

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

In the Matter of

Application of RBC Signals, LLC for a	)	
60-Day Special Temporary Authorization	)	Call Sign:
to Operate with Non-Geostationary Orbit	)	
Spacecraft	)	File No.: SES-STA-_____
	)	

**REQUEST FOR 60-DAY SPECIAL TEMPORARY AUTHORIZATION
(S-band 6m Antenna Uplink – Deadhorse, Alaska)**

RBC Signals, LLC (“RBC Signals”), pursuant to Section 25.120 of the Commission’s rules, 47 C.F.R. § 25.120, respectfully seeks a 60-day special temporary authorization (“STA”) to operate a fixed 6.0 meter S-band earth station in Deadhorse, Alaska to conduct telemetry, tracking, and command (“TT&C”) uplink operations in the 2025-2110 MHz band (Earth-to-space; 300 kilohertz emissions at center frequencies: 2046 MHz, 2048 MHz, 2050 MHz, 2053 MHz, 2056 MHz, and 2075 MHz) to support the Sherpa-AC1¹ and Sherpa-LTE1² spacecraft operated by Spaceflight, Inc. (“Spaceflight”), and the Mandrake spacecrafts Able and Baker³ operated by the Defense Advanced Research Projects Agency (“DARPA”). As demonstrated in this STA request, grant of the requested authority will serve the public interest because it will

¹ See Spaceflight, Inc., File No. SAT-LOA-20220111-00007, Call Sign S3133 (granted May 10, 2022) (“*Sherpa-AC1 Application*”); see also See RBC Signals, LLC, File No. SES-STA-20220509-00470 (granted May 25, 2022) (the “*RBC Signals Sherpa-AC1 STA*”). To the extent applicable, RBC Signals incorporates by reference relevant satellite technical and operational information provided in the *Sherpa-AC1 Application*.

² See SpaceFlight, Inc., File No. SAT-STA-20210205-00017 (granted May 28, 2021) (“*Spaceflight LTE-1 STA*”); see also RBC Signals LLC, File No. SES-STA-20210420-00724 (granted June 29, 2021) (“*Sherpa LTE-1 Earth Station STA*”); see also the pending request for extension of its original STA, File No. SES-STA-20210723-01269 (“*Sherpa LTE-1 STA Extension*”)

³ See RBC Signals, LLC, File No. 0956-EX-ST-2022, Call Sign WT9XYB (granted June 25, 2022) (“*Mandrake STA*”); see also <https://www.darpa.mil/news-events/2021-07-07>. RBC Signals’ authority to provide TT&C services to Able and Baker will expire on December 24, 2022.

allow RBC Signals to continue seamless support for multiple satellite operations while meeting new U.S. government obligations.

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 is attaching a draft Form 312 Schedule B with information relating to the proposed earth station operations.⁴ The 6.0 meter antenna is placed in an area with restricted access, and meets the requirements of 47 CFR 25.115(p). RBC Signals respectfully requests that the Commission consider and authorize the proposed operations as soon as practicable.

I. BACKGROUND

RBC Signals is a Seattle, Washington-based company that provides earth station services around the world. RBC Signals has a contract to support the U.S. Department of Defense's ("DoD") Space Development Agency ("SDA") by providing ground station support for SDA Tranche Zero satellite operations. RBC Signals has been informed by its DoD customer that SDA Tranche Zero operations will require exclusive use of RBC Signals' 4.5 meter earth station in Deadhorse, Alaska.⁵ RBC Signals is constructing a new ground station using a SeaTel Tracker EO 6000 S/X Antenna System (the "6.0m Earth Station") located approximately 50 meters away from the existing 4.5 meter earth station to free up that earth station as required by DoD. As a consequence, RBC Signals seeks this 60-day STA to relocate S-band TT&C operations supporting the SpaceFlight Sherpa and DARPA Mandrake missions listed above to the 6.0m Earth Station. Figure 1, below, shows the locations of the two earth stations: the

⁴ RBC 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.

⁵ The SDA Tranche Zero satellites are scheduled to be launched in December 2022.

yellow pin is the location where the 6.0m Earth Station is to be installed, and the red arrow points to the 4.5 meter earth station that is currently in operation.⁶



Figure 1 - Locations of Current 4.5 Meter Earth Station and Proposed 6.0m Earth Station

RBC Signals intends to file an application for longer-term authority to support the operation of the 6.0m Earth Station.⁷ However, RBC Signals seeks this 60-day STA to obtain Commission authority to allow for continuity of operations for satellites currently communicating with the 4.5 meter earth station due to the near-term scheduled launch date of the SDA Tranche Zero satellites. RBC Signals respectfully requests that the Commission consider and authorize the proposed operations (as appropriately conditioned) as soon as practicable.

⁶ RBC Signals' 4.5 meter earth station is located at 70-12-45 N, 148-24-39 W. The proposed 6.0m Earth Station is located at 70-12-42 N, 148-24-43 W.

⁷ RBC Signals will remove each of these satellites as an authorized point of communication upon the completion of their missions.

