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July 7, 2016

VIA ELECTRONIC FILING

Marlene H. Dortch
Secretary
Federal Communications Commission
445 12th Street, SW
Washington, DC 20554

Re: *Ex Parte* Submission, GN Docket No. 14-177; IB Docket Nos. 15-256 & 97-95; RM-11664; WT Docket No. 10-112

Dear Ms. Dortch:

Inmarsat Inc. and its affiliates (together, "Inmarsat") submit this *ex parte* letter to emphasize the critical need for continued access to the 27.5-28.35 GHz frequencies ("28 GHz Band") by satellite networks and for the protection of satellite operations in the band on a co-primary basis with new mobile wireless services. Inmarsat supports and agrees with the legal analysis presented by ViaSat, Inc. ("ViaSat") in its July 1, 2016 submission, clarifying for the record the framework upon which the satellite industry has relied in investing billions of dollars on high-capacity broadband satellite networks that use the 28 GHz Band.[1]

In the submission, ViaSat details the long history—over 40 years—of satellite's co-primary allocation in the 28 GHz Band,[2] as well as the long-standing Ka-band band plan, under which satellite has had "licensing priority vis-a-vis any third service allocated domestically or internationally in the band,"[3] including mobile wireless services.[4] Inmarsat has urged the

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1 ViaSat, Inc., *Ex Parte* Submission, Legal Status of Fixed Satellite Service in the 28 GHz Band; GN Docket No. 14-177; IB Docket Nos. 15-256 & 97-95; RM-11664; WT Docket No. 10-112 (filed July 1, 2016) ("ViaSat July 1 *Ex Parte*").

2 *Id.* at 5-6.

3 *Rulemaking to Amend Parts 1, 2, 21, and 25 of the Commission's Rules to Redesignate the 27.5-29.5 GHz Frequency Band, to Reallocate the 29.5-30.0 GHz Frequency Band, to Establish Rules and Policies for Local Multipoint Distribution Service and for Fixed Satellite Services*, First Report and Order, 11 FCC Rcd 19005 ¶ 44 (1996) ("*28 GHz First Report and Order*"); *see also* ViaSat July 1 *Ex Parte* at 8.

Commission since the beginning of this proceeding to consider both the status of satellite within the current Ka band plan adopted in 1996, and the investments that have been made in reliance on the satellite network authorizations issued under that plan.

Indeed, Inmarsat and others have deployed in the 28 GHz in the manner contemplated by this band plan. These 28 GHz satellite deployments form the backbone of broadband systems upon which millions of users across the American government, business, and consumer sectors rely every day. As SIA has explained in this proceeding, approximately 2 million U.S. residential customers of satellite broadband are supported by 28 GHz today.[5] This includes both substantial portions of rural America, as well as urban and suburban customers seeking a cost-effective, high-performance alternative to terrestrial broadband technologies. It also includes one million devices connected every day to in-flight Wi-Fi services provided by satellite broadband.

Inmarsat has invested $1.6 billion in its Global Xpress Ka-band satellite network, which provides commercial service in the United States using the 28 GHz Band frequencies. Specifically, the Commission has authorized the Inmarsat-5 F2 satellite to serve the United States using the 28 GHz Band and has licensed Inmarsat's gateway earth station in Lino Lakes, Minnesota.[6] The conditions of this authorization make clear that operations in the 28 GHz Band are subordinate only to LMDS,[7] and, as ViaSat details, LMDS does not include a mobile component—in fact, mobile applications of the LMDS service expressly have been prohibited for twenty years.[8] Inmarsat has emphasized in this proceeding that these investments were made based on the existing band plan, Inmarsat's Commission authorization, and the absence of any accommodation in the Commission's rules for licensing ubiquitously deployed mobile broadband services in the 28 GHz Band.[9] Thus, any proposed changes to the long-established band plan must take into account the nearly 20 years of intervening developments and deployment of services in the band, including Global Xpress.[10]

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4 ViaSat July 1 *Ex Parte* at 8-10.

