Data Acquisition for Solo Competitors

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What is Data Acquisition?

- Recording vehicle information in order to answer questions.
- Recorded data is used to measure performance.
- Interpretation of the data is used to develop the vehicle and the driver.

How DAQ is useful for Solo Racers

- During competitions, it records performance.
- Review between runs MAY identify opportunities for improvement.
- Post event analysis MAY reveal driving techniques or vehicle parameters to focus on.

How DAQ is useful for Solo Racers (cont.)

- When used with a specific test plan, can help maximize car setup, evaluate components such as tires, shocks, even brake pads.
- Test days and end-of-day fun runs may allow comparison with other drivers in the same vehicle.

What do you need for driver development?

- Consider what questions you want to answer.
  - Accelerations & speed are your performance goals.
  - Driver performance requires monitoring controls such as throttle, steering and brake pressure.

What do you need for vehicle development?

- Consider vehicle development questions
  - What wheels are slipping?
  - What is the suspension doing?
  - What are the tire temperatures?
  - Any other positions, forces, pressures or temperatures to examine?

Evaluating Data Systems

- Start with the software.
  - Most are available for download with sample data.
  - Evaluate the data as though you were trying to answer questions -- Can I see the performance difference between two runs (laps of road-course data)
  - Focus on areas where your needs differ from standard usage (sensors, separate start/finish)

Evaluating Data System

- Consider future needs when looking at hardware:
  - Does the system have the capability to measure everything you will want answered?
  - Different cars may require more rugged systems (particularly wiring and waterproofing)
  - Display capabilities (shift lights, alarms)

Installation

- Critical to getting good data. Spend the time and get it right to avoid future trouble. Ask for help with brackets, wiring or sensor mounting.
- Simulate an entire run in the garage (or on the street) before testing at an event. Run car, start logging data, stop logging, and download. Test all sensors.

Interpreting Data

- Track maps (helpful for navigating the data) need good distance, speed and lateral G data. Some systems can't handle a non-closed circuit.
- Speed is the results channel. Overlaying speed traces and looking at the differences is the key to improvement.
- Opportunities for improvement are anywhere the acceleration data is less than an expected value. Use previous runs, other driver data, or test sessions to determine expectations.

What about GPS?

- The good, the bad and the ugly!
  - Many systems offer GPS capabilities.
  - No beacons (good for Solo), drift not an issue for runs within an hour or two, but is an issue morning to afternoon, and day to day.
  - Software varies -- you will need to look at each one to determine suitability for you.
  - Precision is accurate enough for major line differences, but not 6" differences. Speed is usually very accurate (<.3 mph)

Questions

- Feel free to participate on our data acquisition forum -- a link can be found on the Veracity Racing Data website http://veracitydata.com
- Leave your email address and we'll send a copy of these slides to you.