

**Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554**

In the Matter of)
)
Amendment of the Amateur Service Rules to) **RM-11325**
Facilitate Use of Spread Spectrum)
Communications Technologies)

To: The Chief, Wireless Telecommunications Bureau
Via: Office of the Secretary

**REPLY COMMENTS OF ARRL,
THE NATIONAL ASSOCIATION FOR AMATEUR RADIO**

ARRL, the National Association for Amateur Radio, also known as the American Radio Relay League, Incorporated (ARRL), by counsel and pursuant to Section 1.405(b) of the Commission's Rules, hereby respectfully submits its reply comments relative to the above-captioned Petition for Rule Making (the Petition) filed by ARRL March 13, 2006. The Petition proposes the deletion of Section 97.311(d) of the Commission's rules, save for the first sentence thereof. In effect, this would eliminate an automatic power control (APC) provision for Amateur Spread Spectrum (SS) communications. The Petition showed that that the APC requirement has proven over time to be impractical of compliance; is unnecessary in order to protect other Amateur Radio operations or the operation of any licensed radio service sharing certain Amateur Radio allocations; and has served as an unintended, but effective deterrent to Spread Spectrum experimentation in the Amateur Service. In response to the comments filed with respect to the Petition, ARRL states as follows:

1. There were approximately 36 comments filed in response to the Petition. The comments were mixed, some strongly in favor of the proposed deletion of the APC requirement for SS communications in the Amateur Service, and some opposed. Many of those opposed offered no rationale for their position, making it impossible to address their concerns. Others seemed to repeat a one-sentence rationale for their opposition, to the effect that APC has been an important part of “commercial SS applications” and has allegedly contributed to interference reduction. There is no factual support for this assertion, as far as ARRL is aware. Much commercial SS operation is unlicensed and is therefore regulated by Part 15 of the Commission’s rules. These applications, in general, do not incorporate APC technology. Part 15 SS applications are limited to a maximum power of 1 watt in any case, making any comparison with the Amateur Service (and the use of APC in intentional radiator devices) inapplicable.

2. Other opposing comments suggested that the Petition was in effect an effort by Amateurs who are digital communications experimenters to “use SS without the need to mitigate interference,” or to allow Amateurs to make use of commercial 802.11, Part 15 WiFi devices and add amplifiers to them to create wide area wireless Local Area Networks. These comments suggest that there is documentation of interference to narrow bandwidth Amateur operations from Part 15 SS equipment operating at, for example, 2.4 GHz, although the Part 15 devices operate at or below 1 Watt. Given that, they express concern about “100-watt” Amateur SS systems which allegedly “would be permitted” if the Commission acts favorably on the ARRL Petition.

3. There are quite a few rather serious misapprehensions reflected in these opposing comments. First of all, nothing in the ARRL petition would permit use of SS in

the Amateur Service without the need to mitigate interference. Section 97.311(b), which is *not* proposed to be modified or deleted by the ARRL petition, provides rather explicitly that “[a] station transmitting SS emissions must not cause harmful interference to stations employing other authorized emissions, and must accept all interference caused by stations employing other authorized emissions.” Secondly, while there might be some possibility of using commercial SS equipment in the Amateur Service for 802.11 type operation, that does not mean that the deletion of the APC requirement would permit 100-watt SS operation across the board; Far from it. There would be no substantive change in the power level that any given station using SS emissions would be permitted to use in a given application, if the rule change proposed in the Petition is adopted. Rather, the longstanding, overarching requirement in the Amateur Rules that at all times, an Amateur Station must use the minimum transmitter power necessary to carry out the desired communication¹ would continue to apply. Therefore, Amateur Radio licensees using SS emissions must use only that power necessary (up to a maximum of 100 watts, where necessary) to carry out the desired communications, and no more. Finally, though it is quite true that aggregate interference *from* Part 15 devices in, for example, 902-928 MHz and 2400-2450 MHz *to* Amateur Stations has been a problem for narrowband Amateur operation in those bands, that is not an indication that elimination of the APC requirement for Amateur SS experimentation will have any effect whatsoever on narrowband Amateur operation. This is **not**, as some opposing comments unfairly characterize it, a “power increase” proposal for SS emissions.

4. A third category of opposing comments, from localized Internet service providers who are not Amateur licensees, express concern about interference from

¹ 47 C.F.R. § 97.313(a)

Amateur Radio SS operation to unlicensed devices, including consumer products, in certain bands. Again, the concern is misplaced. No one is proposing to “permit 100 Watt SS transmissions” in the 902-928 MHz or 2400-2450 MHz band which have not been permitted previously. Amateurs have always, since SS was first authorized in the Amateur Service, been permitted to utilize up to 100 watts for SS emissions in those bands if that power level is necessary to conduct the communications. Furthermore, as a matter of fact, consumer Part 15 devices are not protected from interference from licensed Amateur Radio stations, according to Section 15.5(b) of the Commission’s Rules. The interference concerns are not valid as a matter of fact, and even if they were, the concern is not a cognizable reason for withholding the relief requested. As was stated in the filed comments of Steven R. Sampson, K5OKC, “...it is risky for any company to base its existence on unlicensed (unprotected) spectrum, and provide market users with no legal recourse.” Tropos Networks opposing comments refer to APC as being somehow critical to the “sharing” of certain allocations between unlicensed devices and the Amateur Service.² There is no “sharing” of allocations. Unlicensed devices are permitted to operate in allocated bands on an “at-sufferance” basis and no more. They have no allocation status. APC is not at all critical to interference protection to other users of a band, licensed or unlicensed, and in the case of unlicensed users, there is no interference protection to be had. It is notable that in the band with which Tropos is concerned, 2.4 GHz, broadband Amateur emission modes other than SS are entitled to

² This is not well-taken. Prior to 1997, when the Commission enacted the APC requirement, Amateur SS emissions were limited only to a maximum transmitter power of 100 watts (subject, nevertheless to the minimum power requirement of Section 97.331(a)). There was no Amateur SS interference complained of then, so there is no reason to believe that deleting the APC requirement now will trigger interference prospectively.

utilize up to 1500 watts PEP output power. See Section 97.313(b) of the Commission's Rules.