5 Satellite Industry Association, Notice of *Ex Parte*, Attachment at 3 (filed May 10, 2016).

6 *See Inmarsat Mobile Networks, Inc., Application to Operate a Fixed-Satellite Service Gateway Earth Station Facility in Lino Lakes, Minnesota with the Inmarsat-5 F2 Space Station*, Order and Authorization and Declaratory Ruling, 30 FCC Rcd 2770 (IB, OET 2015).

7 *Id.* ¶ 12; *see also* Comments of Inmarsat Mobile Networks, Inc., GN Docket No. 14-177, *et al.*, at 5-6 (filed Jan. 28, 2016) ("Inmarsat Comments").

8 *See* ViaSat July 1 *Ex Parte* at 8-10

9 Inmarsat Comments at 6; Reply Comments of Inmarsat Mobile Networks, Inc., GN Docket No. 14-177, et al., at 6 (filed Feb. 26, 2016).

10 *See* ViaSat July 1, *Ex Parte* at 15-16.

To be clear, the Upper Microwave Flexible Use ("UMFU") service contemplated in the NPRM is a new service that is distinct from LMDS. The Commission has proposed to issue new licenses, for the first time with mobile authority, many to new licensees, through a new spectrum auction. The licenses will cover new service areas, and the Commission is contemplating new technical limits. At bottom, every material aspect of the service is changing; the fact that the Commission proposes to grant these new licenses for free to the portion of original LMDS licensees that were able to maintain their licenses does not make UMFU the same as LMDS.

Thus, affording co-primary status for satellite receivers is warranted in light of the industry's reasonable reliance upon the existing band plan. The interference environment created by ubiquitously deployed mobile services for which no service rules exist today is very different than that currently in existence under the primary LMDS service. Indeed, according to the Fact Sheet provided by the Chairman, UMFU stations will be allowed to operate at significantly higher power levels than proposed in the NPRM,[11] which further increases the potential for interference to satellite receivers. Inmarsat urges the Commission to establish clearly the entitlement of 28 GHz satellite receivers to protection from aggregate interference from mobile wireless services operating at 28 GHz as a co-primary service, and to explore mechanisms for providing this protection.

Recognition of co-primary status for space station receivers is essential to implementing an "effective sharing scheme," as articulated in the Fact Sheet.[12] Co-primary status for 28 GHz band satellite receivers is necessary to give satellite operators any reliable level of protection from harmful interference, should it develop in the future. Granting co-primary status to satellite receivers would establish a baseline understanding that both UMFU and FSS operations are entitled to interference protection, promoting incentives for collaboration in developing solutions for effective spectrum sharing. Wireless industry filers in this proceeding have asserted that 28 GHz UMFU deployments naturally will cause no harmful interference to satellite receivers due to technical and operational characteristics inherent in planned wireless deployments at 28 GHz.[13] Based on this assertion, co-primary status for space station receivers simply will give satellite operators certainty of this protection, without hindering 28 GHz UMFU deployment in any way.

Additionally, recognizing co-primary status for 28 GHz space station receivers is the only way for the Commission effectively to mitigate instances of harmful interference in the future, should it occur. In a co-primary environment, the Commission can evaluate future complaints of

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[11] *Fact Sheet: Spectrum Frontiers Proposal to Identify, Open Up Vast Amounts of New High-Band Spectrum for Next Generation (5G) Wireless Broadband*, Federal Communications Commission, at 2 (rel. June 23, 2016).

[12] *Id.* at 1.

[13] Despite several filings from satellite operators, including recently ViaSat, demonstrating that interference to satellite receivers could occur depending on technical/operational characteristics of UMFU, UMFU proponents have so far argued against incorporating the technical or operational characteristics they have espoused into service rules.

harmful interference and take whatever action it deems in the public interest. Should it make FSS secondary to UMFU at 28 GHz now, the Commission's options for addressing harmful interference to FSS in the future, after UMFU operators have been granted primary, flexible use, exclusive licenses, could become much more limited. The Commission should not tie its hands today by imposing secondary status on satellite operators with respect to future UMFU deployments. Relegating FSS to secondary status would be inconsistent with the reasonable investment-backed reliance by satellite operators on the current 28 GHz band plan and their Commission authorizations, and would be unnecessary to protect UMFU deployment, particularly because there is no cost to potential UMFU operators from providing co-primary status for space stations.

