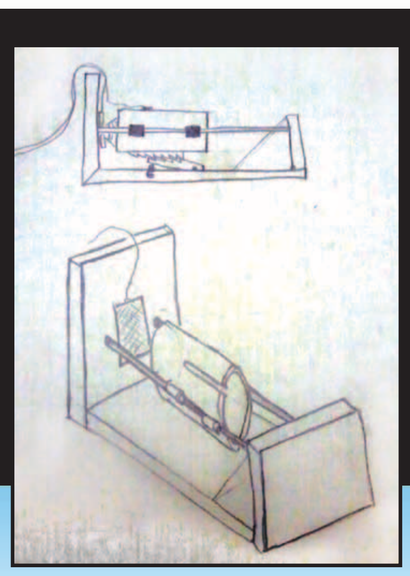
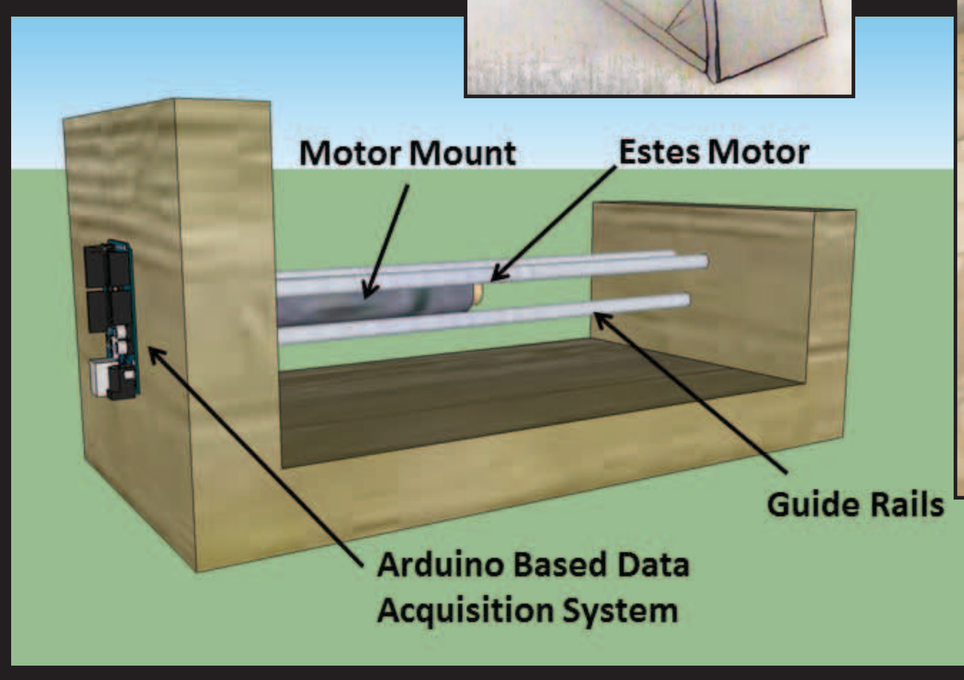
SHEPARD TEST STAND

