



AAE 451 L3: Hoyer's Angels Presents



THE BANANA SPLIT

Flight Testing Results (Nick)

- Flew Two Successful Test Flights.
- Flight 1: 6 payloads and Flight 2: 29 Payloads.
- Successfully flown with a 432.6g payload (~3.666 medium bananas).
- Flight 1: 0.156 oz/sec score.
- Flight 2: 0.854 oz/sec score.

Lessons Learned (Nick)

- Fast-paced design, build, and test program.
- Iterative testing and validation.
- Pre-flight preparations and procedures.
- Real-world performance versus theory.
- Quickly adapting to setbacks and improving.
- Balancing innovation and practicality.

Aircraft Description & Post-CDR Modifications



Control Surface Mechanisms (Sid)

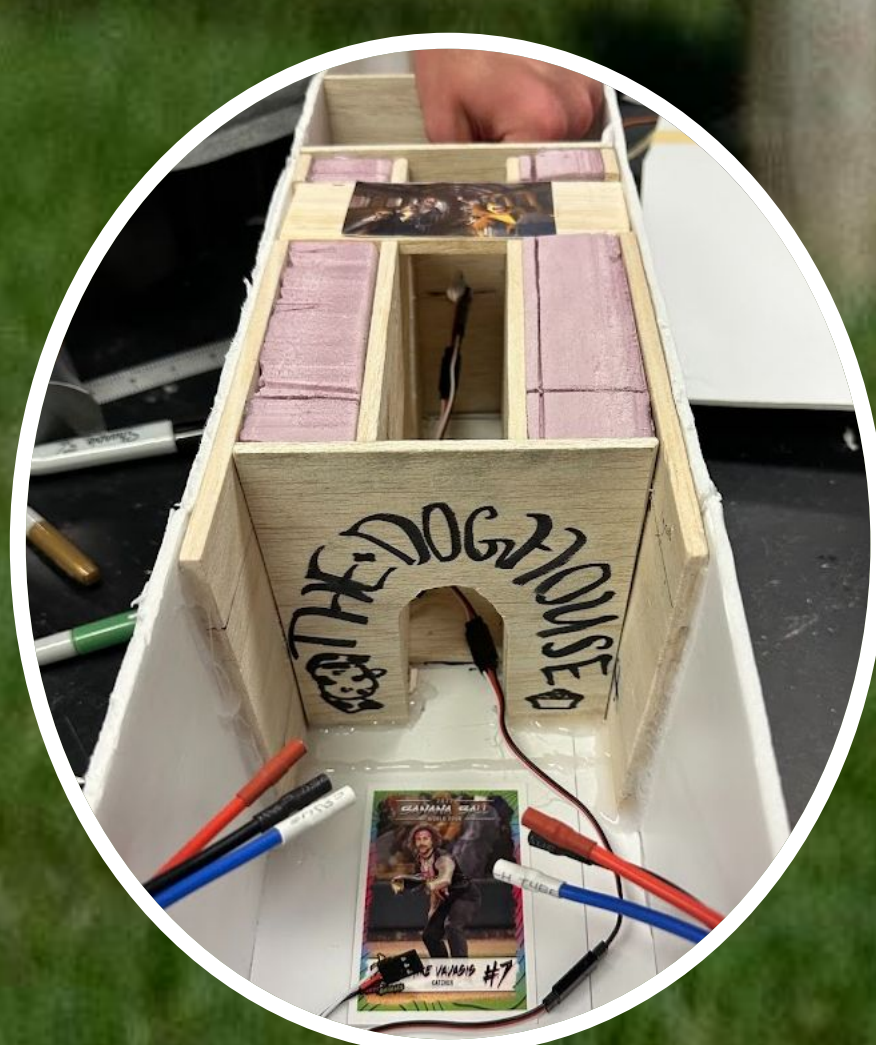
As-Built: Foam control surfaces are pulled by a control horn attached to control rods. Rods were sized based on desired deflection.

Post-CDR Changes: Hinges are plastic inserts rather than dowel rods. Control rod lengths were modified slightly. Control horn dimensions are different than the CAD (due to supplier not providing dimensions).

