Brent Roman Sorted By Project

701147 - MARS O&M IV

708184 - ESP Monitoring PNW

- Got PPP connection scripts working reliably with retries in chat scripts (Week 3)
- Added a big capacitor to the telebuoy to deal with modem inrush (Week 3)
- Discussed with UW how to incorporate this into the actual telebuoy (Week 3)
- Wrote Ruby code to provide optional cjxl compression for puck images (Week 4)
- Testing wireguard timing adjustments to save satellite link bandwidth (Week 6)
- Wrote scripts to reroute between cell and sat comms depending on service availability (Week 7)
- Test and Debug of Cell/Sat/WiFi comms fallback logic in SatComms ESP mooring (Week 9)
- Testing, debugging and enhancing Certus/Cell comms mooring (Week 11)
- Shipped back Certus modem after completing testing with it on Bld B roof (Week 12)
- Altered log level of a few recurring kernel and daemon warnings (Week 12)
    - Reduce the size of the logs uploaded via the expensive Certus link (Week 12)
- Remotely updated both of their ESPs (Week 12)
- Determined how to run JXL decompression on their Windows laptops ☹ (Week 12)
- Discovered timing bug in low-light camera Linux kernel driver (Week 13)
    - Due to using new “approved” user mem copy functions for newer kernels (Week 13)
        - Believe “Fixed” by only using those functions in newer kernels! (Week 13)
- Certus modem quit working after shipment to PNW (Week 13)
    - But started again after a issuing a firmware “factory_reset” (Week 13)
- Decided to deploy without Satcoms in April, with in August (Week 13)
    - Not enough time to test. (Week 13)
- Some stress at NOAA early in the week due to a software bug in the rewritten ESP camera driver in the Linux kernel. (Week 14)
    - Needed to run on newer kernels, but “best practices” broke driver on older ones! (Week 14)
    - Took 2 days to find and fix with conditional #defines depending on kernel version (Week 14)
- NWFSC Deployed one ESP off La Push. Not using Certus yet. (Week 18)
- ESPeddie deployed w/o satcomms (Week 19)
- Testing satcomms on roof of NOAA Office (Week 19)
- ESP deployed off La Push continues sampling once every other day (Week 20)
- Working with APL electrical engineer to debug power supply issues (Week 20)

    - Certus modem inrush current requires buffering with a large cap and slow-start circuit (Week 20)
- Patched deployed ESPeddie to better recover from Forearm cage creep (Week 22)
- Testing updated telebuoy power supply (Week 26)
    - But, still seeing undervoltage failures (Week 26)
- ESPeddie over half through its samples (Week 26)
    - But, its Forearm is suffering from a bad case of cage creep (Week 26)
        - Often needs manual intervention to get bearings aligned (Week 26)
- Testing and tuning Certus satellite comms with ESP on NOAA's roof. (Week 28)
- Helped APL debug their current limiting power supply (Week 28)
- Carried cannibalized ESP 2G elevator to Steph Moore's lab and helped them repair ESPfriday with it. (Week 31)
    - ESPfriday deployed with Iridium Certus 100 satellite communications. (Week 31)
- ESPfriday continues sampling using Certus for comms (Week 33)
- Added debugging output to try to understand occasional camera autoexposure errors (Week 35)
    - No failures since debugging output added (figures 🙂 (Week 35)
- Review of debug log info indicates that 2G ESP camera is not very linear (Week 37)
    - Tweaked autoexposure algorithm on deployed ESPfriday to better cope with this (Week 37)
- Working with Tina's lab to determine cause of occasional camera overexposures (Week 39)
- ESPfriday finally seems to have dropped a sampling puck due to a gripper failure. Not recoverable, but only after processing 170ish of 192 pucks. Not bad. (Week 41)
- Shipped kit of parts for cell modem tester to APL Engineer who mounted them into a deckbox (Week 42)
    - For testing alternative cell modems off La Push, WA (Week 42)
- Added signal quality logging to cell modem tester shipped to APL last week. (Week 43)
- Cell modem test rig I help develop a few weeks ago was deployed to compare two different modems performance while ship loitered around the ESP mooring site (Week 46)
    - I spent a couple hours yesterday monitoring it and playing with modem configuration. (Week 46)
- Steph discovered that the ESPfriday's gripper was failing to stop at it closed position (Week 47)
    - Which explains the trouble we were having late in the last deployment (Week 47)
- Provided a bit of help to Steph's lab debugging ESP 2G gripper issue (Week 50)

