

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

In the Matter of

Request of RBC Signals LLC for a)
180-Day Special Temporary Authorization) Call Sign:
to Operate an Earth Station to Provide)
Tracking, Telemetry & Command for) File No.: SES-STA-_____
Foreign-Licensed Satellites)

REQUEST FOR SPECIAL TEMPORARY AUTHORITY

RBC Signals LLC (“RBC Signals”), pursuant to Section 25.120 of the Commission’s rules,¹ respectfully seeks a 180-day special temporary authorization (“STA”) to operate two (2) yagi antennas (the “400 MHz Yagi”) at its existing teleport facility in Deadhorse, Alaska to perform tracking, telemetry and command (“TT&C”) in the 401-402 MHz band for two foreign-licensed, non-geostationary orbit (“NGSO”) cubesats operated by SatRevolution S.A. (“SatRevolution”): (i) the SWIFT cubesat and (ii) the SteamSat cubesat.²

Grant of this 180-day STA will serve the public interest by enabling RBC Signals to help validate certain satellite technology and establish space heritage of these next-generation cubesat products and services to the benefit of government, non-profit, and commercial satellite operators. Specifically, this STA will allow RBC Signals to support the evaluation of a unique steam-based cubesat propellant module collocated on the SteamSat satellite, as well as the demonstration of cameras and related Earth observation technology on the SWIFT satellite.

¹ 47 C.F.R. § 25.120.

² Specifically, RBC Signals seeks to perform TT&C for the SWIFT cubesat in 401.0375-401.0625 MHz (Earth-to-space) and 401.0125-401.0375 MHz (space-to-Earth) bands, and for the SteamSat cubesat in the 401.0-401.1 MHz (Earth-to-space) and 401.050-401.150 MHz (space-to-Earth) bands. RBC Signals has concurrently filed a STA request to provide limited, receive-only support for the SWIFT cubesat in the 2261.5-2269.5 MHz (space-to-Earth) band.

The expected launch window for the SWIFT and SteamSat satellites is December 18, 2020 to December 31, 2020.³ Notably, these cubesats will be launched on the same vehicle as the AuroraSat satellite, which was recently authorized to communicate with RBC Signals' UHF ground station from Windham, New York for near-identical TT&C operations.⁴

RBC Signals respectfully requests that the Commission consider and authorize the proposed TT&C operations, as appropriately conditioned, as soon as practicable. RBC Signals will update the Commission with the final launch date once the launch schedule is finalized. Given the December launch timeframe, there should be sufficient time for the Commission to place this 180-day STA request on public notice and make a timely decision.⁵

I. BACKGROUND

Consistent with its existing operations under the *Aurora STA*, RBC Signals seeks to provide TT&C support for the SWIFT and SteamSat satellites using a 400 MHz Yagi (the M2 Antenna Systems Model 400CP30A) located at its existing facility in Deadhorse, Alaska, where RBC Signals currently performs near-identical TT&C operations in the 401-402 MHz band.⁶ There have been no reported cases of interference in the 401-402 MHz band from the Deadhorse facility and this request will not create any the potential for interference given its temporary, intermittent use and

³ The mission life of the SWIFT and SteamSat satellites, approximately two years from launch including deorbiting, does not warrant long-term commercial earth station license authority for the proposed operations. Consistent with past practice regarding STA authority for time-limited earth station operations in the subject bands, RBC Signals intends to request renewal of the proposed 180-day STA, as necessary, to ensure appropriate Commission authority for the life of the mission. RBC expressly acknowledges that grant of an initial STA or renewal will in no way affect the Commission's consideration of subsequent renewal requests.

⁴ See RBC Signals LLC, File No. SES-STA-20200724-00799 ("*Aurora STA*"). The STA period commences on December 1, 2020.

⁵ In the event that this 180-day STA is not granted in time for launch in mid- to late-December 2020, RBC Signals will file an additional 30-day STA request to cover the launch and initial mission period for the SWIFT and SteamSat satellites.

⁶ See, e.g., RBC Signals LLC, File No. SES-STA-20200107-00013.

low transmit power. In fact, the 400 MHz Yagi will transmit at significantly lower power levels than those presently authorized at the Deadhorse facility (*see* draft FCC Form 312 Schedule B).⁷

With the support of RBC Signals, SatRevolution seeks to demonstrate: (i) the SteamSat’s steam-based propulsion module (the “TunaCan”) to help improve constellation management, satellite maneuvering and collision avoidance; and (ii) the SWIFT’s Earth observation cameras (the “Vision300”) and optical module (the “SpaceEdgeZero”).⁸ Towards this end, with RBC Signals’ backing, SatRevolution can effectively test components, software design, and operational concepts of these novel cubesat technologies.

