

HD Upgrade Project

Design Goals for HDTV Upgrade

To develop an imaging system upgrade that improves the overall quality of motion and still-based imagery on *Jason* and *Alvin* without impacting the day rate.

- Endorsed by DESSC, December 2007
- Approved for funding by NSF, Spring 2008

Phased Implementation

- Camera Head Completion, Early 2009
- System Integration, Fall 2009



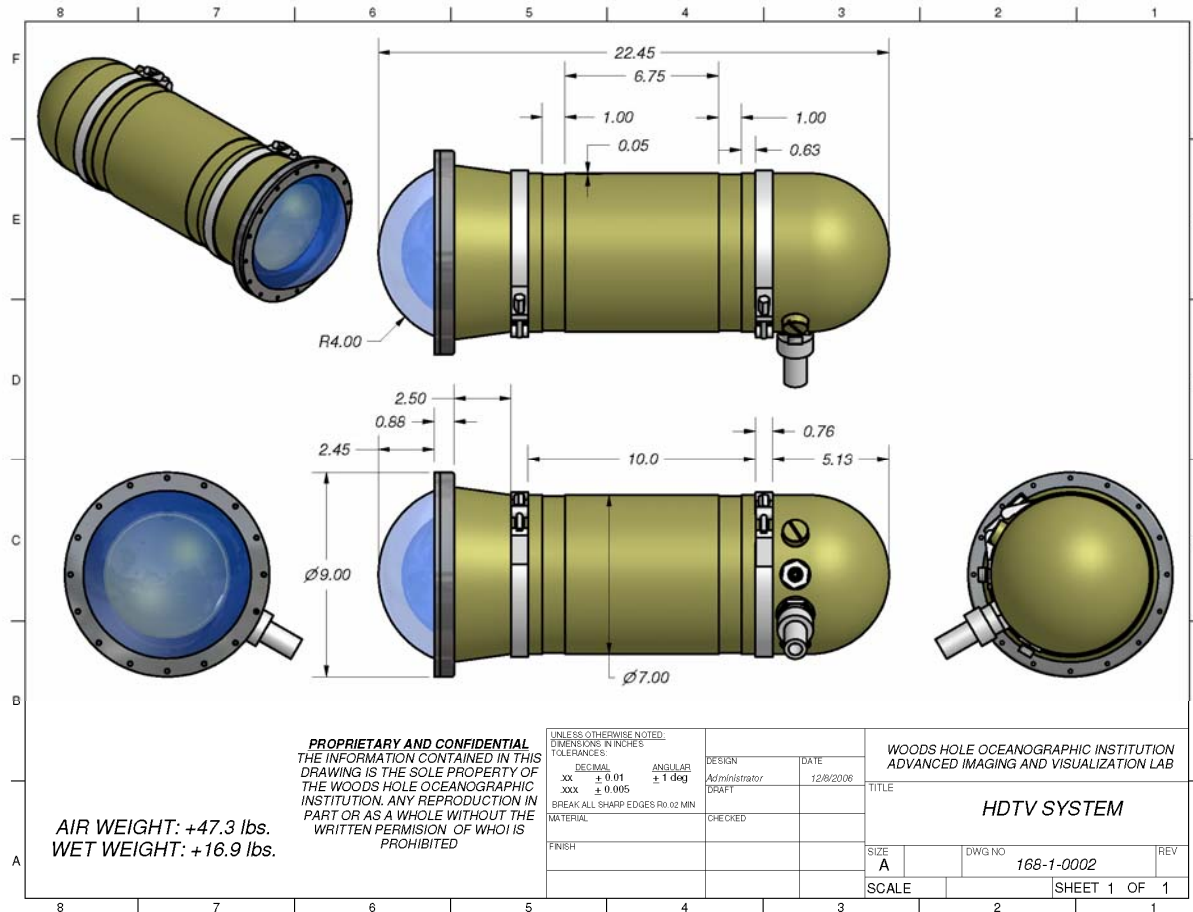
