

GPS Source, Inc. – sponsor and participant in the CSXT amateur space launch - May 17, 2004

The Civilian Space eXploration Team (CSXT) -- www.civilianspace.com -- has embarked on a literally out-of-the-world journey: To build and launch the world's first amateur rocket into space. Many years of effort, literally tens of thousands of hours of development time, and extensive analysis and approvals by the U.S. government have gone into this historic endeavor.

One of the greatest challenges faced by the team is determining the altitude of the flight. "Space" is defined as 62 miles (100 kilometers). Without a reliable way to verify the altitude, there would be no way to determine the success of the mission.

For added stability and thrust centralization, the rocket is designed to spin at approximately six cycles per second through its flight into space. For altitude determination, the rocket employs four external GPS antennas, flush-mounted on the 8.8" diameter airframe, 90-degrees apart around the circumference.

Acquiring and maintaining GPS lock, with a rapidly spinning airframe, is daunting. CSXT turned to GPS Source for the advice and the needed technology to tackle the task.

GPS Source provided two GPS combiners and two in-line amplifiers, along with the necessary expertise. Eric Knight, Project Co-Leader and Avionics Team Manager, said "Not only did GPS Source supply us with superior technology, their technical team helped us solve one of our mission's most critical challenges. Working with them, we were able to uncover a solution that meshed with our design requirements."

Knight went on to say, "Our pre-flight testing proved that not only could we acquire and maintain a GPS lock at the needed 6 CPS, but we were able to do so all the way up to 8.5 CPS."

On September 19, 2002, CSXT attempted their historic flight at Black Rock Desert, Nevada. Unfortunately, a motor failure prematurely terminated the flight. Undaunted, CSXT plans to make another attempt in the not-to-distant future. "If this was easy, someone would have accomplished this before," said Knight. "This is an enormous challenge given our limited resources. But we have already determined the cause of the motor problem -- and a design correction is already in the works. We're very excited about the future."



Even though the overall mission was not successful, there was a major accomplishment. According to Knight, "We were thrilled with the performance of our avionics systems -- by far the most sophisticated ever developed for an amateur launch. They functioned precisely as intended through the initial 7,000-pound-thrust, 18-g boost phase of the flight. But what truly surprised us was their performance after the motor failure."

Knight continued, "The avionics were contained in the rocket's nose section -- which literally sheered off at the time of failure. The avionics -- including GPS Source's components -- were simultaneously and directly exposed to burning motor fuel and supersonic wind shear. They then free-fell and impacted the ground at a very high speed. Everything kept working -- right until impact."

Knight concluded, "Only a very few components survived the impact. The ones that did included the systems from GPS Source. Sure, they were scorched from the burning fuel. But, from every indication, they remain operational. We are totally amazed. Hat's off to some incredible engineering."