

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

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In the Matter of) WT Docket No. 97-12
)
Amendment of the Amateur Service) RM-8737
)
Rules to Provide For)
Greater Use of Spread)
Spectrum Communication)
Technologies)

To: The Commission

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REPLY COMMENTS OF

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INTRODUCTION

I listed my credentials in my Comments on this Proceeding, dated May 2, 1997. The most relevant of these is the fact that I am one of but a handful of PRACTITIONERS in the art and science of Spread Spectrum (SS) as it applies to the Amateur Service. Being the holder of the SS Special Temporary Authorization (STA) caused me to be the focus of those interested in moving forward. Over the years I received many, varied levels of inquiry. It became quite clear how limiting the current Rules are, and also how diverse are the levels of expertise and interest. SS is sufficiently complex that only a few stout experimenters were willing to invest the many hours required to build even the simplest SS systems. A common theme for each of us is that we all started at the very beginning, learning from simple modules, building on that learning until we arrived at a critical mass of elements that could be called a working system. Along this path was the gift of insight into SS's strengths (resistance to interference and multipath fading) as well as its weaknesses (complexity, wideband receivers, the near-far problem). Many of us came to conclude that SS systems resulted from special cases of more general digital codes, and that what we require is blanket authorization to pursue additional avenues whose many desirable properties are worth investigating and adopting.

I find it interesting that many commentors refer, in their remarks, to SS as experimental technology. The fact is quite the contrary; only in Amateur Radio is SS experimental!

DISCUSSION

While I am pleased that the Commission has decided to consider new rulemaking on SS communication within the Amateur Radio Service (ARS), after contemplating all the Comments in this Proceeding, I urge that the Commission step back and take the longest possible view into the future. The outcome of this Rule Making will impact Amateur Radio for the next 10-20 years.

I urge that the Commission grant additional weight to the Comments of those who speak from experience. Particularly, I wish to concur with and endorse (a) the Comments of Phil Karn KA9Q, for his willingness to be a light of experience in a sea of darkness, and for the courage in his Comments to advocate SS technology at HF; (b) the Reply Comments of Dick Bingham W7WKR for his pioneering work in very-low-power 80M DSSS; (c) the Reply Comments of Glenn Elmore N6GN, who eloquently shows that the concerns of current weak-signal enthusiasts are technically unfounded; (d) Greg Jones WD5IVD and Dewayne Hendricks WA8DZP of TAPR, for making SS an organizational priority, thereby making current commercial SS more widely available; and (e) the ARRL, for bringing this matter to the current forum.

In my opinion, the ARRL (as an organization) is illustrative of the lack of consensus among Amateurs. It has the pro-SS and the anti-SS factions, and the many other factions/interests that leave it at cross-purposes with the initiative that is the subject of this Proceeding. The ARRL has neither contributed to nor provided leadership in this matter. As for policy, it wishes to see, predominately that the status quo remain in place, since this position best serves the ARRL as a power broker. All the while, technology is advancing, leaving the current practices in Amateur Radio behind. It's one thing to "say" you are "for something," and very much another to give it life by contributing time and resources. I have little use for the ARRL as an organization, as the advocate and representative for advancement of Amateur Radio. On balance, I would like to acknowledge those individuals inside the ARRL who have, over the years, worked very hard on the side of technology, research, and SS. You know who you are.

Repeater operators and users can forget about concerns they voiced of interference from SS systems. The data I included in my Comments provide a sample of the irrefutable evidence showing that interference is, at most, unlikely and infrequent. If there are any lingering doubts, feel free to look at a spectrum analyzer sometime; how does one interfere with something that isn't there?

I find it interesting that the weak-signal community would seek to differentiate narrowband-SS as acceptable practice; yet wideband-SS is unacceptable. This position exposes a fundamental lack of appreciation for the power of the underlying coding technology involved. I understand the motivation and I encourage the experimentation, confident that these folks will learn as we have, that the wider the signal gets, the better the result. It is just that the differentiation they seek should have no place in the Rules.

I remarked about Metricom in my Comments. After all, they are a struggling business, offering guaranteed service performance using

spectrum to which they do not have exclusive title. Hmmm, but they are only offering this service where the population is dense and there is the possibility of profit. In the same breath, they would enjoin an Amateur from using their product modified with a high power transmit amplifier and receive low-noise preamplifier and high-gain directional antenna, to link across a long distance of wilderness or desert, because doing that might benefit the public interest or assist in a time of emergency. Something is wrong with this picture! The Rules have to work for everyone, everywhere, not just for a particular special interest. Sure, occasionally an Amateur will momentarily capture a Metricom transmission; he/she was granted that privilege when he/she earned his/her Amateur Operators License. I believe both TAPR and ARRL will further address this matter.

In my Comments, I recommended that the Commission turn aside the specific proposal made in this proceeding, in favor of a Rules change embodying the spirit of the STA. After careful consideration, I wish to go further: not only should SS be permitted in all Amateur spectrum (including HF), I suggest that the Rules be fundamentally altered so that "any unspecified code" is permitted without restriction anywhere within any Amateur band. This includes, but is not limited to, what we now think of as Frequency-Hopped Spread Spectrum (FHSS) coding, Direct Sequence Spread Spectrum (DSSS) coding, hybrid combinations of these, Forward Error Correction (FEC) codes of varying properties, all inclusive of digital modulation forms. This recommendation might take the form of: (a) removing section 97.311 in its entirety; (b) rewriting section 97.309 (the definition of the data emission) to permit any imaginable digital code (with the sole prohibition that the code is not used to obscure the transmission) and that section 97.309(b)3 be eliminated; (c) editing section 97.307 to remove verbiage that implies bandwidth limitations for the data emission; and (d) adding entries in section 97.305(c) frequency band table giving the data emission access to the entire band.

I would also ask that the Commission eliminate the requirement of section 97.119(b)(5) for morse code identification of the data emission. This requirement of a cross-mode identification would be likely to cause interference, and a monitoring station would find it quite difficult to associate the narrow band CW emission with a particular data emission signal.

CONCLUSION

The ARS has a long tradition of innovation in communications. With the introduction of new communication methods have always come outcries from existing-mode users. Each new method has advanced the state of the communication art, eventually, in an orderly manner, supplanting the prior method. The ARS, unlike all the others, which the FCC manages, also has a history of self-management. It needs, and deserves, considerably less regulation, to allow it to achieve its Purposes, particularly sections 97.1 (b) (c) and (d). In this Proceeding, the Commission could significantly reduce its workload attributed to the ARS by recognizing these facts, and by removing the bandwidth limitations it has attached to each modulation mode and the arbitrary spectrum allocations given to the various modulation modes. Since SS is but one point on the continuum of digital coding technology, allowing any bandwidth provides system designers with the flexibility to determine what works and what doesn't. There are adequate provisions existent in the Rules to prevent undue interference from new modes, as there are Rules about appropriate transmit power levels. Digital Coding technology, whatever its form or emission consequence, should be freely permitted on ALL Amateur bands, not just those about 50 MHz as I proposed in my Comments, or above 420 MHz as is current.

RESPECTFULLY SUBMITTED,



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