

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

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

NOTICE OF PROPOSED RULE MAKING AND ORDER

Adopted: March 11, 2010

Released: March 16, 2010

Comment Date: [30 days after date of publication in the Federal Register]

Reply Comment Date: [45 days after date of publication in the Federal Register]

By the Commission:

I. INTRODUCTION

1. In this item, we propose to amend the Amateur Service rules to facilitate the use of spread spectrum communications technologies. In this *Notice of Proposed Rule Making and Order* (*NPRM and Order*, respectively), in response to a petition for rulemaking¹ filed by the American Radio Relay League, Inc. (ARRL), we propose to eliminate the requirement that amateur stations use automatic power control (APC) to reduce transmitter power when the station transmits a spread spectrum (SS) emission,² and we propose to reduce the maximum transmitter power output when transmitting a SS emission. We also make certain non-substantive revisions to the amateur service rules.

II. NOTICE OF PROPOSED RULE MAKING

2. *Background.* In 1985, the Commission authorized amateur radio stations to transmit SS emissions, with a maximum transmitter 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

¹ See RM-11325, American Radio Relay League, Inc., Petition for Rule Making (filed March 13, 2006) (Petition).

² Spread spectrum techniques are methods by which the information signal of a particular bandwidth is intentionally spread in the frequency domain. At any point of bandwidth the SS emission occupies, either the power spectral density of the transmitted signal is reduced to a comparatively low level or the duration of a transmission on any frequency in the frequency segment is very brief. Consequently, stations in the same area can transmit SS signals without causing harmful interference to or experiencing harmful interference from each other or a station transmitting a non-SS signal over the same spectrum segment. Spread spectrum systems originally were developed for military applications, but have been adapted for other uses, including medical telemetry, Personal Communications Services, remote meter reading, and position determination.

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).

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 only frequency hopping and direct sequence spreading techniques.⁵

3. In 1999, the Commission eliminated the restriction on spreading techniques, to allow amateur stations greater flexibility and permit them to use the SS techniques used in other communication services.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 in order to ensure that the output power is limited to the minimum level necessary to conduct communications so that interference with other amateur radio stations and users of the frequency bands would be minimized.⁸

4. ARRL requests that we eliminate the APC requirement.⁹ It asserts that compliance with the APC provision has proven to be “virtually impossible” because it requires the operators of transmitting station 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 ARRL further argues that the APC requirement can be eliminated without increasing the risk of harmful interference because (1) the station licensee or control operator of the station transmitting the SS emission would still be obligated under Section 97.313(a) of the Commission’s Rules to use the minimum power necessary to conduct communications, and (2) under Section 97.311(b) of the Commission’s Rules, SS communications are already secondary to other amateur service communications.¹¹

⁴ *See id.* at 23424.

⁵ *Id.* at 23425. The Commission also imposed other conditions, including limiting SS emissions to Amateur Radio Service frequency bands above 420 MHz, and requiring licensees to retain sufficient documentation to enable the Commission to demodulate all SS transmissions. *Id.* at 23424, 23426.

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) (*SS Report and Order*). It also removed some of the other operational constraints, concluding that the recordkeeping and retention requirements associated with SS emissions were no longer necessary. *See id.* at 1489 ¶ 20. The Commission subsequently permitted SS emissions in the 222-225 MHz band. *See* Amendment of Part 97 of the Commission’s Rules Governing the Amateur Radio Services, *Report and Order*, WT Docket No. 04-140, 21 FCC Rcd 11643, 11656 ¶ 25 (2006) (*Omnibus Report and Order*).

⁷ *See SS Report and Order*, 15 FCC Rcd at 1485 ¶ 11, 1486 ¶ 14; *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 (Eb) to the sum of the received power spectral densities of noise (No) and co-channel interference (Io); average transmitter power over 1 watt shall be automatically adjusted to maintain an Eb/(No + Io) ratio of no more than 23 dB at the intended receiver).

⁸ *See SS Report and Order*, 15 FCC Rcd at 1485 ¶ 12. The Commission rejected a suggestion that the power level of SS emissions be limited to one watt with no APC requirement, because reducing the maximum authorized power to such a level could adversely affect experimentation in the amateur service. *See id.* at 1486 ¶ 14.

⁹ *See* Petition at 1. Over fifty comments were filed in response to the ARRL petition. Commenters were divided as to whether the APC requirement should be eliminated.

¹⁰ *Id.* at 5.

¹¹ *Id.* at 6 (citing 47 C.F.R. §§ 97.311(b), 97.313(a)).

5. *Discussion.* One of the purposes of the amateur service is to contribute to the advancement of the radio art.¹² The use of amateur service spectrum to experiment with SS communication systems is consistent with the basis and purpose of the amateur service. In order to experiment, the Commission's rules require 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. Consequently, amateur radio operators currently may not be experimenting with SS communications to the greatest possible extent. We also note that notwithstanding the APC requirement, amateur station power output is limited to the minimum power necessary to carry out the desired communication.¹³ For these reasons, we agree with ARRL that the APC requirement may be unnecessarily impeding amateur radio operators in advancing the radio art. We seek comment on these conclusions.

