

Before the
Federal Communications Commission
Washington, D.C. 20554

In the Matter of)
)
Amendment of Part 15 of the) ET Docket No. 98-156
Commission's Rules to allow certification of) RM-9198
equipment in the 24.05 - 24.25 GHz band at)
field strengths up to 2500 mV/m)
)

NOTICE OF PROPOSED RULE MAKING

Adopted: August 21, 1998

Released: September 1, 1998

Comment Date: [75 days after publication in Federal Register]

Reply Comment Date: [105 days after publication in Federal Register]

By the Commission:

INTRODUCTION

1. By this *Notice of Proposed Rulemaking* ("*Notice*"), we propose to amend Part 15 of our 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.¹ Devices operating at these higher levels will be required to use highly directionalized antennas to minimize the possibility of creating harmful interference to other services in the band. We take this action in response to a *Petition for Rulemaking* ("*Petition*") filed by Sierra Digital Communications, Inc. ("*Sierra*").

BACKGROUND

2. The Commission permits operation of non-licensed radio frequency (RF) devices under Part 15 of the rules. Part 15 equipment operates on a non-interference basis to authorized radio services. That is, the devices must not cause interference to authorized radio

¹ Unless otherwise noted, all field strengths are based on average limits measured at 3 meters.

services and they must accept any interference received from such services.² If a Part 15 device causes harmful interference to an authorized service, operation of the device must cease until the interference is corrected.³ To decrease the likelihood of interference, Part 15 transmitters are generally restricted to very low signal levels. Certain types of devices are permitted to operate in specific frequency bands with slightly higher signal levels than general purpose devices, based upon the device characteristics and typical usage.

3. Section 15.249 of the Rules 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 that Section 15.245 permits field disturbance sensors to operate in the central 100 MHz of this band, 24.075 - 24.175 GHz, with a field strength of up to 2500 mV/m. Sierra requests that the Commission amend Section 15.249 to permit fixed point-to-point operations in the 24.00 - 24.25 GHz band at a field strength of 2500 mV/m.⁴ Sierra proposes that devices operating at this higher limit be required to use antennas with gains of at least 33 dBi. Higher antenna gains would be permitted if transmitter output power is reduced to maintain a maximum field strength of 2500 mV/m. According to Sierra, a directional antenna with a minimum gain of 33 dBi will produce a smaller area of potential interference than an omnidirectional antenna operating at 250 mV/m.⁵

4. Sierra states that emissions outside of the 24.00 - 24.25 GHz band will be in compliance with the present limits. Therefore, Sierra claims that the proposed rule change poses little added potential for interference to other users.⁶ Sierra maintains that the proposed rule change would benefit the public by facilitating Part 15 operation of point-to-point systems as an alternative to operation in a licensed service where there are significant costs and delays involved in obtaining a license.⁷

² See 47 C.F.R. § 15.5.

³ *Id.*

⁴ Peak emission limits would remain unchanged at 2500 mV/m. See *Petition* at 2.

⁵ See *Petition* at footnote 10.

⁶ The 24.00 - 24.25 GHz band is allocated to radiolocation and amateur operations. The band is adjacent to frequencies authorized for satellite earth exploration and radio astronomy (23.60 - 24.00 GHz) and the digital electronic message service (24.25 - 24.45 GHz).

⁷ *Petition* at 1.

5. Sierra states that its proposal is similar to action taken by the Commission in ET Docket 96-8.⁸ In that proceeding, among other things, the Commission permitted the use of higher gain directional antennas for spread spectrum transmitters operating in the 2450 MHz band, but required that the output power of the transmitter be reduced by 1 dB for every 3 dB that the directional antenna gain exceeds 6 dBi. The Commission stated that this restriction would ensure that the area over which harmful interference could occur would be equivalent to that caused by an omnidirectional antenna operating with higher transmitter output powers.⁹

6. On November 5, 1997, the Commission issued a Public Notice seeking comment on Sierra's proposal.¹⁰ Metricom, Inc. ("Metricom") filed comments in support of the *Petition*. The American Radio Relay League, Inc. ("ARRL") filed comments in opposition of the *Petition*.

