

**Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554**

In the Matter of

Hiber Inc.

Petition for Declaratory Ruling to Access U.S.
Market Using the Hiberband Low-Earth Orbit
System

IBFS File No. SAT-PDR-2018____-_____

Call Sign S_____

PETITION FOR DECLARATORY RULING

I. INTRODUCTION

Pursuant to Sections 25.114, 25.137, and 25.142 of the Federal Communications Commission’s (“Commission” or “FCC”) rules, Hiber Inc., a wholly owned subsidiary of Magnitude Space B.V., a corporation registered in the Netherlands (“Hiber”), submits this Petition for Declaratory Ruling (“Petition”) to serve the United States market using a Netherlands-authorized constellation of up to 24 small low-earth orbit (“LEO”) satellites to provide non-voice, non-geostationary (“NVNG”) mobile satellite services (“MSS”)¹ in the 400.15-401 MHz (space-to-Earth) and 399.9-400.05 MHz (Earth-to-space) bands. The planned satellites are expected to launch over the next five years, beginning with the launch of two satellites in the fourth quarter of 2018. The satellites will operate as an integral part of a new Low Power Global Area Network (“LPGAN”) (also known as Hiberband®) that will provide affordable, global connectivity for sensors and Internet of Things (“IoT”) devices. As

¹ See 47 C.F.R. § 2.1 (defining NVNG MSS as a “mobile-satellite service reserved for use by non-geostationary satellites in the provision of non-voice communications which may include satellite links between land earth stations at fixed locations”).

demonstrated herein, grant of this Petition will serve the public interest by facilitating deployment of a new generation of small, low-power NVNG MSS satellites, along with new and innovative services offering affordable, ubiquitous connectivity for IoT and other devices used by consumers in the United States and worldwide.

As demonstrated herein, Hiber is a fully qualified applicant, and grant of this Petition will serve the public interest, convenience, and necessity. In support of this request for U.S. market access, Hiber provides the following legal and technical information required under Part 25 of the Commission's rules.

II. THE HIBERBAND® NETWORK WILL PROVIDE AFFORDABLE, UBIQUITOUS CONNECTIVITY FOR IOT AND OTHER DEVICES

The Hiberband® network consists of both space and ground segments, as described below and in the accompanying Schedule S and Technical Annex. With its planned launch of the Hiberband® network, Hiber seeks to provide true connectivity for rural, remote, and network-independent Internet of Things (“IoT”) and other applications. Subscribers will be able to use the Hiberband® network to manage natural resources, grow crops more efficiently, protect wild animals, and track weather and soil data, among other uses.

Space Segment. The satellite constellation consists of up to 24 LEO satellites, including in-orbit spares, operating in a polar sun-synchronous orbit at an altitude of approximately 600 km, with a maximum of 8 orbital planes, each containing up to 3 satellites circling the earth approximately 15 times per day.

The satellite constellation is authorized by the Agentschap Telecom/
Radiocommunications Agency Netherlands (“RA”) for launch and operations,² and registered

² The grant was issued on April 24, 2018 and is attached as an exhibit to this application with an English translation.

under International Telecommunication Union (“ITU”) filings by the Netherlands for the “HOL-MG-ANS-002” and “HOL-MG-A006” satellite networks. Hiber has completed construction of its first two satellites in partnership with Innovative Solutions in Space B.V. (“Innovative Solutions”), a Netherlands-based company. These two satellites are currently slated for launch in the fourth quarter of 2018, with the first scheduled for an October launch by the Indian Space Research Organisation and the second for a November launch by SpaceX.³

Ground Segment. The Hiberband® satellites will operate with gateway earth stations located outside the United States.⁴ The satellites also will be used to provide service to the United States and abroad through user terminals consisting of highly integrated, low-power communications modems. These modem devices are designed as compact, solderable surface-mount technology (SMT) modules, which can be easily integrated into IoT and other devices for global delivery of sensor data. The user modems are designed to be dormant 99 percent of the time, operating only when a satellite is overhead. At that time, the modems may transmit messages of up to 1400 bits in size to the satellite, and the satellite may broadcast command messages to the modems. The duration of each message will last no longer than approximately 400 milliseconds. This data includes the information the modem receives from sensors, the modem ID, the GPS-based location, and a timestamp. Hiber will seek additional FCC authorization to operate user terminals in the United States, as required under the Commission’s rules.

