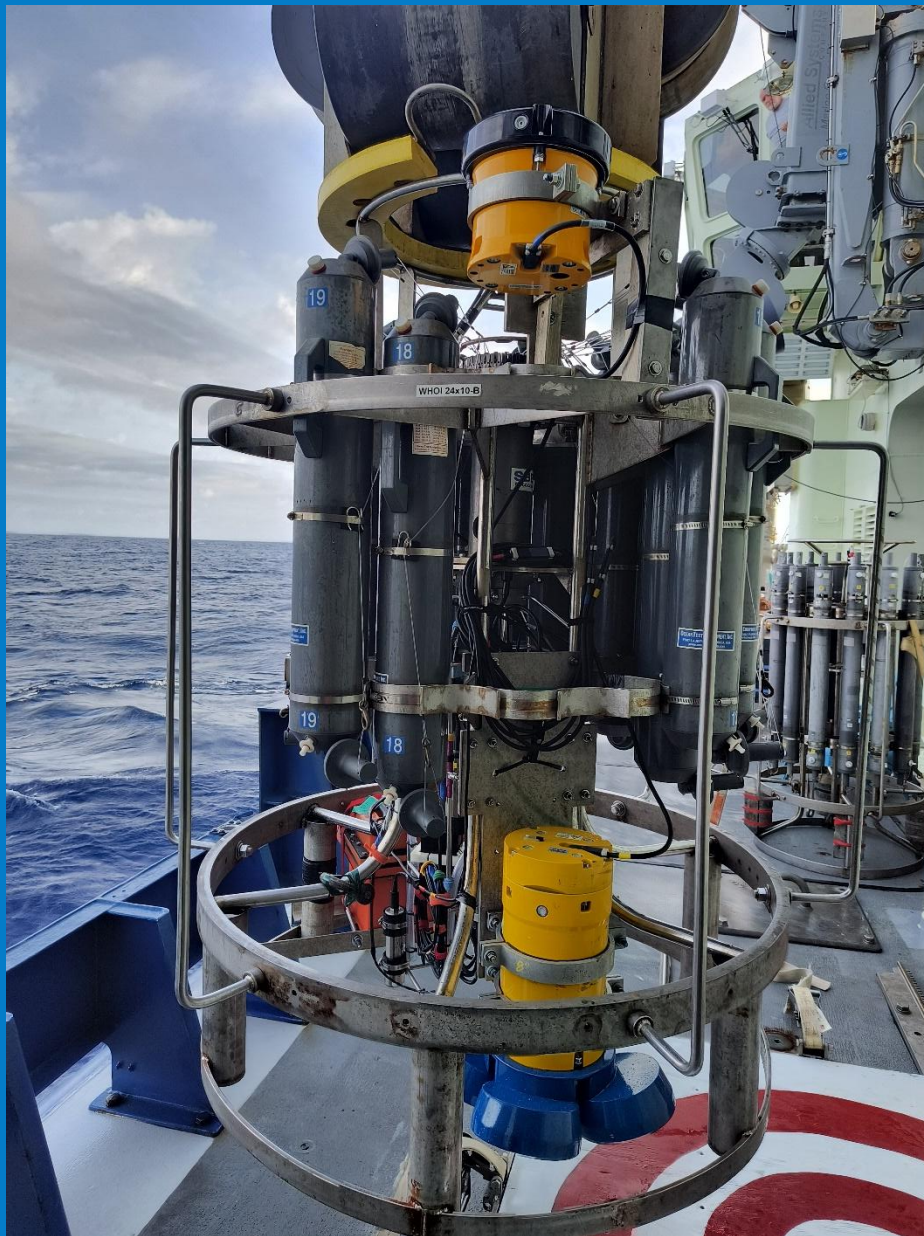




*Current State of LADCP operations at WHOI  
(RVTEC 2023, Honolulu, Hawaii)*

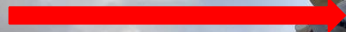
*Daniel J. Torres  
Woods Hole Oceanographic Institution*

