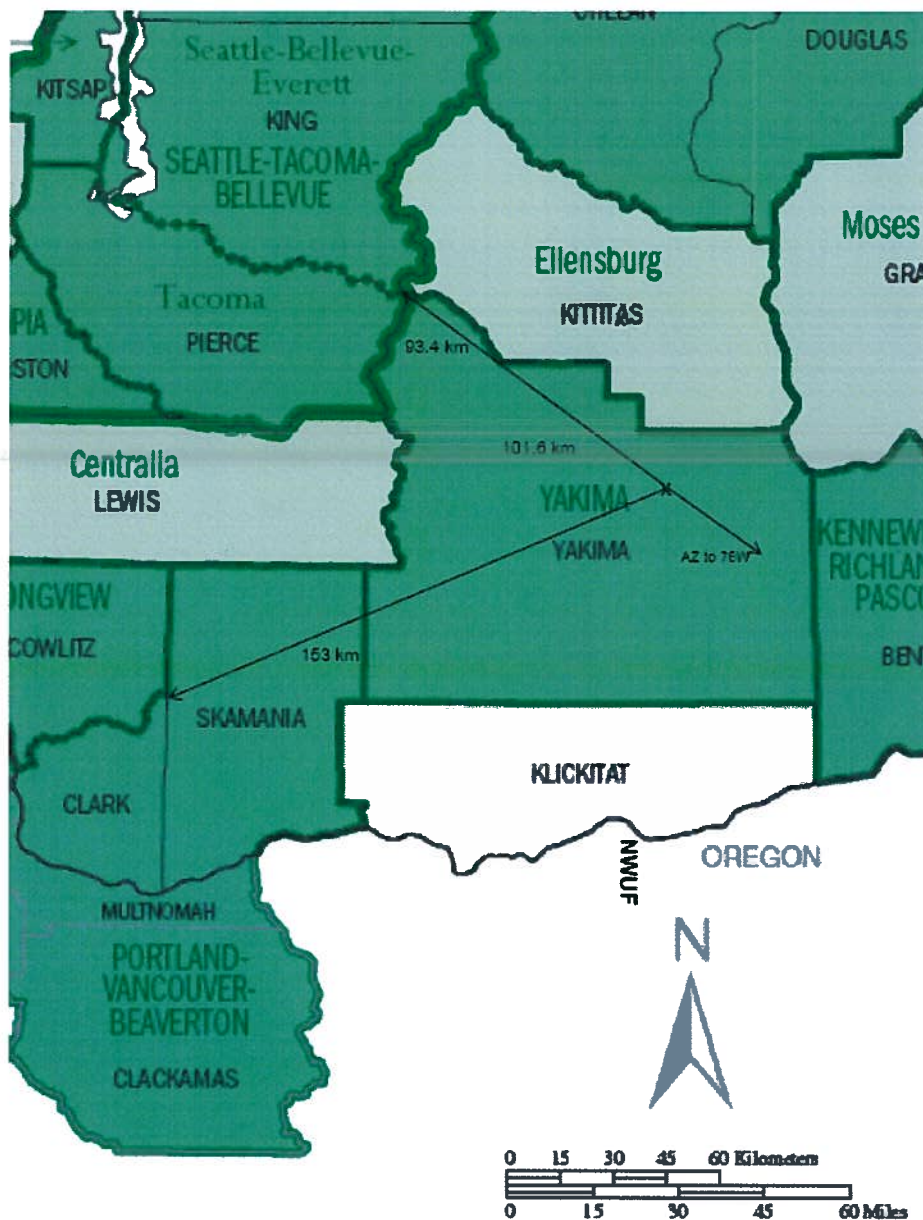
DIRECTV RB-2A max Tx EIRP (dBW)	64
DIRECTV RB-2A Spot beam max gain (dBi)	47.2
Max pwr into spot beam antenna (dBW)	16.8
Spot beam gain at 90° off axis (dBi)	0
Max EIRP in Direction of 77W	16.8
Distance from 76W to 77W (km)	624.54
Spreading loss from 76W to 77W (dB-m ²)	126.9
DIRECTV RB-2A Power Flux Density at 76W (dBW/m ²)	-110.1
Proposed PFD trigger (dBW/m ² /24 MHz)	-93

Finally, there is the issue of potential interference from the DIRECTV 17/24 GHz BSS feeder link earth station to terrestrial licensees operating in the 24.75-25.15 GHz band. Under Section 25.203(l), feeder link facilities operating in the 25.05-25.25 GHz band can only be licensed in Economic Areas (“EA”) where no existing FS licensee has been authorized, and feeder link operations must be coordinated with FS licensees when the PFD of the feeder link transmitted signal is equal to or greater than -114 dBW/m²/MHz at the boundary of the FS licensed area.

