GC 120 Final Project



Quadcopters are a hobby for some, a sport for others, and even a career for the lucky ones.  But no matter what a “quad” is to you, you can’t deny they are becoming more popular all over the world. Since it’s such a recent tech boom, hobbyists and big retailers alike are still working out some of the kinks in what makes a good quad copter. This project was an effort to improve upon the design of a quadcopter, which I have named “Quad A,” and smooth out some of those aforementioned kinks with my own design, “Quad B.” The main issue with the original model was that the body, as a whole, was too heavy, and caused the quad to have poor maneuverability while in flight. The center of the quad’s mass was also high because the battery was mounted on the top of the quad above the props and circuit boards.

To solve the issue of the quad’s weight, I redesigned how the quad’s circuitry, battery, and arms were mounted. I did away with most of the middle plate so that all that was left was the small section that held the actual circuit board. -- It’s important to take a moment now and note that this change in the middle plate compromised the quad’s folding wings, but the folding wings weren’t deemed to be an important enough feature of the quad to sacrifice maneuverability. -- I also redesigned the battery mount so that it would be thinner and use less material. With these changes, I reduced the quads total weight from 48.89 grams to 42.66 grams, a total of 6.23 grams.

To fix the problem of the relatively high center of mass, I had to find some way of lowering the majority of the quad’s weight below the plane the rotors were on. At first I thought I could simply mount the battery to the bottom of the quad, but that would risk the lithium ion battery being punctured every time the quad had a hard landing. To solve the problem, I instead decided to raise the arms up on the same supports that would be holding the quad together, leaving the circuitry, and the middle and bottom plates below the motors, and the battery roughly on the same plane as the rotors.