

George Stern

Week 30

- 300070 - DMO Support - Ventana
- 300078 - DMO Support - AUV
 - DSPL finally scheduled the test, got test articles shipped
- 701147 - MARS O&M IV
- 902106 - Niobicon-Based AUV Docking Development
- 902111 - Carbon Flux Ecology
- 902204 - Scalable Robotics
 - 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
 - Updated the schematic and routed a final version of the ESC breakout board for mola
 - Began a schematic for the final ESC control board
 - ESC bridge controller testing with Michael
- 902208 - Mini ROV Operations
- 902304 - Piscivore Cam
 - Finalized LED board mechanical design, finished schematic and routed the board still need to finish silk and check footprints
 - Finished up last fixturing changes for the Gen4 camera, ordered mcmaster bom and printed everything
- Overhead
- Out of Office

Week 29

- 300070 - DMO Support - Ventana
- 300078 - DMO Support - AUV
- 701147 - MARS O&M IV
- 902106 - Niobicon-Based AUV Docking Development
 - Solar buoy electronics testing
- 902111 - Carbon Flux Ecology
- 902204 - Scalable Robotics
 - Continued integrating the motor controller and began looking at a permanent deployable architecture
 - Ordered parts and made cables for a USB test
- 902208 - Mini ROV Operations
- 902304 - Piscivore Cam

- 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
 - 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
 - Continued working on the light design.
- Overhead
 - Open house
- Out of Office

Week 28

- 300070 - DMO Support - Ventana
 - Still waiting on DSPL to accept my pressure testing request so testing can begin
- 300078 - DMO Support - AUV
- 701147 - MARS O&M IV
- 902106 - Niobicon-Based AUV Docking Development
 - Tested solar buoy subsea can
- 902111 - Carbon Flux Ecology
- 902204 - Scalable Robotics
 - Finished assembly/installation and testing of a prototype esc controller for mola which translates uart commands into dshot150 pulse streams
 - Continued working with Brent on OakD500m improvements
- 902208 - Mini ROV Operations
- 902304 - Piscivore Cam
 - More lens testing - identified another lens to try with the other gen 4 enhancements
 - 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
 - Began working on lighting architecture
- Overhead
- Out of Office

Week 27

- 300070 - DMO Support - Ventana
- 300078 - DMO Support - AUV
- 701147 - MARS O&M IV
- 902106 - Niobicon-Based AUV Docking Development
 - Began testing the solar dock, worked with James to fix
 - Completed schematic for the active diode bridge
- 902111 - Carbon Flux Ecology

- 902204 - Scalable Robotics
 - Finished making up hardware for a mola thruster test
- 902208 - Mini ROV Operations
- 902304 - Piscivore Cam
 - 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.
 - Reviewed schematic with Denis, updated schematic, linked and created netlist and started working with Jose/James on a very tight layout.
 - Continued ordering long lead parts
- Overhead
- Out of Office

Week 26

- 300070 - DMO Support - Ventana
- 300078 - DMO Support - AUV
 - PO transmitted to DSPL for initial pressure testing, waiting for their approval to ship HW
- 701147 - MARS O&M IV
- 902106 - Niobicon-Based AUV Docking Development
 - Active 3 phase bridge schematic redrawn and lightly modified; still need to review
- 902111 - Carbon Flux Ecology
- 902204 - Scalable Robotics
 - Initial preparations for testing new mola thruster hardware/software
 - 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
- 902208 - Mini ROV Operations
- 902304 - Piscivore Cam
 - Finished schematic and mechanical design for gen4, began ME drawings and Etech transfer
 - Started ordering longer lead items, unfortunately the world is out MCBH8MAS
- Overhead
- Out of Office

Week 25

- 300070 - DMO Support - Ventana
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- 701147 - MARS O&M IV

