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July 31, 2020

BY ELECTRONIC FILING

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

Re: *Ex Parte* Notification for IBFS File No. SAT-MOD-20200417-00037 and Docket RM-11768.

Dear Ms. Dortch,

On July 29 and July 30, 2020, representatives of Space Exploration Holdings, LLC ("SpaceX") met telephonically with Commissioner Carr, commissioners' legal advisors, the Wireless Bureau, and the International Bureau. A complete list of the participants in those meetings is attached. In each meeting we discussed the attached presentation.

The 12 GHz band is home to an American success story. Due to the Commission's foresight, the band has been a catalyst for investment and innovation contributing to the Commission's goal of truly closing the digital divide in the U.S. The Commission should not now succumb to speculation designed to sweep away the foundation of this accomplishment just as it is being realized. Instead, by staying true to its forward-leaning policies, the Commission can ensure American consumers reap the benefits of connectivity—just when they need it most.

Recognizing the implausibility of their earlier proposal, some parties now suggest that the additional rights 12 GHz MVDDS licensees request would somehow be consistent with their sharing the band with existing NGSO operations.[1] But technical analyses submitted by the MVDSS licensees themselves flatly contradict this assertion, concluding that MVDDS operators could not be given increased rights without interfering with existing NGSO licensees.[2] This

[1] *See, e.g.*, Letter from Noah Campbell, RS Access, LLC, to Marlene H. Dortch, Secretary, FCC, IBFS File No. SAT-MOD-20200417-00037, GN Docket No. 17-183, at 2 (filed June 11, 2020) (suggesting that these operations may be able to "coexist"); Letter from Jeffrey Blum, DISH, to Marlene H. Dortch, Secretary, FCC, File No. RM-11768, at 2 (filed July 20, 2020) (claiming that a rulemaking would give the Commission an opportunity to "address any interference concerns").

[2] *See, e.g.*, Letter from Alison Minea, DISH Network L.L.C., to Marlene H. Dortch, Secretary, FCC, IBFS File No. SAT-MOD-20180319-00022, File No. RM-11768, at 3 (filed Dec. 2, 2019) ("concurrent sharing of spectrum between co-primary 5G and NGSO FSS operations is not viable in the 12 GHz Band."); Tom Peters, MVDDS 12.2-12.7 GHz Co-Primary Service Coexistence II (June 23, 2016) *as attached to* Reply Comments of MVDDS 5G Coalition at Appendix A, File No. RM-11768 (filed June 23, 2016) ("In our original Coexistence Study, we identified interference to potential future NGSO FSS operations in the 12.2-12.7 GHz as probable even using best-

conclusion has been extensively documented by MVDDS proponents in the docket, yet the MVDDS licensees have never explained why their own analyses should no longer be relied upon. In fact, the record lacks any substantive proposal for how to go forward with the MVDDS proposal without harming NGSO operations, much less any evidentiary support for such a proposal.

Pursuant to the FCC's rules, I have filed a copy of this notice electronically in the dockets referenced above.

Sincerely,

Paul Caritj
Counsel for Space Exploration Holdings, LLC

cc: meeting participants

case assumptions for MVDDS operations. For example, a 5G MVDDS mobile device transmitting at the lowest possible power levels would still overwhelm NGSO devices located within twenty-two meters of the 5G MVDDS mobile device. Worse, even simply maintaining the existing maximum EIRP level of 14 dBm per 24 MHz that currently applies to MVDDS base stations would likely cause harmful interference to an NGSO receiver located as far as eleven kilometers distance from an MVDDS base station. Worse still, the probability for interference would increase if mobile NGSO deployments are allowed in the current FSS allocation. These and related constraints required of MVDDS, NGSO FSS or both services led us to conclude that 'while coexistence between DBS and MVDDS is feasible within limits, coexistence between NGSO FSS and MVDDS is not.'").

