



July 14, 2020

Marlene Dortch
Federal Communications Commission
Office of the Secretary
445 12th Street, SW
Washington, DC 20554

**Re: IBFS File No. SAT-MOD-20200417-00037; Call Signs: S2983 and S3018; MVDDS
5G Coalition Petition for Rulemaking to Permit MVDDS Use of the 12.2-12.7 GHz
Band for Two-Way Mobile Broadband Service, RM-11768**

Dear Ms. Dortch:

Representatives of DISH Network Corporation (“DISH”) met with representatives of the Federal Communications Commission on July 10 and July 14, 2020, to discuss recent filings regarding the 12.2-12.7 GHz band (“12 GHz band”).¹ In the face of serious technical concerns that 12 GHz band licensees have raised, Space Exploration Holdings, LLC’s (“SpaceX’s”) perfunctory response of June 29, 2020,² fails to provide any meaningful assurance that the company’s proposal to dramatically reduce the altitude of 2,824 satellites will not disrupt direct broadcast satellite (“DBS”) services. Even with the little information SpaceX has made publicly available, 12 GHz band licensees like DISH have presented significant evidence that SpaceX’s proposed modifications could imperil DBS transmissions in the 12 GHz band.³ Others have raised similar concerns regarding the multichannel video distribution and data service (“MVDDS”) and

¹ Attending for DISH Network on July 10 were Jeffrey Blum and Alison Minea, and Trey Hanbury and Tom Peters of Hogan Lovells US LLP. Attending from the Federal Communications Commission were Blaise Scinto, Peter Daronco, Stephen Buenzow, Chris Andes, Simon Banyai, Tim Hilfiger, Mark Malonzo, and Stephen Zak. Attending for DISH Network on July 14 were Ms. Minea, Mr. Hanbury, and Mr. Peters. Attending from the Commission on July 14 were Jose Albuquerque, Karl Kensinger, and Clay DeCell.

² See Letter from David Goldman, Director of Satellite Policy, SpaceX, to Marlene Dortch, Secretary, FCC, IBFS File No. SAT-MOD-20200417-00037 (filed June 29, 2020) (“SpaceX June 29 Letter”).

³ See Letter from Jeffrey Blum, Executive Vice President, External and Legislative Affairs, DISH Network LLC, to Marlene Dortch, Secretary, FCC, IBFS File No. SAT-MOD-20200417-00037 (filed June 16, 2020) (“DISH June 16 Letter”).

potential 5G operations in the band.⁴ Yet SpaceX continues to stonewall interested stakeholders and refuses to provide the technical analysis and information requested to date. The Commission should require more information from SpaceX or dismiss the company’s modification application as deficient.

Instead of addressing the technical merits, SpaceX devotes much of its response faulting DISH for not undertaking its own equivalent power flux density (“EPFD”) analysis of SpaceX’s constellation or requesting SpaceX’s underlying data files.⁵ SpaceX’s attempt to shift the burden is nonresponsive, improper, and contrary to the Commission’s rules. It is SpaceX as the applicant that bears the responsibility of demonstrating that its power levels will not exceed what a standard DBS reference antenna can tolerate.⁶ The Commission’s rules do not require DISH or anybody else to do SpaceX’s work for it. And for good reason—SpaceX holds the data and is best positioned to conduct the relevant engineering analysis.

SpaceX limits its substantive response to a single footnote. In footnote nine of its reply, SpaceX says the analytical approach OneWeb employed in its EPFD analysis to assume that a large number of co-frequency satellites could cover a given area “may be appropriate” for a system with large fixed beams, but “is not needed” for systems such as SpaceX’s Starlink that have steerable beams.⁷ SpaceX does not explain why the presence of steerable beams would allow an applicant to move from relatively conservative assumptions in its EPFD downlink analysis to the most permissive value possible.⁸ SpaceX also offers no other explanation for the set of assumptions that underlie its reworking of OneWeb’s analysis or the remarkable conclusion that the changed assumptions do not affect the outcome of its EPFD analysis.

Contrary to SpaceX’s claims, NGSO applicants with steerable beams do, in fact, use the same type of inclusive assumptions in their EPFD downlink analyses that OneWeb did. To take just one example, Telesat has said that each of its satellites will provide up to 24 “fully independent,

⁴ See Letter from V. Noah Campbell, RS Access, LLC, to Marlene Dortch, Secretary, FCC, RM-11768 *et al.* (filed June 11, 2020).

⁵ SpaceX June 29 Letter at 2.

⁶ See 47 C.F.R. § 25.146(a)(2).

⁷ SpaceX June 29 Letter at 2, fn. 9.

