R6500 System Overview
DeSSC Community Meeting

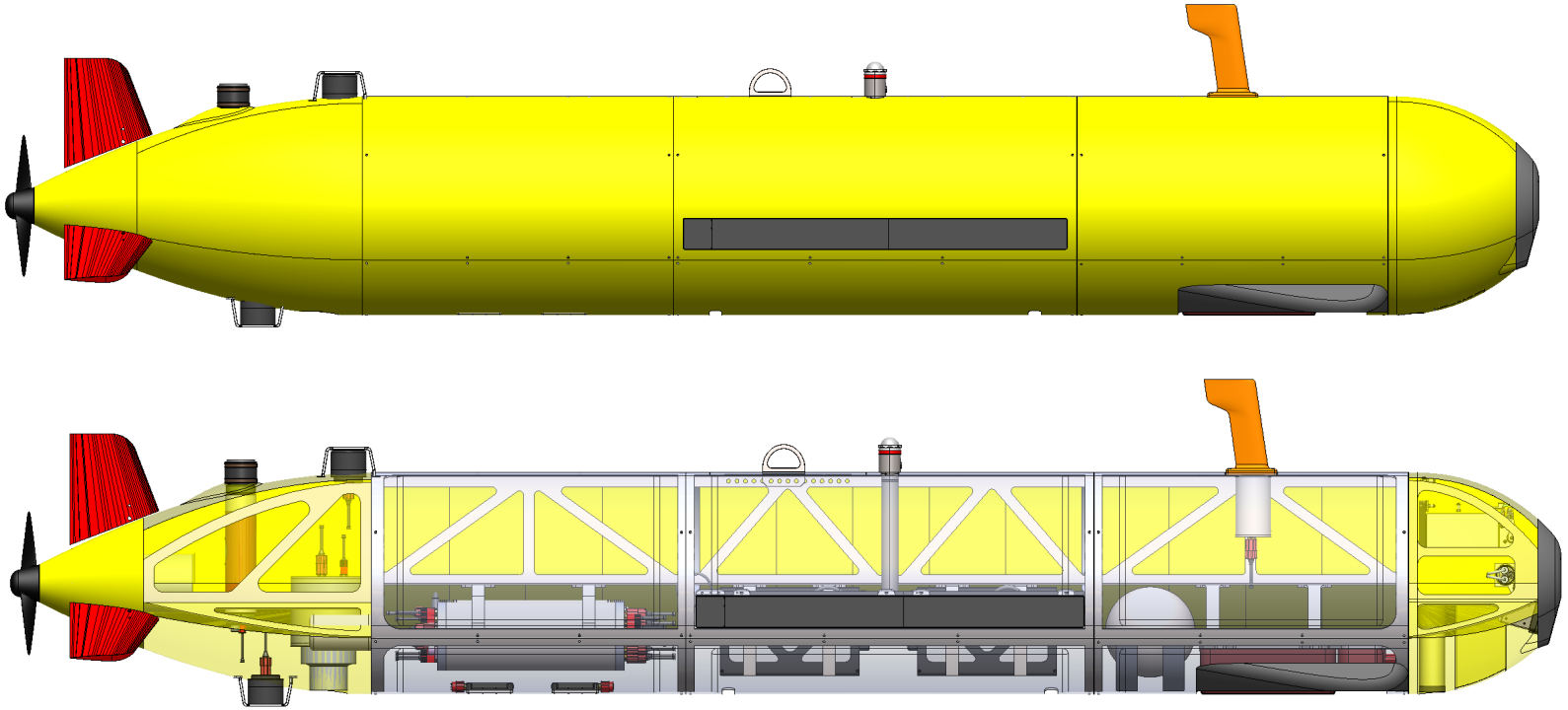
2025-12-14

WOODS HOLE OCEANOGRAPHIC INSTITUTION

OSL OCEANOGRAPHIC SYSTEMS LAB

Office of Naval Research ONR Science & Technology

R6500 General Layout



Propulsion and Maneuvering Section

Nose Launch Recovery Float Ascent Weight

INS/DVL Acoustics

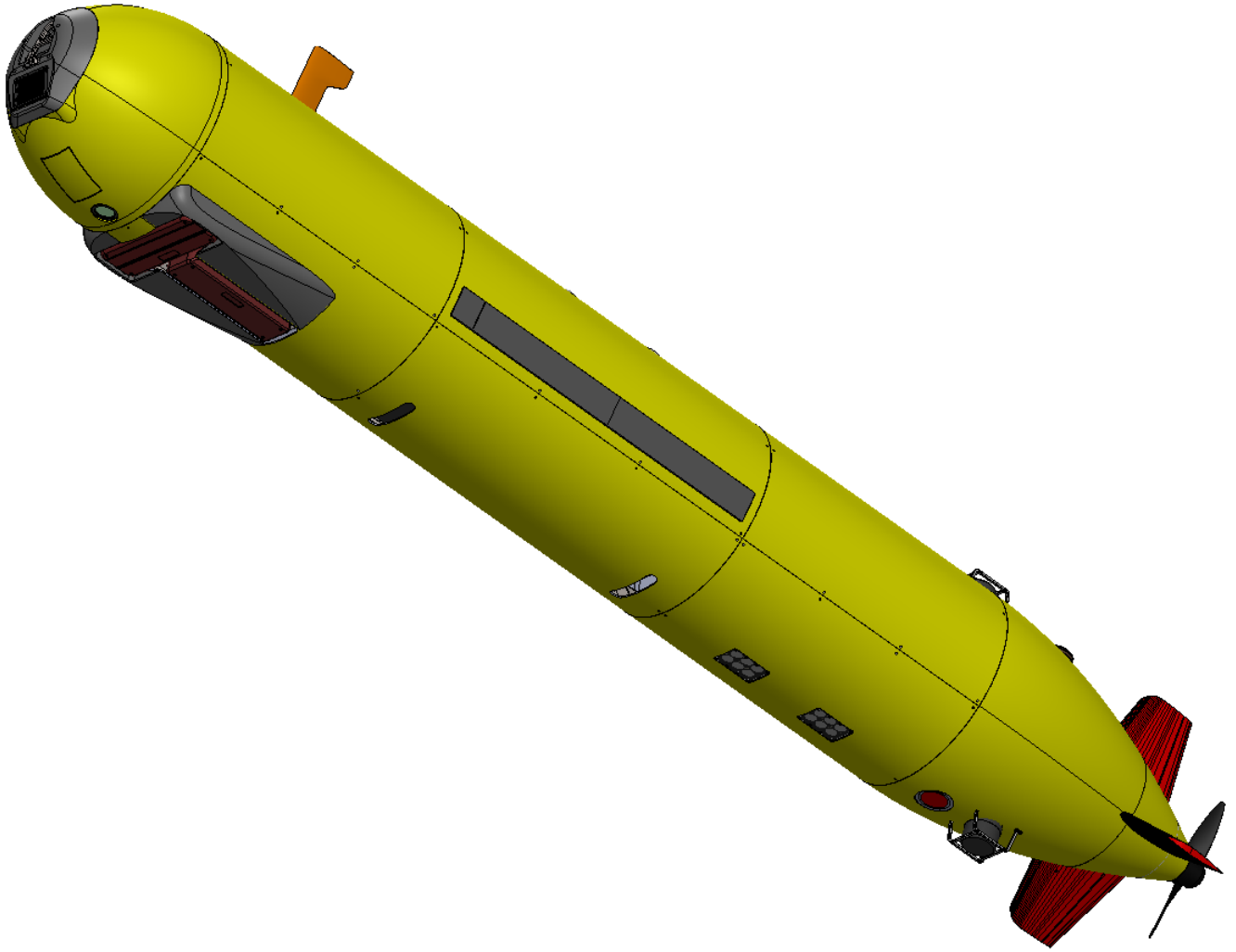