The SteamSat and SWIFT satellites have been authorized and registered by Poland, a WTO-member country. UKE – the Polish Office of Electronic Communications – has submitted ITU filings for the SteamSat and SWIFT satellites on behalf of SatRevolution. RBC Signals understands that the STEAMSAT ITU filing accurately reflects the operational parameters of that satellite, but that UKE will file a modification to the SWIATOWID_2 (SWIFT) satellite filing to reflect updates to certain operational parameters. In the interest of providing the most accurate information possible, RBC Signals submits herewith a SPACEPUB file that reflects the updated operational parameters. RBC Signals also includes a brief overview of the differences between the current SWIATOWID_2 filing and the SWIFT satellite’s updated operational parameters for the Commission’s reference.⁹

During the missions, RBC Signals’ operations will be conducted on an unprotected and non-interference basis intermittently when the satellites pass over the earth station. In addition, RBC

⁷ *Id.*

⁸ SatRevolution is a company established in Poland that is 100% Polish-owned and no U.S. person will conduct or control the remote sensing technology demonstrations of the SWIFT satellite. As a result, a commercial remote sensing authorization from the National Oceanic and Atmospheric Administration (“NOAA”) is not necessary to support these test and demonstration operations.

⁹ RBC Signals has also filed a draft Schedule S for the SWIFT satellite in its contemporaneously filed STA request for limited authority to receive downlink transmissions from that satellite in S-band frequencies.

Signals will conduct these operations in accordance with the Commission's rules and interagency requirements governing fixed earth station operations in the subject bands. RBC Signals provides the attached Technical Appendix for detailed information on the satellite and earth station operations, including an orbital debris assessment report, antenna patterns and a draft FCC Form 312 Schedule B.¹⁰ As discussed below, grant of the requested STA will serve the public interest, convenience, and necessity.

II. DISCUSSION

RBC Signals seeks to operate the 400 MHz Yagi with the SteamSat and SWIFT cubesats in the 401-402 MHz band. Specifically, RBC Signals will operate with the SWIFT cubesat in the 401.0375-401.0625 MHz (Earth-to-space) and 401.0125-401.0375 MHz (space-to-Earth) bands. RBC Signals will operate with the SteamSat cubesat in the 401.0-401.1 MHz (Earth-to-space) and 401.050-401.150 MHz (space-to-Earth) bands.

Grant of this STA request is critical for the reliability of the SteamSat and SWIFT missions and will not increase the potential for interference since there are existing 401-402 MHz band operations at the Deadhorse facility that operate at much higher power levels with no reported cases of interference. RBC Signals provides detailed satellite information in the attached Technical Appendix and Technical Description. RBC Signals understands that the limited, TT&C authority hereunder does not constitute market access to the United States for the SteamSat or SWIFT satellites and is providing the level of technical information consistent with Commission precedent to support its request.¹¹

¹⁰ RBC Signals respectfully requests leave to update the technical or operational data associated with this STA request should the Commission seek any clarifying or supplemental information in considering this STA request.

¹¹ See SES Americom, Inc., File No. SES-MFS-20160624-00607, Call Sign E050287 (granting authority for an earth station to provide TT&C services to the foreign-licensed ASTRA 3A operating at 86.85° W.L.); Hawaii Pacific Teleport, L.P., File No. SES-MFS-20131030-00913, Call Sign E030115 (granting authority

A. SteamSat Satellite Overview

The SteamSat mission will consist of a single satellite launched into sub-synchronous circular orbit with nominal orbit altitude of 525 km (based upon a range of SSO orbit altitudes from 500km to 550km) with an inclination from the equator of 97.6°. The SteamSat satellite is based on the SatRevolution NanoBus and conforms to the form factor of a 1.5U cubesat (190.5 mm x 111 mm x 100 mm) with a total mass of approximately 1.37 kg. The satellite is composed of the 1.5U bus, deployable solar panels, deployable UHF antenna, and the TunaCan propulsion module. The SteamSat cubesat will be launched as a secondary payload aboard a SpaceX Falcon 9 launch vehicle from the Cape Canaveral Air Force Station in December 2020. An orbital lifetime calculation for this orbit estimates that the satellite will remain in orbit for approximately 2.97 years (under worst-case conditions), well within the limits set by internationally accepted guidelines.¹²