6. We do not, however, propose simply to eliminate the APC requirement, as requested by ARRL. As noted above, the purpose of the APC requirement is to limit interference to other stations.¹⁴ Commercial broadband Internet service providers operating in the 900 MHz and 2.4 GHz ISM bands argue that the APC requirement should be maintained, in order to prevent interference to other users.¹⁵ Other commenters suggest that if we eliminate the APC requirement, we should lower the maximum power limit on amateur stations transmitting SS emissions so that interference is minimized.¹⁶ Given these concerns, we propose to both (1) eliminate the APC requirement and (2) reduce the maximum transmitter power output amateur stations may use when transmitting SS communications from one hundred watts to a peak of ten watts.¹⁷ We seek comment on this proposal.

7. We believe that this approach is consistent with both the ARRL's request that we eliminate a requirement that may be impossible to implement and the intent of the APC requirement to limit interference to other stations.¹⁸ We also believe that the proposed rule change would (1) encourage

¹² 47 C.F.R. § 97.1(b).

¹³ See 47 C.F.R. § 97.313(a).

¹⁴ The Commission's rules have always imposed additional limitations on amateur station SS transmissions because, as some comments note, the nature of SS makes it virtually impossible to determine the source of interference. See Comments of Charles Young at 1; Comments of Alexander Krist at 4; Comments of Walter B. Fair at 1; Comments of George J. McCough at 1; Comments of Timothy P. Gorman at 3; Comments of Richard Seifert at 1.

¹⁵ Comments of Amplex Electric, Inc., at 1; Comments of DC Access, LLC at 1; Comments of Lariat.net at 1; Comments of Tropos Networks at 3, 5.

¹⁶ Comments of Steve Sampson at 1 ("very few hams operate at more than 10 watts on 70 cm [420-450 MHz]"); Comments of Michael E. Dobson at 1 ("10 W is still a very significant power level and quite effective for communications at the frequencies where SS signals would routinely be used"); Comments of Timothy P. Gorman at 3 (noting that at 70 cm and above, consistent operation over 10 to 20 km is possible with power levels between 200 milliwatts and 10 W, depending on antenna gain).

¹⁷ The procedures for measuring the power output of digital transmission systems can be found on the Commission's Equipment Authorization web page at <http://www.fcc.gov/oet/ea/eameasurements.html>.

¹⁸ We also agree with the suggestion that we include the power rule applicable to stations transmitting SS emissions with the power rules applicable to other amateur service operations in Section 97.313, Transmitter power standards. See Comments of John B. Johnston at 1. Accordingly, we propose to revise Section 97.311(d) as discussed above and move this provision to Section 97.313.

individuals who can contribute to the advancement of the radio art to more fully utilize SS technologies in experimentation; (2) balance the interests of all users in mixed-mode¹⁹ and mixed-service frequency bands until sharing protocols are sufficiently developed to avoid interference; and (3) promote more efficient use of the radio spectrum currently allocated to the amateur service. We request comment on this proposal and our underlying conclusions.

III. ORDER

8. In this *Order*, we make certain amendments to correct the amateur service rules or conform them to prior Commission decisions.²⁰ First, we note that when the Commission authorized Novice Class operators and Technician Plus Class operators²¹ to transmit in certain portions of the 80, 40, 15, and 10 meter (m) bands in 2006,²² it intended to limit those stations' power in those bands to two hundred watts PEP, but the implementing amendment to Section 97.313(c)²³ inadvertently applied that power limitation to all frequencies authorized to Novice and Technician Class licensees.²⁴ We therefore correct Section 97.313(c) to clarify that the limitation applies only in those bands.²⁵

9. We also revise Sections 97.301 and 97.303²⁶ related to the 40 and 60 m and 70 and 9 centimeter bands to conform to the Table of Frequency Allocations (Table), and to references within the relevant sections of our rules. We also revise the frequency sharing requirements in Section 97.303 to limit the summary to those frequency bands that are allocated to the amateur service on a secondary basis, and to present the requirements more clearly. In addition, we move transmitter power limit information from Section 97.303(s) to Section 97.313, Transmitter power standards. Finally, we amend

¹⁹ 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).

²⁰ These amendments will ensure that our amateur service rules conform to other Commission decisions and will further our ongoing efforts to streamline these rules. We adopt these conforming amendments without notice and comment, which is not required in this case under the Administrative Procedure Act. *See* 5 U.S.C. § 553(b)(3)(A) (notice and comment rulemaking procedures do not apply to interpretative rules, general statements of policy, or rules of agency organization, procedure, or practice).

²¹ *I.e.*, Technician Class operators who have received credit for passing a Morse code examination.

