901205 - ESP SURF Center

Week 52

1. Brent Roman
    a. Upgrading ESPshore server to ARM based CPU (~8x faster processor)

Week 49

1. Scott Jensen
    a. Working out sampling protocol
2. Doug Pargett
    a. Designing new blank cartridge parts for improving pressure testing. Getting first test articles made.
    b. Designing changes to the G3 mechanism for the Function cartridges. Fixing fastener hole misalignments.

Week 48

1. Scott Jensen
    a. Work on sampling technique
2. Brent Roman
    a. Started refactoring ESP core elf code in preparation for adding in-situ programming capability
    b. Supporting ongoing deployments / lab work at GLERL and WHOI

Week 46

1. Brent Roman
    a. Tested ESPbetty: verified it could shuffle and heat short pucks.

Week 45

1. Doug Pargett
    a. Creating G3 ESP models for animation studios
2. Brent Roman
    a. Finally worked through all the networking issues at Ducette's NOAA lab to update ESPchris there
    b. Investigating a nasty race condition I caused by trying to configure ESP dwarves lazily
        i. Multiple threads can end up initiating interleaved configuration sequences

Week 44

1. Doug Pargett
    a. Disassembled Honu to inspect the cartridge bus cabling assembly, reassembled Honu.

Week 43

1. Scott Jensen
    a. Fixing broken sensor board
2. Brent Roman
    a. Supporting troublesome ESPdennis 2G deployment at WHOI (Gripper failures)
    b. Hacked together a set of scripts that enable us to release DHCP leases of ESPs removed from the wired network.

Week 42

1. Doug Pargett
    a. Meetings
2. Brent Roman
    a. Updating ESP laptop for Doucette's lab to utilize the Wireguard ESP VPN
    b. Fixed a bug in handling old-style Flow meter still used at GLERL
    c. Working with Nina and Chris on tweaks to motor control for 3G cartridges

Week 41

1. Doug Pargett
    a. Inspected and refilled the oil dome on Honu.
2. Brent Roman
    a. Refactored ESP Ruby application to support 3G machines lacking Carousel with Toroid valve

Week 40

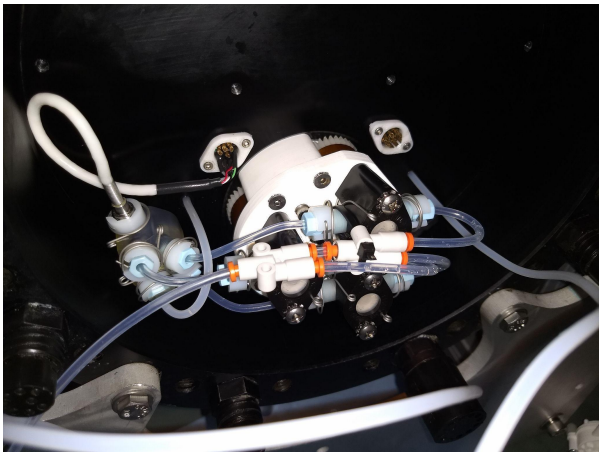
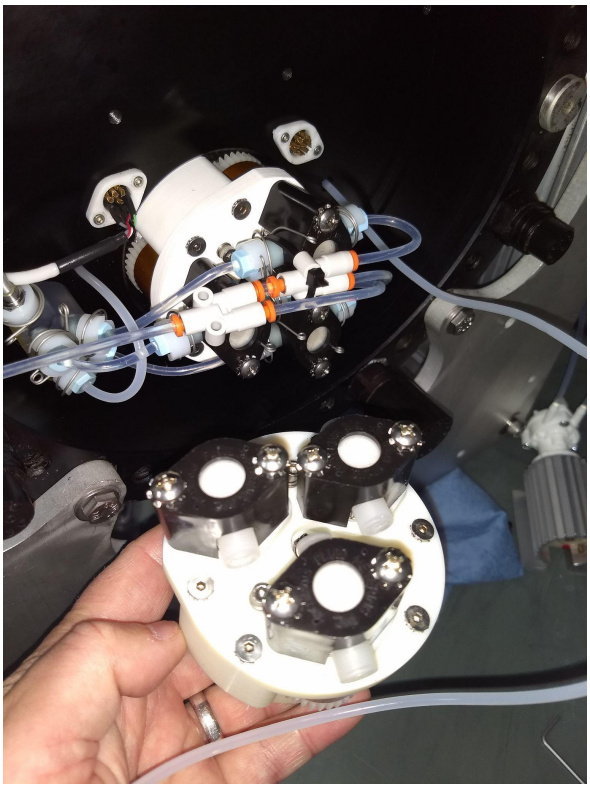
1. Doug Pargett
    a. Cleaning up, Organizing ESP lab
    b. Rebuilt oil dome on Honu
    c. Replaced a few TV valve seals on Honu
2. Brent Roman
    a. Helped Preston prepare ESPmv3 for deployment on this week's Ken Smith cruise
    b. Updated portable ESP configurations to support an optional Plunge Valve

