

# Pathfinder Rover Prototype

**Arduino Mega ADK**  
-ATmega2560  
-usb host interface

**Panoramic Mast  
Assembly**

**20Ahr Battery  
Capacity**

**Ultrasonic Range  
Sensors**

**Dagu Wild Thumper Chassis**  
-Six 120mm wheels with independent suspension  
-GA25Y370-34 motors with 75:1 gear box ratio



## Contents

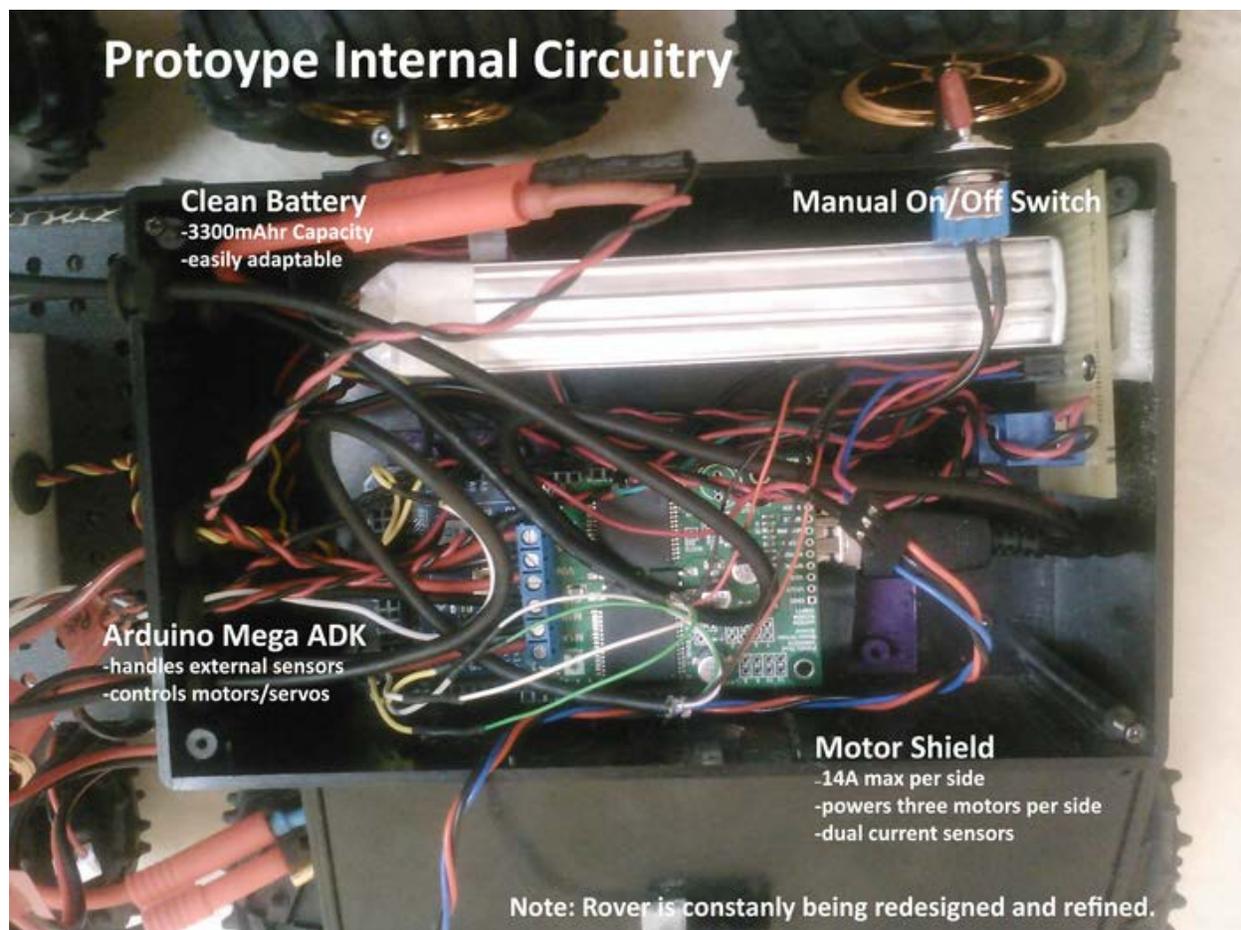
The Brains: .....	3
The Hardware: .....	3
The Software:.....	4
How it works: .....	4
Open Source Design.....	5
Links and Downloads .....	5
Pan and Tilt 3d models.....	5
Arduino IDE .....	5

## The Brains:

The brain of Arxterra's Pathfinder rover prototype is a Google Nexus S 3g phone. Any smart phone will do but this particular phone was chosen for its price point and the fact that it has a gyroscope, accelerometer, and forward and backwards facing cameras. Combining a smart phone's processing power and on-board sensors with the Arduino ADK board's firmware enables flexibility and capacity for redesign and system compatibility.

