

**Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554**

In the Matter of)	
)	
Revision of Part 15 of the Commission's)	ET Docket 98-153
Rules Regarding Ultra-Wideband)	
Transmission Systems;)	
Test Data Submitted By The NTIA Regarding)	
Potential Interference From Ultra-Wideband)	
Transmission Systems)	

COMMENTS OF AT&T WIRELESS SERVICES, INC.

Pursuant to the Commission's January 24, 2001 Public Notice, AT&T Wireless Services, Inc. ("AT&T") hereby submits its comments in the above-captioned proceeding on the National Telecommunications and Information Administration's ("NTIA's") test data regarding potential interference from Ultra-Wideband ("UWB") transmission systems and devices.^{1/} AT&T commends NTIA for the work it has done in this regard. NTIA's tests confirm the need for the Commission to refrain from adopting rules for UWB devices or permitting their more widespread deployment until more is known about the harm this technology could cause to existing operations.

DISCUSSION

AT&T has reviewed NTIA's test methodology and results, and agrees with and supports NTIA's conclusion that UWB devices pose a potentially serious interference problem to existing services. While NTIA found that "operation of UWB devices is feasible in portions of the spectrum between 3.1 and 5.650 GHz," it emphasized that "[o]perations of UWB devices below

^{1/} Public Notice, Comments Requested on Test Data Submitted by the National Telecommunications and Information Administration Regarding Potential Interference from Ultra-Wideband Transmission Systems, ET Docket No. 98-153, DA 01-171 (rel. Jan. 24, 2001).

3.1 GHz will be quite challenging.”^{2/} Based on NTIA’s findings and the need for further research into other incumbent systems, including GPS and commercial radio systems, AT&T urges the Commission not to establish new rules to govern UWB operations until the relevant technical issues have been resolved.

NTIA’s tests focused solely on harmful interference from UWB devices to government communications and radar systems; they did not analyze the potential for interference to commercial radio systems. Nonetheless, AT&T believes that the results of NTIA’s tests are indicative of the types of interference that other, non-government systems could expect to receive. Although commercial operations have different operating parameters than the government systems tested, the potential for interference to commercial systems is still great.

In particular, commercial radio’s ubiquitous nature significantly increases its susceptibility to interference. Most of the government systems tested operate with a limited number of fixed sites. Coordination between those sites and UWB devices can thus be accomplished through use of appropriate separation distances. Commercial systems -- both mobile and fixed -- on the other hand, are universal. There currently are more than 100 million commercial radio users in the United States. Combining the ubiquity of commercial operations with the unlicensed, portable nature of UWB devices does not lend itself to a coordination approach based on separation distance.

In addition, the mobility of commercial mobile radio services (“CMRS”) essentially precludes maintaining a separation distance from a portable UWB device that is designed to be used anywhere. Neither the CMRS nor the UWB user would be able to tell where the other’s device was operating from moment to moment. Many of the proposed uses for UWB -- in cars

^{2/} NTIA Special Publication 01-43, “Assessment of Compatibility Between Ultrawideband Devices and Selected Federal Systems,” (January 2001) (“NTIA 1-43”) at x.

(for forward-looking or lane change collision avoidance systems, backup warning systems, sensors that detect bumps in the road and adjust suspension systems); in the home (as intrusion detection systems or child-proof safety heaters); or at construction sites (to determine the location of underground utilities, pipes or structures)^{3/} -- occur at the very places where people are likely to be using their wireless phones, all at a proximity of significantly less than 200 meters. Since UWB devices can “see through” walls, persons using them in buildings could potentially affect every person walking or driving past.^{4/} NTIA’s conclusion, therefore, that there are “mitigating factors that could relax restrictions on operation of UWB devices below 3.1 GHz” would not necessarily apply to CMRS systems.^{5/} In evaluating UWB interference, the Commission should take into account potential close-range interference, as well as the medium and long-range results reported by NTIA.^{6/}

The foregoing scenario is particularly troublesome because NTIA’s test models are not reliable at ranges of less than 200 meters. This may be sufficient for NTIA’s purposes because government users generally can ensure that their fixed systems are a sufficient distance from UWB devices to minimize interference, but such a limitation is critical in the analysis of potential interference to CMRS systems, which routinely operate at distances of only a few meters. Clearly, more sensitive testing methodologies must be used to determine the extent that

^{3/} See In the Matter of Revision of Part 15 of the Commission’s Rules Regarding Ultra-Wideband Transmission Systems, Notice of Proposed Rulemaking (rel. May 11, 2000) (“NPRM”) ¶¶ 10-11.

