

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

In the Matter of)	
)	
Amendment of Part 15 of the Commission's Rules)	
to allow certification of equipment in the 24.05 –)	ET Docket No. 98-156
24.25 GHz band at field strengths up to 2500)	RM-9189
mV/m)	
)	
)	
)	

REPORT AND ORDER

Adopted: December 11, 2001

Released: December 14, 2001

By the Commission:

INTRODUCTION

1. By this action, we are amending 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 directional antennas to minimize the possibility of creating harmful interference to other services in the band. This action will facilitate the introduction of a variety of new, innovative products and services in the band, such as managing the network traffic on a high-speed wireless Internet service or connecting a multiple building intra-office network.

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 licensed radio services. That is, the devices must not cause interference to licensed radio services and they must accept any interference received from licensed services.² If a Part 15 device causes harmful interference to a licensed service, operation of the device must cease until the interference is corrected.³ To decrease the likelihood of interference, Part 15 transmitters are generally

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

² See 47 C.F.R. § 15.5.

³ *Id.*

restricted to very low signal levels. Part 15 transmitters operating in the 24.0 - 24.25 GHz band are currently limited to a field strength of 250 mV/m.⁴

3. This proceeding was initiated in response to a Petition for Rulemaking filed by Sierra Digital Communications, Inc. ("Sierra"). Sierra requested that the Commission amend Section 15.249 of the rules to permit fixed point-to-point operations in the 24.00 - 24.25 GHz band at a field strength of 2500 mV/m.⁵ To limit the potential for interference from such operations, Sierra also proposed that devices operating at this higher limit be required to use antennas with gains of at least 33 dBi. It further asked the Commission to permit higher antenna gains if transmitter output power were 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.⁶

4. The entire 24.00 – 24.25 GHz band is allocated for use by industrial, scientific, and medical ("ISM") equipment. Additionally, the 24.00 – 24.05 portion of the band is allocated on a primary basis to Amateur and Amateur-Satellite operations. The 24.05 – 24.25 GHz portion is allocated on a secondary basis for Radiolocation in the Private Land Mobile Radio Services, Amateur, and Earth exploration-satellite activity. The 24.00 – 24.25 GHz band is adjacent to frequencies authorized for satellite earth exploration and radio astronomy at 23.60 - 24.00 GHz and the Digital Electronic Message Service ("DEMS") at 24.25 - 24.45 GHz.

5. In the *Notice of Proposed Rulemaking* in this proceeding, the Commission proposed to modify Section 15.249 to allow operation of fixed point-to-point devices in the 24.05 - 24.25 GHz band segment of the 24 GHz spectrum in accordance with the field strength limit and antenna gain requirements requested by Sierra.⁷ The Commission observed that Part 15 field disturbance sensors are already permitted to operate at field strengths up to 2500 mV/m in the 24.075 - 24.175 GHz band segment.⁸ It tentatively concluded that permitting unlicensed devices to operate at this same power level in the 24.05 - 24.25 GHz band segment would not pose an increased interference risk to incumbents.⁹ The Commission declined to propose the higher power operation in the 24.00 - 24.05 GHz portion of the band in order to protect Amateur Satellite operations which have a primary allocation in that portion of the band.¹⁰

⁴ See 47 C.F.R. § 15.249.

⁵ Under Sierra's proposal, the peak emission limits for the 24.0 - 24.25 GHz band would remain unchanged at 2500 mV/m. See Petition at 2.

⁶ See Petition for Rulemaking at footnote 10.

⁷ See *Notice of Proposed Rulemaking*, ET Docket 98-156, 13 FCC Rcd. 16385 (1998).

⁸ See 47 C.F.R. § 15.245.

⁹ See *Notice* at paragraph 8.

¹⁰ See *Notice* at paragraph 11.

6. Three comments and two reply comments were filed in response to the *Notice*.¹¹ Sierra generally supports the proposals contained in the *Notice*. It further requests that the proposal be extended into a portion of the 24.00 - 24.05 GHz band segment. The American Radio Relay League, Incorporated (“ARRL”) argues that allowing higher powered unlicensed devices in the 24.05 - 24.25 GHz band would have an adverse effect on licensed amateur operations. Teligent, Inc. (“Teligent”) expresses concerns that unlicensed devices transmitting in the upper portion of the band might cause interference to DEMS in the adjacent 24.25 – 24.45 GHz band.