Week 39

1. Scott Jensen
    a. Return from Wyoming recovery
2. Doug Pargett
    a. Rebuilding pumps and repairing ESP instruments
3. Brent Roman
    a. Scrambling to update all remote ESPs to comply with IT's request to terminate PPtP services
        i. ESPs now use WireGuard instead. IT considers IOT to be 'niche'.
    b. Considering how to protect against stepper motor overheating so we can safely overdrive them occasionally.
    c. Fixed bug in motor config. Need to revisit this to allow motor and unrelated pressure sensor to share the same hardware channel.

Week 38

1. Doug Pargett
    a. Installing a new pump assembly in Honu

b. 
c. Rebuilding a G3 pump assembly.
d. 

2. Brent Roman
    a. Found and fixed a configuration bug in ESPmv3
    b. Working on getting all the ESPs moved over to Wireguard
        i. Because IS has a new insurer that doesn't like PPtP
        ii. Must complete by end of month (It will be tight)

Week 37

1. Doug Pargett
    a. Rebuilt oil dome assembly on MV1, starting on Honu.

Week 36

1. Doug Pargett
    a. Rebuilding oil domes on 3G ESP instruments

Week 35

1. Doug Pargett

a. A couple meetings...

Week 34

1. Doug Pargett
    a. Meetings, lab organization.
2. Brent Roman
    a. ESP firewall now separates ESPs into groups
        i. e.g. NOAA ESPs cannot “see” MBARI’s on the VPN

Week 33

1. Doug Pargett
    a. Rebuilt the FlowerPot pump housing with a polyurethane diaphragm and viton orings.
    b. Installed the bulkhead valve assembly with the 3d printed frame onto FlowerPot.
    c. Setup the MV-3 instrument to be in the FlowerPot housing. ESP Koa will get rebuilt to use the new Function design cartridges.
2. Brent Roman
    a. Updating development machines from Debian Stretch to Bullseye

Week 32

1. Scott Jensen
    a. Evaluated replaced motor for possible failure, none found:(
    b. Helped diagnose latest Wyoming deployment trouble
2. Doug Pargett
    a. Setting up to test the old 4km ESP style pulse suppressor in the Koa instrument.

Week 31

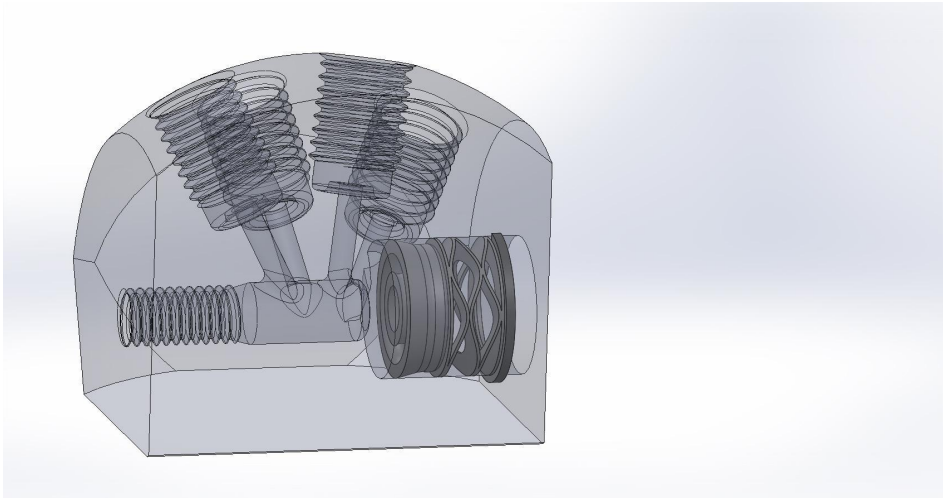
1. Doug Pargett
    a. Working on concepts for a mechanical pressure damper that might fit in the oil chamber of 3G ESP.
2. Brent Roman
    a. Improved “Daily” mission framework to detect phases that run over time.

