

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

In the Matter of	)	
	)	
RBC Signals, LLC	)	Call Sign: E220057
	)	
Application to Modify its 4.5m Earth	)	File No.: SES-LIC-20220509-00468
Station License in Deadhorse, Alaska	)	and File No.: SES-MOD-_____

**Earth Station Modification Application
(4.5m Antenna – Deadhorse, Alaska)**

RBC Signals, LLC (“RBC Signals”), pursuant to Section 25.117 of the Commission’s rules, 47 C.F.R. § 25.117, respectfully seeks to modify the existing authority for its 4.5-meter S/X-band earth station in Deadhorse, Alaska¹ (the “4.5m Earth Station”) to conduct telemetry, tracking, and command (“TT&C”) operations in portions of the 2025-2110 MHz (Earth-to-space) and 8025-8400 MHz (space-to-Earth) bands with additional non-geostationary orbit (“NGSO”) satellites. Specifically, RBC Signals seeks to add as authorized satellite points of communication the U.S.-licensed Vigoride-5² and Vigoride-6³ satellites, the GHOS-1 and GHOS-2 satellites,⁴ and the Starfish Otter Pup satellite⁵ using the frequencies indicated in the attached FCC Form 312, Schedule B.

In addition, RBC Signals is updating the technical characteristics of the 4.5m Earth Station and associated emissions to reflect the full transmit capabilities of the earth station, within which it seeks to communicate with the individual satellite points of communications included in the license. RBC Signals has initiated coordination of these transmissions and the

¹ See RBC Signals, LLC, File No. SES-LIC-20220509-00468, Call Sign E220057 (granted Feb. 16, 2023) (the “Deadhorse 4.5m License”).

² See Momentus Space LLC, File No. SAT-LOA-20220504-00047, Call Sign S3144 (granted Nov. 15, 2022).

³ See Momentus Space LLC, File No. SAT-LOA-20221009-00131, Call Sign S3154 (granted Feb. 27, 2023).

⁴ See Orbital Sidekick, Inc., File No. SAT-LOA-20220325-00035, Call Sign S3139 (granted Dec. 7, 2022).

⁵ See Starfish Space Systems File No. 1117-EX-CN-2022, Call Sign WN2XEL (filed Oct. 3, 2022).

analysis reveals no cases of harmful interference. By coordinating and including the full capabilities of the earth station at its remote Deadhorse, Alaska earth station facility, RBC Signals will establish an operational envelope that will facilitate the addition of new satellite points of communication in the future.

RBC Signals has obtained special temporary authority (“STA”) to communicate with some of the foregoing satellites⁶ given their launch dates, and herein respectfully seeks longer-term authority to communicate with the satellites for the duration of their missions.⁷ RBC Signals will conduct the proposed earth station operations in accordance with the Commission’s rules and requirements. As demonstrated herein, the requested license modification will serve the public interest because it will allow RBC Signals to continue seamless, long-term support of multiple satellite operations.

I. DISCUSSION

RBC Signals is a Redmond, Washington-based company providing innovative earth station services in the United States and around the world to both U.S. government and commercial clients. RBC Signals has provided similar ground station support for multiple customer satellites in the 2025-2110 MHz (Earth-to-space) band from the 4.5m Earth Station,⁸ as well as from a 6.0-meter earth station⁹ located approximately 50 meters away. No harmful interference has resulted from previous uplink/transmit operations, and none is anticipated from

⁶ See RBC Signals, LLC, File Nos. SES-STA-20230109-00047, SES-STA-20230302-00243, and SES-STA-INTR2023-01630, Call Sign E220057.

⁷ Current operation of the 4.5m Earth Station pursuant to STA are at the lower powers indicated therein.

⁸ See *supra* n. 1. See also previous grants for operation of the 4.5m Earth Station, including File Nos. SES-STA-20220415-00412 (granted June 13, 2022), SES-STA-20220509-00469 (granted June 2, 2022), SES-STA-20220509-00470 (granted May 25, 2022), and SES-STA-20220621-00681 (granted Nov. 9, 2022).]

