

# Spectrum Proceedings & Part 15 Waivers

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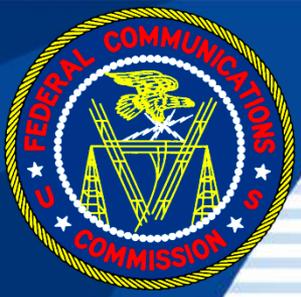


# Policy and Rules Division

The Policy and Rules Division conducts proceedings to develop policy and rules with respect to spectrum allocation and use, unlicensed devices, and equipment authorization. The Division maintains the Table of Frequency Allocations and represents the Commission on NTIA's Interdepartmental Radio Advisory Committee (IRAC) and coordinates Federal and non-Federal frequency assignments in shared frequency bands.

- **Technical Rules Branch** – Develops rules and standards for unlicensed devices that operate under Parts 15 and 18.
- **Spectrum Coordination Branch** - Coordinates Federal and non-Federal frequency assignments in shared frequency bands.
- **Spectrum Policy Branch** -Develops policy, regulations and procedures regarding spectrum allocation and use, including modifications to the Table of Frequency Allocations.





# FCC 5G FAST Plan

*“At the FCC, we call our strategy for U.S. leadership in fifth-generation wireless technology the 5G FAST plan. It consists of three central components: freeing up much more spectrum for the commercial marketplace, promoting wireless infrastructure deployment, and modernizing our regulations to promote more fiber deployment.” – Chairman Ajit Pai*



[www.fcc.gov/5G](http://www.fcc.gov/5G)



# FCC 5G FAST Plan-Spectrum

The FCC is taking action to make additional spectrum available for 5G services.

- **High-band**: Concluded 5G spectrum auction for the 28 GHz & 24 GHz bands. Auction for the upper 37/39/47 GHz bands is complete and we are in the process of issuing the licenses.
- **Mid-band**: Repurposing activities to make a large contiguous block of mid-band spectrum available for commercial use, 3.45-3.55 GHz band and neighboring 3.5 GHz and 3.7 GHz bands could offer 530 megahertz of mid-band spectrum for flexible use.
- **Low-band**: The FCC is acting to improve use of low-band spectrum with targeted changes to the 600 MHz, 800 MHz, and 900 MHz bands.
- **Unlicensed**: Recognizing that unlicensed spectrum will be important for 5G, the agency is creating new opportunities for the next generation of Wi-Fi in the 5.9 GHz and 6 GHz and above 95 GHz band.



# White Spaces

ET Docket No. 20-36

- **FCC proposed rule changes for white space devices in the TV bands (channels 2-35) in February 2020**
- **Report and Order adopting rule changes scheduled for vote at October 27, 2020 Commission meeting**
- **Item under consideration would:**
  - Increase maximum fixed device power from 10 watts to 16 watts EIRP in “less congested” areas (where at least half of TV channels are unused).
  - Increase HAAT limit for fixed devices from 250 meters to 500 meters in “less congested” areas, subject to a coordination procedure with TV broadcasters.
  - Eliminate limit on antenna height above ground in most cases.
  - Allow higher power mobile operations in “less congested” areas within defined “geo-fenced” areas.
  - Establish new rules for narrowband IoT devices.



# 3.45-3.55 GHz Band (C-Band)

GN Docket No. 19-348

- **3.45-3.55 GHz band currently allocated for Federal Radiolocation Service**
- **Report and Order and Further Notice of Proposed Rulemaking adopted September 30, 2020**
- **Summary of R&O changes:**
  - Clear the 3.3-3.55 GHz band of secondary, non-federal allocations.
  - Relocate non-federal radiolocation licensees to the 2.9-3.0 GHz band, allowing them to continue operating there on a secondary basis.
  - Sunset of secondary amateur allocation.
- **Summary of Proposed Changes:**
  - Relocate the 3.45-3.55 GHz Band for Commercial Wireless Use.
  - Relocate of Secondary Non-Federal Radiolocation Operations.
  - Propose technical, licensing, and competitive bidding rules for the band.



