

George Stern Sorted By Project

300070 - DMO Support - Ventana

- Still waiting on DSPL to accept my pressure testing request so testing can begin (Week 28)

300078 - DMO Support - AUV

- Wired up power to the the new electronic gauge Aaron installed on the pressure chamber (Week 11)
- Test plan for pressure testing (Week 13)
- Initial discussions with stake holders to get pressure test scheduled/started (Week 13)
- Support pressure testing and tried to get the strip chart recorder replacement working; unfortunately the old PID controller died and the spare we are lucky enough to have does not appear to have retransmission cards loaded. Hopefully the dead controller's retransmission cards still function and can be successfully swapped in after testing completes; 30 year old controller parts were not available on fleabay. (Week 18)
- Troubleshooting failed pressure test (Week 19)
- Looked at external pressuring testing suppliers and requested quotes (Week 21)
- Began testing pressure test cards after 14kpsi over test; one cap damaged and repaired (Week 23)
- Finally got quote clarification from DSPL regarding their quote, almost ready to get it sent out (Week 23)
- Tested a few things on the over pressured board and motor controllers; one polymer cap was hard shorted and replaced, the other had a soft short (Week 24)
- Got cost clarification and discussed funding, need to follow up on the funding or take the risk and get the design started again (Week 24)
- PO transmitted to DSPL for initial pressure testing, waiting for their approval to ship HW (Week 26)
- DSPL finally scheduled the test, got test articles shipped (Week 30)

701147 - MARS O&M IV

- Looked at MARS and some cots heatsink options while bugging UW for solid models (Week 6)
- Tried to get a solidworks database working only to discover it wasn't the latest. Thankfully the ME just came through and sent us a pack and go version of her latest. (Week 7)
- Finished verifying another fan and fan controller can be added (Week 8)

- Updated documentation and looked through new solid models we received (Week 8)

902106 - Niobicon-Based AUV Docking Development

- meeting (Week 3)
- On going over the past 2wks (Week 6)
 - Datasheet and docs review of the current powerline modems (Week 6)
 - High frequency magnetic field shielding refresher - nonferrous high conductivity metals really do work best due to eddy currents (Week 6)
 - Began looking at filter design and system layouts (Week 6)
 - Potential comms options for new docking buoy and phy layer cable requirements (Week 6)
- Meetings and planning for the buoy cable buy (Week 7)
- Planning (Week 9)
- Began planning mods to the subsea can and LRAUV to try to optimize coms without changing rod geometry (Week 11)
- Lots of tank testing and subsea bottle mods to fix all possible problem causes for bottom topside plc coms failures. Testing indicates the modems achieve 24Mbps/s and the bottom side is limiting speed; still poking at the nice to have increased speeds but have been unable to reproduce dead coms encountered during last years deployments. (Week 13)
- Networking troubleshooting on Pontus backseat (Week 13)
- Troubleshot networking issues on Pontus backseat (Week 14)
- More subsea housing mods (Week 14)
- Finally ran first networking tests to the LRAUV; tests between the subsea bottle and vehicle were only surprising because speeds were 30-40Mbit/s at the feedend of the rod, however bottle to buoy was slower than previous tests with intermittent drops outs. Bottle electronics were pulled for some additional mods and started troubleshooting (Week 14)
- Desk tests with chokes indicate 30% derating is marginally sufficient for Wurth, ordered new parts with 50% and a bit better performance. (Week 14)
- Subsea can troubleshooting, testing and mods (Week 15)
- More tank testing with the long rod (Week 16)
- Final down selection to 2 possible coms techs (Week 16)
- Subsea bottle testing with controlled loads to better understand what initially appeared to be odd losses (Week 16)
- Coms testing with the short rod (Week 17)
- Prep for testing (Week 17)
- Tested power consumption and communication speeds with two potential modems to downselect to one; unspooled 1000ft of cat6a cable through buildings A and B to run a 1hr test and then respoiled it - not recommended... (Week 18)
- Found a 3 phase ideal diode development board which looks promising (Week 21)

- Reviewed specs for the victron system and inverter trying to eliminate a mysterious 50W DC load reported by the Victron GUI when the inverter was started with very light AC loads; finally located current probes large enough to fit around the large buoy conductors and discovered once again that the GUI is very inaccurate despite it having access to sensors with specs that suggest they should be very accurate (Week 21)
- Tested 3phase diode bridge demo board, does not work as well as hoped but better than the diode bridge we have. Attempts to modify it to improve performance have resulted in shoot through; reverse engineering the main component behaviour via Itspice because the datasheet doesn't even explain pin functions. (Week 22)
- Planning for some more coms tests and changes to the solar buoy (Week 23)
- Top side power off except modem feasibility study (Week 24)
- Tested all the various modem modes with the real buoy cable and generator on in the test tank to emulate stretched out hose - should be able to get >125mbps with margin (Week 24)
- Active 3 phase bridge schematic redrawn and lightly modified; still need to review (Week 26)
- Began testing the solar dock, worked with James to fix (Week 27)
- Completed schematic for the active diode bridge (Week 27)
- Tested solar buoy subsea can (Week 28)
- Solar buoy electronics testing (Week 29)

