

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

In the Matter of

|                                         |   |                         |
|-----------------------------------------|---|-------------------------|
| Application of RBC Signals LLC for a    | ) |                         |
| 180-Day Special Temporary Authorization | ) | Call Sign:              |
| to Operate an Earth Station to Provide  | ) |                         |
| Tracking, Telemetry & Command for a     | ) | File No.: SES-STA-_____ |
| U.S.-Licensed Satellite                 | ) |                         |

**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 its existing site 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”) operated by Momentus, Inc. (“Momentus”) – the Vigoride-3 (“VR-3”).<sup>1</sup> Grant of this STA will allow RBC to provide mission critical TT&C support for Momentus during customer payload deployments and orbit adjustment maneuver evaluations.

VR-3 is schedule to be deployed from a Space Exploration Technologies Corporation (“SpaceX”) Falcon 9 launch in June 2022.<sup>2</sup> 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

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<sup>1</sup> See Momentus Inc., File No. SAT-STA-20211216-00195 (“*VR-3 STA*”). The VR-3 is the subject of a pending STA request. RBC signals incorporates by reference relevant satellite technical and operational information provided in the *VR-3 STA*. This STA request is limited to the earth station operating authority only.

<sup>2</sup> The mission life of the VR-3 spacecraft is approximately six (6) months.

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-3 mission using the 4.5m earth station located at its facility in Deadhorse, Alaska, where RBC Signals performs extensive TT&C operations.<sup>3</sup> 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 and is updating this coordination to ensure no interference into existing authorized spectrum users.

With the support of RBC Signals, the VR-3 will perform a series of payload deployments and subsequently conduct orbit-raising maneuvers to a series of targeted maximum altitudes as described in the *VR-3 STA*. The VR-3 is designed to transport and deploy a dozen individual payloads after orbital insertion and prior to deorbit. During the mission, RBC Signals' TT&C support operations will be conducted on an unprotected and non-interference basis intermittently when the satellites pass over the earth station (four to five passes per day, with each pass approximately seven minutes in duration).

RBC 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 Form 312 Schedule B, for information relating to the

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<sup>3</sup> See, e.g., RBC Signals LLC, File No. SES-STA-20181008-03140 (authorizing RBC Signals to provide TT&C to the 3 Diamonds spacecraft in the 401-402 MHz band).

proposed earth station operations.<sup>4</sup> 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-3 satellite as it passes over the Deadhorse earth station. Grant of this STA request is necessary for the reliability of the VR-3 mission and will not increase 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 accommodated.

### **A. VR-3 Satellite Overview**

The VR-3 satellite is a self-propulsive, free-flying spacecraft designed to transport and deploy and permanently host customer payloads.<sup>5</sup> The VR-3 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-3 platform and monitor propellant consumption. RBC Signals will not be providing ground station support for any individual VR-3 customer payloads or missions and solely seeks to partner with Momentus to provide U.S.-based TT&C ground station services to support the safe operation of the VR-3 spacecraft. RBC Signals' TT&C operations will facilitate Momentus' evaluation of VR-3's novel microwave electrothermal thruster ("MET"), a non-toxic and low-pressurized

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<sup>4</sup> 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.

<sup>5</sup> See *VR-3 STA*; see also Letter from Tony Lin to Marlene H. Dortch, File No. SAT-STA-20211216-00195 (April 13, 2022) ("*Momentus April 13, 2022 Update*").

water propellant system capable of providing orbit transfers. RBC Signals incorporates by reference the VR-3 mission information and satellite specifications provided in the *VR-3 STA*.

## **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.<sup>6</sup> RBC Signals seeks to support receive-only TT&C, with limited satellite imaging,<sup>7</sup> in the 8199-8201 MHz band. RBC Signals incorporates by reference space-to-Earth interference analysis and coordination showings provided by Momentus for the proposed receive-only operations.<sup>8</sup>

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 receive-only operations in the 8025-8400 MHz band.<sup>9</sup> RBC Signals submits that waiver is warranted given the limited use of the 8299-8201 MHz band during the brief 180-day mission, Momentus’ commitment to coordinate use of these frequencies,<sup>10</sup> the non-interfering and limited nature of such use, and the

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<sup>6</sup> See 47 C.F.R. § 2.106, fn. US 258.

<sup>7</sup> Such use will also include transmission of limited imagery of the payloads during deployment primarily to provide mission assurance and, to a limited degree, selected images for publicity or marketing purposes. Although such imagery is limited to the spacecraft itself, Momentus holds a commercial remote sensing license issued by the National Oceanic and Atmospheric Administration (“NOAA”) for the operations of imaging sensors.

<sup>8</sup> See *Momentus April 13, 2022 Update* at Exhibit 2.

<sup>9</sup> The Commission may waive any of its rules if there is “good cause” to do so. 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).

<sup>10</sup> See *VR-3 STA*.

public interest justification supporting the mission. RBC Signals will support Momentum 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)**

This band is allocated to Space Operations and Earth-Exploration Satellites Services (“EESS”), *inter alia*, 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.<sup>11</sup>

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-3 consistent with the Commission’s Table of Allocations.<sup>12</sup> 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”).<sup>13</sup> RBC Signals will continue to support Momentum in its coordination efforts 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 100 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 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

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<sup>11</sup> See 47 C.F.R. § 2.106, fn. US 347.

<sup>12</sup> 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.”).

<sup>13</sup> See [https://www.ntia.doc.gov/files/ntia/publications/compendium/2025.00-2110.00\\_01MAR14.pdf](https://www.ntia.doc.gov/files/ntia/publications/compendium/2025.00-2110.00_01MAR14.pdf)

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 4.5m earth station. Micronet circulated the prior coordination notice to potentially affected carriers on April 14, 2022, and RBC Signals will update the FCC immediately upon receipt of the final coordination report.

RBC Signals is confident 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.<sup>14</sup> In addition, RBC Signals understands that Momentus has coordinated access to the subject spectrum as it relates to the VR-3 space station 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.<sup>15</sup> Similar to above, given the limited use of the 2074.90-2075.10 MHz band during the brief 180-day mission, 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 Momentus and Commission staff to ensure that its temporary Earth-to-

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<sup>14</sup> 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 significant lower power levels within a 100 kHz carrier bandwidth.

<sup>15</sup> *See, supra*, n.9.

space operations do not increase the interference into current or future government or commercial users.

### **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-3 mission length (approximately 6 months) does not warrant a long-term commercial earth station license (*i.e.*, a 15-year term). In addition, given the June 2022 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-3, 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-3 and ensure that the VR-3 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, and for all of the reasons proffered by Momentus in its related STA application,<sup>16</sup> the public interest would be served by a grant of this 180-day STA request, with the associated waivers as-needed, to allow RBC Signals to operate the 4.5m in the 2074.90-

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<sup>16</sup> See generally *VR-3 STA*.

2075.10 MHz band (Earth-to-space) and 8199-8201 MHz band (space-to-Earth) to provide TT&C for the VR-3 from its existing facility in Deadhorse, Alaska.