SES-STA-20180430-00416 IB2018001112
RBC Signals, LLC

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:
30–day STA for TT&C

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-20180430-00416
Call Sign N/A Grant Date 5/31/2018
(or other identifier)
Term Dates
From 6/1/2017 To: 7/1/2017
Approved: Paul E Knox

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

GRANTED
International Bureau

File # SES-STA-20180430-00416
Call Sign N/A Grant Date 5/31/2018
(or other identifier)
Term Dates
From 6/1/2018 To: 7/1/2018
Approved:

RBC Signals LLC was granted special temporary authorization beginning June 1, 2018, for 30-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 Windham, NY at NL 42 ° 20 ' 11.3 " WL 74 ° 15 ' 37.4 " (NAD-83). Under the following conditions.

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. 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:	Jason Davila	**Phone Number:**	(202) 730–9706
Company:	LMI Advisors	**Fax Number:**	
Street:	2550 M Street NW	E–Mail:	jdavila@lmiadvisors.com
	Suite 344		
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 06/01/2018	
7. CityWindham	8. Latitude (dd mm ss.s h) 42 20 11.3 N

9. State NY	10. Longitude (dd mm ss.s h) 74 15 37.4 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.)

30-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).

FCC NOTICE REQUIRED BY THE PAPERWORK REDUCTION ACT

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THE FOREGOING NOTICE IS REQUIRED BY THE PAPERWORK REDUCTION ACT OF 1995, PUBLIC LAW 104–13, OCTOBER 1, 1995, 44 U.S.C. SECTION 3507.

Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, DC 20554

In the Matter of

Request of RBC Signals LLC for 30-Day Special Temporary Authorization To Operate an Earth Station To Provide Tracking, Telemetry & Command Services	))))	Call Sign: File No.: SES-STA-_____

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 30-day special temporary authorization ("STA") 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") 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 June 1, 2018, the satellite's scheduled launch date. As discussed below, this STA request is necessitated by RBC Signal's inability to provide TT&C for the Radix cubesat from its recently authorized site in in Boulder, Colorado[1] due to unexpected complications that has made near-term operations from the facility impossible.

I. BACKGROUND

RBC Signals is a Seattle, Washington-based satellite services 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

[1] *See* RBC Signals, File No. SES-STA-20180307-00202 (granted on April 12, 2018) ("*Boulder STA*").

MHz Yagi (Model 400CP30A),[2] including the *Boulder STA* to support ASI'S Radix mission, which was recently authorized by the Commission.[3] Although RBC Signals still plans to operate long-term from the Boulder site, it is presently unable to commission the 400 MHz Yagi antennas due to the unexpected unavailability of power at the site. Thus, RBC Signals seeks this 30-day STA to operate from Windham, New York to ensure timely initiation of TT&C for the satellite's launch.[4]

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 License* application, and will perform the proposed TT&C operations consistent with the terms and conditions imposed by the Commission in the *Radix Experimental License* and *Boulder STA*.

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.

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[2] *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). The Radix cubesat will demonstrate ASI's optical data relay network technology. The Radix cubesat will be launched into a nominal 400 km circular, sun-synchronous orbit with an inclination of approximately 51.6°.

[3] *See* Analytical Space, Inc., File No. 0044-EX-ST-2017, Call Sign WL9XLY ("*Radix Experimental License*").

[4] RBC Signals notes that, although it has a pending request to provide TT&C support for the Radix mission from a facility in Fairbanks, Alaska, the Fairbanks site is a secondary, back-up facility that will only be utilized in the event of primary ground station failure at the Boulder or Windham sites and does not provide the same level of dependability to ensure optimal TT&C communications. *See* RBC Signals, LLC, File No. SES-STA-20180312-00206.

RBC Signals is working diligently to identify and resolve the power issue at the Boulder site, including trenching conduit throughout the property, but it is unlikely that the problem will be resolved in time for the launch of the Radix cubesat. RBC Signals is filing this 30-day STA request to ensure appropriate ground station support while it addresses issues at the Boulder site. Although situated at a more northerly latitude, RBC Signals believes it can provide reliable TT&C support for the Radix mission from the Windham site. RBC Signals does not seek long-term TT&C authority for the Windham site and hopes to resolve the power issue at Boulder prior to the expiration this 30-day STA term (i.e., prior to June 30, 2018).