B. SWIFT Satellite Overview

The SWIFT mission will consist of a single satellite launched into sub-synchronous circular orbit with nominal orbit altitude of 525 km (based upon a range of SSO orbit altitudes from 500km to 550km) with an inclination from the equator of 97.6°. The SWIFT satellite is based on the SatRevolution NanoBus and conforms to the form factor of a 3U cubesat (340.5 mm x 116 mm x 109 mm) with a total mass of approximately 3.0 kg. The satellite is composed of the 3U bus, deployable solar panels, deployable UHF and S-band antennas, camera system, and the SpaceEdgeZero machine learning module. The SWIFT cubesat will be launched as a secondary payload aboard a SpaceX Falcon 9 launch vehicle from the Cape Canaveral Air Force Station in December 2020. An orbital lifetime calculation for this orbit estimates that the satellite will remain

for an earth station to provide TT&C services to ASTRA 3A operating at 176.85° W.L.); SES Americom, Inc., File No. SES-STA-20161110-00884, Call Sign E050287 (granting authority for an earth station to provide TT&C services to ASTRA 3A during drift from 86.85° W.L. to 47.0° W.L.)¹² See SteamSat Orbital Debris Assessment Report (attached).

¹² See SteamSat Orbital Debris Assessment Report (attached).

in orbit for approximately 2.513 years (under worst-case conditions), well within the limits set by internationally accepted guidelines.¹³

C. 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 operations in the 401-402 MHz band, as specified above, consistent with the co-primary space operations allocation in this band.¹⁴

RBC Signals acknowledges that there are certain U.S. government meteorological aids and Earth exploration operations conducted in the 401-402 MHz band.¹⁵ Moreover, RBC Signals understands that although expanded Federal use of the 401-402 MHz band is anticipated, such plans do not commence until well after the end of the SWIFT and SteamSat mission. RBC Signals will continue to work with Commission staff to ensure that these temporary TT&C operations will not increase the potential interference to current or future government users, and will coordinate with NASA, NOAA, and other U.S. government agencies to ensure that the TT&C operations proposed herein are compatible with government operations and that the interests of the United States are fully accommodated.

The facility in Deadhorse, Alaska currently supports TT&C operations in the band with no reported interference, and the TT&C operations proposed herein will be conducted at considerably

¹³ See SWIFT Orbital Debris Assessment Report (attached).

¹⁴ 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.”).

¹⁵ See https://www.ntia.doc.gov/files/ntia/publications/compendium/0401.00-0402.00_01MAR14.pdf.

lower power levels than those currently authorized at the site. Thus, the proposed TT&C operations in this band will not present an increased interference risk to other authorized users.

D. STA Request & Public Interest Considerations

RBC Signals respectfully seeks this 180-day STA pursuant to Section 25.120 of the Commission's rules, 47 C.F.R. § 25.120. A 180-day STA is appropriate because RBC Signals does not plan to file an application for regular authority for the subject TT&C operations because the length of the mission (approximately two years) does not warrant a long-term commercial earth station license (*i.e.*, a 15-year term). The scheduled December 2020 launch date should afford sufficient time to place this application on public notice and make a determination, however, RBC Signals reserves the right to file an additional 30-day STA request to cover the launch and initial mission period for SWIFT and/or SteamSat if this STA is not timely granted.

SatRevolution realizes the crucial importance of reliable TT&C support to ensure successful missions given the SteamSat's novel steam-based propulsion system and the SWIFT's Earth observation modules. RBC Signals can provide tested and proved ground station support from an existing teleport facility that supports operations in the 401-402 MHz band without increasing the potential for interference into other commercial or Federal users. Moreover, grant of this STA request is in the public interest because it will facilitate the safe operation of the SWIFT and SteamSat satellites by ensuring reliable TT&C functions in time for the launch of the satellites.

III. CONCLUSION

Based on the foregoing, the public interest would be served by a grant of this 180-day STA request to allow RBC Signals to perform TT&C in the 401-402 MHz band, as described herein, to support the SWIFT and SteamSat cubesats from its earth station facility in Deadhorse, Alaska.