II. DISCUSSION

RBC Signals seeks to provide TT&C uplink communications in the 2025-2110 MHz (Earth-to-space) band to support the Spaceflight Sherpa-LTE1 spacecraft, the Sherpa-AC1 spacecraft, and the Mandrake Able and Baker satellites using the 6.0m Earth Station as described below. Importantly, no harmful interference has resulted from RBC Signals' current operations and none is anticipated from the proposed operations at the 6.0m Earth Station. RBC Signals will continue to ensure that the TT&C operations will not cause harmful interference to current or future co-frequency operations and that the interests of the United States are accommodated.

A. Summary of Frequency Use

In Table 1 below, RBC Signals presents information on the frequency use currently approved for operations at the 4.5 meter earth station. This application seeks to move these operations, as currently authorized, from the 4.5 meter earth station dish to the 6.0m Earth Station located approximately 50 meters away.

Table 1 - Summary of Frequency Use

<u>Satellite</u>	<u>Center Frequencies</u>	<u>Emission Designator</u>
<u>Sherpa LTE1</u>	2075 MHz	300KG1D
<u>Sherpa AC1</u>	2046 MHz	300KG1D
	2048 MHz	300KG1D
	2050 MHz	300KG1D
	2053 MHz	300KG1D
	2056 MHz	300KG1D
	2075 MHz	300KG1D
<u>Mandrake Able</u>	2075 MHz	300KF1D
<u>Mandrake Baker</u>	2075 MHz	300KF1D

B. Satellite Points of Contact Overviews

1. Sherpa-AC1

The Sherpa-AC1 satellite was previously approved by the Commission,⁸ and RBC Signals incorporates by reference the Sherpa-AC1 mission information and payload specifications provided in the Sherpa-AC1 Application. Sherpa-AC1 is a non-geostationary orbit (“NGSO”) deployment vehicle operated by Spaceflight, which has already deployed seven spacecraft into Sun-synchronous orbit (“SSO”). Two additional payloads are permanently affixed to the Sherpa-AC1 spacecraft: NearSpace Launch’s TROOP-3 payload and Xona Space System’s navigational payload. Under call sign E220056, RBC Signals was authorized to operate 300 kilohertz carriers with center frequencies at 2046 MHz, 2048 MHz, 2050 MHz, 2053 MHz, 2056 MHz, and 2075 MHz to provide TT&C support for the Sherpa-AC1 from its 4.5 meter earth station.⁹ RBC Signals herein requests to communicate with Sherpa AC1 at these same frequencies and the same EIRP from the 6.0m Earth Station.

2. Sherpa-LTE1

The Sherpa-LTE1¹⁰ is an NGSO deployment vehicle with a secondary mission to enable two new modular systems to demonstrate control and propulsive elements, rapidly deorbit the vehicle, and collect data for future missions. Sherpa LTE1 is in SSO with nominal orbit altitude of 525 km (based upon a range of SSO orbit altitudes from 500km to 550km) with an inclination of 97.6°. The Sherpa LTE-1 was launched in July 2021 as a secondary payload aboard a SpaceX Falcon 9 launch vehicle.

⁸ See *supra* n.1. The mission life for the Sherpa-AC1 is approximately one year. RBC Signals will submit an application for earth station authorization soon after this STA request has been filed. When Sherpa-AC1 is no longer in operation, RBC Signals will request to remove the satellite from its license.

⁹ See *supra* n. 1.

¹⁰ See *supra* n. 2.

RBC Signals was authorized to provide critical mission support for Spaceflight's evaluation of the Sherpa LTE-1 controlled deorbiting technology by providing a backup link for the Sherpa LTE-1 using a 300 kilohertz carrier with a center frequency at 2075 MHz from its 4.5 meter earth station.¹¹ RBC Signals will operate the 6.0m Earth Station at the same frequency with the same EIRP as is currently authorized for operations at the 4.5 meter earth station.

3. Mandrake Able and Baker

RBC is also seeking authority to provide TT&C uplinks for two Mandrake satellites being operated by DARPA as part of the Blackjack program. The Blackjack program is exploring inter-satellite communications using laser links. The Mandrake satellites travel in a formation and they are in the same orbit. They are near enough to one another that they will pass over the ground station simultaneously.

RBC Signals was authorized to provide scheduling interface, antenna control and pointing, and radio configuration control for Mandrake Able and Baker under an FCC experimental license, call sign WT9XYB.¹² The satellites pass over the transmit station in Deadhorse, Alaska approximately 10-12 times each day, with each pass lasting approximately 10-12 minutes. RBC Signals' TT&C operations use the center frequency of 2075 MHz with an EIRP of 25.68 kW.¹³

C. Frequency Allocations and Frequency 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 2025-2110 MHz band is allocated

¹¹ *See id.*

¹² *See supra* n.3

¹³ The EIRP of the signal from the 4.5-meter dish is 25.68 kW or 44.095 dBW. That will remain the same at the 6m Earth Station.

