

**Federal Communications Commission  
Office of Engineering and Technology  
Laboratory Division**

December 13, 2017

**BASIC CERTIFICATION REQUIREMENTS FOR WIRELESS MICROPHONES**

**I. INTRODUCTION**

In Report and Order FCC 17-95, the Commission adopted new technical and service rules (effective October 3, 2017) for wireless microphones that operate under Parts 74, 15, and 90 of the FCC rules.<sup>1</sup>

**II. GENERAL GUIDANCE FOR CERTIFICATION OF WIRELESS MICROPHONES THAT OPERATE IN THE REPACKED TV BANDS, THE 600 MHZ GUARD BAND, AND THE 600 MHZ DUPLEX GAP**

The following lists general policies that apply for equipment certification, marketing, sale, or operation of wireless microphones under Part 74 or Part 15.

(a) *Equipment certification.* Wireless microphones can be certified under Part 74 or Part 15 as follows:

(1) Part 74 certification is available for the following<sup>2</sup> –

(i) *New devices that comply with the recently revised Part 74 rules.*

(A) Beginning October 3, 2017, devices can be certified under the newly revised rules (effective October 3, 2017). Such devices must meet the technical requirements for operation in the repacked TV bands and licensed portion of the 600 MHz duplex gap (653-657 MHz), and must not operate in the 600 MHz wireless service band (617-652 MHz / 663-698 MHz).

(B) There are no restrictions on marketing, sale, or operation of these devices (apart from requirements that the user operate on a secondary basis to other users) – either during the post-auction transition period (i.e., up until July 13, 2020) or afterwards.

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<sup>1</sup> This guidance does not apply to certification of various devices that effectively function as wireless microphones but operate under the applicable Part 15 rules for operations in the 88-108 MHz band, the 902-928 MHz band, the 1920-1930 MHz band, the 2.4 GHz band, or the 5 GHz band, or that operate as ultra-wide band devices under the applicable Part 15 rules.

<sup>2</sup> Devices may also be certified under the earlier Part 74 rules until January 13, 2018. Such devices could be designed to operate on the frequencies in the 600 MHz wireless service band (617-652 MHz / 663-698 MHz). The Commission will handle these on a case-by-case basis. There are marketing and sale restrictions on such devices, however, to the extent that they operate in the 600 MHz wireless service band (see DA 17-709), and any such device may no longer be sold after October 13, 2018. E-filing grant code note 26 and appropriate grant comments may be required.

- (ii) *Devices previously certified under the earlier Part 74 rules (i.e., rules in existence prior to the 2015 and 2017 revisions) which either comply with the revised Part 74 rules, or have been modified to comply with these new Part 74 rules.*
  - (A) Beginning October 3, 2017, such devices can be certified as meeting the revised Part 74 rules provided that they meet the technical requirements for operation in the repacked TV bands and licensed portion of the 600 MHz duplex gap, and do not operate in the 600 MHz wireless service band.
  - (B) There are no restrictions on marketing, sale, or operation of these devices – either during the post-auction transition period (up until July 13, 2020), or afterwards.
- (2) Part 15 certification –
  - (i) *New devices.*
    - (A) Wireless microphones that are certified to operate under the Part 15 rules must comply with the technical (e.g., power limits and emission mask requirements) and operational requirements under the new Part 15 rules (effective October 3, 2017) regarding operation in the repacked TV bands (TV channels below 608 MHz), the 600 MHz guard band (614-617 MHz), and/or the 600 MHz duplex gap (652-663 MHz); such devices must not be capable of operating in the 600 MHz wireless service band (617-652 MHz / 663-698 MHz).
    - (B) There are no restrictions on the marketing or sale of these devices, which only operate in the repacked TV bands, 600 MHz guard band, and/or 600 MHz duplex gap.
  - (ii) *Devices previously certified under the earlier Part 74 rules, but comply with the Part 15 rules or can be so modified.*
    - (A) Wireless microphones that have been certified under the previous Part 74 rules (i.e., rules in existence prior to rule revisions adopted in 2015 or 2017) for operations in the previous TV bands (TV channels below 698 MHz) may also be certified under the Part 15 rules *provided* that they comply with the new Part 15 rules or can otherwise be effectively modified to comply with the new Part 15 rules (e.g., technical requirements, power limits, and band restrictions, including the inability to operate on any frequencies in the 600 MHz wireless service band).
    - (B) If certified as compliant with the new Part 15 rules, there are no restrictions on the marketing or sale of these devices, which operate in the repacked TV bands, 600 MHz guard band, and/or 600 MHz duplex gap.
- (b) *Operation of wireless microphones – whether licensed or unlicensed – in the 600 MHz wireless service band during the post-auction transition period (which ends July 13, 2020).* During the post-auction transition period, licensed or unlicensed wireless microphone users may operate in the 600 MHz wireless service band by using wireless microphones certified under the earlier Part 74 rules *provided* that certain conditions are met –
  - (1) Such operations must comply with the technical requirements for operating on a licensed or unlicensed basis in the 600 MHz wireless service band;
  - (2) Such operations must cease no later than the end of the post-auction transition period – July 13, 2020, and must cease earlier than then in areas where a 600 MHz wireless service licensee has commenced operations. Unlicensed wireless microphone users may use these Part 74-certified devices under the 2010 waiver issued by the Commission that permits unlicensed users to use Part 74-certified devices for a limited period of time.

