

Kent Headley Sorted By Project

12/24 - 31 (tentative)

12/4-6 working remotely (BBC filming in test tank)

300057 - Mooring Maintenance

- Troubleshooting downloads with Jared, Karen, and Makenna (Week 25)

300078 - DMO Support - AUV

- met w/ Erik re various planning topics (Week 3)
- Studying Dorado behavior code; hoping to help with behaviors to support I2MAP tow-out capability (Week 6)
- Studying behavior code related to tow-out ops (Week 12)
- studying layered control part of codebase, with any eye towards some updates to enable towed operation use cases (Week 14)
- Though charging to overhead, got a qemu/virt-manager QNX VM for (Intel) MacOS running. Hopefully, this may provide a path for supporting QNX on Apple silicon Macs and/or linux. (Week 16)
- review Erik T scheme for layered control dynamic tasking (Week 20)
- Used qemu emulation/virtualization to set up a QNX (Intel) VM that runs on an M1 mac. Includes an NFS file share with the host, so that repo and editing can take place on the host, and build and run takes place on the guest VM. This provides a development environment for upcoming Dorado work. (Week 47)
- Reviewing the state of code to support TRN in the loop for Dorado sim. Rob and I worked on that, though it's been a while; there is a pending pull request, and currently syncing with the main branch. (Week 47)
- Reviewing layered control for 2025 work to enable remote commands in support of tow-out missions. (Week 47)

3000?? - DMO Support - Ventana

- Ventana valve pack controller board bringup. (Week 10)
- Worked with DJ and technical support group to recover information about the valve controller hardware and software, previously maintained by Dave French (Week 10)
- programmed the boards and brought them up (Week 10)
- documenting location of drawings, software and procedures (Week 10)
- helping DJ with valve pack bench testing (Week 11)
- Thanks to Thom for bridging while I was out (Week 11)

- Looking at controller board actuation signals for potential delay (Week 12)
- Worked with Thom and DJ and measured Wago stack delay (Week 13)
- re-tested delay through Wago stack (modbus write coil :: actuation), looks like < 15 ms (Week 14)
- Worked ROV pilots and Thom on validating valve pack controller board and troubleshooting sampler closure delay. After disassembling a solenoid (fascinating!), the hypothesis is that under low temp/high pressure, the channels in solenoid for enabling fluid displacement when it moves may be too small. DMO thought they'd try opening the channels to see if it helps.
The delay could not be reproduced in air. (Week 16)

500055 - VARS, M3/RS, DSG

901007 - Benthic Biology & Ecology

- Among some issues Enoch is troubleshooting with MRS/BRS, there is a curious periodic power spike that seems to be associated with an Aanderaa optrode or related OASIS hardware/software. To help, I took a look at OASIS configuration and reviewed O5 modbus architecture. (Week 30)
- looked into question re Aanderaa optrode driver and power logic question (Week 44)

901101 - Seafloor Mapping

- test build MB-System release (Week 3)
- Updated TRN intragration package for Sentry: (Week 6)
 - Fixed cmake build errors (libtrnav, mframe) due to packaging changes for libpthread, libm in macOS and linux (Week 6)
 - Updated doc (Week 6)
 - Tested on macOS, Ubuntu 22.04 (Week 6)
 - Merged updates to trndev branch of MB-System (Week 6)
- Issued pull requests to sync w. Libtrnav, mostly cmake build changes (Week 7)
- issued pull request for M3 sonar serial ingest (Week 13)
- Meeting w/ Sentry team re Axial ops, posted TRN integration package (Week 13)
- added new docker builds with Debian and Ubuntu22 based images (Week 14)
- Sentry: prepared latest integration package, attended telecon (Week 14)
- Dave and Cole arriving for Axial cruise this week (Week 25)
- Sentry team mob 6/19 (Week 25)
- On call for Sentry TRN support (Week 25)
- Working on wrapping navigation coordinate transform library to support libproj and/or gctp (current) (Week 25)
- Attended Qt update code review w/ O'Reilly, Caress (Week 29)
- Implemented code to support libproj in addition to gctp for geo coordinate transformation in TRN. libgctp supports lat/lon to UTM, but Dave Caress determined that UTM has an inherent rotational bias that produces offset errors when using TRN at axial; the errors increase with distance from the UTM zone origin. By using libproj, it is possible to use a

local arbitrary mercator projection, which may be centered in the survey area, thereby reducing errors.

