

Design and Construction of R.C. Plane

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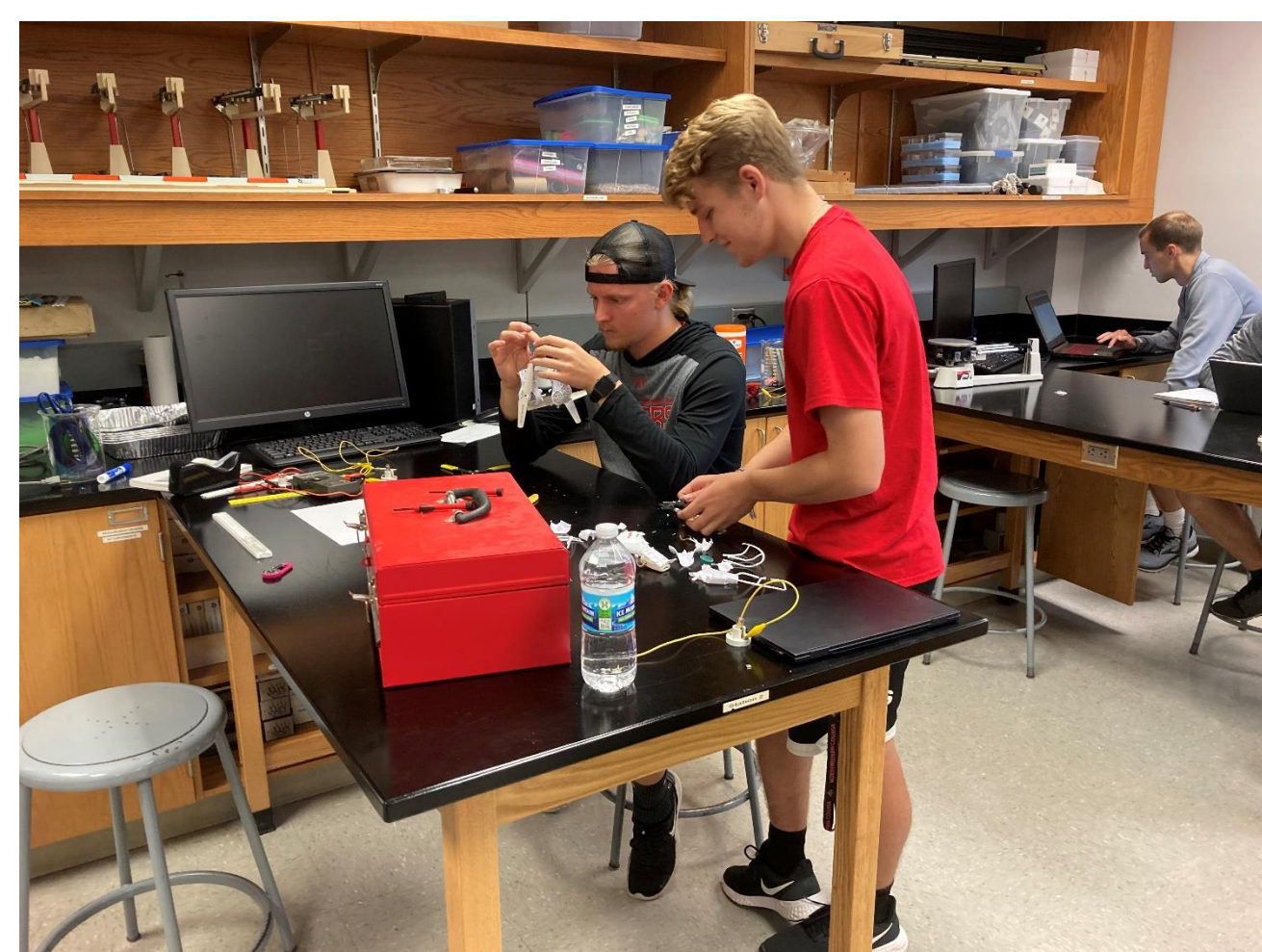