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.¹⁴ RBC Signals is operating these links on a non-interference basis, as required by the Table of Allocations.

The Table of Allocations also provides that the 2025-2110 MHz band is allocated on a primary basis to Space Operation and Earth-exploration satellite services (“EESS”) and Space Research, Fixed Service and Mobile Service, in all ITU regions. In the United States, space operations are limited to federal operators, and EESS use by 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.¹⁵

RBC Signals proposes to transmit on 300 kilohertz carriers using 2046 MHz, 2048 MHz, 2050 MHz, 2053 MHz, 2056 MHz, and 2075 MHz center frequencies (Earth-to-space) to provide TT&C for all four satellites discussed above, consistent with the Commission’s Table of Allocations. 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”).¹⁶ RBC Signals will continue its coordination efforts with NASA and other government agencies to ensure compatibility of the proposed operations.

RBC Signals has been transmitting using a 300 kilohertz carrier bandwidth around each of the designated center frequencies without causing any harmful interference to other spectrum

¹⁴ See 47 C.F.R. § 2.106, fn. US347.

¹⁵ See 47 C.F.R. § 2.1 (defining “space research services” as “a radio communication service in which spacecraft or other objects in space are used for scientific or technologic research.

¹⁶ See https://www.ntia.doc.gov/files/ntia/publications/compendium/2025.00-2110.00_01MAR14.pdf

users operating in the band. The proposed change to the new 6.0m Earth Station nearby is not expected to create any greater risk of interference and RBC Signals has not identified any conflicting Federal operations.

D. Frequency Coordination and Interference

RBC Signals has engaged Micronet to perform a new frequency coordination that considers all existing, proposed, and prior-coordinated terrestrial microwave and other facilities within the contours of the 6.0m Earth Station. The final coordination report from Micronet is pending. All of the operations previously licensed at the 4.5 meter earth station have been coordinated, and those coordination reports were submitted with RBC Signals' applications for operations at the 4.5 meter earth station. The proximity of the 6.0m Earth Station to the 4.5 meter earth station and the use of identical EIRP for uplink transmissions should lead to the same result: no potential for unacceptable interference will result from the proposed operations.

RBC Signals will operate its S-band transmitter 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. RBC Signals is confident that there is no potential for interference between other users of this spectrum and the operations of the 6.0m Earth Station. In addition, RBC Signals understands that the satellites have coordinated access to the subject spectrum as it relates to their respective operations.

E. Waiver Request

To the extent necessary, RBC Signals requests waiver of the Table of Allocations to permit the proposed TT&C transmit operations in the 2025-2110 MHz band. Given the continued operation of 300 kilohertz carriers at six previously authorized center frequencies, RBC Signals' confirmatory coordination of these frequencies, and the public interest justification

supporting the operation of the 6.0m Earth station, RBC Signals submits that a limited waiver is justified in this instance. RBC Signals will continue to ensure that its Earth-to-space operations do not increase the potential for interference into current or future government or commercial users.

The Commission may waive any of its rules for “good cause” shown.¹⁷ In general, waiver is appropriate if (i) special circumstances warrant a deviation from the general rule; and (ii) such deviation would better serve the public interest than would strict adherence to the rule.¹⁸ As discussed, special circumstances justify grant of the requested waivers and grant will not undermine the policy objectives of the rules and otherwise be consistent with the public interest.

Operation of this ground station by RBC Signals to provide TT&C services is consistent with the public interest, and the applicant respectfully requests if a waiver is needed, that it be granted by the Commission.

F. Public Interest Consideration

RBC Signals is at the forefront of reinventing TT&C and earth station support solutions and grant of the requested STA would further cement the United States’ dedication to the advancement of satellite services in the United States. Grant of this application will enable the continued operation and realization of the significant benefits and commercial viability of novel small satellite communications systems. In addition, grant of this STA application will further the public interest by enabling near-term TT&C support for the ongoing missions of the Sherpa-AC1, Sherpa-LTE, Mandrake Able and Baker spacecraft.

¹⁷ See 47 C.F.R. § 1.3; *Northeast Cellular Tel. Co. v. FCC*, 897 F.2d 1164 (D.C. Cir. 1990); *WAIT Radio v. FCC*, 418 F.2d 1153 (D.C. Cir. 1969).

¹⁸ See *Northeast Cellular*, 897 F.2d at 1166; see also *WAIT Radio*, 418 F.2d at 1157.

III. CONCLUSION

Based on the foregoing, RBC Signals respectfully requests that the Commission grant its STA application to enable its new 6.0m Earth Station to provide TT&C services on S-band frequencies for the satellites discussed above, as necessitated by the DoD's need that its SDA Tranche Zero satellites have exclusive access to RBC Signals' 4.5 meter earth station. The operation of the 6.0m Earth Station is essentially identical to the operations of the 4.5 meter earth station, there have been no instances of harmful interference from existing TT&C uplink operations, and RBC Signals will continue to ensure interference-free TT&C uplink operations from its earth station facility.