⁸ Beams from space, whether fixed or steerable, are large when they reach Earth. In a constellation such as SpaceX’s proposed system which features at least 4,400 satellites, an operator will face serious technical and operational impediments in attempting to prevent co-frequency satellite beams from overlapping. SpaceX has not explained how it intends to avoid unintentional co-frequency overlap or whether any solutions it may pursue, such as spectrum splitting, would impair the company’s proposed service to such a degree as to make the offering less economically viable.

shapeable and steerable” beams to its end users⁹ and the constellation will not use more than one satellite on a frequency at any one time with the intention of providing service to a given location.¹⁰ The latter factor—the maximum number of satellites transmitting with overlapping frequencies to a given location—is critical because EPFD levels increase as more satellites transmit to a single point simultaneously. Even though Telesat’s system uses steerable and shapeable beams and will not allow more than one satellite to intentionally transmit to one point on Earth simultaneously, Telesat explained that “a much higher value [than one] needs to be used when running the EPFD validation software in order to capture the contributions to the EPFD_{down} from a larger number of satellites, whether or not they are intentionally transmitting to this given location.”¹¹ Telesat used a value of 30.¹² SpaceX inexplicably used a value of one.

Here and elsewhere, SpaceX has used assumptions that are at odds with the assumptions that similarly situated applicants use to analyze their cumulative EPFD effects on other services. The point here is not to insist on some rigid uniformity of analysis. The point is simply that SpaceX must employ credible assumptions if it hopes to demonstrate the veracity of its purported compliance with the applicable domestic and international EPFD limits used to safeguard DBS subscribers from experiencing harmful interference.

In both its application and its response to written analysis, however, SpaceX simply does not address how DISH’s DBS customers who rely on co-channel frequencies will remain protected after the Starlink’s system’s reconfiguration. SpaceX’s modification seeks to: (1) drop the altitude of its 4,408 satellites by half; (2) triple the number of orbital planes; (3) tightly stack the orbital shells with as little as ten kilometers of separation between them; and (4) drop the consistent minimum elevation angle from 40 to 25 degrees.¹³ As DISH explained, these changes would cumulatively result in a tighter and denser net of Starlink satellites encircling the Earth.¹⁴

Although these changes raise serious questions about whether a modified Starlink can coexist with DBS, SpaceX refuses to provide a robust and reliable single-entry EPFD analysis that would address DISH’s concerns. Instead, SpaceX boasts that by reducing the size of its constellation from 4,409 space stations to 4,408, the modification will lower the “average”

⁹ See *Telesat Canda, Application to Modify Petition for Declaratory Ruling to Grant Access to the U.S. Market for Telesat’s NGSO Constellation*, IBFS File No. SAT-MPL-20200526-00053, Technical Information Supplement to Schedule S, at 2 (filed May 26, 2020).

¹⁰ *Id.* at 15.

¹¹ *Id.*

¹² *Id.*

¹³ DISH June 16 Letter at 2.

¹⁴ DISH June 16 Letter at 3-4.

number of “satellites in view” by 0.96.¹⁵ The “average” number of satellites in view is a partial and misleading metric that does not address EPFD or take into account the actual location of DBS satellite and receivers. And it defies credulity that eliminating one satellite from a massive mega-constellation would decrease the single-entry EPFD, considering all the other changes SpaceX will make to densify its constellation in the Earth’s lower altitude. Tellingly, SpaceX does not claim that Starlink’s single-entry EPFD would decrease following the modification.

Instead of providing the single-entry EPFD analysis DISH requested, SpaceX insists that it met the very minimum required by the Commission’s rules.¹⁶ Even if SpaceX’s defense of bare compliance were true, that does not demonstrate that the modified system will meet the single-entry EPFD limits and protect DBS subscribers and other fixed earth station users on the ground. The Communications Act obligates the Commission to protect licensed services from harmful interference.¹⁷ Moreover, the Commission’s 2017 decision to streamline paperwork burdens on applicants¹⁸ does not alter the Commission’s authority to scrutinize any certification of favorable determination made to the International Telecommunications Union (“ITU”). The Commission’s oversight mandate is especially important where, as here, reasonable basis exists to question the veracity of the certifications or representations made to the agency.¹⁹ The Commission’s rules require dismissal if “[t]he application is defective with respect to completeness of answers to questions, informational showings, internal inconsistencies, execution, or other matters of a formal character; or [t]he application does not substantially comply with the Commission’s rules, regulations, specific requests for additional information, or other requirements.”²⁰ Simply put, if there is reason to believe that SpaceX’s EPFD levels do not comply with the Commission’s rules and policies, including policies incorporated by reference to

¹⁵ SpaceX June 29 Letter at 3.