Meeting Participants

Commissioner Carr's Office
Commissioner Carr
Will Adams

Commissioner O'Reilly's Office
Erin McGrath

Commissioner Starks's Office
William Davenport

Wireless / International Bureau
Wireless Bureau
Blaise Scinto
Peter Daronco
Madelaine Maior
Tim Hilfiger
Stephen Zak
Stephen Buenzow
Matthew Pearl
Becky Schwartz

International Bureau
Jose Albuquerque
Karl Kensinger
Jay Whaley
Jameyanne Fuller
Joseph Hill
Clay DeCell

SpaceX
Mark Juncosa (Office of Commissioner Carr only)
Tim Hughes (Offices of Commissioners Carr, O'Reilly, and Starks)
David Goldman (All meetings)

Meeting with IB and WTB staff only:
Paul Caritj
Kevin Wu
Mihai Albulet
Zahid Islam
Will Seidel

SPACEX

12 GHz Spectrum

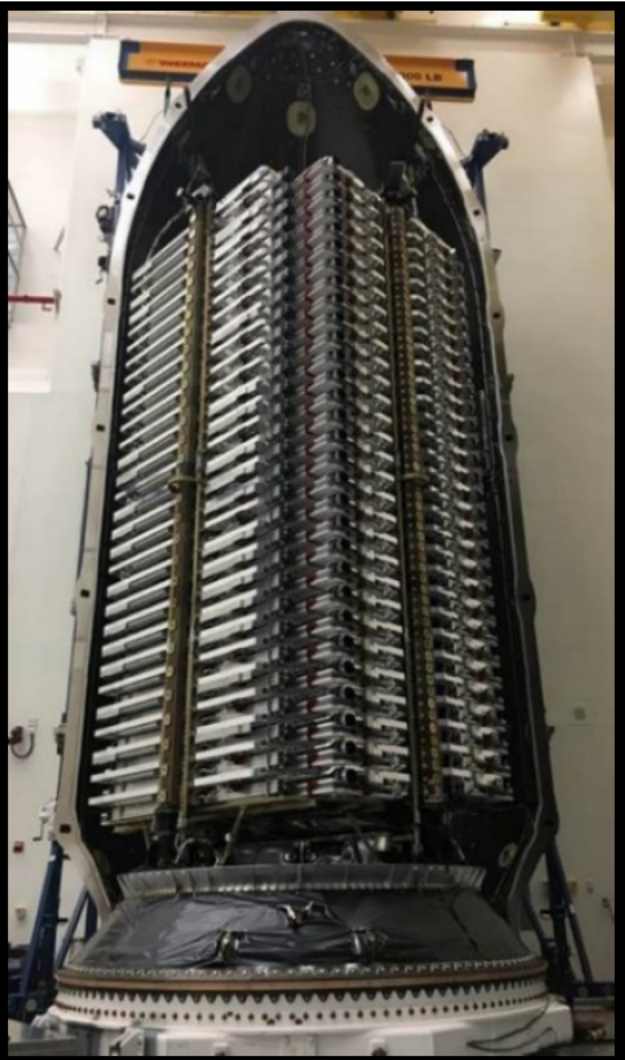
July 2020

Issue in Brief

- Multichannel Video and Data Distribution Service (MVDDS) licensees have held spectrum for 15 years and provided no meaningful connectivity solution

- LEO satellite constellations like Starlink are being deployed today and will begin affordable, high-speed commercial broadband service to remote and rural users this year, a mere two years after being licensed to operate by the FCC

- LEO satellite technology is being realized now and depends critically on the 12 GHz band for servicing consumers.