902111 - Carbon Flux Ecology

- Tested battery #3, may be some manufacturing issues? (Week 3)

902204 - Scalable Robotics

- Tested remaining 2 HSI light electronics stacks (Week 2)
- Designed a new baffle for the new camera module which needs to be installed in the Mola Docking Camera (Week 2)
- Identified the problem with the mola ESC controller code: some of the registers advance when read so the debugger was wreaking havoc and the initial problem was merely forgetting what channel coms was attached to. (Week 2)
- Completed build of 2 HSI lights, and the remaining 3 electronics stacks (Week 3)
- Swapped and tested the new luxonis camera in the mola docking camera assembly; the old camera threw errors on ROS2 kilted but worked on Jazzy, the new camera throws errors on Jazzy but supposedly works on Kilted; looked like a number of people were begging Luxonis to fix for Jazzy, hopefully they come through (Week 3)
- Continued working on ESC controller software, getting close. (Week 3)
- Trigger board calibration procedure (Week 6)
- Tested rolling shutter camera with capacitive discharge strobe light (Week 6)
- Preparations to get triggering working on ventana drawer (Week 6)
- Finished assembling 1 strobe light and ran lumen test with Paul (Week 6)

- Previous weeks - finished ESC controller software and developed preliminary hardware integration test plan but tabled because mola is in high demand. (Week 6)
- Reconfigured 2 of the previously assembled but unhoused HSI light electronic stacks to be strobes(higher lumens LEDs/no lenses) and tested new strobe boards Chris nicely assembled (Week 6)
- HSI lights and POE can rewiring; last minute scrambles to get connectors, rewire housings and get everything tested. Potentially discovered bug in luxonis drivers so the USB version of a card works but the POE version doesn't. (Week 7)
- Began working on fixes for the broken HSI light; need optocouplers with fast edges that won't add to the jitter margin... (Week 8)
- Completed isolation board for OAKD1500M (Week 9)
- Started trigger switching board for PoE can (Week 9)
- Last week: finished schematics and reviewed Jose's layout for a trigger isolation card for the PoE camera and a switching matrix card for the PoE Can's raspberry pi, ordered some parts (Week 11)
- No ground faults apparent but installed kapton isolation washers in two lights to further increase resistance (Week 11)
- Wrote driver to test switchmatrix card and completed card level testing (Week 14)
- Designed fixture for switchmatrix card (Week 14)
- Installed trigger isolation card in OAK1500M (front) (Week 14)
- Completed PoE can harnessing schematics (Week 15)
- RPi test code, created test harnesses and board checkout of the switch matrix card - working (Week 15)
- Switch matrix card fixturing in PoE can (Week 15)
- Rewired PoE can and oakD 1500m and began system level bench tests - not working, but getting close. (Week 15)
- Final PoE housing #1 mods completed and initially tested (Week 16)
- Worked with Etechs to begin modifying PoE housing #2 to match 1st (Week 16)
- Identified and worked on a fix for half a ground fault in the PoE can (Week 16)
- Ordered parts and completed chassis wiring for isolation triggering on the 2nd Oak1500M (Week 16)
- Updated spare PoE can and spare OakD1500M with changes (Week 17)
- Primary can spread bench testing and system integration (Week 17)
- Found magic values for strobe light/camera delay (Week 17)
- Final integration, and bench testing of the PoE cans with lights, tank testing - everything appears to work finally but the luxonis hardware just can't keep up (Week 18)
- updated trigger board software to allow triggering stereo cameras at a submultiple of the color camera frame rate to support laser scanning mode. Looks like it works but once again luxonis software needs lots of tweaking to find regions of stability. (Week 18)
- Tested the trigger board at -20C to see if oscillator performance might explain the poor camera/light sync seen on mola at -2C in the Arctic; trigger board output

looked good so the problem is possibly in luxonis hardware or temperature was just a coincidence. (Week 18)

- Finished updating docs for the now cancelled SuBastian cruise (Week 19)
- Trouble shot a nonresponsive oakd500m on mola, a broken solder joint on mashed connector in mola was repaired and it is now communicating again (Week 21)
- Opened and closed mola far too many times to determine boxfish's network topology (Week 22)
- Helped acclimate Brent to mola (Week 22)
- Laid out a small breakout board for mola ESC testing (Week 23)
- Ordered board/hardware and hardware for faster SD card writing test (Week 23)
- Worked with Brent to test OAK-D and raspi image recording bottle neck; hardware alone is a poor fix (Week 24)
- Looked through many storage options for mola (Week 25)
- Identified alternate SBC which supports NVME and is low power (Week 25)
- Initial preparations for testing new mola thruster hardware/software (Week 26)
- Identified/Ordered new low power SBC (Rock 3C) with NVME interface since the RPi SD card and USB flash hardware is not able to sustain write speeds in Oak500m (Week 26)
- Finished making up hardware for a mola thruster test (Week 27)
- Finished assembly/installation and testing of a prototype esc controller for mola which translates uart commands into dshot150 pulse streams (Week 28)
- Continued working with Brent on OakD500m improvements (Week 28)
- Continued integrating the motor controller and began looking at a permanent deployable architecture (Week 29)
- Ordered parts and made cables for a USB test (Week 29)
- Setup and tested USB over ethernet pairs on mola with Brent, High Speed mode worked with 2 out of 3 hubs suggesting it is probably a feasible option for connecting the OAKD500m, reducing bandwidth bottlenecks and eliminating a few watts (Week 30)
- Updated the schematic and routed a final version of the ESC breakout board for mola (Week 30)
- Began a schematic for the final ESC control board (Week 30)
- ESC bridge controller testing with Michael (Week 30)

