

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 17-283
Spectrum Between 3.7 and 24 GHz)	

To: The Commission

Comments of EIBASS

Engineers for the Integrity of Broadcast Auxiliary Services Spectrum (EIBASS) hereby respectfully submits its 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 February 15, 2019, comment deadline, so these comments are timely filed.

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

1. EIBASS is only commenting on 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. The Number of Mobile TV Pickup Licenses Is Not a Valid Metric for the Number of Mobile TV Pickup Transmitters Actually In Use

2. At Paragraph 74, the NPRM notes that mobile TV Pickup licenses in the U-NII-6 6.5 GHz TV BAS band are 43% of the licenses, and in the U-NII-8 7 GHz TV BAS band are only 2% of the licenses, implying that protecting TV Pickup mobile operations at 7 GHz would not be difficult. It is not surprising that 43% of the 6.5 GHz band stations are mobile TV Pickup stations, since only mobile stations are allowed in that band (the remaining 57% of stations are presumably Part 101 mobile licenses, since 6.5 GHz is a shared band). However, the percentage of 7 GHz mobile TV Pickup licenses compared to 7 GHz fixed, point-to-point licenses is not a valid metric. A single TV Pickup license authorizes an unlimited number of transmitters for each

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TV Pickup licensee¹ (*i.e.*, mobile platforms such as electronic news gathering (ENG) trucks, ENG motorcycles, ENG helicopters, ENG blimps, and portable (itinerant) ENG equipment). Indeed, the Universal Licensing System (ULS) does not even track the number of TV Pickup transmitters used by a TV Pickup licensee, and as such, is a serious, real-world Paragraph 63 factor that the Commission has "not accounted for" in its analysis.

3. For example, the Northern California Frequency Coordinating Committee (NCFCC) is currently negotiating with a Department of Defense (DoD) contractor, Alion Science & Technology, for DoD to commence operation of the Camp Parks Communications Annex Space Ground Link System (SGLS) uplink in the 2 GHz TV BAS band. DoD received authority for eleven (and only eleven) such uplinks pursuant to the October 21, 2004, ET Docket 00-258 *Seventh Report & Order* (R&O); these uplink locations are now listed in U.S. Government footnote US346 to the Part 2, Section 2.106 *Table of Frequency Allocations*. The Camp Parks uplink is problematic because it is located near Pleasanton, California, and has unobstructed line-of-sight to ENG Receive-Only (ENG-RO) sites at Mt. Diablo, Monument Peak, and Mt. Allison, all heavily used sites for TV stations serving the greater San Francisco Bay Area.

4. As part of the NCFCC-DoD negotiations, the number of ENG platforms used by several SF Bay Area TV stations was obtained, as follows (remember, each TV station only needs a single TV Pickup license for its ENG platforms):

KGO-TV (ABC)	23 ENG trucks, 1 ENG helicopter, 5 portable ENG transmitters, 2 camera-back transmitters; total of 31 ENG platforms
KTVU (FOX)	11 ENG trucks, plus 2 combined ENG/satellite trucks; total of 13 ENG platforms
KRON (IND)	6 ENG trucks, 2 portable ENG transmitters; total of 8 ENG platforms
KPIX-TV (CBS)	14 ENG trucks, 1 ENG helicopter, 1 ENG/satellite truck; total of 16 ENG platforms
KNTV (NBC)	15 ENG trucks
KSTS (Telemundo)	2 ENG trucks

¹ See Public Notice DA 05-2223, dated July 29, 2005, *Wireless Telecommunications Bureau (WTB) and Media Bureau Announce Licensing Procedures to Facilitate the Transition of BAS, CARS, and LTTS Licenses to the 2025-2110 MHz Band and WTB Addresses SBE Petition for Declaratory Ruling*, at page 5: "As noted by SBE in its [Declaratory Ruling] request, TV Pickup licenses issued in the ULS do not specify the number of mobile transmitters that may be operation. Moreover, Section 74.632(a) states that 'a mobile station license may be issued for any number of mobile transmitters to operate in a specific area or frequency band....' "

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While the above list applies primarily to the 2 GHz (2,025–2,110 MHz) TV BAS band, many ENG platforms are dual, triple, or even quadruple band capable; that is, they use multi-band transmitters and multi-band antennas capable of operating in the 2, 2.5, 6.5 and/or 7 GHz TV BAS bands. Choice of band use depends on path distance, receive site location, broadcaster-to-broadcaster coordinated frequency sharing agreements, and other factors. Thus, while the ET 18-295 NPRM would apparently count this as just six mobile TV Pickup stations, in reality those licenses represent 85 mobile TV pickup transmitters.

5. Broadcasters can operate both mobile ENG and fixed links in the 7 GHz TV BAS band, because they are aware of the many 7 GHz fixed links such as studio-to-transmitter (STL) and Inter City Relay (ICR) paths, and have great incentive not to interfere with these paths, but such knowledge and incentive does not generally apply to Part 101 fixed-service (FS) licensees. Thus, when the Commission opened the 7 GHz TV BAS band to Part 101 FS stations in the WT Docket 10-153 rulemaking ("Additional Flexibility to BAS and Operational Fixed Microwave Licensees"), and as noted in Paragraph 60 of the NPRM, the Commission adopted a prudent protection requirement that no newcomer Part 101 FS path could intersect the operational area of record of any TV Pickup station in the same band. Further, because of frequency agile nature of ENG operations at 7 (and 13 GHz), a TV Pickup station on any of the available 7 GHz channels, or any of the 13 GHz channels, precludes the entire band to newcomer Part 101 FS links.

