

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

In the Matter of)	
)	
Amendment of the Amateur Service Rules)	WT Docket No. 10-62
to Facilitate Use of Spread Spectrum)	
Communications Technologies)	RM-11325

REPORT AND ORDER

Adopted: February 22, 2011

Released: March 4, 2011

By the Commission:

I. INTRODUCTION

1. In this *Report and Order*, we amend the Amateur Service rules to facilitate the use of spread spectrum (SS) communications technologies.¹ Specifically, as proposed in the *Notice of Proposed Rule Making (NPRM)* in this proceeding,² we eliminate the requirement that an amateur station use automatic power control (APC) to reduce transmitter power when the station transmits a SS emission, and we reduce the maximum allowed transmitter output power for an amateur station transmitting a SS emission.

II. BACKGROUND

2. In 1985, the Commission authorized amateur radio stations to transmit SS emissions, with a maximum transmitter output power limit of one hundred watts peak envelope power (PEP).³ To emphasize the experimental nature of spread spectrum as well as some of the potential benefits associated with it, the Commission authorized such transmissions on a secondary basis to other amateur service communications.⁴ Moreover, to reduce the likelihood that SS transmissions from an amateur station could be made for the purpose of obscuring the meaning of a message, the Commission permitted

¹ Spread spectrum techniques are emissions that use bandwidth-expansion modulation techniques to intentionally spread the information transmitted over a wide bandwidth. At any frequency in the frequency segment or bandwidth the SS emission occupies, either the spectral power density of the transmitted signal is reduced to a comparatively low level or the duration of the transmitted signal is very brief. Consequently, stations in the same geographic area can transmit SS signals in a frequency segment without causing harmful interference to, or receiving harmful interference from, other stations transmitting a SS communications or a station transmitting a non-SS signal. Spread spectrum systems originally were developed for military applications, but have been adapted for commercial uses, including medical telemetry, Personal Communications Services, remote meter reading, and position determination.

² Amendment of the Amateur Service Rules to Facilitate Use of Spread Spectrum Communications Technologies, *Notice of Proposed Rule Making and Order*, WT Docket No. 10-62, 25 FCC Rcd 3374, 3376 ¶ 5 (2010) (*NPRM*).

³ See Amendment of Parts 2 and 97 of the Commission's Rules and Regulations to authorize spread spectrum techniques in the Amateur Radio Service, *Report and Order*, Gen. Docket No. 81-414, 99 F.C.C. 2d 1432 (1985). The text of the *Report and Order* was published at 50 Fed. Reg. 23423 (1985).

⁴ See *id.* at 23424.

amateur stations to transmit using only certain specified spreading techniques.⁵

3. In 1999, the Commission eliminated the restriction on SS techniques.⁶ The Commission also required stations transmitting SS communications with a transmitter power greater than one watt to utilize APC to limit the transmitter power in accordance with a specific formula.⁷ The purpose of the APC requirement is to ensure that the output power transmitted is limited to the minimum power necessary to conduct communications, so that interference with other amateur radio stations and other users of the frequency bands is minimized.⁸

4. Subsequently, ARRL, the National Association for Amateur Radio, also known as the American Radio Relay League, Inc., filed a petition for rulemaking requesting that the Commission eliminate the APC requirement.⁹ ARRL asserted that compliance with the APC provision had proven to be “virtually impossible” because it requires the operators of transmitting stations to determine the transmitter power received at distant receivers, and that this requirement has proven to be “something of a barrier to SS experimentation.”¹⁰

5. In the *NPRM* in this proceeding, we noted that one of the purposes of the amateur service is to contribute to the advancement of the radio art, and concluded that the APC requirement may be unnecessarily impeding amateur radio operators from experimenting with SS communications because it requires knowledge that the control operator of an amateur station transmitting a SS emission does not ordinarily have, *i.e.*, the transmitter power received at a distant receiver or receivers.¹¹ We also noted that the APC requirement was intended to limit interference to other stations, including commercial broadband Internet service providers that share some frequency bands with amateur stations.¹² Consequently, instead of proposing simply to eliminate the APC requirement as requested by ARRL, we

⁵ *Id.* at 23425.

⁶ See Amendment of the Amateur Service Rules to Provide For Greater Use of Spread Spectrum Communications Technologies, *Report and Order*, WT Docket No. 97-12, 15 FCC Rcd 1481, 1484 ¶ 9 (1999) (*Spread Spectrum Report and Order*).

⁷ See 47 C.F.R. § 97.311(d) (permissible power is determined by the use of the ratio, measured at the receiver, of the received energy per user data bit (E_b) to the sum of the received power spectral densities of noise (N_o) and co-channel interference (I_o); average transmitter power over 1 watt shall be automatically adjusted to maintain an $E_b/(N_o + I_o)$ ratio of no more than 23 dB at the intended receiver).