- (3) Effective January 13, 2018, no new certification under Part 74 will be permitted for any device that operates in the 600 MHz wireless service band.
- (c) The rules apply for the frequency bands listed in APPENDIX A.
- (d) Extended frequency listing on the grant, or the EF grant note, is not allowed for wireless microphones.
- (e) For devices marketed and sold to professional users only, a single device authorized for operation as both an unlicensed wireless microphone (Part 15) and a licensed wireless microphone (Part 74) may be approved under a single FCC ID.
  - (1) An application for certification must include two different Form 731 equipment classes:
    - (i) TLD – Licensed LPAS Device<sup>3</sup>
    - (ii) DWM – Part 15 Wireless Microphone
  - (2) The application for each equipment class must be stand-alone/self-contained and clearly identified.
- (f) Previously certified devices may be authorized under the new rules by filing for a Class II permissive change (CIIpc) or through a new original grant under the existing FCC ID, to show compliance with the new rules and avert new marketing restrictions. Guidelines for such applications are as follows.
  - (1) The new original grant or permissive change filing shall demonstrate compliance with all new applicable technical requirements including new band restrictions, emission mask, and output power limits.
  - (2) Changes to the device operation are limited to those made via software/firmware modifications only. The equipment authorization filing should include a detailed explanation of how the software/firmware upgrade process is controlled and managed.
  - (3) All permissive changes will require equipment class updates (KDB inquiry is required to update equipment class).
- (g) Disclosure requirement of Sections 15.37(k) and 74.851(l).
  - (1) Applies to any person who manufactures, sells, leases, or offers for sale or lease, wireless microphones capable of operating in the 600 MHz wireless service band.
  - (2) Consumer disclosure text, as specified by the Consumer and Governmental Affairs Bureau in the Wireless Microphones Consumer Disclosure Order DA 17-709, must be displayed at the point of sale in a clear, conspicuous, and readily legible manner.
  - (3) The Consumer Disclosure must be displayed on the website of the manufacturer (even if the manufacturer does not sell wireless microphones directly to the public) and of dealers, distributors, retailers, and anyone else selling or leasing the devices.

### **III. ADDITIONAL SPECIFIC GUIDANCE FOR LICENSED WIRELESS MICROPHONES UNDER PART 74**

- (a) As of January 13, 2018, applications under Part 74 for certification of licensed wireless microphones that are capable of operating in the 600 MHz wireless service band, 600 MHz guard band, or portions of the 600 MHz duplex band not allocated for LPAS operations will no longer be allowed.

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<sup>3</sup> The abbreviations LPAS (low-power auxiliary station) and LPAD (low-power auxiliary device) may generally be used interchangeably.