771131 - Great Lakes PCM/HAB

- Updated Linux OS on both of the ESPs to be deployed (Week 16)
- Tested ESP Linux integration with Starlink (Week 16)

800165 - eDNA Sampler Trials

808015 - Monitoring McCloud

- PID control parameters for older ESPs needed revisiting. (Week 12)
    - Likely due to “wear-in” of carousel mechanism (Week 12)
- Helped Scott patch problem with Vectron’s Linux kernel WiFi support. (Week 18)
- Supporting the away team! (Week 19)
- Developed a simple procedure to recover depoyed ESPgordon from I2C gateway serial I/O errors (Week 22)
- ESPgordon and ESPwaldo appear to be running well! (Week 26)
- Nothing to report. Ticking over nicely. (Week 31)

901205 - ESP SURF Center

- Helping bring up the new TTL (Week 3)
- Working with Nadia to tame the increased friction of the 3-bearing Carousel (Week 3)
- Helping Team ready for their trip to Tasmania (Week 4)
- Located used thermal forcing system for $8k (who will pay for it?) (Week 6)
    - Working with Enoch to build a quicking acceptance test fixture. (Week 6)
- Configured ESPaway3 to act as router for the team in Tasmania (Week 6)
- Supporting the Tasmanian Away Team (Week 7)
- EE Techs providing good support bringing up SPR boards (Week 7)
    - Identified und the software issue that was causing serial comms to fail (Week 7)
    - Still have a number of boards with unidentified hardware problems. (Week 7)
- Prototyping water bath based temperature control for 3G cartridge sensor calibration (Week 9)
- Working with Enoch on water bath based 3G heater board calibration fixture (Week 11)
- Enoch and I seem to have cobbled together a viable, quick calibration fixture (Week 12)
    - utilizing a plastic bag in a suvee bath! (Week 12)
- Investigating use of refrigerated bath for “cold” temp. Calibration point (Week 13)
- Got almost everything ready for calibrating 100 ESP 3G heater boards starting next week. (Week 14)
    - Working with Enoch on creating two water baths with the board switching between them (Week 14)
        - To form a 2-point linear calibration (Week 14)
- Calibrated first set of new 3G Heaters boards with Chloe’s help (Week 16)
- Enoch is iterating on holder to make it less finicky (Week 16)
- Added capability the ESP to remotely plot time series with gnuplot (Week 16)
    - To help improve performance of puck/cartridge heating PID controllers (Week 16)
- Helped Nadia understand why 3G PV actuators’ calibrations are drifting (Week 20)
    - After she discovered printed parts are flexing and cracking (Week 20)
- Revamped sampler vacuum calibration to more easily handle flow resistance varying between machines. (Week 20)
- Diagnosed hardware problems on a few of the failed ESP 3G heater boards (Week 22)

- Helped Preston and Nadia rediscover old LRAUV bug preventing vehicle from starting its pppd (Week 26)
- Augmented the ESP's existing "daily" mission framework to support missions with multiple assays (Week 28)
    - Which assay to run is determined by the number of remained pucks (Week 28)
        - Rather than by the phase's programmed start time. (Week 28)
- Helped Nadia bring up and debug portable 3G ESPs (Week 31)
- Helped Preston configure and debug ESPkoa (Week 31)
- Reconfigured ESPkoa during deployment to work around cartridge bus I2C failure (Week 31)
- Working with Preston to diagnose PCR instrument failures in Iceland (Week 33)
    - The PCR temperature sensor seems to be reading 35C high (Week 33)
- Unorganized gripper object hierarchy to ease implementation of asymmetric ExternalValve error recovery (Week 35)
    - To better cope with overly stiff valves discharging supercaps (Week 35)
- Found and fixed firmware bug in gripper/valve actuator driver (Week 35)
- Configured ESP on David Parkard to allow both local and remote access (Week 37)
    - Only to discover that IS blocked all remote connections and VPN offshore (Week 37)
    - Worked with Andrianna to restore necessary connectivity. (Week 37)
    - Again. (Week 37)
- Trouble with WiFi concurrent mode on RockPI-S (Week 37)
    - Seems OK in typical scenarios, but reconnects repeatedly on campus networks (Week 37)
        - Suspect some problem with roaming – more work needed (Week 37)
    - Installed RockPI-S with Raspberry PI on Dock to gain more data on connection stability (Week 37)
- Determined that, when using WiFi chip's simultaneous AP/STA mode, the STA must be started before the AP. (Week 39)
- Got cell modems working with FIDO sampler (Week 39)
- Reconfigured FIDO to use a separate USB WiFi dongle for STA(client) mode (Week 39)
- Ordered low power USB cell modem with GPS for testing (Week 39)
- Added "reseek" option to ESP 3G stepper motor controllers (Week 39)
    - To restore position of bumped carousel. (Week 39)
- Enhanced ESP Elf motor controller firmware to support continuous reseeking of carousel position when it slips. Was needed due to added friction in newest builds. Seems to work great. (Week 41)
- Helped FIDO group get RockPI-S WiFi working reliably again. (Week 41)
- Working with APL to prepare a deckbox for comparing different cell modems for use off La Push. (Week 41)
- Worked with Scott Jensen to help debug electrical issues that arose when loading 3G ESP (Week 42)
- With the full complement of 60 smart cartridges (Week 42)
    - I2C bus and electrical overloads resulted (Week 42)