¹⁶ *Id.* at 2.

¹⁷ See, e.g., *Revision of Part 15 of the Rules Regarding the Operation of Radio Frequency Devices without an Individual License*, Notice of Proposed Rulemaking, 2 FCC Rcd 6135, 6166 n.16 (1987) (noting that the Communications Act requires the Commission to “establish regulations necessary to prevent harmful interference to the authorized radio services”). See also 47 U.S.C. § 302(a) (instructing the Commission to promulgate regulations governing the interference potential of devices which are capable of causing “harmful interference” to radio communications); 47 U.S.C. § 303(f) (authorizing the Commission “[m]ake such regulations not inconsistent with law as it may deem necessary to prevent interference between stations”).

¹⁸ *Update to Parts 2 and 25 Concerning Non-Geostationary, Fixed-Satellite Service Systems and Related Matters*, Report and Order and Further Notice of Proposed Rulemaking, 32 FCC Rcd 7809 ¶ 42 (2017).

¹⁹ See, e.g., *Certification of Financial Qualifications by Applicants for Broadcast Station Construction Permits*, Public Notice, 2 FCC Rcd 2122 (1987) (making clear that Commission staff has the authority to request additional information to verify that the certification of financial qualification is true and accurate). The Commission also has the authority to investigate and request additional information in response to formal complaints. See 47 C.F.R. § 1.721.

²⁰ 47 C.F.R. § 25.112(a).

international standards, SpaceX cannot evade the requirement by submitting a favorable certification in the face of material evidence that contradicts the truth of that assertion.²¹

Although SpaceX has characterized the 12 GHz band as a “workhorse” band for its NGSO system,²² the truth is DBS licensees have relied on the 12 GHz band to bring news, entertainment, and information to tens of millions of Americans for many decades. Whereas DBS licensees have few options beyond the 12 GHz band, NGSO operators like SpaceX have received *15 gigahertz* of alternative spectrum to conduct its proposed operations. Please refer to the attached visualization of SpaceX’s spectrum resources. Indeed, for downlink spectrum alone, SpaceX has access to approximately 8,300 megahertz. It is not unreasonable to expect Commission licensees like SpaceX to demonstrate responsible use of shared orbital resources, especially in light of the frequencies the company has already arrogated to date to the exclusion of other stakeholders.

The U.S. economy also needs additional mid-band spectrum to fuel its continued 5G leadership. While the FCC has made great strides in freeing mid-band resources for deployment, the gap in available mid-band resources between the U.S. and its global competitors of China, South Korea, the United Kingdom and other nations shows how much more work in identifying additional 5G spectrum resources remains to be done.²³ The 12 GHz band can help the U.S. remain a 5G leader by immediately delivering 500 megahertz of terrestrial 5G spectrum for commercial investment and innovation without upending existing services. Multiple technical studies have demonstrated how the 12 GHz band can support 5G broadband without disrupting existing DBS operations.²⁴ During the meeting with staff, DISH urged the Commission to act on the long-

²¹ See, e.g., 47 C.F.R. § 1.65 (“Each applicant is responsible for the continuing accuracy and completeness of information furnished in a pending application or in Commission proceedings involving a pending application. Except as otherwise required by rules applicable to particular types of applications, whenever the information furnished in the pending application is no longer substantially accurate and complete in all significant respects, the applicant shall as promptly as possible and in any event within 30 days, unless good cause is shown, amend or request the amendment of the application so as to furnish such additional or corrected information as may be appropriate.”).

²² See Letter from David Goldman, Director of Satellite Policy, SpaceX, to Marlene Dortch, Secretary, FCC, RM-11768, at 1 (filed June 4, 2020).

²³ Janette Stewart et al., *5G Mid-Band Spectrum Global Update* (March 2020), <https://bit.ly/32eBumG> (finding that while the US is “is expected to have assigned 350MHz of licensed mid-band spectrum by 2022, it will still lag behind several other leading markets (including Canada, China, Hong Kong, Japan, South Korea, and the UK), which have moved and/or are continuing to move aggressively in terms of mid-band spectrum assignment”).

²⁴ See Tom Peters, *MVDDS 12.2-12.7 GHz Co-Primary Service Coexistence*, at 35 (June 8, 2016), available at Attachment I to Comments of MVDDS 5G Coalition, RM-11768 (filed June 8, 2016) (finding that “coexistence between MVDDS 5G operations and DBS receivers is possible with modest adjustments to MVDDS site locations and radiofrequency design parameters.”); Tom Peters, *MVDDS 12.2-12.7 GHz Co-Primary Service Coexistence II* (June 23, 2016), available at Appendix A to Reply

pending petition for rulemaking that has sought the regulatory relief operators need to deploy 5G services in the 12 GHz band.²⁵ Please feel free to contact me with any questions regarding this submission.

