Shell Fabrication
Weight: 2.6 lb

Material:
- Prepreg carbon fiber w/ honeycomb core
- Pre-impregnated resin does not cure at ambient temperatures
- Hold resin at 230°F for 100 minutes to cure
- Honeycomb core between two plys of carbon offers a higher strength to weight ratio than solid carbon laminates alone

Method:
- Male plug constructed out of CNC’d MDF board cross sections
- Plug coated with resin and block sanded to a smooth surface finish
- Two symmetrical female molds made out of molding material
- Molds pulled off of plug and bolted together to form a complete mold
- Carbon plys and honeycomb placed in mold, vacuumed bagged, and cured in home-built oven made from thermo foam and heat lamps

Power System
The power diagram illustrates how each component on the pod receives power and is grounded.

Electronic Components:
- LiPo (Lithium Polymer) battery (red) to power entire pod
- BMS (Battery Management System) to monitor battery health
- Mechanical emergency stop and electronically controlled power MOSFET (yellow) as active safety mechanisms
- 6V and 5V buck converters to convert power for PCB and sensors
- Circuit breaker and fuses (purple) to protect electronics from over-current
- Sensors for detecting current, battery temperature, pod position
- Universal ground plane (gray) to ground all electronics on pod

PCB & Sensors
Custom designed PCB (Printed Circuit Board) block diagram below

Legend
Blue = Computing
Red = Sensor Ports
Purple = Motor Ports
Yellow = Power
Orange = Wireless Ports
Green = Communication Ports