DISCUSSION

7. We recognize that, under certain circumstances, Part 15 unlicensed point-to-point operations can satisfy important communications needs. We note that the Part 15 rules already facilitate such operation in several other frequency bands. For example, spread spectrum communication links operating pursuant to Section 15.247 are used for emergency restoration of communications in disaster situations, law enforcement and fire prevention communications, connecting mobile radio cell sites to the main telephone switching site, and various other tasks. Operation under Part 15 can save time and expense because there is no need to obtain a license or to coordinate with other users of the spectrum. At the same time, systems operating under Part 15 must accept any interference received. Keeping this in mind, Part 15 point-to-point operations typically employ robust technologies that are relatively immune to interference.

8. We tentatively conclude that the rule changes requested by Sierra will provide additional flexibility to establish point-to-point operations under Part 15 and will not pose an increased risk of interference to other users of the spectrum. We observe that Sierra is requesting to operate at the same signal levels that are already permitted for Part 15 field disturbance sensors that operate in the 24.075 - 24.175 GHz band segment. We do not believe that granting Sierra's request will pose any greater risk of interference than these

⁸ See *Report and Order*, Amendment of Parts 2 and 15 of the Commission's Rules Regarding Spread Spectrum Transmitters, ET Docket 96-8, 12 FCC Rcd 7488 (1997).

⁹ *Id* at 17.

¹⁰ See *Public Notice*, "Office of Public Affairs Reference Operations Division Petitions for Rulemaking Filed," Report No. 2238, issued November 5, 1997.

devices. Further, the services operating in the range of frequencies covered by Sierra's request are the same as those that exist in the 24.075 - 24.175 GHz segment, except for the 24.00 - 24.05 GHz segment where there is a primary allocation for the Amateur Service and Amateur Satellite Service. We seek comment on this tentative conclusion.

9. We note that the 24.05 - 24.25 GHz band is allocated for Government Radiolocation on a primary basis and for Non-government Radiolocation and Amateur operations on a secondary basis. The band is used extensively for police radar systems. We do not believe that operations of the type proposed by Sierra will cause harmful interference to these radars. However, we request comment on this issue.

10. ARRL objects to Sierra's proposal on the basis of potential interference to Amateur operations, particularly Amateur Satellite operations. We do not believe that ARRL has demonstrated that there will be a significant risk of interference to Amateur operations in the 24.05 - 24.25 GHz band segment. The point-to-point operations proposed by Sierra will still use relatively low powers and will be highly directional. If interference occurs to Amateur operations, it would be relatively simple to identify the source due to the fixed use of the Part 15 operations. Furthermore, we believe that the risk of interference remains substantially less than from industrial, scientific, and medical (ISM) equipment that is permitted to operate in the 24.00 - 24.25 GHz band without any radiated emissions limits.

11. At the same time, we are concerned that Amateur Satellite operations in the 24.00 - 24.05 GHz band segment will be relying on reception of weak signals. ARRL also expresses concerns of possible interference with its Phase 3D amateur satellite which is expected to be launched in early 1999. Phase 3D will use frequencies in the 24.00 - 24.05 GHz band for communication downlinks. We note that Sierra suggests imposing additional conditions to facilitate sharing the 24.00 - 24.05 GHz band segment. Specifically, Sierra proposes conditions requiring point-to-point equipment to be tunable in the field and reserving the 24.00 - 24.05 GHz segment for use only if all other frequencies in the 24.00 - 24.25 GHz band are unavailable.¹¹ Metricom believes that any interference created in the band would be negligible and therefore additional conditions are unnecessary. However, we are not convinced that the proposed conditions suggested by Sierra will provide sufficient protection to amateur satellite operations. Further, it does not appear that disallowing use of the 24.00 - 24.05 GHz segment would have a significant impact on Part 15 point-to-point operations. Therefore, we are not proposing to permit point-to-point operations as requested by Sierra in the 24.00 - 24.05 GHz segment.

12. Finally, ARRL argues that the type of service envisioned by Sierra would be better accommodated under Part 101, at frequencies above 40 GHz, or in other licensed and

¹¹ *Petition at 5.*

unlicensed frequency bands. However, the Commission realizes that operation in any of the suggested bands entails difficulties. Licensing delays, frequency coordination, antenna size, and propagation characteristics all play a significant role in determining the best operating bands. While we make no judgement regarding the acceptability of operating in other bands or pursuant to other rule sections, we believe that the proposal is an acceptable Part 15 operation. We seek comment regarding the acceptability of Sierra's proposal under Part 15 of the rules. Commenters should also address whether this type of service would be better suited in other bands or licensed pursuant to other Commission rules.

