

**Before the  
FEDERAL COMMUNICATIONS COMMISSION  
Washington, DC 20554**

In the Matter of

Request of RBC Signals LLC for a 180-Day	)	
Special Temporary Authorization To Provide	)	Call Sign: N/A
Tracking, Telemetry & Command to a U.S.-	)	
Licensed Satellite	)	File No.: SES-STA-_____

**REQUEST FOR 180-DAY SPECIAL TEMPORARY AUTHORIZATION**

RBC Signals LLC (“RBC Signals”), pursuant to Section 25.120(a) of the Commission’s rules, 47 C.F.R. § 25.120(a), respectfully seeks a 180-day extension of its existing special temporary authorization (“STA”).<sup>1</sup> RBC Signals seeks to continue to operate two (2) M2 Antenna Systems Yagi antennas (the “400 MHz Yagi”) at a site in Windham, New York to communicate with a U.S.-licensed low-Earth orbit (“LEO”) satellite – Analytical Space, Inc.’s (“ASI”) Radix experimental cubesat – to perform tracking, telemetry and command (“TT&C”) in the 401.24-401.36 MHz band (Earth-to-space/space-to-Earth). RBC Signals seeks this 180-day STA extension to ensure continuing authority for critical TT&C functions for the Radix mission.

**I. BACKGROUND**

RBC Signals is a Seattle, Washington-based company that provides earth station services around the world. RBC Signals currently holds multiple STAs to provide similar TT&C support for various LEO non-geostationary orbit satellite (“NGSO”) cubesats using the 400 MHz Yagi (Model 400CP30A),<sup>2</sup> including for the Radix cubesat in the *Windham STA*. The Radix cubesat was

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<sup>1</sup> See RBC Signals LLC, File No. SES-STA-20180430-00416 (grant reissued with an effective date of June 22, 2018) (“*Windham STA*”).

<sup>2</sup> See, e.g., RBC Signals, LLC, File Nos. SES-STA-20180307-00202 & SES-STA-20180605-00993.

deployed from the International Space Station (“ISS”) on July 11, 2018 into a nominal 400 km circular orbit with an inclination of approximately 51.6°. The Radix satellite operations were recently authorized by the Commission to demonstrate ASI’s optical data relay network technology.<sup>3</sup>

For information on the proposed ground station operations, RBC Signals incorporates by reference the draft FCC Form 312 Schedule B and radiation hazard analysis provided with the *Windham STA* application. Moreover, to the extent applicable, RBC Signals incorporates by reference the satellite technical specifications and mission overview information previously provided by ASI in the *Radix Experimental STA* application, and will perform the proposed TT&C operations consistent with the terms and conditions imposed by the Commission in the *Radix Experimental STA* and *Windham STA*. RBC Signals has identified the Windham site as a viable ground station location to support the Radix mission, and plans to provide ongoing TT&C functions for the Radix cubesat from the site. Accordingly, RBC Signals files this 180-day STA extension of the *Windham STA* to ensure appropriate longer-term authority during the Radix mission.<sup>4</sup>

## II. DISCUSSION

RBC Signals seeks to operate the 400 MHz Yagi with the Radix cubesat in the 401.24-401.36 MHz band (Earth-to-space/space-to-Earth) pursuant to the terms of the reissued *Windham STA*, which includes a revised Condition 5 addressing transmissions towards the International Space

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<sup>3</sup> See Analytical Space, Inc., File No. 0044-EX-ST-2017, Call Sign WL9XLY (“*Radix Experimental STA*”) (exp. Dec. 2, 2018).

<sup>4</sup> The anticipated expiration of the *Radix Experimental STA*, and the maximum orbital lifetime of the Radix cubesat (approximately 1.27 years), do not warrant regular commercial authority (i.e., a 15-year license). RBC Signals notes that the requested 180-day STA period may extend beyond the *Radix Experimental STA* period, but that ASI could potentially seek an extension of its experimental authority. RBC Signals acknowledges it can provide TT&C support for the Radix mission only for as long as ASI is authorized to operate the Radix cubesat, and reserves the right to request an additional extension of temporary authority should ASI’s experimental authority be extended.

Station (“ISS”). As the Commission is aware, RBC Signal is coordinating closely with the National Aeronautics and Space Administration (“NASA”) and the National Oceanic and Atmospheric Administration (“NOAA”) to ensure its TT&C operations do not cause interference to U.S. government users of the band.<sup>5</sup> Moreover, RBC Signals will continue to work with FCC, NASA, NOAA and other U.S. government agencies to ensure that the proposed operations create no potential for interference to current or future government users and that the interests of the United States are fully accommodated.

### **A. TT&C Spectrum Use**

The United States Table of Frequency Allocations (“Table of Allocations”), Section 2.106 of the Commission’s rules, 47 C.F.R. § 2.106, provides that the 401-402 MHz band is shared on a co-primary basis between meteorological aids (Earth-to-space) and space operations services (space-to-Earth). RBC Signals seeks to perform TT&C downlink operations in frequencies from 401.24-401.36 MHz consistent with the co-primary space operations allocation in this band,<sup>6</sup> and TT&C uplink operations in the band as a non-conforming use (*i.e.*, on an unprotected, non-interference basis).

