

Kent Headley Sorted By Project

600034 - Control Tech - Rock

- Code and testing for cruise next week (06feb20). We are using a pub/sub mechanism for Terrain Relative Nav (TRN) updates to the main vehicle computer as part of a solution to address some data artifacts in the November dives. We will be doing some obstacle avoidance tests and refining code we plan to run on the WHOI Sentry vehicle this summer at Axial seamount. (Week 5)
- Preparing for dive day this Thu: wrote web-based configuration tool for terrain relative nav (TRN) application, which has a lot of options. Worked with Rob and Hans on software testing. (Week 6)
- Cruise 06feb20 was successful; the vehicle made ~8 obstacle avoidance test runs, and terrain-relative nav (TRN) worked well. The changes in TRN we tested were successful in addressing the sawtooth data artifact from November. Still chasing down an anomaly in one dive. (Week 7)
- Organized TRN log plot scripts into proper command line app (Week 7)
- Re-organized some of the web-based command line builder tool and added responsive buttons (Week 7)
- Updated mbtrnpp app to use single session ID so that log files share common name and made some adjustments to TRN log naming and directories (Week 7)
- Distributed code/doc package for TRN (terrain relative nav) plot generation (Week 8)
- Made updates to TRN configuration tool (simpler, cleaner preset selection) (Week 8)
- Syncing updates among libtrnav and MB-System git repos (Week 12)
- Working with Rich on some TRN code cleanup (Week 16)
- Writing proposed plan for managing new TRN repo (Week 16)
- Working with Rich on concepts for TRN interface architecture (Week 19)
- Fixed a number of warnings from static analyzer/compiler (Week 20)
- Drafted architecture concept notes/diagrams (Week 20)
- Discussion of TRN updates w/ Rich (Week 26)
- Working w/ team to provide 2011 Axial data sets (Week 28)
- Wrote data converter (MB88 bathymetry/navigation to CSV) (Week 28)
- Telecon with Steve to discuss phase 2 proposal (Week 34)
- Phase 2 proposal discussion (Week 35)
- Minor code review for Rich (Week 42)

901101 - Ocean Imaging

- Working w/ Dave on Terrain-relative nav (TRN) merge (Week 13)
- Syncing trndev branch with updates from master (Week 16)
- Addressing (cosmetic/style) issues in TRN code (Week 16)
- Testing mbtrnpp (MB system TRN app) configuration file implementation, code review (Week 19)
- Working on new features and integration package for TRN on Sentry (Week 29)
- Tested release of a Terrain Relative Nav (TRN) client component that we hope to integrate onto Sentry for the upcoming Axial volcano mapping expedition. The TRN client enables the Sentry control system to receive real-time updates from MB-System with an embedded MBARI/Stanford TRN engine instance. MB-System provides filtered multibeam bathymetry and navigation. The TRN engine uses the filtered data to locate the vehicle on map. An estimate of location in the form of an offset is provided that may be used by a control system to direct the vehicle. (Week 33)
- WHOI is working to integrate the TRN client with their control system using ROS. It's not 100% certain it'll happen on this cruise, but the plan is to run with a mission with TRN enabled, which may optionally be used to close the control system navigation loop. (Week 33)