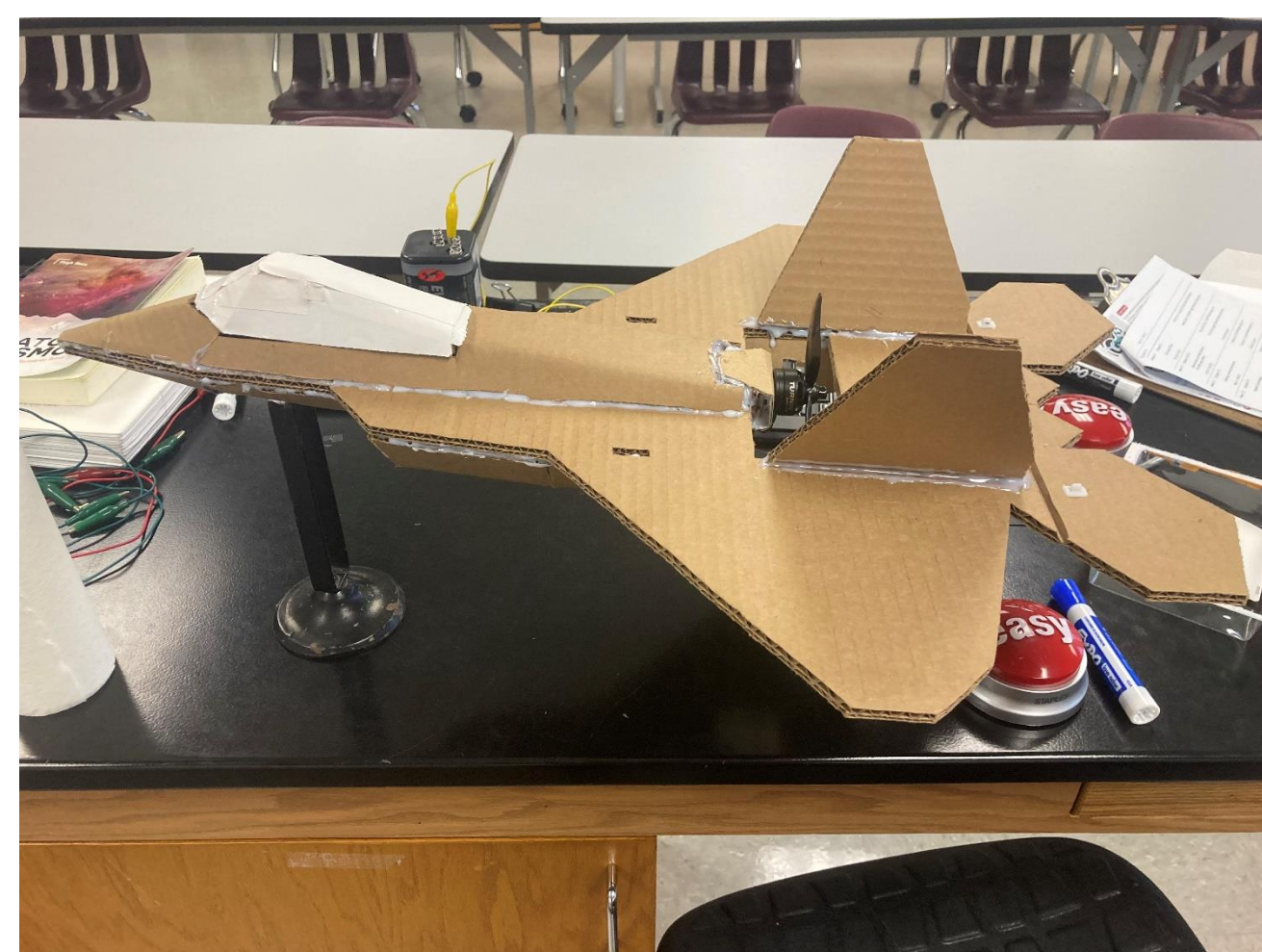
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Abstract