⁹ See, e.g., RBC Signals, LLC, File No. SES-STA-20221014-01134, Call Sign E220185 (granted Dec. 14, 2022) and File No. SES-STA-20220929-01060, Call Sign E220185 (granted Nov. 28, 2022).

those supporting the satellites as requested herein. Indeed, RBC Signals has initiated coordination of these transmissions and the analysis reveals no cases of harmful interference. RBC Signals will submit final coordination reports in the docket of this proceeding as soon as they are available.

The proposed downlink/receive operations, transmitted by the satellite operator pursuant to the terms and conditions of its authorization, also will not cause interference to other spectrum users. For both uplinks and downlinks, the Commission has determined that operations in the frequencies included in the authorization would be consistent with the public interest. Of course, RBC Signals will independently continue to ensure that its TT&C communications at its Deadhorse, Alaska facility will not cause harmful interference to current or future co-frequency operations and that the interests of the United States are accommodated.

A. Description of Operations

RBC Signals seeks to modify its existing authority for the 4.5m Earth Station to provide additional uplink communications in a portion of the 2025-2110 MHz (Earth-to-space) band to support the Vigoride-5, Vigoride-6, GHOS-1, GHOS-2, and Starfish Otter Pup satellites as described herein.¹⁰ RBC Signals also seeks to modify its existing authority for the 4.5m Earth Station to provide downlink communications in a portion of the 8025-8400 MHz (space-to-Earth) band to support the Vigoride-5, Vigoride-6, and Starfish Otter Pup satellites as described herein.

¹⁰ RBC Signals incorporates by reference the operational specifications included in the authorizations of the subject spacecraft and requests leave to update the technical or operational data associated with this license modification application should the Commission seek any clarifying or supplemental information in considering this application.

In Table 1 below, RBC Signals summarizes the satellite points of communication and frequencies to be used by the 4.5m Earth Station for communication with each satellite, including those for the already-licensed Sherpa-AC1.¹¹

Table 1 - Summary of Frequency Use

Satellite Point of Contact	Transmit/ Receive	Center Frequency	Emission Designator
GHOS- 1 and 2	T	2047.5 MHz	5M00G1D
	T	2055 MHz	300KG1D
Sherpa- AC1	T	2046 MHz	300KG1D
	T	2048 MHz	300KG1D
	T	2050 MHz	300KG1D
	T	2053 MHz	300KG1D
	T	2056 MHz	300KG1D
	T	2075 MHz	300KG1D
Starfish Otter Pup	T	2055 MHz	480KF1D
	T	2047.5 MHz	22M1G1D
	R	8200 MHz	90M9G1D
Vigoride- 5 and 6	T	2075 MHz	100KG1D
	T	2075 MHz	32K0F1D
	R	8200 MHz	1M00G1D

B. 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 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 Service (“EESS”) operations, so long as such operations are conducted on a non-interference basis vis-à-vis Federal and non-Federal users of the band.¹² RBC Signals will continue to operate these links on a non-interference basis.

¹¹ See *supra* n. 1.

¹² See 47 C.F.R. § 2.106, n. US347.

The Table of Allocations also provides that the 2025-2110 MHz band is allocated on a primary basis to space operations, EESS, and space research. 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. 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”).¹³ RBC Signals will continue its coordination efforts with NASA and other government agencies to ensure compatibility of the proposed operations.

In the Table of Allocations, the 8025-8400 MHz band is allocated to uplinks for Federal fixed and mobile-satellite service operations, as well as downlinks for EESS for Federal and non-Federal use.¹⁴ To the extent the Commission has included portions of the 8025-8400 MHz band for downlinks from the subject satellites, it has been concluded that doing so would be consistent with the public interest. Of course, the subject satellite operators are responsible for conducting these downlink transmissions consistent with the terms of their authorizations; the 4.5m Earth Station will only receive these downlink transmissions.

C. Frequency Coordination

Previous coordination reports which supported the 4.5m Earth Station and nearby 6.0m earth station have shown no interference cases for uplink transmissions. RBC Signals proposes herein to operate the 4.5m Earth Station at its maximum transmit capabilities, which are higher than those previously authorized by the Commission pursuant to STA. The more robust power

¹³ See https://www.ntia.doc.gov/files/ntia/publications/compendium/2025.00-2110.00_01MAR14.pdf.

¹⁴ See 47 C.F.R. § 2.106, n. US258.

levels are being coordinated with co-frequency users of the spectrum and RBC Signals will adjust the parameters included herein, as appropriate, to reflect the outcome of its coordination efforts and harmful interference concerns that may be raised in the future.¹⁵ In addition, RBC Signals understands that the relevant satellite operators have coordinated access to the required uplink and downlink frequencies for their respective operations.

