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August 6, 2001

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Mr. John Reed  
Senior Engineer  
Technical Rules Branch  
Federal Communications Commission  
Room 7A-140  
445 Twelfth Street, S.W.  
Washington, D. C. 20554

Re: ET Docket No. 98-153

Dear Mr. Reed:

This letter responds to issues raised in the July 31, 2001 meeting held with you and your colleagues in the Office of Engineering and Technology on behalf of Mercedes-Benz USA, LLC ("MBUSA") and its parent company, DaimlerChrysler AG.

First, during the meeting you posed a question regarding the 24 GHz ultra-wideband (UWB) radars we plan to deploy to enhance automotive safety. You noted that one of the pulse durations that we mentioned would appear to result in a bandwidth that was less than the 1.5 GHz bandwidth contained in the proposed UWB definition, and you asked whether we were satisfied with the proposed definition. Our conclusion, after detailed consideration as described below, is that we are satisfied that the proposed definition is acceptable. <sup>1/</sup>

Mercedes-Benz believes that its automotive radars could potentially operate in at least two modes: one mode with pulse durations of 300 to 400 picoseconds, which would easily occupy more than 1.5 GHz, and a second mode with pulse durations of about 1.5 nanoseconds, which would

<sup>1/</sup> In addressing your question regarding the definition of UWB, we have consulted with M/A-COM, one vendor that will be supplying 24 GHz automotive radars, and have received their advice.

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appear to occupy only about 1.2 GHz. The second mode would be intended to cover longer distances, up to 30 meters. We understand that in this mode, additional modulation and signal processing methods would have to be employed to avoid self-interference, and would have the effect of broadening the occupied spectrum.

Mercedes-Benz understands that for these products, there is no simple and direct conversion between pulse duration or pulse repetition rate and occupied bandwidth, because additional modulation and/or signal processing methods will typically be employed. Consequently, it would not be appropriate to base a definition of UWB devices on pulse duration or pulse repetition rate. As these technologies mature, new techniques likely will be developed that could lead to changes in the definition of UWB. But for now, the Commission's proposal to define UWB devices as devices with fractional bandwidth greater than 0.25 or occupied bandwidth of 1.5 GHz or greater <sup>2/</sup> seems appropriate. <sup>3/</sup>

Second, during our meeting Mercedes-Benz emphasized that its ability to offer its safety applications at a reasonable price to U.S. consumers will depend on its ability to operate its 24 GHz UWB radars on an unlicensed basis. It pointed out that MBUSA sells approximately 250,000 automobiles a year, and that requiring licenses for all users of the radars would raise the costs associated with providing the safety applications significantly. On that issue, we note that in a July 16, 2001 submission the U.S. GPS Industry Council ("Council") recently proposed that the FCC permit unlicensed deployment of UWB devices in the 6-12 GHz band. <sup>4/</sup> We do not understand the Council's proposal, however, to suggest that unlicensed UWB operations should not occur in frequency bands higher than 12 GHz. To the contrary, we interpret the Council's proposal as focusing solely on UWB operations in the lower frequencies, and in no way relating to UWB operations at frequencies as high as 24 GHz. Indeed, throughout this proceeding the Council's focus

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<sup>2/</sup> Revision of Part 15 of the Commission's Rules Regarding Ultra-Wideband Transmission Systems, Notice of Proposed Rulemaking, FCC 00-163, ¶21 (May 11, 2000) ("NPRM").

<sup>3/</sup> Several other commenters also support the UWB definition proposed in the NPRM. See, e.g., Comments of Multispectral Solutions, Inc. at 13; Comments of Xtreme Spectrum at 8; Comments of Endress Hauser & Co. at 3; Comments of Zircon Corp. at 2; Comments of M/A-Com at 3.

<sup>4/</sup> Ex Parte Presentation of the GPS Industry Council (July 16, 2001).

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has been limited to frequencies lower than 6 GHz, rather than frequencies as high as 24 GHz.<sup>5/</sup> Moreover, as we discussed in our meeting, no commenters in this proceeding have raised concerns regarding harmful interference from UWB radars operating at 24 GHz.

Finally, I write to emphasize once more the need by Mercedes-Benz to operate its 24 GHz radars outdoors. Unlike the issues discussed with respect to UWB operations below 6 GHz,<sup>6/</sup> no one in this proceeding has indicated that a restriction on outdoor UWB use is needed for operations at 24 GHz.

Thank you for the opportunity to supplement the record in this proceeding.

Respectfully submitted,



Ari Q. Fitzgerald  
Counsel to MBUSA

cc: Magalie Roman Salas  
Bruce Franca  
Julius Knapp  
Karen Rackley  
Ronald Chase

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<sup>5/</sup> See id , Attachment p.3 (Proposed Note indicating reasons given for Council proposal to set lower end of frequency range proposed for unlicensed UWB operations at 6 GHz).

<sup>6/</sup> See, e.g., Ex Parte presentation of XtremeSpectrum (July 25, 2001) at 2.