- 902106 - Niobicon-Based AUV Docking Development
- 902111 - Carbon Flux Ecology
- 902204 - Scalable Robotics
 - Looked through many storage options for mola
 - Identified alternate SBC which supports NVME and is low power
- 902208 - Mini ROV Operations
- 902304 - Piscivore Cam
 - Gen4 schematic finished, the stm32u0 series support RTC/clock with 200nA!
 - Started checking everything
- Overhead
- Out of Office

Week 24

- 300070 - DMO Support - Ventana
- 300078 - DMO Support - AUV
 - 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
 - Got cost clarification and discussed funding, need to follow up on the funding or take the risk and get the design started again
- 701147 - MARS O&M IV
- 902106 - Niobicon-Based AUV Docking Development
 - Top side power off except modem feasibility study
 - 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
- 902111 - Carbon Flux Ecology
- 902204 - Scalable Robotics
 - Worked with Brent to test OAK-D and raspi image recording bottle neck; hardware alone is a poor fix
- 902208 - Mini ROV Operations
- 902304 - Piscivore Cam
 - Schematic work continues but is nearing completion
- Overhead
- Out of Office

Week 23

- 300070 - DMO Support - Ventana
- 300078 - DMO Support - AUV
 - Began testing pressure test cards after 14kpsi over test; one cap damaged and repaired

- Finally got quote clarification from DSPL regarding their quote, almost ready to get it sent out
- 701147 - MARS O&M IV
- 902106 - Niobicon-Based AUV Docking Development
 - Planning for some more coms tests and changes to the solar buoy
- 902111 - Carbon Flux Ecology
- 902204 - Scalable Robotics
 - Laid out a small breakout board for mola ESC testing
 - Ordered board/hardware and hardware for faster SD card writing test
- 902208 - Mini ROV Operations
- 902304 - Piscivore Cam
 - Reviewed machined parts with Aaron and Yamir
 - Identified thermal mitigation plans and estimated thermal resistance without goop
 - Ordered bluerobotics hardware; despite claiming stock, they shipped short and billed the credit card for everything
 - Continued working on electrical design
- Overhead
- Out of Office

Week 22

- 300070 - DMO Support - Ventana
- 300078 - DMO Support - AUV
- 701147 - MARS O&M IV
- 902106 - Niobicon-Based AUV Docking Development
 - 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 ltspice because the datasheet doesn't even explain pin functions.
- 902111 - Carbon Flux Ecology
- 902204 - Scalable Robotics
 - Opened and closed mola far too many times to determine boxfish's network topology
 - Helped acclimate Brent to mola
- 902208 - Mini ROV Operations
- 902304 - Piscivore Cam
 - Pushed out a mostly complete Gen4 mechanical design and electrical feature list based on the still in work schematic for internal team review
 - Fixed (hopefully) and re-prepared the gen2 camera hours before deployment; looking forward to replacing it...
- Overhead
- Out of Office

Week 21

- 300070 - DMO Support - Ventana
- 300078 - DMO Support - AUV
 - Looked at external pressuring testing suppliers and requested quotes
- 701147 - MARS O&M IV
- 902106 - Niobicon-Based AUV Docking Development
 - Found a 3 phase ideal diode development board which looks promising
 - 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
- 902111 - Carbon Flux Ecology
- 902204 - Scalable Robotics
 - Trouble shot a nonresponsive oakd500m on mola, a broken solder joint on mashed connector in mola was repaired and it is now communicating again
- 902208 - Mini ROV Operations
- 902304 - Piscivore Cam
 - Continued working on gen4 schematic and mechanical design. Rough mechanical design is now in review.
- Overhead
- Out of Office

Week 20

- 300070 - DMO Support - Ventana
- 300078 - DMO Support - AUV
- 701147 - MARS O&M IV
- 902106 - Niobicon-Based AUV Docking Development
- 902111 - Carbon Flux Ecology
- 902204 - Scalable Robotics
- 902208 - Mini ROV Operations
- 902304 - Piscivore Cam
- Overhead
- Out of Office