Nacelles and Propulsion (Megan)

As-Built: 3D Printed PLA mounted on the main wing spar

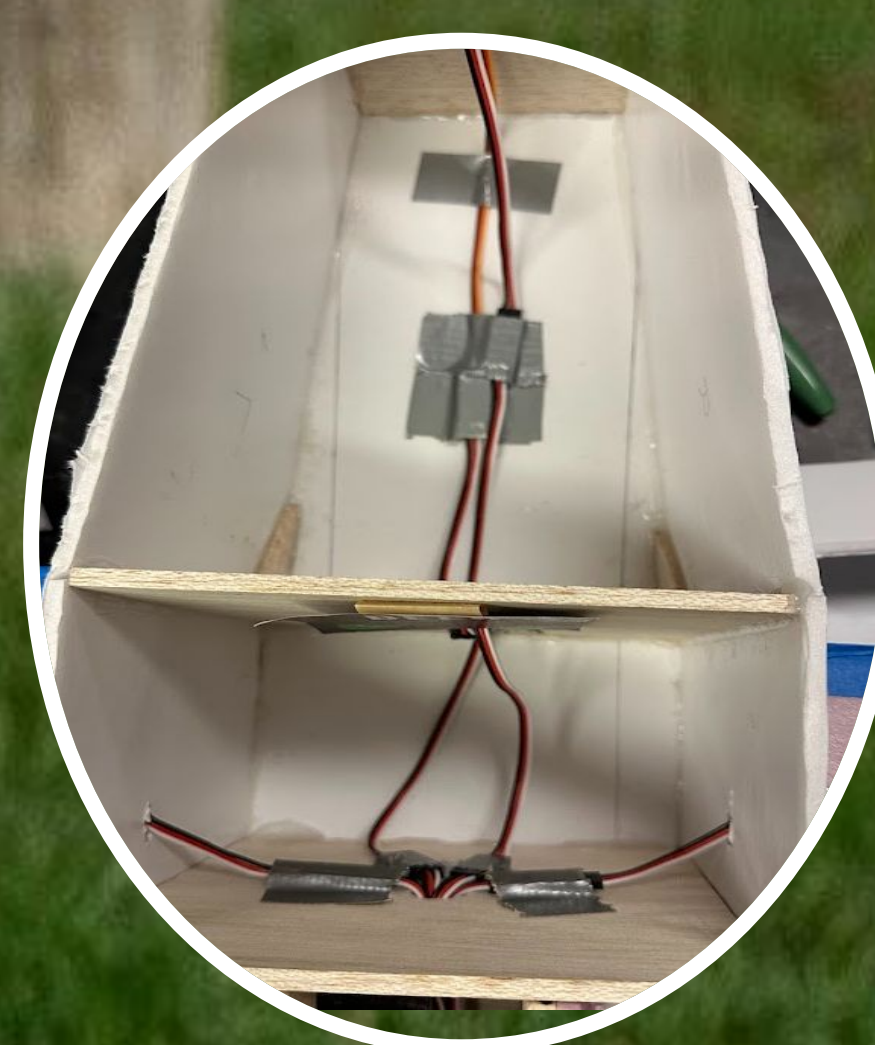
Post-CDR Changes: N/A.



Wing Box (Leean)

As-Built: 4 pieces of balsa support the dihedral spars and are reinforced with additional balsa + foam.

Post-CDR Changes: Balsa dimensions modified (to reinforce fuselage joint). XPS reinforcements were added and the balsa was machined rather than laser-cut. Zip Ties used to secure wing spars instead of pins.



Fuselage Internals (Thalia)

As-Built: Foam board folded into a rectangular fuselage, with holes cut for spars and wiring.

Post-CDR Changes: It was necessary to make the fuselage from 2 discontinuous foam board pieces due to exceeding the dimensions of one sheet.

Rudder and Vertical Stabilizer (Thalia)

As-Built: Foamular XPS 150. Includes two wooden dowels within the vertical tail for attachment and two dowels externally for stability.

Post-CDR Changes: Added diagonal dowel rods to counteract unwanted range of motion. Also added a new structure within the fuselage to retain to vertical stabilizer.

Elevator and Horiz Stabilizer (Alex)

As-Built: Wire-cut XPS 150 foam to the desired airfoil. Additionally cut a flat surface on the bottom of the airfoil to set the horiz stabilizer angle of attack.

Post-CDR Changes: N/A.

