

## FEDERAL COMMUNICATIONS COMMISSION

### 47 CFR Part 15

[ET Docket No. 98-153; FCC 98-208]

### Revision of the Rules Regarding Ultra-Wideband Transmission Systems

**AGENCY:** Federal Communications Commission.

**ACTION:** Proposed rule.

**SUMMARY:** By this *Notice of Inquiry*, the Commission is initiating a proceeding to investigate the possibility of permitting the operation of ultra-wideband (UWB) radio systems on an unlicensed basis under its rules. Comments are requested on the standards and operating requirements that should be applied to UWB systems to prevent interference to other radio services.

**DATES:** Comments are due December 7, 1998, reply comments are due January 4, 1999.

**ADDRESSES:** Federal Communications Commission, 1919 M Street, N.W., Washington, D.C. 20554.

**FOR FURTHER INFORMATION CONTACT:** John A. Reed, Office of Engineering and Technology, (202) 418-2455.

**SUPPLEMENTARY INFORMATION:** This is a summary of the Commission's *Notice of Inquiry* in ET Docket No. 98-153, adopted August 20, 1998, and released September 1, 1998. The complete text of this *Notice of Inquiry* is available for inspection and copying during normal business hours in the FCC Reference Center (Room 239), 1919 M Street, N.W., Washington, D.C., and also may be purchased from the Commission's copy contractor, International Transcription Services, Inc., (202) 857-3800, 2100 M Street, NW, Suite 140, Washington, D.C. 20037.

#### Summary of the Notice of Inquiry

1. The Commission is initiating this inquiry on its own motion to investigate the possibility of permitting the operation of ultra-wideband (UWB) radio systems on an unlicensed basis under part 15 of its rules. Through this inquiry, we are seeking input to help us evaluate UWB technology and to determine what standards and operating requirements are necessary to prevent interference to other users of the radio spectrum. Upon review of the responses to this inquiry, we will determine whether to propose any changes to the rules.

2. UWB radio systems typically use extremely narrow pulse (impulse) modulation or swept frequency modulation that employs a fast sweep

over a wide bandwidth. Because of the type of modulation employed, the emission bandwidths of UWB devices generally exceed one gigahertz and may be greater than ten gigahertz. In some cases, these pulses do not modulate a carrier. Instead, the radio frequency emissions generated by the pulses are applied to an antenna, the resonant frequency of which determines the center frequency of the radiated emission.

3. UWB systems could provide an improved method for providing radar applications where precise distance resolution is required and for providing covert voice or data communications that overcome multipath problems. Radar systems are currently being developed to detect buried objects such as plastic gas pipes or hidden flaws in airport runways or highways. Other radar systems would be used as fluid level sensors in difficult-to-measure situations such as oil refinery tanks and other storage tanks. Public safety personnel have expressed a desire for radar systems that can detect people hidden behind walls or covered with debris, such as from an earthquake. Public safety personnel also have expressed a need for UWB communications systems that can operate covertly. These communications systems could also be employed by heavy industrial manufacturers to overcome multipath and machinery-generated radio noise.

4. *Applications and general characteristics.* What types of UWB devices can we expect to be developed? What are the frequency ranges and bandwidths expected to be used by UWB devices? What are the expected total power levels and spectral power densities, peak and average, of UWB devices? What are the expected or desired operating distances?

5. *Regulatory treatment.* We understand that UWB systems will operate at very low spectral power densities, producing noise-like signals. Further, it appears that UWB systems will operate over very short distances. Because of this, it appears appropriate to provide for UWB technologies under part 15 of the rules. We invite comments on whether it would be appropriate to apply our part 15 rules to UWB technologies. Are there certain types of UWB devices or applications that should be regulated on a licensed basis under some other rule part? If so, which rule parts? If provisions are made for UWB technology under part 15, how should we define UWB technology?