# What is LADCP?

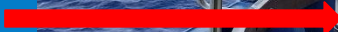


# What is LADCP?

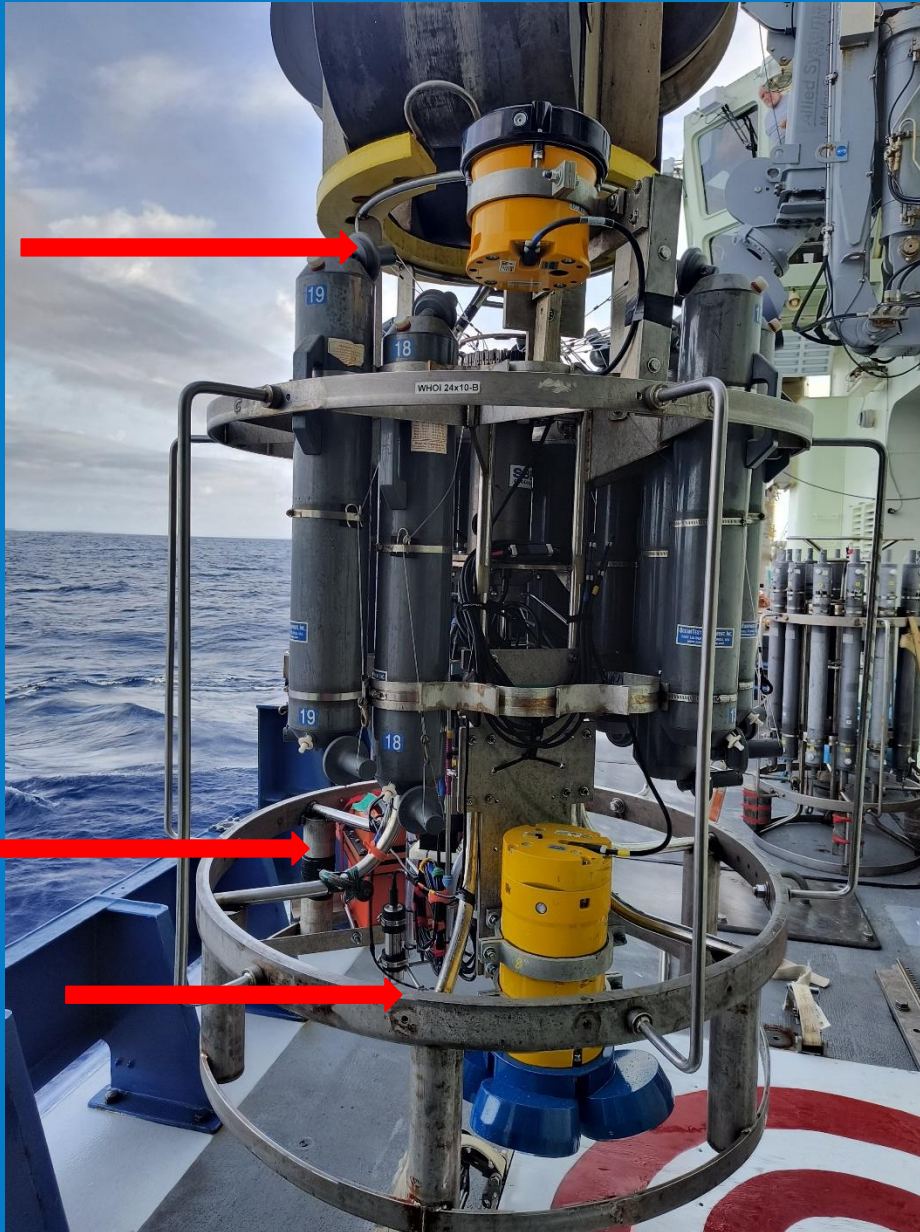
RDI WH300

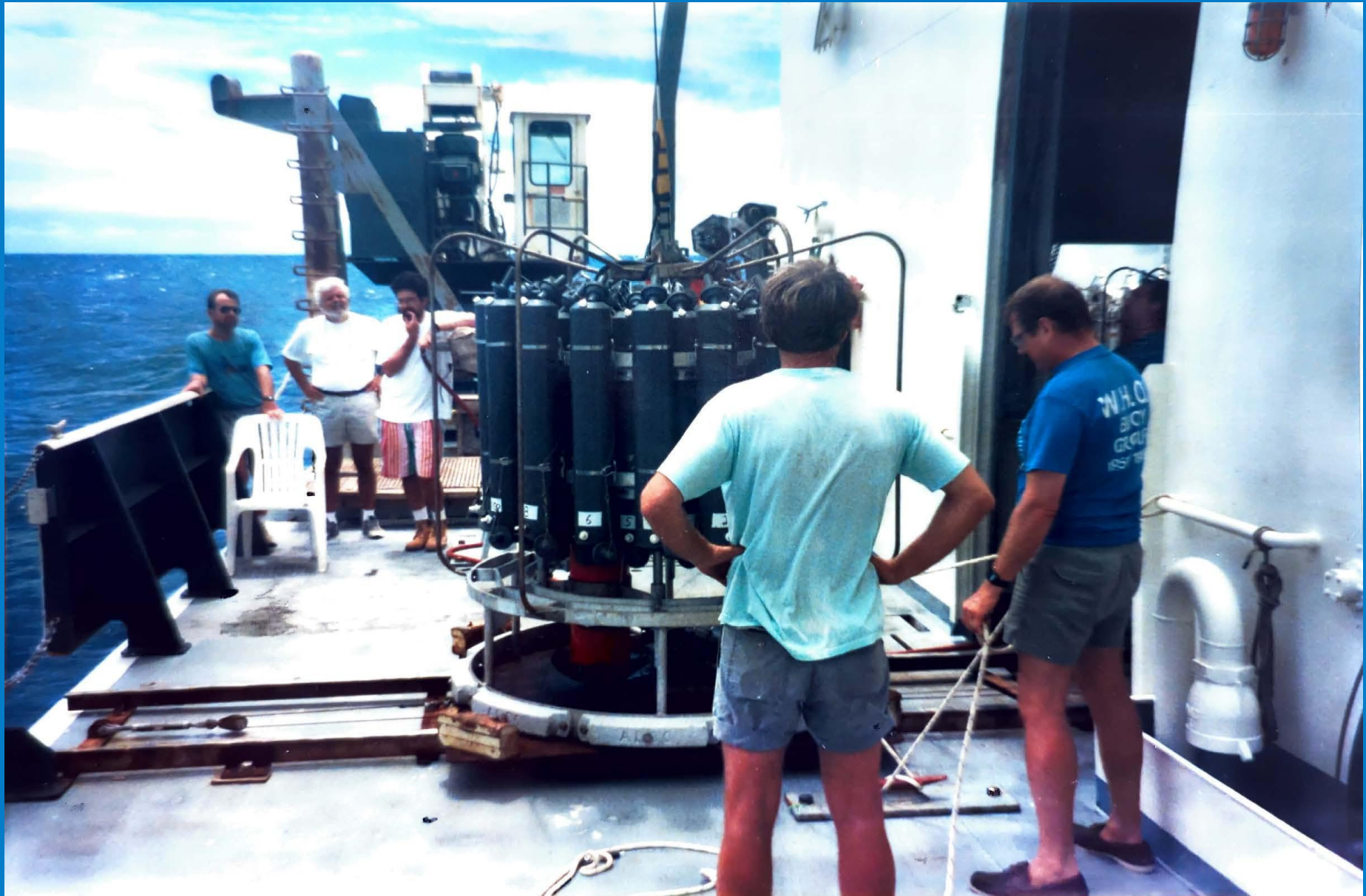


Battery