CONCLUSION

13. In this *Notice* we have proposed to amend Part 15 of our regulations in response to a *Petition* filed by Sierra Digital Communications, Inc. We propose to allow operation of fixed point-to-point devices in the 24.05 - 24.25 GHz band with field strengths up to 2500 mV/m, provided a minimum antenna gain of 33 dBi is employed. We do not believe that such operation will result in harmful interference to amateur operations or other licensed users of the band. We request comments on the issues and proposals addressed in this *Notice*. Further, we encourage commenters to address any other issues that may not have been identified. The record established in this proceeding will allow the Commission to determine the impact of the proposal and will facilitate the development of any future rules.

PROCEDURAL MATTERS

A. Regulatory Flexibility Act

14. As required by Section 603 of the Regulatory Flexibility Act, 5 U.S.C. § 603, the Commission has prepared an Initial Regulatory Flexibility Analysis (IRFA) of the expected impact on small entities of the proposals suggested in this document. The IRFA is set forth in Appendix A. Written public comments are requested on the IRFA. These comments must be filed in accordance with the same filing deadlines as comments on the rest of the *Notice*, but they must have a separate and distinct heading designating them as responses to the IRFA. The Secretary shall send a copy of this *Notice*, including the IRFA, to the Chief Counsel for Advocacy of the Small Business Administration in accordance with Section 603(a) of the Regulatory Flexibility Act, 5 U.S.C. § 603(a).

B. *Ex Parte* Rules -- Permit-But-Disclose Proceedings

15. This is a permit-but-disclose notice and comment rule making proceeding. *Ex parte* presentations are permitted, except during any Sunshine Agenda period, provided they are disclosed as provided in the Commission's rules. See generally 47 C.F.R. §§ 1.1200(a), 1.1203, and 1.1206.

C. Authority

16. This action is taken pursuant to Sections 4(i), 301, 302, 303(e), 303(f), and 303(r) of the Communications Act of 1934, as amended, 47 U.S.C. Sections 154(i), 301, 302, 303(e), 303(f), and 303(r).

D. Comment Dates

17. Pursuant to Sections 1.415 and 1.419 of the Commission's rules, 47 C.F.R. §§ 1.415, 1.419, interested parties may file comments on before [75 days after publication in the Federal Register], and reply comments on or before [105 days after publication in the Federal Register]. 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 Fed. Reg. 24,121 (1998).

18. 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 rulemaking numbers appear in the caption of this proceeding, however, commenters must transmit one electronic copy of the comments to each docket or rulemaking 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 rulemaking 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, and should include 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.

19. Parties who choose to file by paper must file an original and four copies of all comments, reply comments and supporting comments. If participants want each Commissioner to receive a personal copy of their comments, an original plus nine copies must be filed. If more than one docket or rulemaking number appear in the caption of this proceeding, commenters must submit two additional copies for each additional docket or rulemaking number. All filings must be sent to the Commission's Secretary, Magalie Roman Salas, Office of the Secretary, Federal Communications Commission, 1919 M St. N.W., Room 222, Washington, D.C. 20554. Comments and reply comments will be available for public inspection during regular business hours in the FCC Reference Center (Room 239) of the Federal Communications Commission, 1919 M Street, N.W., Washington, DC 20554.

E. Further Information

20. For further information concerning this *Notice*, contact Neal McNeil, Office of Engineering & Technology, (202) 418-2408, TTY (202) 418-2989, email nmcneil@fcc.gov.

FEDERAL COMMUNICATIONS COMMISSION

Magalie Roman Salas
Secretary

APPENDIX A**Initial Regulatory Flexibility Analysis**

As required by Section 603 of the Regulatory Flexibility Act,¹ the Commission has prepared an Initial Regulatory Flexibility Analysis (IRFA) of the expected significant economic impact on small entities by the policies and rules proposed in this *Notice of Proposed Rule Making (Notice)*. Written public comments are requested on the IRFA. Comments must be identified as responses to the IRFA and must be filed by the deadlines for comments on the *Notice* provided above. The Commission shall send a copy of this *Notice*, including the IRFA, to the Chief Counsel for Advocacy of the Small Business Administration in accordance with paragraph 603(a) of the Regulatory Flexibility Act.