Wings (Alex)

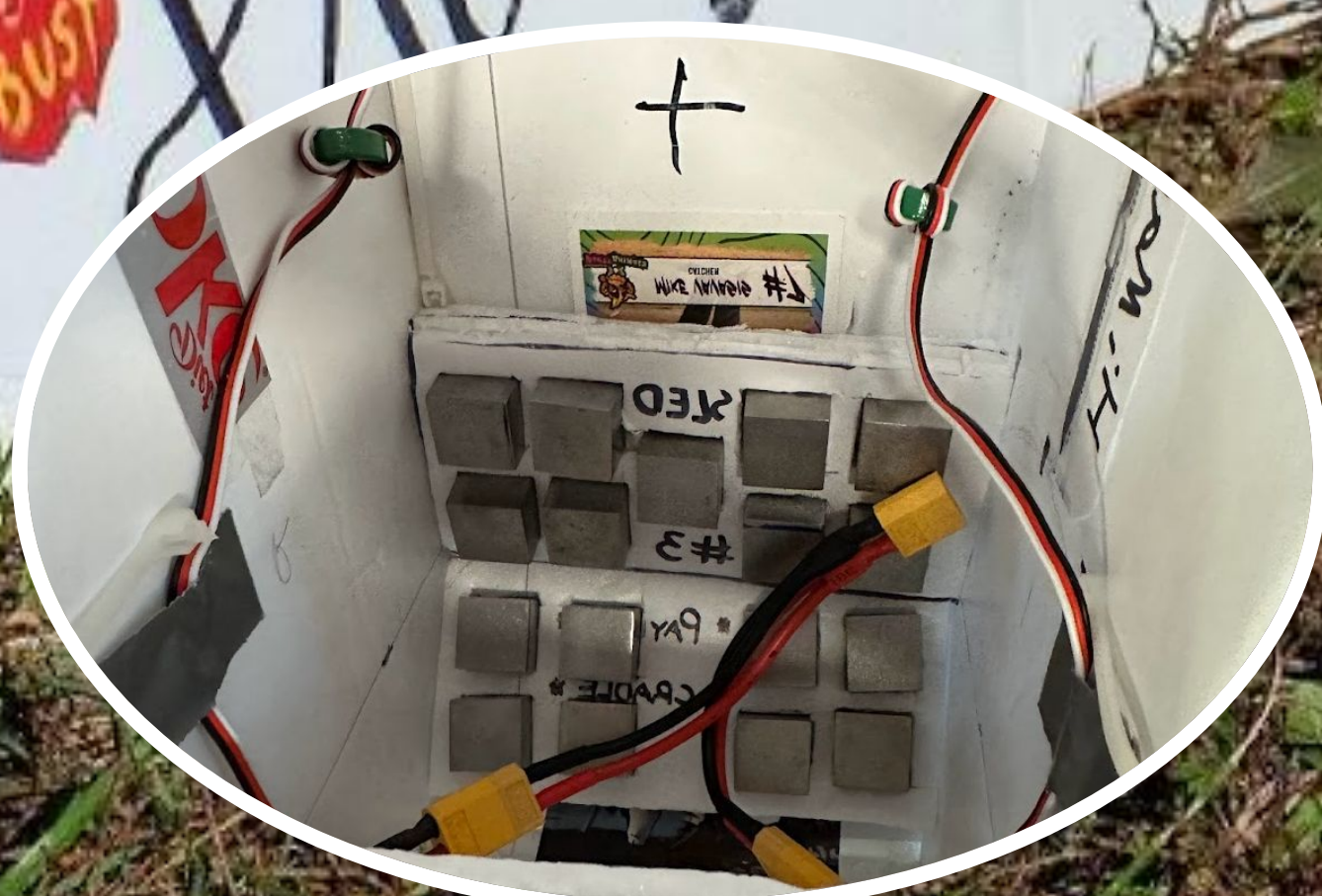
As-Built: Left manually cut on the wire-cutter and right wing auto cut XPS 150

Post-CDR Changes: Wing spars are lesser length due to material delivery delays. Also wingbox spar retention method uses a single zip tie instead of bolts.

ESCs (Dylan)

As-Built: Located on the outside of the fuselage, to allow for cooling.

Post-CDR Changes: N/A.



Nose and Payload Bay (Leean + Thalia)

As-Built: 3x Payload Sleds fitting upto 25 payloads total. 1x Y-splitter to each ESC from the battery.

Post-CDR Changes: Removed the BEC power from 1 ESC to prevent back-current/ground loop issues.