³ The launches were originally scheduled to occur in July and August 2018, respectively, but were postponed by the launch providers, postponements over which Hiber has no control.

⁴ The two gateways will be located in Norway and the Netherlands. The primary gateway is located at Svalbard, Norway, located on the island of Spitsbergen near the North Pole. This Arctic location allows the ground station to have visibility to every satellite on the network once during each polar orbit. The Netherlands gateway is located in Delft. It is an exact duplicate of the primary Svalbard gateway and allows Hiber to satisfy the RA’s requirement that the satellites have a control point located within the Netherlands.

Operating Frequencies. The Hiberband® network will operate on the following frequencies:

Frequencies	Proposed Operations
400.15-401 MHz	NVNG MSS (service downlinks) (U.S. and abroad)
399.9-400.05 MHz	NVNG MSS (service uplinks) (U.S. and abroad)
401-402 MHz	TT&C downlinks (only outside the U.S.)
148-149.9 MHz	TT&C uplinks (only outside the U.S.)
2200-2290 MHz	EESS (feeder downlinks) (only outside the U.S.)

A more detailed description of the Hiberband® channel plan is included in the accompanying Schedule S and Technical Annex. The proposed NVNG MSS operations for service links in the United States are consistent with the U.S. Table of Frequency Allocations⁵ and the Commission’s definitions of NVNG MSS and MSS.⁶ Moreover, the proposed feeder link and TT&C operations will be performed using gateway earth stations located outside the United States, and thus Hiber is not seeking FCC authorization for such operations. In an abundance of caution, however, Hiber requests a waiver to the extent required to permit its proposed feeder link operations, as further discussed in Section V below.

⁵ See 47 C.F.R. § 2.106.

⁶ 47 C.F.R. § 25.103.

III. THE HIBERBAND® NETWORK SATISFIES FCC REQUIREMENTS FOR U.S. MARKET ACCESS

A. Legal Qualifications

Hiber, formerly known as Magnitude Space, is a private Dutch company headquartered in Amsterdam, with locations also in Delft in the Netherlands and in Maryland, U.S.A. The accompanying FCC Form 312 sets forth information establishing Hiber's legal qualifications to provide service to the United States. Additionally, Hiber highlights below its compliance with certain FCC licensing and service requirements.

Milestone schedule. Hiber expects to launch and operate its system in compliance with Section 25.164(b)'s milestone requirement.⁷

Escalating bond. Hiber will post an initial bond amount of \$1 million within 30 days of grant of this PDR as required under Section 25.165(a).⁸

B. Technical Qualifications

The accompanying Schedule S and Technical Annex provide information demonstrating Hiber's technical qualifications to operate the Hiberband® satellite constellation for service to the United States and compliance with applicable FCC technical requirements.

TT&C. As noted above, Hiber proposes to conduct TT&C in the 148-149.9 MHz (Earth-to-space) and 401-402 MHz (space-to-Earth) band only outside the United States, and thus is not seeking FCC authorization for such operations in the United States. Hiber's TT&C operations in the 148-149.9 MHz (Earth-to-space) and 401-402 MHz (space-to-Earth) band are consistent with international allocations, as both frequency bands are allocated for Space Operations on a co-primary basis.

⁷ See 47 C.F.R. § 25.164(b).

⁸ See *id.* § 25.165(a).

