TSAR Team Meeting

12 January 2017

# Attendees

# Kirk J., Georges L., Peter D., Mark M., Michael H.

# Agenda

## Last Meeting Follow-up

1. We received the thermocouples, thermocouple amplifiers, and the LDO (low dropout) regulators (for servo and sensor needs), and 12V car battery for the pintle test.We also received the DC Boost converter for the Solenoid. In addition I (M) started working on a power distro board for car battery to the other systems
2. Fortunately, the Arduino can take a 12V input so I just need to add a 2nd order passive low pass LC filter to connect the car battery to the Arduino
3. Kirk completed the PSU for the main fuel valve.
4. Received the Arduino Mega2560
5. Andrew received everyone’s Github usernames and you should all have access.

## New Info

1. Pintle test ≠Igniter Test
   * The pintle test involves many more sensors (7) but only one servo and solenoid. See [this](https://docs.google.com/presentation/d/1_UoEC2JRzY2DLnE0AtKBU7LnNoWs0JkLJEzGzN2dxwE/edit" \l "slide=id.p3) image. This is our first priority
   * The [igniter test](https://github.com/psas/liquid-engine-test-stand/blob/master/igniter/Igniter Test Stand PID 2017.10.10.pdf) has only 4 components that we care about.
2. We now have a tab with the EPL. Enter your purchase on the google sheet names ‘EPLTab’ in the TSAR drive. Any purchase larger than $20 needs to be approved by me. Just shoot me a text at 503-744-9965.
3. Made a toolbox (on the TSAR shelf) to organize miscellaneous components, sensors, small items. Labeled descriptively.
4. Now that you all have Github access (fingers crossed) we are going to start communicating over ZulipChat, Please download the desktop and Mobile app.
   * <https://zulipchat.com/features/>
     + Tag people using @Name
     + Inline math and code discussion
     + Track github work in real time
   * We will be using the #LFETS stream for our discussions
   * Our server is psas.zulipchat.com, log in with github account

**Member Updates**

# What did you do last week?What will you do this week? Are there any impediments in your way?

# Mark - Got the supplies for the battery to peripheral board but it needs to be rebuilt on a larger piece of wood.

Georges – Simulation of the TSAR system. Matrix implementation to represent the internal state variables, looking into Python libraries for simulations. The purpose is to simulate the hardware to help test the SCADA. **Will the LOX be running through the system as a liquid or a gas? (Erin Schmidt)** [**esch2@pdx.edu**](mailto:esch2@pdx.edu)**, (Joseph Shields)** [**shields6@pdx.edu**](mailto:shields6@pdx.edu)**. He is using a discrete time matrix containing differential equations describing the systems, when multiplied with a state vector (containing the internal state as an f(t) ) Step wise refinement, Linearization via matrix, Euler’s method??, Simpson’s Rule, Trapezoid Rule**

Peter Dilla – Printed the right encoder, code works, let’s make it spin! We should be able to encode the angle from the grey code. We just need the LOX motor to crack and then open 5 -15 degrees and the 90 degrees.

1. Make sure Peter gets a 12V solid state relay protoboard or printed. 12V

2. Maybe make a torque test jig to establish the current limits of the motor

Michael Humphrey – Still alive.

1. Maybe we should add sensors to manual components in order to add a level of safety. Transmit an array of booleans that correspond to each manual switch and tells its states (time domain multiplex to one gpio??)

2. Not gonna use Network X

# Action Items/Next Steps

1. **Kirk,** Mark will all focus on developing the Pintle test system
   1. Each member will tackle separate components and develop arduino functions for each. The functions will then be integrated into one big program. **Functions must: (Discuss this more next meeting)**
      1. To be able to operate the item independently taking in and returning any inputs necessary and returning usable floating point data.
      2. Define the function as part of a Header file describing what your functions operate.
      3. Well documented and stored in the TSAR Github folder ‘liquid-engine-test-stand/TSAR/ArduinoCode’ with a folder created for each specific part containing the code. Each transducer that is not the exact model should have its own folder.
2. Amanda will focus on getting the ATMEGA328P to work with a simple device. I suggest using C to work with the chip. The ATMEGA328P manual will likely make our lives more difficult
   1. See <http://tuxgraphics.org/electronics/200904/avr-c-programming.shtml> A very good guide
3. Work session planned for Fri 19th From 1pm to 5pm
4. Peter, Arman are going to finish up the encoding wheel and then work on pintle test agenda items

# Next Meeting Agenda