902208 - Mini ROV Operations

902304 - Piscivore Cam

- Identified framos camera hardware to order and begged them to send me a quote. (Week 2)
- Chasing framos for a quote (Week 3)
- Swapping CV28 and CV25 soms on OEM boards and EVK2 to check it works (Week 6)

- Previous weeks (Week 6)
 - Preliminary fit check to fit the OEM board and cameras into a 2in housing - it fits! (Week 6)
 - Spent far too much time trying to order analog boards from framos; finally on order and may be on the way? (Week 6)
- Continued work Gen4 camera (Week 7)
- Continued working on housing fixturing for Gen4 (Week 8)
- Ordered new camera sensor (Week 9)
- Gen4 camera design and replacement options as Oclea shutdown (Week 9)
- Continued working Gen4 camera design (Week 11)
- Last minute alternative options research/final preparations for a last time buy from oclea (Week 13)
- Swapped bulkheads on Gen 3 camera and rebuilt (Week 14)
- Last time buy for Oclea hardware (Week 14)
- Worked with DMO on Makai to install a network switch and avoid keeping a backseat on. (Week 14)
- LRAUV re-integration on upgraded makai with new 8pin bulkhead and prep for Gen3 camera deployment hopefully later this week (Week 15)
- Camera focusing and final makai testing in prep for deployment this week (Week 16)
- Updated cots board rework instructions for new boards and continued electrical planning for gen4 (Week 17)
- Continued working on gen4 design (Week 18)
- Reverse engineering camera interfaces - hardware synchronization of cameras/lights failed but we have user space access to kernel controlled i2c interfaces and the hardware default is probably being overwritten by driver binaries we might be able to re-overwrite after they are initialized (Week 19)
- Interface board architecture and parts selection started (Week 19)
- Continued working on gen4 schematic and mechanical design. Rough mechanical design is now in review. (Week 21)
- Pushed out a mostly complete Gen4 mechanical design and electrical feature list based on the still in work schematic for internal team review (Week 22)
- Fixed (hopefully) and re-prepared the gen2 camera hours before deployment; looking forward to replacing it... (Week 22)
- Reviewed machined parts with Aaron and Yamir (Week 23)
- Identified thermal mitigation plans and estimated thermal resistance without goop (Week 23)
- Ordered bluerobotics hardware; despite claiming stock, they shipped short and billed the credit card for everything (Week 23)
- Continued working on electrical design (Week 23)
- Schematic work continues but is nearing completion (Week 24)
- Gen4 schematic finished, the stm32u0 series support RTC/clock with 200nA! (Week 25)
- Started checking everything (Week 25)

- Finished schematic and mechanical design for gen4, began ME drawings and Etech transfer (Week 26)
- Started ordering longer lead items, unfortunately the world is out MCBH8MAS (Week 26)
- Finally completed lens testing of all the cheap lenses from aliexpress, specs were at least partially incorrect on most, only one was faster with similar fov to what we have now but minimum focus distance was much further out which meant not enough pixels on target to resolve small features with an infinity focus. (Week 27)
- Reviewed schematic with Denis, updated schematic, linked and created netlist and started working with Jose/James on a very tight layout. (Week 27)
- Continued ordering long lead parts (Week 27)
- More lens testing - identified another lens to try with the other gen 4 enhancements (Week 28)
- Tried to test the new IMX662 camera to discover metric fastener fit classes are far too complicated, framos's holders are cheap and I should have purchased holders with the lenses (Week 28)
- Began working on lighting architecture (Week 28)
- Worked with James to review the Gen4 board, begin ordering hardware and identify alternates for out of stock parts - the AI data centers or war seems to be recreating 2022 again (Week 29)
- Finally found a lens mount; unfortunately it arrived too late to make the July deployment but will be able to run camera comparison tests when the gen3 camera returns from deployment (Week 29)
- Continued working on the light design. (Week 29)
- Finalized LED board mechanical design, finished schematic and routed the board still need to finish silk and check footprints (Week 30)
- Finished up last fixturing changes for the Gen4 camera, ordered mcmaster bom and printed everything (Week 30)

Out of Office

Overhead

- Open house (Week 29)