

Engineering Weekly Report 12/10/2020 - 12/17/2020

Executive Council Notes

- 901800 LRAUV Development (Hobson) - The LRAUV group, along with collaborators at JPL performed tests in Monterey Bay last week to test a new mission path planning application JPS is developing for future deployments in the ocean worlds of Europa and Enceladus. For the Monterey Bay tests the JPL application was running on the backseat computer installed in LRAUV Pontus to control where the AUV traveled, and when it was time to return to a home base marked by an acoustic beacon. This is the first LRAUV backseat computer application to read active sensor and navigation data, and feed control commands to the main vehicle, though we expect to host many other collaborations like this from within MBARI and other researchers in the near future.
- 902106 Niobicon-Based AUV Docking Development (Hamilton and Hobson) - A prototype of the Niobicon AUV Docking system was integrated and tested in the test tank last week. LRAUV Galene was fitted with a retractable cable capture arm and commanded to swim towards a vertical rod suspended in the tank that it caught and latched onto. Tank tests will continue after the shutdown to investigate higher speed capture as well as power and data transfer.



Individual Activities

- Francois Cazenave
 - 901405 - PowerBuoy Development

- I assembled the dock capture device on the LRAUV and tested it in the test tank, with Brett and Brian's help. The device performs well.
 - Out of Office
 - I am working reduced hour from home.
- Mark Chaffey
 - 300082 - DMO Support - Wave Glider
 - Turned over remaining material to DMO for building and maintaining the HotSpot. A second unit of the compact 2nd generation 1U design has been successfully built by DMO and will be operational soon.
 - 902001.99 - 4K ROV Camera Development
 - Cranking out mechanical drawings and submitting to the machine shop.
 - Working with Jose on finalizing camera PCB layout.
 - DeepSea cutting metal on the camera housing and anticipates continuing progress, they are an exempt business and fully operational in their machine shop.
 - Optical adapter metal parts - round 2 - are done and have successfully been anodized. This process failed with the first round of parts after too much material was etched away.
 - Final optical assembly and the verification testing of the optical adapter was delayed after the optical house had 7 of 18 employees test positive for Covid. They are back in business but our optical engineer is postponing a visit to supervise the build until the appropriate protocols are in place to ensure his safety.
 - All long lead parts are on order or have been received.
 - End-to-end testing with the Shipboard video file capture system by Lonny was successful and recorded 4K x 60P progressive video for 24 hours without problems (besides using *beaucoup* de disk space). Alternate project name: 902001-A *Disk Space Odyssey*.
- Danelle Cline
 - 901502 - Passive Acoustic Sensing
 - Team meeting
 - 902005 - VARS Annotation Assistance
 - Team meeting to discuss 2020 milestones and 2021 plans. No other meetings planned for 2020 and the team expects to begin VARS integration and testing in early 2021.
 - Finishing up database design for GraphQL API. This will serve as a data store for the machine learning visual event tracks and other ML related data needed to manage the ML lifecycle. Onboarding planned with Duane this week. Expect to deploy sometime next week. Wish me luck with the podman blues.
 - Training a larger D4 EfficientDet model to use to populate a test database.
 - Successfully tested several FathomNet and Sagemaker API calls in a web app taking shape that I'm calling DeepSeaAI. This will be both a dashboard and tool for submitting and monitoring the ML pipelines.
- Duane Edgington
 - 901603 - Video TAG: Vis Ocean Chng
 - Plan to catch up on missed NeurIPS presentations
 - 901618 - Pelagic-Benthic Coupling
 - Work to do to try to enhance images for calibration
 - Work to do to run Dan's program on in-air calibration images
 - 902005 - VARS Annotation Assistance
 - Team meeting Dec 10
 - Status meeting Dec 15
 - Update session with Danelle planned for this week.
 - Overhead
 - Home internet outage (regional Monterey DSL) Dec 7 -15