This project was started to help students understand how to conduct a proper research project and to gain a general understanding of circuitry and aerodynamics. As undergraduate students, this was practical information and experience. Our project's goal was to create a functioning airplane made from mainly on-hand pieces. We had to figure out how to improvise and use the resources we had creatively while troubleshooting many problems.

#1 (Final Model)



#2 (Calibrating Steering)



#3 (Dissecting Wiring from Drone)

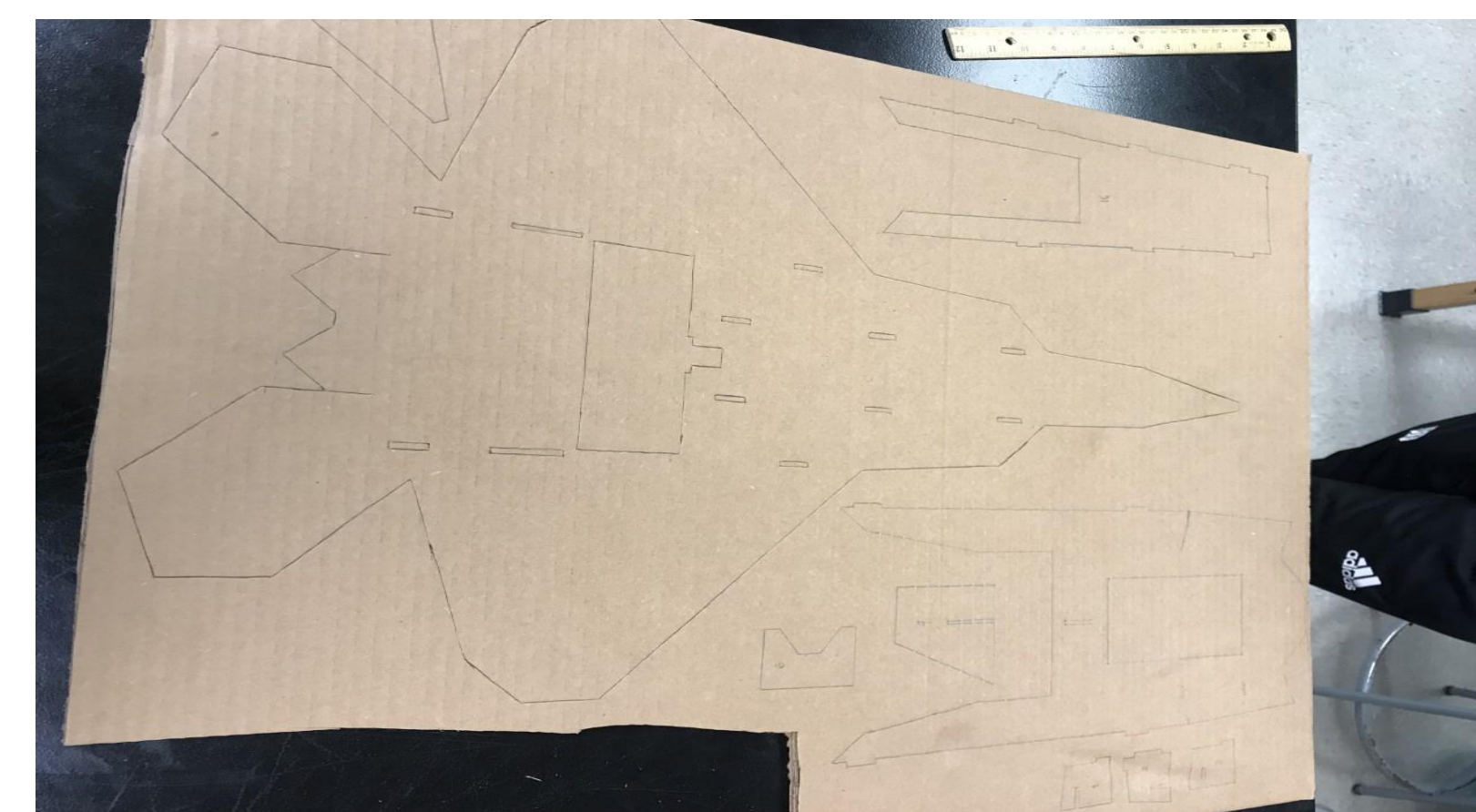
R.C. Vehicles

R.C. vehicles are generally seen as a fun and entertaining way to have fun for a time. Often left unexplained is how they work and what each part of the vehicle does. With most vehicles, we assume they will work without any sense of understanding of how they work. When we talked about circuitry in class, several students were curious about more practical applications and how we could explore the ideas more thoroughly. We proposed an idea to build an R.C. vehicle as a lab project. Our proposal was soon approved, and we could begin working.