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.[5]

RBC Signals understands that there are certain U.S. government meteorological aids and earth exploration operations conducted in the 401-402 MHz band.[6] 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

[5] *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.").

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

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 30-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 a commencement date of June 1, 2018, the planned launch date of the Radix satellite. Additionally, the Commission may grant a 30-day STA if the STA request has not been placed on public notice and the applicant does not plan to file a request for regular authority for the operations. As noted, RBC Signals does not anticipate longer-term operations from the Windham site and plans to operate as soon as possible under the *Boulder STA*.

This STA request is in the public interest because it will ensure that RBC Signals is able to provide 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 authorization and ensure that the Radix cubesat has access to TT&C services prior to the satellite's launch. Further, because the satellite is not scheduled for launch until June 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 grant of a 30-day STA to allow RBC Signals to provide TT&C support for the Radix cubesat, commencing on June 1, 2018, from a site in Windham, New York.

TECHNICAL APPENDIX

RBC Signals LLC
30-Day Special Temporary Authorization (STA)

I. 400 MHz Yagi Radiation Hazard Report

II. Draft FCC Form 312 Schedule B

Radiation Hazard Study

400 MHz Earth Station

This study analyzes the non-ionizing radiation levels for a 400 MHz Yagi tracking earth station. This report is developed in accordance with the prediction methods contained in OET Bulletin No. 65, Evaluating Compliance with FCC Guidelines for Human Exposure to Radio Frequency Electromagnetic Fields, Edition 97-01.

Bulletin No. 65 specifies that there are two separate tiers of exposure limits that are depending on the area of exposure and/or the status of the individuals who are subject to the exposure -- the General Population/Uncontrolled Environment and the Controlled Environment, where the general population cannot access.

The maximum level of non-ionizing radiation to which individuals may be exposed is limited to a power density level of 1.33 milliwatts per square centimeter (1.33 mW/cm^2) averaged over any 6 minute period in a controlled environment, and the maximum level of non-ionizing radiation to which the general public is exposed is limited to a power density level of 0.27 milliwatt per square centimeter (0.27 mW/cm^2) averaged over any 30 minute period in a uncontrolled environment.

In the normal range of transmit powers for satellite antennas, the power densities at or around the antenna surface are expected to exceed safe levels. The purpose of this study is to determine the power flux density levels for the earth station under study as compared with the MPE limits. This comparison is done in each of the following regions:

1. Far-field region
2. Near-field region
3. Transition region
4. The region between the antenna edge and the ground

Input Parameters

The following input parameters were used in the calculations:

Parameters:	Value	Unit	Symbol
Antenna Diameter	3.57	m	*D*
Antenna Transmit Gain	16.2	dBi	*G*
Transmit Frequency	400	MHz	*f*
Power Input to the Antenna	12.53	W	*P*

Calculated Parameters:

The following values were calculated using the above input parameters and the corresponding formulas:

Parameter	Value	Unit	Symbol	Formula
Antenna Surface Area	1.964	m^2	A	$G\lambda 2/(4\pi)/\lambda$
Antenna Efficiency	0.95		η	$G\lambda^2/(\pi^2 D^2)$
Gain Factor	41.7		g	$10^{G/10}$
Wavelength	0.75	m	λ	$300/f$

Behavior of EM Fields as a Function of Distance

The behavior of the characteristics of EM fields varies depending on the distance from the radiating antenna. These characteristics are analyzed in three primary regions: the near-field region, the far-field region and the transition region. Of interest also is the region between the antenna and ground.

For yagi antennas with circular cross sections, such as the antenna under study, the near-field, far-field and transition region distances are calculated as follows:

Parameter	Value	Unit	Formula
Near-Field Distance	4.25	m	$R_{nf} = D^2/(4\lambda)$
Distance to Far-Field	10.2	m	$R_{ff} = 0.60D^2/(\lambda)$
Distance of Transition Region	4.25	m	$R_t = R_{nf}$

The distance in the transition region is between the near and far fields. Thus, $R_{nf} \leq R_t \leq R_{ff}$. However, the power density in the transition region will not exceed the power density in the near-field. Therefore, for purposes of the present analysis, the distance of the transition region can equate the distance to the near-field.

Power Flux Density Calculations

The power flux density is considered to be at a maximum through the entire length of the near-field. This region is contained within a cylindrical volume with a diameter, D, equal to the diameter of the antenna. In the transition region and the far-field, the power density decreases inversely with the square of the distance. The following equations are used to calculate power density in these regions.