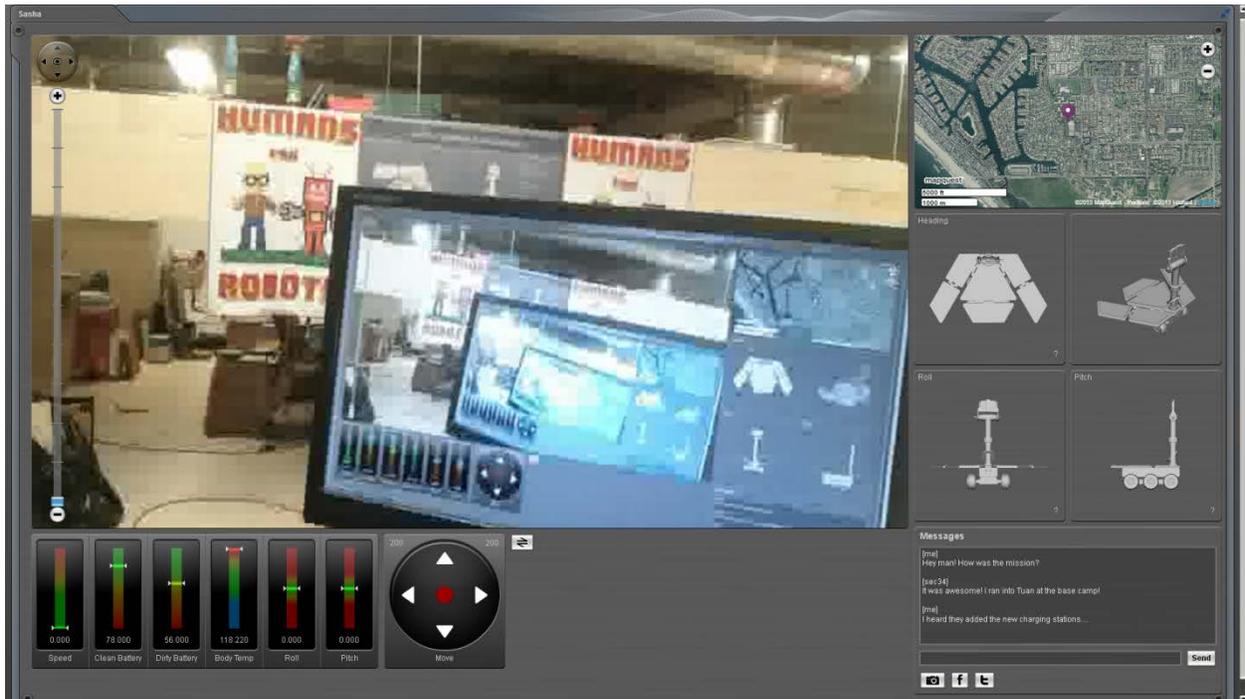
## The Hardware:

The Pathfinder Rover prototype has a Dagu Wild Thumper 6wd chassis with six 75:1 gear ratio motors and independent suspension as the foundation. These motors are driven with a 15A per side shield and powered by two 10Ahr lipo batteries for extending operating time. In addition, a separate "clean" power source is provided for the Arduino and Android.



# The Software:

We have a working user interface prototype which provides internet remote robotic control from server to rover.



User Interface (UI) prototype

## How it works:

Anyone can log on to our user interface (UI) from anywhere on the planet (provided you have internet service) and see the world through the Pathfinder Rover's "eyes". Set permissions will determine whether a user is a pilot or observer. The observers will get some limited telemetry feedback, a shared video feed, and will be able to chat with the pilot and fellow observers. The pilot gets full control over the robots systems, determines the rover's motion, and will be able to personalize which sensor and telemetry values he or she would like to see. The controls are fairly simple. We have manual motor and servo control operational and are developing navigation via the GPS and map system. Mounted ultrasonic sensors are used for object avoidance and systems diagnostics are handled with a variety of sensors (current, voltage, temperature, etc.) to maintain a safe operating temperature, check battery levels, and tune various parameters. The rover's status is displayed through a variety of gauges in the UI. Eventually augmented reality elements will be incorporated into the viewer screen to aid controller and monitoring capabilities.

# Open Source Design

The design of the pathfinder rover is based on open source software and hardware to encourage redesign and innovations from fellow makers, hobbyists, artists, and robotics enthusiasts. We encourage everyone to help build this community from the ground up to revolutionize telepresence in our modern world. We've had a lot of fun going from the real world to the virtual world; let's bring it back into the real world.

## Links and Downloads

[Pan and Tilt 3d models](#)

[Arduino IDE](#)