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**VIA ELECTRONIC FILING**

Marlene H. Dortch, Secretary  
Federal Communications Commission  
45 L Street NE  
Washington, DC 20554

Re: Expanding Flexible Use of the 12.2-12.7 GHz Band, WT Docket No. 20-443; IBFS File No. SAT-MOD-20200417-00037; Petition of Starlink Services, LLC for Designation as an Eligible Telecommunications Carrier, WC Docket No. 09-197; Long-Form Application of Space Exploration Technologies Corp., Auction 904 File Number 0009149922, et al.; Rural Digital Opportunity Fund (Auction 904), AU Docket No. 20-34; Rural Digital Opportunity Fund, WC Docket No. 19-126

Dear Ms. Dortch:

DISH Network Corporation (“DISH”) and five other parties have requested that the Commission not grant SpaceX’s proposed modification request except, if at all, subject to conditions essential to avoid interference with services received by millions of U.S. households, including DISH’s Direct Broadcast Satellite (“DBS”) service customers.<sup>1</sup> In response, SpaceX continues a practice that has become familiar: do not cede any ground except inch by inch; test how much is enough to gain an authorization by begrudging concessions tiny increments at a time; and still offer assurances that are inadequate to provide any comfort that Starlink’s service will not interfere with consumers’ DBS reception, or any mechanism to avoid or cure such interference.

For the first time, after having been prompted by DISH no fewer than nine times, SpaceX finally uses the word “commit[ment],” and commits that it will observe a value of 1 for Nco, and that it will “not use more than one satellite beam from any of its satellites in the same frequency in the same or overlapping areas at a time.”<sup>2</sup> While necessary, this is inadequate for several reasons.

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<sup>1</sup> See e.g., Letter from Jeffrey Blum, DISH, to Marlene Dortch, IBFS File No. SAT-MOD-20200417-00037 (Apr. 6, 2021); Letter from Trey Hanbury, RS Access, to Marlene Dortch, IBFS File No. SAT-MOD-20200417-00037 (Apr. 9, 2021); Letter from Jennifer Manner, Hughes, to Marlene Dortch, IBFS File No. SAT-MOD-20200417-00037 (Apr. 12, 2021); Letter from Amy Mehlman, Viasat, to Marlene Dortch, IBFS File No. SAT-MOD-20200417-00037 (Apr. 12, 2021); Letter from Mariah Dodson Shuman, Kuiper Systems, to Marlene Dortch, IBFS File No. SAT-MOD-20200417-00037 (Apr. 15, 2021); Letter from Nickolas Spina, Kepler, to Marlene Dortch, IBFS File No. SAT-MOD-20200417-00037 (Apr. 16, 2021).

<sup>2</sup> Letter from David Goldman, SpaceX, to Marlene Dortch, FCC, IBFS File No. SAT-MOD-20200417-00037, at 4 (Apr. 15, 2021) (“SpaceX Conditions Reply”).

**First**, DISH’s showing that SpaceX, even operating at an Nco of 1, will exceed the EPFD limits<sup>3</sup> remains un rebutted by SpaceX. NGSO satellite engineering expert Marc Dupuis has used real-world data to show that SpaceX’s Starlink system will exceed the ITU equivalent power flux density (“EPFD”) limits even if only one Starlink satellite were to communicate with any one point on earth at any given point in time (*i.e.*, an Nco value of 1).<sup>4</sup> SpaceX expects an authorization by saying only that it will not use more than one satellite co-frequency and co-coverage at a time, and not sparing one word for the all-important next question—whether one satellite is enough to do harm. Among other omissions, SpaceX has not even tried to object to DISH’s point that using real-world data is superior to the simulation software it used. This is not surprising, because the point is amply supported by Commission precedent.<sup>5</sup>

**Second**, even with a nominal Nco of 1, the effective Nco will be higher for a simple reason: as Mr. Dupuis has pointed out, the software used by the ITU for the calculation of EPFD levels only considers the contribution of those satellites inside the GSO exclusion zone plus the one satellite from outside the exclusion zone corresponding to an Nco of 1, and omits the effect of satellites outside the exclusion zone serving neighboring areas.<sup>6</sup>

**Third**, SpaceX does not explain how it will comply with the obligations imposed on it under the Rural Digital Opportunity Fund (“RDOF”) program, from which it stands to receive almost \$1 billion in subsidies. If the customer demand that SpaceX is required to meet in a rural area requires the use of more than one co-frequency satellite beam, the satisfaction of SpaceX’s RDOF obligations would require a violation of its Nco = 1 commitment.<sup>7</sup> The Nco = 1 commitment remains suspect without an explanation of what SpaceX stands to do in this circumstance.

