

BEFORE THE  
**Federal Communications Commission**  
WASHINGTON, D.C. 20554

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

To: The Commission

**REPLY COMMENTS OF THE U.S. GPS INDUSTRY COUNCIL  
ON TEST DATA REGARDING POTENTIAL INTERFERENCE  
FROM ULTRA-WIDEBAND TRANSMISSION SYSTEMS**

The U.S. GPS Industry Council (“the Council”), by its attorneys and pursuant to a Commission Public Notice,<sup>1</sup> hereby submits these Reply Comments in response to the comments that were made on several studies of the interference potential of ultra-wideband transmission systems into existing radio services, including the National Telecommunications and Information Administration’s (“NTIA”) Special Publication entitled, “*Assessment of Compatibility between Ultrawideband (“UWB”) Systems and Global Positioning System (“GPS”) Receivers.*”<sup>2</sup>

In its Comments, the Council noted that the NTIA Report confirmed beyond any doubt that “*there is no single class of UWB emitter tested that uniformly performed at levels that meet the Part 15 emission limits, nor is there any single category of GPS receiver, that has been shown to be immune from UWB emissions.*”<sup>3</sup> The Council went on to show that with the results reported by NTIA, there is no basis upon which the Commission can adopt any rule that permits UWB devices (i) to be operated on an unlicensed basis in any frequency band; or (ii) to be operated on

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<sup>1</sup> Report No. DA 01-753, *Comments Requested on Reports Addressing Interference from Ultra-Wideband Transmission Systems (ET Docket No. 98-153)* (released March 23, 2001) (“Public Notice”).

<sup>2</sup> NTIA Special Publication 01-45, *Assessment of Compatibility between Ultrawideband (“UWB”) Systems and Global Positioning System (“GPS”) Receivers*, David S. Anderson, et al. (February 2001) (“NTIA Report”).

<sup>3</sup> Comments of the U.S. GPS Industry Council on NTIA Report, et al., ET Docket No. 98-153, at 8 (filed April 25, 2001) (“Council Comments”) (emphasis in original).

any basis within the bands 1164-1610 MHz that are allocated to RNSS and used by GPS.<sup>4</sup> The Council concluded that the Commission absolutely must issue a Further Notice of Proposed Rule Making (FNPRM) before adopting any specific rules – other, perhaps, than a rule that excludes the unlicensed operation of UWB devices and restricts further inquiries into UWB to bands above 3.1 GHz, excluding bands restricted for safety-of-life uses. It argued that such an approach is necessary to ensure that all interested parties have a reasonable opportunity to comment upon any rules the Commission may wish to establish based on the record developed to date, and that all services, operational and planned, are provided the regulatory certainty they need to meaningfully assess the applicable technical and business risks.

The vast majority of the commenters responding to the Public Notice expressed views that echoed the concerns and/or solutions advanced by the Council. For example, Motorola, Inc. states that: “[i]t is clear, however, from the record of this proceeding that UWB has the potential to interfere with a wide variety of radio services, ...[and it] would be inappropriate for the Commission to act to adopt regulations for UWB until such time as the impact of UWB deployment is fully understood.”<sup>5</sup> Nokia, Inc. and Sprint Corporation separately call for the preclusion of UWB devices in bands below 3.1 GHz.<sup>6</sup> The National Association for Amateur Radio, Lockheed Martin Corporation, Sirius Satellite Radio, Inc. and Aeronautical Radio, Inc./Air Transport Association of America, Inc. all observe that harmful interference will be caused to GPS and other services, and that additional studies and/or regulatory limitations are needed to determine the extent, if any, to which UWB devices may be considered for some kind of limited or

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<sup>4</sup> *Id.* NTIA itself admonished against generalization of its test results by stating that “these results are applicable only to those UWB signal permutations examined within this study and to those applications of GPS that are defined by the operational scenarios presented for consideration herein.” NTIA Report at xxi.

<sup>5</sup> Comments of Motorola, Inc., ET Docket No. 98-153, at 7 (filed April 25, 2001).

