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February 23, 2005

Ms. Marlene H. Dortch, Secretary
Federal Communications Commission
445 12th Street SW
Washington DC 20554

Re: ET Docket No. 04-374, Geophysical Survey Systems, Inc., Request for Waiver of Section 15.509(d) of the Commission's Rules
Ex Parte Communication

On behalf of Geophysical Survey Systems, Inc. (GSSI), pursuant to Section 1.1206(b)(1) of the Commission's Rules, I am electronically filing this written *ex parte* communication to amend the above-referenced waiver request, and to present further evidence in favor of a grant. Below, GSSI significantly reduces the emissions levels requested in the waiver.

INTRODUCTION

On October 13, 2004, GSSI requested a waiver of Section 15.509(d) as to the emissions limits applicable to non-contact horn-antenna ground penetrating radars (GPRs). GSSI proposed to comply instead with the emissions levels in Section 15.209, subject to all other UWB requirements, including Section 15.509(e) (on narrowband emissions in the GPS bands).

GSSI explained that non-contact GPRs are most often towed behind a vehicle to inspect transportation facilities such as roadways, bridges, rail beds, and airport runways. These devices offer the only practical way to identify subsurface defects in such facilities before they cause accidents. They unquestionably save lives.

The waiver is needed because the emissions limits in Section 15.509(d) effectively restrict the towing speed of a non-contact GPR to far below the highway speed limit. Operation of a compliant device thus entails the safety hazards and added cost of operating slow-moving vehicles on a high-speed roadway or on facilities shared with aircraft and railroad trains. The waivers will increase the working speed to highway speeds, so that towing vehicles can move with the traffic. This is far safer, less disruptive, and less expensive than low-speed operation,

and will facilitate inspections of busy rail and airport facilities, while maintaining an adequate image resolution to locate small defects in critical surfaces.

AMENDMENT TO WAIVER REQUEST

Following conversations with the National Telecommunications Information Administration (NTIA), GSSI has conducted additional research on its horn antennas, and has determined that it can reduce the emissions levels specified in its original waiver request.

The new proposed limits are as follows:

below 960 MHz:	Section 15.209 (unchanged)
960-2,000 MHz:	**–49.2 dBm EIRP**
above 2,000 MHz:	**–51.3 dBm EIRP (at or below GPR limits)**

In the critical region between 960 MHz and 2 GHz, GSSI proposes to reduce emissions levels under the waiver to approximately 8 dB below Section 15.209 levels, and above 2 GHz, to 10 dB below Section 15.209 levels, in compliance with the GPR limits in Section 15.509. Above 3.1 GHz, the proposed emissions are 10 dB below both Section 5.209 and the present GPR limits.

Attached is a plot comparing the present GPR limits, the Section 15.209 limit (labeled "Class B"), and the limits requested under the waiver.

GPS ISSUES

On January 10, in a meeting with Dennis Johnson of GSSI and me, Karl Nebbia of NTIA expressed concern about possible effects of the proposed waiver on interference into GPS receivers.

As the Commission knows, GPR devices have operated satisfactorily in close conjunction with GPS systems for many years. To confirm this compatibility, GSSI recently conducted tests using two very different GPS systems. One system is WAAS enabled and cost $130; the other system uses correction input from a synchronous satellite and cost $8,500.

The tests were carried out under conditions far more challenging than would ever be encountered in the field:

- The GPR horn antenna was pointed directly at the GPS receiver -- not down at the ground.

- The GPR horn antenna was positioned less than one meter from the GPS receiver -- not the tens or hundreds of meters separation that would be seen in practice.

- The pulse repetition rate was set to 400 kHz -- 6 dB higher than the 100 kHz model currently certified by the Commission.

- The transmit pulse power was increased by 20 dB over the model currently certified.

- The GPR unit was stationary with respect to the GPS receiver for a full five minutes at a time -- not moving past it at 50 mph or more, as would be typical under the waiver.

GSSI took data with the GPR transducer alternately turned on and off for five-minute periods. Even under these extreme conditions, *the horn transducer had no effect on the location data from either GPS system*. Exhibits 1 and 2, attached, show plots of the GPS location data with and without the GPR unit operating.

NOTE: For these tests, total power increase was 26 dB over a currently certified model. This amended version of the waiver requests operation at far lower power.