**Fourth**, while SpaceX has grudgingly agreed with DISH that modification should be “subject to the condition that SpaceX not use more than one satellite beam from any of its satellites in the same frequency in the same or overlapping areas at a time,”<sup>8</sup> SpaceX dismisses the rest of DISH’s proposed conditions with the back of its hand. The conditions proposed by DISH also touch on interference caused by a single satellite, data-based validation, and future Commission findings. SpaceX is silent on the first two of these. But the one-satellite-interference condition is necessary because, as mentioned, the Nco = 1 condition says nothing about the problems *from* Nco = 1, and because SpaceX has not rebutted DISH’s showing. As for data-based validation, it would be necessary in all cases, and all the

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<sup>3</sup> Letter from Jeffrey Blum, DISH, to Marlene Dortch, FCC, IBFS File No. SATMOD20200417-00037; WT Docket No. 20-443 (Mar. 25, 2021) (attaching *EPFD Assessment of SpaceX into DISH Ku-band GSO Networks Located in the United States*) (“March 25 Study”).

<sup>4</sup> *Id.*

<sup>5</sup> See *e.g.*, Applications of T-Mobile US, Inc. and Sprint Corporation for Consent to Transfer Control of Licenses and Authorizations, *Memorandum Opinion and Order, Declaratory Ruling, and Order of Proposed Modification*, 34 FCC Rcd. 10578, 10636 ¶ 128 (2019) (concluding that use of actual real-world porting data is a superior method of calculating diversion than model estimates).

<sup>6</sup> March 25 Study at 3.

<sup>7</sup> See Letter from Amy Mehlman, Viasat, to Marlene Dortch, FCC, AU Docket No. 20-34; WC Docket No. 19-126; WC Docket No. 09-197; IBFS File No. SAT-MOD20200417-00037; WT Docket No. 20-443, at 2 (Apr. 5, 2021) (“SpaceX cannot satisfy *both* the Nco = 1 commitment underlying its pending modification application *and* its RDOF service obligations.”).

<sup>8</sup> SpaceX Conditions Reply at 4.

more so because of SpaceX's history of evasion on the subject, as well as the difficulty of identifying SpaceX as the source of the problem when one, two, or a hundred thousand DBS customers are faced with interference. Put simply, DISH will likely suffer irreparable injury if the Commission were to grant the requested authorization, and that injury will be even more acute if SpaceX is not subjected to conditions including the provision of timely data about its 12 GHz transmissions. Under an appropriate protective order, SpaceX thus must submit sufficient and timely information about its operations to permit DBS licensees to assess compliance with this condition. This condition would pose a minimal burden on SpaceX, as it surely monitors that information itself.

SpaceX's assertion that "there is no legal requirement that third parties evaluate the sufficiency of EPFD data inputs prior to deployment of an NGSO system"<sup>9</sup> is irrelevant, since the Starlink system already has 1,325 satellites in orbit. In fact, the ITU Radio Regulations contain a provision that allows one administration to request information from another administration if it has reasons to believe that its *operational* NGSO FSS system is exceeding certain EPFD limits.<sup>10</sup> Since the United States is the licensing administration for both DISH and Starlink, the Commission should permit DISH to analyze the operations of the Starlink system if it has reasons to believe, and in fact has already demonstrated, the potential excess EPFD caused by this system. The reason that other NGSO FSS systems are authorized to operate with no obligation to submit corroborating information is that, among other things, most of these systems have not yet deployed satellites and are not providing services in the United States.

