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November 1, 2019

VIA ELECTRONIC FILING

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

**Re: *Written Ex Parte Notice*
ET Docket No. 18-295
*GN Docket No. 17-183***

Dear Ms. Dortch:

The Boeing Company (“Boeing”) has been participating in this proceeding primarily with respect to the use of unlicensed devices operating in the 6 GHz band onboard aircraft. Boeing is also extremely interested in the use of 6 GHz unlicensed devices in enterprise settings, including for use in Boeing’s aircraft manufacturing facilities. As Boeing has previously highlighted in its submittals in this proceeding, Boeing makes extensive use of unlicensed spectrum in its manufacturing facilities, often exhausting the frequency bands that are currently employed for unlicensed use.

Boeing therefore strongly supports the proposal of the “RLAN Group” to permit (1) indoor use of low power (30 dBm maximum) unlicensed devices in all four of the UNII-5 through UNII-8 frequency bands and (2) unlimited use of very low power (14 dBm maximum) unlicensed devices in the UNII-5, UNII-7 and the lower portion of the UNII-8 frequency bands, in each case without the burden of incorporating automated frequency coordination (“AFC”).¹

Boeing opposes the mandatory use of AFC for low power indoor (“LPI”) and very low power (“VLP”) devices for a number of reasons, none of which relate to its anticipated cost.² First,

¹ See Comments of Apple Inc., Broadcom Inc., Cisco Systems, Inc., Facebook, Inc., Google LLC, Hewlett Packard Enterprise, Intel Corporation, Marvell Semiconductor, Inc., Microsoft, and Ruckus Networks, ET Docket No. 18-295, GN Docket No. 17-183 (Feb. 15, 2019) (“*RLAN Group Comments*”).

² See Letter from Donald J. Evans et al., Counsel for the Fixed Wireless Communications Coalition to Marlene H. Dortch, Secretary, Federal Communications Commission, ET Docket No. 18-295, GN Docket No. 17-183 at 3 (July 25, 2019) (arguing that the Commission should not consider the potential cost of AFC in considering whether to require it for unlicensed devices operating in the 6 GHz band).

Marlene H. Dortch
November 1, 2019
Page 2

as commenters on both sides of this issue have acknowledged, AFC is still under development and any obligation to incorporate such capabilities would significantly delay the commercial availability of unlicensed devices that are able to operate in the 6 GHz band.³ Second, it is anticipated that AFC technologies will primarily employ GPS to track the location of unlicensed devices, but GPS is not effective in penetrating many buildings and other structures, such as Boeing's aircraft manufacturing facilities. Therefore, unlicensed devices that are controlled by GPS-supported AFC are unlikely to operate in a reliable manner when used in indoor environments.

Third, it is further anticipated that AFC technologies will need access to an Internet connection to coordinate device locations through a database with incumbent 6 GHz spectrum users. Many companies that are engaged in highly secure and sensitive activities, such as Boeing, cannot permit its wireless operational and control systems to connect with the Internet absent the use of highly secure proxies and firewalls, which would likely preclude the transmission of device location data outside of Boeing's network. As a result, AFC controlled devices would be unable to function inside Boeing's secure facilities. Fourth, to ensure physical plant security, Boeing's policies would prohibit the use of an external database system that could ascertain and track the locations of wireless devices inside Boeing's factories. (These identical security risks exist with respect to the use of AFC on unlicensed devices onboard aircraft.) Therefore, an AFC mandate would preclude Boeing and other companies with similar activities and practices, as well as the necessary operational policies to address security risks, from employing unlicensed 6 GHz devices in their operations.