GSSI understands the critical importance of 100-percent success in GPS operations. The demonstration described above -- an over-powered GPR antenna pointed directly at a GPS receiver 1 meter away for a protracted period, with no interference effects -- should help to resolve any concerns about effects of the waiver on GPS operations.

CONCLUSION

A grant of the requested waiver is in the public interest. It will promote public safety by facilitating the maintenance of transportation facilities, and will not cause interference to GPS or any other receivers.

Please do not hesitate to call with any questions.

Respectfully submitted,

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Counsel for Geophysical Survey Systems, Inc.

cc: Ed Thomas
Julius P. Knapp
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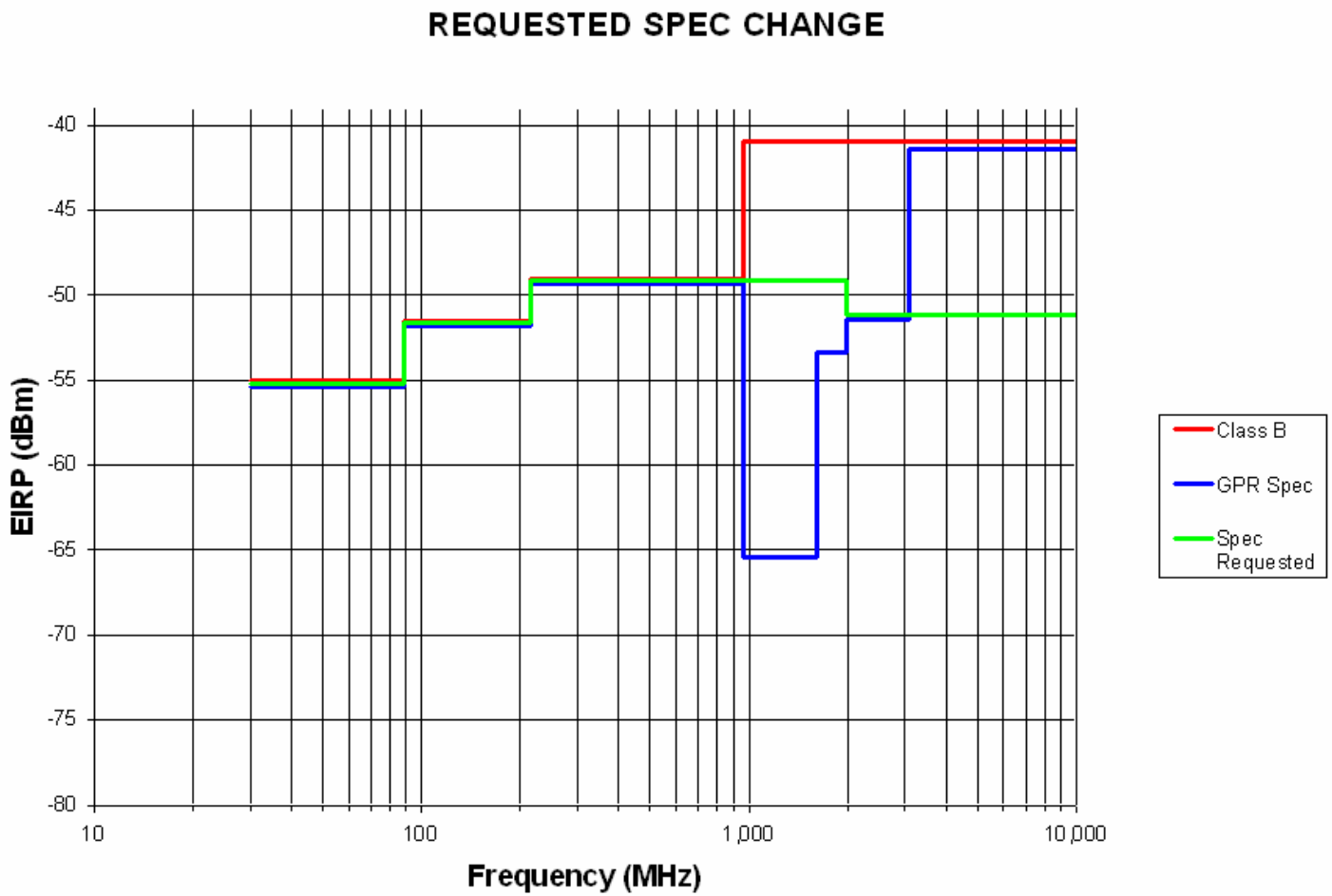
Jim Schlichting
Alan Scrime
Karen Rackley
John Reed
Karl Nebia, NTIA
Donald J. Evans, Esq., counsel for Wavebounce
ET Docket No. 04-374 *via* ECFS