An open source project of Mach 30: Foundation for Space Development

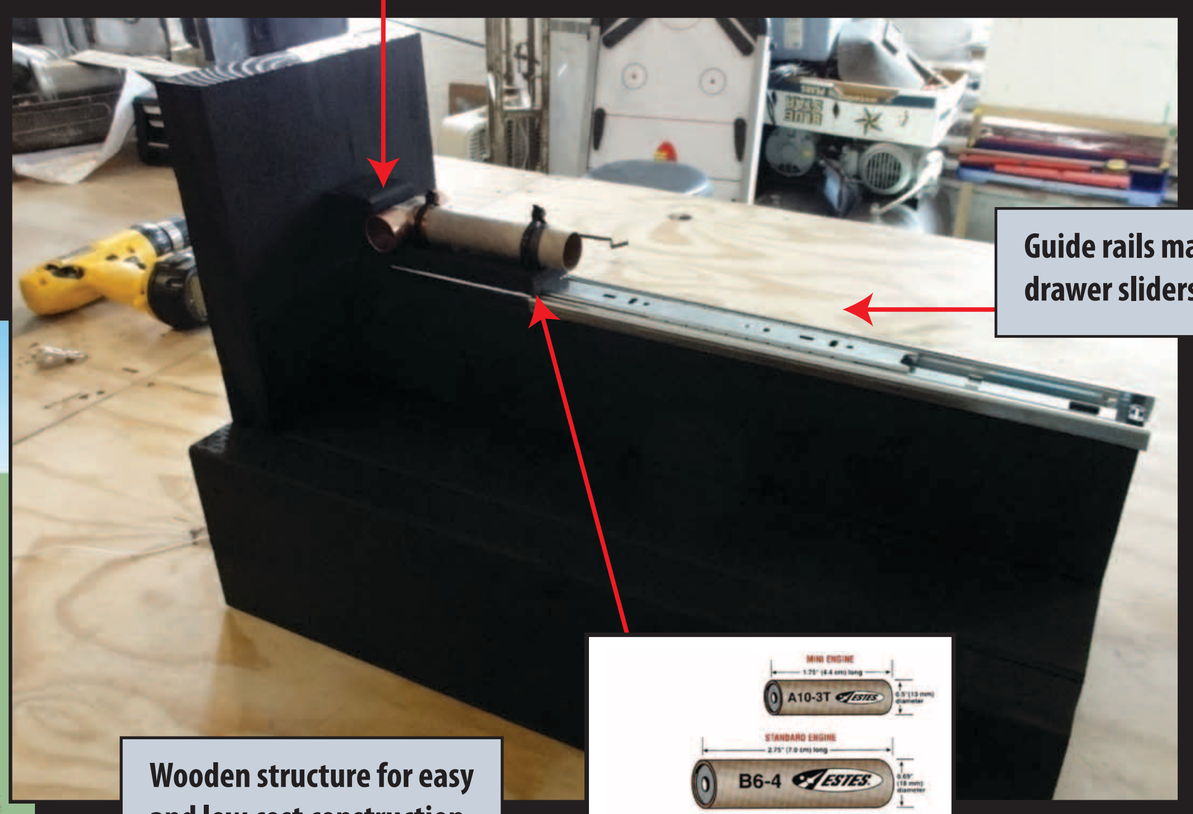
The **Shepard Test Stand** is an open source test stand for Estes rocket motors. This project is the first in a series of open source projects to develop the required skills for the practice of safe rocket engine operation, and to develop the capability to measure and record data about a rocket engine's performance. The use of Estes class motors provides a relatively safe environment to learn in before moving to higher powered motors and engines. The ultimate goal is to develop test stands for full scale liquid rocket engines for use in orbital launch systems.

Concept Sketch





Prototype

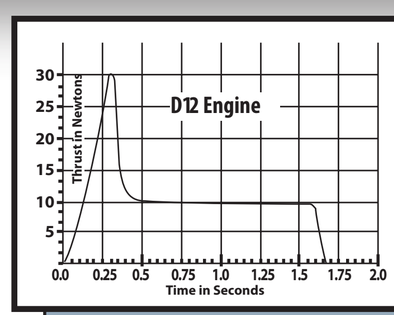


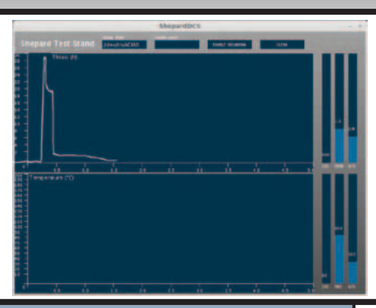
Supports a variety of motor sizes (A-E)

Preliminary Design

Test Process:

Thrust measurements are taken from a force sensing resistor, and motor casing temperature measurements are recorded by a thermocouple. All data is captured by an Arduino Uno and saved to a file on a laptop.





Results:

The goal of the Shepard Test Stand is to verify the performance of small commercial rocket motors. The two plots above show the published "thrust vs. time" data and the thrust recorded from the first instrumented test. It is a good sign that the shape of the curves match. Additional calibration was required after this test.

Build Your Own Shepard Test Stand!

Project hosted on Open Design Engine

http://goo.gl/5RZ5x

- Licensed under the Mach 30 ODP
- Designed by volunteers in four states
- Built at Dayton Diode, in Ohio
- Tested at Club Cyberia, in Indiana

DaytonDiode.org

Club Cyberia

MACH 30
Foundation for Space Development

J. Simmons
President
jrs@mach30.org

Greg Moran
Vice President
gmm@mach30.org

Jeremy Wright
Board Member
jmw@mach30.org

ad astra per civitatem • to the stars through community
www.mach30.org

Poster design credit: Thanks to Rebekah McGrady, Mercenary Art Ninja http://rcmdesign.wordpress.com/