# 3.7-4.2 GHz Band (C-Band)

GN Docket No. 18-122

- **3.7-4.2 GHz band currently allocated for fixed satellite service (FSS) and fixed service (FS)**
- **Report and Order adopted February 28, 2020**
- **Summary of changes:**
  - Add mobile allocation to 3.7-4.0 GHz band.
  - Transition 280 megahertz, plus a 20-megahertz guard band, from incumbent use to flexible-use through public auction.
  - Require FSS operations to relocate to 4.0-4.2 GHz band.
  - Provide incumbent FSS and FS licensees with reimbursement of reasonable relocation costs, paid by flexible-use licensees.
  - Adopt service and technical rules for flexible-use licensees in the 280 megahertz of spectrum designated for transition to flexible-use.
  - Bidding in auction 107 scheduled to begin in December 8, 2020 (see AU Docket No. 20-25).



# 5.9 GHz Band

ET Docket No. 19-138

- **5.9 GHz band (5.850-5.925 GHz) currently reserved for Dedicated Short Range Communication (DSRC) Service**
- **NPRM adopted December 12, 2019**
  - Reply comment deadline extended to April 27, 2020
- **Proposed changes:**
  - Repurpose lower 45 megahertz of the band (5.850-5.895 GHz) for unlicensed operations, e.g., Wi-Fi.
  - Continue to dedicate spectrum in upper 30 megahertz of band to support transportation and vehicle safety-related communications.
  - Permit Cellular Vehicle to Everything (C-V2X) operations in the upper 20 megahertz of band (5.905-5.925 GHz).
  - Seek comment on whether to retain 10 megahertz (5.895-5.905 GHz) for DSRC systems or whether it should be dedicated for C-V2X.



## 6 GHz Unlicensed ET Docket 18-295

- **Report & Order and Further NPRM adopted on April 23, 2020.**
- **Made 1200 megahertz of spectrum available for unlicensed devices:**
  - In the 5.925-6.425 GHz and 6.525-6.875 GHz bands, access points could transmit indoors and outdoors under control of an automated frequency coordination (AFC) system at power levels permitted in 5 GHz band.
  - In the 5.925-7.125 GHz band, access points could operate at lower power without an AFC system, restricted to indoor use only.
- **Proposed to permit very low power operation (indoors and outdoors) across entire 6 GHz band**
  - Also seeks comment on permitting higher power for non-AFC controlled indoor access points.



# 6 GHz Unlicensed ET Docket 18-295

## 6 GHz device power levels (draft R&O)

Device Class	Operating Bands	Maximum EIRP	Maximum EIRP Power Spectral Density
Standard-Power Access Point (AFC Controlled)	U-NII-5 (5.925-6.425 GHz) U-NII-7 (6.525-6.875 GHz)	36 dBm	23 dBm/MHz
Client Connected to Standard-Power Access Point		30 dBm	17 dBm/MHz
Low-Power Access Point (indoor only)	U-NII-5 (5.925-6.425 GHz) U-NII-6 (6.425-6.525 GHz) U-NII-7 (6.525-6.875 GHz) U-NII-8 (6.875-7.125 GHz)	30 dBm	5 dBm/MHz
Client Connected to Low-Power Access Point		24 dBm	-1 dBm/MHz



# Spectrum Frontiers

## Spectrum Allocations

- 12.55 GHz of Spectrum added for mobile
  - **Licensed Bands (Total 3.85 GHz):**  
24.25-24.45 GHz and 24.75-25.25 GHz; 47.2-48.2 GHz; 27.5-28.35 GHz; 37-38.6 GHz; 38.6-40 GHz;
  - **Unlicensed Bands (Total 7 GHz):**  
64-71 GHz

## Service Rules

- Part 30: Upper Microwave Flexible Use Service (UMFUS)
- Geographic Area Licensing, Area Size, Band Plan, License Term, Overlay Auctions
- Technical rules
- Performance Requirements



# Spectrum Horizons

ET Docket No. 18-21

- **FCC expanded access above 95 GHz**
- **Order adopted March 15, 2019**
  - Final regulatory activities ongoing
- **Total of 21.2 GHz for unlicensed use**
  - 116-123 GHz, 174.8-182 GHz, 185-190 GHz and 244-246 GHz, bands
  - Similar to 60 GHz rules
  - Selected high absorption bands
- **New type of experimental licenses > 95 GHz**
  - Longer license terms
  - Ability to sell devices
  - Permits expanded market trials above 95 GHz



