

Before the
Federal Communications Commission
Washington DC 20554

In the Matter of)
)
Revision of Part 15 of the Commission's Rules) ET Docket 98-153
Regarding Ultra-Wideband Transmission)
Systems)

REPLY COMMENTS OF XTREMESPECTRUM, INC.

August 20, 2003

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XtremeSpectrum, Inc. hereby files these Reply Comments in response to the Commission's Further Notice of Proposed Rulemaking in the above-captioned proceeding.¹

A. INTRODUCTION

The Commission's Rules require an ultra-wideband (UWB) system to have a UWB bandwidth of at least 500 MHz or a fractional bandwidth of at least 0.2.² The Further Notice proposes to eliminate both requirements, and to allow certification of any transmitter as UWB, regardless of bandwidth, so long as it complies with the other standards for UWB operation.³ The Commission reasons that manufacturers might otherwise add noise to a signal simply to achieve the minimum bandwidth, and hence occupy parts of the spectrum the device does not actually need.⁴

XtremeSpectrum opposes this change.

¹ *Ultra-Wideband Transmission Systems*, 18 FCC Rcd 3857 (2003) (Memorandum Opinion and Order and Further Notice of Proposed Rule Making) ("Further Notice").

² 47 C.F.R. Sec. 15.503(d). UWB bandwidth is the difference between the upper and lower -10 dB frequencies. Fractional bandwidth is the UWB bandwidth divided by the arithmetic mean of the upper and lower -10 dB frequencies. 47 C.F.R. Secs. 15.503(a), (c).

³ Further Notice at para. 166.

⁴ *Id.*

Today marks the fifth anniversary of the Commission's adopting the Notice of Inquiry that launched this proceeding. Those five years resulted in rules that accomplish two essential goals: (1) they permit the development of flexible UWB technology, while (2) eliminating any realistic threat of harmful interference into other services. As we show below, the proposed change will threaten the second goal without advancing the first. For that reason it is contrary to the public interest and should be abandoned.

B. BACKGROUND

In the heated debate of this proceeding, it is easy to forget that approval of UWB entailed only two relatively minor changes to the rules: (1) allowing UWB to emit in the "restricted bands" otherwise closed to Part 15 intentional emissions;⁵ and (2) a technical change to the measurement procedures.⁶

The restricted bands are allocated for safety-of-life services or reception of very faint signals.⁷ On the assumption that these need an extra margin of protection, the Commission has declared them off-limits to unlicensed operation. But the UWB proceeding forced a second look

⁵ 47 C.F.R. Sec. 15.205.

⁶ The pre-UWB Part 15 procedures require application of a pulse desensitization correction factor to compensate for the measuring instrument's inability to respond fully to a very narrow pulse. The correction can considerably increase the reported peak emissions levels, and is inappropriate for systems that use narrow pulses to achieve wide bandwidths. *See Ultra-Wideband Transmission Systems*, 17 FCC Rcd 7435 at para. 8 (2002) (First Report and Order). The UWB rules also eliminated the prohibition against "Class B, damped wave emissions," a term that dates back to spark gap transmitters and has no clear meaning in the context of modern equipment. *Id.* at paras. 257-259.

⁷ *Revision of Part 15 of the Rules*, 4 FCC Rcd 3493 at para. 66 (1989).

at this principle. A UWB signal may be too wide to avoid all restricted bands.⁸ Achieving the benefits unique to UWB therefore required an exception to the restricted-band prohibition.