Design and Process

1. We ended up finding an airplane design that was relatively simple and cheap while still retaining the educational value. (C #1)
2. We began by tracing the design onto cardboard and cutting the pieces out using razors. (D #1)

#1



3. We had to figure out which wires went together and how they all interacted. (R #3) Some pieces didn't have the proper connection ports, so we had to solder them together. (C #2 & #3)
4. Next, we put everything we had built together using either tape or hot glue. We had to recut some pieces to create the proper shape. (D #2)

#2



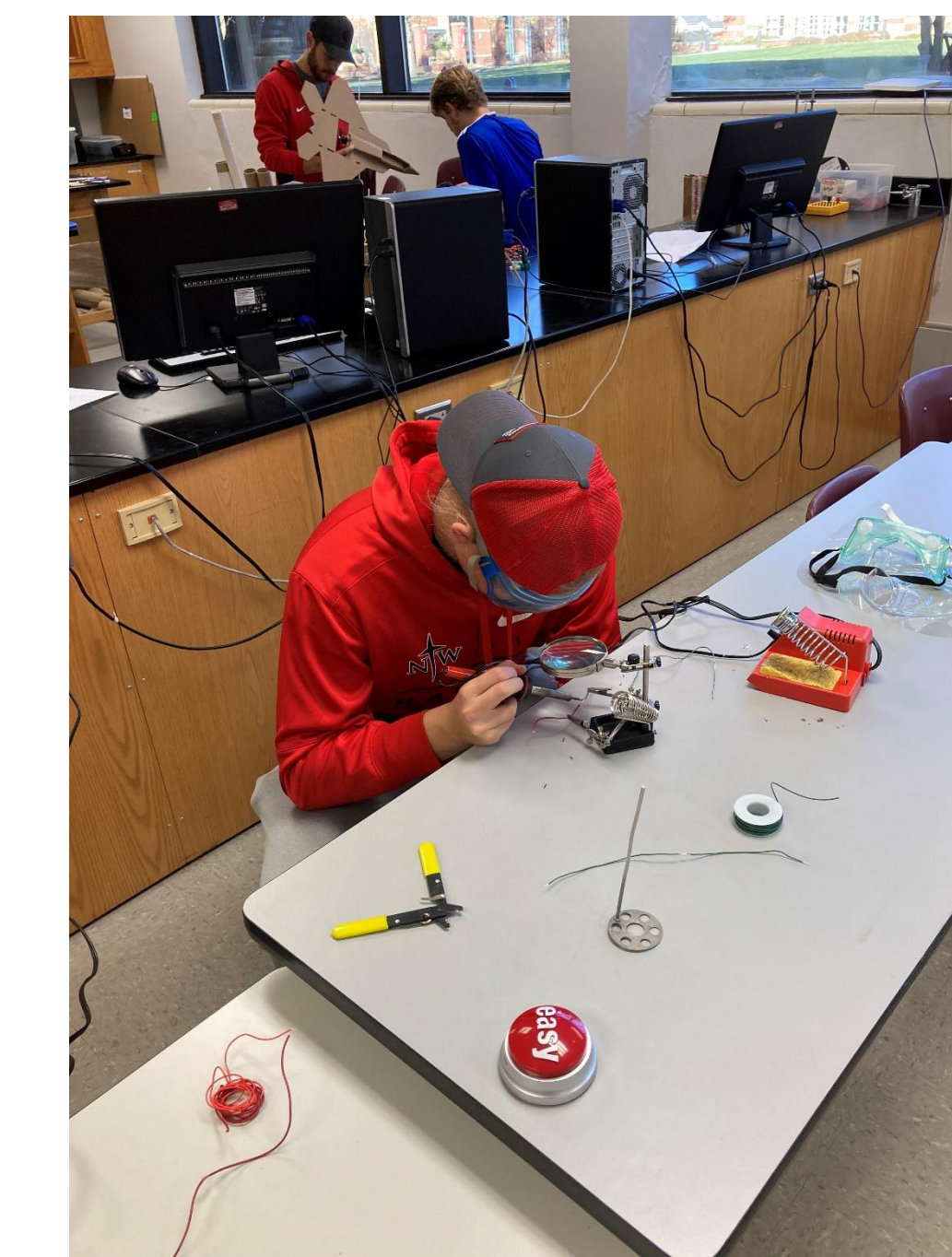
5. Finally, we calibrated the plane's steering and attempted to balance the plane properly. (R #2) This led to our final days of trying to fly the plane.