RBC Signals understands that there are certain U.S. government meteorological aids and earth exploration operations conducted in the 401-402 MHz band.<sup>7</sup> Specifically, NASA raised concerns relating to ground station interference to equipment used during EVAs on the ISS. Thus,

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<sup>5</sup> See, e.g., Letter to Marlene H. Dortch, “RBC Signals – Section 1.65 Submission, File No. SES-STA-20180430-00416”, filed on June 18, 2018 (agreeing with NASA to cease radio line-of-sight transmissions from the Windham site towards the ISS during extravehicular activities (“EVAs”)).

<sup>6</sup> See 47 C.F.R. § 2.1 (defining “space operations” as “a radiocommunication service concerned exclusively with the operation of spacecraft, in particular space tracking, space telemetry, and space telecommand.”).

<sup>7</sup> See [https://www.ntia.doc.gov/files/ntia/publications/compendium/0401.00-0402.00\\_01MAR14.pdf](https://www.ntia.doc.gov/files/ntia/publications/compendium/0401.00-0402.00_01MAR14.pdf).

RBC Signals and NASA agreed to update Condition 5 in the *Windham STA*, which now states that the radio line-of-sight transmissions from the Windham site towards the ISS cannot occur *while any EVA is taking place*.<sup>8</sup> In addition to continuing to adhere to Condition 5, RBC Signals agrees to abide by additional post-grant restrictions or conditions that the Commission imposes, to the extent any unanticipated issues arise.

In addition, NOAA has raised concerns regarding potential interference to meteorological satellite operations. Although RBC Signals is not aware of any interference cause by previously approved operations in the band, it remains in consultation with NOAA regarding these issues and will abide by additional post-grant restrictions or conditions that the Commission imposes to address NOAA's concerns.

In any event, RBC Signals will operate on an unprotected, non-interference basis to Federal users and, if it learns that its operations are causing harmful interference to other Federal operations, it will suspend or modify its operations to resolve such interference. RBC Signals has not identified any co-frequency operations within a 40 km radius of the Windham, New York site and believes its TT&C operations in this band will not present a potential for interference into other authorized spectrum users.

## **B. STA Request and Public Interest Considerations**

RBC Signals respectfully requests this 180-day STA pursuant to Section 25.120 of the Commission's rules, 47 C.F.R. § 25.120. Section 25.120(a) provides that STA requests should be filed at least three working days prior to the date of commencement of the proposed operations. Here, RBC Signals seeks grant and operation under the 180-day STA consistent with the Commission's processing rules, which includes a 30-day public notice period for this STA request.

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<sup>8</sup> RBC Signals is to be notified of scheduled EVAs so that transmission towards the ISS in the subject band can be suppressed during these periods. *See Windham STA*, Condition 5.

Pursuant to Commission rules and precedent, RBC Signals understands that this timely filed extension request will effectively extend its current temporary authority until the Commission acts on the instant request, affording sufficient time for it to be placed on public notice and enabling RBC Signals to continue to support the Radix mission in the interim.<sup>9</sup>

RBC Signals has been providing TT&C uplink and downlink support services using the Windham, New York earth station on a temporary basis with no reported instances of interference. RBC Signals believes that these temporary operations can continue to be conducted on a non-interference basis, and it has no basis to conclude otherwise. Thus, the Commission can grant a limited extension of operating authority as requested herein.

Grant of this STA request is in the public interest because it will ensure no interruption of critical TT&C support during the Radix mission and allow RBC Signals to reliably assist ASI in demonstrating the significant benefits of its satellite communication technology. Moreover, this STA will support ASI's experimental authorization and ensure that the Radix cubesat has access to TT&C services during the limited life of the satellite's mission. RBC Signals acknowledges, however, that any action on the requested STA will not affect the Commission's ultimate determination with respect to any future application for further TT&C operating authority.

### **III. CONCLUSION**

In view of the foregoing, the public interest would be served by grant of a 180-day STA to allow RBC Signals to provide ongoing TT&C support for the Radix cubesat mission from a site in Windham, New York.

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<sup>9</sup> See 47 C.F.R. §§ 25.120 & 25.163(b); Administrative Procedure Act § 9(b). See also 47 C.F.R. §1.955(b); *In the Matter of Marc D. Sobel Application for Consent to Assign the License for Conventional 800 MHz SMR Station KKT934, Montrose, California*, Memorandum Opinion & Order, FCC 05-90, ¶¶ 2 & 6; Intelsat License LLC, File Nos. SAT-STA-20171016-00139 (30-day STA to drift and operate Intelsat 16 in TT&C frequencies) and SAT-STA-20171016-00140 (180-day extension of 30-day STA operations).