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September 10, 2001

Ms. Magalie Salas, Secretary
Federal Communications Commission
445 12th Street SW
Washington DC 20554

**Re: ET Docket No. 98-153 -- Revision of Part 15 of the Commission's Rules
Regarding Ultra-Wideband Transmission Systems
*Ex Parte Communication***

Dear Ms. Salas:

XtremeSpectrum, Inc. (XSI) is eager to assist the Commission in bringing this proceeding on ultra-wideband (UWB) to a speedy conclusion.¹

A. SUMMARY

XtremeSpectrum's prior filings in this docket have suggested UWB emissions limits and other measures more stringent than those the Commission originally proposed. We included engineering analyses to establish that our recommended measures fully protect all other spectrum users that have documented their interference concerns.

The U.S. GPS Industry Council (GPSIC) disputes our analyses, and presses for lower emissions limits.

XtremeSpectrum continues to believe its analyses are correct, and that no additional protection is needed. **Nevertheless, in the interest of a prompt resolution,**

¹ XtremeSpectrum, with 67 employees, conducts research in UWB communications systems as its sole business. XtremeSpectrum intends to become a UWB communications manufacturer once the Commission authorizes certification of such systems. XtremeSpectrum takes no position on UWB radar applications.

XtremeSpectrum will not object to emissions limits in the GPS band consistent with those demanded by the GPSIC: 35 dB below Section 15.209(a) levels, plus an additional 10 dB suppression of spectral lines (as measured with a 10 kHz resolution bandwidth).

XtremeSpectrum emphasizes that it takes this position solely to expedite a resolution of the proceeding. We do not seek rules that would hinder other manufacturers. To the contrary, XtremeSpectrum will endorse any set of limits the Commission reasonable believes is necessary to protect GPS, including any of the several proposals presently before the Commission.

B. XTREME SPECTRUM'S PREVIOUS PROPOSALS

XtremeSpectrum has previously recommended four adjustments to the Commission's proposed rules:

1. Emission mask. XtremeSpectrum proposed an emission mask more stringent than that proposed by the Commission. The proposal was intended to give added protection not only to GPS, but also to WCS, DARS, MMDS and ITFS:

above 2.7 GHz:	500 uV/m at 3m (²)
2-2.7 GHz:	6 dB below 500 uV/M
1.6-2 GHz:	12 dB below 500 uV/m
at and below 1.6 GHz:	18 dB below 500 uV/m.

The tighter limit would apply at frequency boundaries.

2. Attenuation of spectral lines: Reported interference from UWB into GPS is due principally to spectral line emissions in the L1 band.³ For that reason, XtremeSpectrum endorsed the Commission's requiring an additional measurement using a 10 kHz resolution bandwidth, with a limit 10 dB below the 1 MHz bandwidth limits,

² This field strength corresponds to Sections 15.209 (maximum emissions in bands not otherwise specified) and 15.109 (Class B digital devices). *See Revision of Part 15 of the Commission's Rules Regarding Ultra-Wideband Transmission Systems*, 15 FCC Rcd 12086 at para. 39 (2000) (Notice).

³ *See Comments of XtremeSpectrum, Inc. on Issues of Interference Into Global Positioning System Receivers* (filed April 25, 2001).

over the frequency range 1574.92 through 1575.92 MHz. The GPSIC, NTIA, and RTCA all support this test.⁴

3. ***Indoor operation only.*** Because most potential UWB interference victims are located outdoors, XtremeSpectrum urges the Commission to restrict UWB communications systems to indoor operation. According to NTIA test results, the exterior building wall affords an average of at least 9 dB attenuation.⁵

4 ***Measurement of peak/average ratio.*** XtremeSpectrum has noted that the Commission's proposed test to limit peak-to-average ratio does not completely accomplish its purpose,⁶ as the test does not fully account for the presence or absence of spectral lines. We suggested alternative requirements that use time domain and frequency domain measurements of UWB signals to limit the ratio of peak power to average power.⁷

C. GPSIC OBJECTIONS

The GPSIC has complained that XtremeSpectrum's proposed GPS-band limit -- at 18 dB below Section 15.209(a) -- is too high. The GPSIC demands instead that ultra-wideband emissions be held to 35 dB below Section 15.209(a). The GPSIC apparently

⁴ See U.S. GPS Industry Council at Section 1 & Table A.1 (filed June 21, 2001); NTIA Special Publication 01-45, *Assessment of Compatibility Between Ultrawideband Devices And Global Positioning Systems Receivers* at Section 4.1.3 (dated February 2001); RTCA Paper No. 086-01/PMC-139, *Second Interim Report to the Department of Transportation: Ultra-Wideband Technology Radio Frequency Interference Effects to Global Positioning System Receivers and Interference Encounter Scenario Development*, RTCA SC-159 at Section 4.1.1.2 (dated March 27, 2001).