DISCUSSION

7. We are amending Section 15.249 to permit the operation of unlicensed point-to-point transmitters in the 24.05 - 24.25 GHz band with field strengths up to 2500 mV/m, provided that such devices use directional antennas with gains of at least 33 dBi or a main lobe beamwidth not exceeding 3.5 degrees.¹² Using a directional antenna with either the specified minimum gain or maximum main lobe beamwidth will produce a narrow radiation pattern thereby minimizing the area over which interference to other devices may occur.¹³ We find that it is in the public interest to allow such operations on an unlicensed basis to supplement the growing demand for licensed point-to-point facilities to satisfy important communications needs. As Sierra observes, increasing the field strength limit will promote greater use of Part 15 unlicensed devices for purposes such as emergency restoration of communications in disaster situations, low-cost telecommunications delivery in rural areas, and other beneficial applications.

8. ARRL argues that the amateur service in the 24.05 - 24.25 GHz band uses sensitive receivers that will be threatened by Part 15 devices operating pursuant to the proposed rules. We do not agree that there will be an increased risk of interference to amateur operations in the 24.05 - 24.25 GHz band segment. The use of a directional antenna will change the shape of the radiated radio frequency field but not the amount of geographic area contained in that field. While signals will travel further in the intended direction of communication, they will be limited in all other directions. As Sierra demonstrated in response to ARRL's concerns, the total area encompassed

¹¹ Sierra; The American Radio Relay League, Incorporated; and Teligent, Inc. filed comments. Sierra and ARRL also filed replies.

¹² The Commission licenses transmitters in the 24.05- 24.25 GHz band under Part 90 of our rules, 47 C.F.R. § 90.103.

¹³ With conventional antennas, main lobe beamwidth and gain are interrelated. One value may be easily calculated given the other. Antennas with very narrow beamwidths generally have very high gains. A typical dish type antenna designed to produce a main lobe beamwidth of 3.5 degrees will have a gain of about 33 dBi. Alternative antenna designs, such as planer arrays, however, may produce narrow beamwidths without the associated high gain. By allowing the antennas to comply with either the specified minimum gain or maximum main lobe beamwidth we give Part 15 device manufacturers more options in the types of antennas they may employ, without the risk of increasing interference potential.

by the radiated field of the directional antenna will be equal to or less than the area encompassed by the radiated field of a lower-powered omni-directional antenna.¹⁴ We also note that Section 15.245 of the rules allows field disturbance sensors to operate in the same band at 2500 mV/m. These devices have been authorized to operate for years with no adverse affects to other users in the band, including amateur operations. We thus find that, devices operating with field strengths up to 2500 mV/m with a directional antenna as prescribed herein will have the same or less interference potential as other devices currently authorized under Part 15. Our decision here is also consistent with our earlier ruling in the *Report and Order* in ET Docket No. 96-8 wherein the Commission stated that the directional antenna requirement adopted for spread spectrum transmitters would ensure that the area over which harmful interference can occur is equivalent to what would be caused by a transmitter using an omni-directional antenna operating at a lower output power.¹⁵

9. ARRL also argues that there is no justification for straying from an earlier Commission decision that denied a request to allow low power, fixed systems in the 24.05 - 24.25 GHz band. In Docket No. 79-337¹⁶, M/A-COM, Inc. had requested that the Commission permit unlicensed transmitter operation in the 24 GHz band at power levels up to 100 mW. The Commission denied that request on the basis that the frequencies were being used by radar devices and NTIA had recommended that higher power unlicensed operations not be permitted.¹⁷ In comparison, equipment operating pursuant to our decision here will typically have transmitter power output of less than 1 mW and will be used with antennas with very narrow beamwidths to maintain the same field strength contour areas that are currently permitted. Thus, the interference concerns addressed in Docket No. 79-337 were significantly greater than those at issue in this proceeding.

10. In the *Notice*, the Commission did not propose to allow point-to-point facilities operating with the higher antenna gains addressed herein to transmit in the 24.00 - 24.05 GHz band due to potential interference to amateur-satellite operations. Sierra disagrees and asserts that amateur satellites would be threatened only if a number of unlikely conditions were satisfied simultaneously.¹⁸ Accordingly, it suggests that the Commission allow point-to-point operation throughout the 24.00 - 24.25 band, with the exclusion of only 24.048 - 24.049 GHz which it

¹⁴ See Technical Appendix in Reply of Sierra Digital Communications, Inc. to Comments of the American Radio Relay League, Incorporated, December 22, 1997.

¹⁵ See *Report and Order*, Amendment of Parts 2 and 15 of the Commission's Rules Regarding Spreading Spectrum Transmitters, ET Docket 96-8, 12 FCC Rcd. 7488 (1997) at paragraph 17.