Because of these significant impediments, the Commission should not require the use of AFC to facilitate the shared use of the 6 GHz band between LPI and VLP devices and incumbent fixed services. Boeing has been monitoring closely the technical debate on this issue, which has been undertaken primarily between the RLAN Group and the Fixed Wireless Communications Coalition ("FWCC"). Although the positions of these parties differ significantly, they appear largely in agreement with respect to FWCC's contention that "the greatest risk of FS interference comes from a single RLAN in or near the main beam of an FS receiver, with little or no intervening

³ See, e.g., Letter from Raul Magallanes, Rignet, Inc., Assoc. General Counsel, *et al.*, to Marlene H. Dortch, Secretary, Federal Communications Commission, ET Docket No. 18-295, GN Docket No. 17-183 at 1 (Oct. 9, 2019) (acknowledging that "at this point the idea of a fully reliable AFC system is only conceptual. No such AFC system has been designed or tested"); Letter from Alex Roytblat, Senior Director of Regulatory Affairs, Wi-Fi Alliance, to Marlene H. Dortch, Secretary, Federal Communications Commission, ET Docket No. 18-295, GN Docket No. 17-183 at 2 (Oct. 16, 2019) (explaining that "there will be a substantial delay in the time required to complete the required technical design, testing, deployment, and regulatory certification of commercially viable AFC system(s), and it is only once these systems are approved by the Commission that companies can begin manufacturing and marketing compliant devices").

Marlene H. Dortch
November 1, 2019
Page 3

clutter.”⁴ The parties also appear in agreement that the statistical probability of these events is low (although how low is in dispute), but, regardless, such interference events inevitably will occur for some fixed links.

The parties also appear to acknowledge that existing technical measures that are incorporated in fixed link technologies—such as Automatic Transmit Power Control (“ATPC”) and Adaptive Coding and Modulation (“ACM”)—could prevent or correct such interference events. The FWCC, however, argues that ATPC cannot be used to address interference, only for fade events.⁵ FWCC’s sole support for this assertion, however, is an industry-generated ANSI/TIA Standard, not the Commission’s rules, which identify the ANSI/TIA Standard as providing only “guidelines.”⁶ FWCC further objects to any use of ATPC or ACM to address rare events of interference to fixed networks, arguing that such allowances would be “unlawful”⁷ because ATPC would consume a portion of the fade margin that was intended for other purposes and ACM would temporarily reduce the fixed link throughput, which FWCC claims would meet the legal threshold of “seriously degrading” the service.⁸

FWCC’s reliance on these legal arguments belies the fact that such mitigation measures are technically achievable and available. Thus, FWCC’s arguments should be addressed by the Commission through an appropriate balancing of the needs and interests of the parties in order to maximize the use of scarce spectrum resources. FWCC, however, does not condone any balancing of interests, asserting that “[a]ny case that violates the interference criterion is unacceptable.”⁹ In an effort to support this inflexible position, FWCC misconstrues a D.C. Circuit decision, claiming it held that the Commission can authorize unlicensed devices, “only where it has determined the

⁴ Letter from Donald J. Evans et al., Counsel for the Fixed Wireless Communications Coalition to Marlene H. Dortch, Secretary, Federal Communications Commission, ET Docket No. 18-295, GN Docket No, 17-183 at 3 (Aug. 22, 2019) (“*Aug. FWCC Letter*”); *see also* Letter from Donald J. Evans et al., Counsel for the Fixed Wireless Communications Coalition to Marlene H. Dortch, Secretary, Federal Communications Commission, ET Docket No. 18-295, GN Docket No, 17-183 at 2 (Sept. 13, 2019) (“*Sept. FWCC Letter*”) (explaining that “[w]e have emphasized throughout that FS interference most often results from a single source atypically located in or near the receiver main beam, with little or no intervening attenuation”).

⁵ *See Sept. FWCC Letter* at 3, n.5.

⁶ 47 C.F.R. § 101.3.

⁷ *Sept. FWCC Letter* at 3.

⁸ *Id.* at 4.

⁹ *Aug. FWCC Letter* at 11.