Week 30

1. Brent Roman
    a. Helped diagnose ESPwaldo after Sampler Syringe failure
    b. Rewrote the “Daily” ESP mission structure
        i. Factored all logic out of mission files
        ii. Detects processing that overruns next timed start
        iii. Allows for computed time of day values

Week 29

1. Doug Pargett
    a. Designing a possible mechanical pulse damper for the G3 ESP sampling pumps.

b. 

2. Brent Roman
    a. Supporting NOAA deployments in Great Lakes and Puget Sound
    b. Deployed 2 ESPs in stream gauges
        i. First using WireGuard VPN and Solar time specifications
    c. Writing ESP device driver for UW/APL's new Pump/Valve control board

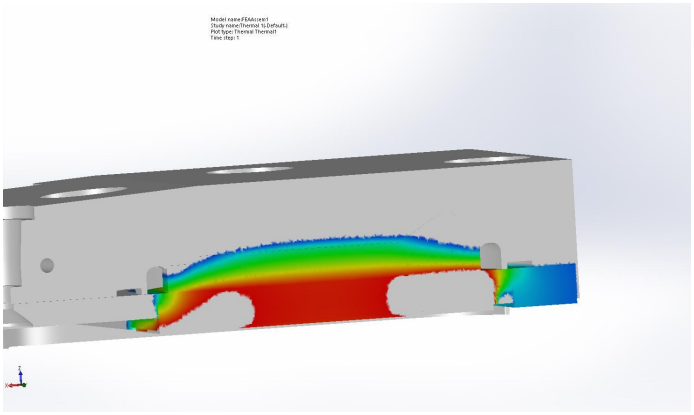
Week 28

1. Doug Pargett
    a. Answering questions
    b. Investigated a potential collaboration.

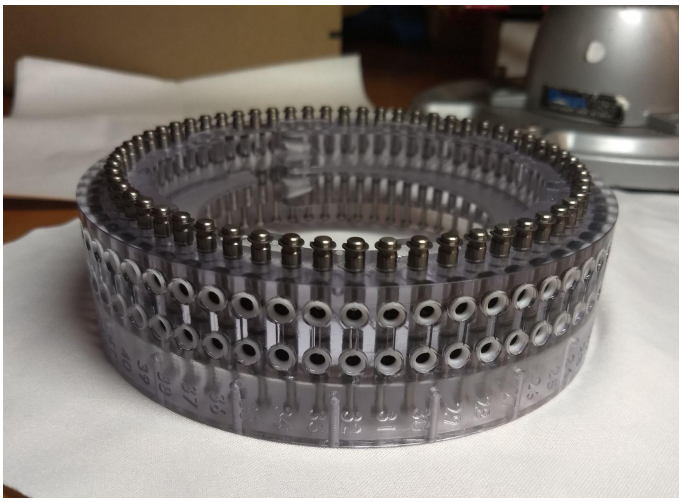
Week 27

1. Brent Roman
    a. Working with WHOI to restore VPN access to their network so I can update their ESPs
    b. Installed tunnel2shore script on the old laptop Bill Ussler will take to GLERL

Week 26

1. Doug Pargett
    a. Lots of thermal FEA to investigate what is driving temperature gradients across the sample filter.
    b. 
    c. Pressure and cold testing of MV2.
2. Brent Roman
    a. Helping Nadia pressure test mv2
    b. Testing puck heating issues with Function cartridges