HD Upgrade Project

Fabrication activities

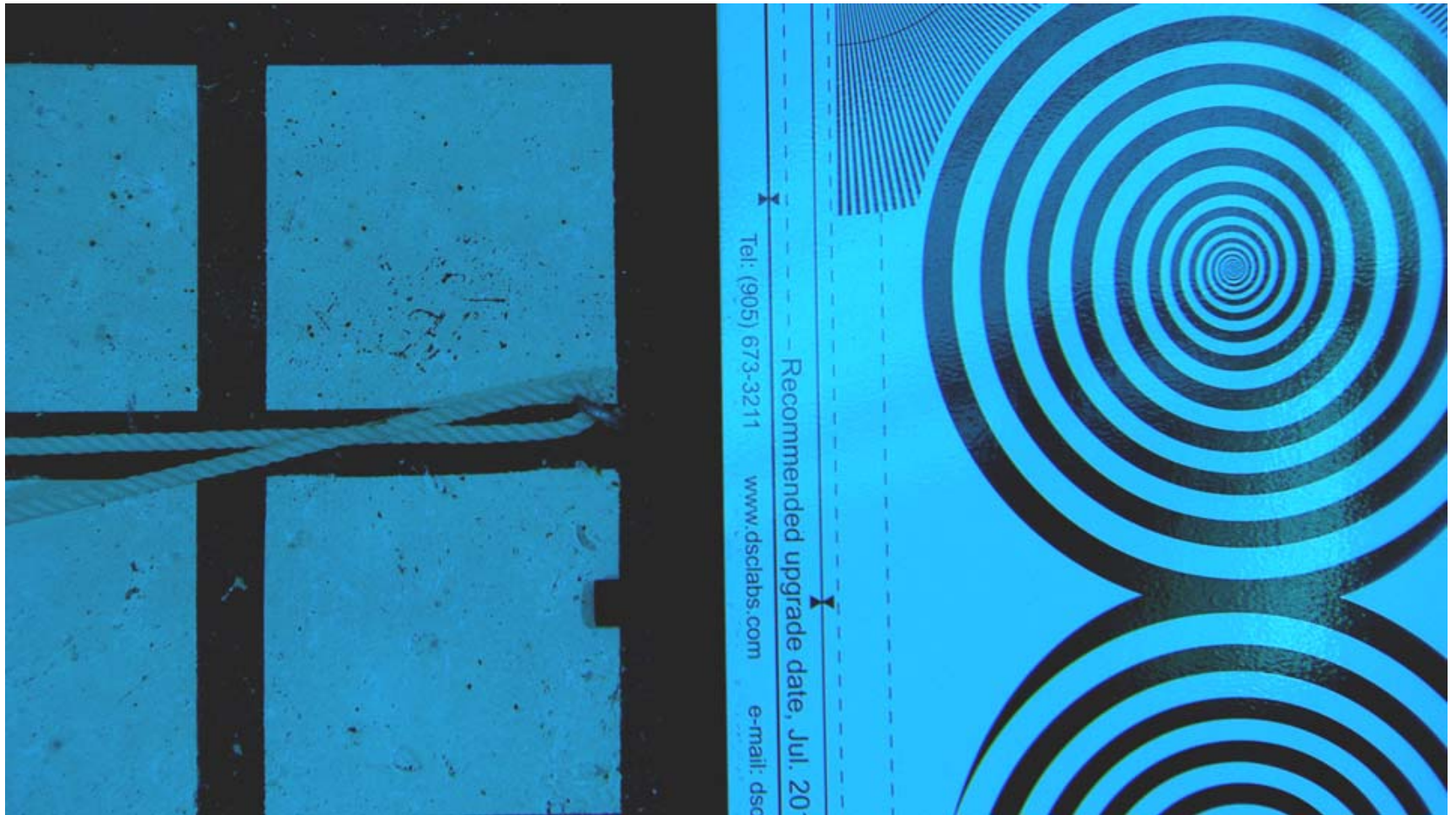
- Optical and Sensor Path - Finalized
- Electronics for Jason Camera - Finalized
- Electronics & Storage for Alvin - In Development
- Pressure Housings - Finalized being fabricated
- Camera Control Software - Field Testing
- Alvin Storage Bottle - In Development
- Final Camera Hardware Integration - March 2009



