

1D Motion Platform

Hardware Guide

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Setting up the top platform

The first part of setting up the 1D motion platform is to put together the top section of the platform. This is the section that attaches to the tip of the linear actuator and is the holding platform for the phantom. We needed to consider radio transparency, as well as a design that would be compatible and easily implemented/reproducible. The materials required would be a laser cut acrylic pane, with 4 holes drilled in the center, lining up with the 3D printed mount screw holes; Nylon screws (7mm) are also required to attach the custom mount to the acrylic pane.

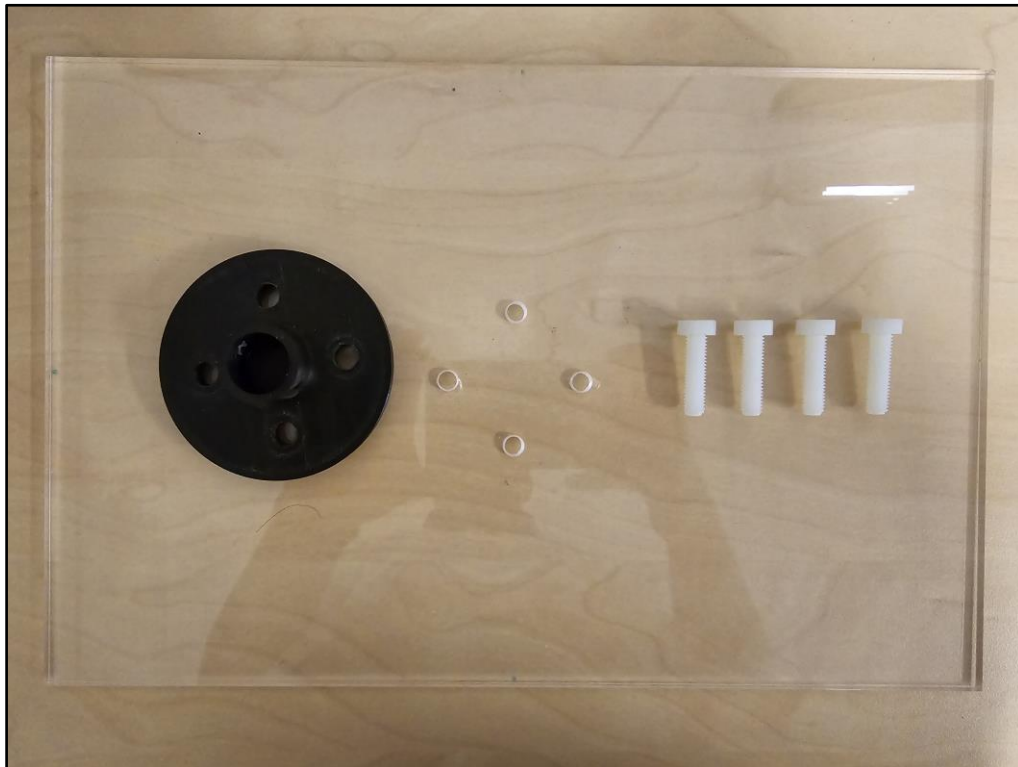
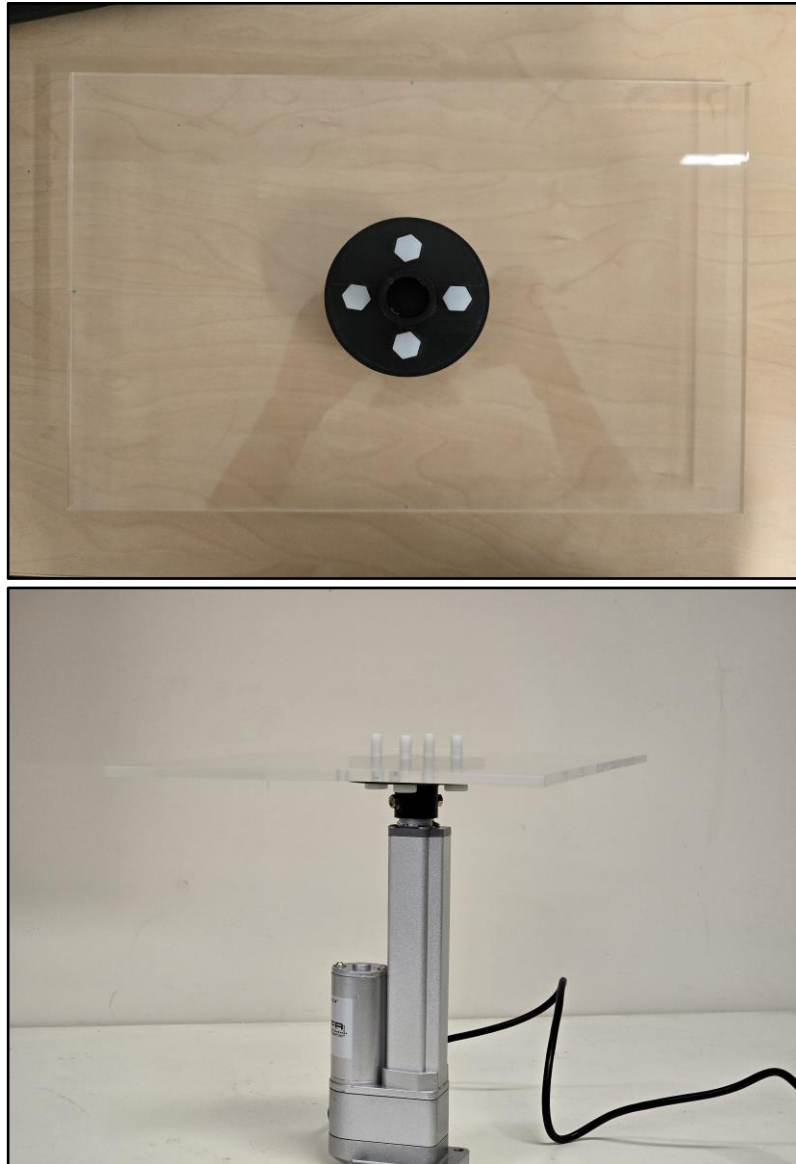


