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October 22, 2001

Julius P. Knapp, Deputy Chief
Office of Engineering and Technology
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 Julie:

On behalf of XtremeSpectrum, Inc.,¹ I am writing to follow up on our October 11 discussions concerning certain aspects of the ultra-wideband (UWB) rulemaking.²

SUMMARY

We understand that OET is evaluating a ban on peer-to-peer UWB communications as one possible means of enforcing indoor-only operation. OET should summarily reject that idea. Banning peer-to-peer operations is unnecessary to prevent interference from UWB devices, and would eliminate many of the most useful and attractive UWB consumer applications. Such a ban would have a major negative impact on the UWB communications market, with no concomitant benefit.

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.

² See also Letter from Mitchell Lazarus, Counsel for XtremeSpectrum, Inc., to Magalie Salas, Secretary, FCC (Oct. 12, 2001).

BACKGROUND

The ostensible purpose of a peer-to-peer ban would be to enforce indoor-only operation of UWB communications devices

XtremeSpectrum was the first party to propose an indoor-only restriction.³ Because most potential victim receivers are outdoors, we reasoned that indoor operation would diminish the potential for interference by the attenuation of an exterior building wall. The idea is not original: Section 15.407(e) of the Commission's Rules confines certain unlicensed U-NII transmitters to indoor operation, so as to protect outdoor MSS receivers.

Our analysis shows that 9 dB of building attenuation resolves most interference cases. We used the 9 dB value because NTIA suggested it in their filings with the Commission.⁴ The NTIA report filed with the Commission agrees that building losses should be taken into account.⁵ Nevertheless, NTIA's analysis ultimately declined to consider *any* building attenuation. In effect, NTIA is proceeding as though all UWB communications will be conducted outdoors.

Concurrent discussions with you and your staff included mention of a ban on outdoor infrastructure -- no UWB antennas on poles or building exteriors -- as a possible alternative to indoor-only operation. XtremeSpectrum raised no objection.

Although a ban on outdoor infrastructure still allows for casual outdoor use at street level -- such as diners at a sidewalk café using their PDAs to exchange business card information -- it is difficult to develop plausible scenarios in which such use causes harmful interference. To

³ Reply Comments of XtremeSpectrum, Inc. at 5 (filed Oct. 27, 2000).

⁴ NTIA Special Publication No. 01-43 at para. 5.6.3 (Jan. 2001). NTIA proposed the following values for typical building loss:

960-3000 MHz:	9 dB
3000-5650 MHz:	12 dB
5650-7250 MHz:	14 dB

XtremeSpectrum conservatively adopted the 9 dB value across the spectrum.

⁵ "If restrictions were placed on the use of UWB devices in certain frequency bands to indoor use only, it is reasonable to include the additional propagation losses that would be encountered as a result of the signal penetration through the wall of buildings." NTIA Special Publication No. 01-43 at para. 5.6.3 (Jan. 2001).

eliminate even the implausible cases, XtremeSpectrum has agreed to stringent GPS-band limits that will eliminate GPS interference even at extremely short distances.⁶

OBJECTIONS TO PEER-TO-PEER RESTRICTIONS

The only possible purpose for favoring a peer-to-peer ban, over a ban on outdoor infrastructure, is to eliminate occasional use outdoors at street level. We show here that such use is not an interference threat. Equally important, *the measures necessary to implement a peer-to-peer ban would cut down on use indoors much more than outdoors*, and would deeply impact the usefulness of UWB communications devices.

As we understand it, a peer-to-peer ban would require that a mobile device communicate only with an access point, not another mobile device. Access points would be defined so as to functionally limit them to indoors -- for example, by requiring that they be powered by wall current, rather than batteries. This measure would all but eliminate operation of mobile devices outside a building.

The proposal is unnecessary because the activity it seeks to eliminate -- occasional outdoor use at ground level -- is not an interference threat. Any such use is necessarily limited to about 1 meter above the street. UWB propagation is extremely poor under those conditions, because it is effectively blocked by buildings, cars, and other ground-level clutter. Moreover, under the proposed rules, the interference from UWB can never be greater than the "unintentional" radio noise permitted from laptops, Palm organizers, etc. In fact, the lack of interference from outdoor use of those devices is persuasive evidence that UWB will likewise be safe. The peer-to-peer proposal would thus serve no useful purpose.

The proposal would, however, eliminate much of the utility of UWB communications.

UWB devices will be factory-installed in other equipment. Consumer products likely to incorporate UWB include computers, laptops, Palm-type organizers, TV sets, cable set-top boxes, video games, VCRs and DVD players, CD and MP3 players . . . basically, any device that runs on information. The same UWB design can interconnect all such products wirelessly at high data speed (100 Mbps), very low cost, and very low battery drain. *No other available technology can fill this need.*⁷

⁶ Letter from Mitchell Lazarus, Counsel for XtremeSpectrum, Inc., to Magalie Salas, Secretary, Federal Communications Commission (Sept. 10, 2001).