- (b) The Operational Description exhibit for devices under Part 74, which may be held confidential, should include:
- (1) A list of all operational bands.
  - (2) Description of how the frequency bands are selected and managed if the hardware or software platform supports such capabilities.
- (c) Compliance for emission mask and spurious emission requirements shall be demonstrated using the applicable measurement procedures of ETSI EN 300 422-1. Compliance with the emission limits shall be demonstrated using a RMS Average detector. Emissions shall be investigated up to the 10<sup>th</sup> harmonic of the fundamental. All other technical requirements shall be demonstrated utilizing the procedures specified in ANSI C63.26,<sup>4</sup> as applicable.
- (d) Additional guidelines for new authorizations of existing Part 74 devices:
- (1) Legacy Part 74 devices that were previously authorized to include the 600 MHz wireless service band, may file a new original application to add Part 15 operation and or modify the existing Part 74 authorization. Along with other new technical requirements, the filing must show how the 600 MHz service band capability has been removed.
  - (2) Along with removal of the 600 MHz wireless service band, Part 74 applications may not contain portions of the 600 MHz duplex gap and 600 MHz guard band available for unlicensed operations.
- (e) Other provisions for Part 74 licensed wireless microphones in specific bands and/or for specific conditions.
- (1) Output is specified as either conducted or EIRP, depending on the specific rule part.
    - (i) The output power limit in the bands 54-72 MHz, 174-216 MHz, and 653-657 MHz is specified as EIRP.
    - (ii) In all other Part 74 Subpart H bands, output power is specified as conducted.
  - (2) For Part 74 wireless microphones that operate in the repacked TV bands or in the 653-657 MHz, 941.5-944 MHz, 944-952 MHz, 952.850-956.250 MHz, 956.45-959.85 MHz, 1435-1525 MHz, 6875-6900 MHz and/or 7100-7125 MHz bands, the device shall meet emission mask and spurious emissions requirements of ETSI EN 300 422-1 v1.4.2.
  - (3) Transition period for 944-952 MHz band out-of-band emissions.
    - (i) Emissions shall be attenuated by at least  $43+10 \log (P)$  dB for the time period between now and January 13, 2018.
    - (ii) Emission mask in the European Telecommunications Institute Standard ETSI EN 300 422-1 v1.4.2 shall apply after January 13, 2018.
  - (4) Operations in 1432-1525 MHz are limited to those that have been coordinated with the Aerospace and Flight Test Radio Coordinating Committee (AFTRCC).<sup>5</sup> The operational description for devices that contain this band shall include a description of the software-based controls that prevent devices in the band from operating except with specific operating parameters that have been coordinated.

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<sup>4</sup> ANSI C63.26, American National Standard for Compliance Testing of Transmitters Used in Licensed Radio Services, Institute for Electrical and Electronic Engineers (IEEE).

<sup>5</sup> AFTRCC Coordination Procedure (<https://www.aftrcc.org/pages/procedures.php>).

- (f) Grants of certification for Part 74 devices shall use equipment class TLD and the following grant comments and/or grant notes as applicable.
  - (1) This device is part of a wireless microphone system operated with FCC ID XXX-YYYYYY.
  - (2) Grant Note: M4 - Operation of this unit is limited to use at stations licensed for use under Part 74 of FCC Rules.

#### **IV. ADDITIONAL SPECIFIC GUIDANCE FOR UNLICENSED (PART 15) WIRELESS MICROPHONES**

- (a) Beginning December 26, 2017, applications for certification of unlicensed wireless microphones must comply with the requirements of Section 15.236.<sup>6</sup>
- (b) The Operational Description exhibit, which can be held confidential,<sup>7</sup> should include:
  - (1) A list of all operational bands.
  - (2) Description of how software is managed and controlled if device is capable of operating outside the current band plan through software configuration.
- (c) User manual should include:
  - (1) Information about the types of antennas and cables that may be used with the device to ensure compliance with the EIRP limits applicable to unlicensed wireless microphones.
  - (2) For devices intended to operate in the 600 MHz guard bands and 600 MHz duplex gap, the user manual should contain instructions directing users to register with and check a white-space database to determine available channels prior to operation at a given location.
- (d) Compliance for emission mask and spurious emission requirements shall be demonstrated using the applicable measurement procedures of ETSI EN 300 422-1.<sup>8</sup> Compliance with the emission limits shall be demonstrated using a QP detector below 1 GHz and a RMS Average detector above 1 GHz. Emissions shall be investigated up to the 10<sup>th</sup> harmonic of the fundamental. All other technical requirements shall be demonstrated utilizing the procedures specified in ANSI C63.10,<sup>9</sup> as applicable.
- (e) Grants of certification for such devices shall use equipment class DWM.
- (f) Compliance with Section 15.203 antenna requirements does not apply to devices operated under Section 15.236.