6. *TV broadcast and restricted bands.* Part 15 designates certain sensitive and safety-related frequency bands as

restricted bands. Only spurious emissions not exceeding the general emission limits are permitted within these restricted bands or, with few exceptions, within the frequency bands allocated for TV broadcasting. However, it is difficult, if not impossible, for UWB systems to avoid placing fundamental emissions within the restricted bands or the TV broadcast bands. Accordingly, comments are requested on whether the Commission should eliminate the requirement that only spurious emissions be permitted to fall within the restricted bands and the TV broadcast bands. Should the rules generally continue to prohibit operation of UWB systems within the restricted bands and the TV broadcast bands? Are there certain restricted bands where operation could be permitted, but not others? If so which bands and what is the justification? If certain restricted bands were retained, what impact would this have on the viability of UWB technology?

7. *Emission limits.* The current part 15 rules are based on the equivalent of a spectral power density, *i.e.*, a field strength limit is specified along with a measurement bandwidth. In most cases, emissions at or below 1000 MHz are based on the use of a quasi-peak detector which employs a designated measurement bandwidth. Above 1000 MHz, emissions are based on average field strength limits with a minimum measurement bandwidth of one megahertz. Where an average limit applies, there is also a limit on peak emission levels. Are the existing general emission limits sufficient to protect other users of the spectrum, especially radio operations in the restricted bands, from harmful interference? Should different limits be applied to UWB systems? Should we specify a different standard for UWB devices based on spectral power density? Should these standards be designed to ensure that the emissions appear to be broadband noise? What is the potential for harmful interference due to the cumulative impact of emissions if there is a large proliferation of UWB devices? Could the cumulative impact result in an unacceptably high increase in the background noise level? Should the Commission limit proliferation by restricting the types of products or should the rules permit manufacturers to design products for any application as long as the equipment meets the standards? Should a limit on the total peak level apply to UWB devices? Can emissions below or above a certain frequency range be further filtered to reduce the potential for interference to

other users of the radio spectrum without affecting the performance of the UWB systems? Are the existing limits on the amount of energy permitted to be conducted back onto the AC power lines appropriate for UWB devices? What operational restrictions, if any, should be required to protect existing users? Is the use of UWB modulation techniques necessary for certain types of communication systems; if so, for what purposes?

8. *Measurements.* Part 15 references the specific measurement procedure to be employed, the frequency range over which measurements are to be made, and the measurement detector functions and bandwidths to be employed. Comments are requested on whether the peak output level continues to be indicative of the interference potential of a UWB system. Is a pulse desensitization correction factor appropriate for measuring emissions from a UWB device? Should any modifications be made to this measurement procedure for UWB devices? Would another measurement procedure that does not apply a pulse desensitization correction factor be more appropriate for determining the interference potential of a UWB device? The frequency range over which measurements are required to be made depends on the frequency of the fundamental emission. Is the frequency of the fundamental emission readily discernible for UWB devices? Are the current frequency measurement ranges specified in the rules appropriate for UWB devices or should these ranges be modified? Are the measurement detector functions and bandwidths appropriate for UWB devices? Should these standards be modified and, if so, how? Are there any other changes to the measurement procedures that should be applied to UWB devices?

9. *Other matters.* There is a prohibition in the rules against the use of a Class B, damped wave emission. This prohibition stems from a similar International Telecommunication Union regulation and is a throwback to the days when spark gap transmitters were employed. There is no longer a clear definition of a Class B, damped wave emission. Should the prohibition against Class B, damped wave emissions apply to UWB systems or is the prohibition irrelevant, especially in light of the relatively low power levels employed by UWB devices? Comments are invited on any other matters or issues that may be pertinent to the operation of UWB systems.

10. This is a non-restricted notice and comment rule making proceeding. *Ex parte* presentations are permitted,

except during the Sunshine Agenda period, provided they are disclosed as provided in the Commission's rules. See generally 47 CFR 1.1202, 1.1203, and 1.2306(a).