Marlene H. Dortch
November 1, 2019
Page 4

devices will not cause harmful interference to licensed services.”¹⁰ The D.C. Circuit, however, employed a much more nuanced stance, explaining that “Commission precedent does not require the elimination of all interference at all times and all places” for unlicensed operations.¹¹

The D.C. Circuit’s conclusion is consistent with Commission action in past rulemaking proceedings involving licensed and unlicensed operations in which the Commission appropriately balanced the needs of new and incumbent services. For example, in the case that prompted the D.C. Circuit decision, the Commission acknowledge that “there is some potential for Access BPL operations to cause interference”¹² but concluded that the potential for harmful interference to licensed services is “low” and “limited to areas within a short distance of the power lines used by this technology.”¹³ The identical conclusion could be reached regarding the sharing conditions between unlicensed devices in the 6 GHz band and incumbent fixed networks.

Furthermore, the Commission has made similar conclusions in comparable proceedings, explaining that “[t]he technical rules for Part 15 devices are designed to ensure that there is a low probability that unlicensed devices will cause harmful interference to other users of the spectrum.”¹⁴ For example, when it adopted rules for unlicensed white spaces devices, the Commission explained “[i]t is not possible to ensure that harmful interference will never occur, as wireless interests apparently request” and instead concluded that it is sufficient to adopt rules for white space devices that made the likelihood of harmful interference to licensed services “extremely low.”¹⁵ In another proceeding, the Commission required amateurs in the 76-81 GHz band to operate in a manner that “minimizes the potential for harmful interference to licensed radar applications” not necessarily to eliminate it.¹⁶

¹⁰ Reply Comments of the Fixed Wireless Communications Coalition, ET Docket No. 18-295, GN Docket No. 17-183 at 7 (March 18, 2019) (*citing* American Radio Relay League, Inc. v. FCC, 524 F.3d 227, 234-35 (D.C. Cir. 2008)).

¹¹ American Radio Relay League, Inc. v. FCC, 524 F.3d 227, 335 (D.C. Cir. 2008).

¹² Amendment of Part 15 Regarding New Requirements and Measurement Guidelines for Access Broadband over Power Line Sys., 19 FCC Rcd 21265, ¶ 33 (2004).

¹³ *Id.*, ¶ 23.

¹⁴ Amendment of Commission’s Rules with Regard to Commercial Operations in the 3550-3650 MHz Band, 27 FCC Rcd 15594, 15608, ¶ 38 (2012).

¹⁵ Amendment of Part 15 of the Commission’s Rules for Unlicensed Operations in the Television Bands, Repurposed 600 MHz Band, 600 MHz Guard Bands and Duplex Gap, and Channel 37, *et al.*, 30 FCC Rcd 9551, 9604-9605, ¶ 132 (2015).

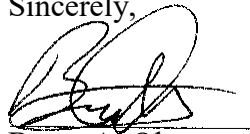
¹⁶ Amendment of Parts 1, 2, 15, 90 & 95 of the Commission’s Rules to Permit Radar Services in the 76-81 GHz Band, 32 FCC Rcd 8822, 8831, ¶ 16 (2017).

Marlene H. Dortch
November 1, 2019
Page 5

Thus, in each of these cases, the Commission recognized an appropriate balancing of interests in order to maximize the use of scarce spectrum resources. Consistent with this, the Commission should refrain from imposing AFC obligations on unlicensed LPI and VLP devices, concluding that the technical challenges of implementing AFC would excessively burden unlicensed operations. Instead, the Commission should recognize that events of harmful interference to fixed networks will be extremely few and can be overcome by fixed link operators using operational measures that are already incorporated into fixed link networks. This balancing of interests will ensure the greatest and most efficient use of scarce spectrum resources without imposing an appreciable burden on incumbent operations.

Thank you for your attention to this matter. Please contact the undersigned if you have any questions.

Sincerely,

A handwritten signature in black ink, appearing to read "Bruce A. Olcott", written over a horizontal line.

Bruce A. Olcott

Counsel to The Boeing Company