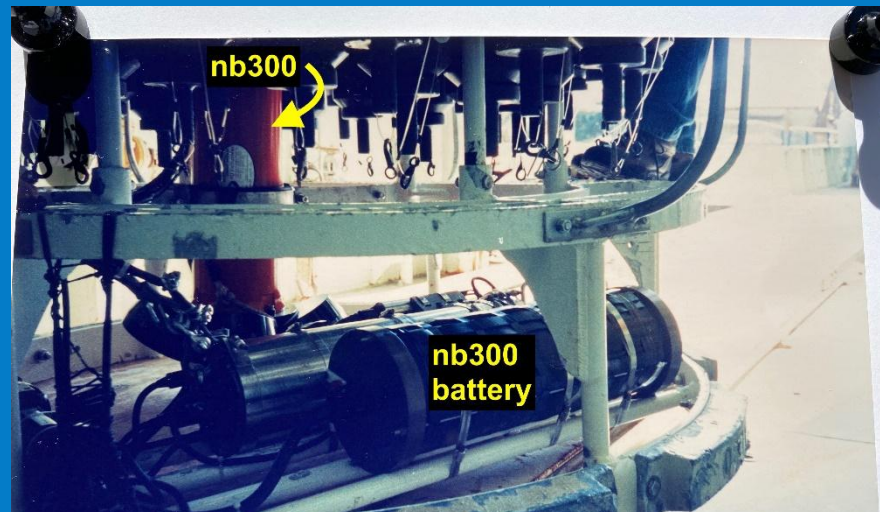
RDI WH150



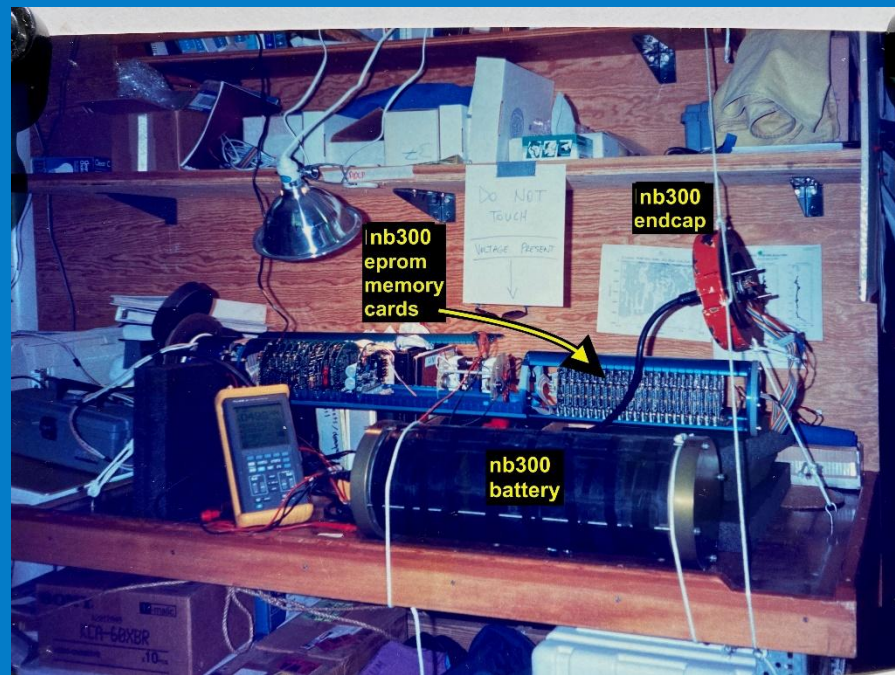




nb300 carried into the main lab to have its eproms erased (every 52 casts)