11. Comments may be filed using the Commission's Electronic Comment Filing System (ECFS) or by filing paper copies. See *Electronic Filing of Documents in Rulemaking Proceedings*, 63 FR 24121 (1998). Comments filed through the ECFS can be sent as an electronic file via the Internet to <http://www.fcc.gov/e-file/ecfs.html>. Generally, only one copy of an electronic submission must be filed. If multiple docket or rule making numbers appear in the caption of this proceeding, however, commenters must transmit one electronic copy of the comments to each docket or rule making number referenced in the caption. In completing the transmittal screen, commenters should include their full name, Postal Service mailing address, and the applicable docket or rule making number. Parties may also submit an electronic comment by Internet e-mail. To get filing instructions for e-mail comments, commenters should send an e-mail to [ecfs@fcc.gov](mailto:ecfs@fcc.gov), and should including the following words in the body of the message, "get form <your e-mail address>." A sample form and directions will be sent in reply.

12. Parties who choose to file by paper must file an original and four copies of each filing. If more than one docket or rule making number appear in the caption of this proceeding, commenters must submit two additional copies for each additional docket or rule making number. All filings must be sent to the Commission's Secretary, Magalie Roman Salas, Office of Secretary, Federal Communications Commission, 1919 M St., N.W., Room 222, Washington, D.C. 20554.

13. The proposed action is authorized under sections 4(i), 301, 302, 303(e), 303(f), 303(r), 304 and 307 of the Communications Act of 1934, as amended, 47 U.S.C. 154(i), 301, 302, 303(e), 303(f), 303(r), 304, and 307.

#### List of Subjects: 47 CFR Part 15

Communications equipment, Radio, Reporting and recordkeeping requirements.

Federal Communications Commission.

**Magalie Roman Salas,**

*Secretary.*

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## FEDERAL COMMUNICATIONS COMMISSION

### 47 CFR Part 15

[ET Docket 98-156; FCC 98-209]

#### Certification of Equipment in the 24.05-24.25 GHz band at Field Strengths up to 2500 mV/m

**AGENCY:** Federal Communications Commission.

**ACTION:** Proposed rule.

**SUMMARY:** By this *Notice of Proposed Rulemaking* ("NPRM"), the Federal Communications Commission proposes to amend its rules to allow the operation of fixed point-to-point transmitters in the 24.05-24.25 GHz band at field strengths of up to 2500 mV/m, measured at 3 meters. Devices operating at these field strength levels will be required to use highly directionalized antennas to minimize the possibility of creating harmful interference to other services in the band. This action is taken in response to a *Petition for Rulemaking* ("Petition") filed by Sierra Digital Communications, Inc. ("Sierra").

**DATES:** Comments must be filed on or before December 7, 1998, and reply comments must be filed on or before January 4, 1999.

**ADDRESSES:** Address all comments concerning this proposed rule to the Commission's Secretary, Magalie Roman Salas, Office of the Secretary, FCC, 1919 M Street NW., Room 222, Washington, DC 20554.

**FOR FURTHER INFORMATION CONTACT:** Neal McNeil, Office of Engineering and Technology, (202) 418-2408, TTY (202) 418-2989, e-mail: [nmcneil@fcc.gov](mailto:nmcneil@fcc.gov).

**SUPPLEMENTARY INFORMATION:** This is a summary of the Commission's *Notice of Proposed Rule Making*, ET Docket 98-156, FCC 98-209, adopted August 21, 1998 and released September 1, 1998. The full text of this document is available for inspection and copying during regular business hours in the FCC Reference Center, Room 239, 1919 M Street, NW, Washington, DC. The complete text of this document also may be purchased from the Commission's duplication contractor, International Transcription Service, Inc., (202) 857-3800, 1231 20th Street, NW, Washington, DC 20036.

#### Summary of Notice of Proposed Rulemaking

1. Section 15.249 of the Commission's rules, 47 CFR 15.249, permits devices to operate in the 24.00-24.25 GHz band with field strengths up to 250 mV/m. However, in its Petition, Sierra notes