



The HotQuads A Tethered Drone

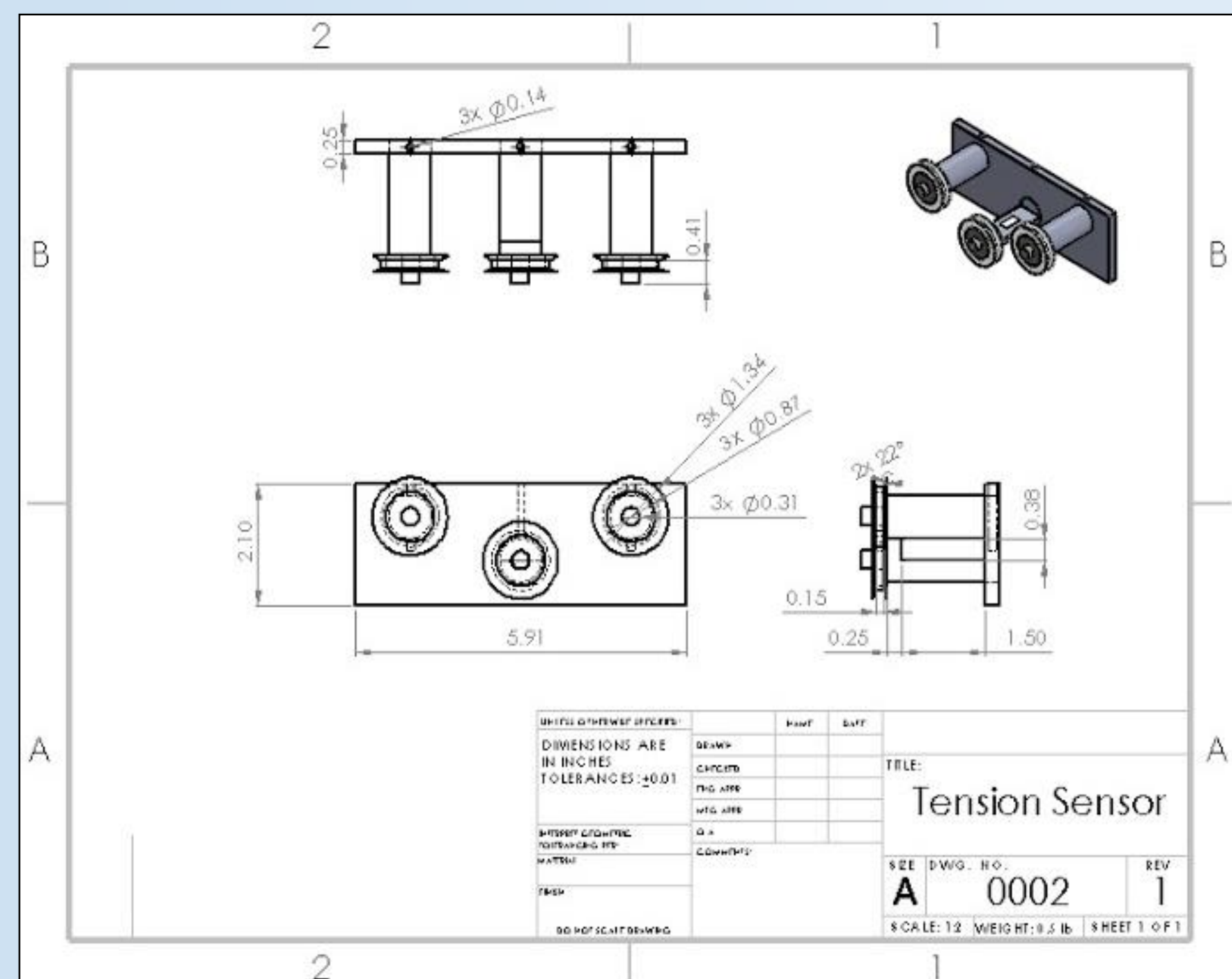