⁵ NTIA Special Publication 01-45, *Assessment of Compatibility Between Ultrawideband (UWB) Systems and Global Positioning System (GPS) Receivers* at Sec. 3.1.8 (dated Feb. 2001). Indoor-only UWB operation does not, by itself, protect wireless phones used indoors. However, XtremeSpectrum has shown that neither communications operations nor handset-based E911 functions of indoor wireless phones are affected by the presence of UWB transmitters. See Reply Comments of XtremeSpectrum, Inc. (filed March 12, 2001) (communications functions); XtremeSpectrum, Inc. (filed July 25, 2001) (GPS-based E911).

⁶ See Notice at paras. 42-43.

⁷ See XtremeSpectrum, Inc. Technical Statement on Reports Addressing Potential GPS Interference from UWB Transmitters at 5, *filed with* Comments of XtremeSpectrum, Inc. on Issues of Interference Into Global Positioning System Receivers (filed April 25, 2001).

arrived at this number through its interpretation of the NTIA test results on UWB interference, which concluded:

GPS receivers of every class are impacted -- some by interference as much as 35 dB below the Part 15 limits -- by UWB emissions.⁸

More recently, the GPSIC again demanded that ultra-wideband emissions into "safety-of-life" bands not exceed 35 dB below Section 15.209(a).⁹ For aviation safety -- perhaps the most publicized interference issue in the proceeding -- the GPSIC insists on levels corresponding only to 19 db below Section 15.209(a) for white noise, and 29 dB below for spectral lines (effectively identical to XtremeSpectrum's original proposal).¹⁰ As to E911, which is also prominent in the debate, the GPSIC calls for an emission mask "about 20 dB below that proposed by [XtremeSpectrum],"¹¹ or about 38 dB below Section 15.209(a). The supporting analysis, however, not only includes a public safety margin of 6 dB as "'a correction factor' for CW-like interference,"¹² but also adds another correction factor of 10 dB "for CW-Like Emissions."¹³ Either of these should suffice.

In short, a GPS-band emission limit at 35 dB below Section 15.209(a), and 10 dB lower than that for spectral lines, will satisfy the GPSIC's worst-case demands.

⁸ Comments of the U.S. GPS Industry Council on Test Data Regarding Potential Interference from Ultra-Wideband Transmission Systems at 5 (filed April 25, 2001).

⁹ U.S. GPS Industry Council at proposed rule Sec. XX.af(b) (filed July 16, 2001).

¹⁰ GPSIC phrased its requested limit as -90 dBW/MHz for white-noise-like emissions, and 10 dB below that for CW emissions, which yield the numbers given in text. U.S. GPS Industry Council at 4 (filed Aug. 22, 2001), *citing* RTCA Special Committee Report, *Preliminary Aviation Approach Segment for Second Interim Report to the Department of Transportation: Ultra-Wideband Technology Radio Frequency Interference Effects to Global Positioning System Receivers and Interference Encounter Scenario Development*, RTCA Paper No. 039-01/PMC-128 (Feb. 2, 2001).

¹¹ U.S. GPS Industry Council at Appendix A, para. A.6 (filed June 21, 2001) (emphasis in original).

¹² *Id.* at Appendix A, para. A.5.

¹³ *Id.* at Appendix A, para. A.5, Table A.1 (last line). The analysis also assumes that receivers are "designed to operate at the thermal noise floor with no interference." *Id.* at Appendix A, para. A.5, Table A.1 (first line).

D. XTREME SPECTRUM'S MODIFIED PROPOSAL

Although XtremeSpectrum is certain that its original proposal fully protects other spectrum users, including GPS, we also attach high value to a speedy resolution of the proceeding. Solely to take the issue of GPS emissions limits out of contention, XtremeSpectrum will cede to the GPSIC's demands. Specifically:

XtremeSpectrum will not object to limits in the GPS bands at 35 dB below Section 15.209(a) levels, plus an additional 10 dB suppression of spectral lines (as measured with a 10 kHz resolution bandwidth).

XtremeSpectrum also continues to support its prior recommendations for an indoor-only restriction and a modified test for peak-to-average ratio.

XtremeSpectrum emphasizes that it does not seek restrictive rules to hinder other manufacturers. We are eager to compete in the marketplace, not the Commission hallways. **XtremeSpectrum will endorse any set of limits that the Commission reasonably determines will protect GPS.** XtremeSpectrum will specifically support any of the four options presently before the Commission: (1) the GPSIC demand for 35 dB below Section 15.209(a) levels; (2) the earlier XtremeSpectrum proposal at 18 dB down; (3) the original Commission proposal at 12 dB down;¹⁴ or (4) the recent request from Time Domain Corporation for Section 15.209(a) limits across the spectrum.¹⁵

CONCLUSION

After three years and more than 700 filings, this docket is ripe for decision. The GPSIC's continuing demands for unrealistically low UWB emissions limits in the GPS bands has been one obstacle to resolution. Although those demands lack technical justification, XtremeSpectrum now accedes to them in order expedite the promulgation of rules.

Pursuant to Section 1.1206(b)(1) of the Commission's Rules, I am electronically filing this written *ex parte* communication for inclusion in the above-referenced docket.

¹⁴ See Notice at para. 39.

¹⁵ Time Domain Corporation (filed Aug. 16, 2001).

If there are any questions about this filing, please call me at the number above.

Respectfully submitted,

Mitchell Lazarus
Counsel for XtremeSpectrum, Inc.

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