

**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 Operate) Call Sign:
an Earth Station to Provide Telemetry &)
Backup Link Services) 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 180-day special temporary authorization (“STA”) to operate a yagi antenna (the “400 MHz Yagi”) at an existing site in Deadhorse, Alaska to provide receive-only telemetry in the 400.48-400.52 MHz band (space-to-Earth) for a non-geostationary satellite orbit (“NGSO”) satellite operated by Spaceflight, Inc. (“Spaceflight”) – the Sherpa-LTE1.¹ RBC Signals also seeks to operate a 4.5m Orbit Gaia-100 earth station (the “4.5m”) to primarily provide a backup link for the Sherpa LTE-1 in the 2074.85-2075.15 MHz band (Earth-to-space).² Grant of this STA will allow RBC Signals to provide critical mission support for Spaceflight’s evaluation of the Sherpa LTE-1 controlled deorbiting technology. RBC Signals’ will communicate with the satellite once per day as the satellite passes over the Earth at latitudes serviceable from the earth station in Deadhorse.

¹ See Spaceflight Inc., File No. SAT-STA-20210205-00017 (“*Spaceflight STA*”). The Sherpa-LTE1 is the subject of a pending request for special temporary authorization. To the extent applicable, RBC Signals incorporates by reference relevant satellite technical and operational information provided in the *Spaceflight STA*. This request is limited to receive-only earth station operating authority.

² RBC Signals’ request to operate in the 2074.85-2075.15 MHz band is limited to the Deadhorse facility only. RBC Signals has concurrently filed identical 180-day STA requests to provide receive-only telemetry for the Sherpa-LTE1 from its existing facilities in Windham, New York and Deadhorse, Alaska.

The expected launch window for the Sherpa-LTE1 is June 1, 2021 to July 31, 2021³ as a secondary payload aboard a SpaceX Falcon 9 launch vehicle. RBC Signals respectfully requests that the Commission consider and authorize the proposed operations (as appropriately conditioned) as soon as practicable to permit ground station support that corresponds to the launch and mission life of the satellite. RBC Signals will update the Commission with the final launch date once the launch schedule is finalized.

I. BACKGROUND

RBC Signals seeks to provide telemetry support for the Sherpa-LTE1 using an existing 400 MHz Yagi (M2 Antenna Systems Model 400CP30A) located at its facility in Deadhorse, Alaska, where RBC Signals performs more extensive telemetry, tracking and command (“TT&C”) operations than those proposed herein.⁴ There have been no reported cases of interference from the Deadhorse facility and this request will not create the potential for interference given the limited, receive-only nature of the operations. In addition, RBC Signals has fully coordinated its 4.5m earth station operations in the 2074.85-2075.15 MHz band to ensure no interference into existing authorized spectrum users.

With the support of RBC Signals, Spaceflight seeks to perform the secondary mission phase of the Sherpa-LTE1,⁵ whereby Spaceflight will demonstrate and evaluate controlled deorbiting technology for future implementation. Specifically, during the controlled deorbit phase, Spaceflight

³ The mission life of the Sherpa-LTE1 spacecraft, approximately six (6) months from launch, does not warrant long-term commercial earth station license authority for the proposed operations. If needed, RBC Signals intends to request renewal of the proposed 180-day STAs, 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, e.g., RBC Signals LLC, File Nos. SES-STA-20181008-03140 (authorizing RBC Signals to provide TT&C to the 3 Diamonds spacecraft in the 401-402 MHz band).

⁵ The first mission phase, expected to last less than six hours, will consist of the Sherpa-LTE1 deploying customer cubesat payloads. RBC Signals will not support the first mission phase.

will test an onboard computer system providing command and control over the Sherpa-LTE1, as well as evaluate an electric propulsion assembly that will rapidly lower the Sherpa-LTE1 vehicle.

During the mission, RBC Signals' operations will be conducted on an unprotected and non-interference basis intermittently when the satellites pass over the earth station (once per day) to support the mission. 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, which includes a radiation hazard analysis, frequency coordination report and draft FCC Form 312 Schedule B, for information relating to the proposed earth station operations.⁶ As discussed below, grant of the requested STA will serve the public interest, convenience, and necessity.

II. DISCUSSION

RBC Signals seeks to receive data from the Sherpa-LTE1 in the 400.48-400.52 MHz band (space-to-Earth) using the 400 MHz Yagi. Moreover, RBC Signals seeks to provide mission backup in the 2074.85-2075.15 MHz band. Operations will be conducted as-needed to communicate with the Sherpa-LTE1 satellite as it passes over the Deadhorse earth station (one time per day for brief periods of approximately 8 minutes). Grant of this STA request is critical for the reliability Sherpa-LTE1 mission and will not increase the potential for interference, as discussed in more detail below. RBC Signals will work with Commission staff and other U.S. government agencies as needed to ensure that these temporary operations will not increase the potential interference to current or future government users and that the interests of the United States are fully accommodated.

⁶ RBC 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 request.

A. Sherpa-LTE1 Satellite Overview

The Sherpa-LTE1 mission will consist of a single satellite launched into sun synchronous 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 total launch mass of the Sherpa-LTE1 will be approximately 415 kg, of which approximately 212 kg is made up of Spaceflight customer spacecraft to be deployed. As noted, the Sherpa-LTE1 mission consists of two mission phases. The first mission phase is the deployment of customer spacecraft, whereby the Sherpa-LTE1 will deploy up to 14 spacecraft.⁷ RBC Signals will not provide ground station support during the first mission phase.