Dave tested this at Axial in June, and it worked well. I've made a general implementation that can be configured at run time. That is now being reviewed. (Week 30)

- start ROV TRN configuration for possible LASS dives (Week 33)
- preparing for cruise (Week 34)
- There may be an opportunity to use multibeam data from the LASS cruise for TRN (Week 36)
- fixed several issues with TRN code to support coordinate transformation via different libraries in MB-System. The change was motivated by the need to use local transverse mercator (LTM) projections for Axial surveys, rather than UTM. Dave determined that UTM introduces errors that are proportional to the distance from the UTM origin. Using LTM reduces these errors significantly by establishing the origin near the survey site. (Week 43)
- Finalizing testing of libproj support for MB-System/libtrnav with Dave C. (Week 45)
- Code and test build system updates for libtrnav and MB-System Sentry builds. These enable the use libproj for coordinate transform, fix build warnings, and add options to build TRN code for ROVs (Week 46)
- MB-System TRN maintenance and updates (Week 49)

901704 - Benthic Observing System Maintenance

902204 - Scalable Robotics

- cruise prep : will be running Gemini sonar on 1/18 cruise (Week 3)
- Troubleshooting issue with gemini sonar: range/gain initialization ignored (Week 4)
- Fixed bug: invalid control references in widget mode cause segfault (Week 4)
- Resolved issue: range/gain initialization not working. A 750 ms delay was needed after connection before the sonar would accept configuration commands (Week 5)
- Prep for cruise 2/9 (Week 5)
- Sprint kickoff meeting (Week 5)
- Added lstream docker image, and did some experiments with opengl forwarding to macOS.

Seems that OpenGL is deprecated on macOS, so while some bits are supported, some of the 3D features don't work when forwarding X11 apps to mac. It is perhaps related to support for direct vs indirect rendering. While there is glxgears test program available for macOS that works, when glxgears is run on a linux machine and forwarded to macOS, it requires LIBGL_ALWAYS_INDIRECT=1 and runs very slowly.. (Week 5)

- Gemini sonar driver, added status bar feature, installed for cruise 2/9 (Week 6)
- Reviewing change image format ID in LCM messages from Gemini sonar driver (Week 6)
- Attended cruise 2/9 via telepresence (Week 7)
- Updates for cruise were successful in fixing range/gain init issue (Week 7)
- Data set was collected, pending analysis (Week 7)

- Tweaked and checked in change set re status bar for readability (Week 7)
- Ran M3 sonar samples w/ mb1stream to generate MB1 LCM log (Week 7)
- Scoping M3 sonar real-time capability (Week 7)
- Help w/ OSM posters (if needed) (Week 7)
- Studying code for real-time M3 sonar data integration via MB-System for SLAM (Week 8)
- Integrating M3 UDP support into MB-System (though priority is lower as it may not be supported on Falkor due to network topology) (Week 9)
- Extended MB-System Kongsberg M3 sonar support to include real-time UDP data ingest (Week 10)
- This intended to be used by Giancarlo during the ongoing Falkor Too cruise to potentially enable SLAM (Week 10)
- Updating mb1stream/mbsystem docker builds (Week 10)
- worked on serial IO support for M3 sonar (Week 11)
- Finished M3 sonar serial stream ingest for MB-System (Week 12)
- Sprint 31 meeting (Week 13)
- Query to Blueprint Subsea re Oculus sonar SDK (Week 17)
- Reviewing oculus sonar driver code (Week 25)
- Finished Oculus sonar driver (Week 29)
- Testing Oculus and Gemini sonar drivers (Week 29)
- Did a burn-in test of the new oculus driver last week, and checked to ensure that it is compatible with the Gemini sonar driver. That is ready for the August 6 deployment. (Week 30)
- preparing for cruise 08/08: testing oculus sonar driver, fixed a few issues, and added test pattern feature to oculus simulator. (Week 32)
- prototyping an oculus sonar visualization/UI in Qt (Week 33)
- Nearly done with prototype oculus viewer (Week 34)
- preparing for cruise (Week 34)
- Tested Oculus Sonar GUI and driver during LASS cruise. Found/fixed a few issues, and continue to add features. (Week 36)
- Collected several data sets using both the Oculus ViewPoint and MBARI drivers that will be used to evaluate sonar performance and compare to Tritech Gemini (Week 36)
- Oculus GUI functionally complete; added a number of features and adjusted layout. The quickie rendering method used may not be adequate; effort depends on oculus use roadmap. (Week 37)
- Consulting with Akshay on Norbit driver he's developing. (Week 37)
- Tested oculus GUI and driver in tank test. Added several new GUI features, and am currently chasing down a distortion in the sonar data visualization. (Week 38)
- testing oculus tools and GUI, fixing related issues; working with Bastian, who is using the various tools to analyze oculus data (and subsequently finding software issues) (Week 40)
- Resolved open question about Oculus sonar 16-bit image format appearing darker; turns out that the sonar firmware applies gamma correction to 8-bit images but not 16-bit images (due to memory limitations, according to Blueprint Subsea). (Week 41)