¹⁶ See *Second Report and Order* in Gen. Docket No. 79-337, 55 RR 2d 1676 (1983).

¹⁷ *Id.* at paragraph 8.

¹⁸ Sierra contends that ARRL's satellite receivers will experience interference only if the satellite is at the horizon, the amateur receiver lies within the Part 15 transmitter's beam, the amateur receiver is pointed directly towards the Part 15 transmitter, and the amateur receiver is in near proximity to the Part 15 transmitter with a visible line-of-sight. Sierra comments at 6.

argues is the only portion of the band used by ARRL's satellite. We re-affirm our initial decision to exclude the entire 24.00 - 24.05 sub-band from the field strength provisions adopted herein. As noted previously, this portion of the spectrum is allocated on a primary basis to the amateur-satellite service. Sierra based its assessment that interference would not occur on the operating parameters of ARRL's Phase 3D satellite.¹⁹ In reply, ARRL contends that amateur satellites with operating parameters that differ from the Phase 3D are under development and also will be entitled to protection on a primary basis. Given the primary status of the amateur-satellite service, and the uncertain operating characteristics of future satellites in the band, we conclude that point-to-point operation should not be allowed in the 24.00 - 24.05 sub-band.

11. ARRL proposes that the Commission require manufacturers to maintain detailed records of unlicensed transmitter installations operating at the expanded operating parameters allowed herein and to supply this information periodically to ARRL for coordination purposes.²⁰ We do not believe that it is necessary to impose new record keeping or notification requirements on manufacturers of devices operating in accordance with the Part 15 rules. Part 15 devices, including those that will be authorized under the rules adopted here, operate at power levels that are sufficiently low as to not be an interference threat to much higher-powered licensed devices. Therefore, coordination procedures that are common and needed among licensed services are not generally needed for Part 15 operation. That is the case here in our determination to allow these devices to operate under the Part 15 rules. The ARRL has failed to demonstrate a sufficient potential for interference or to provide any other basis for such a requirement. Furthermore, all Part 15 devices operate under the condition that transmission must cease if the Part 15 device causes harmful interference.²¹ This operating condition is an adequate measure to ensure that authorized services will not receive interference from unlicensed devices. We thus find that implementing ARRL's suggestion is not necessary for preventing interference to authorized services.

12. Finally, ARRL asserts that the Commission must at some point acknowledge that Part 15 devices, "[A]re allowed under the Communications Act only where they have no interference potential to licensed services."²² We do not agree with this viewpoint. The Communications Act of 1934 as amended provides that, "[T]he Commission may, consistent with the public interest, convenience, and necessity, make reasonable regulations (1) governing the interference potential of devices which in their operation are capable of emitting radio frequency energy by radiation, conduction, or other means in sufficient degree to cause harmful interference to radio

¹⁹ The Phase 3D satellite, now officially known as AMSAT-OSCAR 40 (AO-40), was launched into orbit in November 2000. ARRL successfully tested the satellite's 24 GHz transmitter in September 2001.

²⁰ ARRL comments at paragraph 13.

²¹ See 47 C.F.R. § 15.5(c).

²² ARRL reply comments at paragraph 6.

communications”²³ ARRL's interpretation of this authority is overly conservative. The operating requirements of Part 15 appropriately provide a means for allowing unlicensed devices to share spectrum with licensed services with little risk of interference to licensed services. If interference does occur, these rules provide adequate protection to licensed services by requiring the unlicensed device to cease operation until the problem is corrected.²⁴ The rules permit the creation and advancement of new and innovative unlicensed low power products and services.

13. Teligent requests that the proposed operation not be allowed at 24.24 – 24.25 GHz, thus providing a 10 megahertz guard band to protect DEMS systems in the adjacent 24.25 – 24.45 GHz band from possible adjacent-channel interference caused by Part 15 transmitters. Teligent states that a guard band would be a precautionary measure to ensure that DEMS systems are fully protected. We conclude that a guard band is not necessary to protect DEMS equipment operating outside of the 24.05 - 24.25 GHz band. Instead, we are imposing strict frequency stability requirements as described below that will limit out-of-band emissions to minimal levels.

