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January 28, 2002

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:

Pursuant to Section 1.1206(a)(1) of the Commission's Rules, on behalf of XtremeSpectrum, Inc., I am electronically filing this written ex parte communication in the above-referenced proceeding.¹

XtremeSpectrum responds to two recent ex parte filings by members of the wireless industry.²

By now the respective positions of the wireless companies and XtremeSpectrum are clearly drawn:

- The wireless industry claims that its studies predict interference from ultra-wideband (UWB) into PCS.

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

² Letter from AT&T Wireless, Cingular Wireless, Qualcomm, Sprint PCS, and Verizon Wireless to the Honorable Donald L. Evans and the Honorable Michael Powell (dated Jan. 17, 2002) ("January 17 Letter"); Letter from AT&T Wireless, Cingular Wireless, Qualcomm to Magalie R. Salas, FCC (dated Jan. 22, 2002) ("January 22 Letter").

Ms. Magalie Salas, Secretary
January 28, 2002
Page 2

- XtremeSpectrum claims the PCS industry studies rely on incorrect assumptions, and with those assumptions corrected, predict *no* interference.

We will not revisit these positions, and leave their resolution to the Commission. *Our disinclination to reply yet again to repetitive arguments from the PCS industry is not an acquiescence to those arguments.* But we do respond briefly to a few new scenarios, and to statements by the wireless industry that misrepresent XtremeSpectrum's position in the record. We use the attached table format for brevity.

* * * *

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

Respectfully submitted,

Mitchell Lazarus
Counsel for XtremeSpectrum, Inc.

cc: Chairman Michael Powell
Commissioner Kathleen Q. Abernathy
Commissioner Michael J. Copps
Commissioner Kevin J. Martin
Edmund J. Thomas, Chief (Designated), OET
Bruce Franca, Acting Chief, OET
Julius P. Knapp, Deputy Chief, OET
Michael Marcus, Associate Chief of Technology, OET
Lisa Gaisford, Chief of Staff, OET
Karen E. Rackley, Chief, Technical Rules Branch, OET
John A. Reed, Senior Engineer, Technical Rules Branch, OET

**XtremeSpectrum Responses to
Wireless Companies' Ex Parte Filings
of January 17 and 22, 2002**

<p><i>The wireless companies allege:</i> XtremeSpectrum has not conducted its own tests to show non-interference.³</p>	<p><i>XtremeSpectrum responds:</i> We think the wireless companies' tests and analyses were well done, except for certain assumptions. We accept the wireless companies' methods with those assumptions corrected.</p>
<p><i>The wireless companies allege:</i> "There is no analysis in the record showing that Sprint PCS/Time Domain and Qualcomm studies gave incorrect results."⁴</p>	<p><i>XtremeSpectrum responds:</i> See the XtremeSpectrum filings of January 23, 2002; January 3, 2002; May 10, 2001; and April 25, 2001.</p>
<p><i>The wireless companies allege:</i> The XtremeSpectrum proposal to protect GPS by 35 dB implicitly admits there is a "harmful interference problem with UWB devices" (citing the XtremeSpectrum filing of Sept. 10, 2001).⁵</p>	<p><i>XtremeSpectrum responds:</i> Our September 1, 2001, filing says plainly (at pages 1-2 and 5) that 35 dB attenuation is <i>not necessary</i> to protect GPS, and we propose that level of protection only to expedite the proceeding.</p>
<p><i>The wireless companies allege:</i> The XtremeSpectrum proposal to protect GPS by 35 dB leaves PCS "unprotected."⁶</p>	<p><i>XtremeSpectrum responds:</i> We have shown that the NPRM proposal for 12 dB attenuation is adequate to protect PCS.</p>
<p><i>The wireless companies allege:</i> The intrinsic noise due to other PCS users [at 10,000 times higher permitted power than UWB] is budgeted for in the PCS system design, but UWB devices will "eat into the system margin and render the system non-operative as designed."⁷</p>	<p><i>XtremeSpectrum responds:</i> We do not find this statement technically credible, considering the relative powers involved (and also the fact that digital devices do not render PCS non-operative, despite much higher permitted power than UWB).</p>

³ January 22 Letter at 2-3.

⁴ January 17 Letter at 4.

⁵ January 17 Letter at 5; see also January 17 Letter at 3 n.5, January 22 Letter at 1.

⁶ January 17 Letter at 5; see also January 17 Letter at 3 n.5, January 22 Letter at 1.

⁷ January 22 Letter at 7.

<p><i>The wireless companies allege:</i> Interference is predicted from multiple UWB devices transmitting simultaneously within a few meters of a PCS handset.⁸</p>	<p><i>XtremeSpectrum responds:</i> (1) The wireless companies' filings successively increase the density of operating UWB devices. (2) Multiple UWB devices within a few meters share a common radio channel and <i>cannot transmit simultaneously</i>. (3) The wireless companies' calculations continue to ignore non-UWB effects on the noise floor, compared to which UWB effects are negligible.</p>
<p><i>The wireless companies allege:</i> Aggregation of UWB emissions will raise the noise floor.⁹</p>	<p><i>XtremeSpectrum responds:</i> The "aggregation" from 100,000 UWB indoor simultaneous emitters 100 meters away from a PCS handset would amount to less than 1% of the signal from a single emitter at 3 meters. At 200 meters away, the same 1% "aggregation" would require 1.7 million operating emitters.¹⁰ In short, there is no harmful aggregation.</p>
<p><i>The wireless companies allege:</i> "Speculation [about aggregation] is no substitute for empirical study."¹¹</p>	<p><i>XtremeSpectrum responds:</i> We agree. No empirical study in the docket (or any other we know of) shows harmful aggregation. This is fully consistent with our analysis showing that harmful aggregation does not occur.</p>
<p><i>The wireless companies allege:</i> "The record shows that the aggregation of UWB devices will exacerbate the harmful interference to existing services"¹²</p>	<p><i>XtremeSpectrum responds:</i> There is no such showing in the record (and the wireless companies do not cite any).¹³ Again, this is consistent with our analysis showing that harmful aggregation does not occur.</p>

⁸ January 17 Letter at 5 (2 UWB devices within 1 meter); January 22 Letter at 5 (same), 8-9 (4 UWB devices within 2 meters).