- The scientific context is that MBARI and WHOI are performing annual surveys of the Axial volcano to make high resolution maps of changes to this (large) geologically active region. TRN and MB-System enable the surveys to be conducted without installing navigation infrastructure. Recent TRN research by Steve Rock's PhD students is focused on algorithms for dealing with terrain that has changed since the map was made. (Week 33)
- Wrote some cmake relocatable packaging code to help with Sentry TRN integration (Week 34)
- CMake has a bit of a learning curve, but it's OK to use; less arcane than Autotools and gnu make. Don't know how it scales to large projects and across platforms, but for the small projects I'm working on, it's quick to get up and running. The packaging stuff took a couple of days to make work; there is lots of doc, but concrete examples and best practices/patterns are hard to find. (Week 34)
- Due to the fires interfering with quarantine, Dave will be unable to participate in the UNOLS Axial cruise. There is still a chance that we will be able to participate remotely, at least enough to run TRN on Sentry and collect some performance data. Even if it isn't possible to interface with the Sentry control system. Hans and Dave have prepared Sentry data-pod hardware/drives that ship this week to meet the WHOI team in Oregon. I have been finishing TRN client code for Sentry, updating and documenting configuration/operation procedures, and doing code review on MB-System code updates that Dave has been working on (renaming variables, file process error handling, new TRN reinit triggers). (Week 35)
- Providing remote software support for Axial Sentry cruise with Dave and Hans. (Week 36)
- The ship is transiting and will arrive on site this afternoon (Week 36)
- We've been busy with software updates and configuration/network checks (Week 36)
- First Sentry dive Wed 0600-1800, an engineering dive, will collect some TRN data if all goes to plan, though TRN would not be connected to the Sentry control system (Week 36)
- Been helping with TRN at Axial. We had two Sentry dives before some vehicle issues and weather delayed ops Sun-Tue. Meanwhile, Dave did a lot of testing and analysis of the recent TRN data, and has come up with some modifications that look promising. The changes mostly consist of adjusting parameters that decide when to reset the TRN algorithm. (Week 37)
- It's likely we'll have another Sentry dive Wed, and we'll be able to test the new settings. (Week 37)
- I'm working with Rich, Rob and Steve to implement another change that enables us to specify the TRN algorithm search space during a reset, a complement to a change Dave already implemented to specify the center of the search space. I've also been adding/adjusting metrics and plotting code that generate performance plots. (Week 37)
- Interesting weather note: the folks on the ship reported haze/smoke smell from all the fires (Week 37)
- Finished Axial cruise with some exciting results. In addition to getting good science map coverage overall, Sentry was able to steer away from its holding-pattern trackline, then close the loop using Terrain Relative Navigation to bring it back onto the trackline using the TRN offsets. (Week 39)
- Working on post-cruise software maintenance (Week 39)
- Minor post-cruise code maintenance (Week 40)

901220 - Midwater Ecology

901704.99 - 8 Camera Obs Lander

- MLML will be here this week to calibrate the camera and take a look at the virtualized software environment I set up in December (Week 5)
- Distributed a documentation update (Week 6)
- Rick Starr, Katy (MLML) used the test tank to calibrate BOSS for an upcoming cruise. Stopped by to help with a couple of software questions. (Week 39)

901803 - Carbon Wave Glider Development

- Starting to work on data handling plan (Week 6)
- Working on data processing plan (Week 7)

- Working on possible refactor of sampling and logging scheme to improve resource footprint and simplify post-processing (Week 8)
- Test, debug and documentation for changes to sampling and logging (Week 10)
- Refactoring some log utility code, splitting out cross-platform code and adding a file IO wrapper API. This lets me share source code for data log tools between PIC and desktop platforms. Writing desktop versions of the on-board log utils (lcat, linfo, lless) around the refactored code - much simpler. (Week 12)
- If possible, I'll meet w/ Jacki remotely to talk about a Matlab log reader/loader. If not, I'll take a crack at it. (Week 12)
- Finished port of file utils to cross platform wrapper API (Week 13)
- Starting studying Matlab log reader (Week 13)
- Wrote matlab binary data loader (beta) (Week 20)
- Working on bootloader firmware (Week 23)
- Slow trickle of data workflow discussions (Week 23)
- Abstract text (Week 23)
- Completed boot loader last week (Week 25)
- Setting up remote access (Week 25)
- Working on new feature for accessing selected sections from text files (Week 25)
- Working on cwg client functions (Week 25)
- Testing/debugging feature for accessing text file regions (incl time search) (Week 26)
- Working on scheme for external logging of ancillary licor data in lab (Week 26)
- Drafting client software design (Week 26)
- Team meeting re status and PMEL (Week 29)
- Bringing up a DIC controller board to share with PMEL (Week 33)
- Shared firmware repo with PMEL collaborators (Week 33)
- Continuing board bringup (Week 34)
- Wrote board bringup doc (Week 34)
- Reformatted controller platform help file (markdown) (Week 34)
- Used pandoc and a google markdown extension to style and generate doc PDF (Week 34)
- Working on a reliable scheme for serializing hardware (Week 35)
- Board bringup (Week 35)
- Working on hardware serialization scheme (Week 36)
- Team decided to put a small EEPROM part, which will make it easier (Week 36)
- Learned of a linker issue that may have been causing unpredictable behavior when accessing variables stored in flash. Updated tool chain may help (Week 36)
- MPLAB (microchip IDE) became increasingly flaky, reinstalled. When their tools works they're good, but when they don't, they're a real time sink. (Week 36)
- Participated in (part of) a telecon with PMEL to discuss their testing and analysis of different gas analyzers and measurement methods and processing algorithms (Week 37)
- Unfortunate that Andrea is leaving; wish her success and hope to be able to keep the instrument project and collaboration going (Week 37)
- Am about 5 days deep in chasing a bootloader bug. I may have found the root cause in some component code distributed by Microchip. (Week 39)
- Refactored macro code using table-based structures that better support manifold versioning and are stored in flash. (Week 40)
- Updated macros to support latest manifold revision (Week 40)
- Got confirmation/validation from Microchip on the issue I found in their bootloader library. They plan to fix it in an upcoming release (Week 40)
- Found and fixed a couple of critical issues in the firmware (remnants of earlier refactoring in March) during testing (Week 40)
- Software testing and updating doc (Week 40)
- Refactored carbon waveglider internals and user interface (Week 41)