# Part 15 Waivers

- **A radio frequency device that operates in accordance with the Part 15 unlicensed rules may not be marketed unless it has completed the appropriate equipment authorization process - certification for most intentional radiators.**
- **Certification will only be granted for a device that has demonstrated compliance with all applicable Equipment Authorization rules.**
- **If a specific rule cannot be complied with, the responsible party may submit a request for waiver.**



# Waiver Process

- **A request must demonstrate that there is good cause to waive the specific rule requirement.**
  - If the FCC staff determines that the request warrants further consideration, it typically will release a public notice establishing a period for public comment.
- **The request will be granted or denied based upon review of the entire record.**
  - When appropriate, grants may include special conditions intended to ensure that underlying purpose of the waived rule continues to be satisfied.
- **Parties are expected to provide a copy of the granted waiver when submitting the application for certification.**



# Recent Waiver Grants and Filings

- **Information about waiver filings and decisional documents may be found on the Commission's website**
  - The OET website includes headline links related to all Office activities : **[www.fcc.gov/engineering-technology](http://www.fcc.gov/engineering-technology)**
  - Commission and OET- level decisions may be found in the EDOCS system: **[www.fcc.gov/edocs](http://www.fcc.gov/edocs)**
  - Petitions and related comment may be found in the ECFS system: **[www.fcc.gov/ecfs](http://www.fcc.gov/ecfs)**
  - Decisions are references by FCC/DA #; Most proceedings may be found by Docket No.; Text/title search also available
- **Recent waiver requests have reflected a variety of emerging technologies. Some examples include...**



# Motion Sensing Devices

- **Vayyar Imaging (Open ET Docket No. 20-15)** sensing device in the 57-64 GHz band for applications such as touchless control, medical/safety alerts, vital sign monitoring, and environmental management. Requests interpretation/waiver of Section 15.255(a)(2) (short-range interactive motion sensing (SRIMS) device scope), and waiver of Sections 15.255(b)(2) (prohibition on board aircraft) and 15.255(c)(3) (peak power level).
- **Valeo North America (Open ET Docket No. 20-121)** sensing device in the 57-64 GHz band for child left behind, seatbelt reminder, driver's attention etc., on passenger vehicles. Requests interpretation/waiver of Section 15.255(a)(2) (SRIMS device scope) and waiver of Section 15.255(c)(3) (peak power level).
- **Infineon Technologies America (Open ET Docket No. 20-263)** sensing device in the 57-64 GHz band for child left behind, seatbelt reminder, etc. on passenger vehicles. Requests interpretation/waiver of Section 15.255(a)(2) (SRIMS device scope) and waiver of Section 15.255(c)(3) (peak power level).



# Motion Sensing Devices Continue

- **Tesla (Open ET Docket No. 20-264)** sensing device in the 60-64 GHz band for child left behind, seatbelt reminder, etc. on passenger vehicles. Requests interpretation/waiver of Section 15.255(a)(2) (SRIMS device scope) and waiver of Section 15.255(c)(3) (peak power level).
- **IEE Sensing (Open WT Docket No. 20-144)** sensing device in the 76-81 GHz band for in-cabin safety applications on vehicles. Requests declaratory ruling/waiver of Part 95M to allow use of the 76-81 GHz band for stand-alone in-cabin child left behind, seatbelt reminder, etc., vehicular applications.
- **Google Soli (DA 18-1308)** device senses gestures rather than touch. Required waiver of power requirements for devices operating in the 57-71 GHz band (15.255). Waiver granted Dec. 2018.
- **32 Technologies, LLC (DA 18-1210)** – Tracking dog collar intended to confine pet to defined area. Required waivers of certain restrictions regarding outdoor operations in the 5925-7250 MHz Band (15.250). Waiver granted Nov. 2018.



# Motion Sensing Devices Continue

- **Technological Advisory Council Recommendation ([TAC Sep. 2020 Meeting](#))**
  - Start a rulemaking proceeding to examine 60 GHz rules in 47 C.F.R. 15.255 to address issues raised by waiver requests for field disturbance systems.
    - Power levels for radar applications, including potential for equivalent power levels to communication systems for LBT radar.
    - Coexistence mechanisms, including duty cycle requirements, DFS, and contention-based protocols.