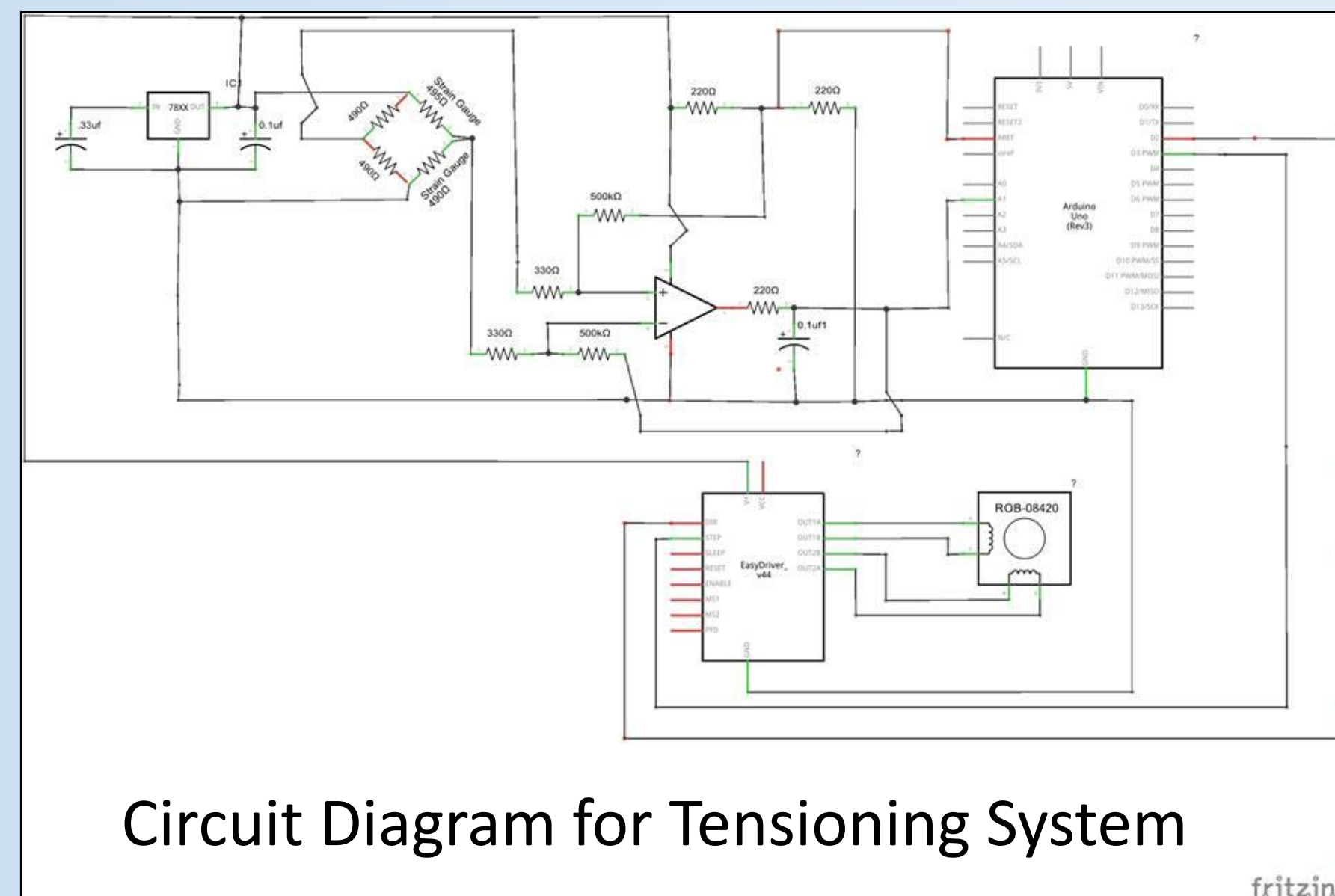


