Paul McGill Sorted By Project

300070 - DMO Support- Ventana

- Designed protection circuitry for PC input pins on Ventana's Vicors. Parts on order and will install next week. Also doing further analysis of ground-fault system to correct problems. (Week 11)
- Trying to set up an Arduino to exercise a Ground Fault Sensing board from Ventana in order to understand some problems with that system. (Week 18)
- Writing code to test ROV ground fault system. (Week 20)
- Helping DJ to better protect the Vicor control inputs on Ventana power supplies. Also researching changes to the ground-fault system so it produces better data. (Week 23)
- Installed protection components on Ventana's Vicor boards to stop frequent damage to their PC control pins. (Week 24)
- Showed pilots my work on ground fault scanning board that demonstrates that current setup on ROV gives incorrect readings. Did more lab testing to show that scanning could also be much faster. (Week 25)
- Found a COTS regen shunt regulator for ROV's pump motor controller that should eliminate failures caused by motor regen events. (Week 25)
- Helping DJ design a power supply for a new pan and tilt on Ventana. (Week 41)
- Helping DJ with Ventana ground-fault system (Week 43)
- Helping DJ with Ventana ground-fault issues (Week 48)

701127 - MARS O&M III

- Working with Craig D. to estimate resources needed for NSF proposal to resurrect MARS extension cable to MOBB seismometer. Had long conference call with collaborators at UC Berkeley and Stanford. (Week 5)
- Continuing to work on NSF proposal (Week 6)

701145 - Penguin Hotspots

- Made spectral noise measurements of Simrad sonar power supply and filter. Working with Craig O. to find better filters, and how to measure their effectiveness. Ordered low-frequency ferrites for us to test. Reviewed Jon E.'s housing design for Remus AUV with group. (Week 5)
- Trying to squeeze electronics into a tight space. It's what we do here. (Week 7)
- Finalized electronics chassis layout with Jon E. (Week 9)
- Did more Simrad power supply noise testing with Chad and concluded we need a quieter power supply. (Week 11)
- Working on electronics for Remus housing chassis. (Week 29)
- Got filter board modified for testing of sonar in REMUS chassis. Awaiting reopening for testing. (Week 31)
- Did power supply noise testing in lab with Chad. Getting some interference from DC-DC converter, working on solutions. (Week 35)
- Worked with Chad in the lab to track down sources of noise in sonar. May be a power supply issue. (Week 36)
- Modified WBT power supply board. Did a few more noise suppression tests on the WBT with Chad W. Working on setting up an ultrasonic sniffer to see if some noise is acoustic and not EM. (Week 38)
- Did more sonar noise testing in lab with Chad W. Discovered that sonar is extremely sensitive to noise on its power input by injecting a signal there. (Week 39)

901221 - Midwater Time Series

- Final editing for predator/prey paper, working on poster for Ocean Sciences. (Week 6)
- Working on Ocean Sciences poster with Rob (Week 7)