6. An additional reason for protecting the entire TV Pickup operational area of record is because a news event near the edge of an operational area may require the receiver at a fixed ENG-RO site to operate at the limit of its sensitivity. Further, most ENG-RO sites routinely employ real-time steerable receive antennas (typically truncated-reflector parabolic dishes), and often with feed horn-mounted low noise amplifiers (LNAs). For this reason the still in effect April 30, 2009, *Memorandum of Understanding (MoU)* between the Society of Broadcast Engineers, Inc. (SBE) and DoD specifies a stringent protection criteria of no more than a 0.5 dB degradation of the noise floor of an ENG-RO receiver.²

7. Thus, EIBASS submits that if the Commission is serious about protecting highly sensitive 6.5 and 7 GHz TV BAS ENG-RO sites as noted at Paragraph 60 of the NPRM from up to almost a billion³ Part 15 Radio Local Area Network (RLAN) devices, then the Commission must adopt

² A copy of the SBE-DoD MoU is available in the ET Docket 00-258 record in the Electronic Comment Filing System (ECFS), at <https://ecfsapi.fcc.gov/file/7020354936.pdf>.

³ This estimate of the number of RLANS is based on the January 25, 2018, *ex parte* joint comments of Apple Inc., Broadcom Corporation, Cisco Systems, Inc., Hewlett Packard Enterprise, Facebook, Inc., Google LLC, Intel Corporation, MediaTek, Inc., Microsoft Corporation, and Qualcomm Incorporated (which EIBASS

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the same TV Pickup operational area preclusion areas that it did in the WT Docket 10-153 "BAS Flexibility" rulemaking. The attached Figure 1 shows the operational areas for 6.5 GHz and 7 GHz TV Pickup stations. Since the TV Pickup white areas where U-NII-6 and U-NII-8 RLANs could operate would be in "rural and underserved areas" that Section I, Paragraph 1 of the NPRM indicates are "especially" intended to be served, such a restriction would not be inconsistent with the primary intent of the rulemaking.

8. EIBASS notes the Section 74.802(a)(1) of the Part 74 rules applying to Subpart H Low Power Auxiliary (LPA) stations, such as wireless microphones and wireless intercoms, to operate in the 7 GHz TV BAS band, albeit only on TV BAS Channels B1 (6,875–6,900 MHz) or B10 (7,100–7,125 MHz). While EIBASS is not aware of any currently available Part 74 7 GHz wireless microphones, given the further reduction of UHF frequencies available for wireless microphone use (from TV Channels 14 through 51 to just TV Channels 14 through 36), EIBASS expects that it will not be long until 7 GHz wireless microphones become available and in use by broadcasters. But LPA wireless microphones are limited to a maximum transmitter power (TPO) output of 1 watt (30 dBm)⁴, and wireless microphones used by talent typically have TPOs in the 50 to 100 mW (17 to 20 dBm) range, because of battery pack size and operating life restraints. EIBASS submits that the interference threat of a 43 mW (16 dBm) Part 15 WLAN in the U-NII-8 band to a co-channel 50 to 100 mW wireless microphone being operated in the same venue is obvious. Protecting the operational areas of 7 GHz TV Pickup stations, as proposed in the prior paragraph, would eliminate this interference threat.

III. Users Can Easily Defeat Proposed Part 15 Protection Requirements

9. The NPRM proposes that U-NII-6 and U-NII-8 devices only be operated "indoors." But there is no guarantee of how much attenuation will be offered by "indoor" operation, and at Paragraph 69 the Commission acknowledges that

"Broadcasters covering large venues such as sporting events and political conventions rely on the U-NII-6 and U-NII-8 bands that may take place indoors."

So how is an indoor operation requirement going to protect licensed Part 74 uses that are also indoors? The answer: It won't. It will just open the "barn door" for users with a desire to exploit a loophole the Commission has created.

refers to as the "Flexible Use Pressure Group") 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*.

⁴ Section 74.861(d)(1) of the FCC Rules.

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10. Placing Part 74 BAS operations that are not indoors at risk, the mechanisms proposed by the Commission to ensure "indoor" operation can easily be defeated. The Paragraph 70 proposal that indoor devices must have a direct connection to a 120 volt AC power outlet can easily be defeated with a low cost and simple expedient of an AC extension cord. An expedient might not even be needed for a RLAN operating on the balcony of a high rise apartment or condominium, where an outdoor AC outlet for use of 120 volt devices on the balcony is available. It is also not technically challenging or unreasonably expensive to use a battery-operated DC-to-AC inverter to provide the "direct connection" to 120 volt AC power. Such 120 volt AC inverters are now standard equipment in many automobiles, trucks and motor homes sold today throughout the United States. The Commission's proposal as stated in the NPRM fails to ensure only "indoor" use because would not exclude RLAN use in a motorhome, truck sleeper cab, or any other wheeled venue with RF-transparent glass and fiberglass that many people consider to be their "home" and therefore "indoors."

