Approved by OMB
3060–0678

APPLICATION FOR EARTH STATION SPECIAL TEMPORARY AUTHORITY

APPLICANT INFORMATIONEnter a description of this application to identify it on the main menu:
60–Day STA to provide TT&C (AS–Fairbanks)

1. Applicant

Name:	RBC Signals, LLC	**Phone Number:**	404–803–7734
DBA Name:		**Fax Number:**	
Street:	2205 152nd Ave NE	**E–Mail:**	crichins@rbcsignals.com
City:	Redmond	**State:**	WA
Country:	USA	**Zipcode:**	98052 –
Attention:	Mr. Christopher Richins		

FEDERAL COMMUNICATIONS COMMISSION
GRANTED
International Bureau

File # SES-STA-20180312-00206
Call Sign N/A Grant Date 7/12/2018
(or other identifier)
Term Dates
From 7/13/2018 To: 9/10/2018
Approved: Paul E Blaes

GRANTED
International Bureau

File # SES-STA-20180312-00206

Call Sign N/A Grant Date 7/12/2018
(or other identifier)

Term Dates
From 7/13/2018 To: 9/10/2018

Approved: Paul E Blaey

Applicant: RBC Signals LLC
File No: SES-STA-20180430-00416
Call Sign: None
Special Temporary Authority (STA)

RBC Signals LLC is granted special temporary authorization beginning July 13,2018, for 60 days to perform tracking, telemetry and command ("TT&C") for housekeeping, orientation and subsystem control of the Analytical Space, Inc.'s ("ASI") Radix experimental CubeSat operating in the in a 400 km x 400km sun-synchronous orbit with an inclination of approximately 51.6° in the 401.24-401.36 MHz (Earth-to-space/space-to-Earth) frequency band from a fixed earth station locate Fairbanks, AK at 64 ° 51 ' 31.0" NL 147° 50 ' 7.0 "WL under the following conditions.

1. Operations shall be on an unprotected, non-interference basis with respect to other authorized stations, including federal stations.
2. All operations will are limited to the parameters in the table below.

Antenna:	YAGI-1
Antenna size (meters):	0.025/3.57
Antenna Gain (dBi):	16.2
Satelite Arc Range for Earth Station	NGSO cubesat operating at a nominal 400 km circular, sun-synchronous orbit with an inclination of approximately 51.6°.
Input power (watts):	12.53 w (11 dBW)
Transmit Frequency (MHz):	401.24-401.36
Receive Frequency (MHz)	401.24-401.36
Emission	114KG1D
EIRP (dBW Carrier)	27.2
EIRP (dBW4 KHz /)	12.6

3. RBC should not have any expectation of having operation in the 401.24 - 401.36 MHz authorized in the long term. Any future requests or extensions will need to submit applications to the FCC to be re-coordinated with NTIA.

4. Uplink operations from the M2 Antenna Systems Yagi antenna to the Radix CubeSat shall not occur while any extravehicular activity (EVA) is taking place when the NASA International Space Station (ISS) (NORAD designation 25544 or international spacecraft ID 1998-067A) is within the horizon to horizon view of the RBC Signals facility in Fairbanks, AK. NASA shall provide advance notification to RBC Signals of all EVA dates/time frames so that RBC Signals may inhibit uplink operations during these periods.

5. Any action taken or expense incurred as a result of operations pursuant to this STA is solely at RBC's risk.

This grant is issued pursuant to Section 0.261 of the Commission's rules on delegated authority, 47 C.F.R. § 0.261, and is effective upon release.

2. Contact

Name:	Carlos Nalda	**Phone Number:**	5713325626
Company:	LMI Advisors	**Fax Number:**	
Street:	2550 M Street NW	E-Mail:	cnalda@lmiadvisors.com
	Suite 345		
City:	Washington	**State:**	DC
Country:	USA	**Zipcode:**	20037 –
Attention:		**Relationship:**	Other

(If your application is related to an application filed with the Commission, enter either the file number or the IB Submission ID of the related application. Please enter only one.)
3. Reference File Number or Submission ID

4a. Is a fee submitted with this application?
◉ If Yes, complete and attach FCC Form 159. If No, indicate reason for fee exemption (see 47 C.F.R.Section 1.1114).
○ Governmental Entity ○ Noncommercial educational licensee
○ Other(please explain):

4b. Fee Classification CGX – Fixed Satellite Transmit/Receive Earth Station

5. Type Request

◉ Use Prior to Grant ○ Change Station Location ○ Other

6. Requested Use Prior Date 05/01/2018	
7. CityFairbanks	8. Latitude (dd mm ss.s h) 64 51 31.0 N

9. State AK	10. Longitude (dd mm ss.s h) 147 50 7.0 W

11. Please supply any need attachments.

Attachment 1: Narrative Attachment 2: Technical Appendix Attachment 3:

12. Description. (If the complete description does not appear in this box, please go to the end of the form to view it in its entirety.)