The secondary mission is a controlled deorbit phase lasting no longer than six (6) months. During the controlled deorbit phase, two new modular systems will be enabled and tested. The Spaceflight system will make use of traditional, flight-proven, satellite control systems to effectively point the vehicle to sun-normal for solar panel charging. During this time, the second modular system, an electric propulsion assembly from Apollo Fusion, will be commissioned to lower the Sherpa vehicle altitude from 525 km to approximately 350 km. Spaceflight seeks to partner with RBC Signals to provide support these critical technical evaluations.

B. Telemetry 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 400.15-401 MHz band is shared between meteorological aids (Earth-to-space), mobile satellite (space-to-Earth), space research (space-to-Earth) and space operation services (space-to-Earth). RBC Signals seeks to perform

⁷ See *Spaceflight STA*, Exhibit A for Spaceflight customer manifest.

receive-only telemetry operations in the 400.48-400.52 MHz band, as specified above, consistent with the co-primary space operation allocation in this band.⁸

RBC Signals acknowledges that there are certain U.S. government meteorological aids and space research operations conducted in the 400.15-401 MHz band.⁹ Moreover, RBC Signals understands that although expanded Federal use of the 400.15-401 MHz band is contemplated, such plans do not commence until well after the end of the Sherpa-LTE1 mission. RBC Signals will support Spaceflight and Commission staff to ensure that these temporary receive-only operations do not increase the potential interference to current or future government users and are compatible with government operations.

The facility in Fairbanks, Alaska currently supports similar earth station transmit and receive operations with no reported cases of interference, and RBC Signals' proposed operations under this STA will not present an increased interference risk to other authorized users.

C. Backup Spectrum Use

The Table of Allocations provides that the 2025-2110 MHz band is allocated on a primary basis to non-Federal terrestrial fixed and mobile services. Non-federal Earth-to-space transmissions may be authorized on a case-by-case basis for space research and Earth exploration-satellite services, so long as such operations are conducted on a non-interference basis with Federal and non-Federal users of the band.¹⁰ RBC Signals proposes to operate the 4.5m in the 2074.85-2075.15 MHz band (Earth-to-space) to provide a backup link for the Spaceflight spacecraft consistent with the Commission's Table of Allocations.¹¹

⁸ See 47 C.F.R. § 2.1 (defining "space operation" as "a radiocommunication service concerned exclusively with the operation of spacecraft, in particular space tracking, space telemetry, and space telecommand.").

⁹ See https://www.ntia.doc.gov/files/ntia/publications/compendium/0400.15-0401.00_01MAR14.pdf

¹⁰ See 47 C.F.R. § 2.106, fn. US347.

¹¹ See 47 C.F.R. § 2.1 (defining "space research services" as "a radiocommunication service in

RBC Signals understands that there are certain U.S. government operations conducted in the 2025-2110 MHz band, including use by National Aeronautics and Space Administration (“NASA”).¹² RBC Signals will coordinate with NASA and other government agencies to ensure compatibility of the proposed operations. Given that RBC Signals only seeks to perform transmit operations in less than one megahertz of spectrum from 2074.85-2075.15 MHz, and given the remote location of the Deadhorse facility in the North Slope of Alaska, RBC Signals has not identified any conflicting Federal operations and believes the proposed operations will not present a potential for interference to other spectrum users of the band. RBC Signals 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.

a. Frequency Coordination

RBC Signals engaged Micronet to perform frequency coordination analysis for the 4.5m earth station, which was completed on March 25, 2021. Pursuant to Sections 25.115(c)(2)(ii) and 25.203 of the Commission’s rules, 47 C.F.R. §§ 25.115(c)(2)(ii) and 25.203, Micronet has conducted a coordination analysis on behalf of RBC Signals that considers all existing, proposed and prior coordinated terrestrial microwave facilities within the contours of the 4.5m earth station at the Deadhorse facility.

As demonstrated in the attached frequency coordination report, there is no potential for interference between other users of the S-band spectrum and the operations of the 4.5m earth station at the Deadhorse facility,¹³ and RBC Signal’s proposed operations are fully compatible with other

which spacecraft or other objects in space are used for scientific or technological research purposes.”).

¹² See https://www.ntia.doc.gov/files/ntia/publications/compendium/2025.00-2110.00_01MAR14.pdf

¹³ Out of an abundance of caution, RBC Signals coordinated worst-case scenario power levels across the entire frequency band. In reality, RBC Signals will operate at significantly lower power levels within a 1 MHz frequency range.

FCC-licensed operations in the band. There are no unresolved interference objections and Micronet has concluded that no unacceptable interference will result with other operations in the band.

D. STA Request and 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 operations because the Sherpa-LTE1 mission length (approximately six months) does not warrant a long-term commercial earth station license (*i.e.*, a 15-year term). In addition, given the June-July 2021 launch timeframe, sufficient time should be afforded for public notice and Commission consideration of this application.

Reliable telemetry and backup links are crucial to ensure successful secondary mission phase for the Sherpa-LTE1, and RBC Signals can provide established and proven ground station support from an existing teleport facility 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 successful operation of the Sherpa-LTE1 and ensure that the Sherpa-LTE1 has access to uninterrupted ground station services during the life of the mission. With RBC Signals' support, Spaceflight will be able to conduct key performance evaluations of its novel controlled deorbiting technology for future implementation.

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 operate in the 400.48-400.52 MHz band (space-to-Earth) and 2074.85-2075.15 MHz band (Earth-to-space) to support the Sherpa-LTE1 from its existing earth station facility in Deadhorse, Alaska.