Exhibit 9



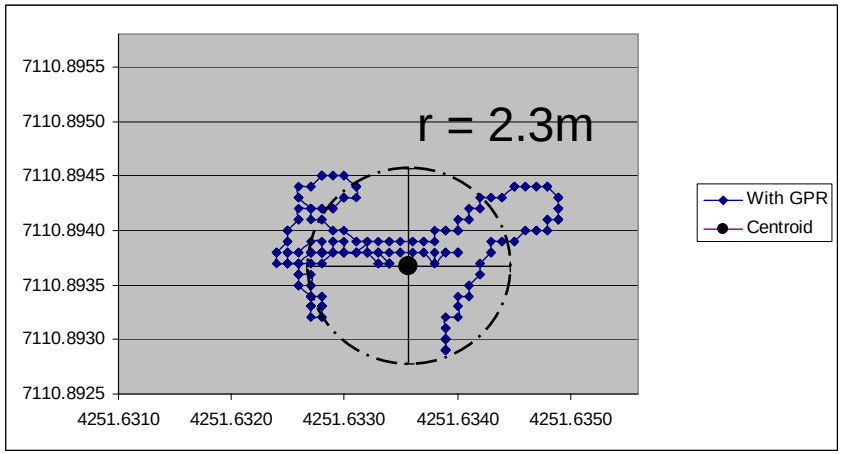
2/23/2005

Geophysical Survey Systems, Inc.

EXHIBIT 6 - Comparison of GPS data taken with a GSSI 4108 Horn antenna (1GHz) with a PRF of 400KHz pointed directly at a WAAS enabled GPS device (Laipac G30L)