FIGURE 1 - 4x NYLON SCREWS, 3D PRINTED MOUNT & CUT/DRILLED ACRYLIC PANE

Hardware Guide

Line up the mount with the screw holes and fasten the nylon screws. Ensure a tight fit and there is no movement.

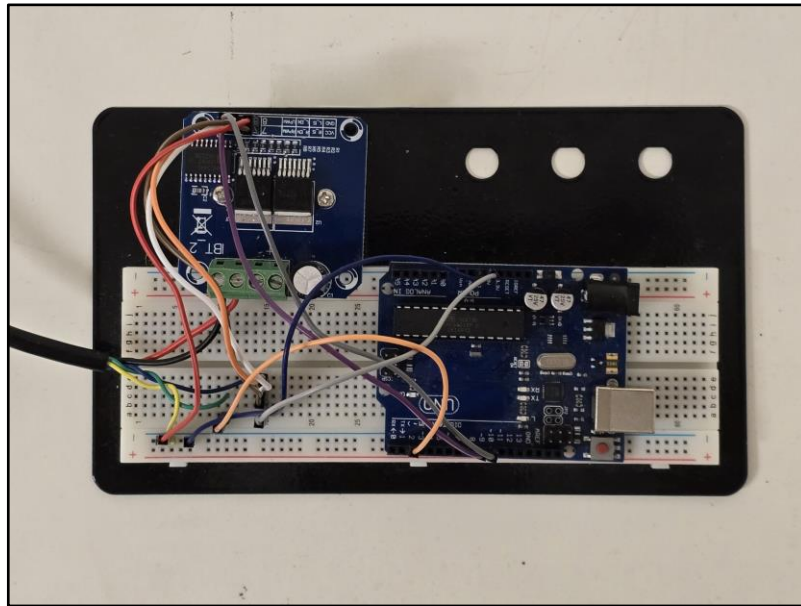


Once the top platform is put together, use M6-1.0 x 30 bolt to secure the mount onto the tip of the linear actuator. The actuator's tip has a 6mm hole for mounting.

