

**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 Data	)	
Downlink Services for a Foreign-Licensed	)	File No.: SES-STA-_____
Satellite	)	

**REQUEST FOR SPECIAL TEMPORARY AUTHORITY**

RBC Signals LLC (“RBC Signals”), pursuant to Section 25.120 of the Commission’s rules,<sup>1</sup> respectfully seeks a 180-day special temporary authorization (“STA”) to provide limited, receive-only downlink support for a foreign-licensed, non-geostationary orbit (“NGSO”) cubesat operated by SatRevolution S.A. (“SatRevolution”) – the SWIFT cubesat – in the 2261.5-2269.5 MHz (space-to-Earth) band using a 2.4m Orbit Gaia-100 (“Orbit-100”) earth station at its existing teleport facility in Deadhorse, Alaska.<sup>2</sup>

Grant of this 180-day STA will serve the public interest by enabling RBC Signals to help validate key satellite technology and establish space heritage of this next-generation cubesat service to the benefit of government, non-profit, and commercial satellite operators. Specifically, this STA will allow RBC Signals to facilitate the demonstration of cameras and related Earth observation technology on the SWIFT satellite and provide mission-critical data downlink support.

The expected launch window for the SWIFT satellite is December 18, 2020 to December

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<sup>1</sup> 47 C.F.R. § 25.120.

<sup>2</sup> RBC Signals has concurrently filed a STA request to provide TT&C support for the SWIFT cubesat in the 401-402 MHz band.

31, 2020.<sup>3</sup> Notably, this cubesat will be launched on the same vehicle as the AuroraSat satellite, which was recently authorized to communicate with RBC Signals' ground station from Windham, New York.<sup>4</sup>

RBC Signals respectfully requests that the Commission consider and authorize the proposed downlink 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.<sup>5</sup>

## **I. BACKGROUND**

RBC Signals seeks to operate Orbit-100 to intermittently receive Earth observation data from the SWIFT cubesat in the 2261.5-2269.5 MHz band and RBC Signals receive-only earth station operations would not cause interference to other spectrum users. As discussed below, RBC Signals, together with SatRevolution, will coordinate with Federal users to ensure that the proposed receive-only (satellite space-to-Earth) operations will not cause harmful interference to Federal spectrum users or otherwise adversely affect U.S. government interests.

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<sup>3</sup> The mission life of the SWIFT satellite, 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.

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

<sup>5</sup> 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.

With the support of RBC Signals, SatRevolution seeks to demonstrate the SW1FT's Earth observation cameras (the "Vision300") and optical module (the "SpaceEdgeZero").<sup>6</sup> Towards this end, with RBC Signals' receive-only earth station support, SatRevolution can effectively test components, software design, and operational concepts of this novel cubesat technology.

The SW1FT satellite has been authorized and registered by Poland, a WTO-member country. UKE – the Polish Office of Electronic Communications – has submitted ITU filing for the SW1FT satellite on behalf of SatRevolution. RBC Signals understands that UKE will file a modification to the SWIATOWID\_2 (SW1FT) 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 SW1FT satellite's updated operational parameters for the Commission's reference.<sup>7</sup>

During the mission, RBC Signals' operations will be conducted on an unprotected and non-interference basis intermittently when the satellite passes over the earth station. In addition, RBC Signals will conduct these operations in accordance with the Commission's rules and interagency requirements governing fixed earth station operations in the subject band. 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 Schedule S

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<sup>6</sup> 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 SW1FT 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.

<sup>7</sup> RBC Signals has also provided a draft Schedule S for the SW1FT satellite in the Technical Appendix.

and FCC Form 312 Schedule B.<sup>8</sup> As discussed below, grant of the requested STA will serve the public interest, convenience, and necessity.

## **II. DISCUSSION**

RBC Signals seeks to provide limited, receive-only support for the SW1FT cubesat in the 2261.5-2269.5 MHz (space-to-Earth) band. Grant of this STA request is critical for the reliability SW1FT mission and will not increase the potential for interference since RBC Signals' receive-only operations are unlikely to result in interference to other spectrum users given the remote location of the earth station facility (i.e., the North Slope of Alaska) and limited, intermittent use. RBC Signals provides detailed satellite information in the attached Technical Appendix and Technical Description.