DIRECTV notes that its NWUF is located in Yakima County, WA, which is in EA 169. According to the Commission’s ULS database, there are no FS licensees in that EA authorized to operate in the relevant band. The closest FS licensees in the 24.75-25.15 GHz band are licensed for the Seattle-Everett, WA SMSA (call signs WMF 854 and WMT 323) and the Portland, OR-WA SMSA (call sign WMF 842). Shown below is a map illustrating the location of DIRECTV’s NWUF and showing the shortest distances to the boundaries of the two closest counties in these SMSAs (King and Clark counties, respectively).

⁵ In addition, DIRECTV has contacted EchoStar on this matter and, while discussions are still ongoing, DIRECTV is fully confident that an agreement will be reached that satisfies any concerns EchoStar may have about these IOT operations.

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Presented below is a worst case analysis of the NWUF feeder link PFD at the closest boundaries of King and Clark counties based on the distances shown above. Note that this worst case analysis assumes free space path loss, as specified in Section 25.203(1)(2). This analysis also assumes maximum transmit power from NWUF, which would only occur near the end of the gain transfer measurement and would only last for a few seconds to a few tens of seconds. Also note that the analysis assumes that the NWUF antenna just meets the performance requirement of Section 25.209, while DIRECTV's experience with these 9.2 meter antenna systems is that their off-axis performance is typically several dB better than required under Section 25.209. That analysis demonstrates that under these worst case assumptions, the

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coordination threshold of $-114 \text{ dBW/m}^2/\text{MHz}$ would be met for Clark County and only slightly exceeded for King County.

24 GHz BSS Feeder Link Antenna Parameters	King County	Clark County
Max EIRP during IOT (dBW)	73.4	73.4
Antenna size (m)	9.2	9.2
Antenna on-axis gain (dBi)	65.4	65.4
Max pwr density into antenna (dBW/MHz)	8.0	8.0
Max gain towards the horizon (dBi) (§25.209)	-10.0	-10.0
Max eirp density towards the horizon (dBW/MHz)	-2.0	-2.0
Min distance to county border (km)	93.4	153.0
Spreading loss over min distance to border (dB-m^2)	110.4	114.7
Max PFD at border ($\text{dBW/m}^2/\text{MHz}$)	-112.4	-116.7
Shortfall in DEMS protection (dB)	1.6	-2.7

Calculation of NWUF Feeder Link PFD at License Area Borders

Finally, DIRECTV notes that the licensed frequencies in the 24.75-25.15 GHz band for the two FS licensees in King County cover only the portion of the band from 25.05-25.15 GHz. DIRECTV desires to conduct the DIRECTV RB-2A IOT at three frequencies (low, middle and high) in the band 24.75-25.15 GHz. As such, the only potential for conflict is with the upper test frequency, as there are no FS licensee emissions below the center of this band (*i.e.*, below 25.0 GHz). Given the worst case assumptions used in the analysis, and the fact that the small PFD exceedance, if it occurs, will occur only near the county border, and only during those very short-term and infrequent occasions when the earth station is operating at maximum power to test the upper portion of the gain transfer, DIRECTV submits that there is no real potential for harmful interference and therefore no further coordination should be required to conduct this IOT.

Accordingly, DIRECTV submits that, even though the IOT operations of DIRECTV RB-2A will exceed the PFD limits established in Sections 25.203(l) and 25.208(w)(3), grant of the requested STA will not result in harmful interference to any co-primary user of the relevant bands.⁶ Additionally, based on the information above, and the fact that DIRECTV is already in contact with EchoStar on the issue of space path interference, DIRECTV submits that there is no possibility of harmful interference from the IOT of DIRECTV RB-2A at 76° W.L. to EchoStar DBS operations at 77° W.L. Finally, DIRECTV submits that there is little chance of harmful interference to any FS licensee operating in the 25.05-25.15 GHz band.

⁶ To the extent the Commission concludes that a waiver of the PFD limit in Section 25.208(w)(3) or Section 25.203(l) is required in connection with either of these STA requests, DIRECTV submits that the public interest would be served by the grant of such a waiver for the reasons stated herein, and requests that such a waiver be granted.

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In addition, DIRECTV would like to take this opportunity to provide 24/7 contact information in case any issue arises in connection with the IOT of DIRECTV RB-2A under the requested STAs. That contact number is 720-733-7290.

If you have any questions, please do not hesitate to contact me.

Respectfully submitted,

/s/

William M. Wiltshire
Counsel to DIRECTV Enterprises, LLC

cc: Andrea Kelly
Kathryn Medley
Mark Young
Chip Fleming
Shahnaz Ghavami