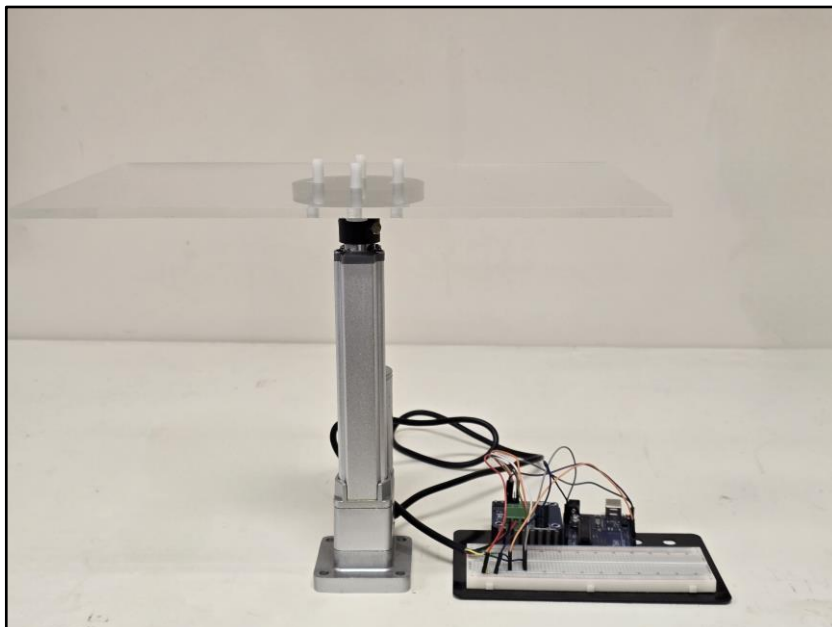
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Hardware Guide

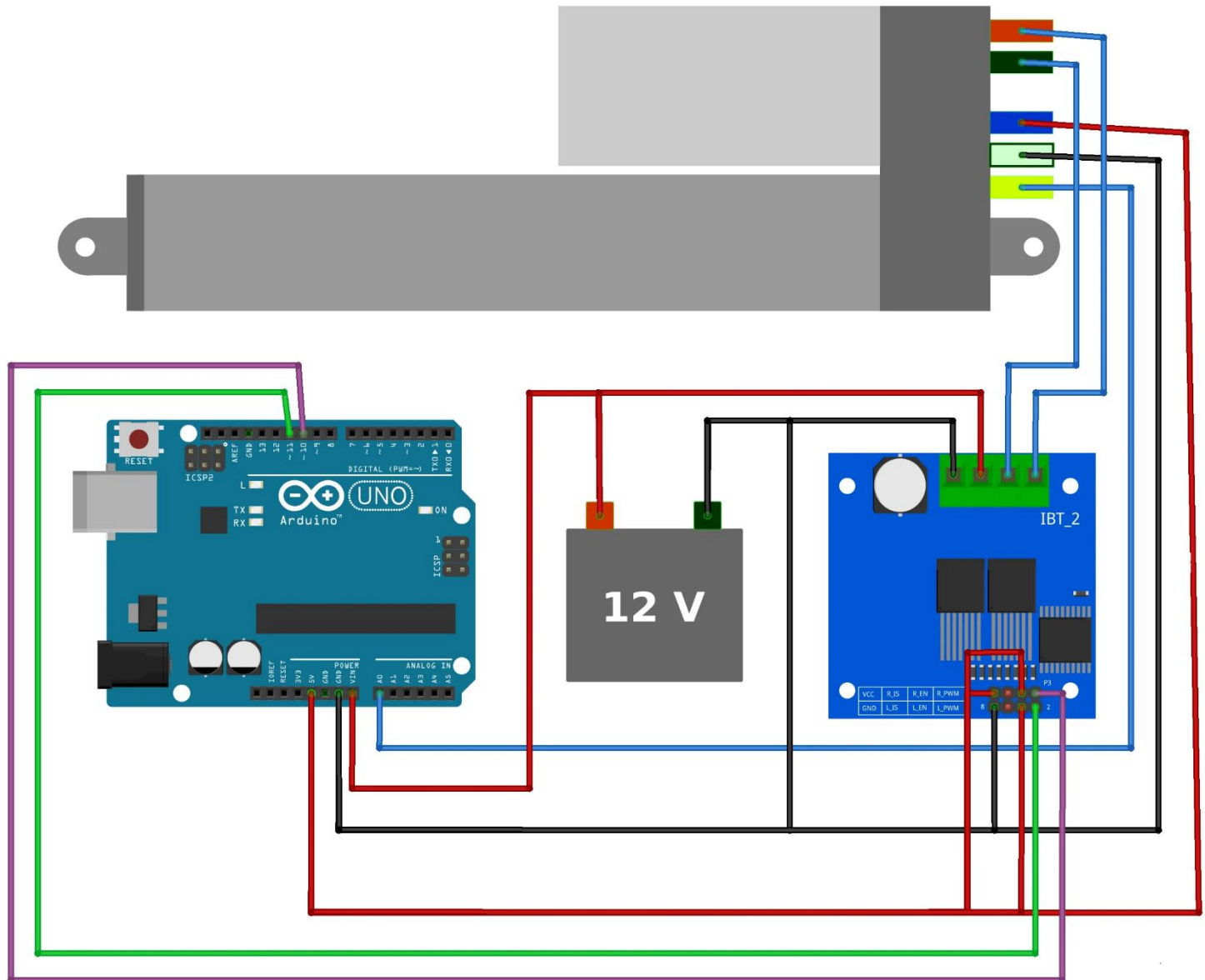
This is how the circuit should look:



Note: In this setup, we have the green wire to Arduino's interrupt pin 2. This is to read the optical feedback signals. The final setup of the motion platform should look like this (excluding PSU).



Hardware Guide



Hardware Guide

Install Arduino IDE (version 2.2.1 tested).

Use a USB-TypeB to USB-TypeA to connect the pc and the Arduino board. If the electrical circuit is correct, the LED will turn on

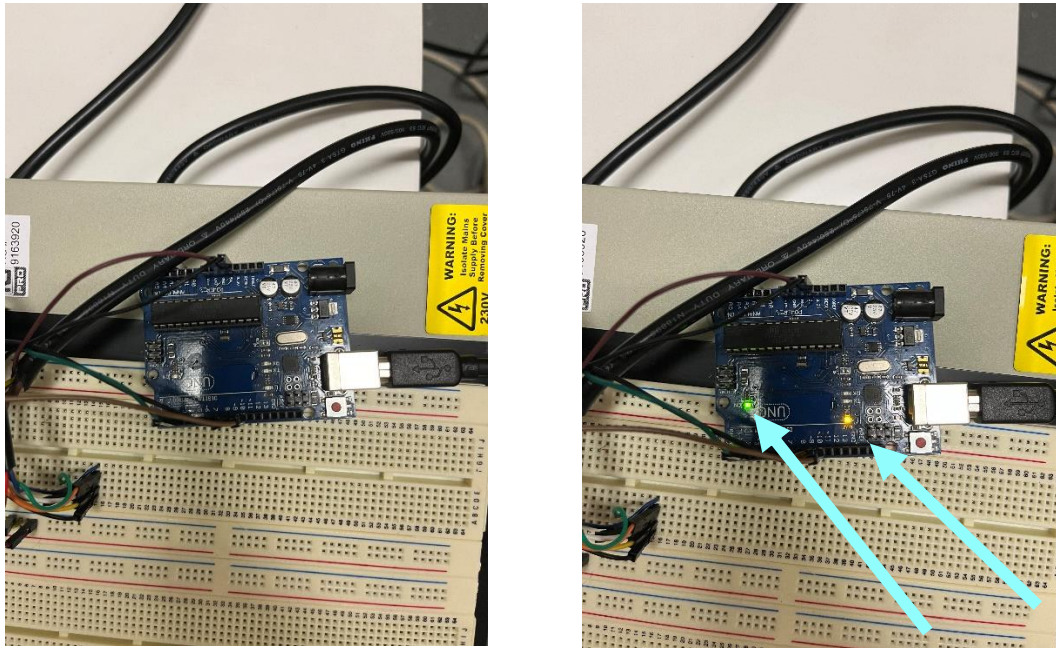


Figure 1: Arduino board

Select the correct COM port then download from GitHub the Arduino code https://github.com/Image-X-Institute/6-DoF-Robotic-Motion-Phantom/blob/main/Documentation/1DoF/Arduino_V3.ino

And upload it in the Arduino Software. (Close the motion control software if opened)