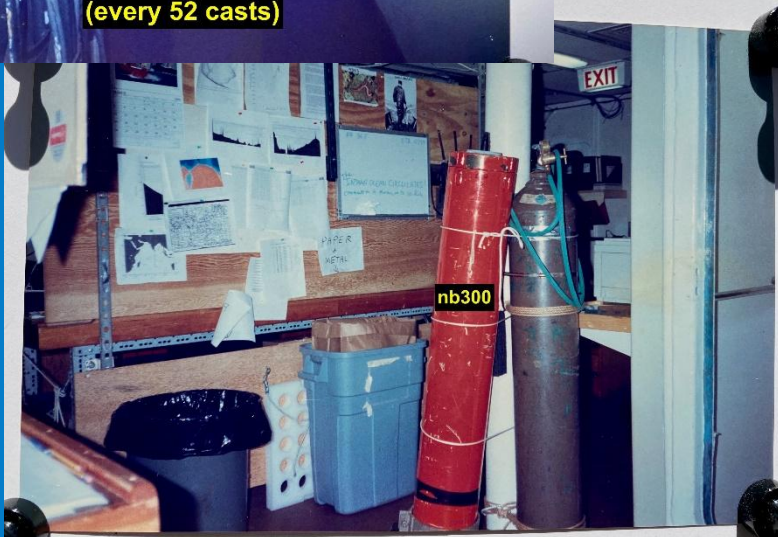
nb300 battery



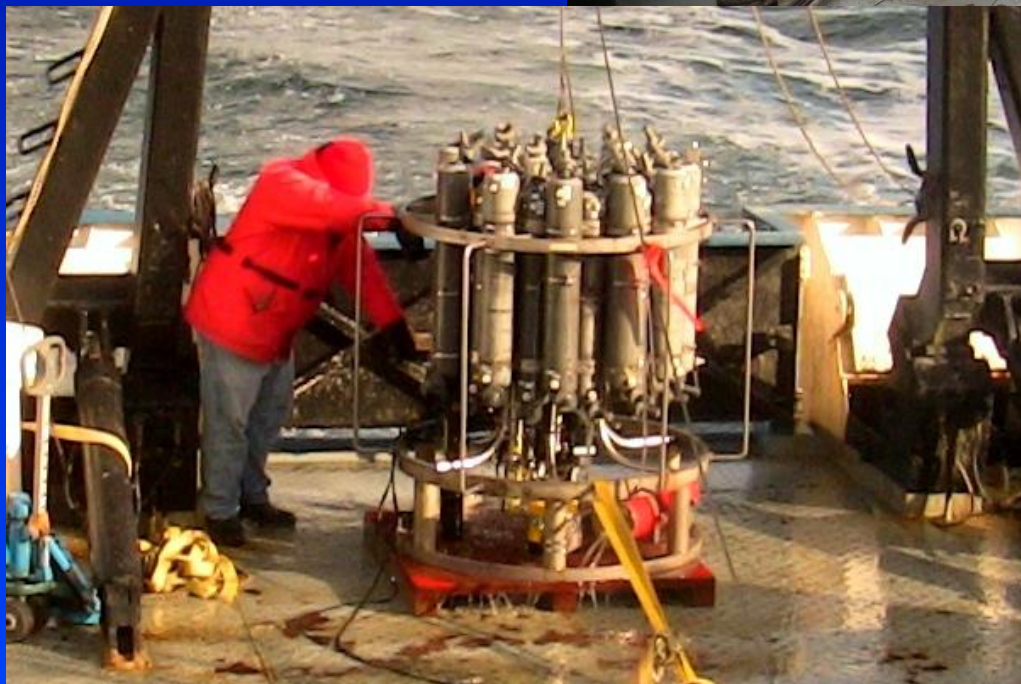
nb300 eprom memory cards

nb300 endcap

nb300 battery



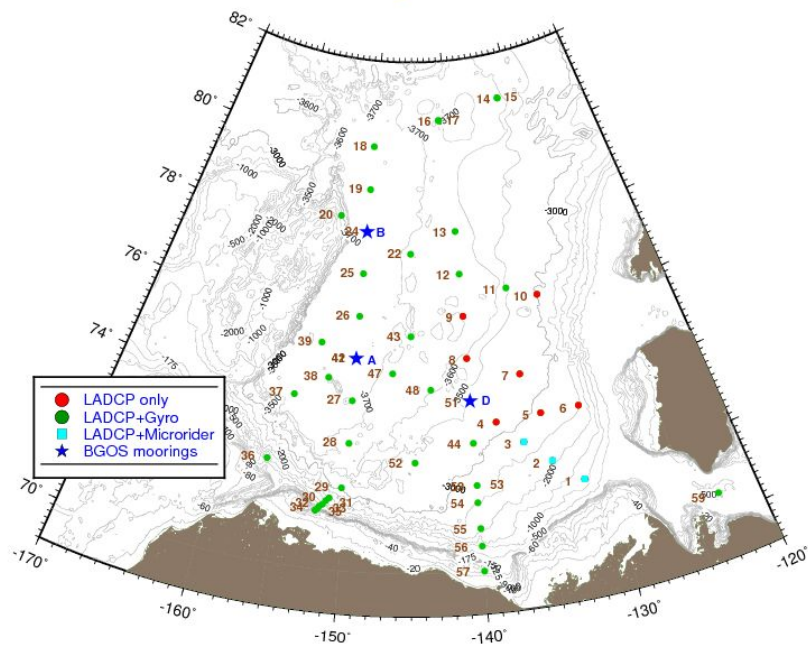
nb300



# Bjarni frame, Iceland, May, 2012

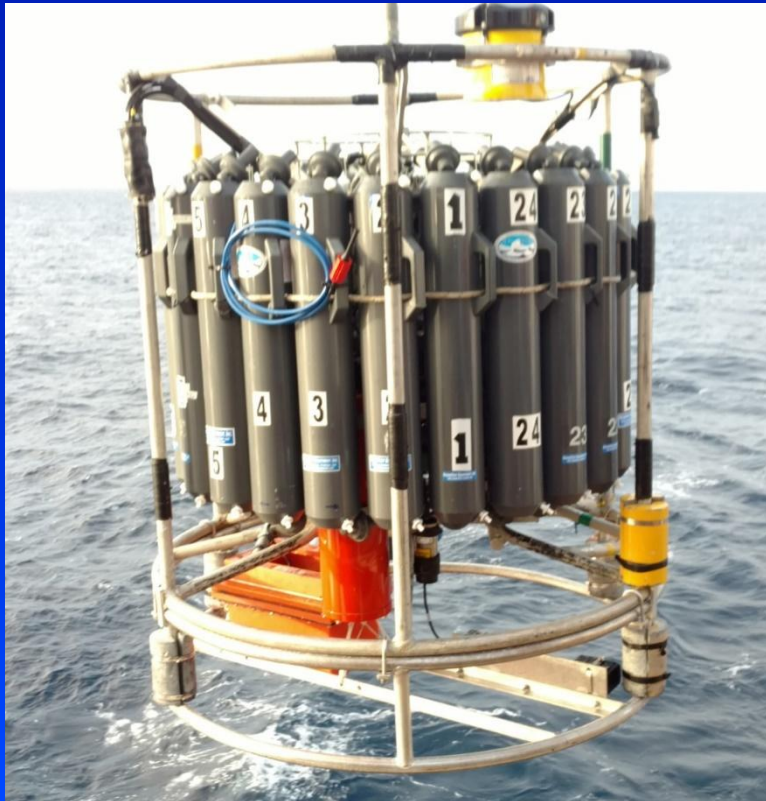


### 2017 Cruise SL1711 Beaufort Gyre Stations





# FOG Logger, SODA, BGOS 2017



# Revelle frame, San Diego, Dec, 2022



# Revelle frame, San Diego, Dec, 2022



# DMB23, Revelle frame, Cape Town, SA, April, 2023





# DSPL Battery

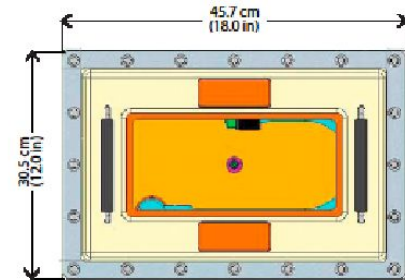
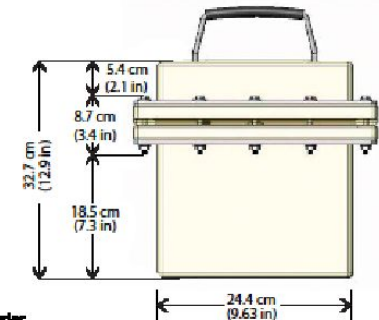
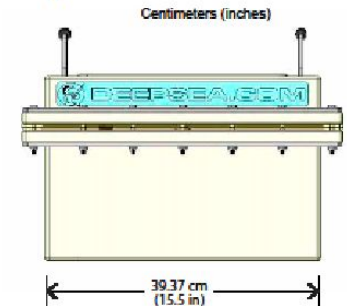
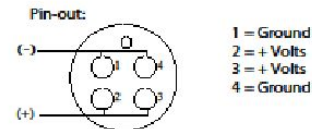
## SeaBattery™ Power Module Specifications

<b>MECHANICAL</b>	
Length:	45.7 cm (18.0 in.)
Width:	30.5 cm (12.0 in.)
Height:	32.7 cm (12.9 in.)
Weight in Air:	
SB-6/174:	48.2 kg (106 lbs.)
SB-12/80:	49.0 kg (108 lbs.)
SB-24/40:	49.0 kg (108 lbs.)
SB-48/18:	49.0 kg (108 lbs.)
Weight in Water:	
SB-6/174:	18.2 kg (40 lbs.)
SB-12/80:	19.1 kg (42 lbs.)
SB-24/40:	19.1 kg (42 lbs.)
SB-48/18:	19.1 kg (42 lbs.)
Case:	Molded Polyethylene
Diaphragm:	Molded Polyether Urethane
Compensating Fluid:	Inert oil

<b>ENVIRONMENTAL</b>	
Depth:	11,000m
Temperature Range:	
Charge:	-15 C to 50 C (5 F to 122 F)
Discharge:	-20 C to 60 C (-4 F to 140 F)

<b>ELECTRICAL</b>	
<b>Standard Configurations (nominal)</b>	
SB-6/174:	6 volt, 174 amp hour
SB-12/80:	12 volt, 80 amp hour
SB-24/40:	24 volt, 40 amp hour
SB-48/18:	48 volt, 18 amp hour
<b>Other Configurations: Available upon special order</b>	
Maximum Discharge Rate:	16 Amps (limited by gauge of cable)

Connector: Right angle diaphragm penetrator on 2-meter cable terminated with IL4FS connector



Box is rotationally molded. Dimensions are Max, but not precise.