- Home T-Mobile cellular MiFi adapter procured to mitigate outage
- Out of Office
 - AWS re:invent virtual conference Nov 30 - Dec 18
 - Neurips 2020 virtual conference Dec 6 - 12
 - Vacation Fri Dec 18, Dec 21 - 31
- Jon Erickson
 - 800139 - EyeRIs
 - Finished the prints for the EyeRis Camera Case for LRAUV.
 - 901217 - Chemical Sensor Program
 - ISUS-APEX: waiting on spectrometer parts from the shop & circuit boards. The carbon fiber tubes are still 8 wks out.
 - 901809 - Deep Sea Bioinspiration
 - Finished motor specs for new particle injector.
 - Part prints next week.
 - 902010 - Mesopelagic LRAUV
 - Working on a pressure case design. Will start scaling dome and shell parts to match.
 - Overhead
 - Learning MATLAB to develop a solution for the Mesopelagic LRAUAV.
 - Out of Office
 - Vacation Day
- Kevin Gomes
 - 901009 - CANON
 - Migrated the /trackingdb API to the new container as I forgot to add it
 - Still chasing down very strange PostgreSQL queries that should be running fast, but are not
 - Overhead
 - Group Lead overhead
 - Met with ThreePoint contractor for their presentation on our digital/web strategy moving forward
 - Hiring committee
- Andy Hamilton
 - Out of Office
 - On vacation until October 26
- Kent Headley
 - 901803 - Carbon Wave Glider Development
 - Status meeting
 - Discussing requirements for RH (relative humidity) sensor
 - Overhead
 - Preparing for remote access
 - Computer maintenance
 - Workplace training
 - Scoping input for NSF docking proposal
 - Review prep
 - Out of Office
 - Nov 30, Jan 19 : personal
 - Dec 28-31 : vacation (tentative)
- Rich Henthorn
 - 600034 - Control Tech - Rock
 - LRAUV TRN mission analysis
 - 901618 - Pelagic-Benthic Coupling
 - Larval sampling system fault analysis
 - 901800 - LRAUV Payload & Support

- Obstacle Avoidance application development
 - TRN mission analysis
- Overhead
 - Prep for exclusive Work-From-Home
- Brett Hobson
- Scott Jensen
 - 901205 - ESP SURF Center
 - Slow testing of the terrestrial housing is continuing. The connectors seem to seal but now onto all the little imperfection in an oil drum:)
 - Most of the pressure sensors have been paired with a calibrated amplifier.
 - 901405 - PowerBuoy Development
 - Deployment power unit is mounted on the lab MG setup. System characterization is taking place for modeling purposes.
 - 901805 - Coastal Biogeochemical Sensing
 - MFET/MCAP has been sent out for fabrication and assembly.
 - Overhead
 - LRAUV Thruster Drive prototype has run the motor in the lab connected to the dynamometer. Efficiency numbers need to be compared to current implementation. It is a sensorless chip and seems to be able to start the motor and keep it spinning. A windmilling test needs to be performed. Discussions are starting about how the final device will interface and mount in the vehicle.
 - Out of Office
 - Current schedule is Monday-Wednesday
- Brent Jones
 - 901112 - Change in MB & CA Current
 - Trying to find a place to manufacture 3 SIPPERS. Our collaborators in SD might be able to do it
 - 901800.98 - Bioacoustic Payload
 - Looking at moving payload cpu to inside LRAUV. Working on ORCAD drawing. Seriously wanna delete ORCAD.
 - 901805 - Coastal Biogeochemical Sensing
 - Diagnosis pH sensor error during above deployment. Can not recreate the problem on the bench nor in the test tank. Ditched an anodized aluminum coupler and installed a PEEK coupler in case that was the problem.
 - Doing last minute purchases of cables.
 - Helped fill ~250 CO2 standards for use in 2021.
 - Overhead
 - Meetings
 - Prepping for MBARI shutdown
- Chad Keycy
 - 901713 - Nearshore FOCE
 - Working with Jim M on various housing builds
 - 902000 - Multi-Spectral StealthCam
 - Camera housing is ready for internal wiring
 - Overhead
 - Changing Ocean: Writing LV code using Wago testbed & ordering parts for next year
 - Bio-Acoustics Lab: Designing Hyd Stab board
 - Out of Office
 - Vacay 12/21-1/1
- Brian Kieft
 - 708158 - DHS Y7