Week 25

1. Doug Pargett
    a. Assembled a new warp core. (Actually, I installed the 120 port seals around the new Toroid valve ring from the MV3 ESP.)
    b. 
    c. Started pressure testing of MV2.
2. Brent Roman
    a. Temperature testing alpha2.2 cartridges indicates need to insulate metal back

Week 23

1. Scott Jensen
    a. Preparing Waldo and Gordon for Yellowstone deployment
    b. Waldo had trouble with hand but problem identified and fixed
2. Brent Roman
    a. Created a cartridge leak test script for Doug Pargett
    b. Ensure that 2G's big carousel motor shuts down entirely when not in use
    c. Helped Nadia tension the finicky carousel drive belt properly

Week 22

1. Scott Jensen
    a. Preparations for Yellowstone deployment
    b. Helping resolve SPR issues
2. Doug Pargett
    a. meetings

Week 21

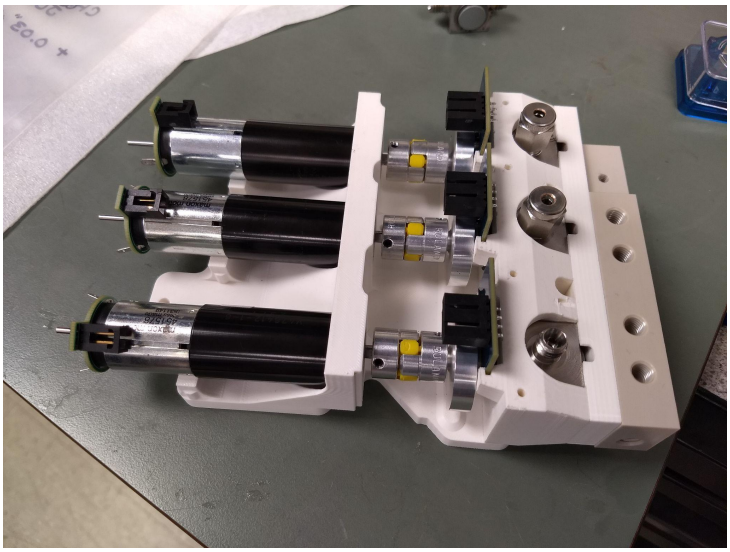
1. Scott Jensen
    a. Continued preparation for Yellowstone deployments
        i. Received Isolated USB adapter and tested
        ii. Sent pumps to collaborators for battery test
2. Doug Pargett
    a. Prep MV2 for initial leak testing

Week 20

1. Scott Jensen
    a. Tested pump controllers for upcoming Yellowstone deployments

    b. Completed fabrication and install of second terrestrial housing lid
2. Doug Pargett
    a. Meetings and a bit of work to prep MV2 for more testing
3. Brent Roman
    a. Helped Bill Ussler get SPR running again in the lab with compressed output files
    b. Added chrony to ESP linux distro to support time sync required for Wireguard VPN
    c. Finally found and fixed a nasty bug in libreadline5
        i. Where multibyte character support allows moving input cursor past end of string

Week 19

1. Doug Pargett
    a. Meetings and interviews
    b. Built up the new bulkhead valve block.
    c. 
    d. Added new parts to MV3 for testing
2. Brent Roman
    a. Built up replacement for ESPshore server based on OpenWRT 19.07

Week 18

1. Scott Jensen
    a. Tested terrestrial pump system components for upcoming deployments
    b. Hiring committee
2. Doug Pargett
    a. Lots of online meetings.
3. Brent Roman
    a. Working with Chris Preston and Bill Ussler on automating cartridge chemistry “standards”
    b. Improved cartridge slot status reporting
    c. ESPshore2 with Wireguard VPN support is up and running. ($40 hardware investment :-)
        i. Cloning its image to have a physical backup (another $40 splurge)

Week 17

1. Scott Jensen
    a. Preparations for the Montana deployments
2. Doug Pargett
    a. Building up new 3G pump assembly to test pressure pulse reduction methods.
3. Brent Roman

    a. Fixing minor bug unearthed during ECOHAB
    b. Demonstrated that SPR data can easily be compressed 14:1
    c. ESPshore2.mbari.org is up and supports the Wireguard VPN in addition to PPtP and ssh tunnel

