

901805 - Coastal Biogeochemical Sensing Program

Week 51

1. Irene Hu
 - a. Forked mCAP to LionCAP in OrCAD and made changes
2. Brent Jones
 - a. Flying Spray29 in support of experiment.
 - b. Diagnosing issues with data coming back
3. Thom Maughan
 - a. Working on pHFET-SOS v5 beta, addressing review comments and new features.
 - b. Parts for two more QA boxes. Procedure for Ik and Ib offset measurement

Week 50

1. Irene Hu
 - a. Got mcaps and nanofet modified for n channel
2. Thom Maughan
 - a. Working on beta release

Week 49

1. Irene Hu
 - a. Developed Nanofet QA procedure and QA'ed 8 new nanofets
 - b. One nanofet (delivered weeks later) has 240 uA bias current draw instead of 216 uA like everyone else; "cleaning" board made it worse, rigorous cleaning brought it back down to 240 uA. Will continue troubleshooting
2. Thom Maughan
 - a. Working on addressing review comments and working to release a beta of v5.0 pHFET-SOS by next week.
 - b. Updating QA procedure.

Week 48

1. Irene Hu
 - a. Getting together QA procedure for nanofets
 - b. Trying to get stuff back from KAUST
 - c. Interviews for new lab tech
2. Thom Maughan
 - a. Working on commandline mods to address review comments.
 - b. Updating QA procedure for 100 board checkout
 - c. Interview for Liz F.
 - d. Helping Irene debug NanoFET hardware.
 - e. Support for Miguel at Scripps

Week 47

1. Thom Maughan
 - a. About half done with commandline implementation and sleep management.

- b. Held a 'users review' with Yui, Jackie, Joseph and Irene to get feedback on usage, names, etc. Great feedback.
- c. Working towards a beta release first week in Dec.

Week 45

1. Irene Hu
 - a. Troubleshoot mfets, missing 5 + need to send all back to rotate RS232 transceiver
 - b. Hiring for new tech
 - c. Convo w/ KAUST
2. Thom Maughan
 - a. Re-write of power management state machine. Testing
 - b. Forked code and in v5 implementing new serial protocol for machine to machine. In progress implementing command line functions for config and control of sampling.
 - c. Prelim QA testing of MFETs, found hardware problem. Updating v4.2.x with changes to QA test routine in prep for run of 100 boards.
 - d. NanoFET spi NAND flash driver

Week 44

1. Irene Hu
 - a. Troubleshoot low iDS issues for LioniX isfet
 - b. Circuit worked out for n-channel nanofet
 - c. Coordinating next steps for recently arrived nanofet, mfet, mcap boards

Week 43

1. Irene Hu
 - a. KAUST trip postponed to TBD date due to regional instability
 - b. Got mcap board into EDM (with James's help), made rev D-1-0 with updates for n-channel LioniX isfet
2. Thom Maughan
 - a. In progress on serial protocol for m2m
 - b. pHFET-SOS Users Guide, delivered to Scripps
 - c. Bug fixing

Week 42

1. Irene Hu
 - a. Shipment finally sent off to KAUST!
 - b. Working through eddy covariance processing code
 - c. Cable diagrams for BEAMS and Nanofet
2. Thom Maughan
 - a. Testing and bug fixing the ymodem upload of PT coeff. Joseph found a but at 9600, fixed and released
 - b. In progress on m2m protocol for lab automation

Week 41

1. Thom Maughan
 - a. Final touches on ymodem import of pressure-temperature coefficients.
 - b. Working on m2m protocol for lab automation.

Week 40

1. Irene Hu

- a. ADV harness rewired; new cables received, wired, tested, potted
 - b. Packing for KAUST, paperwork, and last minute parts mods
 - c. Nanofet looks good in wet lab with second ISFET assembly
2. Thom Maughan
 - a. Working on m2m serial
 - b. NanoFET user's guide for handoff to Scripps
 - c. NanoFET software testing

Week 39

1. Irene Hu
 - a. Packing for KAUST trip and last minute parts modifications
 - b. Figured out how to rewire ADV harness for two-connector endbell; tools, pins, etc on order
 - c. Chat w/ Peter Berg

Week 38

1. Jon Erickson
 - a. New flow cell parts for nanoFET.
2. Irene Hu
 - a. Reassembled seaphox with aluminum fasteners
 - b. Emergency packing and paperwork for KAUST trip
 - c. Planning out second AEC setup
 - d. Keeping an eye on nanofet tests- nano-dfet very noisy in seawater lab (bubble?), less noisy in a bucket in lab; nanofet+DSD had low noise in lab setup; nano-dfet is back to seawater lab to repeat test
3. Brent Jones
 - a. Bug detection on integration of Nanofet. New code should take all flavors of MFET controllers. Bench testing in progress
4. Thom Maughan
 - a. Calibration coefficient import via Ymodem coding is complete.
 - b. Adding defaults and edit capability for the Cal coefficients
 - c. Testing on new nanoFET and MFET

Week 37

1. Irene Hu
 - a. Tank dunk test for AEC instrument
 - b. Visited Stanford to borrow ADV/Rinko; tested ADV
 - c. Tracking down updated Vector firmware
 - d. Massive scramble to order new 2-connector endbell for Vector; mapped out new cables, trying to expedite order
 - e. Helping w/ job description for new tech
2. Thom Maughan
 - a. Implementing ymodem import of calibration coefficients.