HD Upgrade Project - Implementation



HD Upgrade Project - Implementation

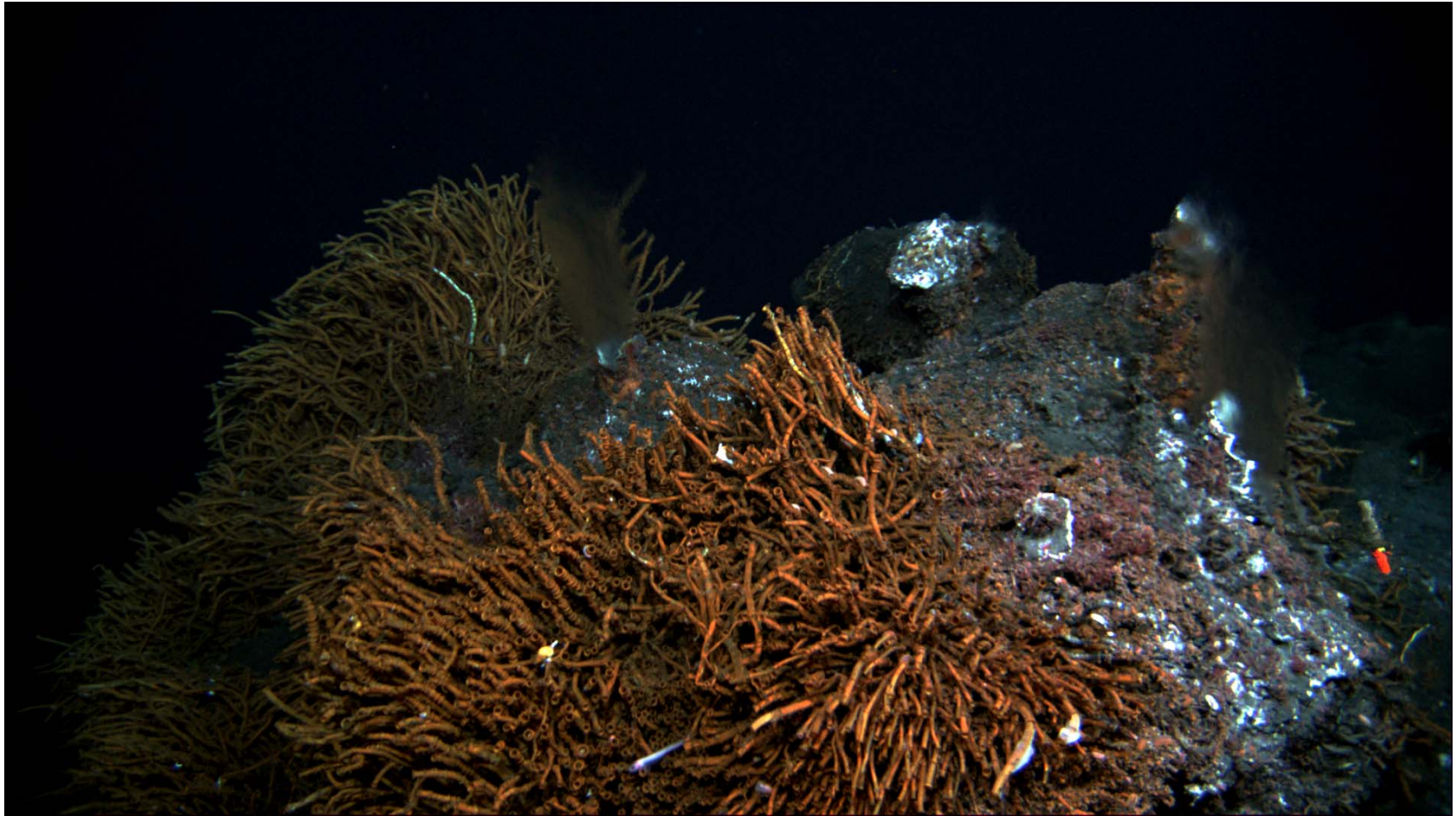


HD Upgrade Project - Implementation

Single-CCD HDTV Still Image



HD Upgrade Project - Implementation Wide View



HD Upgrade Project - Implementation Medium



HD Upgrade Project - Implementation Close-Up



Navigation: LBL

Summary of Prior Reports

- Primary objective: replacement of Benthos 455 hardware in ROV van, Atlantis Top Lab
- Added another objective: replacement of NavBox in submarine
- Several prototypes produced and tested in both ROV and Submarine