Parameter	Value	Unit	Symbol	Formula
Power Density in the Near-Field	2.42	mW/cm^2	S_{nf}	$16.0\ \eta\ P/(\pi D^2)$
Power Density in the Far-Field	0.04	mW/cm^2	S_{ff}	$GP/(4\pi\ Rff^2)$
Power Density in the Transition Region	2.42	mW/cm^2	S_t	$S_{nf}\ R_{nf}/(R_t)$

The power density between the antenna and ground, is calculated as follows:

Parameter	Value	Unit	Symbol	Formula
Power Density b/w Reflector and Ground	0.64	mW/cm^2	S_g	P / A

The below table summarizes the calculated power flux density values for each region. In a controlled environment, the only regions that exceed FCC limitations are shown below. These regions are only accessible by trained technicians who, as a matter of procedure, turn off transmit power before performing any work in these areas.

Power Density	Value	Unit	Controlled Environment
Far Field Calculation	0.04	mW/cm^2	Satisfies FCC MPE
Near Field Calculation	2.42	mW/cm^2	Exceeds Limits
Transition Region	2.42	mW/cm^2	Exceeds Limits
Region b/w Antenna & Ground	0.64	mW/cm^2	Satisfies FCC MPE

The results show that the antenna, in a controlled environment, may exist in the regions noted above and applicant will take the proper mitigation procedures to ensure it meets the guidelines specified in 47 C.F.R. § 1.1310.

The earth station will be marked with the standard radiation hazard warnings, as well as the area in the vicinity of the earth station to inform any residents or guests who might be working or otherwise present in or near the path of the main beam. The earth station will be installed on private property and inaccessible to the general public. In addition, because power levels are down at least 20 dB (or by a factor of 100) one diameter removed away from the center of the main beam, public safety will be ensured by minimum elevation angles that result in upward pointing towards the satellite and away from inhabited areas.

Finally, because there is no potential for public access to the earth station site (on private property), the General Population/Uncontrolled Environment limits are not implicated. Furthermore, only operations and maintenance personnel will have access to areas that may potentially exceed the MPE limits and they will do so only while the earth station is not in operation. The transmitter will be turned off during periods of maintenance so that the Controlled Environment MPE standard will be satisfied.

Approved by OMB
3060-0678

Date & Time Filed:
File Number: ---
Callsign/Satellite ID:

APPLICATION FOR EARTH STATION AUTHORIZATIONS FCC 312 MAIN FORM FOR OFFICIAL USE ONLY	FCC Use Only

APPLICANT INFORMATION

Enter a description of this application to identify it on the main menu:
DRAFT FORM TO SUPPORT 30-DAY STA REQUEST (AS)

1-8. Legal Name of 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		

9-16. Name of Contact Representative

Name:	Jason Davila	Phone Number:	202.730.9706
Company:	LMI Advisors	Fax Number:	
Street:	2550 M Street NW Suite 344	E-Mail:	jdavila@lmiadvisors.com
City:	Washington	State:	DC
Country:	USA	Zipcode:	20037-
Attention:	Mr. Jason Davila	Relationship:	Other

CLASSIFICATION OF FILING

17. Choose the button next to the classification that applies to this filing for both questions a. and b. Choose only one for 17a and only one for 17b.	b.
a. ◉ a1. Earth Station (N/A) a2. Space Station	○ b1. Application for License of New Station ○ b2. Application for Registration of New Domestic Receive-Only Station (N/A) b3. Amendment to a Pending Application (N/A) b4. Modification of License or Registration (N/A) b5. Assignment of License or Registration (N/A) b6. Transfer of Control of License or Registration (N/A) b7. Notification of Minor Modification (N/A) b8. Application for License of New Receive-Only Station Using Non-U.S. Licensed Satellite (N/A) b9. Letter of Intent to Use Non-U.S. Licensed Satellite to Provide Service in the United States ◉ b10. Other (Please specify) ○ b11. Application for Earth Station to Access a Non-U.S.satellite Not Currently Authorized to Provide the Proposed Service in the Proposed Frequencies in the United States.

