

Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

In the Matter of)	
)	ET Docket No. 18-295
Unlicensed Use of the 6 GHz Band)	
)	
Expanding Flexible Use in Mid-Band)	GN Docket 17-183
Spectrum Between 3.7 and 24 GHz)	

To: The Commission

Reply Comments of EIBASS

Engineers for the Integrity of Broadcast Auxiliary Services Spectrum (EIBASS) hereby respectfully submits its reply comments in the above-captioned Notice of Proposed Rulemaking (NPRM) relating to unlicensed use of the "6 GHz" band, or 5.925 GHz to 7.125 GHz. This includes the 6.425-6.525 GHz and 6.875-7.125 GHz Part 74, Subpart F, TV Broadcast Auxiliary Service (BAS) bands. The NPRM was published in the Federal Register on December 17, 2018, giving a March 18, 2019, reply comment deadline, so these reply comments are timely filed.

I. Reply Comments Pertain To Just the 6.5 GHz and 7 GHz TV BAS Bands

1. As with its initial comments, these EIBASS reply comments only address Part B of the NPRM, applying to "lower power" indoor unlicensed devices operating at 6.425–6.525 GHz (the Unlicensed National Information Infrastructure Band 6 [U-NII-6] and at 6.875–7.125 GHz, U-NII Band 8 [U-NII-8]). These are also known as the 6.5 GHz and 7 GHz TV BAS bands.

II. AFCCE, EIBASS, FWCC, Globalstar, NAB, NPSTC, NSMA, SBE and 57 Others Have All Filed Comments with the Commission Noting That Opening the Upper 6 GHz Bands to Unlicensed Use is a Risky Move

2. The Association of Federal Communications Commission Consulting Engineers (AFCCE), EIBASS, the Fixed Wireless Communications Coalition (FWCC), Globalstar, the National Association of Broadcasters (NAB), the National Public Safety Telecommunications Council (NPSTC), the National Spectrum Management Association

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(NSMA), the Society of Broadcast Engineers, Inc. (SBE) and 32 other parties¹ have now filed comments with the Commission in opposition to opening the 6.5 and 7 GHz TV BAS bands to unlicensed use due to likely interference to incumbent licensed stations in those bands. Another 25 parties² filed comments stating that they favored opening the upper 6 GHz band to unlicensed use only if it could guaranteed that harmful interference would not be caused to existing licensed users.

3. EIBASS finds it ominous that a group it is calling the Flexible Use Pressure Group, or FUPG³, has submitted a detailed technical showing⁴ claiming to prove that harmful interference to existing licensees is unlikely to be caused, whereas NSMA has submitted technical showings claiming to demonstrate just the opposite: That harmful interference to incumbent licenses would be likely to be caused. The FWCC technical showing claims that harmful interference to incumbents could be avoided only if strict and difficult to defeat protection protocols are adopted for U-NII devices.

4. Faced with these conflicting technical showings, EIBASS recalls the assurances given to incumbent licensees in the 2,400–2483.5 MHz band ("2.4 GHz"), when that band was opened to unlicensed use that became known as Wi-Fi, and documented by the Institute of Electrical and Electronic Engineers (IEEE) 802.11 family of standards.⁵ The May 24, 1985, General Docket 81-413 Report and Order (R&O) stated at Paragraph 6 (*italics added*):

¹ American Electric Power (AEP), American Petroleum Association (APA), Baltimore County, Chelan County Public Utility District, City of New York, Cook County Sheriff's Police Department, Decawave, Denver County, Edison Electric Institute, Electro Systems Engineers, Inc. (ESEI), El Paso Electric Company, GCI Communication Corporation, Idaho Power Company, Intelsat License LLC, iRobot Corporation, Joshua Marvel, Kansas City, Lucas County Emergency Medical Service, Mark Atkins, Nathan Timm, National American Public Power Association, Novela US, Inc., San Bernardino County, Sania Radcliffe, Sheboygan County Sheriff's Office, Southern Company Services, Inc., Texas New Mexico Power Company, Tucson Electric Power Company, UNS Electric, Inc., Utilities Technology Council, , and Xcel Energy Services, Inc.

² AT&T Services, Inc., B.J. Battig, Charles Eric Wilson, City of Los Angeles, City of Madison, Comsearch, the Critical Infrastructure Coalition, Dakota County, Encina Communications Corporation, the Internet & Television Association (NCTA), Lincoln County, Lucas County Sheriff's Office, Michael Meissner, Motorola Solutions, Inc., the National Academy of Sciences (CORF), NXP USA, Inc., Peter Stallone, Rignet Satcom, Inc., Riverbend Communications LLC, Sirius XM Radio, Inc., St. Croix County, Steven Long, Viaero Wireless, Volkswagen Group of America, Inc., and Zebra Technologies.

³ FUPG consists of Apple Inc., Broadcom Corporation, Cisco Systems, Inc., Hewlett Packard Enterprise, Facebook, Inc., Google LLC, Intel Corporation, MediaTek, Inc., Microsoft Corporation, and Qualcomm Incorporated.

⁴ "Frequency Sharing for Radio Local Area Networks in the 6 GHz Band," prepared by RKF Engineering Services in January 2018, on behalf of FUPG.

⁵ Namely, for 2.4 GHz, 802.11-1997, 802.11b, 802.11g, 802.11n, 802.11ax, 802.11-2007, 802.11-2012, and 802.11-2016.