RBC Signals notes that it has operated in the subject spectrum using the 4.5m Earth Station without any harmful interference incidents. Nonetheless, RBC Signals will operate the 4.5m Earth Station on an unprotected, non-interference basis and if RBC Signals learns that its operations are causing harmful interference to other operations, it will suspend or modify its operations immediately to resolve such interference.

The 24/7 point of contact for the proposed operations is:

John Ames
RBC Signals Operations
Email: john.ames@rbcsignals.com
Mobile: 719.502.6206

D. Waiver Request

To the extent the Commission concludes that any of the proposed operations in the 2025-2110 MHz band do not conform to the available non-Federal allocations, RBC Signals requests a waiver of the Table of Allocations to permit the proposed transmit operations of the 4.5m Earth Station. Similarly, to the extent the Commission concludes that any of the proposed operations in the 8025-8400 MHz band do not conform to the available non-Federal allocations, RBC Signals requests a waiver of the Table of Allocations to permit the proposed receive operations of the 4.5m Earth Station.

¹⁵ Indeed, RBC Signals has initiated coordination of these transmissions and the analysis reveals no cases of harmful interference. *See* Exhibit 1. RBC Signals will submit final coordination reports in the docket of this proceeding as soon as they are available.

The Commission may waive any of its rules for “good cause” shown.¹⁶ In general, a 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.¹⁷ Special circumstances justify grant of the requested waivers and grant will not undermine the policy objectives of the rules and will otherwise serve the public interest.

Given RBC Signals’ limited spectrum use, prior use of the same frequencies for the same operations without interference incident, and coordination of these frequencies at the full capabilities of the 4.5m Earth Station, the public interest would be served by permitting the 4.5m Earth Station to support the operations of the identified satellites as described herein. RBC Signals will continue to ensure that its earth station transmit operations do not cause harmful interference to current or future U.S. government or commercial users.

With respect to 4.5m Earth Station receive operations, RBC Signals notes that they cannot cause interference in the band. The relevant satellite operators have coordinated access to the required downlink frequencies and are responsible for their respective satellite transmit operations.

Additionally, in all cases, the Commission has authorized the satellites to operate on the frequencies set forth herein, confirming that such operations would be consistent with the public interest. Accordingly, RBC Signals respectfully submits, if a waiver is needed for operation of the 4.5m Earth Station as proposed herein, that it should be granted by the Commission.

¹⁶ 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).

¹⁷ See *Northeast Cellular*, 897 F.2d at 1166; see also *WAIT Radio*, 418 F.2d at 1157.

E. Public Interest Considerations

RBC Signals is at the forefront of reinventing TT&C and earth station support solutions and grant of the requested authority would promote U.S. leadership in innovative satellite technologies and services. Grant of this modification application will enable the continued realization of these significant benefits and commercial viability of developing novel small satellite communications systems. In addition, grant of this modification application will further the public interest by enabling longer-term and more robust TT&C support for the Vigoride-5, Vigoride-6, GHOS-1, GHOS-2, and Starfish Otter Pup satellite missions.

The operations proposed herein, which reflect the full transmit capabilities of the 4.5m Earth Station, are being coordinated with co-frequency users of the spectrum. RBC Signals will adjust the parameters included herein, as appropriate, to reflect the outcome of its coordination efforts and any harmful interference concerns that may arise. In the meantime, operation of the 4.5m Earth Station will continue pursuant to existing STA authority.

II. CONCLUSION

Based on the foregoing, RBC Signals respectfully requests that the Commission grant this modification application to enable the 4.5m Earth Station to conduct TT&C operations in the spectrum for the satellite points of communication identified herein. There have been no instances of harmful interference from existing TT&C uplink operations in the subject spectrum, coordination of the transmissions proposed herein reveals no interference cases, and RBC Signals will continue to ensure interference-free operation of the 4.5m Earth Station through appropriate coordination and operational means.