- Added gamma correction option for image export (Week 41)
- Working on feature request to support Oculus v2 protocol, which contains accelerometer info that may be useful for navigation. Support hooks are already in place, but some details and testing are pending. (Week 41)
- Added support for Oculus Simple Fire Message ver 2 (OSFMv2), and use of extended sonar configuration settings that may provide better range resolution, making the images perform better for SLAM. (Week 43)
- Tank testing Oculus sonar using Mola ROV (Week 43)
- Prepping for Rachel Carson/MiniROV cruise (will collect sonar data set for SLAM), (Week 43)
- Tested Oculus driver/GUI on first leg of Rachel Carson cruise; providing shore support for remaining legs. (Week 44)
- Working with Blueprint Subsea on Oculus sonar configuration issues to try and extend output image resolution (Week 44)
- Software updates and testing for cruise (Week 44)
- Reorg GUI branch, finalize changes, Submit PR (Week 45)
- Testing GUI support for Oculus 750d on Mola (for Maldives) (Week 45)
- Potential Oculus software install on new project laptop (Week 45)
- Last week, Giancarlo and I tested the Oculus sonar driver with the M750 model on ROV Mola. It's expected to be used to collect SLAM evaluation data in the upcoming trip to the Maldives. (Week 46)
- Giancarlo and team are enjoying some success in the Maldives, they posted that they've completed their second MOLA dive, and are collecting some good data in the Magoodhoo heart lagoon. (Week 47)

902405 - Precision Control Technologies

- Working on outline for doc (Week 6)
- Developing TRN documentation outline (Week 17)
- met with Steve to talk about doc outline, and potential TRN update tasks (Week 18)
- Looking at role of sensor type and IO data structures in TRN code with an eye towards developing multi-input TRN and/or a sensor- and geometry- independent data structure (Week 19)
- Working on documentation outline (Week 19)
- Meeting with Steve to discuss these activities (Week 19)
- converting axial TRN data sets to help Steve Rock evaluate it (Week 33)
- quick meeting with Steve Rock re covariances, correlation, and multibeam filtering (Week 34)
- Met with Dave and Steve re interpretation of terrain relative nav covariances. (Week 37)
- Studying Steve's TRN notes and transcribing for documentation (Week 44)
- Met with Steve Rock to get a better understanding of the Kalman Filters that form the basis of TRN (Week 46)
- updating gnu build files to better support homebrew builds on MacOS and simplify Makefiles (Week 48)

- documented dorado sim with MB-System TRN in the loop (and got the sim running) (Week 48)
- Libtrnav build system maintenance and updates (Week 49)

Out of Office

- 1/18 (Rachel Carson)
- Out sick 2/16,19
- 2/28 after 14:30
- 3/1 WFH, off line ~12:30-2:30
- Mo 3/11 (out sick)
- Th 3/21 (med)
- Th 3/21 after 15:00 (med)
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- Thu 4/25 after 3 pm
- Tue 5/7 (a.m., on line in afternoon)
- Fri 5/10 after 12 pm (on line in afternoon)
- Jun 4-7
- Jun 20 (a.m. only, ETA ~10:30)
- 08/08 Rachel Carson
- 08/27-29 Rachel Carson (tentative)
- 10/10-17 Vacation
- developing hiring process
- misc admin