⁹ January 17 Letter at 6.

¹⁰ For details, see our ex parte filing of Jan. 3, 2002, at 3 n.4.

¹¹ January 17 Letter at 6.

¹² January 17 Letter at 6.

¹³ There is an NTIA *simulation* (not an actual experiment) that erroneously predicted aggregation. That outcome resulted solely from a manipulation of assumptions. For details, see our ex parte filing of Jan. 3, 2002, at 8.

<p><i>The wireless companies allege:</i> XtremeSpectrum's proposal to restrict UWB to indoors will not solve PCS interference problems.¹⁴</p>	<p><i>XtremeSpectrum responds:</i> Our proposal for indoor-only operation (since amended; see attached Appendix) has nothing to do with PCS. We long ago made clear that this proposal was intended to protect outdoor receivers, such as certain radar systems.¹⁵</p>
<p><i>The wireless companies allege:</i> Assistant Secretary of Defense John Stenbit believes UWB emissions below 4.2 GHz will cause harmful interference.¹⁶</p>	<p><i>XtremeSpectrum responds:</i> We have proposed a workable solution consistent with the Assistant Secretary's position: rules that would eliminate intentional, in-band UWB emissions below 4.2 GHz, for peer-to-peer operation.¹⁷</p>
<p><i>The wireless companies allege:</i> The Commission should bar UWB below 6 GHz, to protect critical aviation systems.¹⁸</p>	<p><i>XtremeSpectrum responds:</i> The Commission should consider the wireless companies' concerns about interference into their own bands (and it has done so). Other spectrum users can speak for themselves. But XtremeSpectrum has proposed rules that fully protect all safety-of-life and navigation systems.</p>
<p><i>The wireless companies allege:</i> XtremeSpectrum says, "Trust us."¹⁹</p>	<p><i>XtremeSpectrum responds:</i> XtremeSpectrum says, "Adopt emissions limits that fully protect PCS." (But market forces require is to protect PCS anyway, because some of our customers will manufacture devices that have both PCS and UWB capability.)</p>

¹⁴ January 17 Letter at 6. XtremeSpectrum has also proposed allowing peer-to-peer operation, which can occur outdoors, but at far lower emissions limits. See the Appendix; see also our ex parte filing of November 29, 2001.

¹⁵ See "Detailed Technical Analysis of Systems Studied in NTIA Reports," *filed with* Letter from Mitchell Lazarus to Magalie Salas, Secretary, FCC (filed Nov. 14, 2001); *Reply Comments of XtremeSpectrum, Inc.* and attached "XtremeSpectrum, Inc. Technical Statement on NTIA Report" (filed March 12, 2001). We also reiterated this matter in our recent ex parte filing of Jan. 3, 2002, at 11-12.

¹⁶ January 22 Letter at 2.

¹⁷ See the Appendix; see also our ex parte filing of November 29, 2001.

¹⁸ January 17 Letter at 2; January 22 Letter at 4.

¹⁹ January 22 Letter at 3-4.

APPENDIX -- Proposed Rule Text

15. ___ Protection of other services.

(a) An ultra-wideband communications device may not be mounted on an outdoor surface or support.

(b)(I) Under no circumstances may the emissions from an ultra-wideband communications device exceed these limits:

Frequency (MHz)	Field strength (microvolts/meter)	<i>[NOTE IN DRAFT]</i>
960-1574.92	125	<i>[Class B - 12 dB]</i>
1574.92-1575.92	45	<i>[Class B - 21 dB]</i>
1575.92-1990	125	<i>[Class B - 12 dB]</i>
above 1990	500	<i>[Class B]</i>

(ii) In the table above, the measurement distance is 3 meters. The tighter limit applies at band edges. Measurements shall be performed using a resolution bandwidth of 1 MHz.

(iii) In addition to the provisions of paragraph (b)(I), emissions limits in the band 1574.92-1575.92 MHz measured using a resolution bandwidth of 10 kHz shall not exceed 15 microvolts/meter measured at 3 meters. *[NOTE IN DRAFT: This represents a 10 dB additional attenuation for spectral lines in the GPS band.]*

©) The provisions of this subsection apply to a battery-powered ultra-wideband device in communication with another battery-powered ultra-wideband device.

(I) The following emissions limits apply in lieu of those set out in section (b):

Frequency (MHz)	Field strength (microvolts/meter)	<i>[NOTE IN DRAFT]</i>
960-1610	10	<i>[Class B - 34 dB]</i>
1610-3100	80	<i>[Class B - 16 dB]</i>
3100-4200	160	<i>[Class B - 10 dB]</i>
above 4200	500	<i>[Class B]</i>

(ii) A battery-powered ultra-wideband device must be designed so that it cannot commence communicating with another battery-powered ultra-wideband device unless the user affirmatively initiates the transmission, as by pressing a button.

(iii) As an alternative to compliance with paragraphs (I) and (ii), a battery-powered ultra-wideband device can be made incapable of communicating with another battery-powered ultra-wideband device outdoors.

[NOTE IN DRAFT: The last provision allows "full power" peer-to-peer operation where the device can establish it is indoors -- e.g., by detecting a nearby AC-powered unit.]