⁸ See *Spread Spectrum Report and Order*, 15 FCC Rcd at 1485-86 ¶¶ 11-14.

⁹ ARRL was then known as the American Radio Relay League, Inc. See RM-11325, American Radio Relay League, Inc., Petition for Rule Making (filed March 13, 2006).

¹⁰ See *id.* at 5. ARRL further argued that the APC requirement could be eliminated without increasing the risk of harmful interference because SS communications are secondary to other amateur service communications, and amateur stations already are obligated to use the minimum power necessary to conduct communications. *Id.* at 6 (citing 47 C.F.R. §§ 97.311(b), 97.313(a)).

¹¹ See *NPRM*, 25 FCC Rcd at 3376 ¶ 5 (citing 47 C.F.R. § 97.1(b)).

¹² See *id.* at 3376 ¶ 6.

proposed to eliminate the APC requirement and to reduce the maximum allowed transmitter power when an amateur station is transmitting a SS emission from one hundred watts to ten watts PEP.¹³

III. DISCUSSION

6. All commenters who addressed the proposed rule changes¹⁴ support the proposal to eliminate the APC requirement,¹⁵ but are split with respect to reducing the maximum transmitter output power for amateur stations transmitting SS communications. ARRL concedes that it has not been demonstrated that the proposed power limit would pose a substantial obstacle to SS experimentation, and states that “it is willing to accept the restriction presently, subject to revisiting the matter after some reasonable experience is gained.”¹⁶ We agree that the proposal in the *NPRM* to eliminate the APC requirement and reduce the power limit “is a reasonable accommodation and trade-off that will encourage amateur radio experimentation with SS technology.”¹⁷

7. We disagree with the suggestion that a limit of ten watts PEP “would hamper amateurs who would try to use [SS] over long distance links.”¹⁸ Because amateur stations that want to communicate over long distance links can use other emission types and higher power in frequency bands where SS emissions are permitted, we conclude that limiting amateur stations transmitting SS communications to ten watts PEP does not preclude amateur stations from communicating over long distances.¹⁹

8. Based on the record before us, we conclude that eliminating the APC requirement and reducing the maximum allowed transmitter power to ten watts PEP when an amateur station is transmitting a SS emission will afford amateur radio operators greater flexibility to experiment with SS communications, while limiting the potential for interference to other stations. Accordingly, we amend Sections 97.311 and 97.313 of the Commission’s Rules as proposed.

IV. CONCLUSION

9. In summary, we believe that the public interest will be served by amending the amateur

¹³ *See id.*

¹⁴ Six comments were received in response to the *NPRM*. Two commenters did not address the proposed rule changes, but instead made suggestions regarding SS emissions that are beyond the scope of this proceeding. *See* Richard Dowty Comments at 1; Floyd C. Fox Comments at 1.

¹⁵ *See* ARRL Comments at 2 (the APC requirement “has served as an unintended, but effective deterrent to SS experimentation in the Amateur Service”); Nickolaus E. Leggett Comments at 2; Ben Jackson Comments at 1; Steve Bunch Comment at 1 (the APC requirement “sets a high minimum bound on the complexity of a compliant transmitter and receiver system”).

¹⁶ *See* ARRL Comments at 7.

¹⁷ *See* Nickolaus E. Leggett Comments at 2; *see also* Steve Bunch Comment at 2-3 (supporting a ten watt PEP limit in bands that are shared with non-amateur users; “there are many users of unlicensed wireless digital communications, such as WiFi, in these bands, accepting some restrictions in order to reduce the potential for interference is a reasonable tradeoff”).

¹⁸ *See* Ben Jackson Comments at 1.

¹⁹ *See* 47 C.F.R. § 97.305(c).

service rules to eliminate the APC requirement, and reducing the current limit on transmitter output power for amateur stations transmitting SS emission types to ten watts PEP. We believe that these rule changes will (1) encourage individuals who can contribute to the advancement of the radio art to more fully utilize SS technologies in experimentation, and (2) balance the interests of all users in mixed-mode²⁰ and mixed-service frequency bands until sharing protocols are sufficiently developed to avoid interference. We therefore adopt the proposed rule changes.