^{4/} Indeed, mobile handsets are very widely used by construction workers, which would result in the distance between CMRS and UWB devices being virtually non-existent in some cases.

^{5/} NTIA 1-43 at xi.

^{6/} UWB devices may also cause interference to U-NII operations at 5.6 GHz. See In the Matter of Revision of Part 15 of the Commission’s Rules Regarding Ultra-Wideband Transmission Systems (“NPRM Comments”), Comments of AT&T Wireless at 8 (filed Sept. 12, 2000); NPRM Reply Comments of AT&T Wireless at 5 (filed Oct. 27, 2000). Accordingly, the Commission should not approve UWB devices that operate at those frequencies absent further testing.

UWB devices may interfere with CMRS and other commercial systems, and the results of such tests must be carefully analyzed before the Commission can promulgate rules applicable to such devices.

NTIA's test results also contradict the Commission's previous conclusion that the aggregate effect of UWB devices "appear to be negligible."^{7/} In fact, NTIA demonstrates plainly that "aggregate UWB interference can be a significant factor to receiving systems"^{8/} because "[b]oth theory and measurements support the view that the average (RMS) power emitted by UWB devices, both total power as well as average power contained within a narrow bandwidth, is linearly additive in a receiver."^{9/} The five different aggregate modeling approaches used by NTIA yielded "nearly identical results" in this regard.^{10/} As to "[o]ther published studies which claim that aggregate UWB interference can never exceed that from a single UWB emitter," NTIA explains that such studies "typically used an unrealistic very close-in reference distance for the single UWB emitter, thus leading to misleading conclusions."^{11/} NTIA's test results also are supported by prior findings that cumulative UWB use could significantly harm existing services in the GPS band,^{12/} the PCS band,^{13/} the Amateur Radio Service band,^{14/} and the Mobile Satellite Service band.^{15/}

^{7/} See NPRM ¶ 47.

^{8/} NTIA 1-43 at x.

^{9/} Id. at 6-3.

^{10/} Id.

^{11/} Id. at 6-4.

^{12/} See NPRM Comments of GPS Industry Council at 34-35.

^{13/} See NPRM Comments of Nortel Networks at 3-4.

^{14/} See NPRM Comments of National Association for Amateur Radio at 13-14.

^{15/} See NPRM Comments of Rockwell Collins.

This possibility of UWB aggregate interference poses a real-world problem; as NTIA observes:

It has been suggested by many UWB proponents that this technology could lead to widespread use with potentially high emitter densities. In highly populated areas, one might envision that hundreds, thousands or even more of these devices might be employed per square kilometer.^{16/}

Given the Commission's and the UWB industry's goals of making UWB devices available on a mass-market basis, more in-depth testing and analysis must be conducted to determine the effects of aggregate interference on communications systems before rules are proposed and devices made available. Once the devices are approved and used widely in consumer applications, it would be too late to correct what are likely to be very serious problems caused by interference. In particular, additional studies must be undertaken to explore the potential mitigation factors that might affect aggregate interference levels.

Finally, the NTIA tests, which confirm that UWB devices are likely to cause harmful interference to certain existing radio applications and services, do not even address the potentially larger issue of interference to Global Positioning Systems ("GPS"). As the Commission observes, NTIA has indicated that it intends to submit a report in the near future concerning UWB interference to GPS.^{17/} Other parties, including the United States Department of Transportation, Stanford University, the Ultrawideband Consortium, and other private parties, are also testing the effects of UWB interference in the GPS band.^{18/} Because it is openly acknowledged that UWB devices are likely to cause interference to GPS,^{19/} it is premature to consider approving UWB devices until such time as their effect on GPS is known.

^{16/} NTIA 1-43 at 5-2.

^{17/} See Public Notice at 1.

^{18/} See NPRM Reply Comments of AT&T Wireless Services, Inc. at 2.

^{19/} See NPRM ¶ 23 (noting the "particular concerns about potential interference to GPS operating in the frequency band 1559-1610 MHz").

CONCLUSION

AT&T continues to believe that UWB technology holds great promise and may significantly benefit consumers through innovative new services. NTIA's first round of tests, however, has established that there is a very real concern regarding UWB interference to existing services. AT&T urges the Commission to take note of this potential for interference and the need for further studies before adopting any rules regarding ubiquitously deployed UWB devices.

Respectfully submitted,

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CERTIFICATE OF SERVICE

I, Margo Adams, hereby certify that on this 23rd day of February, 2001, a copy of the foregoing "Comments of AT&T Wireless Services, Inc." was hand delivered to the following:

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