11. At Paragraph 71 the Commission proposes that a U-NII-6 or U-NII-8 device have an antenna to detect the presence of a Global Positioning System (GPS) signal.⁵ If no GPS signal is detected, then the assumption is being made that the Part 15 device must be "indoors." But this supposed safeguard can also be easily bypassed: If an external GPS antenna is used, just disconnect it. If an internal GPS antenna is used, just place aluminum foil over the portion of the device's plastic case where the GPS antenna is embedded (the Part 15 Equipment Certification requirement for detailed photographs of a device requesting certification would make identifying the location of an embedded GPS antenna easy, and such information would likely quickly find its way to a YouTube "defeat it yourself" or other social media venues). For example, a simple Google search revealed a YouTube video "*How to increase your router's WiFi signal using high power antennas!*". Unfortunately, the video forgets to mention the required reduction in transmitter power output (TPO) if a higher gain 16 dBi or 24 dBi antenna is substituted, using the simple hack of a reverse polarity SMA cable. The link to the video is <https://www.youtube.com/watch?v=9EjddFh1BDo&feature=youtu.be>. Another example is a web page, "Set Your Wi-Fi Card's TX Power Higher Than 30 dBm", at <https://null-byte.wonderhowto.com/how-to/set-your-wi-fi-cards-tx-power-higher-than-30-dbm-0149606/>. Users following these instructions can increase their Part 15 device TPO to an illegal 33 dBm (2 watts), or double the TPO allowed for 2.4 GHz Part 15 devices.

⁵ These are L-band signals, 1,575.42 MHz for GPS L1, 1,227.60 MHz for GPS L2.

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12. If a user is willing to search eBay, there are many options for devices made in China that do not appear to comply with the Commission's Part 15 rules. For example, the attached Figure 2 shows a 2.4 GHz power amplifier claiming a TPO of 39 dBm (8 watts), or more than eight times the allowable Part 15 TPO of 30 dBm (1 watt).

13. And there is always the possibility of a device manufacturer making it all too easy to defeat a feature that can only reduce the effectiveness of a Part 15 device to the end user, by making it possible to re-program or otherwise defeat a software-based lock out or protection feature, or to make it physically not too difficult to defeat a hard-wired protection feature (for example, "whatever you do, do not cut jumper J3 on the circuit board A2, because that will defeat the GPS sensing intended to ensure indoor-only operation").

14. The problem of an end user making unauthorized modifications to an FCC-approved Part 15 device is not a new concept. In 2011 the Commission fined Utah Broadband (UB) \$25,000 for disabling the dynamic frequency selection (DFS) feature of an U-NII device, causing harmful interference to FAA Terminal Doppler Weather Radar (TDWR) operations.⁶ UB was using Ubiquiti Networks, Inc. (Ubiquiti) XtremeRange5 Part 15 devices in an unauthorized manner: By defeating the protections created to ensure no interference to licensed weather radars by allowing the device to improperly operate at 5,580 MHz and 5,640 MHz and near a TDWR location, and with higher than allowable equivalent isotropic radiated power (EIRP) due to the use of unauthorized, higher gain transmitting antenna, harmful interference was caused.

15. Nor does the UB situation appear unique. At <http://www.fcc.gov/encyclopedia/weather-radar-interference-enforcement> is a list of no fewer than 49 FCC enforcement actions against Part 15 U-NII devices causing interference to FAA weather radars. Thus, the temptation for end users to operate Part 15 devices that have achieved FCC equipment certification in an unauthorized manner is real. Unfortunately, RLAN interference to 6.5 or 7 GHz TV BAS operations is unlikely to receive the high-profile enforcement that interference to FAA weather radar demands. All the more reason to require strict compliance and hard to defeat rules for U-NII-6 and U-NII-8 devices, in addition to protecting the operational areas of 6.5 GHz and 7 GHz TV Pickup stations.

IV. Amend Section 15.5(c) To Allow Enforcement by Other Than FCC Staff

16. The last sentence of Paragraph 71 asks if there are any other considerations the Commission might take to ensure that U-NII-6 and U-NII-8 devices do not cause harmful

⁶ See the February 11, 2011, *Notice of Apparent Liability Forfeiture and Order* issued to Utah Broadband.

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interference to incumbent operations. The answer is yes: Amend Section 15.5(c) of the FCC rules to allow interference-aggrieved private parties the right to take legal action, such as a Small Claims Court case, against a Part 15 user causing harmful interference to a licensed user. EIBASS notes that in the March 19, 2009, *Petition for Reconsideration* of the ET Docket 04-186 *White Spaces Devices (WSD)* R&O jointly filed by Dane Ericksen and Richard Rudman, the Commission was requested to do just that. The current Section 15.5(c) language limits enforcement to only "a Commission representative," and now the even fewer FCC Enforcement Bureau field offices and smaller staff make such Part 15 interference enforcement unlikely. Regrettably, at paragraph 151 of the September 23, 2010, ET Docket 04-186 *Second Memorandum, Opinion & Order*, the Commission declined to modify Section 15.5(c), stating that "The Commission's statutory authority and its rules provide for a range of enforcement actions that could be relied upon to eliminate and prevent interference." Nevertheless, in response to the question posed in Paragraph 71, EIBASS makes just such a request.