EXHIBIT 1

Micronet Communications, Inc.
812 Lexington Dr
Plano, Texas 75075
972-422-7200

File: A2234305

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TECHNICAL CHARACTERISTICS OF TRANSMIT ONLY EARTH STATION

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Company:	RBC Signals, LLC		
Site Name, State:	Deadhorse, AK		
Call Sign:			
Latitude	(NAD83)	70 12	44.6 N
Longitude	(NAD83)	148 24	39.5 W
Elevation AMSL	(ft/m)	49.21	15.00
Receive Frequency Range	(MHz)		
Transmit Frequency Range	(MHz)	2025-2110	
Range of Satellite Orbital Long.	(deg W)	0.00	360.00
Range of Azimuths from North	(deg)	0.00	360.00
Antenna Centerline	(ft/m)	13.12	4.00
Antenna Elevation Angles	(deg)	5.00	90.00

Equipment Parameters	Transmit
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Antenna Gain, Main Beam	(dbI)	37.00
15 DB Half Beamwidth	(deg)	1.20

Antennas Transmit: ORBIT 100 4.5M

Max Transmitter Power	(dBW/4KHz)	-1.76
Max EIRP Main Beam	(dBW/4KHz)	35.24
Modulation / Emission Designator	DIGITAL 480KF1D	

Coordination Parameters	Transmit
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Max Greater Circle Distances	(km)	795.34
Max Rain Scatter Distances	(km)	100.00
Max Interference Power Long Term	(dBW/MHz)	-140.60
Max Interference Power Short Term	(dBW/MHz)	-118.40
Rain Zone / Radio Zone	3	A

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Company:	RBC Signals, LLC		
Site Name, State:	Deadhorse, AK		
Call Sign:			
Latitude	(NAD83)	70 12	44.6 N
Longitude	(NAD83)	148 24	39.5 W
Elevation AMSL	(ft/m)	49.21	15.00
Receive Frequency Range	(MHz)		
Transmit Frequency Range	(MHz)	2025-2110	
Range of Satellite Orbital Long.	(deg W)	0.00	360.00
Range of Azimuths from North	(deg)	0.00	360.00
Antenna Centerline	(ft/m)	13.12	4.00
Antenna Elevation Angles	(deg)	5.00	90.00

Equipment Parameters	Transmit
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Antenna Gain, Main Beam	(dbI)	37.00
15 DB Half Beamwidth	(deg)	1.20

Antennas Transmit: ORBIT 100 4.5M

Max Transmitter Power	(dBW/4KHz)	5.05
Max EIRP Main Beam	(dBW/4KHz)	42.05
Modulation / Emission Designator	DIGITAL 100KG1D	

Coordination Parameters	Transmit
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Max Greater Circle Distances	(km)	909.36
Max Rain Scatter Distances	(km)	179.22
Max Interference Power Long Term	(dBW/MHz)	-140.60
Max Interference Power Short Term	(dBW/MHz)	-118.40
Rain Zone / Radio Zone	3	A

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Company:	RBC Signals, LLC		
Site Name, State:	Deadhorse, AK		
Call Sign:			
Latitude	(NAD83)	70 12	44.6 N
Longitude	(NAD83)	148 24	39.5 W
Elevation AMSL	(ft/m)	49.21	15.00
Receive Frequency Range	(MHz)		
Transmit Frequency Range	(MHz)	2025-2110	
Range of Satellite Orbital Long.	(deg W)	0.00	360.00
Range of Azimuths from North	(deg)	0.00	360.00
Antenna Centerline	(ft/m)	13.12	4.00
Antenna Elevation Angles	(deg)	5.00	90.00

Equipment Parameters	Transmit
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Antenna Gain, Main Beam	(dbI)	37.00
15 DB Half Beamwidth	(deg)	1.20

Antennas Transmit: ORBIT 100 4.5M

Max Transmitter Power	(dBW/4KHz)	-18.51
Max EIRP Main Beam	(dBW/4KHz)	18.49
Modulation / Emission Designator	DIGITAL 22M7G1D	

Coordination Parameters	Transmit
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Max Greater Circle Distances	(km)	589.60
Max Rain Scatter Distances	(km)	100.00
Max Interference Power Long Term	(dBW/MHz)	-140.60
Max Interference Power Short Term	(dBW/MHz)	-118.40
Rain Zone / Radio Zone	3	A