Core Vehicle Electronics

Pressure Tolerant Batteries

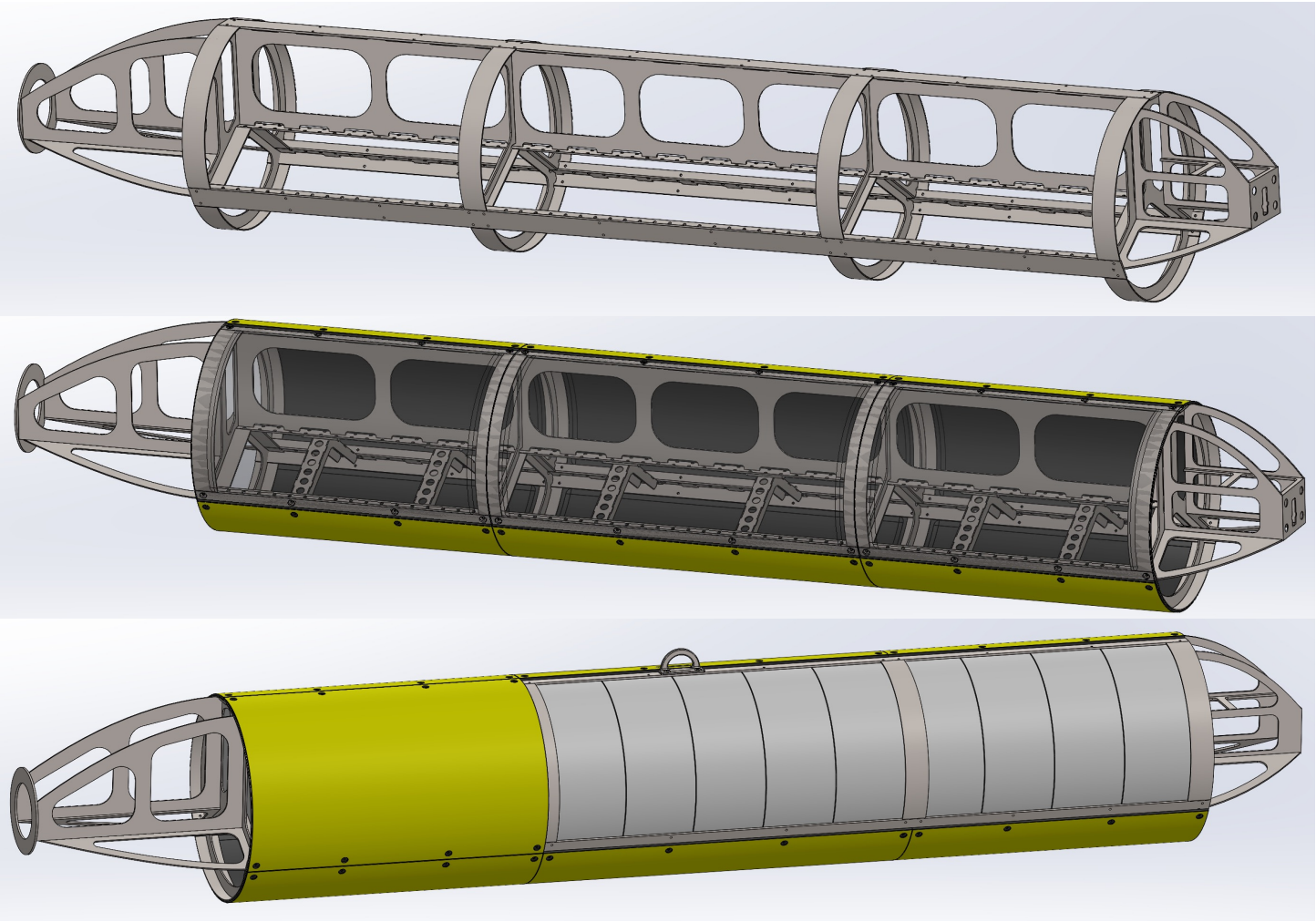
Kraken MinSAS

EM2040 Multibeam OR Payload Bay

R6500 General Layout



Mechanical Structure and Flotation

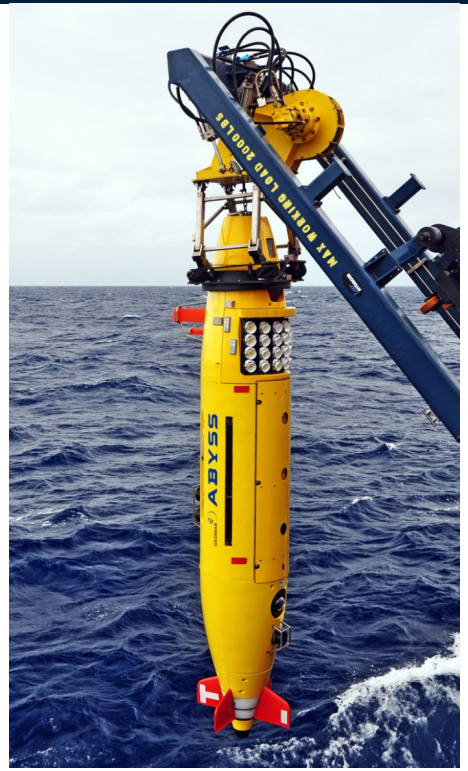


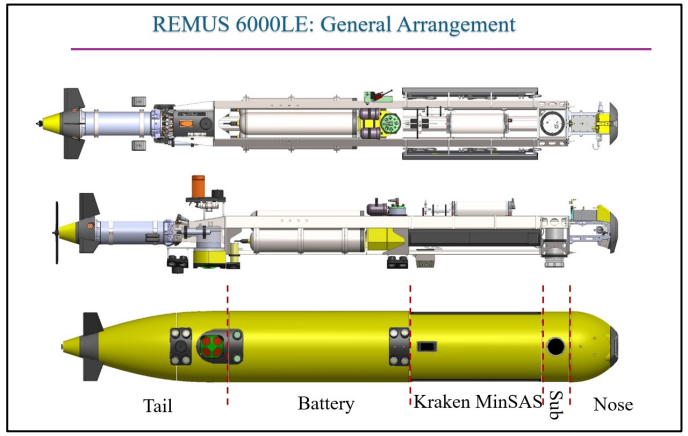
- Welded Ti structure
- Mechanically fastened panels and cross brackets
- Modular syntactic flotation

