Date: 8/1/12
Location: Fairview Ave & W Dudley Ave, St. Paul MN
Aircraft: Thor
Pilot: Arion Mangio (driver)
Flights: 4 driving tests with Thor

Weather Sunny, temps around 90F.

METAR (St. Paul Downtown): KSTP 011953Z 24011G18KT 10SM FEW120 32/21 A2981

Adhika, Andrei, Arion, and Will arrived at Fairview & Dudley Ave at 3 pm to run some tests related to the faulty GPS/INS filtering on Thor. The airplane was strapped down to the bed of Arion's truck, which he drove in a rectangular pattern along Fairvew Ave, Field Rd N, and W Dudley Ave. All flight ops ran smoothly. The main objective for this flight test was to obtain and compare filtered GPS/INS data from Thor while the engine was at various throttle settings, while using the 16 Hz internal IMU filtering bandwidth.

The first run consisted of driving with the engine off around the pattern. The filter performed well, as expected.

Thor Ground 06

The second run involved a low throttle setting with flight-like manual control inputs to the actuators to simulate real flight. The filter performed well at this setting.

Thor Ground 07

The third run was similar to the second, except a mid-throttle setting was used. The filter still performed well at this setting.

Thor Ground 08

The fourth run was similar to the previous to, except full throttle was used for the first four laps, and mid power was used for the second two. During the full throttle laps the filter performed poorly, however, during the following mid throttle laps it performed well. It was found that at full throttle, the measured 'az' from the IMU has very large spikes. These spikes are only apparent throughout all four tests during the full throttle period.

Thor Ground 09

The software used for this flight was trunk/Software/FlightCode rev 866