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Small Entity Compliance Guide

Operation of Unlicensed Personal Communications Service Devices in the 1920-1930 MHz Band

Report and Order
FCC 12-33
ET Docket No. 10-97
Released: March 23, 2012

This Guide is prepared in accordance with the requirements of Section 212 of the Small Business Regulatory Enforcement Fairness Act of 1996. It is intended to help small entities—small businesses, small organizations (non-profits), and small governmental jurisdictions—comply with the new rules adopted in the above-referenced FCC rulemaking docket(s). This Guide is not intended to replace the rules and, therefore, final authority rests solely with the rules. Although we have attempted to cover all parts of the rules that might be especially important to small entities, the coverage may not be exhaustive. This Guide may, perhaps, not apply in a particular situation based upon the circumstances, and the FCC retains the discretion to adopt approaches on a case-by-case basis that may differ from this Guide, where appropriate. Any decisions regarding a particular small entity will be based on the statute and regulations.

In any civil or administrative action against a small entity for a violation of rules, the content of the Small Entity Compliance Guide may be considered as evidence of the reasonableness or appropriateness of proposed fines, penalties or damages. Interested parties are free to file comments regarding this Guide and the appropriateness of its application to a particular situation; the FCC will consider whether the recommendations or interpretations in the Guide are appropriate in that situation. The FCC may decide to revise this Guide without public notice to reflect changes in the FCC's approach to implementing a rule, or to clarify or update the text of the Guide. Direct your comments and recommendations, or calls for further assistance, to the FCC's Consumer Center:

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Compliance Requirements for Operation of Personal Communications Service Devices in the 1920-1930 MHz Band

1. Objectives of the Proceeding

In the *Report and Order* adopted in March 2012 in ET Docket No. 10-97, the Commission amended the Part 15 Subpart D rules to improve the operation of Unlicensed Personal Communications Service (UPCS) devices operating in the 1920-1930 MHz band (known as the UPCS band), while limiting the potential for in-band and adjacent-band interference and maintaining equal access to the available spectrum on a shared basis for all users. In the *Report and Order*, the objectives of the Commission were to improve the utilization of the UPCS band by allowing access to additional usable time and frequency windows (*i.e.*, channels) whose use was previously restricted, reduce infrastructure costs through allowing a greater density of UPCS devices to be used with fewer base stations, and to allow UPCS devices that use wider bandwidth channels but define fewer than 40 channels to use the least-interfered channel access method and access additional usable time and spectrum windows.

Specifically, the Commission eliminated the 50 dB above thermal noise signal threshold that UPCS devices must monitor when using the least-interfered channel access method. Under this method, after monitoring the required minimum number of channels, UPCS devices may use the combined time and spectrum windows with the lowest signal level, instead of using only those windows with the lowest signal level below 50 dB above thermal noise. The Commission also reduced from 40 to 20 channels the number of channels a UPCS device must define and monitor in order to use the least-interfered channel access method. Because the new rules do not have a maximum monitoring threshold and require that fewer channels be defined and monitored by UPCS systems and devices, UPCS-band products that have already been authorized will continue to be in compliance with the Commission's technical rules. UPCS-band device manufacturers have the option of producing products that reflect the deletion of the monitoring threshold and reduction in the number of channels that must be defined and monitored.

The *Report and Order* also updated the Part 15 UPCS rules to reflect that UPCS devices no longer need to protect incumbent fixed microwave radio stations in the 1920-1930 MHz band and are no longer coordinated by UTAM, Inc., and to make the Part 15 UPCS rules consistent with previous changes to other FCC rules. In addition, the Commission amended Sections 15.31(a)(2) and 15.38(b)(12) of the rules to reference the latest version of the ANSI C63.17-2006 standard by which UPCS devices must be measured for compliance with the requirements in Part 15 Subpart D of the rules. The Commission also modified the Part 15 Subpart D rules to remove outdated provisions and to make other minor updates.

