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Via IBFS

Marlene H. Dortch, Secretary
Federal Communications Commission
445 12th Street, S.W.
Washington, D.C. 20554

**Re: Notice of Ex Parte Communication - IBFS File No. SAT-PDR-20200228-00021;
Call Sign S3064**

Dear Ms. Dortch:

Swarm Technologies, Inc. (Swarm) submits this ex parte communication for the purpose of informing the Federal Communications Commission about Swarm's recent progress launching its commercial Very High Frequency (VHF) Non-Voice, Non-Geostationary (NVNG) constellation. In addition, Swarm herein corrects the records with respect to its pending petition for market access in the FCC's Ultra High Frequency (UHF) NVNG processing round.¹

While Swarm has previously provided fulsome information addressing the merits and public interest benefits of its participation in the FCC's UHF processing round, it does so again in the instant ex parte to ensure that mischaracterizations and misrepresentations by several competitors attempting to disadvantage Swarm do not go unanswered. Swarm, the only UHF processing round applicant that will manufacture and operate its spacecraft in the United States, remains the most capable applicant to ensure finite spectrum resources allocated for NVNG service are utilized expeditiously and to their maximum potential.

With respect to VHF operations, Swarm has successfully launched its first wave of satellites of its planned constellation. On September 2, 2020 an Arianespace Vega rocket launching from French Guiana lifted twelve Swarm VHF spacecraft into orbit. Swarm subsequently made successful first contact with all twelve spacecraft and has begun commercial VHF operations with our early customers. This launch represents a major milestone for Swarm, comes less than a year after the FCC granted the company authority to operate the system,² and further demonstrates that Swarm is committed to making immediate use of the spectrum resources the FCC makes available.

¹ See *Myriota Pty. Ltd. Petition Accepted for Filing, IBFS File No. SAT-PDR-20190328-00020 CutOff Established for Additional NVNG MSS Applications or Petitions for Operations in the 399.9-400.05 MHz and 400.15-401 MHz Bands*, Public Notice, 34 FCC Rcd 7185 (2019) ("UHF Processing Round PN").

² Swarm's VHF NVNG satellite system was authorized by the FCC under Call Sign S3041 on October 17, 2019. See IBFS File Number: SAT-LOA-20181221-00094

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Swarm's ability to rapidly design, build and launch spacecraft is directly attributable to the company's investment in the domestic U.S. satellite industry. Swarm is headquartered, conducts research and development, manufactures its spacecraft in-house, and performs network operations on American soil. With respect to next steps for its VHF system, Swarm remains committed to launching 150 commercial satellites within the next twelve months and will support customers with data connectivity services in the immediate term with spacecraft already launched.

With respect to its pending UHF petition, Swarm corrects below a number of factually inaccurate, misleading, or contradictory assertions made by its competitors in recent meetings with the Commission. Specifically, statements made by Hiber, Inc., Myriota Pty. Ltd., and Kinéis (Overseas Operators) during ex parte meetings in late August misrepresent the progress that Swarm's competitors have made coordinating the UHF NVNG band, inaccurately speculate that UHF spectrum will not alleviate Swarm's spectrum needs in a meaningful way, and misrepresent that Swarm has not undertaken a good faith effort to begin coordination discussions with other NVNG UHF processing round applicants.³

Swarm urges the FCC to disregard the disingenuous assertions made by the Overseas Operators regarding their level of effort already made to coordinate the UHF NVNG band and the exaggerated challenges associated with coordinating one additional satellite network. The Overseas Operators assert that they have enjoyed "fruitful" coordination discussions and reached a "set of agreed general principles."⁴ As a result of this progress, they ask the Commission to "avoid the disruption to current coordination discussions that would necessarily result from admitting additional applicants."⁵ The arguments of the Overseas Operators regarding the challenges of coordination, however, are at best intentionally overstated, and, at worst, evidence that they likely never developed the technological capabilities discussed in their original petitions to the Commission. Regardless, their arguments lack merit and should be disregarded.

First, beyond tentatively agreeing that the 400.02-400.05 MHz might be suitable for telemetry, tracking, and control (TT&C) operations, the Overseas Operators do not appear to have made meaningful progress on other substantive coordination issues.⁶ Instead, the other "agreed general principles" between these operators reflect nothing more than vague complaints about how supposedly difficult it will be to generally share the relatively modest amount of spectrum in the UHF NVNG band.⁷ For example, the Overseas Operators assert that there is a "high noise floor" and "uncertainty of protection from TT&C" in the 399.9-400.02 MHz, and that the "tiny amount of spectrum available in the uplink makes sharing very challenging" altogether.⁸ Outside these and

³ See, e.g., Letter from Tony Lin, David S. Keir and Eric Graham, co-counsel for Hiber Inc., Kinéis and Myriota Pty. Ltd., to Marlene H. Dortch, Secretary, FCC (Aug. 25, 2020) ("*Overseas Petitioner Ex Parte Notice*") (summarizing an August 24 telephone meeting with Sean Spivey, Legal Advisor to Chairman Ajit Pai).