Turner Anderson • Kevin Chen • Les Girard • Jackson Hendershott • Lavanya Jawaharlal • John Norton

Tensioning System

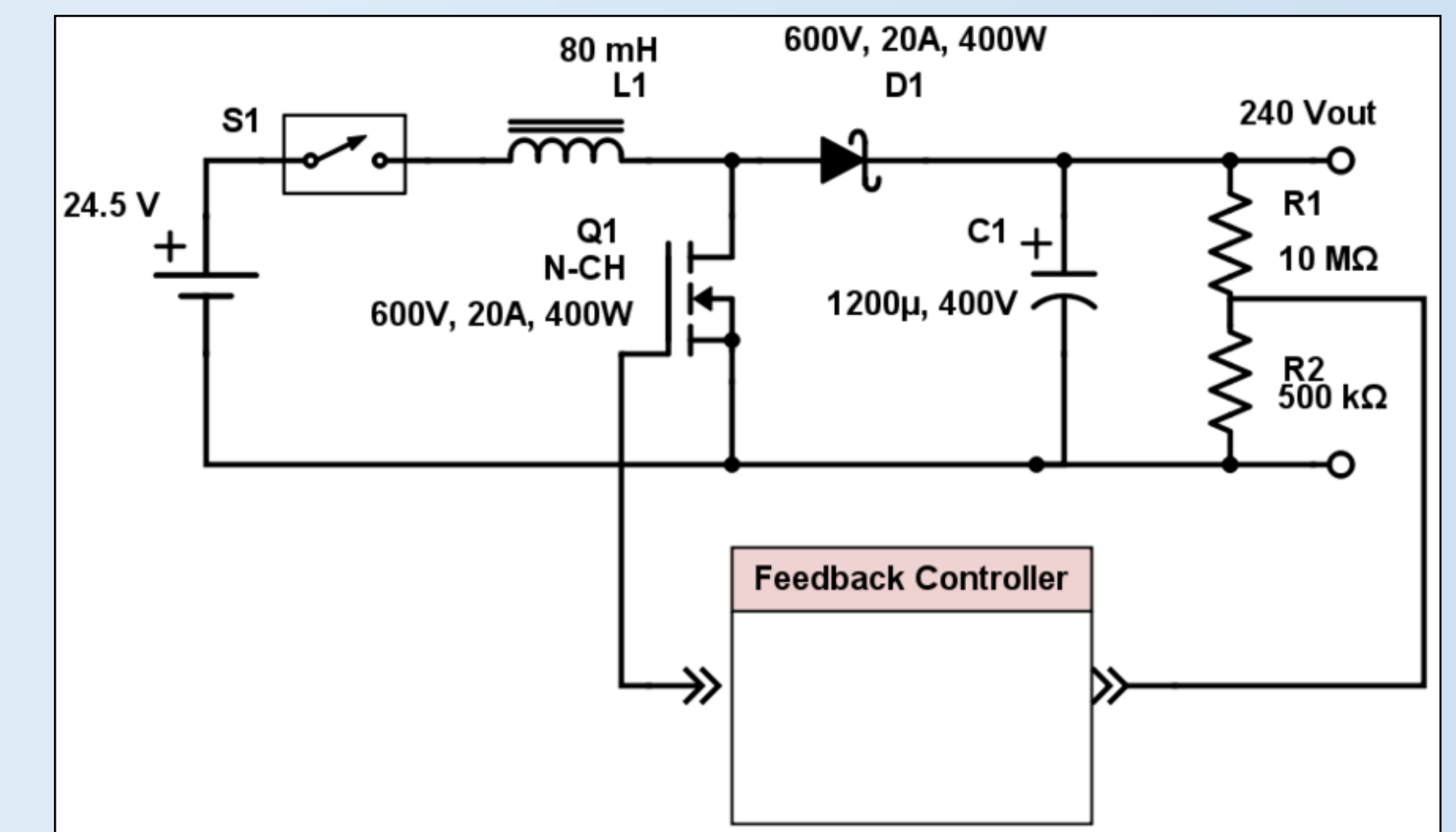
DJI sponsored The Hot Quads to design the mechanical and electrical accessories and interface needed to achieve unlimited hover time in a Matrice 100 quadcopter. The HotQuads divided the project into three main components:

1. Power Transmission System
2. Tensioning System
3. Linear Actuator System



Drawing of Tensioning System

Power Transmission System



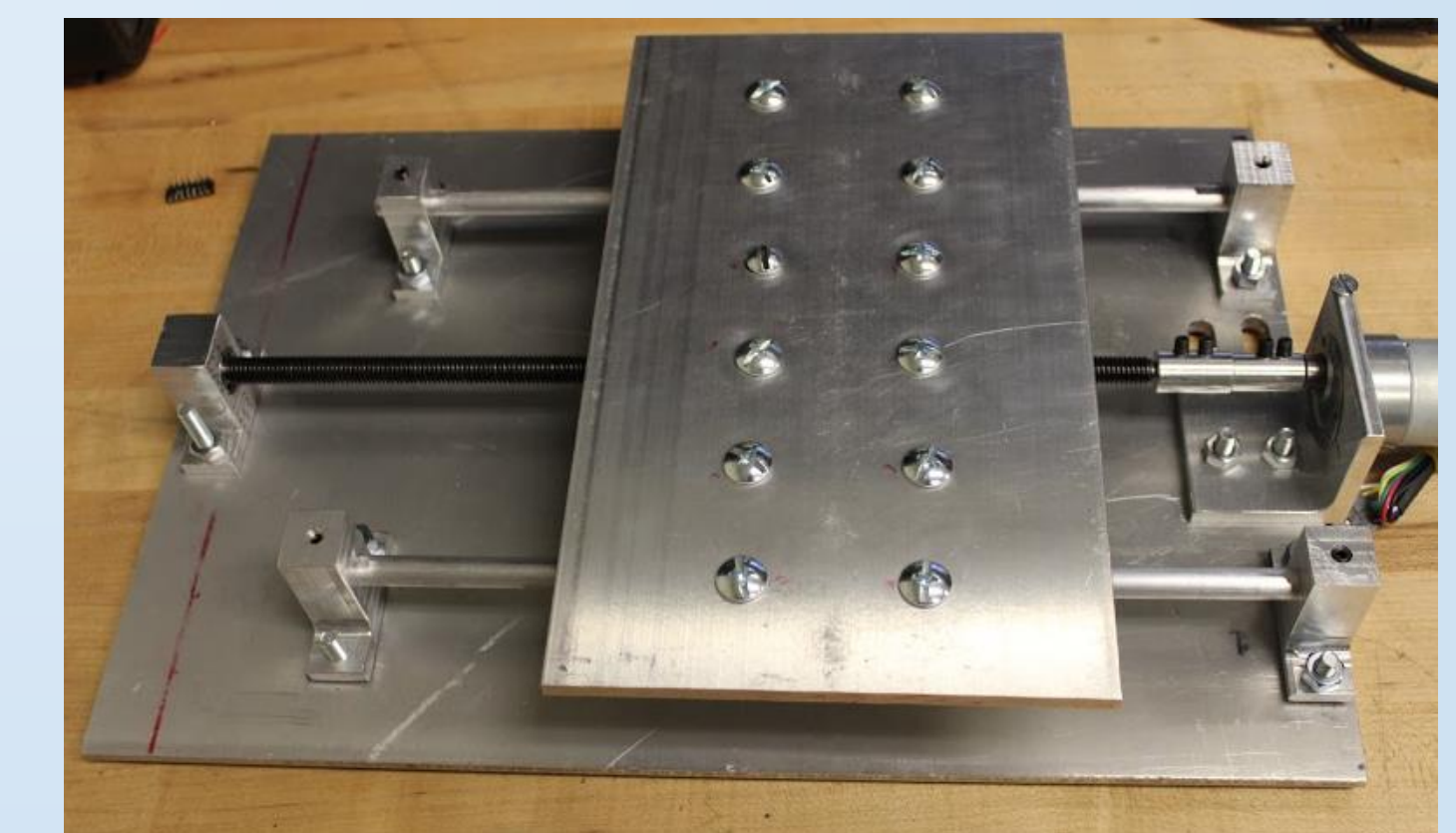
Buck Converter Circuit Design

To decrease bulk, the HotQuads decided to use an AC/DC conversion.