**Finally**, with respect to future Commission findings, SpaceX states only that "DISH includes surplus language related to application of potential future Commission interpretations of the EPFD rules, but SpaceX would already be subject to any such interpretations and there is no reason to single out that possibility in this condition."<sup>11</sup> But this is not even a proper objection. Since SpaceX concedes that such findings will govern, there is no harm in clarifying that point. SpaceX's authorization should explicitly be subject to any findings the Commission may make about the method for determining EPFD limit compliance and the operating requirements for avoiding unacceptable interference into DBS systems consistent with international footnote RR 5.487A. This language would make clear that SpaceX would need to comply with any such findings in the future, even if promulgated after a grant of SpaceX's modified authorization. In fact, SpaceX's existing authorization is subject to similar conditions.<sup>12</sup> What has changed since militates in favor of more, not less, vigilance: the Commission has before it previously unavailable evidence of the interference risks arising from the Starlink system; and what was then a petition for rulemaking regarding the sharing of the 12 GHz band has now matured into a full-fledged rulemaking proceeding.<sup>13</sup>

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<sup>9</sup> *Id.*

<sup>10</sup> ITU RR Provision No. 22.5I.

<sup>11</sup> SpaceX Conditions Reply at 4.

<sup>12</sup> See Space Exploration Holdings, LLC, Application for Approval for Orbital Deployment and Operating Authority for the SpaceX NGSO Satellite System, *Memorandum Opinion, Order and Authorization*, 33 FCC Rcd. 3391, 3407 ¶ 40(r) (2018).

<sup>13</sup> See Expanding Flexible Use of the 12.2-12.7 GHz Band, WT Docket No. 20-443, *Notice of Proposed Rulemaking*, 36 FCC Rcd. 606 (2021).

In the interest of reaching a compromise, DISH agrees to narrow its proposed one-satellite-interference condition to make sure it is specifically tailored to the question of real-life exceedance of the EPFD limits, by adding an appropriate qualification. DISH's proposed conditions (as modified) read as follows:

**Condition 1:**

Operations in the 12.2-12.7 GHz (space-to-Earth) frequency band are authorized up to the power flux-density limits in 47 CFR § 25.208(o) and Article 21 of the ITU Radio Regulations, and up to the equivalent power flux-density requirements of Article 22 of the ITU Radio Regulations, as well as Resolution 76 (Rev. WRC-15) of the ITU Radio Regulations, subject to the condition that SpaceX not use more than one satellite beam from any of its satellites in the same frequency in the same or overlapping areas at a time; and further subject to any findings the Commission may make about EPFD limit compliance and the operating requirements for avoiding unacceptable interference into DBS systems consistent with international footnote RR 5.487A, **specifically with respect to DISH's showing that the Starlink system will exceed EPFD limits for many types of consumer DBS antennas and locations with an Nco of 1**; SpaceX must submit under an appropriate protective order sufficient information about its operations to permit DBS licensees to assess compliance with this condition.

**Condition 2:**

This authorization is subject to modification to bring it into conformance with any rules or policies adopted by the Commission in the future. Accordingly, any investments made toward operations in the bands authorized in this order by SpaceX in the United States assume the risk that operations may be subject to additional conditions or requirements as a result of any future Commission actions, including the obligation to cease operations as a result of any future Commission actions on related matters, including the pending rulemaking proceeding regarding the 12.2-12.7 GHz band,<sup>14</sup> SpaceX's Petition for designation as an eligible telecommunications carrier,<sup>15</sup> and SpaceX's application for modification of its blanket earth station license to permit operation of earth stations in motion ("ESIMs").<sup>16</sup>

For these reasons, the Commission should not grant the requested modification except subject to the foregoing conditions.

/s/ Jeffrey H. Blum  
Jeffrey H. Blum

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<sup>14</sup> Expanding Flexible Use of the 12.2-12.7 GHz Band, WT Docket No. 20-443, *Notice of Proposed Rulemaking*, FCC 21-13 (Jan. 15, 2021).

<sup>15</sup> Petition of Starlink Services, LLC for Designation as an Eligible Telecommunications Carrier, WC Docket No. 09-197 (Feb. 3, 2021).

<sup>16</sup> SpaceX Services, Inc, Application for Blanket-Licensed Earth Stations in Motion, IBFS File No. SES-LIC-INTR2021-00934 (Mar. 5, 2021).