Week 16

1. Scott Jensen
    a. Preparing for second terrestrial housing fabrication
2. Doug Pargett
    a. Meetings
3. Brent Roman
    a. Fixed bug in onESPclient script. Pushed fix to LRAUVs running ECOHAB

Week 15

1. Scott Jensen
    a. Ordering parts for terrestrial housing
2. Doug Pargett
    a. Requested final parts from the shop to build new G3 bulkhead valve assembly with the 3d printed frame.
3. Brent Roman
    a. Finally got WireGuard VPN working with low-power ESP CPU and a new tiny ESPshore server!
    b. Working with IS to resolv problems I believe are being causes by block UDP ports in the DMZ
    c. Brizo/mv1 ESP archival only run seems to be going well. (touch wood)

Week 14

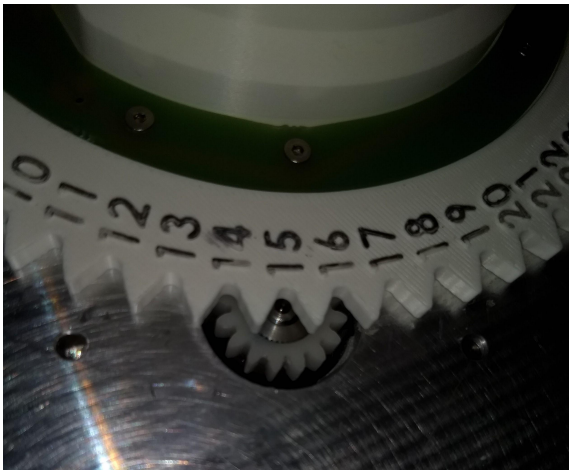
1. Scott Jensen
    a. Exercising the solar power station after updates
2. Doug Pargett
    a. Building up new bulkhead valve assembly with 3d printed frame. Several mods and new parts needed.
    b. Reviewing G3 pump pulsing conditions.
3. Brent Roman
    a. Last-minute, inadequate testing before ECOHAB
    b. Finally bringing up replacement for 13 yr old ESPshore server.

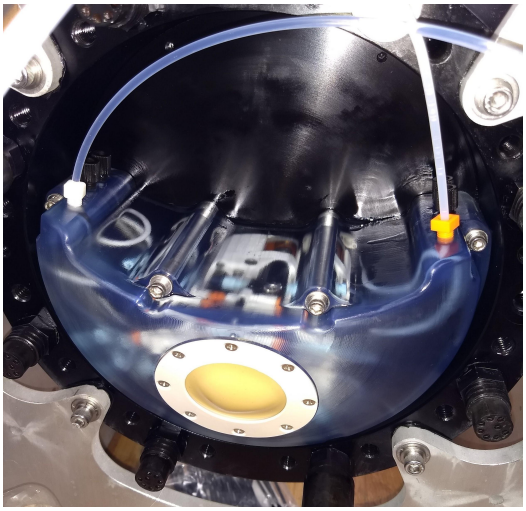
Week 13

1. Doug Pargett
    a. Lots of zoom meetings
    b. Parts sent to shop for print.

Week 12

1. Doug Pargett
    a. Replaced valve pins and seals on a few carousel positions of the ESP Honu instrument.
    b. Inspected and realigned the carousel drive on MV2 due to a gear slipped on the shaft.

c. 

d. Installed a pump into the MV2 instrument, and filled the oil dome. This oil dome was printed on MBARI's in-house acrylic 3D printer. Thanks!
e. 
2. Brent Roman
    a. Worked with Scott Jensen to diagnose environment sensor failures on our 3G hostgate boards