Inmarsat requests that the Commission seek comment in a further notice or subsequent public notice on how best to monitor and mitigate the potential for harmful interference to 28 GHz space stations caused by the aggregate emissions from UMFU deployment. Such options could include future limitations on aggregate or individual UMFU base station transmissions, but also could include monitoring mechanisms. At a minimum, Inmarsat proposes that the information collection requirements that the Commission set forth in the proposed Section 30.205 in the NPRM be adopted.[14] Coupled with co-primary status for satellite receivers, the mechanisms enumerated in the proposed rule would be suitable for monitoring mobile wireless deployment in the 28 GHz band going forward. Specifically, understanding where, when, and how mobile wireless networks are deployed is important for enabling satellite and wireless services to coexist and enable evaluation of the potential for aggregate interference into satellite receivers from UMFU deployment. The mechanism proposed in Section 30.205 particularly would be critical if the Commission declines to adopt other technical limitations on wireless deployment. In any event, the Commission should also make clear in its order in this proceeding that mobile and fixed services in the United States must comply with ITU Radio Regulation No. 21.5, which specifies that the power delivered to the antenna of a station in the fixed or mobile service shall not exceed 10 dBW (40 dBm) per station.

Inmarsat is also concerned about the ability to deploy future earth stations in the 28 GHz band going forward. Inmarsat understands that the Commission is considering overly stringent criteria, similar to those proposed by Verizon,[15] which would severely limit future deployment of FSS earth stations, including in areas where earth station deployment is unlikely to negatively impact UMFU operations. For example, prohibiting earth station deployment in areas that might exceed 0.1 percent of the population of a given census tract or county counter-intuitively would discourage deployment in less densely populated areas. Imposing arbitrary restrictions on the number or placement of earth stations without respect to the impact on actual or planned UMFU deployment, or limiting earth station deployment to only a tiny percentage of the geography of an area of which an UMFU licensee is only expected to cover 40 percent, would unnecessarily

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[14] *See Use of Spectrum Bands Above 24 GHz For Mobile Radio Services*, GN Docket No. 14-177, *et al.*, Notice of Proposed Rulemaking, FCC 15-138 ¶ 147 & Appendix A, § 30.205. (rel. Oct. 23, 2015).

[15] *See* Verizon, Notice of *Ex Parte* Presentation, GN Docket. No. 14-177 (filed June 14, 2016).

restrict the growth of satellite services, including those relied upon consumers in rural and remote areas. This approach is inconsistent with the Commission's stated goal of spectrum efficiency, and will not take advantage of the well-utilized and established practice in spectrum management—frequency coordination.

Satellite industry participants have offered several alternative approaches to ensuring that deployment of new 28 GHz earth stations does not interfere with UMFU operations. For example, rather than defining the protection zone by a specific geographic distance, a June 22, 2016 SIA filing proposed that the FCC adopt a PFD limit of -77.6 dBm/m^2/MHz in relation to population-weighted density of 1500 people per square mile.[16] In a recent filing, O3b Limited endorsed the SIA approach, with additional flexibility for NGSO systems, and articulated various concerns with approaches based on geographic distance, percentage of population affected without regard to population density, and other anticompetitive siting limits.[17] Inmarsat supports the analysis and arguments set forth in the SIA and O3b Limited filings.

For these reasons, Inmarsat urges the Commission to afford co-primary status to satellite receivers that have been designed in reliance on the current 28 GHz band plan and existing Commission authorizations, and also to seek comment on mechanisms for monitoring and mitigating the potential for aggregate interference into satellite receivers by future mobile wireless deployment, including the adoption of the proposed Section 30.205.

Respectfully submitted,

/s/ Giselle Creeser

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cc: Chairman Tom Wheeler
Commissioner Mignon Clyburn
Commissioner Jessica Rosenworcel

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16 Satellite Industry Association, Written *Ex Parte* Presentation, GN Docket No. 14-177 (filed June 22, 2016).

17 O3b Limited, Notice of *Ex Parte* Presentation, GN Docket No. 14-177 (filed July 4, 2016).

Commissioner Ajit Pai
Commissioner Michael O'Rielly
Diane Cornell
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