### **A. SW1FT Satellite Overview**

The SW1FT 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 SW1FT 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 SW1FT 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

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<sup>8</sup> 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.

in orbit for approximately 2.513 years (under worst-case conditions), well within the limits set by internationally accepted guidelines.<sup>9</sup>

## **B. Downlink Spectrum Use**

RBC Signals seeks to provide limited, downlink support for the SWIFT spacecraft in the 2261.5-2269.5 MHz band. The Table of Allocations provides that the 2200-2290 MHz band may be used for Federal EESS, space operations, and space research with no allocation for non-Federal uses.<sup>10</sup> RBC Signals, together with SatRevolution, will coordinate with Federal users to ensure that the proposed receive-only (satellite space-to-Earth) operations will not cause harmful interference to Federal spectrum users or otherwise adversely affect U.S. government interests.

RBC Signals acknowledges that this band is used by Federal agencies for diverse satellite and terrestrial applications, including the Tracking and Data Relay Satellite System (“TRDSS”),<sup>11</sup> but there does not appear to be any incompatibility issues. Accordingly, when operating the Orbit-100 earth station in the 2261.5-2269.5 MHz band for data downlink operations, RBC Signals will operate the earth station on a non-conforming (unprotected and non-interference) basis. RBC Signals respectfully requests a waiver of the Table of Allocations, 47 C.F.R. §2.106, to the extent necessary to permit its non-conforming use of the 2261.5-2269.5 MHz band.

Given the remote geographical location of the earth station, RBC Signals is confident it can operate the Gaia-100 earth station without causing harmful interference to authorized spectrum users and agrees to accept any harmful interference from Federal stations while operating on a non-conforming, unprotected basis. In addition, RBC Signals’ use of this band will be limited to

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<sup>9</sup> See SWIFT Orbital Debris Assessment Report (attached).

<sup>10</sup> Non-federal operations in this band are limited to transmissions to the Tracking and Data Relay Satellite System (“TRDSS”). See 47 C.F.R. §2.106, fn. US303.

<sup>11</sup> See <https://www.ntia.doc.gov/files/ntia/publications/compendium/2200.00-2290.00-01MAR14.pdf>.

intermittent receive operations in eight megahertz of spectrum, and the earth station will be located in a controlled facility that is managed on a 24/7 basis to immediately respond to any reports of harmful interference. RBC Signals will neither ensure that these operations do not cause harmful interference to, and RBC Signals will not claim protection from, Federal operations in the band.

RBC Signals respectfully seeks a waiver of Section 2.106 of the Commission's rules, 47 C.F.R. § 2.106, to permit operation of Orbit-100 earth station in the 2261.5-2269.5 MHz band to provide limited, downlink support for the SWIFT spacecraft. As noted, the Table of Allocations provides that the 2200-2290 MHz band may be used for Federal EESS, space operations, and space research with no allocation for non-Federal uses (non-federal operations are limited to TRDSS transmissions).<sup>12</sup> The Commission may waive its rules for "good cause shown."<sup>13</sup> In general, good cause exists if grant of a waiver would not undermine the purposes of the rule and would otherwise serve the public interest.<sup>14</sup>

A waiver is warranted in this case because there is limited potential for interference from the proposed receive-only operations and RBC Signals will ensure that the operations do not adversely impact U.S. government operations. Specifically, RBC Signals limited operations will occur only when the satellite is within view of the relevant earth station for brief periods of time and will only utilize proposed 8 MHz of spectrum to communicate with the satellite. In addition, RBC Signals will avoid harmful interference to other authorized spectrum users, will immediately cease operations if it learns they are causing harmful interference, and agrees to accept any harmful interference from Federal stations while operating on a non-conforming, unprotected basis. Finally, RBC Signals and its customer SatRevolution will comply with any limitations or restrictions on

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<sup>12</sup> See 47 C.F.R. §2.106, fn. US303.

<sup>13</sup> See 47 C.F.R. § 1.3. *WAIT Radio v. FCC*, 418 F.2d 1153, 1157 (D.C. Cir. 1969).

<sup>14</sup> See *id.*

satellite downlink (space-to-Earth) operations necessary to protect Federal uses from harmful interference. Thus, grant of the requested waiver is appropriate and RBC Signals commits to working with Federal agencies to coordinate use of the band as necessary.

### **C. 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 downlink 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 SW1FT if this STA is not timely granted.

SatRevolution realizes the crucial importance of reliable mission-data downlink support to ensure a successful mission given the SW1FT's Earth observation modules. RBC Signals can provide tested and proved ground station support from an existing teleport facility without increasing the potential for interference into other commercial or Federal users, and help SatRevolution gather critical mission data to validate the commercial viability of its earth observation technology to the benefit of all NGSO satellite operators.

### **III. CONCLUSION**

For the foregoing reasons, the public interest would be served by a grant of this 180-day STA request to allow RBC Signals to provide limited, receive-only support for the SW1FT cubesat in the 2261.5-2269.5 MHz band, as described herein, from an existing earth station facility in Deadhorse, Alaska.