Results

The project, while interesting and informative to build, was not a particular success on every front. We could make it glide, but controlled flight was a challenge. There were a bunch of small problems that accumulated. For example, the motor we soldered on was slightly burnt out before we even attached it due to a previous testing of its max power output without proper cooling. Another problem was hot glue coming loose on the control bars of the plane. This caused sliding and uneven steering. (F #2) Ultimately the project, even without a fully functioning plane, was a success due to everything that we got to be involved in such as learning circuitry, soldering, and a bunch of troubleshooting techniques.

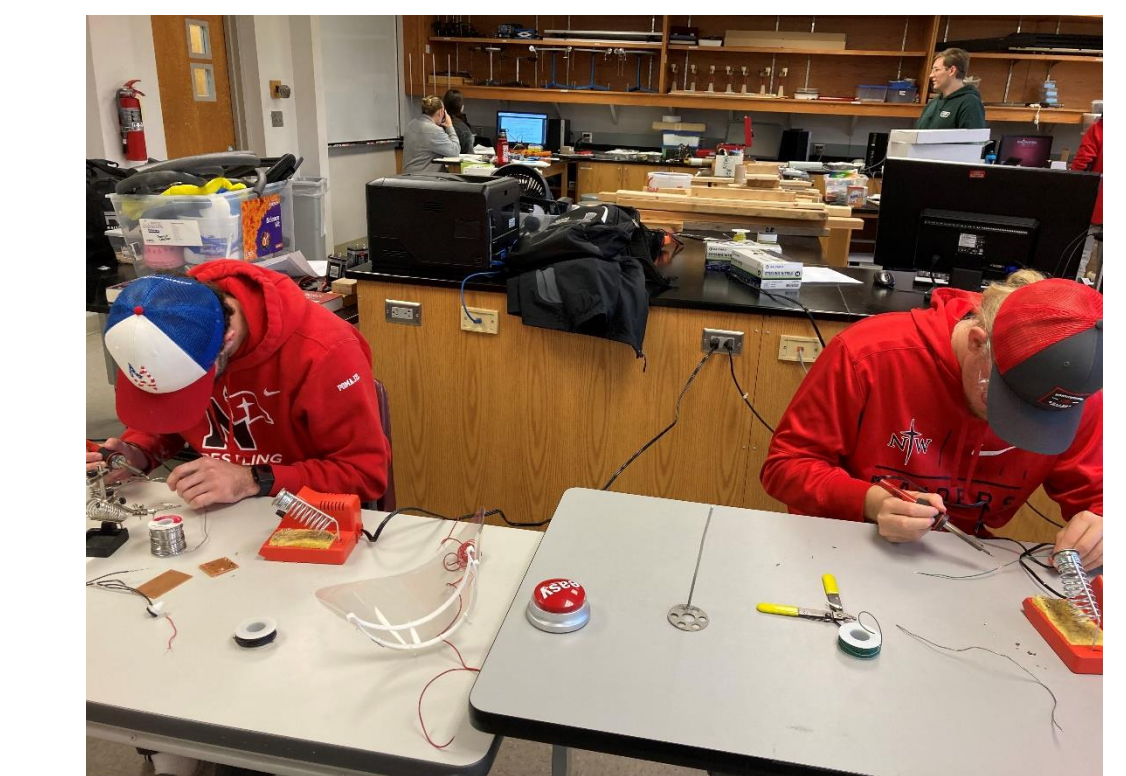
Construction

#1 (Right)



#2 (top)

#3 (right)