14. In an effort to ensure, to the greatest extent possible, that devices operating in accordance with these regulations will not create unwanted adjacent band interference, we are imposing more stringent operating conditions than proposed in the *Notice*. Although the *Notice* proposed a frequency stability requirement of only 0.003%, we will require these devices to maintain their transmitting frequency within 0.001% of nominal.²⁵ Requiring 0.001% frequency stability in lieu of 0.003% will ensure that emissions remain within the authorized transmission bandwidth and minimize drift into the adjacent bands which are allocated on a primary basis to the amateur satellite service (24.00 24.05 GHz) and the DEMS (24.25 - 24.45 GHz) both of which are susceptible to interference from relatively low-level signals. Additionally, we are requiring, under Section 15.249, that the field strength of emissions outside of the 24.05 – 24.25 GHz band, except for harmonics, be attenuated by at least 50 dB below the fundamental or to the general emissions limits contained in Section 15.209 of the Commission's rules, whichever is the lesser attenuation.²⁶

²³ 47 U.S.C. 302(a)

²⁴ See 47 C.F.R. § 15.5.

²⁵ Sierra supports this frequency stability requirement. See Sierra reply comments at 2.

²⁶ See 47 C.F.R. § 15.249.

15. Finally, we will address harmonic emissions. Section 15.209 set the limit for out-of-band emissions of Part 15 devices, which is 500 uV/m at 3 meters. Harmonic emissions²⁷ from transmitters operating under Section 15.249 are permitted at different levels, generally higher, than other out-of-band emissions, and those limits are specified in that section. Section 15.205(b), however, provides that the Section 15.209 limits shall not be exceeded in the restricted bands. All of the harmonics of the 24 GHz transmitters at issue here fall into the restricted band above 38.6 GHz,²⁸ and thus must observe the 15.209 limits, rather than the less restrictive 15.249 limits. The Commission is considering in a separate proceeding, the possibility of removing the Section 15.209 limits for some bands above 38.6 GHz,²⁹ among other issues.

16. In conclusion, we find that the public interest is served by permitting unlicensed point-to-point devices to operate at 2500 mV/m, under the conditions discussed above, in the 24.05 - 24.25 GHz band. The band has accommodated unlicensed transmissions, government radar, and amateur facilities with no major conflicts. By allowing a greater variety of systems to occupy the band, we will provide the opportunity for innovative products and services to be made available to the American public as quickly as demand dictates.

PROCEDURAL MATTERS

17. *Final Regulatory Flexibility Analysis.* The Final Regulatory Flexibility Analysis, required by Section 603 of the Regulatory Flexibility Act, as amended by the Contract with America Advancement Act of 1996, Pub. L. No. 104-121, 110 Stat. 847 (1996), is contained in Appendix A.

ORDERING CLAUSES

18. Accordingly, IT IS ORDERED that Part 15 of the Commission's Rules and Regulations ARE AMENDED as specified in Appendix B. This action is taken pursuant to the authority contained in 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).

19. IT IS FURTHER ORDERED that the Commission's Consumer Information Bureau, Reference Information Center, SHALL SEND a copy of this Report and Order, including the Final Regulatory Flexibility Certification, to the Chief Counsel for Advocacy of the Small Business Administration.

²⁷ Harmonic emissions occur in bands beyond the immediately adjacent bands because harmonic frequencies are integral multiples of the fundamental frequency.

²⁸ See 47 C.F.R. §15.205.

²⁹ See *Notice of Proposed Rulemaking*, Review of Part 15 and other Parts of the Commission's Rules, ET Docket 01-278, released October 15, 2001, 66 Fed Reg. 59209, November 27, 2001.

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

FEDERAL COMMUNICATIONS COMMISSION

Magalie Roman Salas
Secretary

APPENDIX A

Final Regulatory Flexibility Analysis

As required by Section 603 of the Regulatory Flexibility Act ("RFA"),³⁰ an Initial Regulatory Flexibility Analysis (IRFA) was incorporated in the *Notice of Proposed Rule Making (Notice)*.³¹ The Commission sought written public on the proposal in the *Notice*, including comment on the IRFA. The Commission's Final Regulatory Flexibility Analysis ("FRFA") in the Report and Order conforms to the RFA.³²

A. Need for and Objective of the Rules.

The rule changes adopted in this *Report and Order* will help satisfy the growing demand for readily available unlicensed systems in the 24 GHz band.³³ The rules will allow fixed point-to-point transmitters to operate in the 24.05 - 24.25 GHz band at field strengths of up to 2500 mV/m. This action will facilitate the introduction of a variety of new services to the band. The requirement to use directional antennas will minimize the possibility of creating harmful interference to existing services while, at the same time, providing for communication links of greater distances.

B. Summary of Significant Issues Raised by Public Comments in Response to the IRFA.

No comments were filed in direct response to the IRFA. Moreover, no comments in response the NPRM discussed small business-related issues.

