VIA ELECTRONIC FILING

May 4, 2019

Ms. Marlene H. Dortch, Secretary
Federal Communications Commission
445 Twelfth Street, SW
Washington, DC 20554

Re: Ex Parte Presentation, Notice of Inquiry on Expanding Flexible Use in Mid-Band Spectrum Between 3.7 and 24 GHz. GN Docket No. 17-183

Dear Ms. Dortch:

On May 2, 2019, Ultra Wide Band Alliance ("UWB Alliance") Executive Director Tim Harrington, Ira Renfrew (iRobot), as well as Kelli Emerick and Marc-Anthony Signorino (121 Strategies, consultant to UWB Alliance) met with Aaron Goldberger, Acting Wireless and International Advisor for Chairman Pai, to discuss the above-referenced proceeding.

During the meeting, the UWB Alliance discussed proposals for spectrum sharing coexistence that would benefit all potential users of the 6 GHz band. This includes benefits for proposed broadband users as well as protecting incumbent licensed users and existing unlicensed UWB users. A visual presentation was also provided during the meeting, which has been attached to this letter.

The UWB Alliance representatives explained tighter OOBE requirements would benefit all users including broadband in that there would be less self-generated, cross channel interference. Similarly, a significant reduction in the proposed power levels would provide much better spectral efficiency allowing more users to have access to the band because there would be less self-generated interference. Shorter range gives more users access, which is key for urban users.

Additionally, the unique attributes of UWB in a balanced sharing environment will make best use of the spectrum to support the explosion of IoT products that are in the market and coming forth at an accelerating rate. Band sharing that allows each technologies' capabilities to be maximized will result in the most effective use of the finite resource of spectrum bandwidth.

Reducing with proposed bandwidth for broadband will cause the spectrum to be used more efficiently and foster innovation. Similarly, to the way the length of a given task will grow to match its deadline, the use of spectrum will expand to fit the full amount available. The rule as proposed by the NPRM will result in applications such as IoT trying to be fulfilled by broadband, a technology that has been optimized to moving large amounts of data. In contrast, UWB has been optimized for small bursts of data from many devices, ideal for both IoT and the other incumbent services, applications and technologies. An effective partitioning of the band will allow all users to maximize spectral efficiency for all.

Additionally, the UWB Alliance requested that the FCC direct a neutral third-party organization to perform studies to analyze the impact of sharing between unlicensed operations in the 6 GHz band and existing services. To date, the only study presented to the FCC – that prepared by RKF Engineering Solutions on behalf of

members of the WiFi Alliance[1] – has been widely criticized as offering misleading conclusions and lacking sufficient analysis to support them.[2] We urge FCC forbearance from promulgating any new rules until thorough, definitive, and replicable studies can prove minimal harm to all incumbents in the 6 GHz band.

Respectfully Submitted,

/s/ Timothy Harrington
Timothy Harrington
Executive Director
UWB Alliance

[1] *See* Ex Parte filing of Harris, Wiltshire & Grannis LLP, counsel to Apple Inc., Broadcom Corporation, Facebook, Inc., Hewlett Packard Enterprise, and Microsoft Corporation, GN Docket No. 17-183, filed January 26, 2018.
[2] *See* Ex Parte filing of AT&T Services, Inc., GN Docket No. 17-183, filed March 19, 2018; and Ex Parte filing of the National Spectrum Management Association, GN Docket No. 17-183, filed March 27, 2018.

1

Ultra Wide Band Alliance – Some of our members

HYUNDAI · KIA · DENSO Crafting the Core · Ubisense · Decawave · ZEBRA · XETHRU BY NOVELDA · alteros An Audio-Technica Company · iRobot

2

6 GHz NPRM Concerns – and a Solution

- Unlicensed broadband is an expanding essential technology
- But, the Ultra-Wideband (UWB) ecosystem is growing and thriving with Billions of $ of investment based on the stability of the Part 15 Rules

- NPRM as proposed will have an unintended negative impact
  - First responders, public safety, consumer, commercial, medical, and scientific users will be subjected to ***unintentional – but significant – interference*** that will harm these incumbent technologies, services, and applications

- There's a solution: Coexistent sharing of 6 GHz for all users
  Unlicensed: UWB, Wide Band, Wi-Fi and 5G Broadband
  Licensed: FS, FSS, Mobile

3

UWB: Innovating For Multiple Sectors and Industries

UWB offers unique advantages over traditional technologies
(e.g., Wi-Fi/5G/Bluetooth/etc.)