- Added a latch delay feature for docking deployment today
- 901800 - LRAUV Payload & Support
 - Testing on Pontus offshore and working on Tethys for a docking run
- Out of Office
 - Will not be in the office due to quarantine policy
- Denis Klimov
 - 118000 - Safety Office - LSO activity
 - We have initial release of the procedure for disinfecting / cleaning optics, electronics, PPEs (laser safety goggles). This goes under the category of lab specific procedure.
 - 901800 - LRAUV Payload & Support
 - PAR sensor 8454 had some tiny leakage of the water to the inside which deteriorated the internals somewhat, requiring reconditioning. Housing had been pressure tested and is ready for assembling
 - 901809 - Deep Sea Bioinspiration
 - Making final touches to the procedure of using DeepPIV of ship's deck. Label for the fiber cable had been designed and documented in procedure.
- Eric Martin
 - 901101 - Ocean Imaging
 - Purchasing spare and parts repair.
 - 901206 - Coastal Profiling Float
 - Setting up home tests for console code cleanup
 - Exploring replacement microprosster ST Nucleo board
 - 901911 - ROVVR
 - Tank tests and integration on the Mini ROV are complete, we were able to demonstrate VR in the test tank, and collected needed data for the enxt phase of our collaboration with student at Olin College.

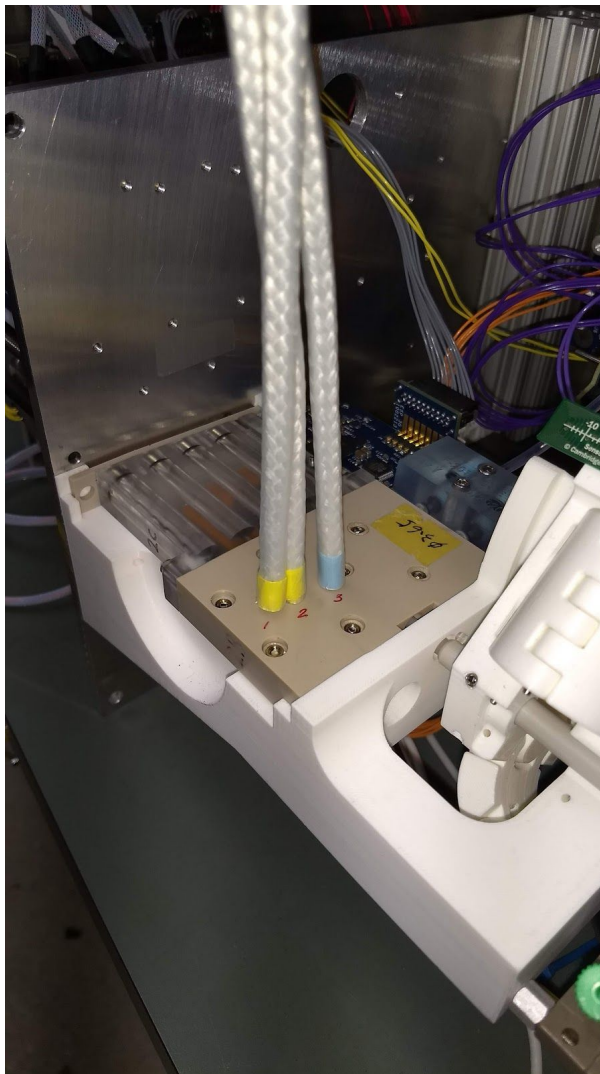
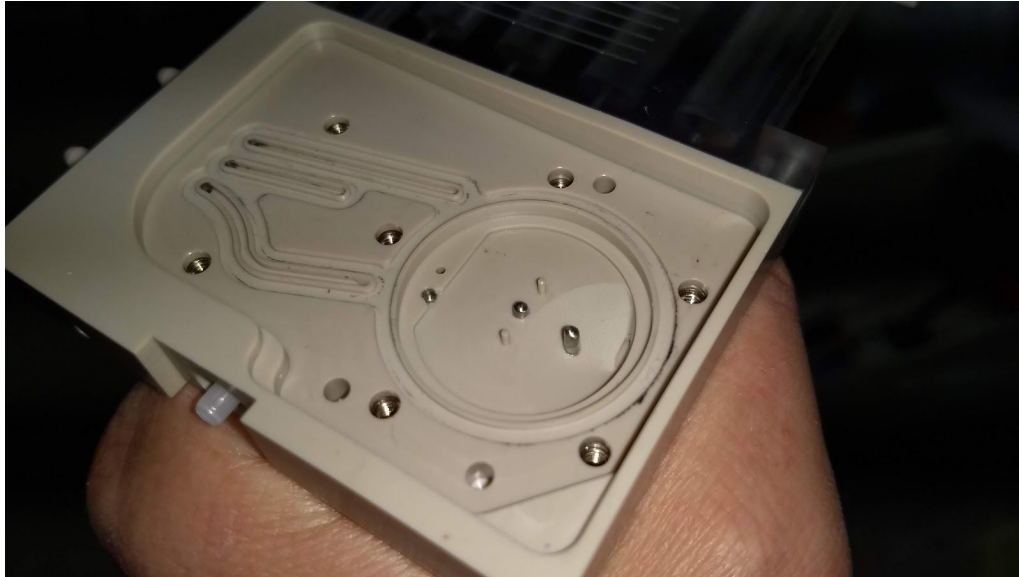