Sincerely,

/s/ Jeffrey Blum

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Attachment

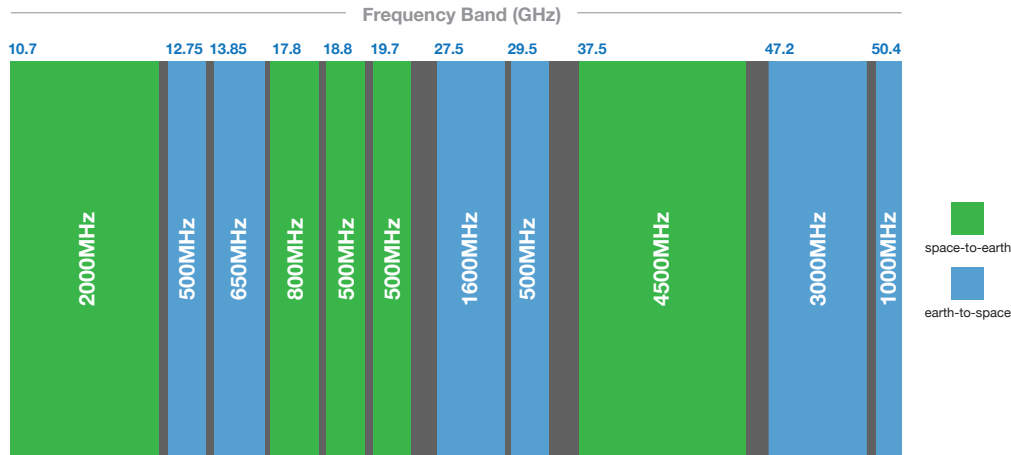
Comments of MVDDS 5G Coalition, RM-11768 (filed June 23, 2016) (revalidating the original coexistence study in different topological use-cases); Tom Peters, *MVDDS 12.2 - 12.7 GHz NGSO Coexistence* (August 15, 2016), *available at* Exhibit I of Petition to Deny of MVDDS 5G Coalition, RM-11768, *et al.* (filed August 15, 2016).

²⁵ See Petition of MVDDS 5G Coalition for Rulemaking, RM-11768 (filed Apr. 26, 2016).

Spectrum Available to SpaceX Non-Geostationary Orbit Fixed-Satellite Service (NGSO FSS).

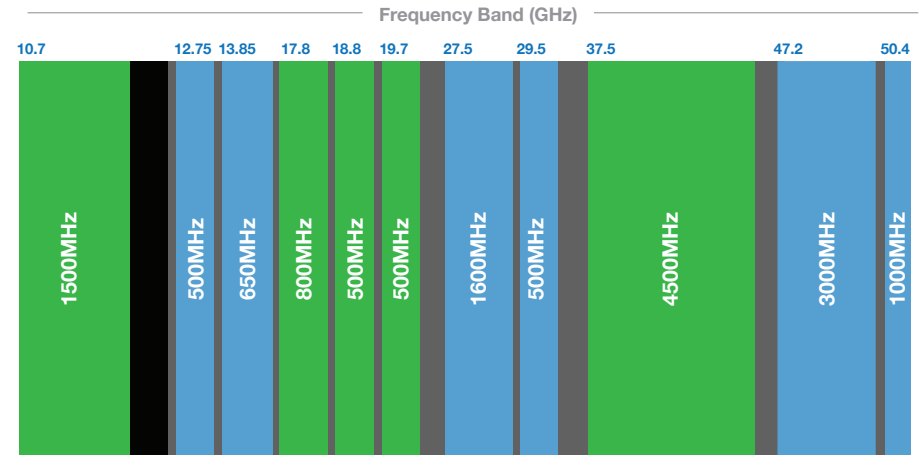
With **over 15,000 megahertz** of spectrum at its disposal, SpaceX has the significant spectrum resources necessary to provide satellite service today and in the years to come, with or without the 12 GHz band.

Total Spectrum Available for NGSO FSS



Total Spectrum: 15,550 MHz

Total Spectrum Available for NGSO FSS exclusive of 12.2-12.7 GHz (12 GHz Band)



Total Spectrum: 15,050 MHz

If the FCC were to repurpose the 12 GHz band for terrestrial 5G services, SpaceX would retain nearly 97% of all spectrum and nearly 94% of all space-to-earth spectrum made available for its proposed NGSO FSS system.

* SpaceX has been on notice that their authorization in the 12 GHz Band is subject to modification by FCC rules and policies.