²² Specifically, any portion of the 80, 40, and 15 m bands that provide for telegraphy operation by General Class operators, and the 28,000-28,300 kHz segment of the 10 m band. *See Omnibus Report and Order*, 21 FCC Rcd at 11650 ¶ 13.

²³ *See* 47 C.F.R. § 97.313(c).

²⁴ *See Omnibus Report and Order*, 21 FCC Rcd at 11680. This limitation did not previously apply to stations controlled by Technician Class licensees when the station was transmitting above 30 MHz. *See* 47 C.F.R. § 97.313(c) (2006).

²⁵ We also revise this rule to reflect that, in light of the 2006 decision to eliminate the telegraphy examination requirement, Technician Class licensees are authorized the same privileges in these bands as Novice and Technician Plus Class licensees. *See Amendment of Part 97 of the Commission's Rules to Implement WRC-03 Regulations Applicable to Requirements for Operator Licenses in the Amateur Radio Service, Report and Order*, WT Docket No. 05-235, 21 FCC Rcd 14797, 14808 ¶ 21 (2006).

²⁶ 47 C.F.R. §§ 97.301, 97.303.

Section 97.103(c) to delete the cross-reference to Section 0.314(x), which was removed in 1999;²⁷ and we remove the entry “1260-1270 MHz” from Section 97.207(c), which lists the frequency bands authorized to amateur space stations, because footnote 5.282 to the Table limits the use of that segment to earth station transmissions.²⁸

IV. CONCLUSION

10. In summary, we believe that the public interest will be served by revising the amateur service rules to eliminate the APC requirement now applicable to stations transmitting SS emission types. We also believe that this proposed rule change will allow amateur service licensees to better fulfill the purpose of the amateur service and will enhance the usefulness of the amateur service as an experimental service, while still protecting other users from interference. We therefore seek comment on the proposed rule change.

V. PROCEDURAL MATTERS

11. *Initial and Final Regulatory Flexibility Certifications.* The Regulatory Flexibility Act (RFA)²⁹ requires an initial 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.”³⁰ The RFA generally defines the term “small entity” as having the same meaning as the terms “small business,” “small organization,” and “small governmental jurisdiction.”³¹ In addition, the term “small business” has the same meaning as the term “small business concern” under the Small Business Act.³² 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).³³

12. In the *NPRM*, we propose to amend the amateur service rules to eliminate the requirement that an amateur station transmitting a SS emission must automatically use APC to reduce the transmitter power when the station transmits with a power greater than one watt and to reduce from one hundred watts to a peak of ten watts the transmitter power output that an amateur station may transmit when the station is transmitting a SS emission.³⁴ Because “small entities,” as defined in the RFA, are not persons eligible for

²⁷ See Establishment of Enforcement and Consumer Information Bureaus, *Order*, 14 FCC Rcd 17924 (1999).

²⁸ 47 C.F.R. § 2.106 n.5.282.

²⁹ 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).

³⁰ See 5 U.S.C. § 605(b).

³¹ See 5 U.S.C. § 601(6).

³² 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.”

³³ See 15 U.S.C. § 632.

³⁴ See 47 C.F.R. § 97.311(d).

licensing in the amateur service, this proposed 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 proposals in this *NPRM*, if adopted, will not have a significant economic impact on a substantial number of small entities. The Commission will send a copy of the *NPRM*, including a copy of this Initial Regulatory Flexibility Certification, to the Chief Counsel for Advocacy of the SBA.³⁵ This initial certification will also be published in the Federal Register.³⁶

13. In the *Order*, we amend the amateur service rules to conform them with previous Commission decisions. The amended rules apply exclusively to individuals who are licensees in the Amateur Radio Service. Such amendments are in the public interest because they will clarify and conform the amateur service rules to other parts of the Commission’s Rules and previous decisions. The rule changes do not result in any mandatory change in manufactured amateur radio equipment or have any impact on business entities because such entities are not eligible for licensing in the amateur service. Therefore, we certify that the rules reflected in this *Order* will not have a significant economic impact on a substantial number of small entities. The Commission will send a copy of the *Order*, including a copy of this Final Regulatory Flexibility Certification, to the Chief Counsel for Advocacy of the SBA.³⁷ This certification will also be published in the Federal Register.³⁸

14. *Paperwork Reduction Analysis.* This *NPRM* does not contain proposed 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).

15. *Ex Parte Presentations.* This is a permit-but-disclose notice and comment rulemaking 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 C.F.R. §§ 1.1202, 1.1203, 1.1206(a).

16. *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 Affairs Bureau at (202) 418-0530 (voice), (202) 418-0432 (TTY). This *NPRM and Order* also may be downloaded from the Commission’s web site at <<http://www.fcc.gov/>>.

17. *Comment Dates.* 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 or before [**30 days after date of publication in the Federal Register**] and reply comments on or before [**45 days after date of publication in the Federal Register**].