Week 36

1. Jon Erickson
 - a. Parts for nanoFET 1000m housings
2. Thom Maughan
 - a. Pressure calibration coefficient manual entry is complete and ready for review. The user can copy from excel and paste into Teraterm. Working on file import.

Week 35

1. Irene Hu
 - a. Finishing nanoB current tests; titrations look good
 - b. Testing nanoB modifications to reduce noise
 - c. Prepping AEC instrument for tank dunk; convo with Stanford team; planning for Saudi Arabia
2. Brent Jones
 - a. Diagnosing and fixing comms problems between pH and spray
 - b. Diagnosing excessive corrosion on spray pcase
3. Thom Maughan
 - a. Testing pHFET-SOS for nanoFET
 - b. Working on adding calibration coefficients for pressure and K2. User manual entry and file import.
 - c. M2m protocol
 - d. Investigating Spray ground fault. Sent a proposal with options to Yui for an experimental sniffer technique.

Week 34

1. Jon Erickson
 - a. nanoFET: Believe all the parts are finished into assembly.
2. Irene Hu
 - a. Nanofet rB tests of bias and main power/current consumption using Yokogawa
 - b. Initial analyses of Nanofet noise performance, waiting for titration tests
 - c. Prepping AEC instrument for tank dunk
3. Thom Maughan
 - a. Helped with Spray corrosion diagnostics and MFET uSD card diagnostic. Recommended updating firmware from 3.3.1 to 4.1.6 and disabling uSD card for Spray since persistor logs the data. If uSD is needed, used industrial 1GB or 2GB cards

Week 33

1. Brent Jones
 - a. Monitoring spray 34
 - b. Adding more tracking capability to WG
2. Thom Maughan
 - a. Wirewalker bug investigation. No need for a point release, the fix will be rolled up in the end of August release.
 - b. Loaded code on the new nanoFET, ran some quick tests.

Week 32

1. Thom Maughan
 - a. Irene's updated NanoFET is built and we are getting ready for software handoff to Scripps for Spray2 development.

Week 31

1. Irene Hu
 - a. Compiled knowledge/understanding of ISFET chemistry and circuitry
2. Thom Maughan
 - a. Verified nanoFET build, getting ready for Irenes updated version and collab with Scripps.

Week 30

1. Irene Hu
 - a. Nanofet rB sent out for fab
 - b. Laid out and sent out battery adaptor board
 - c. Looked at some data from Wirewalker Humboldt, and helped Jacob troubleshoot their Durafet
 - d. Wrote some EC data processing code, planning how to deploy EC instrument
2. Thom Maughan
 - a. Starting rework on serial interface to improve machine to machine interface for labview.
 - b. Getting ready for new nanoFET and collaboration with Scripps.

Week 29

1. Jon Erickson
 - a. Waiting on the endcaps from the shop for 1000m duraFET.
 - b. Successful pressure test of cases.
2. Irene Hu
 - a. Completed EC mockup build
 - b. Worked w/ Jose to rewire some connections in nanofet for better routing
 - c. Making Tadiran battery adaptor board
 - d. Wirewalker/Humboldt meeting
3. Thom Maughan
 - a. Met with Yui on near term plans. BEAMS firmware worked well on the recent Maui deployment.

Week 28

1. Irene Hu
 - a. Continuing to build up EC instrument, modified some parts as necessary
 - b. For nanofet, lots of reading on guard rings, low current measurements, reference electrodes; looked at a bunch of op amps and decided to continue with current selection for now (minor modifications to help with routing)
 - c. Reorganized nanofet schematic and fixed references
 - d. Li-SW first contact

Week 27

1. Irene Hu
 - a. Continue building up EC system and fixing parts as problems arise, update drawings as needed

Week 26

1. Irene Hu
 - a. Working w/ Jon and Jose to design/integrate battery clips for nanofet board. Battery will hover above circuit to save space
 - b. Mods to circuitry to accommodate "internal" reference as default

Week 25

1. Jon Erickson
 - a. Waiting on parts from the shop. The circuit board changed, need to get Jose, and Irene to sing off on my hardware changes.