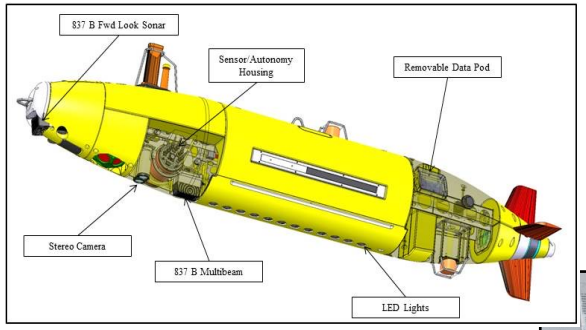
Resident Payloads

Sensor	Manufacturer	Model	Frequency	Altitude	Mission
Side Scan Sonar (SSS)	Edgetech	2205	75-230-540 kHz	5-100m	Broadscale Mapping/Seabed Characterization
Sub-Bottom Profiler (SBP)	Edgetech	2-16	2-16 kHz	10-120m	Seabed Characterization
Synthetic Aperture Sonar (SAS)	Kraken	MINSAS 120	337 kHz	25m	Finescale Mapping
MultiBeam Echo Sounder (MBES)	Kongsberg	EM 2040	400-700 kHz	50m	Bathymetry
Electronic Still Camera (ESC)	WHOI/Sony	???	1 Hz	7m	Identification
Camera Flasher	Arctic Rays	Fusion 6	1 Hz	7m	Identification
Forward Look Sonar (FLS)	Imagenex	837 Delta T	165 kHz	100m	Obstacle Avoidance
Doppler Velocity Logger (DVL)	Nortek	333	333 kHz	375m	Speed over Ground
Inertial Navigation System (INS)	Exail	PHINS C7	N/A	N/A	Inertial Navigation