Boost Converter: 24V DC input → 120V DC

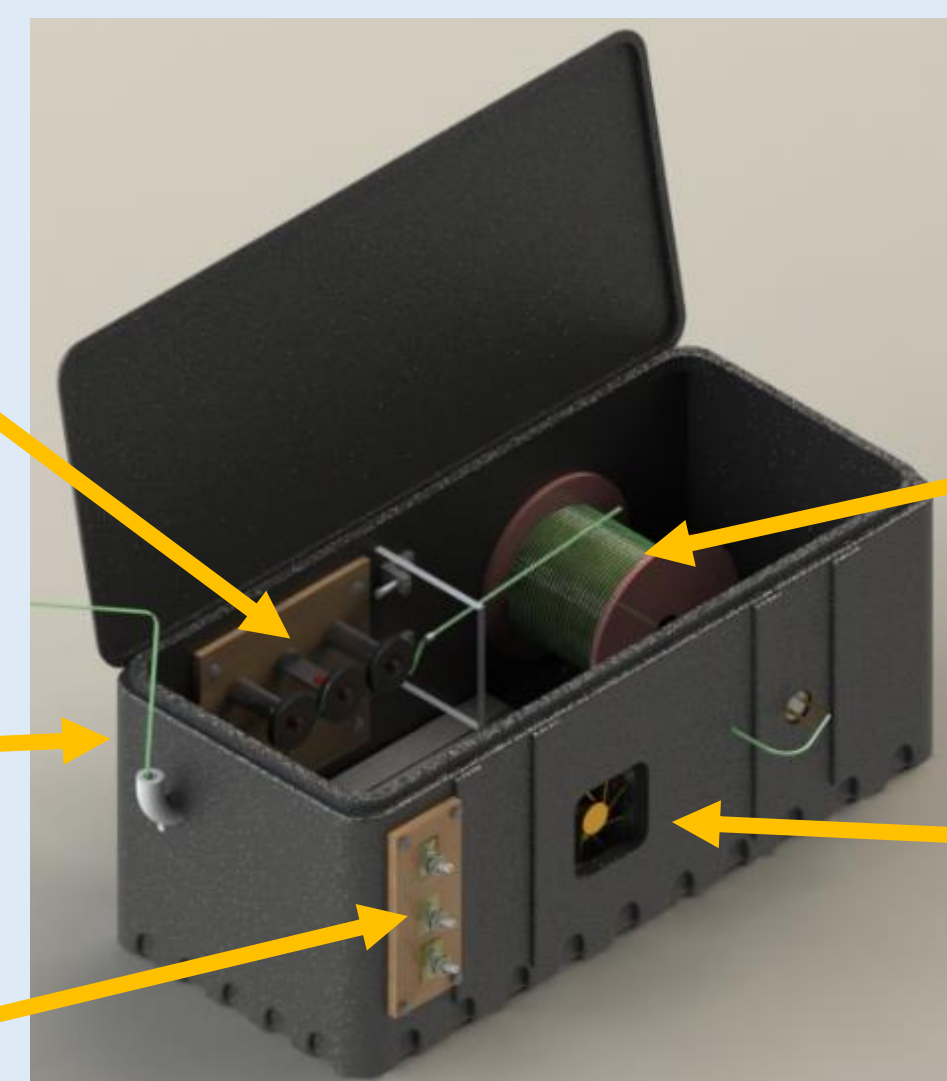
Buck Converter: 120V DC signal → 22.2V

Linear Actuator System



This system actuates the spool linearly. It ensures the even winding and unwinding of the tether.

Isometric View



Tensioning System

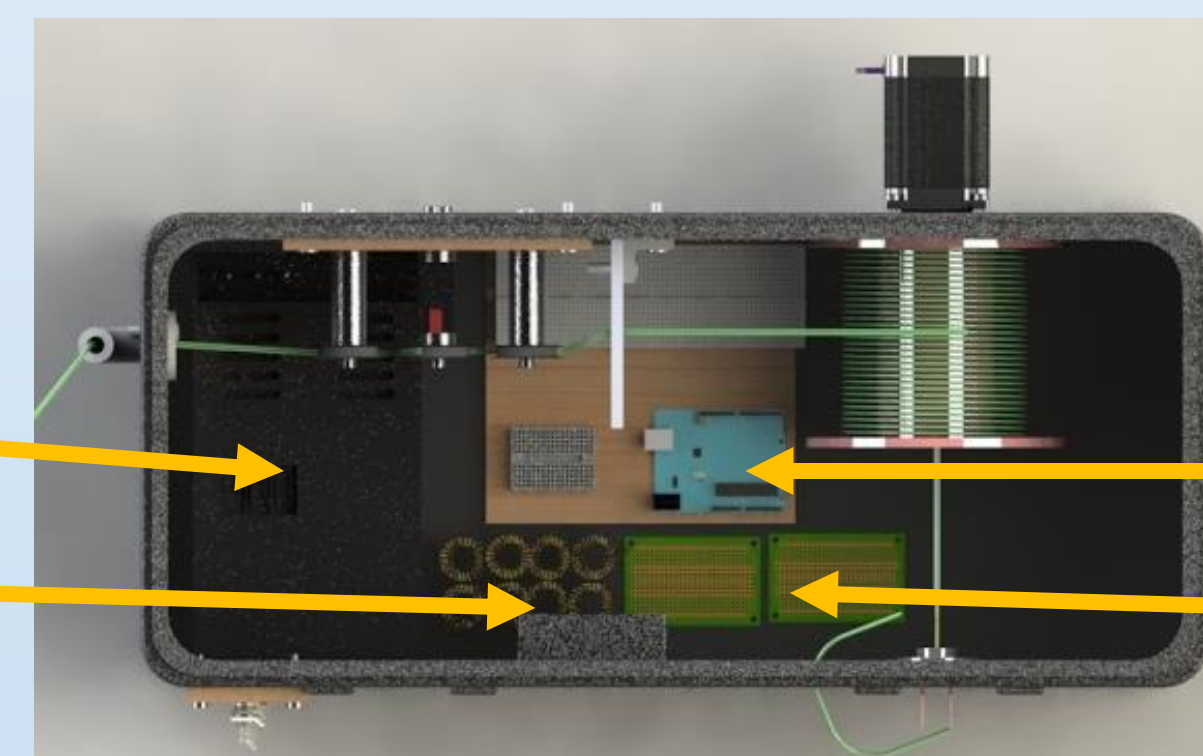
Spool & Tether

Tether to Drone

Fan for Electronics

Power Switches

Top View



Power Supply

Arduino

Capacitor Bank

Protoboards