5. The concern that prompted the ARRL Petition, as stated therein, is that there is too little SS experimentation in the Amateur Service at present. As Mr. Sampson states, [m]ost [Amateurs] do not use Spread Spectrum, because the APC rule has stopped them in their tracks...The obvious solution for Amateurs has been to avoid Spread Spectrum...They have ignored a mode where there are no tools or designs to mechanize a restrictive automatic power control rule." As John B. Johnston, W3BE, put it, he supports the petition because "it rids our Amateur Service rules of an unnecessary 'how-to' rule. Such rules stifle innovation." ARRL petitioned the Commission to implement the APC requirement in the first place. APC has, however, proven in practice to be a stumbling block preventing SS experimentation, which is antithetical to the goals of the Amateur Service, in Section 97.1(b), (c) and (d). As Nickolaus E. Leggett, N3NL, stated in filed comments, "[u]nder the current rules, amateur radio operators are deterred from building and experimenting with spread spectrum technology. This is because the significant complication of automatic transmitter power control is added to the already challenging task of designing and building a working spread spectrum amateur radio station." It is time to eliminate the requirement.

6. Some thoughtful comments in opposition to the Petition were filed by Timothy P. Gorman, AB0WR. Mr. Gorman suggests that manual power control works well for analog modes, inasmuch as the control operator can actively listen to the incoming signal and can adjust power accordingly (dynamically) based on received signal strength.

This dynamic control based on operator feedback does not, Gorman argues, translate well to digital communications, as the incoming signal is not typically monitored. This factor, Gorman suggests, leads to operation of stations using data modes at maximum power. He suggests that the use of 802.11 equipment, on frequencies above 70 cm, works well with Amateur applications at between 1 and 10 watts. Given this, Gorman does not understand the justification for deleting the APC requirement. He is concerned that there should be a workable means of limiting power if APC is deleted, in order to comply with Section 97.313(a). He believes that only the use of a feedback loop can be employed.

7. Gorman makes some reasonable points. However, while Amateurs do use 802.11 protocols some of the time, SS emissions are not restricted to that. If 802.11 devices are used, and power can be limited in that fashion, then Section 97.313(a) dictates that power *be* so limited. Other SS emissions, however, are not subject to the same method of limiting power. A feedback loop cannot be employed where, for example, there are more than two stations communicating with each other. The rules should not be configured so as to limit SS operation to 802.11 facilities only. In unknown SS systems, there is no standardization possible. There should be a good deal of flexibility in the means by which minimum power is determined in a given application, now or in the future.

8. Furthermore, the issue under consideration is the APC requirement for SS emissions only, not for all digital communications modes. For non-SS emissions, whether at 902-928 MHz, 2400-2450 MHz or elsewhere, non-SS data emissions of wide bandwidth can be used at up to 1.5 kW PEP output. This includes OFDM emissions. Power control, regardless of the type of emission, requires some operator discretion. It is

suggested that the Commission should, with respect to SS, act consistently with its longstanding practice of relying on operator discretion for compliance with Section 97.313(a). Elimination of the APC requirement would not have any effect on the obligation of an Amateur station transmitting SS emissions to utilize the minimum power necessary to conduct communications. The station licensee or control operator would still have that absolute obligation, according to Section 97.313(a) of the Commission's Rules. Furthermore, as noted above, the SS rules, at 97.311(b), already make SS essentially secondary to any Amateur narrowband emission modes. Given these existing rules, which are not proposed to be modified or deleted, the APC requirement is not necessary to avoid interference to any other user of the same spectrum as the Amateur SS emission. The only substantive change would be that Amateur SS equipment would not have to be configured to calculate automatically the lowest transmitter power necessary by reference to a remote receiver or to multiple receivers (which has proven an impossible task in many applications). The minimum transmitter power can be determined more flexibly, and practically, by the Amateur station transmitting the SS emissions, using whatever techniques are necessary to comply with the minimum power rule. This provides greater flexibility and removes a substantial obstacle to SS experimentation, which is clearly the Commission's goal.

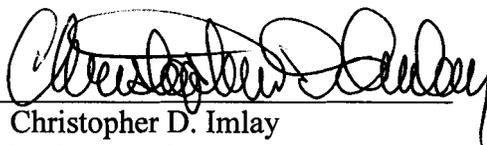
Therefore, the foregoing considered, ARRL again respectfully requests that the Commission issue a Notice of Proposed Rule Making to implement the modification to Section 97.311(d) of the Commission's proposed in the Petition, and adopt the same after

an opportunity for notice and public comment.

Respectfully submitted,

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May 18, 2006

CERTIFICATE OF SERVICE

I, Christopher D. Imlay, do hereby certify that I caused to be mailed, via first class U.S. Mail, postage prepaid, a copy of the foregoing REPLY COMMENTS, to the following, this 18th day of May, 2006.

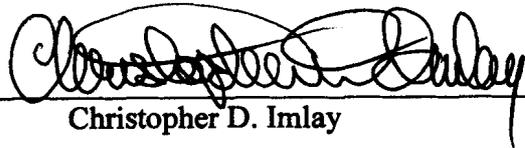
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