- A VR view of the bottom of the test tank with ROV data overlays in testing
- DQ1942 - Buoy Power Generation
 - Working on utility to create a radar playback utility to test online wave identification from logged data on the Paragon.
- 901200 - Telepresence
 - The telepresence policy has been accepted by MT
 - Telepresence last Monday for the Aquarium.
- Overhead
 - Helping Lonny Lundsten shore up code for M3RS monitoring devices.
- Thom Maughan
 - 901009 - CANON
 - Helping out with MBARI - Johns Hopkins APL report on embedded system for eDNA analysis

- Handed off box and components for proto of portable eDNA sequencer with Xavier NX system for use on ship.
 - 901805 - Coastal Biogeochemical Sensing
 - UV-C flashlight (duty cycle, period) for bio-fouling mitigation on sensors. Verify effect on sensors
 - Getting set back up for development after project shuffling. I've got a desk space limit.
 - 902004 - Planktivore
 - DeepRip proposal (thanks to all), funding discussions, parts ordering, part re-ordering, etc. DeepRip: AMD 3990x 64 core cpu + 256 GB RAM + SSD + 2x RTX 8000 Quadro with 48GB RAM each.
 - All parts should be received this week, and we can perhaps make special requests the following week. Met with Jose on the build. He raised some very good points on the cooling I want and the challenges with the selected case. We are ordering a better one and making a return.
 - 901713 - Nearshore FOCE
 - Delivered an MpHOx and and MCAP (no serial number) to Jim Montgomery for housing fitment.
 - Overhead
 - Met with Rich Schramm regarding XOJO. Hunting for box with Wago stack, must have left it at MBARI as the house has been turned upside down.
 - Organizing
 - Out of Office
 - Vacation Dec 10 to 15 - Fence project with family labor.
 - Vacation Dec XX to YY TBD on dates. Likely a two week.
 - Quarantine from visiting Cal Poly Pier ends on Dec.3
 - Working remote with regular access as needed at MBARI Tues,Wed,Thurs
- Mike McCann
 - 901009 - CANON
 - Working with Pat on configuring a CentOS 8 kraken2 system for stoqs.shore.mbari.org
 - Learning all about podman:
 - An NFS mounted atlas home directory does not work well
 - I'm hopeful that podman-compose will be able to use my existing docker-compose.yml
 - Helped with testing the new ODSS
 - 901800 - LRAUV Payload & Support
 - Reloaded the stoqs_mbts database, which took a few days
 - 901910 - Plankton Taxonomic GrpAUV
 - Implementing the navigation adjustment code in auv-python
 - Overhead
 - Provided evaluation to their professor of the capstone students
 - Out of Office
 - 21-31 December 2020
- Rob McEwen
 - 708167 - Wave Energy Converter
 - Will investigate Hough transformation for wave arrival prediction.
 - 901800 - LRAUV Payload & Support
 - Assisting Rich H in LCM implementation in the OA app.
 - Out of Office
 - WFH on Thursday and Friday.
- Paul McGill
 - 901618 - Pelagic-Benthic Coupling
 - Did some analysis of Rover current meter data from Pulse 72. Found some issues with the data logging and got Rich H. in the loop to address them.

