Team ARGOS

Aerospace Engineering Capstone Senior Design 2021-2022

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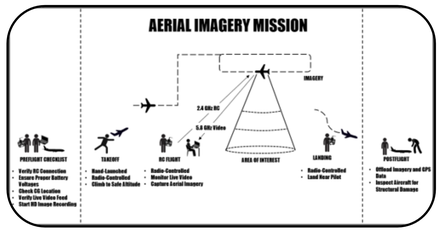
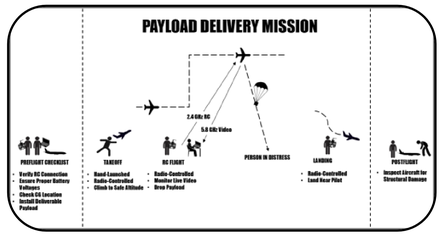
Instructor: Dr. Ewere | Stakeholders: Kevin Gitushi & Michael Hughes| Customer: NC Forestry Service

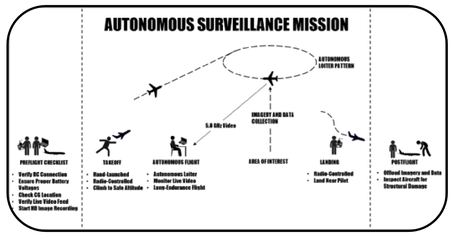
Project Overview



Pictured left is the Concept of Operation for the *Aerial Imagery Mission.* The aircraft is equipped with a standard RGB camera as well as a multi-spectral camera.

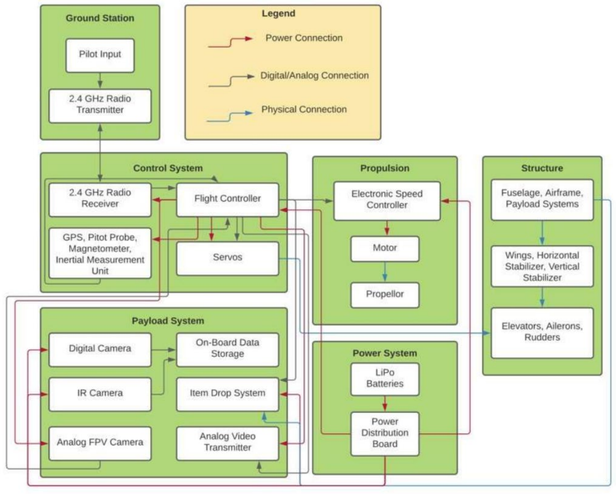
Pictured right is the Concept of Operation for the *Payload Delivery Mission.* The aircraft is equipped with a payload bay that can be open and closed remotely.





Pictured left is the Concept of Operation for the *Autonomous Surveillance Mission.* The aircraft contains a flight controller and GPS that can be programmed to fly a certain path.

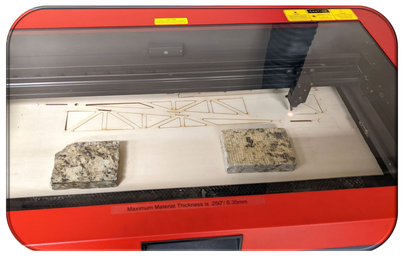
Functional Block Diagram

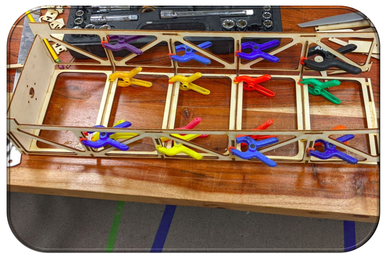


CAD Model

Using Computer Aided Design, Team ARGOS was able to generate renderings and drawings of the aircraft before construction. This was critical for testing and checking for assembly interferences.

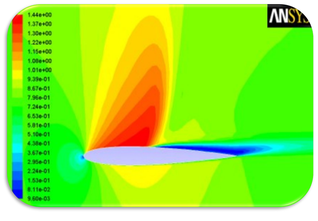
Manufacturing

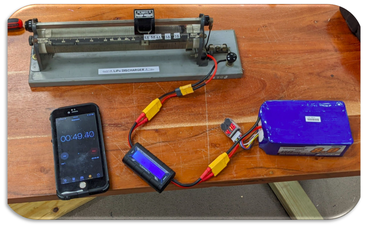


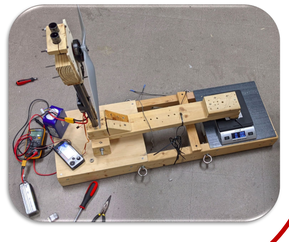


The manufacturing process of the aircraft involved the use of many engineering tools, namely a laser cutter and 3-D printer. As pictured above, all the fuselage, wing, horizontal, and vertical tail pieces were laser cut out of poplar and birch stock.

Verification Testing



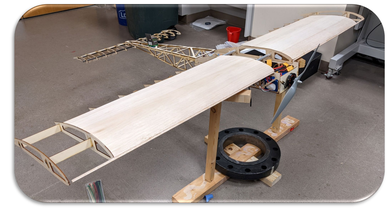




Design Solution

Design Parameter	Value
Wingspan	8 ft
All-Up Weight	8 lbs
Cruise Speed	19.4 kt
Stall Speed	12.6 kt
Wing Loading	0.75 lbs/ft^2
Maximum Thrust	9 lbs
Thrust-to-Weight Ratio	1.125
Endurance	76.5 minutes
Range	19 mi
Payload Volume	374 in^3, 6U

Prototype



Flight Testing