⁴ *Overseas Petitioner Ex Parte Notice* at 2.

⁵ *Id.* at 2.

⁶ See *Id.* at 2.

⁷ *Id.* at 2.

⁸ *Id.* at 2. It is unclear how the Overseas Operators can credibly complain about TT&C interference below the boundary of 400.02 GHz, when they are the ones that tentatively

certain other unsubstantiated complaints, the Overseas Operators provide no evidence that a meaningful coordination effort has begun or that coordination with Swarm will prove burdensome.

Second, the Overseas Operators' complaints about insufficient spectrum in the NVNG bands ignore the practical realities of operating a space-based network below 1 GHz and the need for such networks to implement sharing technologies that efficiently use available spectrum. Even 30 years ago when the FCC first established the rules for NVNG operations, "greenfield" spectrum was exceedingly hard to identify below 1 GHz. In the interim decades, the dearth of spectrum below 1 GHz has significantly worsened. That said, the NVNG bands were never intended to support more spectrum intensive broadband or voice communications applications.⁹ Instead, the NVNG bands were always meant to support narrowband machine-to-machine communications and spectrally efficient satellite networks that are metaphorically capable of "doing a lot with a little" through technological innovation and smart engineering – exactly the type of satellite system Swarm is building for the UHF.¹⁰

Of course, when it was convenient for them, the Overseas Operators previously made unwavering assertions that they had technologically sophisticated spacecraft that could easily coordinate and share the UHF NVNG band with other satellites systems. For example, Myriota stated definitively that, its system enjoyed the "flexibility and spectral efficiency to be able to operate harmoniously," and touted that its "satellites can vary the bandwidth of their emission through on-board processing and dynamically control their emissions to accommodate sharing arrangements with other users of the band."¹¹ Myriota further elaborated that its "downlink emissions can range in bandwidth between 10-140 kHz and operate with the entire 850 MHz MSS allocation or any portion thereof designated for their use ... [and] can employ frequency hopping to move throughout the assigned band or operate with a defined channel plan, using either multiple contiguous channels or a fragmented channel arrangement. By combining [a] 10% duty cycle with the flexibility of the software defined radio on board its satellites, Myriota will be able to share spectrum by coordinating usage and/or time of operations."¹²

Hiber was no less enthusiastic about its flexible architecture and ability to share NVNG UHF band. Hiber stated that its satellites only transmit to the earth stations in short bursts when the satellite is within line-of-sight, and that it is "fully capable" of coordinating successfully with Orbcomm

agreed to place TT&C operations above 400.02 GHz. They provided no substantive information about their proposed TT&C operations, but Swarm stands ready to assist them in resolving this issue.

⁹ Voice communications are actually prohibited by FCC rules. See 47 CFR § 25.142(b)(1).

¹⁰ See generally *Amendment of the Commission's Rules to Establish Rules and Polices Pertaining to a Non-Voice Non-Geostationary Mobile-Satellite Service*, CC Docket 92-76, Notice of Proposed Rulemaking, 8 FCC Rcd. 6330 (1993).

¹¹ *Application of Myriota Pty. Ltd.*, Petition for Declaratory Ruling Granting Access to the U.S. Market for Non-Voice Service, Non-Geostationary Satellite System, SAT-PDR-20190328-00020, Legal Narrative at 10 (filed Mar. 28, 2019).

¹² *Id.* at 10-11.

and any other users in the band such that “mutual exclusivity would not prevent future entrants from using the same spectrum.”¹³

For its part, Kinéis held a meeting with the Commission that closed with the following point: “All systems should have an opportunity to enter the market and develop in the whole band. Band saturation is a long term perspective at this stage.”¹⁴

Given that the Overseas Operators have now walked back their ability to coordinate with other satellite systems, the only reasonable conclusions are that their assertions about sophisticated technology were exaggerated or that they are now downplaying their capabilities in an effort to exclude Swarm from the instant process round.

The Overseas Operators wrongly assert that Swarm will not benefit from access to UHF spectrum and have failed to justify why Swarm’s waiver of the processing round deadline should be denied. The Overseas Operators argue that Swarm would not materially improve its spectrum position by adding 140 kHz of downlink spectrum and 150 kHz uplink spectrum (or, as they claim in a hypothetical worst-case scenario, only 30 kHz of usable uplink spectrum) given that Swarm already has access to 500 kHz of VHF spectrum, and thus would not be harmed by exclusion from the UHF processing round.¹⁵ This argument suffers from several fundamental flaws.