Specifications subject to change without notice



DeepSea Power & Light ■ 4033 Ruffin Road ■ San Diego, CA 92123 USA ■ TEL (858) 576-1281 ■ FAX (858) 576-0219

www.deepsea.com ■ info@deepsea.com

DSPL ENG 730-001  
rev: 08/27/09

- 108 lbs
- 18" x 12" x 13 inches
- 48V/18 Amp Hour



# SeaSafe Direct Battery



- 17.5 lbs
- 10" x 8" x 2.9 inches
- 37V/28 Amp Hour

## SWE SeaSafe Direct® 37V 28Ah 10Amp Subsea Battery Module Datasheet SWE #46793728.3402



### Specifications

Max State of Charge-Standard – 93% SOC

#### Output Voltage

- 37.0 V - Nominal
- 40.0 V - Max
- 33.0 V - Min

#### Capacity @ 93% SOC:

- 28 Ah – Nominal @ 83% SOC
- 1036 Wh – Nominal @ 93% SOC

#### CC/CV Charge Voltage Setting:

- 41.0 V - Suggested
- 42.0 V - Max
- -0.3 V - Min

#### Communication Supply Voltage:

- 3.0 V - Nominal
- 6.0 V - Max
- -0.2 V - Min

#### Operating Current:

- Discharge
  - 1.0 A – Max (Continuous)
  - 12 A – Max (30 second pulse)
  - 31.2 A – Max (1 second pulse)
  - 54 A – Max (60 μs pulse)
- Charge
  - 8 A – Suggested-Normal Temp
  - 10 A – Max-Normal Temp
  - 9 A – Max if <= 10 °C Low Temp
  - 0 A – Max if <= 0 °C Low Temp

#### Operating Temperature:

- Charge
  - >= 10 °C to <= 45 °C Normal Temp.
  - <= 10 °C – Low temp <=9A rate req.
  - <= 0 °C – NO Charge
- Discharge
  - -20 °C to 60 °C
- Storage
  - -40 °C to 60 °C

#### Module Dimensions:

- Height: 10.0 ± 0.1 in
- Length: 8.0 ± 0.1 in
- Width: 2.9 ± 0.1 in

#### Module Weight:

- AIR = 17.5 lbs. (7.9 kg) ±0.2 lbs Max
- WATER = 8.0 lbs. (3.5 kg) ±0.2 lbs Max

#### Life Cycle:

- 1000+ (Then 80% Original Capacity)

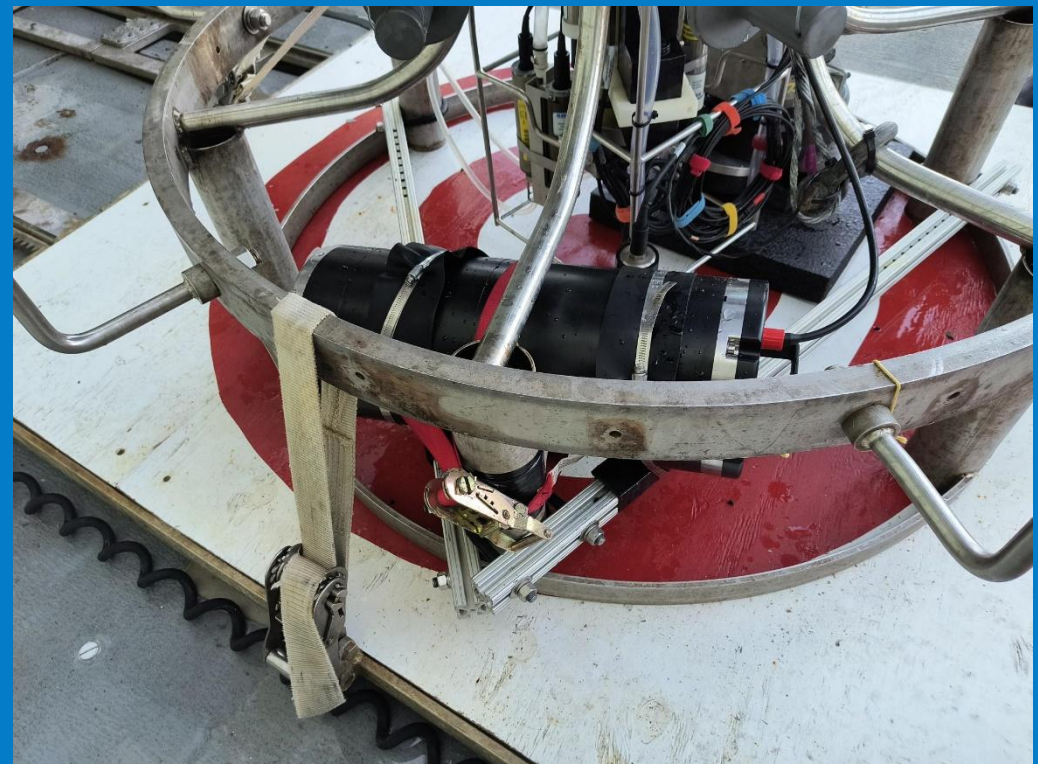
### Description and Benefits

SWE SeaSafe Direct Smart Battery Modules are designed to be autonomous (self-sufficient), easy to use battery system building blocks specifically developed for subsea vehicles, oceanographic systems, and deep-sea oil and gas infrastructure. Each module consists of pressure tolerant, high-performance Li-Polymer cells, a SWE Battery Management System (BMS) with patented safety protection and current paths, a thermally potted enclosure, and connectors for power and communications. The modules have a proven record of delivering longer life and longer missions than lead-acid batteries (Up to 4x more energy, 6x more available energy at colder temperatures typical of the seabed, and 8x longer cycle life) and pressure tolerance to 6000 meters ocean depth.