18. Commenters may file comments electronically using the Commission’s Electronic Comment Filing System (ECFS), the Federal Government’s eRulemaking Portal, or by filing paper

³⁵ *See* 5 U.S.C. § 605(b).

³⁶ *See id.*

³⁷ *See* 5 U.S.C. § 605(b).

³⁸ *See id.*

copies.³⁹ Commenters filing through the ECFS can be sent as an electronic file via the Internet to <<http://www.fcc.gov/e-file/ecfs.html>>. If multiple docket or rulemaking numbers appear in the caption of this proceeding, filers must transmit one electronic copy for each docket or rulemaking number referenced in the caption. In completing the transmittal screen, commenters should include their full name, U.S. Postal Service mailing address, and the applicable docket or rulemaking number. Commenters 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." Commenters will receive a sample form and directions in reply. Commenters filing through the Federal eRulemaking Portal <<http://www.regulations.gov>>, should follow the instructions provided on the website for submitting comments.

19. Commenters who chose to file paper comments must file an original and four copies of each comment. If more than one docket or rulemaking number appears in the caption of this proceeding, filers must submit two additional copies for each additional docket or rulemaking number. All filings must be sent to the Commission's Secretary, Office of the Secretary, Federal Communications Commission, 445 12th Street, SW, Room TW-A325, Washington, D.C. 20554.

20. Commenters may send filings by hand or messenger delivery, by commercial overnight courier, or by first-class or overnight U.S. Postal Service mail. The Commission's contractor will receive hand-delivered and/or messenger-delivered paper filings for the Commission's Secretary at the FCC Headquarters building located at 445 12th Street, SW, Room TW-A325, Washington, DC 20554. The filing hours at this location are 8:00 a.m. to 7:00 p.m. Commenters must bind all hand deliveries together with rubber bands or fasteners and must dispose of any envelopes before entering the building. This facility is the only location where the Commission's Secretary will accept hand-delivered or messenger-delivered paper filings. Commenters must send commercial overnight mail (other than U.S. Postal Service Express Mail and Priority Mail) to 9300 East Hampton Drive, Capitol Heights, MD 20743. Commenters should address U.S. Postal Service first-class mail, Express Mail, and Priority Mail to 445 12th Street, SW, Washington, DC 20554.

21. Interested parties may view documents filed in this proceeding on the Commission's Electronic Comment Filing System (ECFS) using the following steps: (1) access ECFS at <http://www.fcc.gov/cgb/ecfs>. (2) In the introductory screen, click on "Search for Filed Comments." (3) In the "Proceeding" box, enter the numerals in the docket number. (4) Click on the box marked "Retrieve Document List". A link to each document is provided in the document list. Filings and comments are also available for public inspection and copying during regular business hours at the FCC Reference Information Center, 445 12th Street, SW, Room CY-A257, Washington, DC, 20554. Filings and comments also may be purchased from the Commission's duplicating contractor, Best Copy and Printing, Inc., Portals II, 445 12th Street, SW, Room CY-B402, Washington, DC 20554, telephone 1-800-378-3160, or via e-mail www.bcpweb.com.

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

VI. ORDERING CLAUSES

23. IT IS ORDERED that, pursuant to Sections 4(i), 4(j), and 303(r) of the Communications Act of 1934, as amended, 47 U.S.C. §§ 154(i), 154(j), and 303(r), NOTICE IS HEREBY GIVEN of the proposed amendment to Part 97 of the Commission's Rules, 47 C.F.R. Part 97, as described above, and

³⁹ See Electronic Filing of Documents in Rulemaking Proceedings, *Report and Order*, 13 FCC Rcd 11322 (1998).

that COMMENT IS SOUGHT on this proposal to amend Part 97 of the Commission's Rules as set forth in Appendix A.

24. IT IS FURTHER ORDERED that, pursuant to Section 1.407 of the Commission's Rules, 47 C.F.R § 1.407, the Petition for Rulemaking, RM-11325, submitted by the American Radio Relay League, Inc., on March 13, 2006 IS GRANTED to the extent indicated herein.

25. IT IS FURTHER ORDERED that Part 97 of the Commission's Rules is AMENDED in accordance with the foregoing *Order* and as set forth in Appendix B, effective upon publication in the Federal Register.

26. IT IS FURTHER ORDERED that the Commission's Consumer and Governmental Affairs Bureau, Reference Information Center, SHALL SEND a copy of this *Notice of Proposed Rule Making and Order*, including the Initial and Final Regulatory Flexibility Certifications, to the Chief Counsel for Advocacy of the Small Business Administration.

FEDERAL COMMUNICATIONS COMMISSION

Marlene H. Dortch
Secretary

Appendix A
Proposed Rule Changes

Chapter 1 of Title 47 of the Code of Federal Regulations is proposed to be 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.

Appendix B

Final Rule Changes

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 97.103 is amended by revising paragraph (c) to read as follows:

§ 97.103 Station licensee responsibilities.