901618 - Pelagic-Benthic Coupling

- Worked with Tom M. to reassemble pump for Larval Sampler, and drew schematic for pressure test setup. Tracked down schematics for SES to MARS interface and measured the length of the extension cable. (Week 5)
- Collected graphics and did on-camera interview for Station M video. Working on pressure test of Larval Sampler pump, and adding a regen shunt to its controller. (Week 6)
- Wired Larval Sampler pump through pressure test bulkhead and got it spinning in preparation for upcoming pressure tests. Still working on content for Station M 30th anniversary video. (Week 7)
- Finally tested larval sampling pump in pressure test chamber but pump failed. Ordered parts for one more test and working on contingency plans if that also fails. (Week 11)
- Did a little work estimating Rover's location for upcoming Wave Glider visit, but will have to delay final estimate until we know when WG will be at Station M. (Week 12)
- Working on camera tripod optical calculations for a paper Crissy is writing. (Week 16)
- Got SnappyTNG camera controller code to compile with latest XC8 compiler. Also fixed problems with Rover Wakey controller code and reflashed Rover's spare. (Week 17)
- Reviewed depth-of-field testing images for Macro Camera and tried to compare them with my modeling, but more in-lab testing will be required. (Week 18)
- Prioritizing work for MBARI reopening next month. Developing backup plan in case pressure-tolerant motor control isn't. (Week 20)
- Working with John F. to refurbish SES. Tracking down equipment and docs to test MARS connection for SES. Also tracking down equipment to test larval pump motor driver with new pressure-tolerant oscillator. Hard to find stuff when people aren't at MBARI! (Week 23)
- Working on SES refurbishment and testing of MARS interface. (Week 24)
- Tested the attempted repair of Larval Pump's Elmo motor drive that failed at 6500 psi, but it's truly dead. Now designing a 1 atm housing for our last remaining Elmo. (Week 24)
- Analyzed SES fluorometer data for Pulse 71 with our new standard fluorescence target and discovered that black Delrin fluoresces at 590 nm. Designing new protocol for establishing reference fluorescence during SES deployment. (Week 24)
- Continuing with BLISS larval pump 1 atm motor controller design. Ordered all connectors. (Week 25)
- Got connectors installed on SES MARS interface so I can continue testing it. (Week 25)
- Tested battery on SES modem and thought it was good but it isn't. More testing needed. (Week 25)
- Got the SES rewiring completed and housings closed in preparation for next week's tank testing. (Week 29)
- Determined specs for new camera calibration target for Laser Measure. (Week 29)
- Got SES into Test Tank but controller is having problems so we'll have to pull it when MBARI reopens. (Week 31)
- Finished schematics for Larval Sampler motor controller, but can't get it built until MBARI reopens. (Week 31)
- Gave new Laser Measure calibration target specs to Mariah and she'll work on it this week. (Week 31)
- Finished modification and reassembly of larval sampling pump. Did bench testing and addressed a few problems. Set up flow rate recording system and ran system in Test Tank to identify optimal pumping rates. (Week 33)
- Finished tank testing of BLISS larval sampler. Based on flow data collected, was able to calculate the optimal flow rate for this week's deployment at MARS. (Week 34)
- Finished preparing SES for deployment. (Week 34)
- Went to sea on Carson on Tue and Wed to deploy and recover instruments. (Week 34)
- Wrote code to geolocate Rover with Wave Glider data and worked with O'Reilly on algorithm to do loop-and-cross navigation autonomously. (Week 34)
- Post-cruise cleanup and data analysis. Tracked down cause of RF beacon failure on elevator. (Week 35)
- Moved a metric crapton of lithium batteries from garage to Rover lab. (Week 35)
- Troubleshot power issues with SES on MARS. (Week 36)
- Prepping equipment and setting schedule for Carson cruises at end of this month. (Week 38)
- Fixed some issues in my ROV transect volume calculations. (Week 38)

- Cruise prep for next Mon and Tue. Found a last-minute problem with larval pump but think we've got it resolved. (Week 39)
- Did loop and cross algorithm testing on Wave Glider with Tom O. Discovered some issues and modified algorithm, but won't get to test until WG is at Sta. M. (Week 39)
- Doing frame grabs of camera calibration target video from ROV dives last week. (Week 41)
- Reconfigured SES from MARS operation to autonomous mode for Station M. Troubleshot imaging issue with SES camera. Disassembled, cleaned, and reassembled camera imaging chamber with Johnny and Rich. (Week 42)
- Loading ship for Flyer cruise next week. Working with Duane E. to analyze camera calibration images from last Ventana dive. Made some changes to our calibration target. (Week 43)
- Processing Laser Measure camera calibration images from last Station M cruise. Doing calculations to feed distortion-corrected images into Dan Davis's MATLAB code. (Week 47)
- Working on math to do Laser Measure calibration underwater instead of in moonpool. (Week 48)
- Did more post-cruise clean up such as sending optodes off for cal and beacon inventory. (Week 50)
- 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. (Week 51)
- 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. (Week 51)