Week 10

1. Scott Jensen
    a. Studied the SPR heater circuit to assist in tuning and failure analysis. Assisted in determined an erroneous setting allowing a previously non-function board to be functional.
2. Doug Pargett
    a. Discussion with Lee Valve Co about G3 ESP valve needs, and G2 ESP valves that are being obsoleted by another mfg.
    b. Testing of the pump on ESP Honu to see if there's a problem with it. So far it looks ok as most of the other pumps also have this pressure fluctuation. More testing needed to see what we can do about it.
3. Brent Roman
    a. Preston noticed that ESP was not detecting clogged filters reliably.
        i. I discovered that pulsations in ESP 3G sample pump pressure can cause the ESP firmware to fail to detect clogs.
        ii. Worked with Doug to characterize pump pulsations
        iii. Tweaked digital filter in ESP firmware to ignore those pulsations
        iv. Preston is testing now

Week 9

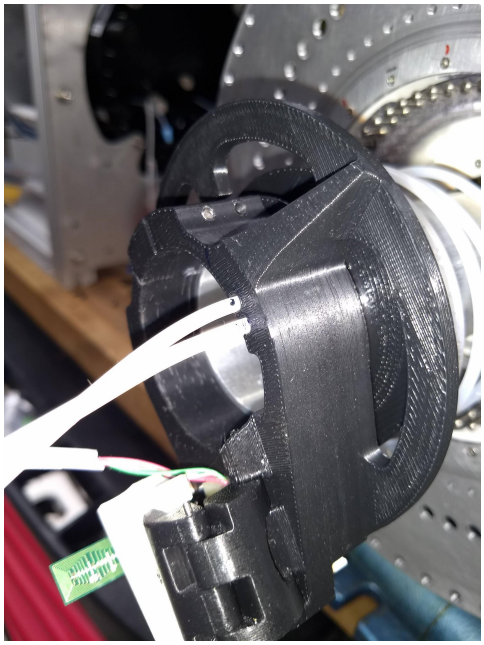
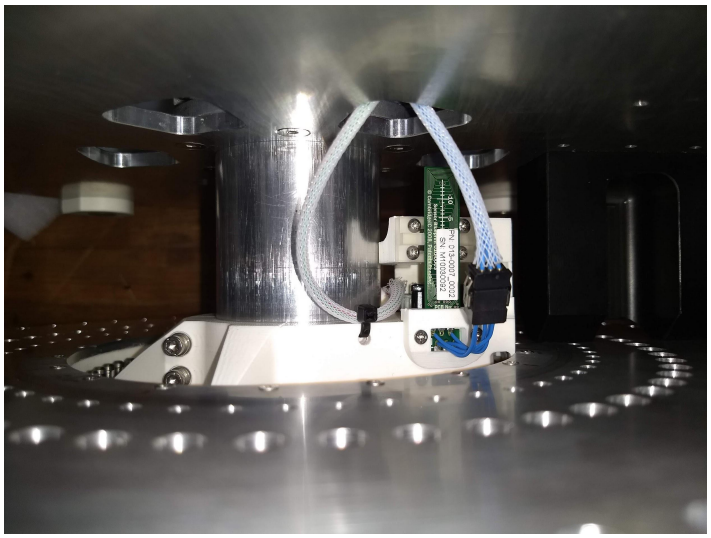
1. Doug Pargett
    a. Calibrating MV2 for new pump installation and build-up.

2. Brent Roman
    a. Brought up ESPtower (portable ESP configured for deep sampling)
    b. Chris Preston says the new Lysate recovery procedure is working very well

Week 8

1. Doug Pargett
    a. Meetings, answering emails...
2. Brent Roman
    a. Working on associating absolute encoder “absSkew” with the axis rather than with each of its trajectory configurations. This will allow recalibration without needing to alter all those configs.
    b. Associated motor config updates with movement commands to avoid races
        i. Helps, but this uncovered another race condition
        ii. I’ll be restructuring the older motor control firmware to handle events and messages like the newer temperature control boards do. This should eliminate the races at their source.

Week 7

1. Doug Pargett
    a. Repaired the Koa ESP instrument after a part broke and misaligned deep inside it.
    b. Broken 
    c. Fixed 
2. Brent Roman

    a. Implemented deferred motor configuration changes. It works and avoids the errors I'd intended, but the system is now producing ominous warning messages that need to be investigated.