Overhead

- Review prep (Week 1)
- Hiring (application review) (Week 1)
- resource request (Week 3)
- review prep (Week 3)
- misc admin (Week 3)
- hiring (Week 3)
- Review meetings (Week 4)
- Resource request (Week 4)
- Hiring: application review, planning (Week 4)
- Misc admin (Week 4)
- Reviews: submitted, followup (Week 5)
- (Week 5)
- Hiring: application review (Week 6)
- Misc admin (Week 6)
- Hiring application review (Week 7)
- Merit increases (Week 7)
- Misc admin (Week 7)
- Ground fault workshop (Week 7)

- Misc admin (Week 8)
- Attend dorado MVC meeting (Week 9)
- Helping DJ with programming valve controller boards (Week 9)
- Consult w/ Enoch re MRS/BRS, locate relevant doc (Week 9)
- Help w/ Irauv docking debug (Week 9)
- Ventana valve controller board (Week 10)
- catching up on application review (Week 11)
- Hiring: reviewing applications, discussions, committee meeting (Week 12)
- Staffing adjustments (Week 12)
- Misc admin (Week 12)
- hiring: committee meeting, chatted with applicant, reviewed applications
attended interview with OVAI/SE-EAD applicant (Week 13)
- Meeting with Cawthron, Andy re wire-crawler project using Niobicon (Week 13)
- attended director's dialog (Week 13)
- hiring: screenings (2), scheduling, planning (Week 14)
- misc admin (Week 14)
- Recovering from computer failure; thanks to Doug and Daniel for a quick turn-around.
(Week 16)
- Hiring: zoom screening (Nick Ross). Reviewing applications. (Week 16)
- Hiring: application review, discussion meeting (Week 17)
- Laptop failures - thanks to Daniel and Doug for a speedy recovery (Week 17)
- Misc admin (Week 17)
- hiring: application review, interviews, other issues (Week 18)
- hiring: application review, interview planning, misc. (Week 19)
- misc admin (Week 19)
- hiring: application review, screening/interview prep, draft job description (Week 20)
- abstract review (Week 20)
- attended DAS design review (Week 20)
- misc admin (Week 20)
- hiring: interview, feedback review, job description etc. (Week 22)
- Prep for Akshay arrival (Week 25)
- Proposal: labor spreadsheet prep, proposal review (Week 29)
- Planning for new group member (Week 29)
- Group lead meeting with Antje Boetius (Week 29)
- Misc admin (Week 29)
- Developing Akshay's work plan (Week 30)
- Group lead meeting with Antje Boetius (Week 30)
- Proposal review (Week 30)
- Starting to plan next hire process (Week 30)
- Attended Workplace Violence Prevention training (Week 30)
- Misc admin (Week 30)
- developing activities with Akshay (Week 32)
- proposal review (Week 32)
- misc admin (Week 32)

- proposal review (Tu - Fri) (Week 33)
- misc admin (Week 33)
- staffing plan (Week 34)
- misc admin (Week 34)
- McEwen exit summary review and office clean out (Week 36)
- Staffing (Week 36)
- Misc admin (Week 36)
- Working through Rob's materials (Week 37)
- Misc admin (Week 38)
- Helping Paul Barter from Cawthron with an OASIS driver issue (Week 38)
- Proposal phase 2 review (Week 38)
- reviewing some OASIS code issues with Paul Barter. (Week 41)
- planning hiring process (Week 41)
- misc admin (Week 41)
- hiring process planning (Week 43)
- misc admin (Week 43)
- hiring process planning (Week 44)
- misc admin (Week 44)
- Hiring planning (Week 45)
- Misc admin (Week 45)
- SE Hiring plan (Week 46)
- Meetings re space planning (Week 46)
- Misc admin (Week 46)
- end of year budget, planning (Week 48)
- starting office cleanout (Week 48)
- misc admin (Week 48)
- Office cleanout (Week 49)
- Review prep (Week 49)
- Purchasing (Week 49)
- Crane training (Week 49)