Navigation: LBL

Progress Since Last Meeting (ROV)

- Benthos 455 not installed in new control van, new system (N456) used exclusively
- Successfully tracking Medea, Jason, elevators



Navigation: LBL

Progress Since Last Meeting (Alvin)

- New hardware installed in submarine, top lab, November 2008
 - Software integrated with dvlnav
- Successfully supported last 5 dives of recent series
 - Relay mode
 - Synchronous mode
 - Elevator tracking



Navigation: LBL Fully Integrated Software

LBL GUI

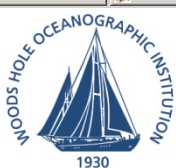
The screenshot displays the DVLNAV software interface, which is used for navigation and data collection. The main window is titled "DVLNAV Version 211" and contains several key components:

- Mode Selection:** A list of modes including Command, Elevator Cycle, Relay Nav, Synchronous Nav, and Tracking Only.
- Ship Data Table:** A table showing ping times and travel times for a ship.

Time	Travel Time	Depth	Range
7.00			
7.50			
8.00			3.08
8.50			
9.00	1.35	1.64	1.74
9.50			
10.00			
10.50			
11.00			
11.50			
12.00			
13.00	2.98	3.1	
13.50			
14.00			
14.50			
- Travel Time Plot:** A graph showing travel time (max TT: 10, min TT: 0) over a range of 0 to 500.
- Navigation Data Panel:**
 - HDG gyro: 98.6 °T
 - Depth lbl: 2001.8 m
 - ALT estim lbl: -1.8 m
 - COG: 130 °T
 - SOG lbl: 24.4 m/min
 - Z Vel lbl: 12.3 m/min
 - ETS lbl: 22:31 gmt ↑
 - EWD estimated
- Map:** A map showing the location of the ship "Atlantis" and other targets. The map includes a coordinate grid and a "No Doppler Data" warning.
- Control Panel:** A panel on the right side of the map with various controls like Zoom In, Zoom Out, CTR SHIP, Map Grid, CTR DOP, Show Trail, CTR LBL, UNITS, CTR CUR, Auto CTR, Doppler, Reset 14209d 19h, RST LBL, RST CUR, Cursor Pos: XY meters (X: 2361.1, Y: 838.9), Target, TGT DOP, TGT LBL, LABELS, TGT CUR, trail length, I/O Status, R T err, dop, oct, hst, bin, SNAP, and CPU.
- Data Table:** A table at the bottom of the window showing detailed data for each ping.

TIME	BL S/D	TT A	TT B	TT C	TT D	Slant Range	X	Y	DEPTH	LABEL	
19:45:23	AB DEP	4.5780	4.4980	2.7030	2.7030	2.7030s	2003m	+2233	+732	+2007	Alvin
19:45:43	AB DEP	4.5830	4.5020	2.7090	2.7090	2.7090s	2007m	+2232	+727	+2011	Alvin
19:46:03	AB DEP	4.5700	4.4900	2.6980	2.6980	2.6980s	1999m	+2242	+733	+2003	Alvin
19:46:23	AB DEP	4.5810	4.5010	2.7090	2.7090	2.7090s	2007m	+2232	+730	+2011	Alvin
19:46:43	AB SHL	3.3920	3.3120	1.5170	1.5170	1.5170s	1123m	+0	+0	+0	Alvin
19:47:03	AB DEP	4.5770	4.4960	2.7000	2.7000	2.7000s	2000m	+2236	+728	+2004	Alvin
19:47:23	AB DEP	4.5880	4.5080	2.7140	2.7140	2.7140s	2011m	+2229	+732	+2015	Alvin
19:47:43	AB DEP	4.5730	4.4920	2.6970	2.6970	2.6970s	1998m	+2235	+727	+2002	Alvin
19:48:03	AB SHL	1.0900	1.0500	2.7230	2.7230	2.7230s	2018m	+0	+0	+0	Alvin
19:48:23	AB DEP	4.5850	4.5040	2.7110	2.7110	2.7110s	2009m	+2230	+731	+2013	Alvin