<sup>6</sup> Comments of Nokia, Inc., ET Docket No. 98-153, at 1 (filed April 25, 2001); Comments of Sprint Corporation, ET Docket No. 98-153, at 7 (filed April 25, 2001).

category-by-category deployment.<sup>7</sup> These are compelling comments, and they generally reflect (as did the Council's Comments) as open a mind toward proponents of UWB as is possible in the face of hard and rationally irrefutable evidence that UWB transmission systems pose an extreme threat to the operations of the commenters' systems and services.

On the other side of the issue are two commenters that engage in strained and often internally inconsistent attempts to diminish the NTIA Report and other studies that show conclusively that UWB transmission systems will, in every GPS application and scenario examined, cause GPS receivers either to lose lock of the first satellite or be impaired on reacquisition.<sup>8</sup> By relying on generally unintelligible assertions that the interference it causes is somehow not "harmful," and that the findings made by NTIA were somehow built upon incorrect assumptions, Time Domain in particular fails to advance its losing cause. Its attempt to parse the definition of harmful interference is particularly unavailing, as this rulemaking proceeding is most definitely not about finding a sharing solution in a situation where two services are incentivized to arrive at a mutually agreeable solution. Instead, this is a proceeding where Time Domain and other UWB proponents have the sole and absolute burden of demonstrating that their use of the bands occupied by GPS and other existing radio services will be transparent to the current occupants. Time Domain and XtremeSpectrum, Inc. have both lost sight of this critical fact, and both have failed in meeting their burdens.

Time Domain is also wrong when it asserts that the studies examining the possible interaction of GPS and UWB signals show that UWB devices employing random pulse position

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<sup>7</sup> Comments of ARRL, The National Association for Amateur Radio, ET Docket No. 98-153, at 1, 4 (filed April 25, 2001) (ARRL also proposes limiting UWB to bands above 6 GHz and for specific definitional and operating rules that are subject to prior notice and comment); Comments of Lockheed Martin Corporation, ET Docket No. 98-153, at 5 (filed April 25, 2001); Comments of Sirius Satellite Radio, Inc., ET Docket No. 98-153, at 14 (filed April 25, 2001); Comments of Aeronautical Radio, Inc. and The Air Transport Association of America, Inc., ET Docket No. 98-153, at 15-16 (filed April 25, 2001).

<sup>8</sup> This level of interference qualifies as "harmful" under any interpretation of that term.

modulation appear in the passband of a GPS receiver as white noise, and thus can be authorized at the general limits set forth in Part 15 of the Commission's Rules without jeopardizing GPS services.<sup>9</sup> The NTIA Report shows exactly the opposite. Fully 88% of the test cases examined by NTIA indicate that GPS receivers suffer harmful interference at UWB transmission system power levels below the Part 15 limit of  $-71.3$  dBW/MHz. Moreover, Time Domain's assertion that UWB signals are white-noise like is false, and is based on a series of unscientific normalizing assumptions that are intended to obscure the impact of UWB on more vulnerable GPS receivers.

The data compiled by NTIA and the other objective testing bodies speaks for itself – and it speaks volumes. The errors in the UWB proponents' interpretation of the NTIA Report are both plentiful and serious. The bottom line is that even with incomplete studies that address only a fraction of the cases necessary for a generalized rulemaking determination to be made, the data objectively collected and analyzed shows interference levels into GPS that cannot be ignored or explained away.

## **CONCLUSION**

The test results objectively produced by NTIA demonstrate unequivocally that there is no GPS application that appears to be immune from UWB interference, and there is no class of UWB emitter that appears to be universally benign in its interference impact. These views are echoed by comments filed by a broad cross-section of operators of existing radio services, and are disputed only by a pair of completely unobjective UWB proponents. For the reasons stated in its April 25

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<sup>9</sup> See, e.g., Comments of Time Domain Corporation, ET Docket No. 98-153, at ii, 10 (filed April 25, 2001).

Comments, and as supplemented above, the Council urges the Commission to preclude any UWB device from operating in a frequency band below 3.1 GHz, and to prohibit operation of any UWB devices (licensed or unlicensed) in bands above 3.1 GHz that are restricted for safety-of-life use.

Respectfully submitted,

THE U.S. GPS INDUSTRY COUNCIL

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