

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

In the Matter of

Application of RBC Signals, LLC for an	)	Call Sign:
Earth Station License to Operate with a	)	
Non-Geostationary Orbit Spacecraft	)	File No.: SES-LIC-_____

**APPLICATION FOR FIXED EARTH STATION LICENSE
(S-band Antenna Uplink – Deadhorse, AK)**

RBC Signals, LLC (“RBC Signals”), pursuant to Section 25.115 of the Commission’s rules, 47 C.F.R. § 25.115, respectfully seeks a license to operate a fixed 4.5 meter S band earth station in Deadhorse, Alaska to conduct telemetry, tracking, and command (“TT&C”) operations in the 2025-2110 MHz band (Earth-to-space; frequencies requested: 2046 MHz, 2048 MHz, 2050 MHz, 2053 MHz, 2056 MHz, and 2075 MHz) to support a non-geostationary orbit (“NGSO”) deployment vehicle, the Sherpa-AC1 spacecraft, operated by Spaceflight, Inc. (“Spaceflight”).¹ As demonstrated in this application, grant of the requested authority will serve the public interest because it will allow RBC Signals to support Sherpa-AC1 operations and further facilitate U.S. leadership in the advancement of novel satellite technologies.

The Sherpa-AC1 is scheduled to be deployed from a Space Exploration Technologies Corporation (“SpaceX”) Falcon 9 on May 25, 2022.² RBC Signals respectfully requests that the

¹ See Spaceflight, Inc., File No. SAT-LOA-20220111-00007 (“*Sherpa-AC1 Application*”). The Sherpa-AC1 is subject to a pending application for space station authority. To the extent applicable, RBC Signals incorporates by reference relevant satellite technical and operational information provided in the *Sherpa-AC1 Application*.

² The Sherpa-AC1 launch date was recently rescheduled to an earlier date of May 25, 2002, and RBC Signals is concurrently requesting special temporary authorization (“STA”) to support the accelerated launch date. Although the mission life for Sherpa-AC1 is approximately one year, RBC Signals seeks the requested license to regularize its earth station authority at the Deadhorse, Alaska site.

Commission consider and authorize the proposed operations (as appropriately conditioned) as soon as practicable.

I. BACKGROUND

RBC Signals is a Seattle, Washington-based company that provides earth station services around the world. With this application, RBC Signals seeks earth station license authority to operate in Deadhorse, Alaska to support the Sherpa-AC1 mission. RBC Signals will remove the Sherpa-AC1 as an authorized point of communication upon the completion of the mission.

Sherpa-AC1 will be placed in Sun-synchronous orbit (“SSO”) at an altitude between 525-575 km $\pm$ 25 km⁴ at an inclination of 97.59 degrees. Sherpa-AC1 will perform a series of payload deployments and subsequently conduct orbit-raising maneuvers to a series of targeted maximum altitudes as described in the *Sherpa-AC1 Application*. With the support of RBC Signals, the Sherpa-AC1 will inject payload satellites into their desired orbits after the Sherpa-AC1 itself is deployed into orbit by the launch vehicle. Sherpa-AC1 is designed to transport and deploy seven (7) spacecraft into SSO. During the mission, RBC Signals’ TT&C operations will be conducted on an unprotected and non-interference basis intermittently when the spacecraft passes over the earth station (approximately seven times per day).

RBC will conduct all operations in accordance with the Commission’s rules and requirements governing fixed earth station operations in the subject bands. RBC Signals provides the attached Technical Appendix, which includes a radiation hazard analysis and Form 312 Schedule B, for information relating to the proposed earth station operations.³

³ RBC requests leave to update the technical or operational data associated with this license request should the Commission seek any clarifying or supplemental information in considering this request.

II. DISCUSSION

RBC Signals seeks to provide TT&C support to the Sherpa-AC1 spacecraft from Deadhorse, Alaska in the 2025-2110 MHz band (Earth-to-space; 300 kHz carriers with center frequencies at 2046 MHz, 2048 MHz, 2050 MHz, 2053 MHz, 2056 MHz, and 2075 MHz). RBC Signals will work to ensure that these operations will not cause harmful interference to current or future co-frequency operations and that the interests of the United States are accommodated.⁴

A. Sherpa-AC1 Satellite Overview

Sherpa-AC1 will be similar to Sherpa-LTE1, which was previously approved by the Commission,⁵ and RBC Signals incorporates by reference the Sherpa-AC1 mission information and payload specifications provided in the *Sherpa-AC1 Application*. Spaceflight will host two payloads that are permanently affixed to the Sherpa-AC1 spacecraft (NearSpace Launch's TROOP-3 payload and Xona Space System's navigational payload). In addition, there are seven customer spacecraft being carried by Sherpa-AC1. TT&C support for these important space operations is plainly in the public interest.