#### **V. CERTIFICATION UNDER PART 90**

- (a) Selected frequencies in the 169-172 MHz band are available for wireless microphone operations under Section 90.265.

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<sup>6</sup> Equipment authorization under Section 15.236 is currently available; the current rules became effective October 3, 2017.

<sup>7</sup> See KDB Publication 726920 for Confidentiality Request procedures.

<sup>8</sup> ETSI EN 300 422-1 V1.4.2 (2011-08), European Telecommunications Standards Institute Electromagnetic Compatibility and Radio spectrum Matters (ERM); Wireless microphones in the 25 MHz to 3 GHz frequency range; Part 1: Technical characteristics and methods of measurement.

<sup>9</sup> ANSI C63.10, American National Standard for Testing Unlicensed Wireless Devices, Institute for Electrical and Electronic Engineers (IEEE).

- (b) Part 90 wireless microphones with emission bandwidths exceeding 54 kHz shall meet the emission requirements of ETSI EN 300 422-1 v1.4.2.
- (c) For devices marketed and sold to professional users only, a single device authorized for operation as both an unlicensed wireless microphone (Part 15) and a licensed wireless microphone (Part 90) may be approved under a single FCC ID.
  - (1) An application for certification must include two different Form 731 equipment classes:
    - (i) TNB – Non-broadcast transmitter
    - (ii) DWM – Part 15 Wireless Microphone
  - (3) The application for each equipment class must be stand-alone/self-contained and clearly identified.

## **VI. ADDITIONAL GUIDANCE FOR ALL WIRELESS MICROPHONES**

- (a) Third-party or field configuration of frequency, power, or other parameters that affect regulatory compliance:
  - (1) For licensed wireless microphones: allowed within operational bands and other conditions specified during certification; the operational description exhibit must explain what can be modified/configured by any third-party (anyone other than the grantee), the associated procedure, and how control is achieved to prevent end users from accidentally configuring or modifying the device resulting in unauthorized operation.
  - (2) For unlicensed wireless microphones: not allowed unless under direct control of grantee; the operational description exhibit must describe how control is achieved.
- (b) All wireless microphones, whether licensed or unlicensed, must comply with the general population / uncontrolled RF exposure limits.
- (c) Test reporting and application contents:
  - (1) Identify specific rule paragraph(s) relevant for compliance demonstration of each set of test results, and for each test-setup and test-procedure description section of a report.
  - (2) With each set of test results, provide text explaining where and how the specific numeric, graphic, and/or tabular results demonstrate compliance for the associated rule paragraph(s).
  - (3) Where a single application for equipment authorization is intended to cover multiple model number versions (e.g., with corresponding multiple separate user manual exhibits in a filing), please include a cover letter exhibit in the filing listing the intended versions and brief description of the differences.

## **CHANGE NOTICE**

**12/13/2017:** 206256 D01 Wireless Microphone Certification v01 has been replaced by 206256 D01 Wireless Microphone Certification v02 – clarified the measurement detectors to use for emission measurements.