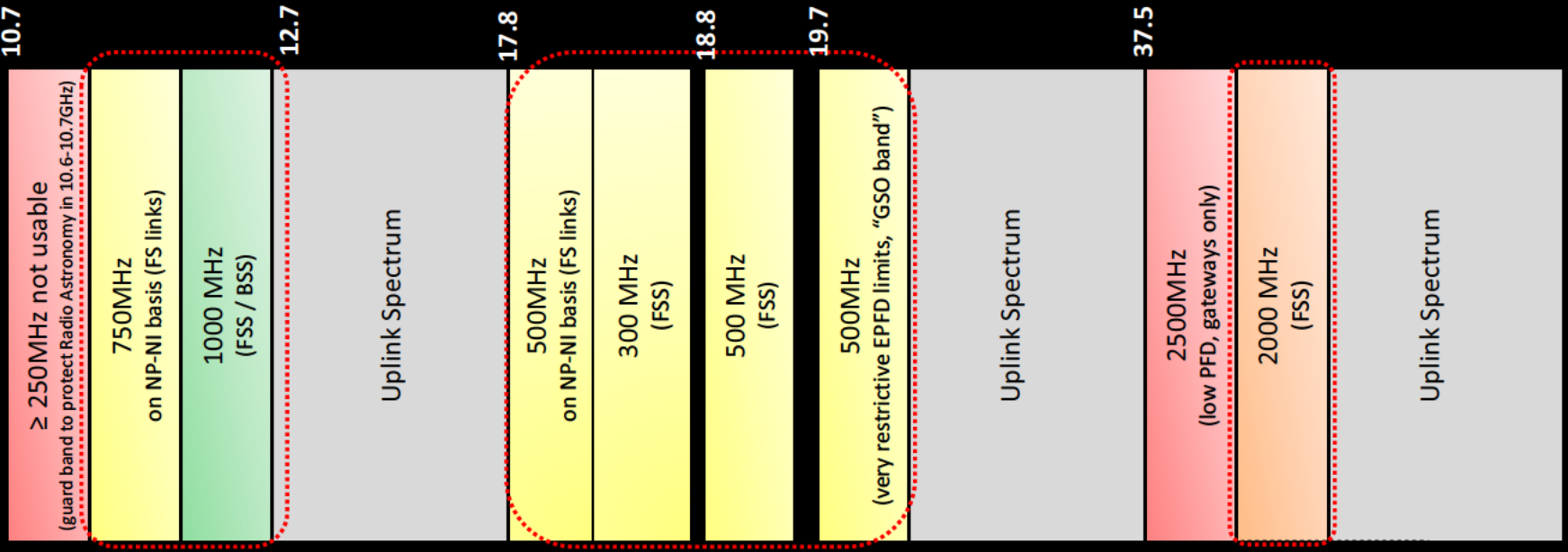


Starlink Deployment Status

- FCC licensed Starlink in 2018

- In just two years, SpaceX has:
  - Invested hundreds of millions of dollars in Starlink to date
  - Built a U.S. world-leading manufacturing system, now building 120 satellites per month
  - Deployed 500+ satellites using 12 GHz, now the largest satellite constellation in the world by far
  - Deployed gateway ground stations throughout the United States
  - Invested over $70 million developing and producing thousands of consumer user terminals per month using 12 GHz, with high-rate production soon to come
  - Fully licensed by the FCC for 1 million consumer user terminals in the U.S. that use 12 GHz
  - Begun beta service for hundreds of users in multiple states, including tribal communities

NGSO Licenses are Not Flexible Use—Services Cannot Be Moved



Spectrum available for reliable user downlink service

- Must protect GSOs
- Shared with other NGSOs

- High atmospheric attenuation
- Federal GSO and non-GSO networks must be protected over the entire Ka downlink spectrum (significant limitation)
- Must protect commercial GSOs
- Shared with other NGSOs

Not suitable for user service

- poor propagation
- technology not available for consumer terminals
- must protect GSOs
- shared with other NGSOs

Widespread Opposition to MVDDS Proposal to Evict NGSO

OneWeb: the record "conclusively demonstrate that the Coalition's petition should be dismissed or denied."

AT&T: MVDDS users "have not presented any technical justification for revisiting the rules"

Intelsat: "opposes both the proposal to allow mobile services in a DBS band and any degradation of the NGSO FSS allocation."

SES: MVDDS "has provided no technical analysis to rebut the sharing studies relied on by the Commission or to suggest that these regulatory restrictions are no longer needed to prevent MVDDS from causing harmful interference."

T-Mobile: "additional rights should not be automatically extended to the current MVDDS licensees."

Public Interest Groups: "any expanded spectrum rights or other terrestrial use of the band must be secondary to existing incumbent satellite users."

Federated Wireless: "recognizes the importance of protecting and preserving other authorized uses of the band."

WeLink: believes 5G should protect incumbent uses.

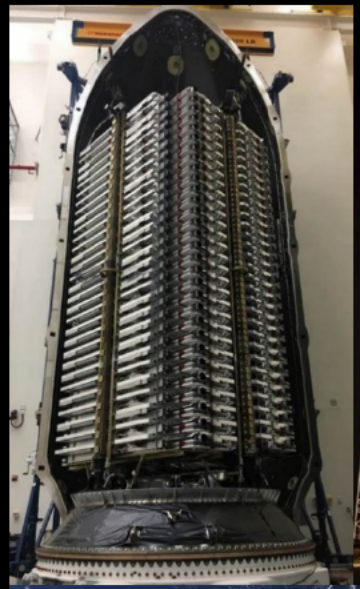
Competitive Carriers Association: the Commission should explore whether new uses could "co-exist with incumbent operations."