The SWE SeaSafe Direct modules are designed as building blocks to connect in series and/or parallel, as needed, to create the desired voltage, capacity, and maximum current requirements of the desired battery system. These SeaSafe Direct battery modules include subsea tolerant standard circular connectors for Power and for RS485 Modbus Communications to enable easy subsea connection. Battery system voltage is the result of the number of battery modules connected in series in the string. These SeaSafe Direct battery strings can then be connected in parallel (with Diode ORing protection) to increase the battery system capacity in increments of the battery module capacity and/or increase maximum current output in increments of the module maximum current rating (with appropriate peak current shared load consideration). SWE SeaSafe Direct modules are validated to an operational depth of 6000 meters. Modules inter-connect and operate directly in the Sea Water without the need for a subsea pressure balanced oil filled case, nor a more expensive subsea pressure vessel.

SeaSafe Direct Battery modules are built within ISO 9001 – 2015 quality certified manufacturing and are UN38.3 certified for transportation. SeaSafe has earned certification from the American Bureau of Shipping (ABS) Type Approval – Product Design Assessment (PDA); Certificate Number 17-HS1687100-PDA, including UL And IEC tests passed.



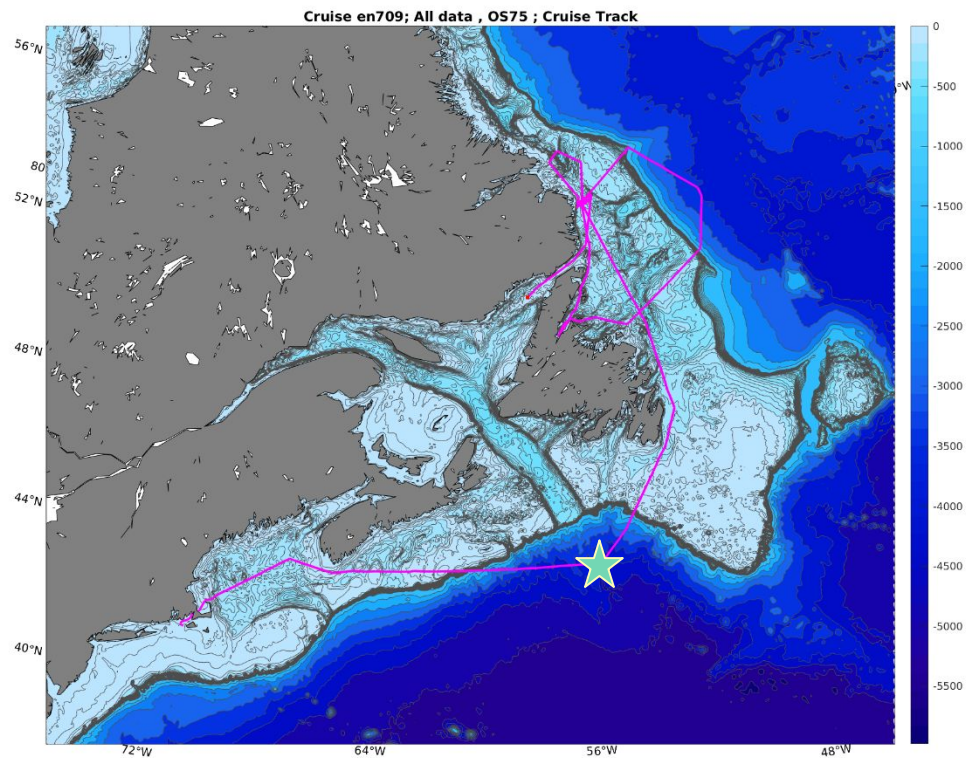


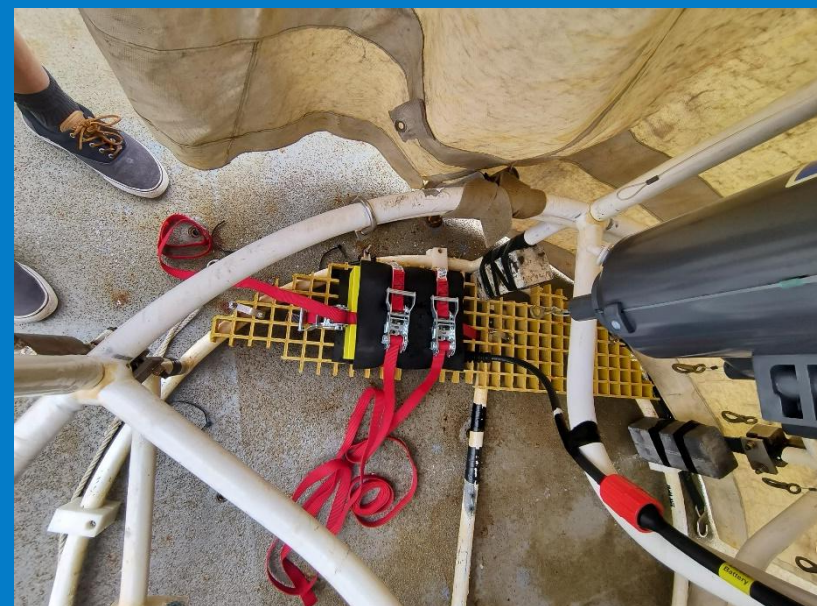


# Pensacola – WHOI Transit, 4/2023

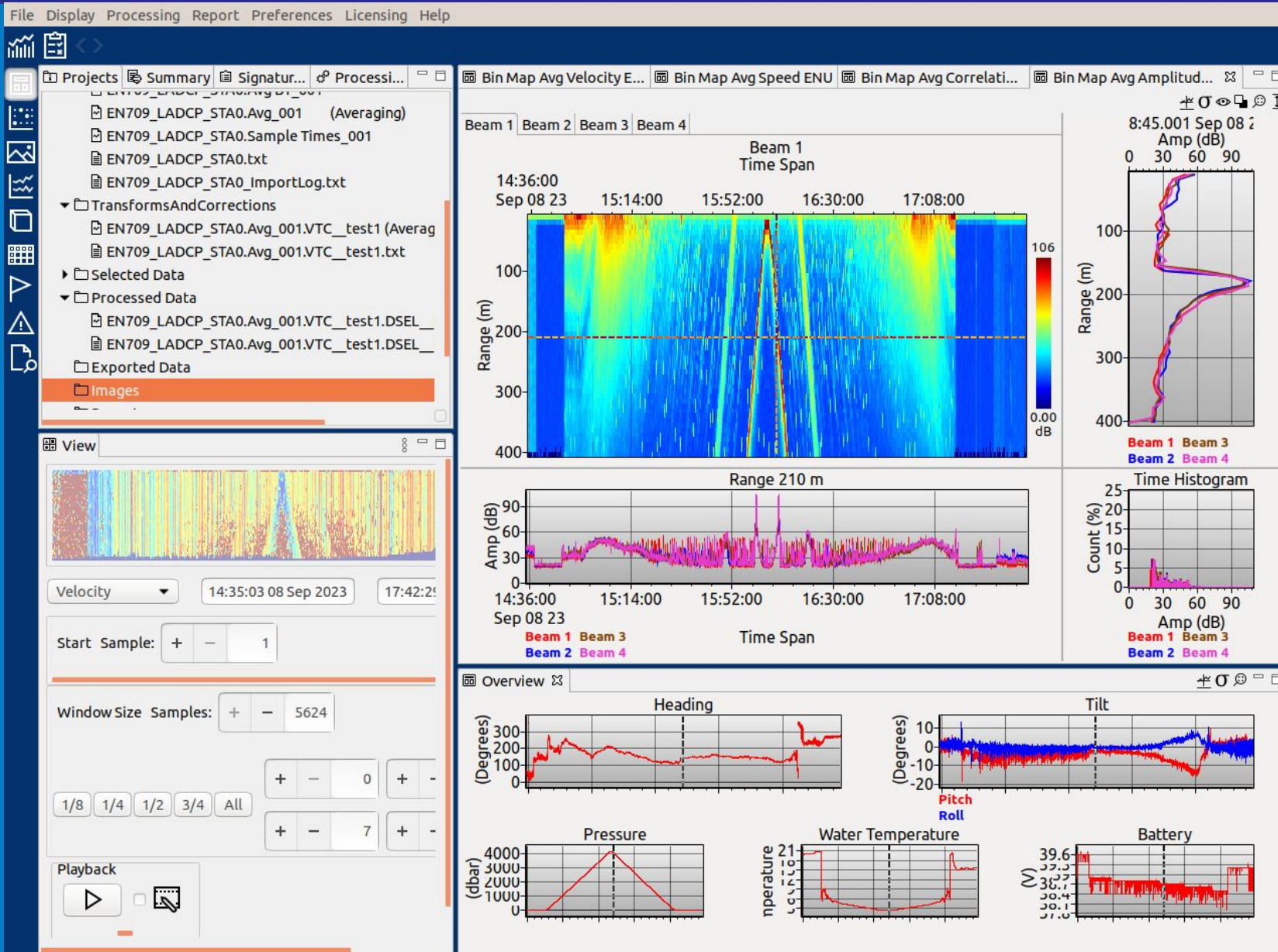


# Endeavor EN709 Cruisetrack – Sep, 2023

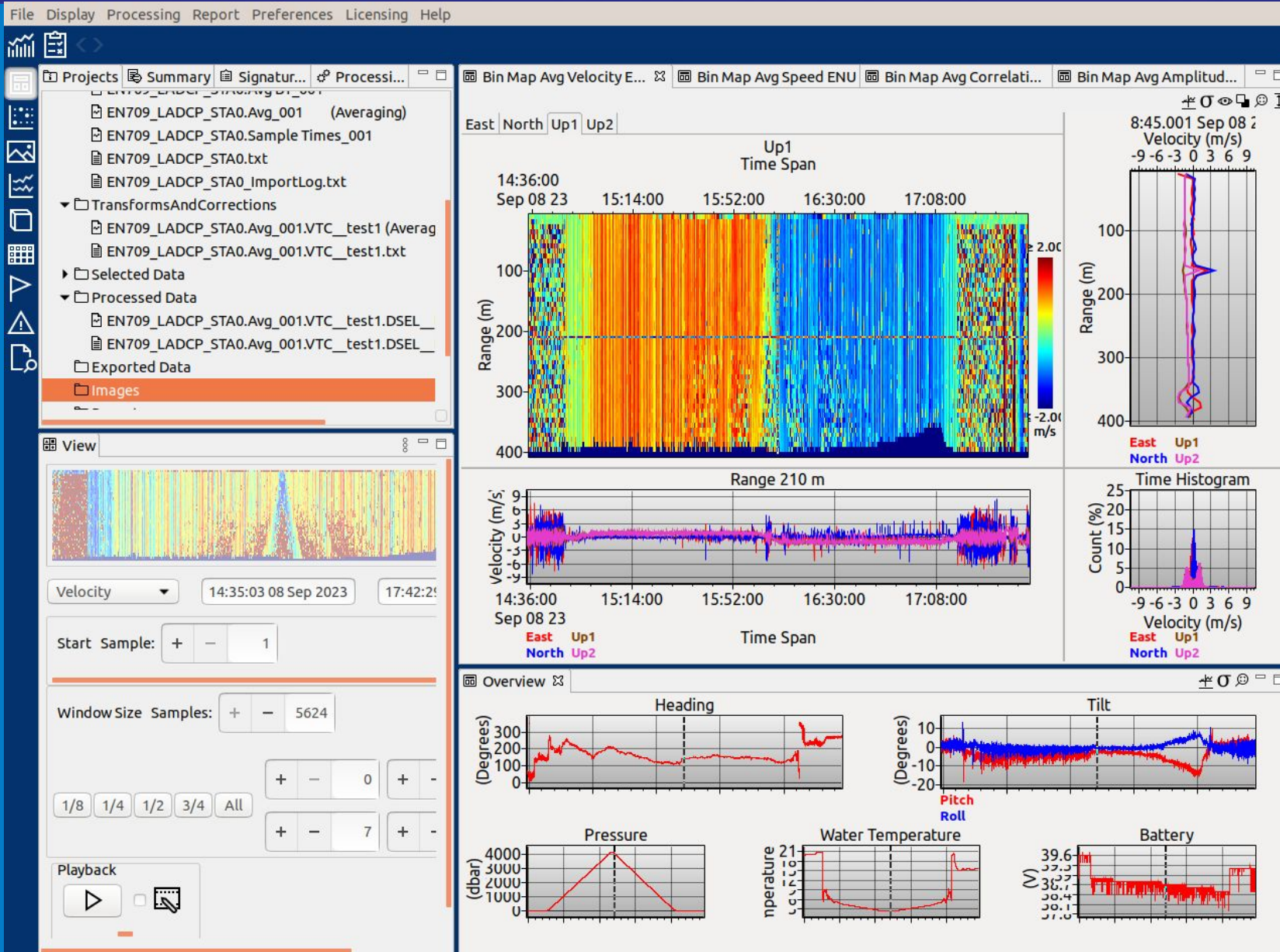




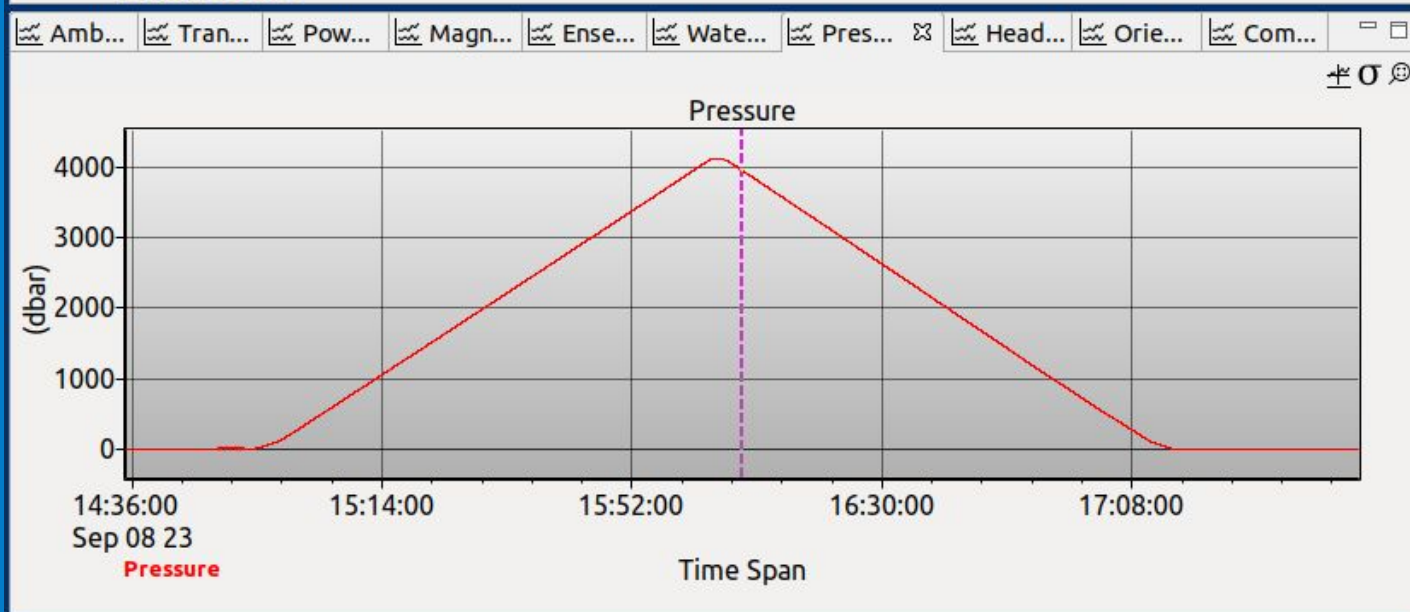
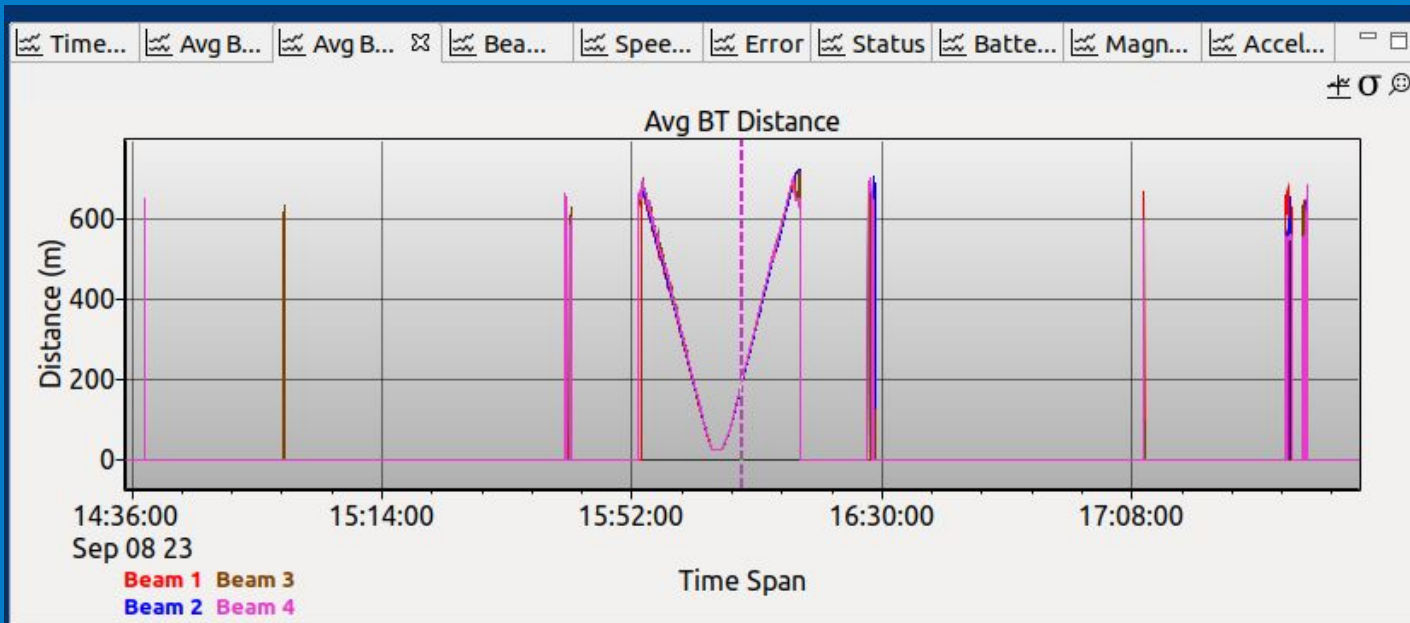
# SIG100 Amplitude



# SIG100 Vertical Velocity



# SIG100 Range



Thanks !!!