V. PROCEDURAL MATTERS

10. *Final Regulatory Flexibility Certification.* The Regulatory Flexibility Act (RFA)²¹ requires a final regulatory flexibility analysis to be prepared for notice and comment rulemaking proceedings, unless the agency certifies that “the rule will not, if promulgated, have a significant economic impact on a substantial number of small entities.”²² The RFA generally defines the term “small entity” as having the same meaning as the terms “small business,” “small organization,” and “small governmental jurisdiction.”²³ In addition, the term “small business” has the same meaning as the term “small business concern” under the Small Business Act.²⁴ 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).²⁵

11. In this *Report and Order*, we amend the amateur service rules to eliminate the requirement that an amateur station transmitting a SS emission must use APC to reduce the transmitter power when the station transmits with a power greater than one watt, and we reduce the transmitter power output that an amateur station may transmit when the station is transmitting a SS emission from one hundred watts to a peak of ten watts.²⁶ Because “small entities,” as defined in the RFA, do not include persons eligible for licensing in the amateur service, this rule does not apply to “small entities.” Rather, it applies exclusively to individuals who are the control operators of amateur radio stations. Therefore, we certify that the rules adopted in this *Report and Order* will not have a significant economic impact on a substantial number of small entities. The Commission will send a copy of this *Report and Order*, including a copy of this Final

²⁰ Mixed-mode frequency bands are frequency bands where different emission types, such as Morse code telegraphy (CW), voice, narrow-band direct-printing telegraphy (RTTY), data, and SS are transmitted. All amateur service frequency bands are mixed-mode frequency bands. See 47 C.F.R. § 97.305(c).

²¹ See 5 U.S.C. § 603. The RFA, see 5 U.S.C. § 601– 612, has been amended by the Small Business Regulatory Enforcement Fairness Act of 1996 (SBREFA), Pub. L. No. 104-121, Title II, 110 Stat. 857 (1996).

²² See 5 U.S.C. § 605(b).

²³ See 5 U.S.C. § 601(6).

²⁴ See 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.”

²⁵ See 15 U.S.C. § 632.

²⁶ See 47 C.F.R. § 97.311(d).

Regulatory Flexibility Certification, to the Chief Counsel for Advocacy of the SBA.²⁷ This certification will also be published in the Federal Register.²⁸

12. *Paperwork Reduction Analysis.* This *Report and Order* does not contain information collection(s) subject to the Paperwork Reduction Act of 1995, Public Law 104-13. In addition, it does not contain any new or modified “information collection burden for small business concerns with fewer than 25 employees,” pursuant to the Small Business Paperwork Relief Act of 2002, Public Law 107-198, *see* 44 U.S.C. § 3506(c)(4).

13. *Congressional Review Act.* The Commission will send a copy of this *Report and Order* to Congress and the Government Accountability Office pursuant to the Congressional Review Act, *see* 5 U.S.C. 801(a)(1)(A).

14. *Alternative formats.* To request materials in alternative formats for people with disabilities (Braille, large print, electronic files, audio format), send an e-mail to <FCC504@fcc.gov> or call the Consumer and Government Bureau at (202) 418-0530 (voice), (202) 418-0432 (TTY). This *Report and Order* also may be downloaded from the Commission’s web site at <<http://www.fcc.gov/>>.

15. For further information, contact William T. Cross, Mobility Division, Wireless Telecommunications Bureau, (202) 418-0620 or TTY (202) 418-7233.

VI. ORDERING CLAUSES

16. IT IS ORDERED, pursuant to Sections 4(i), 303(r), and 403 of the Communications Act of 1934, 47 U.S.C. §§ 154(i), 303(r), 403, that this *Report and Order* IS HEREBY ADOPTED.

17. IT IS FURTHER ORDERED that Part 97 of the Commission’s Rules IS AMENDED as set forth in the Appendix, effective 30 days after publication in the Federal Register.

18. IT IS FURTHER ORDERED that the Commission’s Consumer and Governmental Affairs 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.

FEDERAL COMMUNICATIONS COMMISSION

Marlene H. Dortch
Secretary

²⁷ *See* 5 U.S.C. § 605(b).

²⁸ *See id.*

Appendix**Final Rules**

Chapter 1 of Title 47 of the Code of Federal Regulations is amended as follows:

Part 97 - Amateur Radio Service

The authority citation for part 97 continues to read as follows:

AUTHORITY: 48 Stat. 1066, 1082, as amended; 47 U.S.C. 154, 303. Interpret or apply 48 Stat. 1064-1068, 1081-1105, as amended; 47 U.S.C. 151-155, 301-609, unless otherwise noted.

1. Section 97.311 is amended by removing paragraph (d).
2. Section 97.313 is amended by adding paragraph (j) to read as follows:

§ 97.313 Transmitter power standards.

* * * * *

(j) No station may transmit with a transmitter output exceeding 10 W PEP when the station is transmitting a SS emission type.