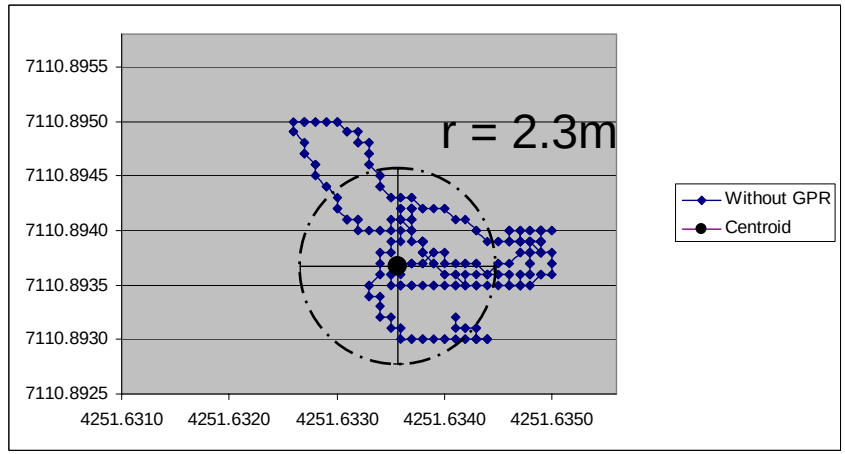
GPS w GPR transmitter ON below

Start 19:52:30 UTC End 19:57:37 UTC – 308 data points

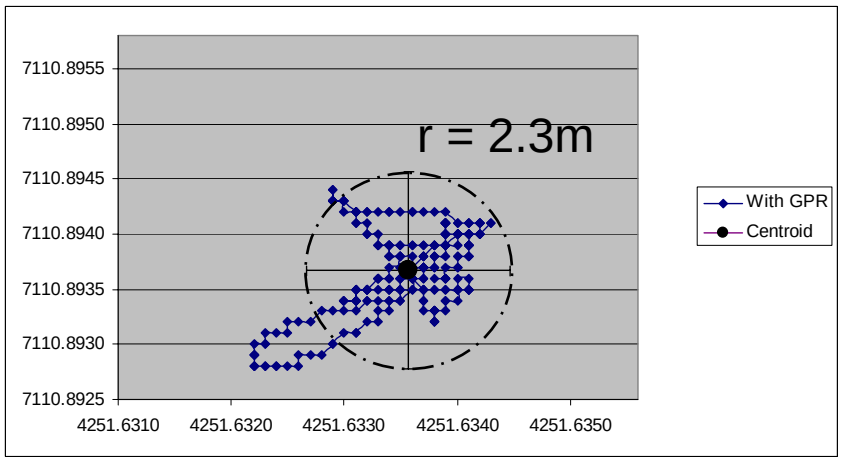


GPS w GPR transmitter OFF below

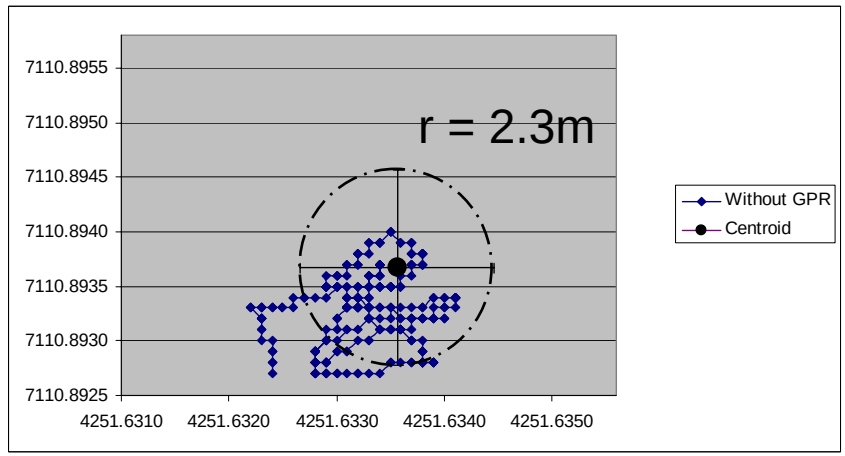
Start 19:59:27 UTC End 20:05:20 UTC – 354 data points



Start 20:06:38 UTC End 20:10:00 UTC – 323 data points



Start 20:14:00 UTC End 20:19:34 UTC – 335 data points

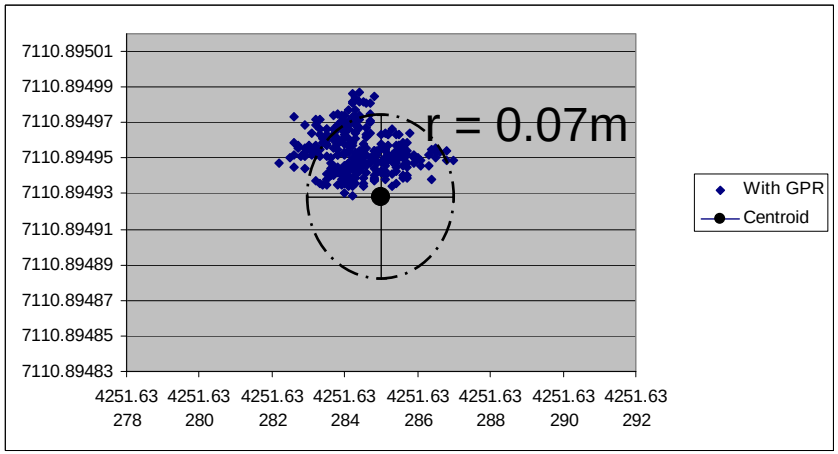


Notes: GPR antenna power set to 26 dB above FCC-approved model. Decimal Minute Lat and Long are shown. Data was taken on January 31, 2005 with minimal obstructions.