But the Commission was careful to limit proliferation of signals in the restricted bands by narrowing eligibility to those transmitters whose bandwidth actually needs it. The Commission said:

At this time, we do not wish to open the restricted bands for operation by any Part 15 device that can operate satisfactorily between the restricted bands. Accordingly, we are limiting the minimum bandwidth limit to 500 MHz.⁹

"In the absence of a minimal bandwidth requirement," the Commission added, "many devices could be designed to operate in restricted bands even though they have no need to do so."¹⁰ It pointed out there is ample spectrum to operate such devices outside the restricted bands.¹¹

C. DISCUSSION

As noted, the Commission suggests that eliminating the bandwidth requirement will reduce interference because it will remove an incentive for manufacturers to add noise merely to achieve the minimum bandwidth and thereby qualify for the UWB rules.¹²

⁸ See *Ultra-Wideband Transmission Systems*, 13 FCC Rcd 16376 at para. 11 (1998) (Notice of Inquiry).

⁹ First Report and Order at para. 31.

¹⁰ *Id.* at para. 30.

¹¹ *Id.*

¹² Further Notice at para. 166.

There are two problems with this reasoning. First, the deliberate addition of unnecessary noise to a signal violates long-standing Commission rules.¹³ Such a device should never qualify for certification in any event. Second, rather than reduce interference, eliminating the bandwidth requirement will *increase* the risk by multiplying the numbers of devices authorized to transmit in the restricted bands -- including devices that make no attempt to capture the advantages unique to UWB. Certain users of the restricted bands were among the most outspoken opponents of UWB. The threat of additional categories of devices may needlessly reopen the UWB debate, and also may derail the Commission's plan to consider increasing the UWB emissions limits in the future.¹⁴ There is little to be gained, and much to be lost, by unnecessarily opening these bands to more transmitters.

The Commission specifically declined to propose "major changes" in the Further Notice, on the ground that they would be "disruptive to the current industry product development efforts."¹⁵ That is a wise decision, at least for the moment -- and difficult to square with the proposed change on minimum bandwidth. The Commission may not appreciate how disruptive that change would be. The industry is now going through the difficult process of developing global standards for UWB devices. Those proceedings are hampered by disputes over whether

¹³ "An intentional . . . radiator shall be constructed in accordance with good engineering design and manufacturing practice. *Emanations from the device shall be suppressed as much as practicable . . .*" 47 C.F.R. Sec. 15.15(a) (emphasis added).

¹⁴ First Report and Order at para. 21.

¹⁵ Further Notice at para. 153.

some of the proposed standards comply with the *present* rules.¹⁶ Changing the UWB eligibility rules now will only increase the uncertainty and confusion, and further delay commercial availability.

The UWB industry shows little support for eliminating the minimum bandwidth. Three automotive radar interests say they favor the change, but none offers any rationale beyond the Commission's own.¹⁷ One asserts that some applications could benefit from bandwidths varying between 250 and 2500 MHz,¹⁸ but it does not say what those applications are, or why they cannot operate under the non-UWB rules.

The Commission promised to revisit the minimum bandwidth requirement after "additional experience has been gained with UWB operation."¹⁹ That time has not yet come. Neither the Commission nor industry has *any* experience with commercial UWB devices (apart from ground penetrating radars). The rules should be left alone unless actual operation in the field shows a clear need for change. In the meantime, systems that can function properly without extremely high bandwidth may continue to operate under other sub-parts of the Part 15 rules.

¹⁶ See XtremeSpectrum, Inc. and Motorola, Request for Declaratory Ruling on Application of the Commission's Rules to Frequency Hopping Ultra-Wideband Systems (No File Number) (filed July 28, 2003).

¹⁷ Siemens VDO Automotive AG at 15 (filed July 21, 2003); Short Range Automotive Radar Frequency Allocation Group at 2 (filed July 21, 2003); Delphi Automotive Systems Corp. at 8 (filed July 18, 2003).

¹⁸ Delphi Automotive Systems Corp. at 8.

¹⁹ First Report and Order at para. 31.

CONCLUSION

This has been a long proceeding, and one of the most contentious in recent memory. We commend the Commission for steering a course between competing interests to arrive at UWB rules that fully protect other spectrum users, yet are flexible enough to foster a broad range of UWB technologies. The Commission should now stand back and let the industry develop in a stable regulatory environment.

Respectfully submitted,

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