First, the argument presupposes that coordination efforts will fail in the UHF and the four processing round applicants cannot share the uplink spectrum on a co-equal basis. Swarm unequivocally wants to avoid that outcome and will strive to coordinate and de-conflict with the other applicants in the processing round to avoid forcing the FCC into a worst-case outcome (*i.e.*, segmentation of the UHF uplink band). Second, Swarm indeed considers the available spectrum in the UHF NVNG band to have value and utility, even if it is less total spectrum than is granted to Swarm in the VHF band. The UHF has different propagation characteristics vis-à-vis the VHF, and for certain applications these characteristics will be advantageous.¹⁶

Swarm also reaffirms that its participation in the instant UHF processing round serves the public interest and does not undermine the FCC’s rules. No third party disputes that the public interest is unequivocally served by having a well-funded NVNG system that is headquartered in the U.S.; designs, builds and operates its spacecraft domestically; and, has a proven track record of

¹³ Letter from Lynn M. Montgomery, Counsel to Hiber, Inc. to Marlene H. Dortch, Secretary, FCC, RE: Hiber Inc. Hiber, Inc., Petition for Declaratory Ruling to Access U.S. Market Using the Hiberband Low-Earth Orbit System, Call Sign S3038, IBFS (File No. SAT-PDR-20180910-00069) at Attachment 8-9 (filed Oct. 19, 2018).

¹⁴ Letter from David S. Keir, Counsel to Kinéis to Marlene H. Dortch Secretary, RE: Kinéis, Petition for Declaratory Ruling Pursuant to Section 25.137 of the Commission’s Rules Seeking Access to the U.S. Market for an NVNG MSS Satellite Network (File No. SAT-LOI-20191011-00113) at Attachment 3 pg. 14 (filed Feb. 18, 2019).

¹⁵ See *Overseas Petitioner Ex Parte Notice* at 2.

¹⁶ For example, the UHF NVNG frequencies facilitate a smaller form factor with respect to end user antennas (e.g., up to three times smaller than VHF) and will at least be less prone to some types of ground interference from TV stations and FM stations along with taxi cab and railway communications).

expeditiously making use of spectrum resources available to it. Moreover, Swarm filed its application *prior* to any FCC action on another pending application, far in advance of any other system finalizing its system architecture, and certainly prior to any party attempting to launch and bring a system into use. Thus, no party was prejudiced by Swarm's inclusion in the processing round, and the procedural mechanism itself, which has served the FCC well since its introduction, is not undermined. That said, it appears that the Overseas Operators fail to appreciate that participation in an FCC processing round is not an auction granting a licensee an exclusive use right, and the obligation to coordinate in good faith pursuant to the FCC's instruction that applies to all NVNG satellite systems also applies in the instant situation.¹⁷

The Overseas Operators wrongly assert that Swarm's outreach involved only a single email.

The Overseas Operators allege that the "only communication from Swarm directed to the First Round Parties was a single email sent two days after Swarm filed its application."¹⁸ While Swarm did send an email subsequent to the submission of its petition, this is far from the "only communication" with the other applicants in the instant processing round. Swarm has participated in several reasonable and positive meetings with Spire.¹⁹ While Myriota did not respond to Swarm's initial correspondence regarding the UHF processing round, Swarm and Myriota have held five phone calls this year (after Swarm initiated these discussions via email on March 17, 2020) on topics including the UHF processing round. These conversations have included both company's respective CTOs and engineers under a mutual non-disclosure agreement. Hiber responded to Swarm's outreach concerning the UHF processing round with correspondence indicating that it was too busy working with the other operators, which had taken "priority" over other coordination efforts, including discussions with Swarm regarding the UHF round. Finally, Kinéis requested a meeting "before the summer time" but this initial dialogue chilled after it urged the FCC to deny Swarm's petition to participate in the UHF processing. Outside the context of the FCC's UHF processing round, however, Swarm has continued to work alongside all three of the Overseas Operators in a variety of international and country specific forums and regulatory arenas. These forums and their still ongoing work have resulted in discussions, both publicly and privately, between all operators.

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¹⁷ See 47 CFR § 25.142(b)(3), which states "all affected [NVNG] applicants, permittees, and licensees shall, at the direction of the Commission, cooperate fully and make every reasonable effort to resolve technical problems and conflicts that may inhibit effective and efficient use of the radio spectrum."

¹⁸ See *Overseas Petitioner Ex Parte Notice* at 3.

¹⁹ Spire has not opposed Swarm's participation in the processing round.

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Swarm urges the Commission to conclude its review and grant its above-referenced petition to participate in the 2019 UHF NVNG processing round. Certainty with respect to the standing of all applicants in the processing round will help facilitate coordination between prospective satellite systems and motivate timely, efficient use of the UHF NVNG band.

To the extent you have questions or concerns, please feel free to contact the undersigned.

Very truly yours,

/s/

Timothy Bransford
Counsel for Swarm Technologies, Inc.

cc (via email):

For the Commission

Chairman Ajit Pai
Commissioner Michael O'Rielly
Commissioner Brendan Carr
Commissioner Jessica Rosenworcel
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