* * *

(c) The station licensee must make the station and the station records available for inspection upon request by an FCC representative.

2. Section 97.207 is amended by revising paragraph (c)(2) to read as follows:

§ 97.207 Space station.

* * * * *

(c) * * *

* * * * *

(2) The 7.0-7.1 MHz, 14.00-14.25 MHz, 144-146 MHz, 435-438 MHz, 2400-2450 MHz, 3.40-3.41 GHz, 5.83-5.85 GHz, 10.45-10.50 GHz, and 24.00-24.05 GHz segments.

* * * * *

3. Section 97.301 is amended to read as follows:

§ 97.301 Authorized frequency bands.

The following transmitting frequency bands are available to an amateur station located within 50 km of the Earth's surface, within the specified ITU Region, and outside any area where the amateur service is regulated by any authority other than the FCC.

(a) For a station having a control operator who has been granted a Technician, Technician Plus, General, Advanced, or Amateur Extra Class operator license, who holds a CEPT radio amateur license, or who holds any class of IARP:

Wavelength band	ITU Region 1	ITU Region 2	ITU Region 3	Sharing requirements see § 97.303 (Paragraph)
VHF	MHz	MHz	MHz	
6 m.....	.....	50-54.....	50-54.....	(a)
2 m.....	144-146.....	144-148.....	144-148.....	(a), (k)
1.25 m.....	.....	219-220.....	.....	(l)
Do.....	.....	222-225.....	.....	(a)
UHF	MHz	MHz	MHz	
70 cm.....	430-440.....	420-450.....	430-440.....	(a), (b), (m)
33 cm.....	.....	902-928.....	.....	(a), (b), (e), (n)
23 cm.....	1240-1300.....	1240-1300.....	1240-1300.....	(b), (d), (o)
13 cm.....	2300-2310.....	2300-2310.....	2300-2310.....	(d), (p)
Do.....	2390-2450.....	2390-2450.....	2390-2450.....	(d), (e), (p)
SHF	GHz	GHz	GHz	
9 cm.....	.....	3.3-3.5.....	3.3-3.5.....	(a), (b), (f), (q)
5 cm.....	5.650-5.850.....	5.650-5.925.....	5.650-5.850.....	(a), (b), (e), (r)
3 cm.....	10.0-10.5.....	10.0-10.5.....	10.0-10.5.....	(a), (b), (k)
1.2 cm.....	24.00-24.25.....	24.00-24.25.....	24.00-24.25.....	(b), (d), (e)
EHF	GHz	GHz	GHz	
6 mm.....	47.0-47.2.....	47.0-47.2.....	47.0-47.2.....	
4 mm.....	76-81.....	76-81.....	76-81.....	(c), (f), (s)
2.5 mm.....	122.25-123.00.....	122.25-123.00.....	122.25-123.00.....	(e), (t)
2 mm.....	134-141.....	134-141.....	134-141.....	(c), (f)
1 mm.....	241-250.....	241-250.....	241-250.....	(c), (e), (f)
	Above 275.....	Above 275.....	Above 275.....	(f)

(b) For a station having a control operator who has been granted an Amateur Extra Class operator license, who holds a CEPT radio amateur license, or who holds a Class 1 IARP license:

Wavelength band	ITU Region 1	ITU Region 2	ITU Region 3	Sharing requirements see § 97.303 (Paragraph)
MF	kHz	kHz	kHz	
160 m.....	1810-1850.....	1800-2000.....	1800-2000.....	(a), (c), (g)
HF	MHz	MHz	MHz	
80 m.....	3.500-3.600.....	3.500- 3.600.....	3.500- 3.600.....	(a)
75 m.....	3.600- 3.800.....	3.600- 4.000.....	3.600- 3.900.....	(a)
60 m.....	.....	See § 97.303(h)...	.....	(h)
40 m.....	7.000- 7.200.....	7.000- 7.300.....	7.000- 7.200.....	(i)
30 m.....	10.100- 10.150.....	10.100- 10.150.....	10.100- 10.150.....	(j)
20 m.....	14.000- 14.350.....	14.000- 14.350.....	14.000-14.350	

17 m.....	18.068-18.168.....	18.068-18.168.....	18.068-18.168
15 m.....	21.000- 21.450.....	21.000- 21.450.....	21.000-21.450
12 m.....	24.890- 24.990.....	24.890- 24.990.....	24.890-24.990
10 m.....	28.000- 29.700.....	28.000- 29.700.....	28.000-29.700

(c) For a station having a control operator who has been granted an operator license of Advanced Class:

Wavelength band	ITU Region 1	ITU Region 2	ITU Region 3	Sharing requirements see § 97.303 (Paragraph)
MF	kHz	kHz	kHz	
160 m.....	1810-1850.....	1800-2000.....	1800-2000.....	(a), (c), (g)
HF	MHz	MHz	MHz	
80 m.....	3.525-3.600.....	3.525-3.600.....	3.525-3.600.....	(a)
75 m.....	3.700- 3.800.....	3.700- 4.000.....	3.700-3.900.....	(a)
60 m.....	.....	See § 97.303(h)....	.....	(h)
40 m.....	7.025-7.200.....	7.025-7.300.....	7.025-7.200.....	(i)
30 m.....	10.100- 10.150.....	10.100- 10.150.....	10.100- 10.150.....	(j)
20 m.....	14.025-14.150....	14.025-14.150....	14.025-14.150	
Do.....	14.175-14.350....	14.175-14.350....	14.175-14.350	
17 m.....	18.068-18.168....	18.068-18.168....	18.068-18.168	
15 m.....	21.025-21.200.....	21.025-21.200.....	21.025-21.200	
Do.....	21.225-21.450....	21.225-21.450....	21.225-21.450	
12 m.....	24.890- 24.990.....	24.890- 24.990.....	24.890-24.990	
10 m.....	28.000- 29.700.....	28.000- 29.700.....	28.000-29.700	

(d) For a station having a control operator who has been granted an operator license of General Class:

Wavelength band	ITU Region 1	ITU Region 2	ITU Region 3	Sharing requirements see § 97.303 (Paragraph)
MF	kHz	kHz	kHz	
160 m.....	1810-1850.....	1800-2000.....	1800-2000.....	(a), (c), (g)
HF	MHz	MHz	MHz	
80 m.....	3.525-3.600.....	3.525-3.600.....	3.525-3.600.....	(a)
75 m.....	.....	3.800- 4.000.....	3.800- 3.900.....	(a)
60 m.....	.....	See § 97.303(h)....	.....	(h)
40 m.....	7.025-7.125.....	7.025-7.125.....	7.025-7.125.....	(i)
Do.....	7.175-7.200.....	7.175-7.300.....	7.175-7.200.....	(i)
30 m.....	10.100- 10.150.....	10.100- 10.150.....	10.100- 10.150.....	(j)

20 m.....	14.025-14.150.....	14.025-14.150.....	14.025-14.150	
Do.....	14.225-14.350.....	14.225-14.350.....	14.225-14.350	
17 m.....	18.068-18.168.....	18.068-18.168.....	18.068-18.168	
15 m.....	21.025-21.200.....	21.025-21.200.....	21.025-21.200	
Do.....	21.275-21.450.....	21.275-21.450.....	21.275-21.450	
12 m.....	24.890- 24.990.....	24.890- 24.990.....	24.890-24.990	
10 m.....	28.000- 29.700.....	28.000- 29.700.....	28.000-29.700	

(e) For a station having a control operator who has been granted an operator license of Novice Class, Technician Class, or Technician Plus Class:

Wavelength band	ITU Region 1	ITU Region 2	ITU Region 3	Sharing requirements see § 97.303 (Paragraph)
HF	MHz	MHz	MHz	
80 m.....	3.525- 3.600.....	3.525-3.600.....	3.525-3.600.....	(a)
40 m.....	7.025-7.125.....	7.025-7.125.....	7.025-7.125.....	(i)
15 m.....	21.025-21.200.....	21.025-21.200.....	21.025-21.200	
10 m.....	28.0-28.5.....	28.0-28.5.....	28.0- 28.5.....	
VHF	MHz	MHz	MHz	
1.25 m.....	..... ...	222-225.....	.....	(a)
UHF	MHz	MHz	MHz	
23 cm.....	1270-1295.....	1270-1295.....	1270-1295.....	(d), (o)

4. Section 97.303 is amended to read as follows:

§ 97.303 Frequency sharing requirements.

The following paragraphs summarize the frequency sharing requirements that apply to amateur stations transmitting in the frequency bands specified in § 97.301 of this part. Each frequency band allocated to the amateur service is designated as either a secondary service or a primary service. A station in a secondary service must not cause harmful interference to, and must accept interference from, stations in a primary service.

NOTE: The Table of Frequency Allocations contains the complete, unabridged, and legally binding frequency sharing requirements that pertain to the Amateur Radio Service. See 47 CFR 2.104, 2.105, and 2.106. The United States, Puerto Rico, and the U.S. Virgin Islands are in Region 2 and other U.S. insular areas are in either Region 2 or 3; see Appendix 1 to Part 97.

(a) Where, in adjacent ITU Regions or sub-Regions, a band of frequencies is allocated to different services of the same category (*i.e.*, primary or secondary services), the basic principle is the equality of right to operate. Accordingly, stations of each service in one Region or sub-Region must operate so as not to cause harmful interference to any service of the same or higher category in the other Regions or sub-Regions.

(b) Amateur stations transmitting in the 70 cm band, the 33 cm band, the 23 cm band, the 9 cm band, the 5 cm band, the 3 cm band, or the 24.05-24.25 GHz segment must not cause harmful interference to,

and must accept interference from, stations authorized by the United States Government in the radiolocation service.