⁷ For example, Bluetooth offers low cost and low battery drain, but its 1 Mbps speed cannot support video. IEEE 1394 (Firewire) has the necessary speed, but requires a direct cable

A ban on peer-to-peer applications would require manufacturers to install different configurations of UWB devices in different consumer products, so as to prevent certain pairs from interoperating. The additional complication to the fabrication process would dissuade many manufacturers.

Moreover, manufacturers would not accept the consumer frustration certain to result from obvious and attractive UWB applications being unavailable. A ban on peer-to-peer operations would cause these attempts (and countless others) to fail:

- synchronizing a PDA (such as a Palm organizer) with a laptop;
- downloading a digital camera to a laptop or PDA for editing or viewing;
- projecting a PowerPoint presentation from a laptop;
- exchanging music files among MP3 players;
- printing from a laptop to a portable printer; and
- even exchanging business card information between PDAs.

Consumers would find such restrictions completely arbitrary. Neither manufacturers nor consumers would accept them.

In short, a peer-to-peer ban would seriously detract from the promise of UWB devices, while serving no useful propose

REGULATORY ALTERNATIVES

XtremeSpectrum proposes the following alternatives to a peer-to-peer ban.

Option 1: Ban outdoor infrastructure. XtremeSpectrum continues to believe that a ban on outdoor infrastructure is the simplest, easiest-to-enforce means of preventing harmful interference from outdoor operation. The most serious UWB interference cases cited by NTIA all postulated an outdoor UWB emitter 30 meters off the ground. An infrastructure ban will eliminate any such cases. Whatever occasional outdoor use remains will necessarily be limited

connection. IEEE 802.11b (WiFi) and HomeRF entail equipment costs and battery drain that are too high for typical consumer devices.

to about 1 meter above street level. As noted above, UWB propagation is so poor under those conditions that harmful interference is not a realistic possibility

Option 2: Set emissions limits that protect against outdoor use. If the Commission concludes that occasional street-level use threatens harmful interference, it should simply set UWB emissions limits low enough to protect against that eventuality. XtremeSpectrum has shown that 9 dB of building attenuation goes a long way toward resolving all of the interference cases cited by NTIA.⁸ The Commission could thus limit UWB communications devices to 9 dB below Section 15.209(a) levels, at frequencies below 3.1 GHz. Although XtremeSpectrum still believes such stringent levels are unnecessary, we will not oppose them.

XtremeSpectrum also reiterates its proposal to hold emissions at frequencies below 2 GHz to 12 dB below Section 15.209(a), and at frequencies below 1.6 GHz to 18 dB below Section 15.209(a).⁹ Finally, XtremeSpectrum stands by its commitment not to oppose a GPS-band limit at 35 dB below Section 15.209(a), plus another 10 dB suppression of spectral lines in the GPS band.¹⁰

Option 3: Provide regulatory choices. XtremeSpectrum has consistently favored rules that promote innovation and competition by accommodating the broadest possible range of technologies consistent with protecting other users. In that spirit, if the Commission deems a peer-to-peer ban to be essential, under emissions limits based on those in the NPRM, then we suggest that the Commission offer manufacturers the alternative of permitting peer-to-peer operations under the stricter emissions limits set out in Option 2, above. Either of these alternatives will fully protect other users

CONCLUSION

XtremeSpectrum agrees the Commission must adopt UWB rules that protect other services against harmful interference. In doing so, it may have to regulate outdoor operation. The Commission can best achieve that goal with a ban on outdoor infrastructure or, alternatively, with emissions limits low enough to eliminate any risk of interference from outdoor operations.

⁸ See *Reply Comments of XtremeSpectrum, Inc.* (filed March 12, 2001). Other factors that XtremeSpectrum addressed in re-analyzing the NTIA results include the applicable standard for harmful interference, outdoor propagation effects, and plausible receiver geometries.

⁹ *Reply Comments of XtremeSpectrum, Inc.* at 4 (filed Oct. 27, 2000).

¹⁰ Letter from Mitchell Lazarus, Counsel for XtremeSpectrum, Inc., to Magalie Salas, Secretary, Federal Communications Commission (Sept. 10, 2001).

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A ban on peer-to-peer operations is both unnecessary and harmful. It is unnecessary because the only activity it prevents, compared to a ban on outdoor infrastructure, is casual outdoor use at street level, where the propagation is so poor that the risk of interference is all but nonexistent. A peer-to-peer ban would be harmful because it would eliminate far more usage indoors than outdoors. It would deny consumers many of the most attractive applications of UWB, and would impose on manufacturers the unacceptable burden of configuring UWB devices differently for different consumer products.

In short, a peer-to-peer ban offers no net regulatory advantage, and should receive no further consideration.

* * * *

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.

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

Respectfully submitted,

Mitchell Lazarus
Counsel for XtremeSpectrum, Inc.

cc: (by email)
Chairman Michael Powell
Commissioner Kathleen Q. Abernathy
Commissioner Michael J. Copps
Commissioner Kevin J. Martin
Bruce Franca, Acting Chief, OET
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