17. EIBASS repeats a portion of its November 11, 2017, reply comments to the General Docket 17-183 NOI *Expanding Flexible Use in Mid-Band Spectrum Between 3.7–24 GHz*, since those comments remain applicable to the instant ET 18-295 NPRM:

NSMA correctly notes that in shared fixed microwave service bands
...since interfering transmitter characteristics and locations are
well known, interference prediction is now standardized.⁷

For this reason the recently authorized shared use of the 6,875–7,125 MHz "7 GHz" Part 74, Subpart F, TV BAS band with Part 101 Fixed Service (FS) microwave stations, as created in the WT Docket 10-153 "BAS Flexibility" rulemaking, has been a success. However, opening these bands to many Part 15, unlicensed mobile and/or itinerant users would be a recipe for disaster. While the 7 GHz TV BAS band is used by both fixed, point-to-point stations such as TV studio-to-transmitter links (STL) and Inter City Relay (ICR) stations, and also mobile TV Pickup (electronic news gathering, or ENG) stations, this mixture of fixed link and mobile stations in the same band only works because all are licensed stations, and all licensees are linked users: TV stations, Broadcast Network Entities (BNEs), and Cable Network Entities (CNEs). These shared industry users have a strong incentive to carefully limit their use of mobile TV Pickup stations in markets with same band fixed STL and ICR stations, and to cooperate with each other, often with sophisticated, real-time or near real-time frequency coordination. This incentive to minimize interference and industry-supported frequency coordination by the Society of Broadcast Engineers, Inc. (SBE), would be missing should the 7 GHz TV BAS band be opened to non-broadcast mobile licensees. *The interference threat would be even more severe (and obvious) if opened to Part 15 Subpart E Unlicensed National Information*

⁷ NSMA comment to GN Docket 17-183, at page 6.

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Infrastructure (U-NII) users. [italics added].

V. Further Example of Part 15 Devices Interfering with TV BAS Operations

18. Existing 1-watt TPO/4-watt equivalent isotropic radiated power (EIRP) Section 15.247 applying to 2,400–2,483.5 MHz Part 15 devices have a long history of causing chronic interference to TV BAS operations on Channel A8 (2,460–2,467 MHz) and A9 (2,467–2,483.5 MHz). In fact, this is so well known to the broadcast industry that visiting itinerant broadcasters regularly request to local SBE-affiliated volunteer BAS frequency coordinators to use only a 2 GHz TV BAS channel rather than either of the two 2.5 GHz TV BAS channels. For example, at the April 20, 2004, meeting of the *2 GHz ad hoc Committee* at the National Association of Broadcasters (NAB) Broadcast Engineering Conference (BEC) in Las Vegas, the BAS frequency coordinator for the Phoenix, Arizona, market explained that Phoenix has four major ENG receive sites: Shaw Butte, South Mountain, Usuary Pass and White Tanks. These four ENG receive only (ENG-RO) sites are north, south, east, and west of Phoenix, as shown by the attached Figure 3. The Phoenix coordinator explained that about every six months or so one of these four sites becomes unusable for 2.5 GHz Channel A8 and A9 operations because of the proliferation of 2.4 GHz WiFi devices at the site (most often for wireless local area networks, or WLANs). Of course, as a Part 15 device, WLANs are not permitted to cause interference to licensed TV BAS operations. To cure the problem, the ENG-RO site is visited, and the operators of the offending Part 15 devices are instructed to cease and desist their interference-causing operations. The Phoenix coordinator provided the analogy that these visits are like turning on the light in a cockroach-infested room: The 2.4 GHz Part 15 "cockroaches" scurry to get out of the light. But they inevitably come back, over time, and the process has to be repeated. EIBASS does not want to see this same problem, troublesome and costly to resolve, repeated in this proceeding by allowing unlicensed operations in the 6.5 and/or 7 GHz TV BAS bands. This would result in real dollar costs to broadcasters for interference tracking time and resources, and the loss or impairment of real-time operations capability for news and sporting events.

19. The attached Figure 4 demonstrates the 2.4 GHz WiFi interference problem, which has become so much worse that many broadcasters have given up trying to use TV BAS Channels A8 or A9: It shows noise floor measurements taken on January 9, 2013, at the South Mountain ENG-RO site in Phoenix, AZ. The top spectrograph shows a good noise floor of about -85 dBm for the 2 GHz TV BAS band, and the bottom spectrograph shows degraded noise floors of about -74 dBm for TV BAS Channel A8 at 2,450–2,467 MHz and about -80 dBm for TV BAS

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Channel A9 at 2,467–2,483.5 MHz. Whereas grandfathered TV BAS Channel A10, which is uncontaminated by Part 15 WiFi devices, and also uncontaminated for the present by Globalstar Terrestrial Low Power Service (TLPS)⁸ operations, the noise floor is back to a “good” -85 dBm. These 50 MHz wide measurements were taken with a calibrated Anritsu spectrum analyzer in peak hold mode, with a 100 kHz resolution bandwidth, 30 kHz video bandwidth, and a five-minute capture time. Note the incoming TV BAS Channel A2 ENG signal seen on the left-hand side of the top spectrograph is only 8 dB above the noise floor. The ENG receiver at this site successfully received and decoded this high-definition signal with a “link quality”⁹ of 6, meaning a low-level signal that most TV stations could use on-air if necessary. Because of Part 15 WiFi noise, it would not be possible to reliably decode this program feed at this low signal level on TV BAS Channels A8 or A9.