Week 6

1. Scott Jensen
    a. Terrestrial housing held pressure over this last break. Looks like it is ready for use.
    b. Group Meetings as well as individual task meetings
2. Doug Pargett
    a. Working on a concept for an electromagnet tipped actuator for the G3 ESP.
3. Brent Roman
    a. Preston and I finally managed to get an algorithm cobbled together that reliably recovers lysate from the ESP3G cartridges, detecting and correcting when the plunger sticks in the syringe barrel. It's a thing of beauty ;-)

Week 5

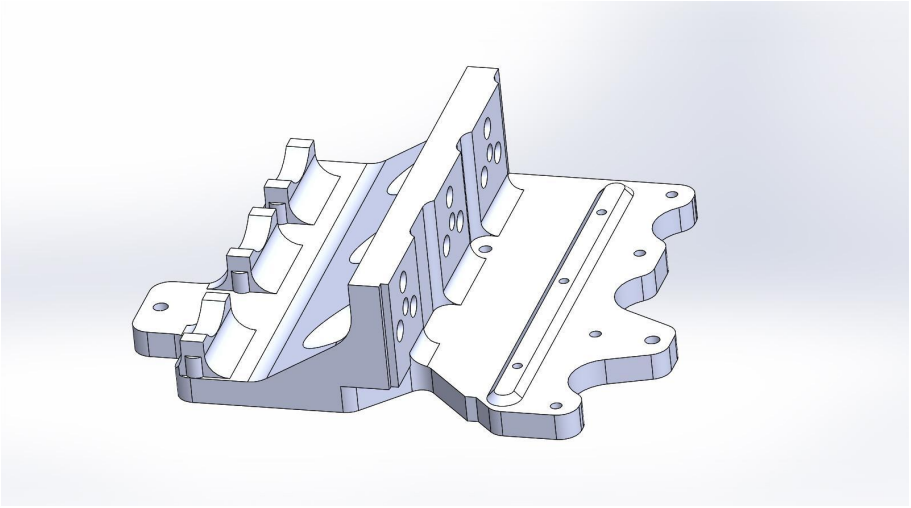
1. Scott Jensen
    a. Various meetings
2. Doug Pargett
    a. Completed redesign of bottle holder. Submitted fab request to shop.
3. Brent Roman
    a. Worked with Preston to improve ESP 3G lysate recovery
        i. Now can detect when syringe plunger sticks in the barrel
    b. Continued support of WHOI
        i. Updating ESProman

Week 4

1. Doug Pargett
    a. Finished bulkhead valve redesign and submitted parts to MBARI shop for 3d printing.
    b. Started redesign of Flowerpot bleach bottle bracket.
2. Brent Roman
    a. Working with Preston on improving Lysate recover in ESP 3G for EcoHab

Week 3

1. Scott Jensen
    a. Meetings and working with the Rosal Group to get another set of the HostGate boards ordered.
2. Doug Pargett
    a. Meetings
    b. Coordinating with shop for fab of parts, checking with outside shops.
    c. Design mod for bulkhead valves to use different flex coupling to assist assembly.
    d. Final changes to bulkhead valve mounts prior to 3d print.

e. 

3. Brent Roman
    a. Worked with Preston to understand 3G lysis processing and how we might improve it.
    b. Proposed using an electro- or electropermanent magnet to avoid losing control of Lysis syringe plunger. Still in the “hair-brained” idea stage, however :-)

Week 2

1. Scott Jensen
    a. Meetings and preparing for another build of the hostgate. Due to a few parts not available suitable replacements needed to be identified.
2. Doug Pargett
    a. Revised the bench ESP stage to match the new cartridge and sent it to Ray for 3d printing.
    b. Traced back which parts got printed and which ones got delayed at the end of last year. Requesting one to be made at an outside shop.
    c. Designing new 3G toroid valve to work with the new cartridge port spacing.
3. Brent Roman
    a. Wrapped up analysis of GoMex power consumption
    b. Implemented scheduling of modem power scheduling to reduce consumption

Week 1

1. Doug Pargett
    a. Meetings
    b. Updating the solid models for the Bench G3 ESP (and subsequent 3d prints) to use the Alpha 2 cartridges coming from Function. Solidworks has some new bugs… likely due to still using the 2019 version.