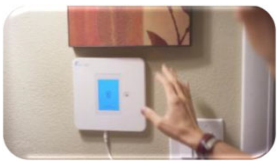
- Coexistence with all current 6-7 GHz users (since 2002)
- Extremely precise ranging, tracking and material/object sensing (1 cm)
- Devices use much less power (7 year battery life with coin cell)
- Smallest size (Under a shoulder pad or in a football)
- Instantaneous motion detection (Personnel safety, e.g., proximity alert)
- Short bursts for many devices in a small area (IoT)
- Highly resistant to hacking and hijacking (Vehicle and entry key fob)
- Real-time full frequency audio (Entertainment and gaming)

UWB is the best technology to support the explosion of IoT devices

4

UWB: A Thriving Marketplace for Consumer Devices

- Robotic lawn mowers
- High Security Wireless Key Fobs
- Baby, sleep apnea, and pulse monitoring devices
- Radars for wall exploration
- Elder-care safety - fall monitoring



5

UWB: Commercial Applications Throughout Industry

- Professional audio systems
- Sports tracking (NFL)
- Automotive, aviation, and industrial production automation
- Industrial asset tracking
- Bus and train control with communication

6

UWB – Many more applications are coming fast

- IEEE TG4z Enhanced Impulse Radio is the most well attended TG in IEEE 802.15 Working Group
  - Chip Designers: Decawave, Microchip, NXP, 3dB
  - Automotive Industry: BMW, Marquardt, Valeo, Continental
  - Smartphone Manufacturers: Apple, Samsung
- Smartphone and vehicle ecosystems are in development
  - Watches, secure automated entry, fitness trackers, automated "follow-me", pet tracking, etc.

7

Why doesn't UWB just move to another band?

- **No Place To Go**
  - **Most products certified under Part 15.250**
    - **15.250 allows indoor/outdoor use with no 10 s rule or restrictions as to class of service**
    - **Part 15.250 stops at 7.250 GHz and Can't Go Higher because of Government Use restricted Band**
  - **Some licensed and unlicensed production wireless devices have already moved twice and this is the "last stop"**
- **Disruption Of Operation Of Installed Base:** Millions of devices which are in daily use
  - Most centered at 6.5 GHz
- **Disruption of Business:** The threat of change is already damaging business
  - New projects for safety have been cancelled, rollouts put on hold
- **Performance Risk:** Potential bands for UWB (10 GHz?) would have vastly different characteristics
- **Time:** Successful technology innovation takes time
- **Expense:** Hundreds of millions of dollars invested to bring Part 15 unlicensed devices to market: relocating is not economically viable

8

Coexistence Suggestion 1

- Authorize new unlicensed Broadband in 5.925 - 6.1 GHz
  - Exceeds 100+55 MHz mandated by the MOBILE NOW Act
  - Will inspire innovation and conservative use of the available bandwidth
  - Provides open field for incumbent UWB, FSS, FS and Scientific Users

AND

- Specify Out Of Band Emissions (OOBE) to -61 dBm/MHz
  - A tight OOBE mask is a key technical tool for maximizing capacity and band sharing
  - Proposed NPRM limit is higher than mean UWB transmit power making co-existence impossible across all bands
    - Current NPRM is -27 dBm/MHz while UWB is allowed *intentional* at -41.3dBm/MHz

9

Coexistence Suggestions 2

- Restrict duty cycle of each 6 GHz transmitter to 0.5% over a period of 1 s

- Specify lower power levels which will yield more capacity given the high demand for the band
  - What is driving the requirement for these high power levels?

10

Additional requirements for commercial applications

- Create central AFC which all access points must connect to in order to enable use of 6 GHz Band
  - Require AFC everywhere (all bands, all locations)

  And/or

- A registered beacon fence device
  - Allows commercial users to broadcast a signal that informs access points in their fence area not to transmit or allow transmission.
  - This addresses the problem of AFC with mobile devices
  - It also addresses the hidden node and rogue AP problem

11

12