Body Tube – Parachute Bay

Designer: Jonathan Cochran

Function: Containment area for parachute. Connects to nosecone/payload bay with a friction fit. It also connects to Electronics Bay with a coupler. Black powder charge will be located in a bulkhead near the E-Bay to interact with the electronics and eject the parachute.

Design:

- The tube is a shell with a wall thickness of 0.079in (0.2cm), allowing for enough strength while minimizing weight/material.
- The upper section has a friction fit to the nosecone so when the black powder charge goes off the nosecone will pop off and pull out the parachute.
- Four 1/8in thru-holes are located 90deg from each other and 1in from the bottom so the bulkhead/coupler can screw into the body tube.

Dimensions: 24in length, 2.5in inner diameter, 2.658in outer diameter.

Material: Fiberglass-epoxy resin. Selected for high strength to weight ratio and manufacturability.

Mass: 1.156 lbs.

Tools: Power drill, 1/8in drill bit, Screwdriver, 36in Cardboard layup tube

Safety Equipment: Safety glasses, gloves

Manufacturing Plan:

Step	Process Description	Tools	Safety Equipment
1	Elevate layup tube above table and orient fiberglass sheet so it can be rolled around layup tube. Apply epoxy resin to all fiberglass as it is rolled to 8 layers.	Cardboard layup tube	Safety glasses, gloves
2	Drill 4 1/8in holes thru body tube 1in from bottom and 90deg perpendicular to each other	Power drill, 1/8in drill bit	Safety glasses
3	Screw 1/8in bolts thru body tube into threaded holes in bulkhead/coupler part	Screwdriver	N/A

Design Changes

- 1/2/2020: [Design] Added 1/8in thru holes so fasteners could connect the body tube to the E-Bay.
- 1/2/2020: [Tools] Added power drill, drill bit, and screwdriver for thru holes.
- 1/2/2020: [Manufacturing Plan] Added processes to insert thru holes.
- 1/5/2020: [Dimensions] Inner diameter changed from 2.75in to 2.5in for manufacturability. This also affects outer diameter.
- 1/5/2020: [Mass] Dimension changes reduced weight from 1.312 lbs. to 1.156 lbs.