B. Frequency Use

a. TT&C Uplink – 2025-2110 MHz band (Earth-to-space)

The United States Table of Frequency Allocations Section 2.106 of the Commission's Rules, 47 C. F. R. §2.106, provides that the 2025-2110 MHz band is allocated on a primary basis to space operations and Earth-exploration satellite services ("EESS"), *inter alia*, in all ITU regions. In the United States, space operations are limited to federal operators, and EESS use by

⁴ Spaceflight will have a camera onboard for the purpose of mission assurance and to confirm customer deployments. Spaceflight will obtain appropriate NOAA licensing, as appropriate.

⁵ See Spaceflight Inc., File No. SES-STA-20200728-00089.

commercial operators is subject to conditions as may be applied on a case-by-case basis and the limitation that any use may not cause harmful interference to authorized operations.⁶

RBC Signals proposes to operate 300 kHz carriers on 2046 MHz, 2048 MHz, 2050 MHz, 2053 MHz, 2056 MHz, and 2075 MHz center frequencies (Earth-to-space) to provide TT&C for the Sherpa-AC1 consistent with the Commission's Table of Allocations.⁷ RBC Signals understands that there are certain U.S. government operations conducted in the 2025-2110 MHz band, including use by the National Aeronautics and Space Administration ("NASA").⁸ RBC Signals will continue to support Sherpa-AC1 in its coordination efforts with NASA and other government agencies to ensure compatibility of the proposed operations.

Given that RBS signals only seeks to perform transmit operations using a 300 kilohertz carrier bandwidth around each of the designated center frequencies, and given the remote location of the Deadhorse facility in the North Slope of Alaska, RBC Signals believes that the proposed operations will not present a potential for interference to other spectrum users of the band and has not identified any conflicting Federal operations. 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.

Although RBC Signals previously coordinated its uplink operations in the 2025-2110 MHz band at the Deadhorse facility (in 2021 with no concerns or objections), it engaged Micronet to perform a new frequency coordination on behalf of RBC Signals that considers all existing, proposed, and prior-coordinated terrestrial microwave facilities within the contours of the 4.5 m earth station. Micronet circulated the expedited prior coordination notice to potentially affected

⁶ See 47 C.F.R. § 2.106, fn. US 347.

⁷ See 47 C.F.R. § 2.1 (defining "space research services" as a "radio communication service which spacecraft or other objects in space are used for scientific or technological research purposes.")

⁸ See https://www.ntia.doc.gov/files/ntia/publications/compendium/2025.00-2110.00_01MAR14.pdf

carriers on April 13, 2022, requesting responses by April 27, 2022, and there were no unresolved interference objections. The final coordination report from Micronet is attached.⁹

RBC Signals is confident that there is no potential for interference between other users of this spectrum and the operations of the 4.5m earth station at the Deadhorse facility.¹⁰ In addition, RBC Signals understands that Sherpa-AC1 has coordinated access to the subject spectrum as it relates to its operations.

To the extent necessary, RBC Signals requests waiver of the U. S. Table of Frequency Allocations, 47 C.F.R. §2.106, to permit the proposed TT&C transmit operations in the 2025-2110 MHz band. Similar to above, given the limited use of the specified six frequencies during the brief one year mission of Sherpa-AC1, RBC Signals' commitment to coordinating use of the band with Micronet well beyond its actual operational limits and the public interest justification supporting the mission, RBC Signals submits that a limited waiver is justified in this instance. RBC Signals will support Sherpa-AC1 and Commission staff to ensure that its temporary Earth-to-space operations do not increase the interference into current or future government or commercial users.

D. Public Interest Considerations

Grant of this earth station license will further the public interest by enabling TT&C support for the Sherpa-AC1 mission. It will also further position the United States as a leader in the development and encouragement of pioneering satellite technologies.

RBC Signals is at the forefront of reinventing TT&C and earth station support solutions and grant of a license would further cement the United States' dedication to the advancement of

⁹ See Coordination Report, April 2022 (attached).

¹⁰ Out of an abundance of caution, RBC Signals coordinated worst-case scenario power levels across the entire frequency band. In reality, RBC Signals will only use 6 300 kHz carrier bandwidth frequencies.

satellite services. Grant of this application will enable the continued operation and realization of the significant benefits and commercial viability of novel small satellite communications systems.

The grant of this application also will regularize RBC Signals' operations in Deadhorse, Alaska and provide long-term authority for this earth station facility. Grant of an earth station license will afford RBC Signals an earth station authorization that can facilitate communications with other satellite points of communication through appropriate license modifications.

III. CONCLUSION

Based on the foregoing, RBC Signals respectfully requests that the Commission grant its earth station license application to provide TT&C services on S-band frequencies for the Sherpa AC-1 spacecraft from its Deadhorse, Alaska facility.