

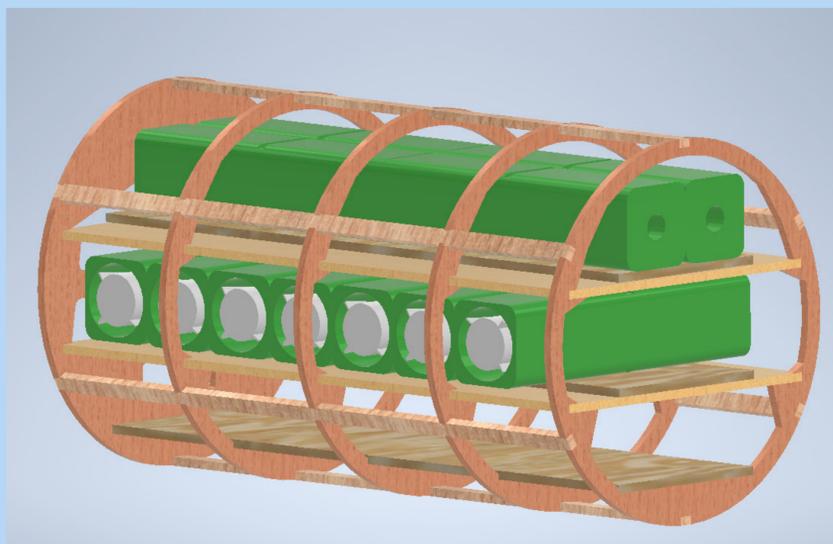
Background and Objective

The principal task of the NMT Aero Competition Team is to design, build, and fly an unmanned aerial vehicle in the AIAA Design/Build/Fly (DBF) 2021 Competition that is capable of carrying cargo as well as deploying and retracting a towed sensor mid-flight.

Due to the on going COVID-19 pandemic, the in-person competition has been moved to a virtual format where the team will submit a brief presentation followed by a demonstration video that includes a technical inspection on the ground as well as take off, landing, and sensor deployment demonstrations.

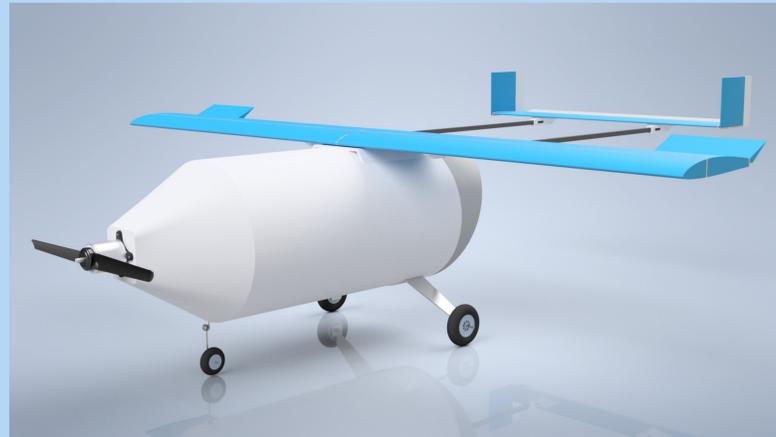
Previous Progress

- The Fuselage, Wing/Tail, and cargo system were developed and tested with CAD software such as Autodesk Inventor and XLF5
- A final design report was submitted to AIAA in February



Cargo hold layout with all eleven containers

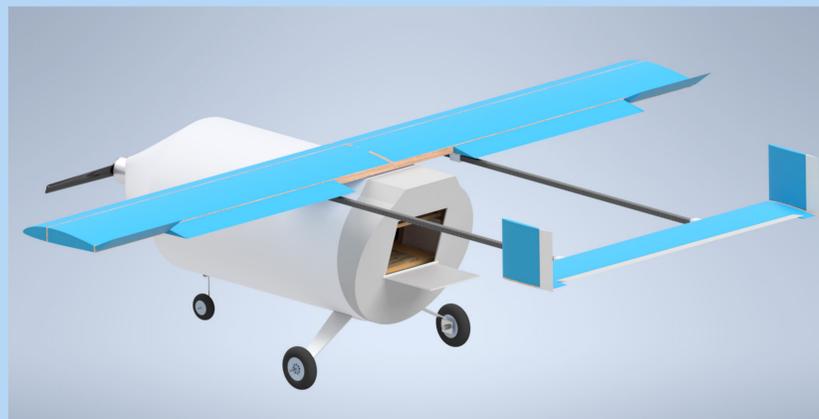
Airplane Design



Render of the final plane design

- **Wingspan:** 60 inches
- **Aspect ratio:** 5
- **Airfoil:** K3311 (smoothed)
- **Cargo capacity:** 11 containers
- **Est. weight loaded:** 14 lbs
- **Est. weight unloaded:** 4.88 lbs

- The fuselage is constructed with a fiberglass outer shell with the cargo-hold built with laser cut foamboard
- The wing and tail are constructed with foam and wood with a Monokote outerlayer
- The containers, towed sensor, awinch are 3D printed with PLA



The rear of the plane with the hatch open for sensor deployment

Manufacturing Progress

Overall, manufacturing has been progressing steadily in time for AIAA's deadline for the virtual competition on April 18th.

- Wing and tail assemblies are almost complete
- Fuselage manufacturing has lagged behind schedule due to shipping delays in getting the necessary materials for the composite, though the mold, and interior cargo hold structure have been built
- The payload has been 3D printed and the construction of the circuitry is underway



The current state of the wing and tail assembly



The mold in which fiberglass will be applied too and the interior cargo structure cut from foamboard