Basic Facts on the 12GHz Band

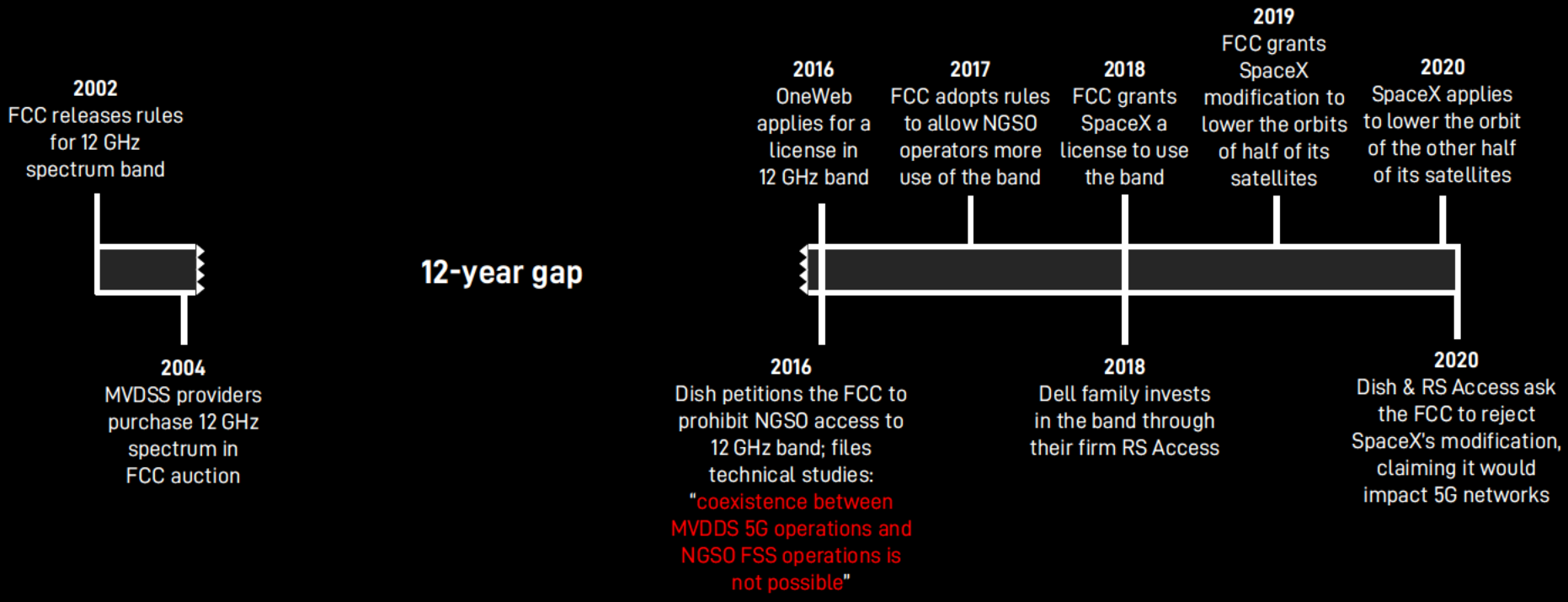
- MVDDS spectrum holders of the 12 GHz band purchased the spectrum knowing that they had to protect LEO fixed satellite systems
- The FCC did not mention 12 GHz in its "mid-band" NOI and there are no technologies, standards, or international rules relating to this band for 5G
- Under 47 CFR § 101.105 - Interference protection criteria, MVDDS is required to avoid interfering with fixed satellite systems in low Earth orbit
- MVDDS licensees asking to be given 5G rights for free