(c) Amateur stations transmitting in the 1900-2000 kHz segment, the 76-77.5 GHz segment, the 78-81 GHz segment, the 136-141 GHz segment, or the 241-248 GHz segment must not cause harmful interference to, and must accept interference from, stations authorized by the United States Government, the FCC, or other nations in the radiolocation service.

(d) Amateur stations transmitting in the 430-450 MHz segment, the 23 cm band, the 3.3-3.4 GHz segment, the 5.65-5.85 GHz segment, the 13 cm band, or the 24.05-24.25 GHz segment, must not cause harmful interference to, and must accept interference from, stations authorized by other nations in the radiolocation service.

(e) Amateur stations receiving in the 33 cm band, the 2400-2450 MHz segment, the 5.725-5.875 GHz segment, the 1.2 cm band, the 2.5 mm band, or the 244-246 GHz segment must accept interference from industrial, scientific, and medical (ISM) equipment.

(f) Amateur stations transmitting in the following segments must not cause harmful interference to radio astronomy stations: 3.332-3.339 GHz, 3.3458-3.3525 GHz, 76-77.5 GHz, 78-81 GHz, 136-141 GHz, 241-248 GHz, 275-323 GHz, 327-371 GHz, 388-424 GHz, 426-442 GHz, 453-510 GHz, 623-711 GHz, 795-909 GHz, or 926-945 GHz. In addition, amateur stations transmitting in the following segments must not cause harmful interference to stations in the Earth exploration-satellite service (passive) or the space research service (passive): 275-277 GHz, 294-306 GHz, 316-334 GHz, 342-349 GHz, 363-365 GHz, 371-389 GHz, 416-434 GHz, 442-444 GHz, 496-506 GHz, 546-568 GHz, 624-629 GHz, 634-654 GHz, 659-661 GHz, 684-692 GHz, 730-732 GHz, 851-853 GHz, or 951-956 GHz.

(g) Amateur stations transmitting in the 1900-2000 kHz segment must not cause harmful interference to, and must accept interference from, stations authorized by other nations in the fixed, mobile except aeronautical mobile, and radionavigation services.

(h) Amateur stations may only transmit single sideband, suppressed carrier (emission type 2K80J3E), upper sideband on the channels 5332 kHz, 5348 kHz, 5368 kHz, 5373 kHz, and 5405 kHz. Amateur operators shall ensure that their station's transmission occupies only 2.8 kHz centered at each of these frequencies. Amateur stations must not cause harmful interference to, and must accept interference from, stations authorized by: (1) the United States Government, the FCC, or other nations in the fixed service; and (2) other nations in the mobile except aeronautical mobile service.

(i) Amateur stations transmitting in the 7.2-7.3 MHz segment must not cause harmful interference to, and must accept interference from, international broadcast stations whose programming is intended for use within Region 1 or Region 3.

(j) Amateur stations transmitting in the 30 m band must not cause harmful interference to, and must accept interference from, stations by other nations in the fixed service. The licensee of the amateur station must make all necessary adjustments, including termination of transmissions, if harmful interference is caused.

(k) For amateur stations located in ITU Regions 1 and 3: Amateur stations transmitting in the 146-148 MHz segment or the 10.00-10.45 GHz segment must not cause harmful interference to, and must accept interference from, stations of other nations in the fixed and mobile services.

(l) In the 219-220 MHz segment:

(1) Use is restricted to amateur stations participating as forwarding stations in fixed point-to-point digital message forwarding systems, including intercity packet backbone networks. It is not available for other purposes.

(2) Amateur stations must not cause harmful interference to, and must accept interference from, stations authorized by: (i) the FCC in the Automated Maritime Telecommunications System (AMTS), the 218-219 MHz Service, and the 220 MHz Service, and television stations broadcasting on channels 11 and 13; and (ii) other nations in the fixed and maritime mobile services.

(3) No amateur station may transmit unless the licensee has given written notification of the station's specific geographic location for such transmissions in order to be incorporated into a database that has been made available to the public. The notification must be given at least 30 days prior to making such

transmissions. The notification must be given to: The American Radio Relay League, Inc., 225 Main Street, Newington, CT 06111-1494.

(4) No amateur station may transmit from a location that is within 640 km of an AMTS coast station that operates in the 217-218 MHz and 219-220 MHz bands unless the amateur station licensee has given written notification of the station's specific geographic location for such transmissions to the AMTS licensee. The notification must be given at least 30 days prior to making such transmissions. The location of AMTS coast stations using the 217-218/219-220 MHz channels may be obtained as noted in paragraph (l)(3) of this section.

(5) No amateur station may transmit from a location that is within 80 km of an AMTS coast station that uses frequencies in the 217-218 MHz and 219-220 MHz bands unless that amateur station licensee holds written approval from that AMTS licensee. The location of AMTS coast stations using the 217-218/219-220 MHz channels may be obtained as noted in paragraph (l)(3) of this section.

