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,	)	
Tracking & Command (TT&C)	)	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 4.5m Orbit Gaia-100 earth station (the "4.5m") at an existing site in Deadhorse, Alaska to provide telemetry, tracking and command ("TT&C") in the 2074.90-2075.10 MHz (Earth-to-space) and 8199-8201 MHz (space-to-Earth) bands for a non-geostationary satellite orbit ("NGSO") satellite operated by Momentus, Inc. – the Vigoride-2 ("VR-2").[1] Grant of this STA will allow RBC Signals to provide mission-critical TT&C support for Momentus during customer payload deployments and orbit adjustment maneuver evaluations. RBC Signals' will communicate with the satellite approximately 4-5 times per day as the satellite passes over the Earth at latitudes serviceable from the earth station in Deadhorse.

The expected launch window for the VR-2 is June 1, 2021 to July 31, 2021[2] as a secondary

[1] *See* Momentus Inc., File No. SAT-STA-20200831-00102 ("*Momentus STA*"). The VR-2 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 *Momentus STA*. This request is limited to the earth station operating authority only.

[2] The mission life of the VR-2 spacecraft, approximately two (2) 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.

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 TT&C to support the VR-2 mission using the 4.5m earth station located at its facility in Deadhorse, Alaska, where RBC Signals performs extensive TT&C operations.[3] There have been no reported cases of interference from the Deadhorse facility to-date and, as discussed below, this request will not increase the potential for interference. RBC Signals has fully coordinated its 4.5m earth station operations in the entire 2025-2110 MHz band to ensure no interference into existing authorized spectrum users.

With the support of RBC Signals, the VR-2 will perform a series of payload deployments and subsequently conduct orbit-raising maneuvers to a series of targeted maximum altitudes as described in the *Momentus STA*. 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 (4-5 times per day for approximately seven minutes). 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 bands. RBC Signals provides the attached Technical Appendix, which includes a radiation hazard analysis, frequency coordination report and draft FCC

[3] *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).

Form 312 Schedule B, for information relating to the proposed earth station operations.[4] As discussed below, grant of the requested STA will serve the public interest, convenience, and necessity.

II. DISCUSSION

RBC Signals seeks to provide TT&C in the 2074.90-2075.10 MHz (Earth-to-space) and 8199-8201 MHz (space-to-Earth) bands as-needed to communicate with the VR-2 satellite as it passes over the Deadhorse earth station. Grant of this STA request is critical for the reliability VR-2 mission and will not increase the potential for interference. RBC Signals will work with Momentus and Commission staff 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.

A. VR-2 Satellite Overview

The VR-2 satellite is a self-propulsive, free-flying spacecraft designed to transport and deploy customer payloads (under the *Momentus STA,* Momentus seeks to transport ten customer payloads). The VR-2 mission will consist of a single satellite launched into sun synchronous orbit with nominal orbit altitude of 454 km with an inclination from the equator of 97.4°. VR-2 will carry customer payloads, deliver those payloads to multiple sequential orbits, and then perform a post-deployment series of demonstration maneuvers to exhibit the orbital adjustment capabilities of the VR-2 platforms and monitor propellant consumption. Momentus seeks to partner with RBC Signals as a proven U.S.-provider of TT&C ground station services to support these critical technical evaluations.

[4] 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.

B. TT&C Spectrum Use

a. 8025-8400 MHz band (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 8025-8400 MHz band is allocated on a primary basis for non-federal Earth exploration-satellite service (space-to-Earth) and other non-federal operations may be authorized on a case-by-case basis space.[5]

RBC Signals seeks to perform receive-only TT&C in the 8199-8201 MHz band and thus there is no potential for interference from the earth station operations in this band. RBC Signals understands that Momentus is working with Commission staff to demonstrate how the VR-2 will comply with the PFD limits for the 8025-8400 MHz band and otherwise protect existing and future operations from harmful interference. RBC Signals will support Momentus and Commission staff to ensure that its temporary receive-only operations do not increase the interference into current or future government or commercial users.

b. 2025-2110 MHz band (Earth-to-space)

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.[6] RBC Signals proposes to operate the 4.5m in the 2074.90-2075.10 MHz band (Earth-to-space) to provide TT&C for the VR-2 consistent with the Commission's Table of Allocations.[7]

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[5] *See* 47 C.F.R. § 2.106, fn. US 258.

[6] *See* 47 C.F.R. § 2.106, fn. US347.

[7] *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").[8] 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 using a 1 kilohertz carrier bandwidth from 2074.90-2075.10 MHz, and given the remote location of the Deadhorse facility in the North Slope of Alaska, RBC Signals believes 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.

i. 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,[9] and RBC Signal's proposed operations are fully compatible with other

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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

[9] 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 kHz carrier bandwidth.

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.

C. 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 VR-2 mission length (approximately two 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 TT&C is crucial to ensure successful mission phase for the VR-2, and RBC Signals can provide established and proven ground station support from an existing earth station 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 VR-2 and ensure that the VR-2 has access to uninterrupted ground station services during the life of the mission. With RBC Signals' support, Momentus will be able to successfully deploy customer payloads into orbit and conduct key performance evaluations of its orbital adjustment

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 the 4.5m in the 2074.90-2075.10 MHz band (Earth-to-space) and 8199-8201 MHz band (space-to-Earth) to provide TT&C for the VR-2 from its existing facility in Deadhorse, Alaska.