Week 19

- 300070 - DMO Support - Ventana
- 300078 - DMO Support - AUV
 - Troubleshooting failed pressure test
- 701147 - MARS O&M IV

- 902106 - Niobicon-Based AUV Docking Development
- 902111 - Carbon Flux Ecology
- 902204 - Scalable Robotics
 - Finished updating docs for the now cancelled SuBastian cruise
- 902208 - Mini ROV Operations
- 902304 - Piscivore Cam
 - 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
 - Interface board architecture and parts selection started
- Overhead
- Out of Office

Week 18

- 300070 - DMO Support - Ventana
- 300078 - DMO Support - AUV
 - 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.
- 701147 - MARS O&M IV
- 902106 - Niobicon-Based AUV Docking Development
 - 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 respooled it - not recommended...
- 902111 - Carbon Flux Ecology
- 902204 - Scalable Robotics
 - 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
 - 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.
 - 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.
- 902208 - Mini ROV Operations

- 902304 - Piscivore Cam
 - Continued working on gen4 design
- Overhead
- Out of Office

Week 17

- 300070 - DMO Support - Ventana
- 300078 - DMO Support - AUV
- 701147 - MARS O&M IV
- 902106 - Niobicon-Based AUV Docking Development
 - Coms testing with the short rod
 - Prep for testing
- 902111 - Carbon Flux Ecology
- 902204 - Scalable Robotics
 - Updated spare PoE can and spare OakD1500M with changes
 - Primary can spread bench testing and system integration
 - Found magic values for strobe light/camera delay
- 902208 - Mini ROV Operations
- 902304 - Piscivore Cam
 - Updated cots board rework instructions for new boards and continued electrical planning for gen4
- Overhead
- Out of Office

Week 16

- 300070 - DMO Support - Ventana
- 300078 - DMO Support - AUV
- 701147 - MARS O&M IV
- 902106 - Niobicon-Based AUV Docking Development
 - More tank testing with the long rod
 - Final down selection to 2 possible coms techs
 - Subsea bottle testing with controlled loads to better understand what initially appeared to be odd losses
- 902111 - Carbon Flux Ecology
- 902204 - Scalable Robotics
 - Final PoE housing #1 mods completed and initially tested
 - Worked with Etechs to begin modifying PoE housing #2 to match 1st
 - Identified and worked on a fix for half a ground fault in the PoE can
 - Ordered parts and completed chassis wiring for isolation triggering on the 2nd Oak1500M
- 902208 - Mini ROV Operations
- 902304 - Piscivore Cam
 - Camera focusing and final makai testing in prep for deployment this week

- Overhead
- Out of Office

Week 15

- 300070 - DMO Support - Ventana
- 300078 - DMO Support - AUV
- 701147 - MARS O&M IV
- 902106 - Niobicon-Based AUV Docking Development
 - Subsea can troubleshooting, testing and mods
- 902111 - Carbon Flux Ecology
- 902204 - Scalable Robotics
 - Completed PoE can harnessing schematics
 - RPi test code, created test harnesses and board checkout of the switch matrix card - working
 - Switch matrix card fixturing in PoE can
 - Rewired PoE can and oakD 1500m and began system level bench tests - not working, but getting close.
- 902208 - Mini ROV Operations
- 902304 - Piscivore Cam
 - LRAUV re-integration on upgraded makai with new 8pin bulkhead and prep for Gen3 camera deployment hopefully later this week
- Overhead
- Out of Office

Week 14

- 300070 - DMO Support - Ventana
- 300078 - DMO Support - AUV
- 701147 - MARS O&M IV
- 902106 - Niobicon-Based AUV Docking Development
 - Troubleshoot networking issues on Pontus backseat
 - More subsea housing mods
 - 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
 - Desk tests with chokes indicate 30% derating is marginally sufficient for Würth, ordered new parts with 50% and a bit better performance.
- 902111 - Carbon Flux Ecology
- 902204 - Scalable Robotics
 - Wrote driver to test switchmatrix card and completed card level testing
 - Designed fixture for switchmatrix card
 - Installed trigger isolation card in OAK1500M (front)