        - Modified ESP software and firmware to better report when overloads occur (Week 42)
- Installing Debian T2 chip equipped MacBook pros is “interesting” (Week 43)
    - Got most everything working except suspend/hibernate (Week 43)
- Worked with Adrianna to alter policy on DP-Guest (Week 43)
    - To allow ESPs to create WiFi APs with DP-Guest as uplink (Week 43)
- Helped Scott debug I2C Bus electrical issues on 3G’s Cartridge bus (Week 43)
- Better error reporting for tripped overload breakers (Week 45)
- Helping to diagnosis I2C bus failure on ESPkoa (Week 45)
- Evaluating various USB modem LTE Cat1.bis modules from uBlox, SimCOM, and Quectel (Week 45)
    - Discovering lots of poor quality firmware especially in uBlox modems (Week 45)
- Finished repairing ESPecoscope and discovered an Arm drive belt needs replacement. (Week 46)
- Presented results of LTE cell modem evaluation to the ESP team (Week 46)
- Installed the chosen modem dongle on the FIDO sample being deployed on dock next week. (Week 46)
- Continuing testing of Cellular modem and GPS for FIDO sampler (Week 47)
- Helped Nadia diagnosed Forearm problems at NWFSC (with ESPeddie at Steph’s lab) (Week 49)
- Rewrote and debugged udev rules to configure cell modems on FIDO and ESP (Week 49)
- Completed configuration of T2-chip equipped MacBook Pro (Week 50)
    - Built bootable USB SSD to facilitate recovery and cloning (Week 50)
- Found and fixed problem where FIDO WiFi AP was being assigned random MAC (Week 50)
- Scripted custom APN rewriting logic needed for connecting SIM7672G cell modem (Week 50)
    - Took weeks to work this out! (Week 50)
    - Sent script to SIMCom with plea to fix module firmware bug necessitating this (Week 50)

901913 - Wet Wifi

- OceanComm will supply a pair of modems in April. (Week 6)
    - No more deployments on fast moving ships as that seems to cause housing leaks (Week 6)
- Spoke with OceanComm about can flooding. Agreed to delay further work until April. (Week 7)
- Board bullets (Week 7)
- Convinced Brett we should demonstrate better LRAUV/Waveglider coordination before purchasing another year subscription for OceanComm modems (Week 18)
- Decided to focus on LRAUV <-> Waveglider tracking for next few months (Week 19)
- Still debating what to do for next year (Week 26)
- Decided to fold WetWifi into LRAUV Tech devopment in 2026 (Week 28)

- Lunch with GreenSeas engineers who have had good luck with OceanComms modems (Week 35)