60-day STA for TT&C.

13. By checking Yes, the undersigned certifies that neither applicant nor any other party to the application is subject to a denial of Federal benefits that includes FCC benefits pursuant to Section 5301 of the Anti-Drug Act of 1988, 21 U.S.C. Section 862, because of a conviction for possession or distribution of a controlled substance. See 47 CFR 1.2002(b) for the meaning of "party to the application" for these purposes.

(●) Yes ( ) No

14. Name of Person Signing Christopher Richins	15. Title of Person Signing CEO

WILLFUL FALSE STATEMENTS MADE ON THIS FORM ARE PUNISHABLE BY FINE AND / OR IMPRISONMENT (U.S. Code, Title 18, Section 1001), AND/OR REVOCATION OF ANY STATION AUTHORIZATION (U.S. Code, Title 47, Section 312(a)(1)), AND/OR FORFEITURE (U.S. Code, Title 47, Section 503).

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Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, DC 20554

In the Matter of

Request of RBC Signals LLC for 60-Day Special Temporary Authorization ("STA") To Operate an Earth Station To Provide Tracking, Telemetry & Command ("TT&C") Services	)))))	Call Sign: File No.: SES-STA-_____

Expedited Consideration Requested

REQUEST FOR SPECIAL TEMPORARY AUTHORIZATION

RBC Signals LLC ("RBC Signals"), pursuant to Section 25.120 of the Commission's rules, 47 C.F.R. § 25.120, respectfully seeks a 60-day special temporary authorization ("STA") to operate a M2 Antenna Systems Yagi antenna (the "400 MHz Yagi") at a facility in Fairbanks, Alaska to communicate with a proposed U.S.-licensed low-Earth orbit ("LEO") satellite – Analytical Space, Inc.'s ("ASI") Radix experimental cubesat – to perform tracking, telemetry and command ("TT&C") for housekeeping, orientation and subsystem control in the 401.24-401.36 MHz band (Earth-to-space/space-to-Earth). RBC Signals seeks to commence these short-term TT&C operations on May 1, 2018, the satellite's scheduled launch date. Moreover, RBC Signals requests expedited consideration and grant at the soonest practicable time to support the associated space station license application pending with the Commission.[1]

I. BACKGROUND

RBC Signals is a Seattle, Washington-based satellite services company that provides earth station services around the world. RBC Signals previously conducted similar TT&C operations from the Fairbanks facility,[2] a site that is currently used to provide TT&C support for experimental

[1] *See* Analytical Space, Inc., File No. 0044-EX-ST-2017, Call Sign WL9XLY.

[2] *See* RBC Signals, LLC, File Nos. SES-STA-20171015-01165.

cubesat operations in the 401-402 MHz band.[3] In addition, RBC Signals holds multiple STAs to provide TT&C support for various LEO cubesats from a facility in Deadhorse, Alaska using the 400 MHz Yagi.[4]

RBC Signal recently filed an STA to conduct identical TT&C operations from a facility in Boulder, Colorado.[5] Coordination of the proposed TT&C operations from the Boulder facility remains ongoing and it is unlikely that such coordination can be completed in a time frame to support launch of the Radix satellite. Because TT&C operations in this frequency range are already being conducted from the Fairbanks site, RBC is filing this separate STA request to ensure appropriate ground station support in time for the satellite's launch even while it continues other coordination discussions.

The Radix cubesat will demonstrate ASI's optical-based data relay network technology and is currently the subject of an experimental STA request which will allow ASI to analyze the performance characteristics of its optical communications technology. Here, RBC Signals seeks authority to conduct TT&C following the Radix satellite's planned launch on May 1, 2018, as a secondary payload aboard Orbital Sciences' CRS Cygnus OA-9E from Kennedy Space Center.[6] The Radix cubesat will be launched into a nominal 400 km circular, sun-synchronous orbit with an inclination from the equator of approximately 51.6°.

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[3] *See* Astranis Space Technologies Corp, File No. 1624-EX-ST-2017, Call Sign WL9XAF.