- 902208 - Mini ROV Operations
- 902304 - Piscivore Cam
 - Swapped bulkheads on Gen 3 camera and rebuilt
 - Last time buy for Oclea hardware
 - Worked with DMO on Makai to install a network switch and avoid keeping a backseat on.
- Overhead
- Out of Office

Week 13

- 300070 - DMO Support - Ventana
- 300078 - DMO Support - AUV
 - Test plan for pressure testing
 - Initial discussions with stake holders to get pressure test scheduled/started
- 701147 - MARS O&M IV
- 902106 - Niobicon-Based AUV Docking Development
 - 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.
 - Networking troubleshooting on Pontus backseat
- 902111 - Carbon Flux Ecology
- 902204 - Scalable Robotics
- 902208 - Mini ROV Operations
- 902304 - Piscivore Cam
 - Last minute alternative options research/final preparations for a last time buy from oclea
- Overhead
- Out of Office

Week 12

- 300070 - DMO Support - Ventana
- 300078 - DMO Support - AUV
- 701147 - MARS O&M IV
- 902106 - Niobicon-Based AUV Docking Development
- 902111 - Carbon Flux Ecology
- 902204 - Scalable Robotics
- 902208 - Mini ROV Operations
- 902304 - Piscivore Cam
- Overhead
- Out of Office

Week 11

- 300070 - DMO Support - Ventana
- 300078 - DMO Support - AUV
 - Wired up power to the the new electronic gauge Aaron installed on the pressure chamber
- 701147 - MARS O&M IV
- 902106 - Niobicon-Based AUV Docking Development
 - Began planning mods to the subsea can and LRAUV to try to optimize coms without changing rod geometry
- 902111 - Carbon Flux Ecology
- 902204 - Scalable Robotics
 - 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
 - No ground faults apparent but installed kapton isolation washers in two lights to further increase resistance
- 902208 - Mini ROV Operations
- 902304 - Piscivore Cam
 - Continued working Gen4 camera design
- Overhead
- Out of Office

Week 10

- 300070 - DMO Support - Ventana
- 300078 - DMO Support - AUV
- 701147 - MARS O&M IV
- 902106 - Niobicon-Based AUV Docking Development
- 902111 - Carbon Flux Ecology
- 902204 - Scalable Robotics
- 902208 - Mini ROV Operations
- 902304 - Piscivore Cam
- Overhead
- Out of Office

Week 9

- 300070 - DMO Support - Ventana
- 300078 - DMO Support - AUV
- 701147 - MARS O&M IV
- 902106 - Niobicon-Based AUV Docking Development
 - Planning
- 902111 - Carbon Flux Ecology
- 902204 - Scalable Robotics

- Completed isolation board for OAKD1500M
 - Started trigger switching board for PoE can
- 902208 - Mini ROV Operations
- 902304 - Piscivore Cam
 - Ordered new camera sensor
 - Gen4 camera design and replacement options as Oclea shutdown
- Overhead
- Out of Office

Week 8

- 300070 - DMO Support - Ventana
- 300078 - DMO Support - AUV
- 701147 - MARS O&M IV
 - Finished verifying another fan and fan controller can be added
 - Updated documentation and looked through new solid models we received
- 902106 - Niobicon-Based AUV Docking Development
- 902111 - Carbon Flux Ecology
- 902204 - Scalable Robotics
 - Began working on fixes for the broken HSI light; need optocouplers with fast edges that won't add to the jitter margin...
- 902208 - Mini ROV Operations
- 902304 - Piscivore Cam
 - Continued working on housing fixturing for Gen4
- Overhead
- Out of Office