VI. SBE Comments To the Commission in 2004 Regarding Part 15 Devices Unfortunately Remain True 15 Years Later

20. In the November 30, 2004, SBE comments to ET Docket 04-186 pertaining to unlicensed operation on “unused” TV channels, aka White Spaces Devices or WSDs, the following portion remains so true and pertinent 15 years later that EIBASS is repeating those comments here:

19. Further, SBE believes that many, perhaps most, vendors of high power Part 15 devices could care less about the interference potential of such devices. They are primarily interested in making the sale. Sales of such high power Part 15 devices over the Internet would be particularly prone to inappropriate use. And even vendors that might have honest concerns about interference to licensed services would be powerless to control when, where and how the purchaser operates the device.

20. SBE believes that many users are typically unaware of a device's FCC status (i.e., licensed vs. unlicensed) unless they are told by a vendor. Additionally, most users only look at the manual when the product doesn't work-- and they hardly ever read the "legalese fine print" which is usually where the licensing status information is "hidden." And, by this time, they already own the product! This is evidenced by all the Part 74

⁸ See the December 23, 2016, R&O to IB Docket 13-213, *Terrestrial Use of the 2473–2495 MHz Band for Low-Power Mobile Broadband Networks*. This R&O assigned 2,483.5–2,495 MHz to Globalstar for terrestrial use of its Mobile Satellite Service (MSS) allotment. However, as far as EIBASS is aware, such Globalstar terrestrial operation has not yet commenced. EIBASS notes that Globalstar is obligated to protect co-primary, indefinitely grandfathered TV BAS Channel A10 stations at 2,483.5–2,500 MHz. There are grandfathered Channel A10 TV Pickup stations in many of the major TV markets, including Boston, Chicago, Denver, Detroit, Los Angeles, Miami, New York City, Philadelphia, Phoenix, Sacramento, Salt Lake City, San Diego, San Francisco, and Washington, DC.

⁹ Link Quality is an arbitrary scale of 1-10, where 1 is a poor signal and 10 is an excellent signal. Link quality takes into consideration all the performance metrics associated with a digital ENG signal and gives a non-technical operator a scale to rate the incoming signal.

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(license required) wireless devices being used outside the FCC's rules in nuclear power plants (Telex Intercoms), churches and auditoriums, including possibly the FCC's own conference room in Washington, DC. Users simply rely on the word of the vendor that "you don't need a license to use this device," purchase the device and assume that it will work. When it doesn't, or stops working due to interference, the user returns it as "broken," or just accepts the loss. The vendor, on the other hand, has a built in conflict of interest: If he tells the user they legally can't use the device without FCC authorization, the vendor could lose the sale. So everyone "assumes" the user is aware of the product's license status and sells them a product that they may not actually be able to license, furthering the "wink and a nod" marketing that is so common for devices requiring an FCC license.

21. Ultimately, it's the user that is stuck with a device that simply quits working when a new station goes on the air; just like all those hospitals found out when the first VHF DTV station commenced operation. The FCC would be setting up a whole new class of users for failure, with broadcasters becoming the "bad guy" when the devices fail, even though high power Part 15 operations were never entitled to interference protection in the first place.

EIBASS sees the same "trashing" of the 6.5 GHz and 7 GHz TV BAS bands as happened to the 2.5 GHz TV BAS band unless all of the protection steps described elsewhere in these EIBASS comments are adopted.

21. For example, there is now so much Part 15 use of the 2.5 GHz TV BAS band that at least one SBE BAS frequency coordinator, Mr. Karl Voss, the Phoenix, AZ, coordinator, reports that at large venues the Information Technology (IT) departments routinely deploy indoor WiFi systems to support "the fan experience," and even challenge Part 74 Subpart F TV BAS licensees operating on TV BAS Channels A8 and A9 to get off "their" spectrum. At one event Mr. Voss coordinated, the IT folks were actively jamming a licensed camera-mounted transmitter that was not known to their WiFi system. Mr. Voss arranged for the TV Pickup transmitter to shift its frequency several times before figuring out what was happening, and then educated the IT department on the pecking order between licensed Part 74 stations and unlicensed, Part 15 use. He reported that he got the total attention of the IT department after explaining that 2.5 GHz TV BAS frequencies are also used by Public Safety for bomb detection robots, and that Public Safety agencies do not tolerate active interference by anyone. Further, Public Safety licensees have the clout to get the FCC on site when they are being interfered with.