IV. PUBLIC INTEREST CONSIDERATIONS

Under the Commission's *DISCO II* policies and Section 25.137(a)(2) of its rules,⁹ U.S. market access requests for satellites licensed by World Trade Organization ("WTO") member countries to provide WTO-covered services, including NVNG MSS, to the United States are presumed to enhance competition and thus serve the public interest.¹⁰ Hiber is authorized by the Netherlands, a WTO member country, to operate its Hiberband® satellite constellation, which will be used to provide NVNG MSS to the United States and abroad. Thus, grant of this PDR is presumed to be pro-competitive and in the public interest.

A Commission grant of this Petition will allow Hiber to access the United States market and introduce new and innovative LPGAN services to American consumers. These services, in turn, offer substantial public interest benefits, including delivering an affordable IoT solution to otherwise unconnected rural and remote areas.

Additionally, grant of this PDR satisfies other public interest considerations, including spectrum availability, national security, law enforcement, and foreign and trade policy concerns.¹¹ As noted above, Hiber's proposed U.S. operations are consistent with the U.S. Table of Frequency Allocations. Moreover, as demonstrated in the accompanying Schedule S and Technical Annex Hiber's satellite constellation will share spectrum with other NGSO systems in accordance with applicable FCC and ITU technical limits and sharing requirements. Thus, grant of this PDR will have no adverse impact on spectrum availability or potential for harmful

⁹ See 47 C.F.R. § 25.137(a)(2); *Amendment of the Commission's Regulatory Policies to Allow Non-U.S. Licensed Space Stations to Provide Domestic and International Satellite Service in the United States*, Report and Order, 12 FCC Rcd 24094 ¶ 39 (1997) ("*DISCO II Order*"), *on recon.*, 15 FCC Rcd 7207 (1999) ("*DISCO II First Reconsideration*"), *recon. denied*, 16 FCC Rcd 19794 (2001).

¹⁰ See, e.g., *ICO Services Limited*, Order, 16 FCC Rcd 13762, ¶ 23 (IB & OET 2001) (noting that WTO-covered services include MSS).

¹¹ See *DISCO II Order* ¶¶ 146-82.

interference to other authorized services. This Petition on its face raises no national security, law enforcement, or foreign and trade policy concerns that would warrant special consideration. Indeed, the Commission has noted that such issues are likely to arise only in rare circumstances.¹²

V. WAIVER REQUESTS

Hiber requests waivers of certain FCC requirements, as set forth below. The Commission may waive its rules upon a showing of good cause,¹³ which may be found when a waiver would not undermine the underlying purposes of the rule and otherwise would serve the public interest.¹⁴ As demonstrated below, good cause exists for granting the requested waivers.

A. Modified Processing Round Rules

Consistent with Commission precedent, Hiber requests that this Petition be processed pursuant to Section 25.158's the first-come, first-served procedure adopted for "GSO-like" satellite systems,"¹⁵ and further requests a waiver, to the extent necessary, of the modified processing round procedure for "NGSO-like satellite systems" under Sections 25.156 and 25.157 of the FCC's rules.¹⁶ Following the termination and surrender of prior NVNG MSS licenses, the Commission announced that spectrum assigned under those licenses would be available pursuant to the first-come, first-served procedure.¹⁷ Thus, the Commission's announcement regarding the applicability of the first-come, first-served procedure remains in effect with respect to Hiber's request for access to available NVNG MSS spectrum.

¹² *See id.* ¶ 180.

¹³ 47 C.F.R. § 1.3.

¹⁴ *See WAIT Radio v. FCC*, 418 F.2d 1153, 1157 (D.C. Cir. 1969), *cert. denied*, 409 U.S. 1027 (1972); *Northeast Cellular Tel. Co., L.P. v. FCC*, 897 F.2d 1164, 1166 (D.C. Cir. 1990).

¹⁵ 47 C.F.R. § 25.158.

¹⁶ *Id.* §§ 25.156 and 25.157.

¹⁷ *See Orbcomm License Corp.*, Order and Authorization, 23 FCC Rcd 4804, ¶ 10 (IB/OET 2008).