Survey of AUV Wet Payload Bays







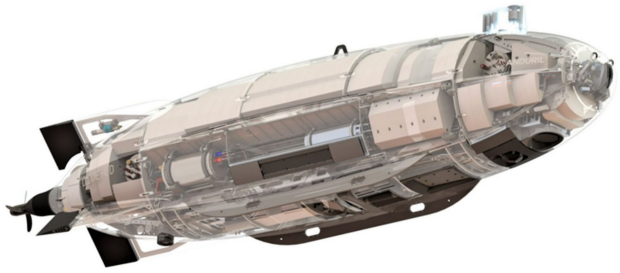


Figure 1. DIVE-LD Geophysical Survey Build

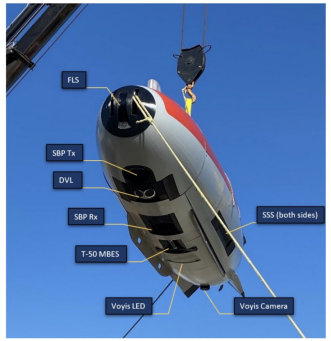
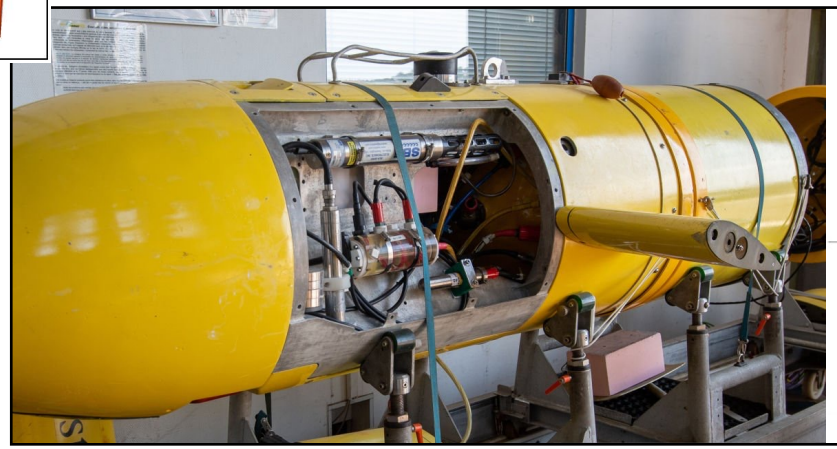
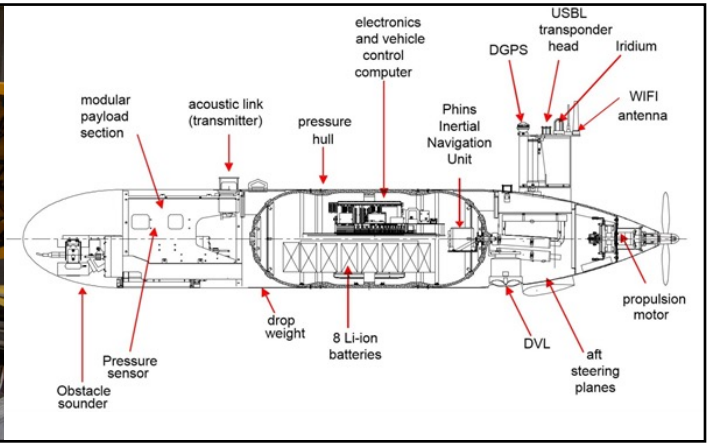


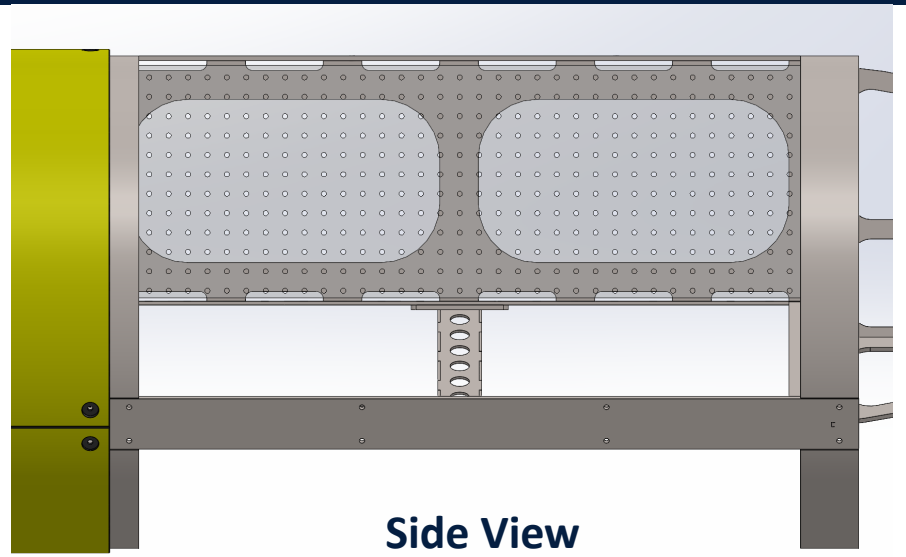
Figure 2. DIVE-LD Geophysical Survey Sensors