Micronet Communications, Inc.
812 Lexington Dr
Plano, Texas 75075
972-422-7200

File: D2234305

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TECHNICAL CHARACTERISTICS OF TRANSMIT ONLY EARTH STATION

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Company:	RBC Signals, LLC		
Site Name, State:	Deadhorse, AK		
Call Sign:			
Latitude	(NAD83)	70 12	44.6 N
Longitude	(NAD83)	148 24	39.5 W
Elevation AMSL	(ft/m)	49.21	15.00
Receive Frequency Range	(MHz)		
Transmit Frequency Range	(MHz)	2025-2110	
Range of Satellite Orbital Long.	(deg W)	0.00	360.00
Range of Azimuths from North	(deg)	0.00	360.00
Antenna Centerline	(ft/m)	13.12	4.00
Antenna Elevation Angles	(deg)	5.00	90.00

Equipment Parameters	Transmit
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Antenna Gain, Main Beam	(dbI)	37.00
15 DB Half Beamwidth	(deg)	1.20

Antennas Transmit: ORBIT 100 4.5M

Max Transmitter Power	(dBW/4KHz)	10.00
Max EIRP Main Beam	(dBW/4KHz)	47.00
Modulation / Emission Designator	DIGITAL	32K0F1D

Coordination Parameters	Transmit
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Max Greater Circle Distances	(km)	996.25
Max Rain Scatter Distances	(km)	278.80
Max Interference Power Long Term	(dBW/MHz)	-140.60
Max Interference Power Short Term	(dBW/MHz)	-118.40
Rain Zone / Radio Zone		3 A

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Company:	RBC Signals, LLC		
Site Name, State:	Deadhorse, AK		
Call Sign:			
Latitude	(NAD83)	70 12	44.6 N
Longitude	(NAD83)	148 24	39.5 W
Elevation AMSL	(ft/m)	49.21	15.00
Receive Frequency Range	(MHz)		
Transmit Frequency Range	(MHz)	2025-2110	
Range of Satellite Orbital Long.	(deg W)	0.00	360.00
Range of Azimuths from North	(deg)	0.00	360.00
Antenna Centerline	(ft/m)	13.12	4.00
Antenna Elevation Angles	(deg)	5.00	90.00

Equipment Parameters	Transmit
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Antenna Gain, Main Beam	(dbI)	37.00
15 DB Half Beamwidth	(deg)	1.20

Antennas Transmit: ORBIT 100 4.5M

Max Transmitter Power	(dBW/4KHz)	0.28
Max EIRP Main Beam	(dBW/4KHz)	37.28
Modulation / Emission Designator	DIGITAL 300KG1D	

Coordination Parameters	Transmit
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Max Greater Circle Distances	(km)	829.49
Max Rain Scatter Distances	(km)	105.20
Max Interference Power Long Term	(dBW/MHz)	-140.60
Max Interference Power Short Term	(dBW/MHz)	-118.40
Rain Zone / Radio Zone	3	A

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TECHNICAL CHARACTERISTICS OF TRANSMIT ONLY EARTH STATION

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Company:	RBC Signals, LLC		
Site Name, State:	Deadhorse, AK		
Call Sign:			
Latitude	(NAD83)	70 12	44.6 N
Longitude	(NAD83)	148 24	39.5 W
Elevation AMSL	(ft/m)	49.21	15.00
Receive Frequency Range	(MHz)		
Transmit Frequency Range	(MHz)	2025-2110	
Range of Satellite Orbital Long.	(deg W)	0.00	360.00
Range of Azimuths from North	(deg)	0.00	360.00
Antenna Centerline	(ft/m)	13.12	4.00
Antenna Elevation Angles	(deg)	5.00	90.00

Equipment Parameters	Transmit
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Antenna Gain, Main Beam	(dbI)	37.00
15 DB Half Beamwidth	(deg)	1.20

Antennas Transmit: ORBIT 100 4.5M

Max Transmitter Power	(dBW/4KHz)	-11.94
Max EIRP Main Beam	(dBW/4KHz)	25.06
Modulation / Emission Designator	DIGITAL	5M00G1D

Coordination Parameters	Transmit
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Max Greater Circle Distances	(km)	664.11
Max Rain Scatter Distances	(km)	100.00
Max Interference Power Long Term	(dBW/MHz)	-140.60
Max Interference Power Short Term	(dBW/MHz)	-118.40
Rain Zone / Radio Zone		3 A