- Looking for a Python implementation of Zhang's camera calibration algorithm so I can run images myself and perhaps avoid the steep MathWorks license fees for their MATLAB toolbox.
 - 901700 - 2017 Acoustical Ocean Eco
 - Trying to set up my local copy of OrCAD to connect to MBARI's CIS database. Will need Jose's help with this.
 - 901803 - Carbon Wave Glider Development
 - Held group Google Meet meeting to discuss end-of-year spending and humidity sensor integration.
 - Sending Andrea's Collaborator's Agreement up the chain of command for approval.
 - 901904.99 - Coral Camera System
 - Spent a little time looking at lock-in detection for cameras to detect coral fluorescence.
 - Overhead
 - More OrCAD online training.
 - Out of Office
 - Sick day to deal with medical appts.
- Ed Mellinger
 - Out of Office
 - Scheduled in-office days Tuesday, Friday
 - Minor family medical issues will affect my availability for the next 2-3 weeks.
- Tom O'Reilly
 - 300082 - DMO Support - Wave Glider
 - Configuring onboard software on "Hotspot 3" payload, in preparation for deployment in early 2021. Updated software on "Hotspot 3" payload with current "master" version.
 - 901009 - CANON
 - Based on connections made at last week's Open Geospatial Consortium meeting, I'm learning more about standards for planning and coordinating autonomous vehicle fleets, including the Joint Architecture for Uncrewed Systems (JAUS). The JAUS standard was developed by the US DoD and has been evaluated by the US Navy with vehicle networks containing AUVs, USVs, and aerial drones. Kongsberg Geospatial is using JAUS and other standards to develop a Standards-based UxV Interoperability Test-bed, a control station allowing an operator to monitor and control multiple vehicles across multiple domains (air, surface, sub-surface). These systems could be quite relevant to CANON and MBARI autonomous vehicles in general.
 - 901902 - Aerial Drones for Sci&MO
 - Attending American Geophysical Union Fall meeting online, including presentations, posters and town halls addressing UAV design, best practices and standards for operations and data processing. I made connections and shared experiences with others in the UAV science community who are applying UAVs to volcano monitoring and Arctic studies.
- Craig Okuda
 - 901803 - Carbon Wave Glider Development
 - Design test fixture
 - Update docs
 - Out of Office
 - Vacation days last week
 - Overhead
 - Get stuff from MBARI
- Doug Pargett
 - 300078 - DMO Support- AUV
 - Discussed with Hans Thomas scope and ideas of new AUV lift structure.
 - 901205 - ESP SURF Center
 - Reviewed the Function designs for the Alpha 2.2 cartridge, focusing on the seals at first.

- Installed thermocouples into an old cartridge body to help map sample temperatures.



- Installed pressure sensors and amp boards into ESP Tower, mostly so they don't get lost. Tower will need to be disassembled when we get the new stage components.