Starlink Modification

- MVDDS proponents now claim SpaceX's modification to lower the altitude of Starlink's operational orbit only on the basis that this will increase "interference" for 5G operations
  - The FCC previously approved a separate modification to lower Starlink's altitude with zero objection from MVDDS
  - Starlink's lower altitude modification is specifically designed to reduce latency for consumers and improve space safety, as satellites under 600km deorbit very rapidly, minimizing the risk of orbital debris
  - MVDDS has zero 5G operations with which to interfere; modification will not harm existing MVDDS services
  - LEO satellite constellations like Starlink have co-primary allocation of the 12GHz band—it is the responsibility of MVDDS licensees not to interfere with fixed satellite under longstanding FCC rules
  - SpaceX has filed extensive analysis proving lowering the altitude does not increase interference—MVDDS has provided zero technical analysis to the contrary



MVDDS Proposal Has Nothing to do with SpaceX's Modification



MVDDS Licensees Are Adamant That They Cannot Share

The MVDDS licensees recently stated that they simply wish to "share the spectrum," but they have regularly argued and provided technical data demonstrating that sharing is not possible

- MVDDS licensees are giving lip service that an NPRM to "draft new rules" explore how LEO fixed satellite and MVDDS can "share" the 12 GHz spectrum.

- This is contradicted by years of public statements and technical studies by the MVDDS coalition:

  - June 8, 2016 Study from Tom Peters (hired by MVDDS) states: "While the NGSO receiver may have a directional, upward facing antenna that provides some protection from the emissions of the 5G mobile UE, even 30 dB of antenna discrimination by the NGSO receiver would still require more than a kilometer of separation distance between the 5G mobile device and the NGSO receiver when the 5G mobile device was operating with an EIRP of 23 dBm per 24 MHz."

  - June 23, 2016 Study from Tom Peters reiterates the previous study and concludes its not worth even studying NGSO co existence any further: "The outlook for same frequency, same geography sharing between 5G MVDDS and NGSO FSS operations was less promising, however. In our original Coexistence Study, we identified interference to potential future NGSO FSS operations in the 12.2 12.7 GHz as probable even using best case assumptions for MVDDS operations.3 For example, a 5G MVDDS mobile device transmitting at the lowest possible power levels would still overwhelm NGSO devices located within twenty two meters of the 5G MVDDS mobile device. Worse, even simply maintaining the existing maximum EIRP level of 14 dBm per 24 MHz that currently applies to MVDDS base stations would likely cause harmful interference to an NGSO receiver located as far as eleven kilometers distance from an MVDDS base station. Worse still, the probability for interference would increase if mobile NGSO deployments are allowed in the current FSS allocation. These and related constraints required of MVDDS, NGSO FSS or both services led us to conclude that "while coexistence between DBS and MVDDS is feasible within limits, coexistence between NGSO FSS and MVDDS is not."4 As a result, the current study focuses on coexistence between 5G MVDDS operations and DBS receive antennas."

  - Dish Network has responded for the record: "Allowing NGSO totally precludes 5G service in the 12.2 12.7 GHz band..."

  - December 2, 2019 filing from Dish directed at OneWeb another LEO satellite system arguing "OneWeb cannot use this band without harming this 5G opportunity..." and that "...concurrent sharing of spectrum between co primary 5G and NGSO FSS operations is not viable in the 12 GHz Band"

MVDDS Supporters have Rejected SpaceX's Offers to Find Workable Technical Solutions

- SpaceX has repeatedly offered publicly and privately to explore technical solutions.
- MVDDS supporters have failed to present any technical analysis to show how sharing could work

  - Letter from SpaceX (July 22, 2020): "SpaceX has repeatedly stated, both publicly and privately, its openness to evaluating possible paths to sharing the 12 GHz Band more extensively, and reaffirms its commitment to doing so here."
  - Letter from SpaceX (July 22, 2020): "SpaceX has offered, in the record and elsewhere, to explore ways to share the band more extensively."
  - Letter from SpaceX (December 4, 2019): Expressing hope to find "coordination strategies to address" MVDDS proposals.

Moving Forward with the 2016 Petition Would Exacerbate the Digital Divide

NGSO Broadband "meshes well with the FCC's twin goals of closing the digital divide and promoting innovation."

- NGSOs like SpaceX are poised to offer commercial service.
  - MVDDS proposal is years from deployment—at best.
- 12 GHz is only viable downlink spectrum for consumers.
  - MVDDS proposal would shred consumer throughput.
- Physics of high-band frequencies like 12 GHz allow satellite operators to serve every corner of the country.
  - MVDDS would never step outside of the densest parts of urban environments.