17c. 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): DRAFT FORM

17d.
Fee Classification

18. If this filing is in reference to an	19. If this filing is an amendment to a pending application enter:

existing station, enter:	(a) Date pending application was filed:	(b) File number of pending application:
(a) Call sign of station: Not Applicable	Not Applicable	Not Applicable

TYPE OF SERVICE

20. NATURE OF SERVICE: This filing is for an authorization to provide or use the following type(s) of service(s): Select all that apply:

- ☐ a. Fixed Satellite
- ☐ b. Mobile Satellite
- ☐ c. Radiodetermination Satellite
- ☐ d. Earth Exploration Satellite
- ☐ e. Direct to Home Fixed Satellite
- ☐ f. Digital Audio Radio Service
- ☒ g. Other (please specify)

NGSO

21. STATUS: Choose the button next to the applicable status. Choose only one.
○ Common Carrier ◉ Non-Common Carrier

22. If earth station applicant, check all that apply.
☒ Using U.S. licensed satellites
☐ Using Non-U.S. licensed satellites

23. If applicant is providng INTERNATIONAL COMMON CARRIER service, see instructions regarding Sec. 214 filings. Choose one.
Are these facilities:
○ Connected to a Public Switched Network ○ Not connected to a Public Switched Network ◉ N/A

24. FREQUENCY BAND(S): Place an "X" in the box(es) next to all applicable frequency band(s).
☐ a. C-Band (4/6 GHz) ☐ b. Ku-Band (12/14 GHz)
☒ c.Other (Please specify upper and lower frequencies in MHz.)
Frequency Lower: 401.24 Frequency Upper: 401.36

TYPE OF STATION

25. CLASS OF STATION: Choose the button next to the class of station that applies. Choose only one.

- ◉ a. Fixed Earth Station
- ○ b. Temporary-Fixed Earth Station
- ○ c. 12/14 GHz VSAT Network
- ○ d. Mobile Earth Station
- (N/A) e. Geostationary Space Station
- (N/A) f. Non-Geostationary Space Station
- ○ g. Other (please specify)

26. TYPE OF EARTH STATION FACILITY: Choose only one.
◉ Transmit/Receive ○ Transmit-Only ○ Receive-Only ○ N/A

PURPOSE OF MODIFICATION

27. The purpose of this proposed modification is to: (Place an 'X' in the box(es) next to all that apply.)
Not Applicable

ENVIRONMENTAL POLICY

28. Would a Commission grant of any proposal in this application or amendment have a significant environmental impact as defined by 47 CFR 1.1307? If YES, submit the statement as required by Sections 1.1308 and 1.1311 of the Commission's rules, 47 C.F.R. §§ 1.1308 and 1.1311, as an exhibit to this application.A Radiation Hazard Study must accompany all applications for new transmitting facilities, major modifications, or major amendments. ○ Yes ◉ No

ALIEN OWNERSHIP Earth station applicants not proposing to provide broadcast, common carrier, aeronautical en route or aeronautical fixed radio station services are not required to respond to Items 30-34.

29. Is the applicant a foreign government or the representative of any foreign government?	○ Yes ◉ No
30. Is the applicant an alien or the representative of an alien?	○ Yes ○ No ◉ N/A
31. Is the applicant a corporation organized under the laws of any foreign government?	○ Yes ○ No ◉ N/A
32. Is the applicant a corporation of which more than one-fifth of the capital stock is owned of record or voted by aliens or their representatives or by a foreign government or representative thereof or by any corporation organized under the laws of a foreign country?	○ Yes ○ No ◉ N/A
33. Is the applicant a corporation directly or indirectly controlled by any other corporation of which more than one-fourth of the capital stock is owned of record or voted by aliens, their representatives, or by a	○ Yes ○ No ◉ N/A

foreign government or representative thereof or by any corporation organized under the laws of a foreign country?
34. If any answer to questions 29, 30, 31, 32 and/or 33 is Yes, attach as an exhibit an identification of the aliens or foreign entities, their nationality, their relationship to the applicant, and the percentage of stock they own or vote.