(m) In the 70 cm band:

(1) No amateur station shall transmit from north of Line A in the 420-430 MHz segment. See § 97.3(a) for the definition of Line A.

(2) Amateur stations transmitting in the 420-430 MHz segment must not cause harmful interference to, and must accept interference from, stations authorized by the FCC in the land mobile service within 80.5 km of Buffalo, Cleveland, and Detroit. See § 2.106, footnote US230 for specific frequencies and coordinates.

(3) Amateur stations transmitting in the 420-430 MHz segment or the 440-450 MHz segment must not cause harmful interference to, and must accept interference from, stations authorized by other nations in the fixed and mobile except aeronautical mobile services.

(n) In the 33 cm band:

(1) Amateur stations must not cause harmful interference to, and must accept interference from, stations authorized by (i) the United States Government; (ii) the FCC in the Location and Monitoring Service; and (iii) other nations in the fixed service.

(2) No amateur station shall transmit from those portions of Texas and New Mexico that are bounded by latitudes 31° 41' and 34° 30' North and longitudes 104° 11' and 107° 30' West; or from outside of the United States and its Region 2 insular areas.

(3) No amateur station shall transmit from those portions of Colorado and Wyoming that are bounded by latitudes 39° and 42° North and longitudes 103° and 108° West in the following segments: 902.4-902.6 MHz, 904.3-904.7 MHz, 925.3-925.7 MHz, and 927.3-927.7 MHz.

(o) Amateur stations transmitting in the 23 cm band must not cause harmful interference to, and must accept interference from, stations authorized by: (1) the United States Government in the aeronautical radionavigation, Earth exploration-satellite (active), or space research (active) services; (2) the FCC in the aeronautical radionavigation service; and (3) other nations in the Earth exploration-satellite (active), radionavigation-satellite (space-to-Earth) (space-to-space), or space research (active) services.

(p) In the 13 cm band:

(1) Amateur stations must not cause harmful interference to, and must accept interference from, stations authorized by other nations in fixed and mobile services.

(2) Amateur stations transmitting in the 2305-2310 MHz segment must not cause harmful interference to, and must accept interference from, stations authorized by the FCC in the fixed, mobile except aeronautical mobile, and radiolocation services.

(q) Amateur stations transmitting in the 3.4-3.5 GHz segment must not cause harmful interference to, and must accept interference from, stations authorized by other nations in the fixed and fixed-satellite (space-to-Earth) services.

(r) In the 5 cm band:

(1) Amateur stations transmitting in the 5.650-5.725 GHz segment must not cause harmful interference to, and must accept interference from, stations authorized by other nations in the mobile except aeronautical mobile service.

(2) Amateur stations transmitting in the 5.850-5.925 GHz segment must not cause harmful interference to, and must accept interference from, stations authorized by the FCC and other nations in the fixed-satellite (Earth-to-space) and mobile services and also stations authorized by other nations in the fixed service. In the United States, the use of mobile service is restricted to Dedicated Short Range Communications operating in the Intelligent Transportation System.

(s) Authorization of the 76-77 GHz segment for amateur station transmissions is suspended until such time that the Commission may determine that amateur station transmissions in this segment will not pose a safety threat to vehicle radar systems operating in this segment.

(t) Amateur stations transmitting in the 2.5 mm band must not cause harmful interference to, and must accept interference from, stations authorized by the United States Government, the FCC, or other nations in the fixed, inter-satellite, or mobile services.

5. Section 97.305 is amended by revising the last entry in the table following paragraph (c) to read as follows:

§ 97.305 Authorized emission types.

* * * * *

(c) * * *

Wavelength band	Frequencies	Emission types authorized	Standards see § 97.307(f), paragraph:
* *	*	*	*
	Above 275 GHz	MCW, phone, image, RTTY, data, SS, test, pulse	(7), (8), and (12).

6. Section 97.313 is amended by revising paragraph (c)(2) and adding paragraph (i) to read as follows:

§ 97.313 Transmitter power standards.

* * *

(c) No station may transmit with a transmitter power output exceeding 200 W PEP:

(1) * * *

(2) On the 3.525-3.60 MHz, 7.025-7.125 MHz, 21.025-21.20 MHz, and 28.0-28.5 MHz segment when the control operator is a Novice Class, Technician Class, or Technician Plus Class operator; or

* * *

(i) No station may transmit with an effective radiated power (ERP) exceeding 50 W PEP on the 60 m band. For the purpose of computing ERP, the transmitter PEP will be multiplied by the antenna gain relative to a dipole or the equivalent calculation in decibels. A half-wave dipole antenna will be presumed to have a gain of 1. Licensees using other antennas must maintain in their station records either the antenna manufacturer data on the antenna gain or calculations of the antenna gain.