

Before the
Federal Communications Commission
Washington DC 20554

In the Matter of)	
)	
Geophysical Survey Systems, Inc.,)	ET Docket No. 19-155
Request for Waiver of Part 15 of the)	
Commission's Rules to Market an Ultra-)	
Wideband Evaluation Kit)	

**REPLY COMMENT OF
GEOPHYSICAL SURVEY SYSTEMS, INC.**

Geophysical Survey Systems, Inc. (GSSI) replies to the comment filed by the GPS Innovation Alliance (GPSIA) on June 19, 2019.

A. INTRODUCTION

GSSI requested a waiver of the Commission's rules to permit the marketing of an evaluation kit for an ultra-wideband (UWB) ground penetrating radar (GPR) device solely for testing in autonomous vehicles. Mounted under the vehicle, the system looks down through the pavement and reads features of the roadbed beneath to help keep the vehicle in its correct lane. In place of conventional UWB short-pulse modulation, the device uses stepped continuous wave (CW) frequencies for improved performance in this application. The system complies in full with the GPR emission limits, when measured with the system in normal operation. Its interference potential is no higher than a compliant UWB system in the same frequency range. GSSI requested a waiver of specified GPR technical and eligibility rules to permit sale of the evaluation kit under marketing restrictions intended to minimize the risk of harmful interference to other spectrum users.

The Commission put the request on public notice on May 30, 2019.¹ GPSIA filed the only comment.

GPSIA does not oppose the waiver, although it impliedly reserves judgment, inasmuch as part of its filing requests additional information from GSSI. Another part proposes requirements for UWB waiver requests more generally. We take no position here on those latter issues, except as they apply to the present request.²

GPSIA's aim is to protect the integrity of GPS operations by limiting radio-frequency interference on GPS frequencies.³ GSSI wholeheartedly supports this goal. In addition to acknowledging the public interest in reliably functioning GPS, the autonomous vehicles that may ultimately use some version of GSSI's technology will depend also on GPS for safe operation. We are not in conflict with GPSIA, it being in GSSI's self-interest to further GPSIA's goals.

B. RESPONSE TO GPSIA

GPSIA asks GSSI for two kinds of data beyond that spelled out in the waiver request: the EIRP and out-of-band emissions up to 2 GHz; and the antenna patterns.⁴

1. GPS band emissions

GPSIA seeks the emissions data below 2 GHz to satisfy itself that the device will not emit excessive power in the GPS bands.⁵

¹ *Office of Engineering and Technology Seeks Comment on Geophysical Survey Systems, Inc. Request for Waiver of Certain Part 15 Ultra-Wideband (UWB) Rules*, ET Docket No. 19-155, Public Notice, DA 19-491 (released May 30, 2019).

² We trust the Commission will not change the procedures for waiver applications going forward without prior public notice and an opportunity to comment.

³ GPS Innovation Alliance at 2.

⁴ GPS Innovation Alliance at 4.

⁵ GPS Innovation Alliance at 4.

Our initial request assured the Commission that the evaluation kit will comply with all applicable Commission requirements, other than those we sought to have waived. This includes a commitment to comply with the GPS-band limits in Section 15.509(e).

If the product were intended for the general market, we could assure GPSIA that the Commission would enforce the GPS-band emissions limits through the certification process, and would publish GSSI's certification test report. We cannot say that here, because evaluation kits are not subject to certification. Instead, to address GPSIA's concerns, we will place in the docket the results of the same measurements we would take for certification, and will notify GPSIA when we do so. This is a courtesy on GSSI's part; it does not give GPSIA any say in the design or marketing of the device.

2. *Antenna pattern*

GPSIA requests, in addition, the system's antenna pattern.⁶ This is among the data it seeks for all UWB waivers, in the context of assessing how much power the GPS device will receive at the frequencies of interest.⁷ In the particular case of a GPR device, however, and assuming compliance with the GPS band emission limits, the details of the antenna pattern should not be relevant. The antenna pattern predicts the small fraction of RF energy that might radiate sideways from under the vehicle. Inasmuch as we will make public the actual measured emissions, the antenna pattern seems superfluous.

⁶ GPS Innovation Alliance at 7.

⁷ GPS Innovation Alliance at 7 (antenna pattern can be used to refine estimate of RF power at GPS receiver). The other requested data for all UWB waivers are EIRP, out-of-band emissions up to 2 GHz, transmit waveform, and operational orientation. *Id.* GSSI's initial request provided the transmit waveform and operational orientation, and committed to comply with the Commission's in-band EIRP and out-of-band limits.

CONCLUSION

GPSIA has not opposed the waiver request; and GSSI has offered to accommodate its request for additional information, albeit in a different form. GSSI asks the Commission to consider and grant the requested waiver.

Respectfully submitted,

A handwritten signature in black ink, appearing to read "Mitchell Lazarus". The signature is fluid and cursive, with the first name "Mitchell" and last name "Lazarus" clearly distinguishable.

Mitchell Lazarus
FLETCHER, HEALD & HILDRETH, P.L.C.
1300 North 17th Street, 11th Floor
Arlington, VA 22209
703-812-0440
Counsel for Geophysical Survey Systems, Inc.

July 5, 2019