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Quad-Rotor Process

The Process of Building my Quad-Rotor

**Design**

First I created a plan to design my quadcopter. Using the Autodesk Inventor CAD tool, I made rough 3D plans of the Quad-Rotor. I first began to design the main Body of the Quad-Rotor and I then branched out farther to the extremities of the Quad-Rotor. 3D modeling helped me get a visual representation of each section and how they will all work with one another, to help prevent any future problems. In the design phase, I looked and planned for all third party parts that I may need, and made sure that all these parts are compatible to each other.

**Manufacturing/Engineering**

The second step in my process to produce Quad-Rotor was to port all of the 3D graphical models and create CNC toolpaths to mill out on a material. We used standard 6061 Aluminum block to build our Quad-Rotor Frame, because Aluminum will give the Quad-Rotor a rigid, stable structure, and keep the frame from being too heavy. This would ensure that the Quad-Rotor is highly maneuverable and not burdened by weight. To cover the many Electronics sections, I used a vacuum former to mold tin plastic sheets to fit over the Quad-Rotor, giving a clean, aesthetic appearance to the Quad-Rotor. For the actual Electronics aspect of the Quad-Rotor, I used a microprocessor board that can be programmed to tweak the many Quad-Rotor settings that may need some tweaking. The Quad-Rotor runs on one main Lithium Polymer Battery, and provides lasting power for the device to fly.

**Assembly**

My final stage in the production of the Quad-Rotor was the assembly process. With all the sections and the parts that I had designed, now it was just a matter of fitting, and fastening each part in the right place. In this step, however, there were a few mistakes in the design that I noticed, mostly with not providing enough margins and slack to fit together. For those few cases, I had to go back to the design step, and redesign those parts. This process gave me a deeper insight into how in real production I need to provide some extra space and margins, and I learnt a lot from that redesign experience. Once I had finished the assembly process, my Quad-Rotor was just plain humming and ready to fly.