22. EIBASS does not want to see the "trashing" of the 6.5 GHz or 7 GHz TV BAS bands like happened to the 2.5 GHz TV BAS band. But if sufficient controls such as protecting the operational areas of 6.5 GHz and 7 GHz TV Pickup stations (which would include interior venues like sports stadia and convention centers that are within those operational areas), and

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adoption of difficult-to-circumvent methods of truly ensuring indoor-only operation in the remaining areas outside of TV Pickup operational areas are not adopted, then just such a result is likely.

VII. Summary

23. EIBASS continues to believe that this proposal is not a rational, feasible or compatible sharing of the 6.5 and 7 GHz TV BAS bands, and as proposed in the NPRM will result in chronic and difficult to locate intermittent interference. But, realizing that Congress has given the Commission its marching orders, regardless of the laws of Physics and reasonable and prudent spectrum management, EIBASS asks that the operational areas of 6.5 GHz and 7 GHz TV Pickup stations be protected (*i.e.*, excluded), and that extraordinarily stringent steps be taken to ensure that U-NII-6 and U-NII-8 devices cannot be easily hacked to defeat their interference protection features.

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List of Figures

24. The following figures or exhibits have been prepared as a part of these ET Docket 18-295 comments:

1. Maps showing operational areas of 6.5 and 7 GHz Part 74, Subpart F, TV Pickup stations.
2. eBay add for 8-watt 2.4 GHz Wi-Fi power amplifier.
3. Map showing Phoenix-area ENG-RO sites.
4. Comparison of noise floors at 2 vs. 2.5 GHz for the South Mountain ENG-RO site.

Respectfully submitted,

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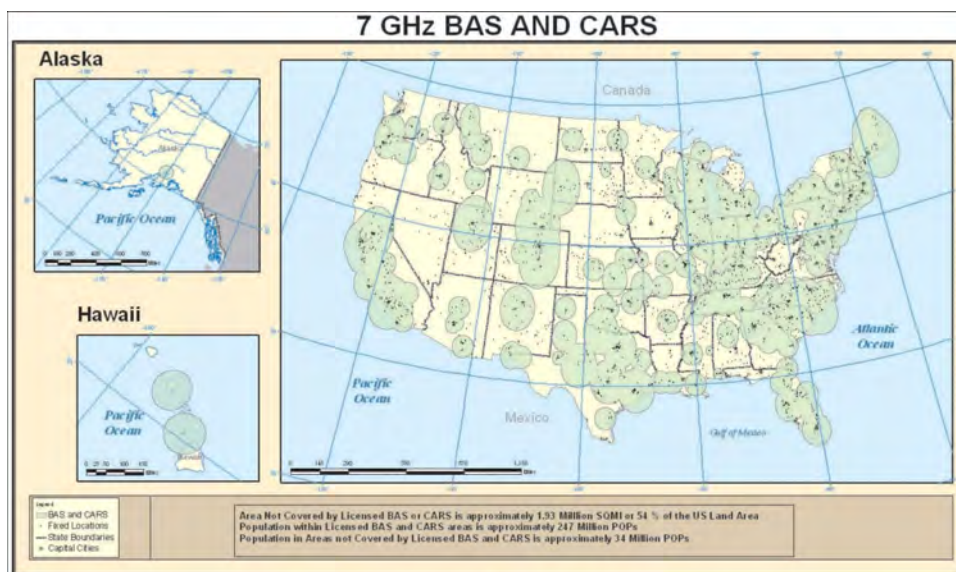
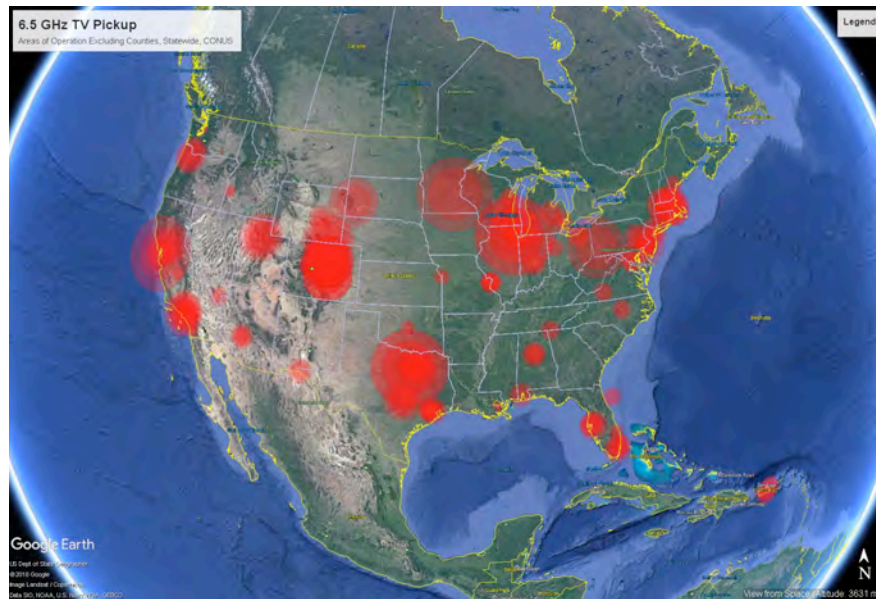
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Maps Showing Operational Areas of 6.5 and 7 GHz TV Pickup Stations



6.5 GHz map (top) courtesy of Micronet Communications, Inc.; 7 GHz map (bottom) from National Spectrum Management Association (NSMA) Recommendation WT 03.17.001, *Fixed Service Frequency Coordination in the Broadcast Auxiliary Service and Cable Television Relay Service Bands of 6875–7125 MHz and 12,700–13,150 MHz* (only the 7 GHz band map from that document is shown here). Only TV Pickup stations with circular operational areas are shown.