# Detection/Screening

- **Rohde & Schwarz (DA 20-1025)** Security scanner system in the 70-80 GHz band designed to detect the presence of concealed metallic and non-metallic threats carried in or underneath the clothing of persons. Requests waivers of Sections 15.205 (restricted bands) and 15.209 (field strength limits). Waiver granted Sep. 2020
- **Liberty Defense (Open ET Docket 19-217)** seeks waivers of rules related to measurements, ultra-wideband (UWB) operations and certain user restrictions (15.31, 15.503, 15.511 and 15.521) for its HEXWAVE weapons/threat detection system.





# Ground Penetrating Radar (GPR), mapping, measuring & other uses

- **Robert Bosch (Open ET Docket No. 20-65)** parking lot occupancy sensor in the 2400-2483.5 MHz band. Requests waiver of Section 15.245(b) (frequency band for field disturbance sensors).
- **Zebra Technologies (Open ET Docket No. 20-17)** positioning system in the 7125-8500 MHz band for applications such as tracking players in sports venues and preventing accidents to airplane maintenance personnel. Requests waiver of Section 15.517(a) (indoor operation), 15.519(a)(1) (UWB technical requirements), or 15.250 (frequency range for wideband operation).
- **Wavesense (Open ET Docket No. 19-241)** driver-assistance technology, which relies on UWB GPR to enable active lanekeeping in challenging environmental conditions; seeks waivers of certain operational and Federal coordination requirements (15.509 and 15.525)



# Ground Penetrating Radar (GPR), mapping, measuring & industrial uses

- **GSSI (Open ET Docket 19-155)** request for waivers of the UWB rules to market up to 2000 evaluation kits for an UWB GPR intended to enable self-driving cars to read features of the roadbed beneath the pavement. (15.31, 15.503, and 15.509)
- **Leica (Open ET Docket No. 19-350)** radar modules operating in the 60-64 GHz frequency band used on UAVs for hazard detection while in flight. Seeks waiver of the prohibition on-board aircraft in Section 15.255(b)(2). Waiver granted Jul. 2018.



# Railroad Safety

- **Metrom (Open ET Docket 18-284)** requests waiver of the UWB rules for their AURA system designed to prevent collisions between trains, over-speed derailments, unauthorized train movement in work zones, and to minimize human error. (15.519(a), and 15.519(c)).
- **Piper (Open ET Docket 19-246)** requests waiver of the UWB rules for their Enhanced Transit Location System (ETLS) designed to provide position information of trains, prevent train-to-train collisions and identifying unauthorized train movements in work zones. (15.519(a)(2) and 15.250(c)-(d))



# U-NII Bands

- **Hydroid (Open ET Docket No. ET 19-240)** seeks a waiver to use directional gains in excess of 6 dBi, without reducing transmitter power, for two-way communications between vessels, and between shore points at fixed locations and vessels. (15.407(a)(3))
- **Radwin LTD. (DA 20-1088)** Seeks waiver to permit the operation of its JET point-to-multipoint, beamforming fixed wireless base stations in the 5.15-5.25 GHz and 5.725-5.85 GHz with EIRP of up to 48 dBm (12 dB above the limit prescribed by the Commission's rules). The waiver will permit its customers to provide better high-speed broadband service to subscribers so that they can stay connected and access essential services during the COVID-19 pandemic. Waiver granted Jul. 2020, extension granted Sep. 2020 (15.407(a) )



# Medical devices

- **Zoll Medical /Kyma Medical Tech (DA 16-1009 mod. By DA 19-742)** – uCor medical device to monitor congestive heart failure. Required waivers of Sections 15.31, 15.503, 15.513, and 15.521 for bandwidth, measurement, and frequency range.
- **Sensible Medical Innovations, LTD (DA 19-937)** - ReDS System designed to measure lung fluid measurements in congestive heart failure patients. Required waivers of Sections 15.31, 15.503, 15.513, 15.521, and 15.525 related to bandwidth, frequency range, measurements and coordination. Waiver granted Sep. 2019
- **MIT (DA 20-445 )** – WiTrack system passively monitors mobility, breathing, and other physiological signals in patients without body-worn sensors. Requests Waivers of Sections 15.503, 15.31, and 15.521 related to UWB operations and measurements. Waiver granted Apr. 2020



# Questions ?

# Thank you!