2. Regulations and Policies that the Commission Modified

- **Small Business Compliance Obligation Involving Measurement Standards.**
 - UPCS devices are to be measured for compliance with the Commission's Part 15 rules using ANSI C63.17-2006: "Methods of Measurement of the Electromagnetic and Operational Compatibility of Unlicensed Personal Communications Services (UPCS) Devices." Copies of this standard are available for purchase from at least one of the following addresses: Global Engineering Documents, 15 Inverness Way

East, Englewood, CO 80112, (800) 854-7179, or at <http://global.ihs.com>; or American National Standards Institute, 25 West 43rd Street, 4th Floor, New York, NY 10036, (212) 642-4900, or at <http://webstore.ansi.org/ansidocstore/default.asp>; or Society of Cable Telecommunications Engineers, 140 Philips Road, Exton, PA 19341-1318, (800) 542-5040, or at <http://www.scte.org/standards/index.cfm>. A copy of this standard is available for inspection at the Federal Communications Commission, 445 12th St., SW, Reference Information Center, Room CY-A257, Washington, DC 20554, (202) 418-0270, and at the National Archives and Records Administration, (202) 741-6030, http://www.archives.gov/federal_register/code_of_federal_regulations/ibr_locations.html.

▪ **Small Business Compliance Obligation for UTAM, Inc. Membership**

- In the *Report and Order*, the Commission maintained the UTAM, Inc. membership requirement for UPCS-band device manufacturers. (UTAM, Inc. is the entity that coordinated and managed the transition of the 1910-1930 MHz band from the Private Operational-Fixed Microwave Service to UPCS operations. The remaining funding obligations for that transition are tied to membership fees paid by the UPCS-band device manufacturers.)
- Each application for certification of UPCS-band equipment operating under the provisions of Part 15 must be accompanied by an affidavit from UTAM, Inc. certifying that the applicant is a participating member of UTAM, Inc. In the event a grantee fails to fulfill the obligations attendant to participation in UTAM, Inc., the Commission may invoke administrative sanctions as necessary to preclude continued marketing and installation of devices covered by the grant of certification, including but not limited to revoking certification.
- UPCS devices no longer need to protect fixed microwave incumbents in the 1920-1930 MHz band. Thus, UPCS devices that operate in the 1920-1930 MHz band are longer required to be notified or coordinated by UTAM, Inc., or to incorporate a disabling mechanism until they are initially coordinated or re-coordinated after being moved outside of the area where previously coordinated. In addition, the UTAM, Inc. labeling requirement for UPCS devices is no longer necessary.

▪ **Small Business Compliance Obligation for UPCS Devices' General Technical Requirements.**

- All transmissions from UPCS devices must use only digital modulation techniques. Both asynchronous and isochronous operations are permitted within the 1920-1930 MHz band. Operation shall be contained within the 1920-1930 MHz band. The emission bandwidth shall be less than 2.5 megahertz. The power level shall not exceed 100 microwatts multiplied by the square root of the emission bandwidth in hertz with a power spectral density that shall not exceed 3 milliwatts in any 3 kilohertz bandwidth, but in no event shall the emission bandwidth be less than 50 kilohertz.

▪ **Small Business Compliance Obligation for UPCS Devices' Selection of Available Time and Spectrum Windows (Channels) on Which to Transmit, Number of Channels to Monitor, Out-of-Band Emissions, and Frame Period.**