The Commission also has previously waived the modified processing round requirement and allowed NGSO satellite systems, including small satellites in the EESS, to be processed on a first-come, first-served basis.¹⁸ Indeed, the Commission recently noted that these waivers rely upon the demonstration that the small satellites “can avoid interference events through means such as scheduling of transmissions, and would not preclude future entrants from using the same spectrum.”¹⁹ For example, where a satellite operates with a limited number of earth stations for purposes of downlinking sensor data during relatively short periods of time, it may be possible for such a satellite system to accommodate future entrants utilizing the same frequency bands.”²⁰

Like the EESS NGSO systems that received waivers of the modified processing round rule, Hiber’s system is fully capable of sharing with current and future NGSO systems operating in the same frequency bands, and thus there is no mutual exclusivity. Spectrum sharing is possible because satellites in the Hiberband® transmit only during short periods of time when the satellite is visible from the transmitting earth station. As a result, harmful interference is unlikely to occur and in any event could be avoided through coordination with the other NGSO operators to avoid simultaneous satellite and Hiberband® earth station transmissions. Accordingly, waiver of Sections 25.156 and 25.157 will not undermine the underlying purpose of the rules to preserve opportunities for competitive entry.

¹⁸ See generally *Space Imaging, LLC*, Declaratory Order and Order and Authorization, 20 FCC Rcd 11964 ¶¶ 9-11 (2005) (“*Space Imaging Order*”).

¹⁹ *Streamlining Licensing Procedures for Small Satellites*, Notice of Proposed Rulemaking, FCC 18-44, at ¶ 42 (Apr. 17, 2018).

²⁰ *Id.* ¶ 42 n.148 citing *Planet Labs, Inc.* IBFS File No. SAT-LOA-20130626-00087 (granted Dec. 3, 2013). See also *DG Consents Sub., Inc.*, IBFS File No. SAT-MOD-20050511-00097 (granted Jan. 9, 2006); *Space Imaging, LLC*, Declaratory Order and Authorization, 20 FCC Rcd 11964, at ¶¶ 8-11 (IB 2005); *DigitalGlobe, Inc.*, Order and Authorization, 20 FCC Rcd 15696, at ¶¶ 6-8 (IB 2005).

B. Feeder Downlink Operations in the 2200-2290 MHz Band

As noted above, Hiber will operate its feeder downlinks in the 2200-22900 MHz only outside the United States, and thus is not seeking FCC authorization for such use in the United States. Nonetheless, Hiber's proposed feeder downlink use is consistent with international allocations, as the 2200-2290 MHz band is allocated internationally for Earth-Exploration Satellite Service ("EESS") downlink operations on a co-primary basis.²¹ The FCC's rules define EESS as "a radiocommunication service between earth stations and one or more space stations, which may include links between space stations, in which: (1) Information relating to the characteristics of the Earth and its natural phenomena, including data relating to the state of the environment, is obtained from active sensors or passive sensors on Earth satellites; (2) Similar information is collected from airborne or Earth-based platforms."²² Hiber's proposed service involves connecting its modems to sensors that will gather information about the state of the environment, including monitoring weather and soil data to improve agriculture and monitoring groundwater levels, thus qualifying as EESS, consistent with international allocations.

In any event, to the extent necessary, Hiber seeks a waiver of Section 25.112(a)(3) of the Commission's rules to permit its proposed feeder downlink operations on a non-conforming basis.²³ Use of this band outside of the U.S. should be possible and will allow Hiber to operate in accordance with the Table of Frequency Allocations in other countries and enable data downlink earth stations.

²¹ See 47 C.F.R. § 2.106 nn.5.392, US303.

²² 47 C.F.R. § 2.1.

²³ 47 C.F.R. § 25.112(a)(3).

VI. CONCLUSION

As demonstrated herein, grant of this Petition serves the public interest and is consistent with the Commission's rules and *DISCO II* policies permitting U.S. market access. As Hiber has already received its authorization to launch and operate by the RA, Hiber urges prompt Commission approval to allow Hiber to commence providing affordable IoT service to customers throughout the United States.