901700 - 2017 Acoustical Ocean Eco

- Trying to use a signal generator and oscilloscope's FFT function to characterize filters in the 0 to 500 kHz range, as we don't have a spectrum analyzer that works this low. (Week 6)
- Modified new Linear Tech power supply to output 15 V in preparation for noise testing on Simrad sonar. (Week 7)
- Finally found and corrected problem with MXNet installation on DeepDark and can now run neural nets with multiple GPUs. (Week 9)
- Working on neural network code for classifying sonar target data. We're all becoming software engineers... (Week 12)
- Continuing to work on processing sonar data with neural nets. Currently struggling to get data imported in a form usable by MXNet. Many functions done automatically by Mathematica must be performed explicitly by Gluon. With power comes responsibility. (Week 13)
- Finally got MXNet code running on Deepdark for machine learning, which gives me a x200,000 speedup. Having network problems which keep dropping my connection to Jupyter notebook server on Deepdark; I am troubleshooting. (Week 14)
- Still banging away on machine learning code. Can't get raw MXNet performance to match Mathematica performance even though the nets are identical. Will continue to beat my head against it. (Week 15)
- Still trying to reconcile differences in results between Mathematica and MxNET. Am trying to import results from one framework into the other to offer some insight. (Week 16)
- Battled configuration problems with Deepdark not recognizing its GPUs, but finally got it going again. (Week 18)
- Wrote Python code to augment sonar data set. (Week 20)
- Got sonar classification neural network running with all 4 GPUs on Deepdark, for a 60x speedup from CPU alone. Testing new network architectures. (Week 29)
- Implemented data augmentation on sonar data and achieved new high of 77% accuracy with neural network. Still tuning hyperparameters. (Week 31)
- Working on hyperparameter tuning code for sonar neural network. (Week 35)
- Arranged for a Mathematica pre-release license so I can run latest version on Deepdark without buying another license. Researching methods of hyperparameter tuning for our neural network to improve accuracy above the current 75%. (Week 36)
- Learning how to set up more complex neural nets to improve accuracy. Concepts are easy, syntax is hard. (Week 38)

- Worked with Chad W in the lab to measure the sensitivity of the Simrad WBT sonar to external noise sources. Bottom line - it's VERY sensitive. Working on mitigation strategies. (Week 41)
- Ordering materials and tools for sonar Faraday cage. Designing power input filter circuit. (Week 42)
- Still ordering EMI shield materials for WBT Mini sonar. (Week 43)
- Drawing schematics for Simrad sonar noise-shielding enclosure. (Week 47)
- Designing Faraday cage for Simrad sonar. Did Zoom call with Jose to get my OrCAD set up correctly for this. (Week 48)
- Created symbols for new parts and submitted to CIS database, waiting for Jose to create footprints. Looking for ways to shield xducer cables into shield. (Week 50)
- Trying to set up my local copy of OrCAD to connect to MBARI's CIS database. Will need Jose's help with this. (Week 51)

901800.98 - Bioacoustic Payload

901803 - Carbon Wave Glider Development

- Had kickoff meeting for year and hope to get system running in lab again this month. (Week 11)
- Working with Andrea and Craig to write project coronavirus update for management. (Week 16)
- Submitted project Coronavirus update. (Week 17)
- Planning for starting up lab work again to test analyzer. (Week 20)
- Had meeting to plan next steps. Working on getting lab system going again. (Week 29)
- Reviewed design documents to be shared with NOAA PMEL as part of our CRADA. (Week 33)
- Responded to Phase 1 feedback (Week 35)
- Making doc to better understand LI-COR calibration in preparation for meeting with NOAA/PMEL on Friday. (Week 36)
- Finished doc on LI-COR calibration and shared with our PMEL collaborators. (Week 38)
- Talked with Chris Meinig, Director of Engineering at NOAA/PMEL to assure his that MBARI is still committed to building the DIC instrument even with Andrea leaving. (Week 43)
- Ordering lots of parts for Wave Glider instrument build. Team met on Zoom to discuss strategy for rest of this year. (Week 47)
- Ordering parts for DIC analyzer (Week 48)
- Ordered the last of the parts for the DIC analyzer build. (Week 49)
- Inventory of DIC analyzer parts as they're received and coding of CC charges. (Week 50)
- Set up Collaborator's Agreement for Andrea so she'll have access to MBARI network. (Week 50)
- Held group Google Meet meeting to discuss end-of-year spending and humidity sensor integration. (Week 51)
- Sending Andrea's Collaborator's Agreement up the chain of command for approval. (Week 51)