## APPENDIX A

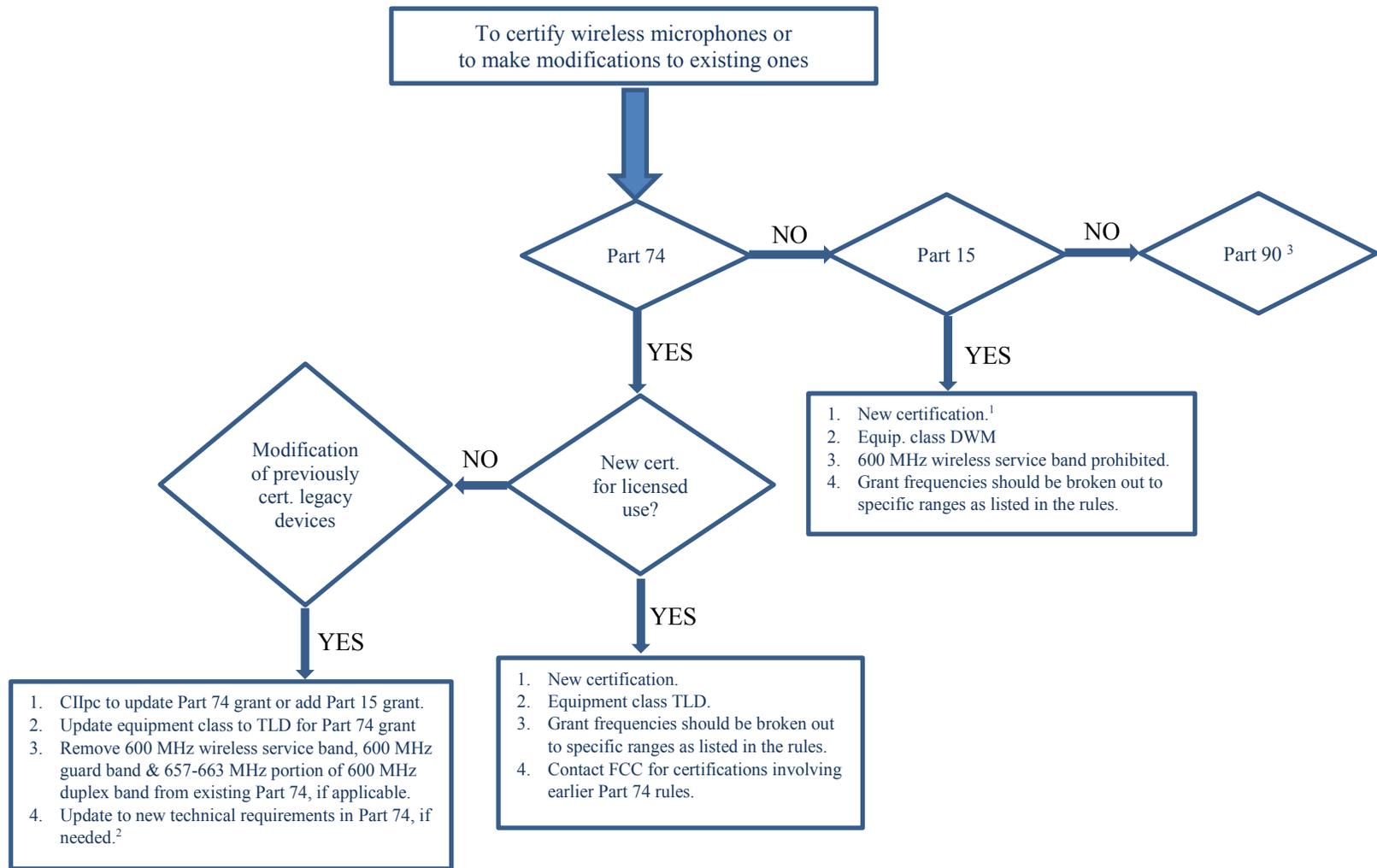
### FREQUENCY BANDS FOR WIRELESS MICROPHONES

**Table A.1 – Frequency Bands (in MHz) and Rule Parts for Wireless Microphone Equipment Grants**

<i>Frequency Band</i>	<i>Licensed/unlicensed</i>	<i>Rule Part</i>
26.1-26.48 MHz (VHF)	Licensed	Part 74
54-72 MHz (VHF)(TV Band Ch 2-4), 76-88 MHz (VHF)(TV Band Ch 5-6)	Licensed and unlicensed	Part 74 and Part 15
161.625-161.775 MHz (VHF)	Licensed	Part 74
169-172 MHz (VHF)	Licensed	Part 90
174-216 MHz (VHF)(TV Band Ch 7-13)	Licensed and unlicensed	Part 74 and Part 15
450-451 MHz (UHF), 455-456 MHz	Licensed	Part 74
470-608 MHz (UHF)(TV Band Ch 14-36)	Licensed and unlicensed	Part 74 and Part 15
614-616 MHz (guard band)	Unlicensed	Part 15
653-657 MHz (duplex gap)	Licensed	Part 74
657-663 MHz (duplex gap)	Unlicensed	Part 15
941.5-952.0 MHz, 952.850-956.250 MHz, 956.450-959.85 MHz	Licensed	Part 74
1435-1525 MHz	Licensed	Part 74
6875-6900 MHz / 7100-7125 MHz	Licensed	Part 74

