

Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C.

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

SUPPLEMENTAL COMMENTS OF SIRIUS SATELLITE RADIO INC.

Sirius Satellite Radio Inc. ("*Sirius*") hereby submits the following comments in response to the Commission's January 24, 2001 Public Notice¹ that requested comment on the test data submitted by the National Telecommunications and Information Administration in the above-captioned docket.

At the outset, Sirius lauds NTIA's substantial efforts in conducting its testing program and in preparing the detailed reports that are now a part of the Commission's record in this proceeding. The testing results produced by NTIA provide the Commission significant and important data in evaluating the interference impacts that UWB devices can have on licensed users of the spectrum. In this regard, Sirius has reviewed NTIA's testing results with considerable interest because Sirius's objections to the Commission's proposals in the NPRM in this proceeding are based solely on concerns about interference to Sirius' licensed system, not on the desire to delay potential UWB competitors in the marketplace. As Sirius has stated before,

¹ *Comments Requested on Test Data Submitted by the National Telecommunications and Information Administration Regarding Potential Interference from Ultra-Wideband Transmission Systems*, DA 01-171 (rel. January 24, 2001)

Sirius has no competitive stake in whether or not the Commission authorizes the use of UWB technology because UWB devices will not compete with Sirius' licensed service.

NTIA's testing results support and confirm the positions that Sirius took in its Comments and Reply Comments in this proceeding in several respects, including Sirius' view as to the proper approach for investigating the deployment of UWB technology. Sirius proposed a staged investigation that focuses, in each step, on specific classes of UWB applications as they develop and are capable of definitive description, that permits adequate time for thorough testing and that culminates in a licensing procedure for UWB applications with similar interference characteristics.²

The NTIA program fully tested only five UWB devices,³ and yet the devices in this small sample had characteristics that were different enough -- *e.g.* pulse repetition frequency -- to have differing interference impacts on the sample federal receivers that were tested.⁴ In view of the time constraints, it is understandable that NTIA only tested five devices, but, as a result, NTIA's tests really amount to a threshold inquiry rather than a comprehensive study of all existing or potential devices. However, the varying results from the small sample of devices do reinforce Sirius' argument that a one-size-fits-all rule will serve neither UWB proponents nor licensed spectrum users, and that the Commission would be better off separately considering classes of UWB devices with similar interference characteristics. This concept is further reinforced by the fact that only twenty UWB devices -- many of which were only prototype or

² See, *e.g.*, Reply Comments of Sirius Satellite Radio Inc. at 4, ET Docket 98-153 (filed October 27, 2000).

³ *The Temporal and Spectral Characteristics of Ultrawideband Signals*, at viii, 1-3, NTIA Report 01-383, William A. Kissick, Editor (January 2001) ("*ITS Report*").

⁴ See *Assessment of Compatibility Between Ultrawideband Devices and Selected Federal Systems*, at vii - viii, NTIA Special Publication 01-43 (January 2001) ("*OSM Report*").

experimental devices -- were available to NTIA to select from for their testing program. The twenty devices that were actually available contrast sharply with the myriad proposals discussed in the comments in this proceeding, the technical characteristics of which are essentially unknown.

The NTIA results also demonstrate that UWB devices are more likely to cause interference in a certain parts of the radiofrequency spectrum -- namely below 3.1 GHz -- and to cause interference to certain types of receivers. NTIA's conclusion that UWB operations are most feasible in the 3.1 GHz to 5.65 GHz band⁵ is fully consistent with Sirius' position on the cut-off for emissions from UWB devices. Sirius argued that the Commission should prohibit all UWB applications, with the possible exception ground-penetrating radars and wall-imaging devices, from radiating below at least 2.9 GHz. Sirius supports NTIA's position that the cut-off frequency should be 3.1 GHz. Sirius notes that the cut-off frequency should apply to all UWB emissions -- not just the fundamental emissions of the UWB device -- because the extremely wideband nature of the UWB emissions are such that the unwanted emissions may also cause interference to licensed spectrum users.

The NTIA results also demonstrate that UWB devices are more prone to cause interference to certain types of licensed receivers, especially those that use digital modulation, because of the high peak power of the UWB emission.⁶ In this regard, the NTIA results further confirm Sirius' concern about UWB interference into Sirius receivers. The Sirius system uses digital modulation and the Sirius receivers, which operate at 2.3 GHz, have unique technical characteristics and are extremely sensitive, wideband receivers. Also, the Sirius receivers operate in an omni-directional manner, which further increases the likelihood of interference

⁵ OSM Report at x.

from UWB devices. NTIA's testing results are not directly applicable to Sirius receivers because the FSS earth stations and SARSAT land user terminals that were tested by NTIA are sufficiently different from Sirius' receivers in their operating parameters. However, NTIA's findings show that there are legitimate interference concerns with respect to the satellite terminals that NTIA tested, especially when digital modulation is considered,⁷ and therefore the NTIA results in no way diminish Sirius' concerns about UWB interference into Sirius receivers. Indeed, Sirius supports NTIA's conclusion⁸ that further testing is necessary to determine the impact of UWB signal duty cycle on the performance of earth stations that utilize digital signal processing.

NTIA's results also confirm Sirius' view that aggregate interference impacts from multiple UWB devices are possible and that additional testing is required to further refine the record for the Commission on this issue. NTIA's testing shows that aggregate effects are possible or even likely when considering realistic assumptions.⁹ In addition, the NTIA studies do not investigate the cumulative effect on digitally modulated systems of multiple peak signal powers, which is a source of further concern to Sirius. As Sirius has suggested, the problem of aggregate interference argues strongly for a licensing approach to UWB deployment, rather than the unlicensed approach proposed by the Commission in the NPRM. The NTIA studies make clear that UWB deployment may need to be conditioned in a number of respects: by frequency band, by numerical density in any given geographic location, and by operating parameters, for example. Licensing of UWB devices is the only practical way for the Commission to impose

⁶ OSM Report at ix.

⁷ OSM Report at vii-ix.

⁸ OSM Report at 6-1.

⁹ OSM Report at x.

and enforce the differing operational conditions that may be required for the varying UWB applications.

Thus, in conclusion, Sirius lauds NTIA for its efforts, which represent a strong first step towards completing the testing regime that will be required for the Commission to fulfill its obligation to ensure that any UWB devices that the Commission authorizes do not interfere with licensed users of the spectrum. NTIA's results support in many respects the positions and concerns that Sirius and other licensed spectrum users have articulated in this proceeding, including the view that UWB emissions should not be permitted below 3.1 GHz. Sirius looks forward to a continued dialog with the Commission and UWB proponents on the conditions under which UWB devices can be deployed above 3.1 GHz.

Respectfully submitted,

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