DVLNav



Navigation: LBL Summary

- Benthos 455 retired
- Effectively supporting ROV and submarine LBL requirements with new supported hardware and software
- “new” capabilities added (synchronous nav)
- Effective, modern baseline for future developments in software and hardware

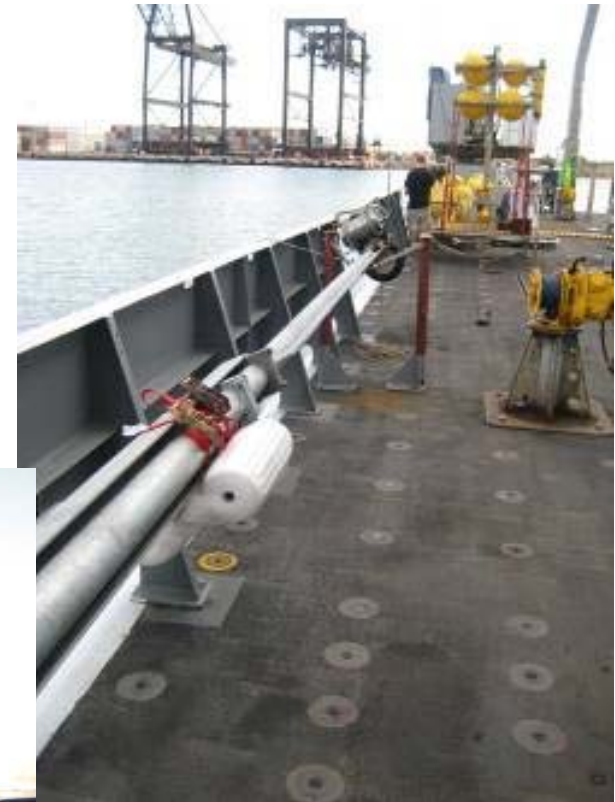


Navigation: USBL Procurement

- Sonardyne system successfully tested off Hawaii
 - Successful testing at 4700m
 - Jason, medea, elevators
- Ixsea GAPS tested on Oceanus
 - Ship noise an issue, lost Sentry tracking at 2400m



Navigation: USBL Installation on Thompson/Jason



Navigation: USBL Selection Process

- Narrowed selection from 7 to 2, now securing final proposals
- Expect procurement to begin by end of year
- 16-24 week delivery
 - Atlantis in-hull mount
 - ROV/AUV pole
 - Integration into vehicle data systems



Data Activities

General

- Scott McCue has made 6 Alvin and Jason cruises in 2008
– learning the ropes
- See: Abstract IN53A-1188 (Friday, AGU 2008).
V.L. Ferrini, R. Arko, S. McCue “Building an Interoperable Relational Database for the National Deep Submergence Facility (NDSF)”

Infrastructure Improvements

- Added 2 x 8 TB RAID 6 (highly reliable!) storage to the server installed earlier in 2008. Recent cruises being placed on it directly.
- Update to web documents to better present NDSF data-bearing archives and separate pre-cruise documentation from these archives.
<http://www.whoi.edu/page.do?pid=8475>



Data Activities

Sentry Data Management

- Develop/implement MBSystems as primary processing tool for vehicle-based multibeam (Reson 7125)

Alvin Data Management

- Reson SeaBat 7125 integration
 - Signal paths, Logging, Merge w/Alvin data system
- Modernization of Alvin images database (w/WHOI Data Library and Graphics)
- Refinement of policy and procedures regarding data deliverables from Atlantis/Alvin cruises shared by multiple independent science parties.



Data Activities

Jason Data Management

- Event Logger
 - new release trialled on Reysenbach, Moyer, & Duennebier cruises.
 - further revisions underway to improve use: ease of consistent science & operations vocabularies.
- Virtual Van – “by-lowering” functionality added to timebar.
- Working to further codify data collection protocols
 - “How-to” guides for Image Mosaicing, Multi-beam Surveys

On the Horizon

- Data archiving for future HD Imaging cruises



Future Upgrades

Based upon Science User requests

- “CHIRP” system portable between Alvin, Jason & Sentry
- Reson 7125 Multi-beam for Jason, to match Alvin & Sentry
- Implementation of sidescan sonar capability on Sentry (joint with HMRG)