BASIC QUALIFICATIONS

35. Does the Applicant request any waivers or exemptions from any of the Commission's Rules? If Yes, attach as an exhibit, copies of the requests for waivers or exceptions with supporting documents.	○ Yes ◉ No
36. Has the applicant or any party to this application or amendment had any FCC station authorization or license revoked or had any application for an initial, modification or renewal of FCC station authorization, license, or construction permit denied by the Commission? If Yes, attach as an exhibit, an explination of circumstances.	○ Yes ◉ No
37. Has the applicant, or any party to this application or amendment, or any party directly or indirectly controlling the applicant ever been convicted of a felony by any state or federal court? If Yes, attach as an exhibit, an explination of circumstances.	○ Yes ◉ No
38. Has any court finally adjudged the applicant, or any person directly or indirectly controlling the applicant, guilty of unlawfully monopolizing or attemptiing unlawfully to monopolize radio communication, directly or indirectly, through control of manufacture or sale of radio apparatus, exclusive traffic arrangement or any other means or unfair methods of competition?If Yes, attach as an exhibit, an explanation of circumstances	○ Yes ◉ No
39. Is the applicant, or any person directly or indirectly controlling the applicant, currently a party in any pending matter referred to in the preceding two items? If yes, attach as an exhinit, an explanation of the circumstances.	○ Yes ◉ No
40. If the applicant is a corporation and is applying for a space station license, attach as an exhibit the names, address, and citizenship of those stockholders owning a record and/or voting 10 percent or more of the Filer's voting stock and the percentages so held. In the case of fiduciary control, indicate the beneficiary(ies) or class of beneficiaries. Also list the names and addresses of the officers and directors of the Filer.	
41. 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
42a. Does the applicant intend to use a non-U.S. licensed satellite to provide service in the United States? If Yes, answer 42b and attach an exhibit providing the information specified in *47 C.F.R. 25.137, as appropriate*. If No, proceed to question 43.	○ Yes ◉ No
42b. What administration has licensed or is in the process of licensing the space station? If no license will be issued, what administration has coordinated or is in the process of coordinating the space station?	
43. Description. (Summarize the nature of the application and the services to be provided). Draft Form to support 30-day STA request to provide TT&C for Analytical Space cubesat.	
43a. Geographic Service Rule Certification By selecting A, the undersigned certifies that the applicant is not subject to the geographic service or geographic coverage requirements specified in 47 C.F.R. Part 25.	◉ A
By selecting B, the undersigned certifies that the applicant is subject to the geographic service or geographic coverage requirements specified in 47 C.F.R. Part 25 and will comply with such requirements.	○ B
By selecting C, the undersigned certifies that the applicant is subject to the geographic service or geographic coverage requirements specified in 47 C.F.R. Part 25 and will not comply with such requirements because it is not feasible as a technical matter to do so, or that, while technically feasible, such services would require so many compromises in satellite design and operation as to make it economically unreasonable. A narrative description and technical analysis demonstrating this claim are attached.	○ C

CERTIFICATION

The Applicant 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, and requests an authorization in accordance with this application. The applicant certifies that grant of this application would not cause the applicant to be in violation of the spectrum aggregation limit in 47 CFR Part 20. All statements made in exhibits are a material part hereof and are incorporated herein as if set out in full in this application. The undersigned, individually and for the applicant, hereby certifies that all statements made in this application and in all attached exhibits are true, complete and correct to the best of his or her knowledge and belief, and are made in good faith.
44. Applicant is a (an): (Choose the button next to applicable response.)

- ○ Individual
- ○ Unincorporated Association
- ○ Partnership
- ○ Corporation
- ○ Governmental Entity
- ◉ Other (please specify)

LLC

45. Name of Person Signing	46. Title of Person Signing
Christopher Richins	CEO

47. Please supply any need attachments.

Attachment 1:	Attachment 2:	Attachment 3:

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).

SATELLITE EARTH STATION AUTHORIZATIONS
FCC Form 312 - Schedule B:(Technical and Operational Description)

FOR OFFICIAL USE ONLY

Location of Earth Station Site

E1: Site Identifier:	UHF-Windham	E5. Call Sign:	
E2: Contact Name	Zachary Reich	E6. Phone Number:	415-622-5548
E3. Street:	County Road 10	E7. City:	Windham
		E8. County:	Greene
E4. State	NY	E9. Zip Code	12496
E10. Area of Operation:		Windham, NY	
E11. Latitude:	42 ° 20 ' 11.3 " N		
E12. Longitude:	74 ° 15 ' 37.4 " W		
E13. Lat/Lon Coordinates are:		○ NAD-27	◉ NAD-83 ○ N/A
E14. Site Elevation (AMSL):		10.0 meters	