A. Reason for Action.

This rule making proceeding is initiated to obtain comment regarding proposed changes to the regulations for non-licensed transmitters. The Commission seeks to determine if the standards should be amended as sought in the *Petition for Rulemaking ("Petition")* filed by Sierra Digital Communications, Inc.

B. Legal Basis.

The proposed action is taken pursuant to Sections 4(i), 301, 302, 303(e), 303(f), and 303(r) of the Communications Act of 1934, as amended, 47 U.S.C. Sections 154(i), 301, 302, 303(e), 303(f), and 303(r).

C. Description and Estimate of the Number of Small Entities to Which the Proposed Rules Will Apply.

For the purposes of this NPRM, the RFA defines a "small business" to be the same as a "small business concern" under the Small Business Act, 15 U.S.C. § 632, unless the Commission has developed one or more definitions that are appropriate to its activities.² Under the Small Business Act, a "small business concern" is one that: (1) is independently owned and operated; (2) is not dominant in its field of operation; and (3) meets any additional

¹ 5 U.S.C. § 603.

² See 5 U.S.C. § 601(3) (incorporating by reference the definition of "small business concern" in 5 U.S.C. § 632).

criteria established by the Small Business Administration (SBA).³ SBA has defined a small business for Standard Industrial Classification (SIC) category 4812 (Radiotelephone Communications) to be small entities when they have fewer than 1500 employees.⁴ Given this definition, nearly all such companies are considered small.

D. Description of Projected Reporting, Recordkeeping and Other Compliance Requirements.

Part 15 transmitters are already required to be authorized under the Commission's certification procedure as a prerequisite to marketing and importation. The changes proposed in this proceeding would not change any of the current reporting or recordkeeping requirements. Further, the proposed regulation adds permissible methods of operation and would not require the modification of any existing products.

E. Significant Alternatives to Proposed Rules Which Minimize Significant Economic Impact on Small Entities and Accomplish Stated Objectives.

None.

F. Federal Rules that May Duplicate, Overlap, or Conflict With the Proposed Rule.

None.

³ 15 U.S.C. § 632.

⁴ 13 C.F.R. § 121.201.

APPENDIX B

Proposed Rule Changes

We propose to amend Title 47 of the Code of Federal Regulations, Part 15, as follows:

Section 15.249 is proposed to be amended by revising paragraphs (a), redesignating paragraphs (b), (c), (d), and (e) as (c), (d), (e), and (f); respectively, adding a new paragraph (b), and revising paragraph (e) to read as follows:

Section 15.249 Operation within the bands 902-928 MHz, 2400 - 2483.5 MHz, 5725 - 5875 MHz, and 24.0 - 24.25 GHz.

(a) Except as provided in paragraph (b) of this section, the field strength of emissions from intentional radiators operated within these frequency bands shall comply with the following:

* * * * *

(b) Fixed, point-to-point operation as referred to in this paragraph shall be limited to systems employing a fixed transmitter transmitting to a fixed remote location. Point-to-multipoint systems, omnidirectional applications, and multiple co-located intentional radiators transmitting the same information are not allowed. Fixed, point-to-point operation is permitted in the 24.05 - 24.25 GHz band subject to the following conditions:

(1) The field strength of emissions in this band shall not exceed 2500 millivolts/meter.

(2) The frequency tolerance of the carrier signal shall be maintained within $\pm 0.003\%$ of the operating frequency over a temperature variation of -20 degrees to +50 degrees C at normal supply voltage, and for a variation in the primary supply voltage from 85% to 115% of the rated supply voltage at a temperature of 20 degrees C. For battery operated equipment, the equipment tests shall be performed using a new battery.

(3) Antenna gain must be at least 33 dBi. At antenna gains over 33 dBi, power must be reduced to ensure that the field strength does not exceed 2500 millivolts/meter.

* * * * *

(e) As shown in § 15.35(b), for frequencies above 1000 MHz, the field strength limits

in paragraph (a) of this section are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation. For point-to-point operation under paragraph (b) of this section, the peak field strength shall not exceed 2500 millivolts/meter at 3 meters.