EXHIBIT 8 - Comparison of GPS data taken with a GSSI 4108 Horn antenna (1GHz) with a PRF of 400KHz pointed directly at a DGPS device (NavCom 2050 with StarFire Network Differential Corrections applied)

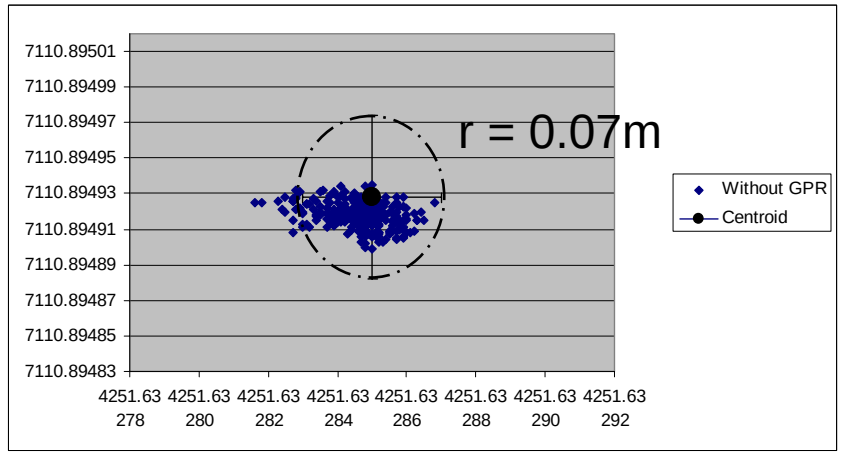
GPS w GPR transmitter ON below

Start 15:42:09 UTC End 15:47:27 UTC – 319 data points

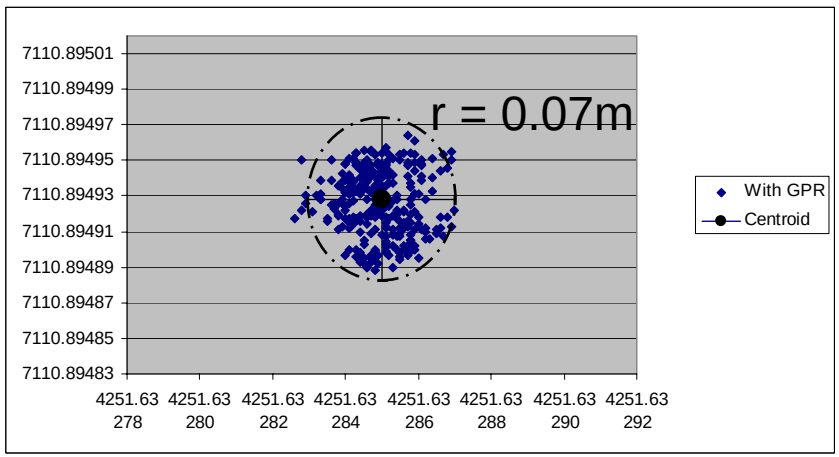


GPS w GPR transmitter OFF below

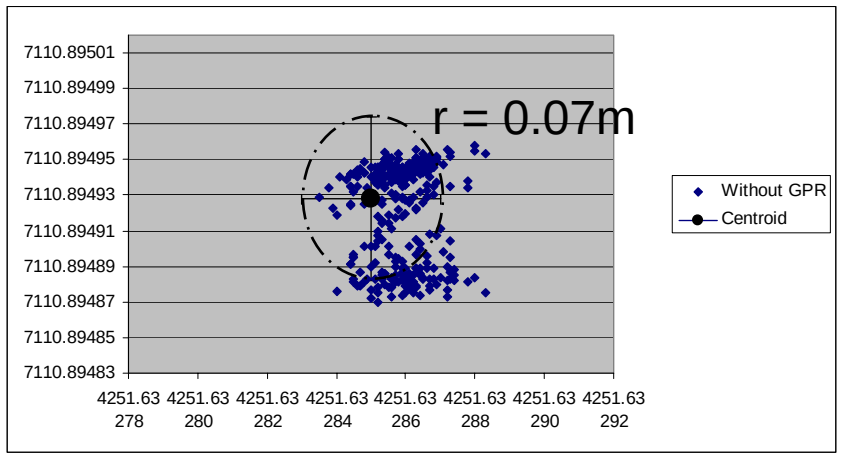
Start 15:48:58 UTC End 15:54:03 UTC – 306 data points



Start 15:55:00 UTC End 16:00:10 UTC – 310 data points



Start 16:02:02 UTC End 16:07:30 UTC – 329 data points



Notes: GPR antenna power set to 26 dB above FCC-approved model. Decimal Minute Lat and Long are shown. Data was taken on February 2, 2005 with minimal obstructions.