E15. If the proposed antenna(s) operate in the Fixed Satellite Service (FSS) with geostationary satellites, do(es) the proposed antenna(s) comply with the antenna gain patterns specified in Section 25.209(a) and (b) as demonstrated by the manufacturer's qualification measurement? If NO, provide asa technical analysis showing compliance with two-degree spacing policy.	○ Yes ○ No ◉ N/A
E16. If the proposed antenna(s) do not operate in the Fixed Satellite Service (FSS), or if they operate in the Fixed Satellite Service (FSS) with non-geostationary satellites, do(es) the proposed antenna(s) comply with the antenna gain patterns specified in Section 25.209(a2) and (b) as demonstrated by the manufacturer's qualification measurements?	◉ Yes ○ No ○ N/A
E17. Is the facility operated by remote control? If YES, provide the location and telephone number of the control point.	◉ Yes ○ No
E18. Is frequency coordination required? If YES, attach a frequency coordination report as	○ Yes ◉ No
E19. Is coordination with another country required? If YES, attach the name of the country(ies) and plot of coordination contours as	○ Yes ◉ No
E20. FAA Notification - (See 47 CFR Part 17 and 47 CFR part 25.113(c)) Where FAA notification is required, have you attached a copy of a completed FCC Form 854 and or the FAA's study regarding the potential hazard of the structure to aviation? **FAILURE TO COMPLY WITH 47 CFR PARTS 17 AND 25 WILL RESULT IN THE RETURN OF THIS APPLICATION.**	○ Yes ◉ No

POINTS OF COMMUNICATION

Satellite Name:OTHER | OTHER | If you selected OTHER, please enter the following:	
E21. Common Name: Radix	E22. ITU Name:
E23. Orbit Location: NGSO	E24. Country: USA

POINTS OF COMMUNICATION (Destination Points)

E25. Site Identifier: UHF-Windham	
E26. Common Name:	E27. Country:USA

ANTENNA

Site ID	E28. Antenna Id	E29. Quantity	E30. Manufacturer	E31. Model	E32. Antenna Size	E41/42. Antenna GainTransmint and/or Recieve(____dBi at _____GHz)
UHF-Windham	YAGI-1	1	M2 Antenna Systems	400CP30A	3.57	16.2 dBi at 0.400

E28. Antenna Id	E33/34. Diameter Minor/Major(meters)	E35. Above Ground Level (meters)	E36. Above Sea Level (meters)	E37. Building Height Above Ground Level (meters)	E38. Total Input Power at antenna flange (Watts)	E39. Maximum Antenna Height Above Rooftop (meters)	E40. Total EIRP for al carriers (dBW)
YAGI-1	0.025/3.57	4.0	0.0	0.0	12.53	0.0	27.2

FREQUENCY

E28. Antenna Id	E43/44. Frequency Bands(MHz)	E45. T/R Mode	E46. Antenna Polarization(H,V,L,R)	E47. Emission Designator	E48. Maximum EIRP per Carrier(dBW)	E49. Maximum ERIP Density per Carrier(dBW/4kHz)
YAGI-1	401.24 401.36	R	Right Hand Circular	114KG1D	0.0	0.0
E50. Modulation and Services TT&C Downlink						
YAGI-1	401.24 401.36	T	Right Hand Circular	114KG1D	27.2	12.6
E50. Modulation and Services TT&C Uplink						

FREQUENCY COORDINATION

E28. Antenna Id	E51. Satellite Orbit Type	E52/53. Frequency Limits(MHz)	E54/55. Range of Satellite Arc E/W Limit	E56. Earth Station Azimuth Angle Eastern Limit	E57. Antenna Elevation Angle Eastern Limit	E58. Earth Station Azimuth Angle Western Limit	E59. Antenna Elevation Angle Western Limit	E60. Maximum EIRP Density toward the Horizon(dBW/4kHz)
YAGI-1	Non-Geostationary	401.24 401.36	0.0/ 0.0	0.0	5.0	360.0	5.0	0.0
	Non-Geostationary	401.24 401.36	0.0/ 0.0	0.0	5.0	360.0	5.0	12.6

REMOTE CONTROL POINT LOCATION

REMOTE CONTROL POINT LOCATION

E61. Call Sign NOTE: Please enter the callsign of the controlling station, not the callsign for which this application is being filed.	E65. Phone Number 650-746-8744		
E62. Street Address 2205 152nd Street NE			
E63. City Redmond	E67. County King	E64/68. State/Country WA/ USA	E66. Zip Code 98052

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