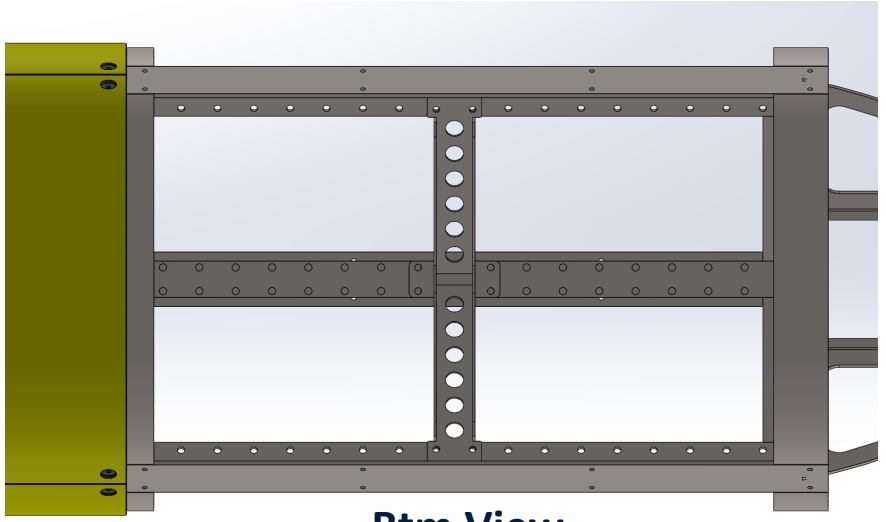


Payload Bay

- Payload bay defined for additional sensors
- Depending on payload, requires dropping EM2040 Multibeam
- 36” long, entire volume can be used
  - Adjustable cross-brackets
  - Can add cutouts in panels
  - Can mount directly to panels
  - Some negotiation required for maintaining floatation
- Three 13-pin Guest Port cables available
  - 20 amp connections to battery power
  - Network to vehicle
  - Leak detect, I/O triggers available

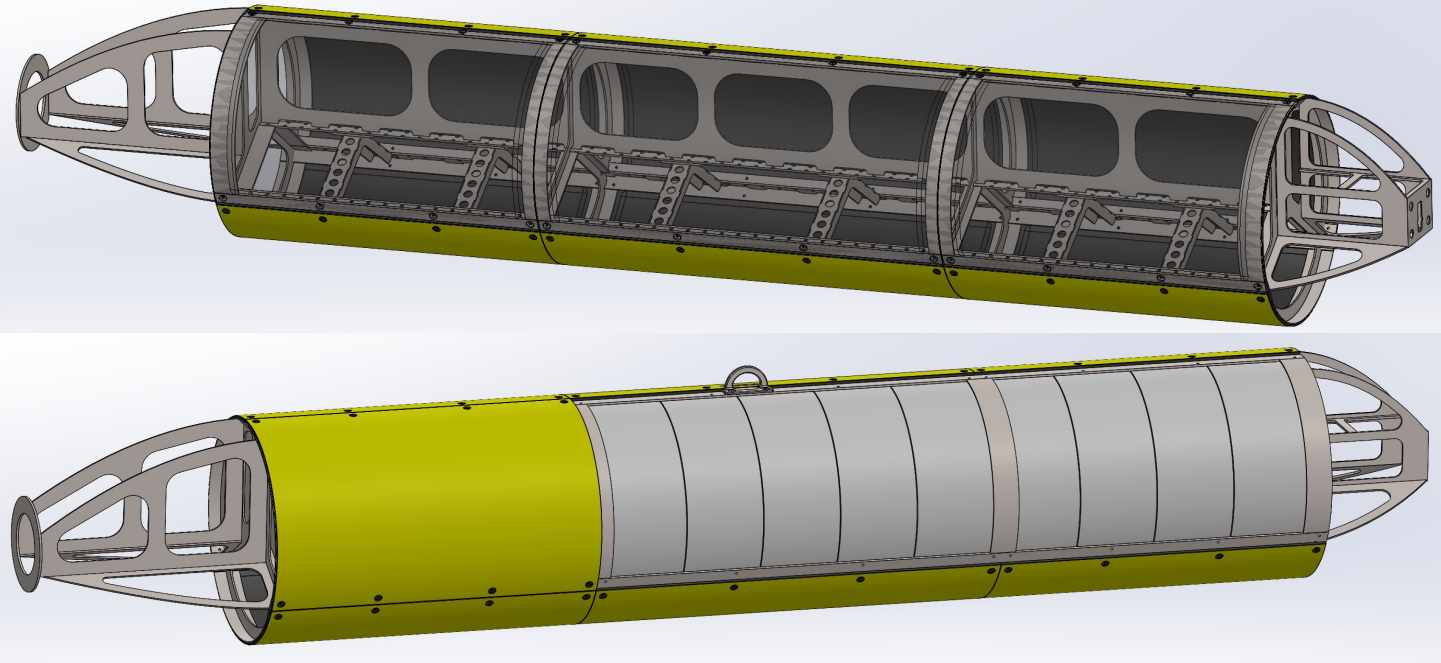


Side View



Btm View

Modular Payload Integration



- Payload sensors can be easily integrated anywhere on the vehicle
- Modular foam can be moved, removed, changed in density
- Center mounting spine, modular brackets
- Modifiable panels that can be drilled or replaced for different payloads
- Payload configurations are field swappable and inexpensive

Payload Examples

- Gulper- in-situ water sampler
- Marker/EPADS- marking or neutralizing targets
- Additional batteries for long endurance