

**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
(RBC Signals | Fairbanks, 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 400 MHz Yagi earth station in Fairbanks, Alaska to conduct telemetry, tracking, and command (“TT&C”) operations in the 400.48-400.52 MHz band (space-to-Earth; center frequency 400.5 MHz) and the 402.88-402.92 MHz band (Earth-to-space; center frequency 402.9 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 schedule 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 LTE-1 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 Fairbanks, 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 Fairbanks, 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

II. DISCUSSION

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.

RBC Signals seeks to provide TT&C support to the Sherpa-AC1 spacecraft from Fairbanks, Alaska in the 400.48-400.52 MHz band (space-to-Earth; center frequency 400.5 MHz) and the 402.88-402.92 MHz band (Earth-to-space; center frequency 402.9 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 Downlink – 400.15-401 MHz (space-to-Earth)

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

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.

TT&C downlink operations consistent with the co-primary space operations allocation in this band.⁶

RBC Signals seeks to perform TT&C downlink operations using the 400 MHz Yagi in the 400.48-400.52 MHz band (space-to-Earth; center frequency 400.5 MHz) consistent with the secondary allocation for space operations in this band. RBC Signals is not currently aware of any use of the subject frequency bands by incumbent operators near the Fairbanks, Alaska facility and will coordinate as needed to ensure its TT&C operations do not cause interference with primary mobile satellite or meteorological-aid services.

b. TT&C Uplink - 402.88-402.92 MHz band (Earth-to-space)

The Table of Allocations provides that the 402-403 MHz band is allocated on a primary basis to non-Federal meteorological-aid services and on secondary basis to EESS (Earth-to-space). Moreover, the Table of Allocations provides that “in the band 401-403 MHz, the non-federal Earth exploration-satellite (Earth-to-space) and meteorological-satellite (Earth-to-space) services are limited to earth stations transmitting to Federal space stations.”⁷ RBC Signals acknowledges that there are certain U.S. government meteorological aids and Earth exploration operations conducted in the 402-403 MHz band.⁸

C. Waiver Request

⁶ See 47 C.F.R. § 2.106 (defining “space operations” as “radiocommunication service concerned exclusively with the operation of spacecraft, in particularly space tracking, space telemetry, and space telecommand.”).

⁷ 47 C.F.R. §2.106, fn. US384.

⁸ See https://www.ntia.doc.gov/files/ntia/publications/compendium/0402.00-0403.00_01MAR14.pdf.

The Commission may waive its rules for “good cause shown.”⁹ RBC Signals respectfully seeks a waiver of Section 2.106 of the Commission’s rules, 47 C.F.R. § 2.106, to the extent necessary to operate the 400 MHz Yagi and perform TT&C in the 402.88-402.92 MHz band using a 402.9 MHz center frequency. Good cause exists to grant a waiver in this case to permit RBC Signals to perform critical TT&C functions for the Sherpa-AC1 mission, and this waiver would not undermine the purpose of the rules. The waiver is also consistent with the Commission precedent previously granting such a waiver to operate in this band in a previous satellite authorization.¹⁰ RBC Signals acknowledges that the authority to conduct earth station operations in this band is associated with a similar grant of the *Sherpa-AC1 Application*.

The Table of Allocations provides that the 402-403 band is allocated on a primary basis to non-federal meteorological-aid services and on secondary basis to EESS (Earth-to-space). Moreover, “in the band 401-403 MHz, the non-federal Earth exploration-satellite (Earth-to-space) and meteorological-satellite (Earth-to-space) services are limited to earth stations transmitting to Federal space stations.”¹¹ Thus, RBC Signals seeks a waiver of this footnote to permit it to provide TT&C uplink support for the Sherpa-AC1 mission, which will facilitate the development and evaluation of an innovative U.S.-licensed satellite.

Acknowledging the connect between the *Sherpa-AC1 Application* and this earth station application, a waiver is warranted here because it will provide RBC Signals with the ability to dependably provide critical satellite support for the short-term, one-year, Sherpa-AC1 mission. Further, a waiver will serve the public interest as RBC Signals will support novel space

⁹ See 47 C.F.R. §1.3 (“Any provision of the rules may be waived by the Commission on its own motion or petition if good cause therefor is shown.”).

¹⁰ See Astro Digital U.S., Inc., File No. SAT-LOA-20170508-00071 (grant stamp Oct. 9, 2020) (the “*Astro Digital License*”), Condition 9.

¹¹ *Supra* n. 7.

technologies that bridge traditional launch deployment services. Finally, given the limited nature of the proposed operations and the coordination performed in support of the *Sherpa-AC1 Application* to ensure the proposed operations will not cause harmful interference to co-frequency operations, grant of the waiver will not undermine the purposes of the rule. Thus, there is good cause to grant the requested waiver to permit the limited earth station operations proposed herein.

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 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 Fairbanks, Alaska and provide long-term authority for this facility and 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 for the Sherpa AC-1 spacecraft from its Fairbanks, Alaska facility.