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eBay Ad for 8-watt 2.4 GHz Wi-Fi Power Amplifier

ebay Shop by category

Search for anything

All Categories Search

Back to home page | Listed in category: Computers/Tablets & Networking > Home Networking & Connectivity > Boosters, Extenders & Antennas > See more EDUP 2.4ghz 8w Wireless WiFi Power Booster Ran... Add to

SAVE UP TO 7% WHEN YOU BUY MORE

EDUP®

6dBi

8W

2.4GHz

8W 2.4G Wireless WiFi Repeater Broadband Power Extender Signal Booster Amplifier

1 product rating

Condition: **New**

Bulk savings: Buy 1 \$47.99/ea Buy 2 \$45.59/ea

Quantity: 1 3 or more for \$44.63/ea

Last one / 2 sold

Unit price: **US \$47.99/ea** Buy It Now

Add to cart

Add to watch list

☐ 3-year protection plan from SquareTrade - \$6.99

Last item available More than 66% sold Free shipping and returns

Shipping: **FREE** Standard Shipping | See details
Item location: Rowland Heights, California, United States
Ships to: United States | See exclusions

Delivery: Estimated on or before **Fri, Jan. 18** to 95476

Payments: **PayPal CREDIT**
Special financing available. Apply Now | See terms

Returns: Free 60 day returns | See details

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Last updated on Jan 06, 2019 10:16:39 PST [View all revisions](#)

Item specifics

Condition:	New: A brand-new, unused, unopened, undamaged item in its original packaging (where packaging is ... Read more	Brand:	EDUP
MPN:	Does not apply	Country/Region of Manufacture:	China
Network Connectivity:	Wireless-Wi-Fi 802.11b, Wireless-Wi-Fi 802.11g, Wireless-Wi-Fi 802.11n	Frequency Bands:	2.4 GHz
Type:	Booster	Model:	EP-AB003
UPC:	723172893200		

EIBASS Comments: ET Docket 18-295, Unlicensed Use of the 6 GHz Band

eBay Ad for 8-watt 2.4 GHz Wi-Fi Power Amplifier

Note:

- Your device must be SMA antenna detachable Connector when used it , for example SMA detachable antenna
- Please confirm that you device output power range is between 3dBm and 20dBm,only that the wifi signal booster could work

Features:

- Low-noise receive gain
- Signal activity LED indicates
- High Gain, High Value, High Performance
- Maximum output power of 8000mW by the Booster
- Plug-and-play, Easy installation, no driver needed
- Ideal for increase the 2400-2500Mhz frequency devices
- Increase the effective range and coverage area of your Wi-Fi network
- Simply attach the booster in between the standard antenna on a wireless router or wireless access point and \
- The amplified wireless signal may even penetrate complex environments with many walls and obstacles
- Ideal for use with 2.4GHz Wireless LANs, Support 802.11b, 802.11g, 802.11n (2.4Ghz mode only)

Specification:

- Operation Range: 2400-2500 MHz.
- Operation Mode: Bi-directional, half-duplex, Auto-Switching via carrier sensing.
- Frequency Response: ± 1 dB over operation range.
- Input Power: 3dBm (Min.)-20dBm (Max.).
- Output Power: 8000mW/39dBm nominal
- Connector: SMA Receptacle, 50 ohm.
- Transmit Gain: 16-18dBm nominal.
- Receiver Gain: 10-12dBm.
- Receive Noise Figure: 3.0dBm nominal.
- Operating Temperature: -40 to 70 degree.
- Operating Humidity: Up to 95% relative humidity.
- Material: Cast Aluminum
- INPUT: 100-240V 0.3A 50/60HZ
- OUTPUT:12V 1.5A