**Table A.2 –Wireless Microphone Output Power and Emission Mask Requirements**

<i>Frequency Band</i>	<i>Unlicensed</i>		<i>Licensed</i>		<i>Output Power Rule Section</i>	<i>Emission Mask Rule Section</i>
	<i>Rule Section</i>	<i>Output Power</i>	<i>Rule Section</i>	<i>Output Power</i>		
26.1-26.48 MHz (VHF)			74H	1 Watt	§74.861(d)(1)	§74.861(d)(3)
54-72 MHz (VHF)(TV Band Ch 2-4)	§15.236	50 mW EIRP	74H	50 mW EIRP	§15.236(d)(1) and §74.861(e)(1)(i)	§15.236(g) and §74.861(e)(7)
76-88 MHz (VHF)(TV Band Ch 5-6)	§15.236	50 mW EIRP	74H	50 mW EIRP	§15.236(d)(1) and §74.861(e)(1)(i)	§15.236(g) and §74.861(e)(7)
161.625-161.775 MHz (VHF)			74H	1 Watt	§74.861(d)(1)	§74.861(d)(3)
169-172 MHz (VHF)			90.265	50 mW	§90.265(b)(2)	§90.265(b)(3)
174-216 MHz (VHF)(TV Band Ch 7-13)	§15.236	50 mW EIRP	74H	50 mW EIRP	§15.236(d)(1) and §74.861(e)(1)(i)	§15.236(g) and §74.861(e)(7)
450-451 MHz (UHF)			74H	1 Watt	§74.861(d)(1)	§74.861(d)(3)
455-456 MHz			74H	1 Watt	§74.861(d)(1)	§74.861(d)(3)
470-488 MHz			74H	250 mW	§74.861(e)(1)(i)	§74.861(e)(7)
488-494 MHz			74H	250 mW	§74.861(e)(1)(i)	§74.861(e)(7)
494-608 MHz			74H	250 mW	§74.861(e)(1)(i)	§74.861(e)(7)
470-608 MHz (UHF)(TV Band Ch 14-36)	§15.236	50 mW EIRP	74H	250 mW	§15.236(d)(1) and §74.861(e)(1)(i)	§15.236(g) and §74.861(e)(7)
614-616 MHz (guard band)	§15.236	20 mW EIRP			§15.236(d)(1)	§15.236(g) and §74.861(e)(7)
653-657 MHz (duplex gap)			74H	20 mW EIRP	§74.861(e)(1)(ii)	§15.236(g)
657-663 MHz (duplex gap)	§15.236	20 mW EIRP			§15.236(d)(2)	§15.236(g) and §74.861(e)(7)
941.5-952.0 MHz			74H	1 Watt	§74.861(d)(1)	§74.861(d)(4)
952.850-956.250 MHz			74H	1 Watt	§74.861(d)(1)	§74.861(d)(4)
956.450-959.85 MHz			74H	1 Watt	§74.861(d)(1)	§74.861(d)(4)
1435-1525 MHz			74H	250 mW	§74.861(d)(1)	§74.861(d)(4)
6875-6900 MHz			74H	1 Watt	§74.861(d)(1)	§74.861(d)(4)(iii)
7100-7125 MHz			74H	1 Watt	§74.861(d)(1)	§74.861(d)(4)(iii)



1. All new applications for unlicensed microphone certifications must comply with Section 15.236. Such devices are allowed to operate in the repacked TV bands, the 600 MHz guard band (614-616 MHz), and the 600 MHz duplex gap (657-663 MHz).
2. New emission mask, spurious emissions, power etc. Note that in some Part 74 bands the technical requirements may not have changed.
3. There are no new requirements on existing Part 90 wireless microphones and therefore those are not affected by the new transition dates. Hence manufacturers/users do not need to do anything to bring devices into compliance.