- To allow UPCS devices to access additional available channels in the 1920-1930 MHz UPCS band, the Commission amended the Part 15 Rules to eliminate the 50 dB above thermal noise least-interfered channel monitoring threshold for UPCS devices. Without this threshold, after monitoring the required minimum number of channels (*i.e.*, 20), UPCS devices may use the time and spectrum windows with the lowest signal level, rather than using only those windows with the lowest signal level below 50 dB above thermal noise. Without a predetermined maximum threshold, manufacturers have the flexibility to select an appropriate channel access threshold to prevent harmful interference to other UPCS devices.
- The Commission reduced the number of channels that must be defined and monitored under the least-interfered channel access method from 40 to 20 channels. Specifically,
 - Devices must incorporate a mechanism for monitoring the time and spectrum windows (*i.e.*, channels) that its transmission is intended to occupy.
 - Immediately prior to initiating transmission, devices must monitor the combined time and spectrum windows in which they intend to transmit for a period of at least 10 milliseconds for systems designed to use a 10 milliseconds or shorter frame period or at least 20 milliseconds for systems designed to use a 20 milliseconds frame period.
 - The monitoring threshold must not be more than 30 dB above the thermal noise power for a bandwidth equivalent to the emission bandwidth used by the device in order to use the monitored time and spectrum windows.
 - If no signal above the threshold level is detected, transmission may commence and continue with the same emission bandwidth in the monitored time and spectrum windows without further monitoring. However, occupation of the same combined time and spectrum windows by a device or group of cooperating devices continuously over a period of time longer than 8 hours is not permitted without repeating the access criteria.
 - If access to spectrum is not available as determined by the above, and a minimum of 20 duplex system access channels are defined for the system, the time and spectrum windows with the lowest power level may be accessed. A device utilizing the provisions of this paragraph must have monitored all access channels defined for its system within the last 10 seconds and must verify, within the 20 milliseconds (40 milliseconds for devices designed to use a 20 milliseconds frame period) immediately

preceding actual channel access that the detected power of the selected time and spectrum windows is no higher than the previously detected value. The power measurement resolution for this comparison must be accurate to within 6 dB. No device or group of co-operating devices located within 1 meter of each other shall during any frame period occupy more than 6 megahertz of aggregate bandwidth, or alternatively, more than one third of the time and spectrum windows defined by the system.

- Emissions outside the UPCS band shall be attenuated below a reference power of 112 milliwatts as follows: 30 dB between the band and 1.25 megahertz above or below the band; 50 dB between 1.25 and 2.5 megahertz above or below the band; and 60 dB at 2.5 megahertz or greater above or below the band. Emissions inside the band must comply with the following emission mask: In the bands between 1B and 2B measured from the center of the emission bandwidth the total power emitted by the device shall be at least 30 dB below the transmit power permitted for that device; in the bands between 2B and 3B measured from the center of the emission bandwidth the total power emitted by an intentional radiator shall be at least 50 dB below the transmit power permitted for that radiator; in the bands between 3B and the band edge the total power emitted by an intentional radiator in the measurement bandwidth shall be at least 60 dB below the transmit power permitted for that radiator. “B” is defined as the emission bandwidth of the device in hertz. Compliance with the emission limits is based on the use of measurement instrumentation employing peak detector function with an instrument resolution bandwidth approximately equal to 1.0 percent of the emission bandwidth of the device under measurement.
- The frame period (a set of consecutive time slots in which the position of each time slot can be identified by reference to a synchronizing source) of an intentional radiator operating in the UPCS band shall be 20 milliseconds or 10 milliseconds/X where X is a positive whole number. Each device that implements time division for the purposes of maintaining a duplex connection on a given frequency carrier shall maintain a frame repetition rate with a frequency stability of at least 50 parts per million (ppm). Each device which further divides access in time in order to support multiple communication links on a given frequency carrier shall maintain a frame repetition rate with a frequency stability of at least 10 ppm. The jitter (time-related, abrupt, spurious variations in the duration of the frame interval) introduced at the two ends of such a communication link shall not exceed 25 microseconds for any two consecutive transmissions. Transmissions shall be continuous in every time and spectrum window during the frame period defined for the device.

A copy of the *Report and Order* is available at http://transition.fcc.gov/Daily_Releases/Daily_Business/2012/db0323/FCC-12-33A1.pdf

27 FCC Rcd 3645. The Commission's Rules (47 Code of Federal Regulations (47 C.F.R.)) are available at http://wireless.fcc.gov/index.htm?job=rules_and_regulations.