**Software and Navigation Systems:**

Overview of pod procedures and software triggers to be analyzed, explained and vetted in person (easier to visualize the system).

**State Machine & Transitions:**

**Sensor Layout:**

**Internal**

1. 2 x Gyroscopes: Collocated with the accelerometers (Gyro-Accel combo). Positioned in front and back allows us to easily calculate roll and pitch measurements. Communication method: I2C to Arduino to PWM/Analog to the cRIO
2. 2 x Accelerometers: Working in tandem to determine speed. One is located in frontal area of the pod, the other in back. These proved acceleration readings and act as a rough sketch for velocity change between strips. Communication method: I2C to Arduino to PWM/Analog to the cRIO
3. 2 x Strip sensors: Act as primary velocity calculators and reinforce acceleration measurments and pod position in tube. Communication Method: Digital Input to cRIO
4. 2 x Internal Pressure Sensors: Monitor internal pod pressure statistics (located near gyro-accel combo). Communication method: I2C to Arduino to PWM/Analog to the cRIO
5. 2 x Temperature sensors: Keeps pod internals within nominal range. Communication method: I2C to Arduino to PWM/Analog to the cRIO
6. 2 x Tank pressure sensors: Monitors the pnumeatics tank pressure and makes sure we don’t drop below 100psi (brakes rated to actuate above 90psi). Communicaation Method: Analog Input to cRIO

**Battery**

1. 2 x Resistor Voltage Divider: Steps down battery voltage into proper range for cRIO analog input. Communication Method: Analog Input on the cRIO
2. 4 x Temperature Sensor: Monitors corners of battery and battery pressure pot for heat generation. Communication Method: Analog Input to cRIO
3. 1 x Pressure sensor: Monitors battery compartment for pressure influx/outflux (nominal ~1atm). Communication method: I2C to Arduino to PWM/Analog to the cRIO

**Levitation**

1. 4 x Ultrasonice Sensors: Primarily for external testing and align fits/checks, help us determine how far off the ground we are currently hovering/rolling. Communication method: PWM to Arduino to PWM/Analog to the cRIO

**Pusher Interface**

1. 4 x Break Beam Sensors. Constantly monitor and reinforce whether pusher is engaged. Communication Method: Digital Input to cRIO