EIBASS Comments: ET Docket 18-295, Unlicensed Use of the 6 GHz Band

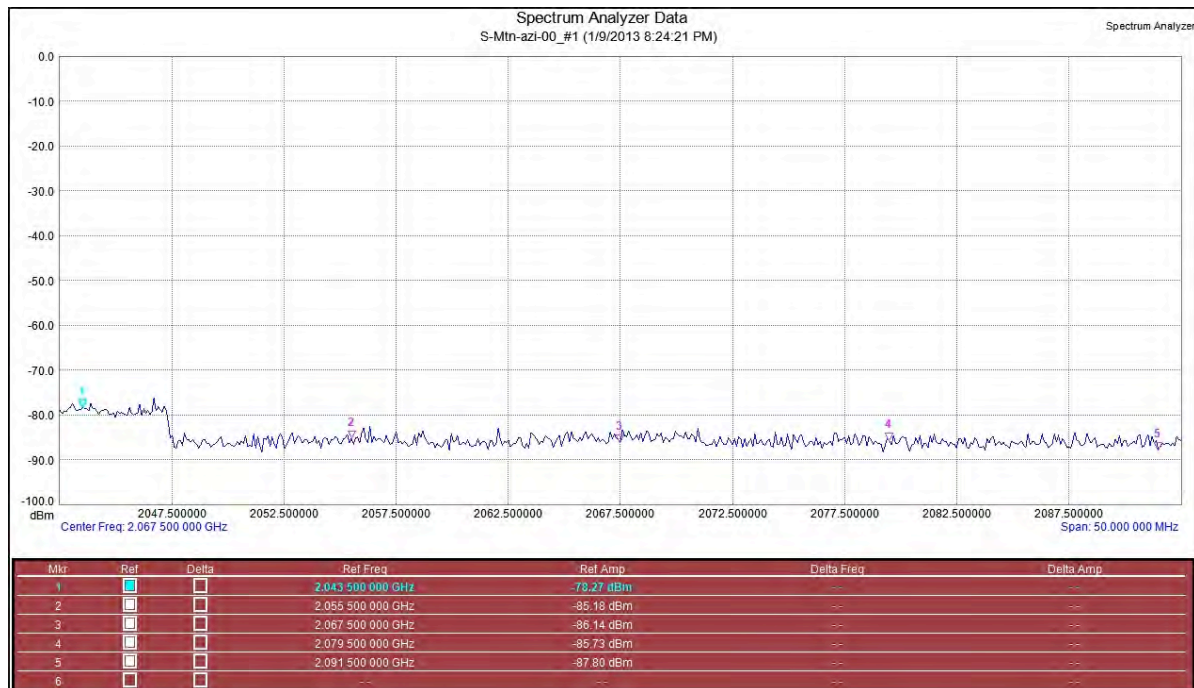
Phoenix Area ENG Receive-Only Sites



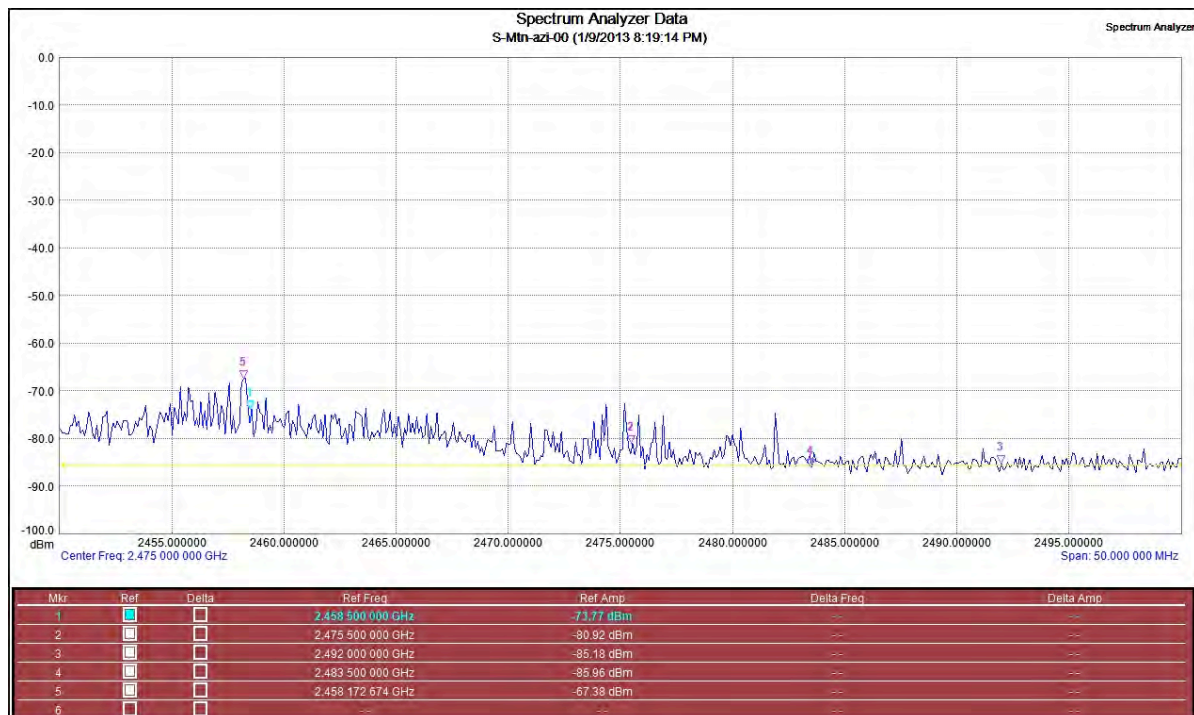
The four major ENG-RO sites for Phoenix: Shaw Butte, South Mountain, Usuary Pass and White Tanks.

EIBASS Comments: ET Docket 18-295, Unlicensed Use of the 6 GHz Band

Observed South Mountain Noise Floors at 2 vs 2.5 GHz



The noise floor of the 2 GHz TV BAS band is about -85 dBm across the entire band. An active ENG signal about 8 dB above the noise floor is present on TV BAS Channel A2.



The noise floor is about -74 dBm for TV BAS Channel A8, about -80 dBm for TV BAS Channel A9, and about -85 dBm for grandfathered TV BAS Channel A10.