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

The RFA directs agencies to provide a description of, and where feasible, an estimate of the number of small entities that may be affected by the rules adopted herein.³⁴ The RFA generally defines the term "small entity" as having the same meaning as the terms "small business," "small organization," and "small governmental jurisdiction."³⁵ In addition, the term

³⁰ 5 U.S.C. § 603.

³¹ See ET Docket 98-156, 63 Fed. Reg. 50185 (1998), Appendix A.

³² See 5 U.S.C. § 604.

³³ Unlicensed transmitters are permitted to operate in the 24 GHz band pursuant to certain conditions. See *Report and Order* at paragraph 2. See also 47 C.F.R. § 15.249.

³⁴ 5 U.S.C. § 603(b)(3).

³⁵ 5 U.S.C. § 601(6).

“small business” has the same meaning as the term “small business concern” under the Small Business Act.³⁶ A “small business concern” is one which: (1) is independently owned and operated; (2) is not dominant in its field of operation; and (3) satisfies any additional criteria established by the Small Business Administration (SBA).³⁷

The Commission has not developed a definition of small entities applicable to unlicensed communications devices. Therefore, we will utilize the SBA definition applicable to manufacturers of Radio and Television Broadcasting and Communications Equipment. According to the SBA regulations, unlicensed transmitter manufacturers must have 750 or fewer employees on order to qualify as a small business concern.³⁸ Census Bureau data indicates that there are 858 U.S. companies that manufacture radio and television broadcasting and communications equipment, and that 778 of these firms have fewer than 750 employees and would be classified as small entities.³⁹

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 adopted in this proceeding do not change any of the current reporting or recordkeeping requirements. Further, the regulations add permissible methods of operation and do not require the modification of any existing products.

E. Steps Taken to Minimize the Significant Economic Impact on Small Entities, and Significant Alternatives Considered.

The rule changes adopted in this *Report and Order* will permit manufacturers, including small entities, to market more diverse products in the 24 GHz band. The American Radio Relay League filed comments suggesting that the Commission also require manufacturers to maintain

³⁶ 5 U.S.C. § 601(3) (incorporating by reference the definition of “small business concern” in the Small Business Act, 15 U.S.C. § 632). Pursuant to 5 U.S.C. § 601(3), the statutory definition of a small business applies “unless an agency, after consultation with the Office of Advocacy of the Small Business Administration and after opportunity for public comment, establishes one or more definitions of such term which are appropriate to the activities of the agency and publishes such definition(s) in the Federal Register.”

³⁷ 15 U.S.C. § 632.

³⁸ See 13 C.F.R. § 121.201, NAICS Code 334220 (SIC Code 3663). Although SBA now uses the NAICS classifications, instead of SIC, the size standard remains the same.

³⁹ See U.S. Dept. of Commerce, *1992 Census of Transportation, Communications and Utilities* (issued May 1995), SIC category 3663 (NAICS Code 334220).

detailed records of their customers' installations of these devices. This information would be given to ARRL periodically to aid in coordination. The Commission believes that compliance with this additional regulation would create an undue economic burden for device manufacturers, especially smaller entities. The Commission noted that instituting such a rule could lead to more expensive Part 15 equipment and slower speed to market. Therefore, the Commission declined to adopt such a requirement.

F. Report to Congress.

The Commission will send a copy of the Report and Order, including this FRFA, in a report to be sent to Congress pursuant to the Congressional Review Act.⁴⁰ In addition, the Commission will send a copy of the Report and Order, including this FRFA, to the Chief Counsel for Advocacy of the SBA. A copy of the Report and Order and FRFA (or summaries thereof) will also be published in the Federal Register.⁴¹

IT IS FURTHER ORDERED that the Commission's Consumer Information Bureau, Reference Information Center, SHALL SEND a copy of this Report and Order, including the Final Regulatory Flexibility Analysis, to the Chief Counsel for Advocacy of the Small Business Administration.

⁴⁰ See 5 U.S.C. § 801(a)(1)(A).

⁴¹ See 5 U.S.C. § 604(b).

APPENDIX B

Authority: 47 U.S.C. 154, 301, 302, and 303.

Title 47 of the Code of Federal Regulations, Part 15, is amended as follows:

Section 15.249 is amended by revising paragraphs (a), re-designating 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 $\pm 0.001\%$ 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. Alternatively, the main lobe beamwidth must not exceed 3.5 degrees. The beamwidth limit shall apply to both the azimuth and elevation planes. At antenna gains over 33 dBi or beamwidths narrower than 3.5 degrees, 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 paragraphs (a) and (b) 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 along the antenna azimuth.