902304 - Piscivore Cam

- Researching possibility of using commodity processor board and open source software (Week 6)
- Researched more open alternative hardware architectures. (Week 7)
- Advocated for higher power alternative architectures which also provide a much more open and well developed software ecosystem that would make it easier to establish optical requirements and iterate on optical parts (Week 7)
- Researched GStreamer viz a viz Ocelea. (Week 9)
- Design meetings (Week 11)
- Working with Oclea to convince them to allow us access to their “portal” ahead of $6k purchase (Week 12)
    - So MBARI can determine if their development kit suites our needs (Week 12)
- Wrote LOI to Oclea to get a preview of their SDK before committing to purchase (Week 13)
- Sent EOI and got 2-week early access to their development portal for pre-purchase evaluation (Week 14)
- Worked with George Stern to write EOI requesting early access to their EVK/SDK for board development (Week 16)
- Received and reviewed material. (Week 16)
- Recommending we purchase ASAP (Week 16)
- Configured Yocto to build images for Olcea hardware on my Desktop machine (Week 18)
- Demonstrated RTSP video server with the module we hope to deploy. (Week 18)
- Oclea’s CV25-based camera module is up and running (Week 19)
    - Built Yocto-based distro (after much trial and error) (Week 19)
    - Reconfiguring Linux kernel for USB host instead of device (Week 19)
    - Working with George Stern on packaging, physical ports, etc. (Week 19)
- Finally got the CV25 Ambarella based camera board image configured to my liking (Week 20)
    - With support for High-Speed WiFi, Wireguard VPN and SDcard storage (Week 20)
- Finally (sort of) wrapped my head around BitBake and Yocto. (Week 22)
- The prototype is recording HD video @60hz while serving a real-time RTSP stream. (Week 22)
- Also corrects for camera lens warping and provides a WiFi link. (Week 22)
- Worked with George Stern and Oclea to find a hardware fix for Battery Backed RTC. (Week 22)
- Seem to have fixed the timing deadline failures by turning off sync mode in the queue for monitoring video. (Week 26)
- Working with Brian on a “backseat” software interface for Piscivore (Week 26)
- Bringing up 2nd test article. (Week 28)
- Worked out how to update device-tree without reflashing entire image (Week 28)

- Brought up 2nd article (Week 31)
- Fixed issue causing failure after every few minutes of recording (Week 31)
- Testing waterproof housing and cabling. (Week 31)
- Integration of packaged camera is going well. (Week 33)
    - Initial tests in tank working well (Week 33)
    - Need to confirm that LRAUV restart sys will warn camera of shutdown (Week 33)
    - Need to create some LRAUV mission to switch camera off at night (Week 33)
- Delaying start of backseat heartbeat seems to be required so that LRAUV shuts it down properly. (Week 35)
- 2nd deployment of 3rd Gen Piscivore (Week 37)
    - Increased record data rate from 4Mb/s to 13.24Mb/s (Week 37)
    - Discovered that record rate is limited by SDcard write rate of 20Mb/s (Week 37)
    - Reworked file naming convention per Lonnie's request (Week 37)
- Worked out an acceptable video file naming convention with Brian Schlining (Week 39)
- Negotiated a punch list for next camera deployment. (Week 39)
- Finally received converted ML model for testing on G3 camera (Week 39)
- Added a bunch of new command line switches to facilitate adjusting video parameters during deployments. (Week 41)
- Switched to h.264 encoding because h.265 encoded video was jerky (Week 41)
- Modified max gain halfway through deployment to see its effect on low light video quality (Week 42)
- Evaluating gen3 camera video from last week's deployment (Week 43)
    - Looks really good this time, much improved exposure range than gen2 (Week 43)
- Readied for another deployment (Week 45)
- Evaluating effectiveness of video encoding parameters (Week 45)
- Working with Olclea to determine how to use the CV25 chip for off-line transcoding (Week 45)
- Monitoring ongoing deployment. (Week 46)
- Wrote a script to sequence through alternative shutter speeds and auto exposure gains. (Week 46)
- Contacted USB camera vendor recommended by Paul Roberts (Week 46)
- Finally ran a YOLO object ID model on the CV25 camera. (Week 47)
    - Draws only 3W IDing full HD video at 16hz. (Week 47)
    - Lots of work left to do (Week 47)
- Set up purloined camera focusing rig in old pilot's area being remodeled (Week 47)
- Configured G3 camera for another deployment (Week 49)
- Dropped framerate to 30hz as an experiment for remainder of this deployment (Week 50)

Out of Office

- May 30 – June 23
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- Visiting family in Anacortes, WA for funeral Sept 3 - 9th

Overhead

- Moving into new G206 office (Week 4)
- Moving into my new office. Gotta get blinds! (Week 6)
- The office move in continues. Spec'd and ordered light filtering cellular shades. (Week 7)
- Finally moving my main Linux desktop to 64-bit user space with Encrypted BTRFS (Week 14)
    - Everytime I update Linux, it breaks Bluetooth ☹ (Week 14)
- Moved my main workstation to Debian Trixie with BTRFS replacing EXT4 (Week 16)
    - BTRFS allows rollback to checkpoints – which has already proven useful (Week 16)
- Finally got shelving installed in my office. Thank you, Tyler! (Week 18)
- Filling new shelves in my office (Week 20)
- Helped Brett Hopson choose a replacement for LRAUV's CradlePoint router (Week 50)