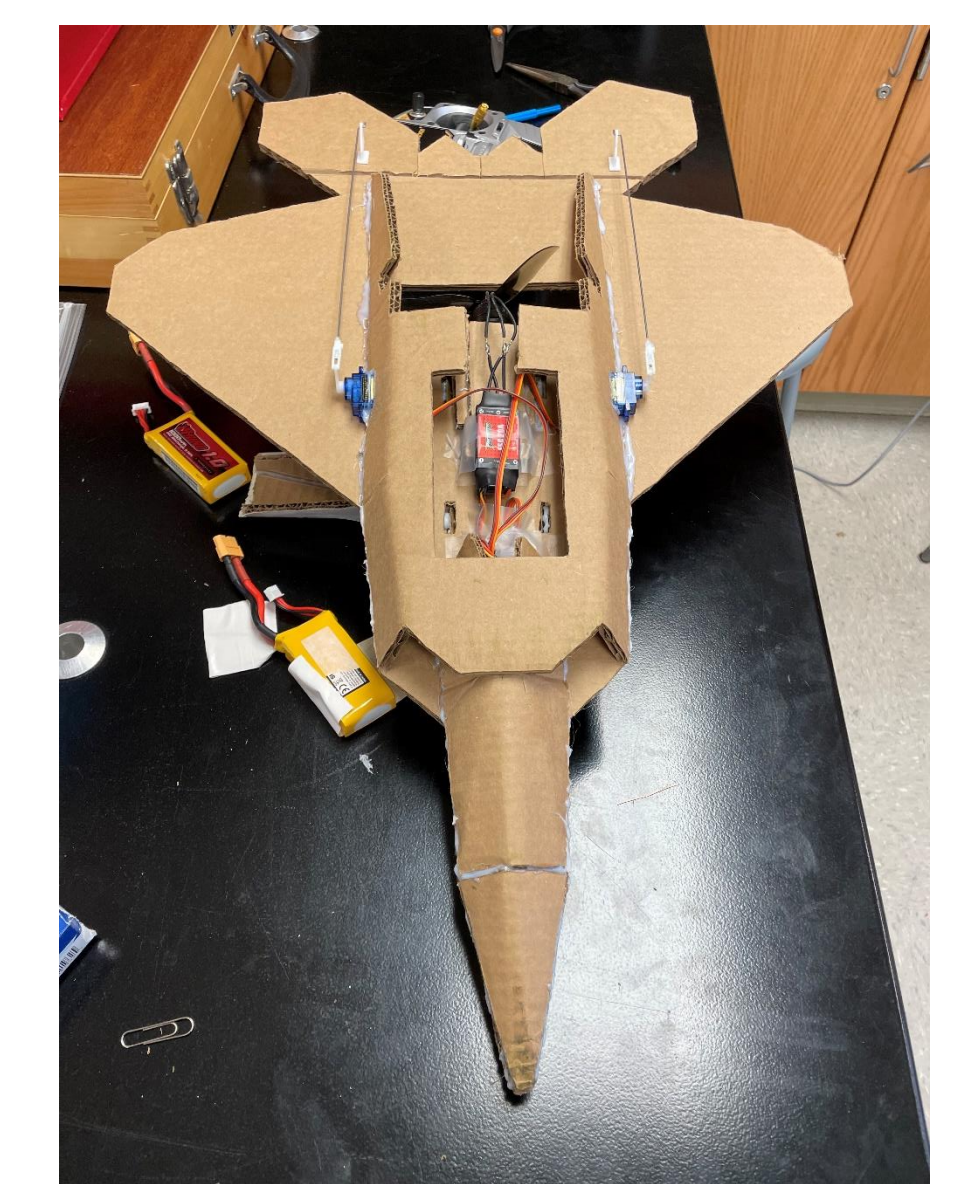


Final Model

#1



#2



Sources

- [1] RCwithAdam. How rc airplanes work (intro to rc electronics for beginners), Aug 2017.
URL: <https://www.youtube.com/watch?v=8-lqNBlaDs&list=PLdsxg126Olncte8w8eGy2ZY4uQkZxnRR&index=4>.
- [2] S-DiY. Cardboard rc airplane diy - f22 raptor, Jan 2021.
URL: <https://www.youtube.com/watch?v=WKkWEIvF-a0&list=PLdsxg126Olncte8w8eGy2ZY4uQkZxnRR&index=2>.