Week 7

- 300070 - DMO Support - Ventana
- 300078 - DMO Support - AUV
- 701147 - MARS O&M IV
 - 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.
- 902106 - Niobicon-Based AUV Docking Development
 - Meetings and planning for the buoy cable buy
- 902111 - Carbon Flux Ecology
- 902204 - Scalable Robotics
 - 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.
- 902208 - Mini ROV Operations

- 902304 - Piscivore Cam
 - Continued work Gen4 camera
- Overhead
- Out of Office

Week 6

- 300070 - DMO Support - Ventana
- 300078 - DMO Support - AUV
- 701147 - MARS O&M IV
 - Looked at MARS and some cots heatsink options while bugging UW for solid models
- 902106 - Niobicon-Based AUV Docking Development
 - On going over the past 2wks
 - Datasheet and docs review of the current powerline modems
 - High frequency magnetic field shielding refresher - nonferrous high conductivity metals really do work best due to eddy currents
 - Began looking at filter design and system layouts
 - Potential comms options for new docking buoy and phy layer cable requirements
- 902111 - Carbon Flux Ecology
- 902204 - Scalable Robotics
 - Trigger board calibration procedure
 - Tested rolling shutter camera with capacitive discharge strobe light
 - Preparations to get triggering working on ventana drawer
 - Finished assembling 1 strobe light and ran lumen test with Paul
 - Previous weeks - finished ESC controller software and developed preliminary hardware integration test plan but tabled because mola is in high demand.
 - 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
- 902208 - Mini ROV Operations
- 902304 - Piscivore Cam
 - Swapping CV28 and CV25 soms on OEM boards and EVK2 to check it works
 - Previous weeks
 - Preliminary fit check to fit the OEM board and cameras into a 2in housing - it fits!
 - Spent far too much time trying to order analog boards from framos; finally on order and may be on the way?
- Overhead
- Out of Office

Week 5

- 300070 - DMO Support - Ventana
- 300078 - DMO Support - AUV
- 701147 - MARS O&M IV
- 902106 - Niobicon-Based AUV Docking Development
- 902111 - Carbon Flux Ecology
- 902204 - Scalable Robotics
- 902208 - Mini ROV Operations
- 902304 - Piscivore Cam
- Overhead
- Out of Office

Week 4

- 300070 - DMO Support - Ventana
- 300078 - DMO Support - AUV
- 701147 - MARS O&M IV
- 902106 - Niobicon-Based AUV Docking Development
- 902111 - Carbon Flux Ecology
- 902204 - Scalable Robotics
- 902208 - Mini ROV Operations
- 902304 - Piscivore Cam
- Overhead
- Out of Office

Week 3

- 300070 - DMO Support - Ventana
- 300078 - DMO Support - AUV
- 701147 - MARS O&M IV
- 902106 - Niobicon-Based AUV Docking Development
 - meeting
- 902111 - Carbon Flux Ecology
 - Tested battery #3, may be some manufacturing issues?
- 902204 - Scalable Robotics
 - Completed build of 2 HSI lights, and the remaining 3 electronics stacks
 - 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
 - Continued working on ESC controller software, getting close.
- 902208 - Mini ROV Operations
- 902304 - Piscivore Cam

- Chasing framos for a quote
- Overhead
- Out of Office

Week 2

- 300070 - DMO Support - Ventana
- 300078 - DMO Support - AUV
- 701147 - MARS O&M IV
- 902106 - Niobicon-Based AUV Docking Development
- 902111 - Carbon Flux Ecology
- 902204 - Scalable Robotics
 - Tested remaining 2 HSI light electronics stacks
 - Designed a new baffle for the new camera module which needs to be installed in the Mola Docking Camera
 - 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.
- 902208 - Mini ROV Operations
- 902304 - Piscivore Cam
 - Identified framos camera hardware to order and begged them to send me a quote.
- Overhead
- Out of Office