[4] *See, e.g.,* RBC Signals, LLC, File Nos. SES-STA-20171213-01333 (60-Day STA to provide TT&C for Planetary Resources Development Corp. cubesats), SES-STA-20180118-00042 (60-Day STA to provide TT&C for Astranis Space Technology Corp. cubesats).

[5] *See* RBC Signals, File No. SES-STA-20180307-00202 (filed on March 7, 2018) ("*Boulder STA*").

[6] *See* Analytical Space, Inc., File No. 0044-EX-ST-2017, Call Sign WL9XLY, Radix Technical Description.

This 60-day STA will cover initial TT&C for the Radix cubesat and RBC Signals plans to file an application for longer-term authority for the operations sought herein. RBC Signals provides the attached draft FCC Form 312 Schedule B and radiation hazard analysis for additional information relating to its proposed ground station operations. 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 request and will perform the proposed TT&C operations consistent with the terms and conditions imposed by the Commission in any grant issued to ASI.

II. DISCUSSION

RBC Signals seeks to operate the 400 MHz Yagi with the proposed Radix cubesat in the 401.24-401.36 MHz band (Earth-to-space/space-to-Earth). RBC Signals has examined other operations in the subject bands and confirms that the proposed TT&C operations will not cause interference to current or future U.S. government users of the band.

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 and space operations services. RBC Signals seeks to perform TT&C uplink and downlink operations in frequencies from 401.24-401.36 MHz consistent with the co-primary space operations allocation in this band.[7]

RBC Signals understands that there are certain U.S. government meteorological aids and

[7] *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.").

earth exploration operations conducted in the 401-402 MHz band.[8] RBC will operate on an unprotected, non-interference basis and, if it learns that its operations are causing harmful interference to other operations, it will suspend or modify its operations to resolve such interference.

The Fairbanks facility currently supports ground station operations in the 401-402 MHz band with no reported cases of interference and RBC Signals believes its similar TT&C operations in this band will not present a potential for interference into other authorized users. In addition, prior coordination and present TT&C operations at the Fairbanks facility suggests that expedited processing and grant of this request would not adversely affect other users of the spectrum.

B. STA Request & Public Interest Considerations

RBC Signals respectfully requests this 60-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 an expedited grant date but a commencement date of May 1, 2018, the planned launch date of the Radix satellite.

Additionally, the Commission may grant a 60-day STA if the STA request has not been placed on public notice and the applicant plans to file a request for regular authority for the operations. RBC Signals plans to file an application for longer-term authority as soon as possible to permit continuing TT&C operations for the Radix cubesat from the Fairbanks facility.

RBC Signals requests that the Commission authorize the TT&C operations proposed in this STA request at the earliest practicable time.[9] RBC Signals has been working with ASI and the Commission staff for some time with respect to an appropriate TT&C earth station facility for the

[8] *See* https://www.ntia.doc.gov/files/ntia/publications/compendium/0401.00-0402.00_01MAR14.pdf.

[9] 47 C.F.R. § 25.120(a).

Radix satellite. Although unexpected circumstances have made TT&C operations from the Boulder facility an unviable option at this time, RBC Signals believes it is possible to support the Radix mission from the Fairbanks facility which currently provides TT&C services in the 401-402 MHz band with no reported cases of interference.

This STA request is in the public interest because it will ensure that RBC Signals is able to commence TT&C in time for the launch of the Radix satellite and assist ASI in demonstrating the significant benefits of its satellite communication technology. Moreover, this STA will support ASI's experimental STA request and ensure that the Radix cubesat has access to TT&C services prior to the satellite's launch. RBC Signals acknowledges that any action on the requested STA will not affect the Commission's ultimate determination with respect to the application for longer-term TT&C earth station operating authority.

Because TT&C operations in the 401-402 MHz band at the Fairbanks facility have already been coordinated with other U.S. government agencies and are presently conducted at the site, expedited processing and grant should be possible. Further, because the satellite is not scheduled for launch until May 1, 2018, the Commission may impose additional, post-grant restrictions or conditions on the proposed TT&C operations to the extent any unanticipated issues arise. RBC Signals agrees to abide by any such additional conditions.

III. CONCLUSION

In view of the foregoing, the public interest would be served by expedited grant of a 60-day STA to support grant of the underlying experimental satellite application and to allow RBC Signals to perform TT&C for the Radix cubesat commencing on May 1, 2018.