901807 - Next Gen Acoustic Dorado

901904.99 - Coral Camera System

- Did some cable testing with Alana. (Week 7)
- Tank tested camera overnight, and captured a bunch of calibration target pictures to try some new distortion removal software. Mobilizing for Mon cruise on Flyer. (Week 9)
- Participated in end of Barry's Flyer cruise on Fri/Sat w/Alana. Camera was set up during ROV dive and seemed to be working well; will recover in Dec. (Week 11)
- Helped Alana with some macro camera calculations to gather requirements from Jim B. (Week 13)
- Had Zoom meeting with team to discuss this year's plans. (Week 16)
- Did field-of-view and depth-of-field calculations for Macro Camera design. (Week 17)
- Inspected and tested lithium battery shipment (Week 23)
- Looking at camera and lens specs for Coral Macro camera. (Week 24)
- Checked drawings for new Macro Camera housing. There are issues that need to be addressed. (Week 29)

- Working on code to adapt Okuda's pump controller to flash lasers on coral camera. Having trouble getting programmer to recognize PIC on board. (Week 35)
- Helped Alana with concept review materials and attended review. (Week 36)
- Working on strobe design with Alana. (Week 39)
- Helping Alana with Coral Macro Camera strobe power supply and battery pack design. (Week 41)
- Working with Alana and Electrochem engineer to design battery for Coral Macro Camera. (Week 42)
- Helping Alana with strobe charge circuit for Macro Camera. (Week 43)
- Helping Alana with strobe testing. Working on deepsea connect wireless data system for Macro Camera. (Week 47)
- Working on Deep-Sea Connect wireless data system for macro camera (Week 48)
- Helping Alana with Raspberry Pi software configuration (Week 48)
- Participated in Wed's ROV dive through virtual presence. (Week 49)
- Working on layout for Deep Sea Connect data system. Trying to find deep-rated power switch to control power to it. (Week 50)
- Spent a little time looking at lock-in detection for cameras to detect coral fluorescence. (Week 51)

Out of Office

- Will be at Ocean Sciences 16Feb to 21Feb.
- On vacation last Thu and Fri
- Was on vacation Wed thru Fri of last week.
- Sick day to deal with medical appts.

Overhead

- Spent many, many hours on NSF proposal to refurbish MARS extension cable and broadband seismometer. Got UPS working again on neural net development machine deepdark. Helped Gene with his CPF talk for Ocean Sciences. (Week 7)
- Attended Ocean Sciences meeting in San Diego last week (Week 9)
- Set up Web cam for Aaron S. to monitor pressure-test facility. (Week 11)
- Attended Engineering Zoom meeting. (Week 13)
- Engineering Zoom meeting. (Week 14)
- Training - Got OrCAD 17.2 loaded onto my virtual Win10 machine to take online course (Week 16)
- Training: Got online accounts and software set up for OrCAD training. (Week 18)
- Reviewed some of Yanwu's on data decimation filters for the hydrophone data. (Week 20)
- Helping Yanwu to make improvements to DSP code for decimation of hydrophone data. (Week 23)
- Dealt with dead AC power circuit that shut down computer Deepdark. (Week 23)
- Working on OrCAD online training. (Week 31)
- Designing MARS cable extension with Craig D. for possible project with NPS. (Week 39)
- Had phone call with entrepreneur who contacted Alana about using seafloor rovers to mine mineral nodules. Also had phone call with MetOcean about our problems with their beacons and possible solutions. (Week 47)
- Had a major laptop computer crash and had to restore from a ten-day old backup, which took a whole day. (Week 49)
- Out Monday for family medical reasons (Week 49)
- Have resumed OrCAD online training classes (Week 49)
- More OrCAD online training. (Week 50)
- Finished fixed-asset inventory. (Week 50)
- Renewed some software licenses. (Week 50)
- More OrCAD online training. (Week 51)

Training