- Ben Raanan
- Mike Risi
 - 200105 - Core Nav - MDUC
 - Working on vorne process with test display
 - 600034 - Control Tech - Rock

- Implementing roV-control commands
 - Continuing Qt Pilot GUI development
- 662000 - Software Eng
 - Made last trip to MBARI to pick equipment for shutdown, setting up office at home
- Out of Office
 - February 19-22: Ocean Imaging Cruise
 - March 9-12: Vacation
 - May 26-29: Vacation
 - June 29 - July 1: Vacation
 - September 7 - September 11: Vacation
 - October 12-17: Ocean Imaging Cruise
 - October 19-23: Vacation
 - December 21 - January 4: Vacation
- Brent Roman
 - 901205 - ESP SURF Center
 - Worked with Doug Pargett to test temperature probes in Function's "alpha1" prototype cartridge
 - Added code to support the "Frankentower" deep sampling ESP3G lab prototype
 - DQ1865 - Bryde Whale
 - Resurrected the GoMex satcomms off ESPmoe for testing in my home office
 - Overhead
 - Moved more MBARI equipment to my home
- Carlos Rueda
 - 300083 - DMO Support - LRAUV
 - Some TethysDash work (see below) charged here (thanks Erik).
 - 901009 - CANON
 - MXM work
 - 901502 - Passive Acoustic Sensing
 - Group meeting
 - 901513 - Targeted Sampling by AUVs
 - Some code cleanup to wrap up the year.
 - 901800 - LRAUV Payload & Support
 - A number of Dash adjustments specially during WHOI vehicle deployment. As part of this, implemented preliminary version of the async notifications using our own websocket endpoint (only for cell connection ping results at this point) so WHOI wouldn't hit the Pusher limit. Thanks much to Ryan Govostes for setting up a websocket proxy on his nginx server. Good testing!
 - Motivated by this I decided to make more progress and I'm close to having a complete system (both backend and frontend) using this new websocket endpoint.
 - Overhead
 - Implemented option to indicate "mkdocs" subdirectory in our [docs.mbari system](#), already exercised with that meta-documentation repository, which now also includes the code behind this service.
 - Out of Office
 - Dec 21-31: vacation
- Karen Salamy
 - Out of Office
 - Out of Office this whole week due to a Family Medical Emergency. I may have to extend this through next week as well.
 - Will be working on MBARI campus ONLY on Tuesdays until further notice.
- Brian Schlining
 - 902002 - Fathomnet Detect and Classify

- Started work on spinning up tooling for staff looking for tasks during the shutdown. There will be an opportunity to correct localizations in VARS. See <https://mbari.slack.com/archives/C01GU8N0ZKN>
 - Continuing work on the fathomnet website and REST services. We're getting closer!
 - Working on support services required by FathomNet (e.g. automated image validation and metadata extraction)
- Out of Office
 - 12/21-1/1 Vacation
- Rich Schramm
 - 200103 - Core CTD Data -MDUC
 - Routine O2 QC Flag work
 - 300057 - Mooring Maint
 - Something going on with OA downloads - will look at today
 - 300070 - DMO Support- Ventana
 - Reverse engineer and document the SubseaControlCan Wago stack addressing from GSS config files
 - Overhead
 - Attend a multitude of virtual meetings.
 - Continue review of all old software in various CVS, SVN and Git repositories
 - Preparing spreadsheet of systems and subsystems Im responsible for.
 - Test all MATLAB rovctd profile plot scripts, document and put in bitbucket
 - Update Xojo SerialDataSimulator code, document and put into bitbucket
- Alana Sherman
 - 300080 - DMO Support-Mini ROV
 - Got two NUCs running and updated with all the software. Bringing up the next Nuc for the MiniROV. Working through some LabView debugging. Getting set up with a workable system to test at home.
 - 901618 - Pelagic-Benthic Coupling
 - Purchasing components for Smith Macro camera
 - 901904.99 - Coral Camera System
 - Looking at best way to disconnect USB via Raspberry Pi from Sony Camera.
 - Working on final schematics
 - Overhead
 - Packed up projects to work on from home
 - Out of Office
 - Vacation day 12/15