- Now using table-driven composition of measurements and IO sequences (uses abundant program memory instead of RAM, and simplifies user interface parsing routines. (Week 41)
- Simpler, more intuitive user interface (Week 41)
- Fixing bugs, some old, some new (Week 41)
- Making updates for new manifold (now easier with refactored code) (Week 41)
- coding/testing cron-like scheduler implementation (Week 42)
- Doc edits (Week 42)
- Integrated cron-style scheduler for carbon waveglider payload (Week 44)
- Working on doc (Week 44)
- Handed off first hardware release to Jacki, w. Draft documentation (Week 44)
- Testing and fixing bugs. (Week 45)
- Currently isolating an elusive bug that intermittently causes a sleep hiccup, delaying a scheduled event by ~10s. Long manifestation times make it slow to track. (Week 45)
- Working on reference client design and related machine-machine interface updates. (Week 46)
- Developing C client library (Week 47)
- Adding/updating M2M (machine-machine) features (Week 47)
- Status meeting (Week 47)
- Released development snapshot and updated hardware (Week 47)
- Using Python and Tkinter to prototype a file transfer GUI for the controller and learn more about Python, (Week 48)
- Working on Python GUI to simplify some operational tasks and learn a bit about Python (Week 49)
- Minor doc and firmware updates related to machine/machine and GUI (Week 50)
- Looking at system resource requirements for proposed RH sensor (Week 50)
- Refactored Python GUI to use model/view/controller pattern (Week 50)
- Checking GUI windows compatibility (Week 50)
- Status meeting (Week 51)
- Discussing requirements for RH (relative humidity) sensor (Week 51)

Out of Office

- errands for at-risk family/neighbors
- Nov 30, Dec 16 : personal
- Nov 30, Jan 19 : personal
- Dec 28-31 : vacation (tentative)

Overhead

- Annual review meetings (Week 5)
- External review practice session (Week 5)
- Annual review wrap up (Week 6)
- Misc admin (Week 6)
- Misc admin (Week 8)
- Misc admin (Week 10)
- Misc Admin, group comms (Week 12)
- Engr/Group-lead Telecons, misc admin (Week 13)
- meetings (Week 16)
- Misc admin, meetings (Week 19)
- LRAUV backseat driver architecture discussions (Week 19)
- Misc admin (Week 20)
- Reopening planning (Week 23)
- 2021 Planning (Week 23)
- Misc admin, meetings, input re reorg (Week 25)

- Misc admin (Week 26)
- Attending Embedded Linux Conference (virtually) (Week 28)
- Working on proposals and budget (Week 28)
- Proposal scoping, updating labor spreadsheet (Week 29)
- Proposal and engineering meetings (Week 29)
- Proposals (Week 33)
- Misc admin (Week 33)
- Misc admin and meetings (Week 34)
- misc admin, proposal process (wrapping up phase 2 resource balancing) (Week 37)
- Helped Brett H with MB-System; set up test server to work out the technical issues, may help set up more permanent installation (Week 37)
- Clean up on allocations (Week 39)
- Misc admin (Week 39)
- Misc admin (Week 47)
- Reading on software licensing (Week 47)
- Misc admin, e.g. end of year purchasing, meetings, office/lab space discussion, review planning (Week 48)
- Following Apple ARM and virtualization roadmap (Week 49)
- Purchasing (Week 49)
- Planning for potential site closure (and hoping it won't be necessary) (Week 49)
- Starting prep for reviews (Week 49)
- Meeting re Charlie Paull external proposal activity scoping meeting (Week 50)
- Implementing Python GUI as learning project (Week 50)
- Computer maintenance (Week 50)
- Review prep (Week 50)
- Preparing for remote access (Week 51)
- Computer maintenance (Week 51)
- Workplace training (Week 51)
- Scoping input for NSF docking proposal (Week 51)
- Review prep (Week 51)

Overhead - misc admin

Overhead - misc admin, distributed 2021 allocations

Overhead - misc admin, distributed 2021 allocations, flurry of purchasing and other activity

Overhead - misc admin, proposal process