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6. Many of the respondents favored the proposed authorization of spread spectrum for low-power limited range communications devices and considered the proposed rules conservative enough for immediate adoption. *Others, including broadcasting interests in particular, expressed concern over interference to their services from these devices. Though not opposing the Commission's action in general, they did oppose the overlay of spread spectrum systems on the frequency bands in which they are operating.*

But, not to worry, in the Paragraph 27 the R&O conclusion the Commission stated (italics again added):

27. The rules which are adopted here for spread spectrum systems operating in the Police Radio Service and in the ISM bands *have been kept deliberately conservative in order to minimize any possibility of interference from these systems to existing services.*

5. So, on the one hand, 2.4 GHz Wi-Fi has proven to be one of the Commission's greatest success stories, in that it is widely used in consumer electronics everywhere. But it is sadly also a horror story, because the ubiquitous nature of 2.4 GHz Wi-Fi low-power transmitters has so "trashed" the 2.5 GHz TV BAS band that TV BAS Channels A8 at 2,450–2,467 MHz and A9 at 2,467–2,483.5 MHz have become all but useless to Part 74, Subpart F, TV Pickup stations for electronic news gathering (ENG) purposes.⁶ EIBASS does not want to see that same "trashing" of the 6.5 or 7 GHz TV BAS bands by hundreds of millions of low-power radio local area networks (RLANs), as envisioned by FUPG.⁷

III. If Congressional Spectrum Guidelines Can Be Achieved Without Including the U-NII-6 and U-NII-8 Bands, as Claimed by SBE, Then the Commission Should Definitely Not Contaminate Those Bands with Unlicensed Users

6. EIBASS notes that at paragraph 11 of the SBE's comments, SBE concluded that the Commission does not need to include the 6.5 GHz (U-NII-6) and 7 GHz (U-NII-8) TV BAS bands in the spectrum to be opened up to unlicensed, Part 15 use, in that the obligations of the FY 2018 Omnibus Spending bill, which includes the MOBILE NOW Act under Title VI of RAY BAUM'S Act, only requires that at least 100 MHz of spectrum below 8 GHz be opened for unlicensed use. Thus, limiting the new unlicensed use to 5.925–6.100 GHz, constituting 175 MHz of spectrum, would meet the Commission's legislative obligation, and there is no need to also place the 6.5 and 7 GHz TV BAS bands at risk.

⁶ In addition to the documentation of noise floor degradation provided in the initial EIBASS comments, see also the Globalstar comments at page 11, the NAB comments at page 11, the SBE comments at page 4, and the Sirius XM Radio comments at page 10.

⁷ The January 25, 2018, *ex parte* FUPG comments to the August 3, 2017, GN Docket 17-183 Notice of Inquiry (NOI), *Expanding Flexible Use in Mid-Band Spectrum Between 3.7 and 24 GHz*, estimated 958 million RLANS would be in use (RKF study, at page 13).

IV. If the U-NII-6 and U-NII-8 Bands Are to Nevertheless be Targeted, Then the Operational Areas of BAS and CARS stations Should Be Protected by Not Permitting Unlicensed Operation in Those Areas

7. If the 6.5 and 7 GHz TV BAS bands are nevertheless to be targeted for unlicensed use, then EIBASS re-iterates its request that the operational areas of 6.5 GHz and 7 GHz TV Pickup stations be protected; that is, precluded areas for unlicensed use. EIBASS notes that even the FUPG comments support the protection of the operational areas of TV Pickup stations; indeed, the FUPG comments further suggest protecting the operational areas of Part 74 Subpart H Low Power Auxiliary Service (LPAS) stations (*e.g.*, wireless microphones) operating at 7 GHz (wireless mics are not allowed at 6.5 GHz).⁸ EIBASS concurs with the FUPG suggestion to protect the operational areas of LPAS stations as well as TV Pickup stations.

V. Sirius Also Has Concerns About Unauthorized Operation and/or Unauthorized Modifications to Unlicensed Devices

8. EIBASS notes that Sirius XM Radio also expressed concern about unauthorized operation and/or unauthorized modifications to Part 15 devices (Sirius comments at pages 16-17). If unlicensed devices are to be permitted in the 6.5 or 7 GHz TV BAS bands, then the device physical limitations must be bullet-proof; that is, the Commission must not rely on admonitions printed on the outside of the Part 15 device's box, or in the user instructions, to be an effective guarantee of proper operation. Improper operation, whether due to honest ignorance or due to malicious intent, needs to be precluded by hardware design and by software that cannot be modified (*e.g.*, defeated) by unauthorized user software modifications.

⁸ FUPG comments, at page 46.

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VI. Summary

9. The best solution would be to not open the 6.5 GHz (U-NII-6) and 7 GHz (U-NII-8) TV BAS bands to unlicensed devices, aka "flexible use." As noted by SBE, the Commission can meet its Congressional mandate of at least 100 MHz of below-8 GHz spectrum being opened to unlicensed use by just doing so for the 5.925–6.100 GHz band. But, if the 6.5 and/or 7 GHz TV BAS bands are to nevertheless be opened to flexible use, then the operational areas of TV Pickup and LPAS stations need to be protected (*i.e.*, exclusion zones), and unauthorized operation or unauthorized modifications of unlicensed RLAN devices must have strict safety protocols, both at the hardware level and with software that cannot be defeated by unauthorized user modifications.

Respectfully submitted,

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