Week 24

1. Jon Erickson
 - a. Received the new version electronics. Requires dimension changes to pressure case.
2. Irene Hu
 - a. Troubleshoot Nano4 (solder blob)
 - b. Nano3 modified to tie buffer shdn to RES; seems to work. ~40 uA parasitic draw thru relay when HIB doesn't properly go low is still a problem, but tabled for now
 - c. Final mods to nanofet revB and discussed w/ Jose for layout

Week 23

1. Irene Hu
 - a. Continued testing of HIB solution for buffer shutdown: incorrect pH voltages traced to software
 - b. HIB pin does not go low when power is arbitrarily cut, despite implications in docu. On further probing and googling, it never has and probably never will. Working w/ Thom + consulted Scott, Alana, etc to brainstorm alternate solutions
 - c. EC parts sent to MTechs to fix.
2. Thom Maughan
 - a. Troubleshooting Labview serial comm to MFET bug after a run of several days.
 - b. Discussions on nanoFET software/hardware with Irene. Release 4.1.7 which addresses a mux bug.

Week 22

1. Irene Hu
 - a. Fixed broken Nanofet2 (replaced microprocessor + reprogrammed)
 - b. Continued testing of HIB solution for buffer shutdown: Nano2 submitted to replace ADC

Week 21

1. Irene Hu
 - a. Nanofet issue with bias battery powering circuit during sleep: discussed w/ Scott to ID/understand issue, testing fix involving HIB pin (may have new issues: current draw too low, Durafet voltages are off)
 - b. Troubleshooting nanofet2 after accidentally shorting battery power to some components
 - c. Continuing assembly of eddy covariance instrument, and fixing small problems with machined parts
 - d. Weekly meetings
2. Thom Maughan
 - a. Assist on MFET logging problem

Week 20

1. Irene Hu
 - a. Created (from old B draft) nanofet A-1-1 schematic with small changes, and sent to Jose's group for assembly of 2 more nanofets
 - b. Created new nanofet B schematic to be a multipurpose small controller with integrated battery; changes ongoing pending battery decisions and parts arrival/evaluation
 - c. Added missing resistors to existing nano1 and nano2; nano1 to Joe for titration test
 - d. Borrowed Yokogawa from Paul M to measure bias battery current consumption. Bias battery appears to be parasitically powering other parts of circuit after it falls asleep
2. Thom Maughan
 - a. Attended meeting on nanoFET size reduction, gave several suggestions.

Week 19

1. Irene Hu
 - a. Review nanofet circuit, discuss w/ Scott; some parts missing
 - b. Meeting to discuss updates and timelines
 - c. Weekly meetings
2. Thom Maughan
 - a. Review nanoFet and provided size reduction recommendations.
 - b. Update to CCS v12 for development on new laptop. Git integration bug looks to be fixed.

Week 18

1. Jon Erickson
 - a. Started on final prints for 1000m pH
2. Irene Hu
 - a. Cut out channel for Rinko in flowcell spacer using jigsaw / file
 - b. Started untangling mcap circuit

Week 17

1. Irene Hu
 - a. Started assembling new parts for ECV system; will need to modify flowcell spacer
 - b. Attended Carbon Lab weekly meeting
2. Brent Jones
 - a. Processing pH data from MBARI Wire Walker

Week 16

1. Jon Erickson
 - a. Still working on the end caps for nanoFET
2. Irene Hu
 - a. Helped with analyzing/interpreting data from latest nanofet test

Week 15

1. Thom Maughan
 - a. Code composer studio v12 eval on new laptop. No issues found, however git integration is not yet tested.

Week 12

1. Thom Maughan
 - a. Reviewed nanoFET test data

Week 10

1. Brent Jones
 - a. Flying spray 29 and 34
 - b. Testing WG tracking code using elevation
2. Thom Maughan
 - a.

Week 9

1. Jon Erickson

- a. Another design change to accomodate Pave Tech seals.
2. Brent Jones
 - a. Flying spray 34
 - b. Prepping spray 29
 - c. Testing code on WG tiny for upcoming tracking mission
3. Thom Maughan
 - a. Bug fix affecting nanoFET sampling has passed a multi-day lab test.

Week 8

1. Brent Jones
 - a. Flying spray 29 in support of Yui experiments
 - b. Teaching James how to do batt swaps
 - c. Designed test tank bridge plate adapter for new ballasting facility

Week 7

1. Scott Jensen
 - a. nanoFET continues to be noisy. Late last week an anomaly was discovered that looks like it answers the noise question.
2. Brent Jones
 - a. Beginning design for more automated ballast scale readings. Matlab code to take measurement readings and run through a low pass filter
 - b. Mechanical design for scale apparatus
3. Thom Maughan
 - a. Joseph found a noise issue on the nanoFET. We chased it down to an incorrect MUX setting in the nanoFET. Fixed and in test.
 - b. Weekly ISFETology meeting / techfest.

Week 6

1. Thom Maughan
 - a. Starting m2m interface design

Week 5

1. Brent Jones
 - a. Starting to integrate elevation return from Benthos USBL for better tracking
 - b. Moved into Spray lab at ESB

Week 3

1. Brent Jones
 - a. Ground station testing on Pico integration into Spray

Week 2

1. Jon Erickson
 - a. Finished design and drawings. Yet to be reviewed/approved.
2. Brent Jones
 - a. Working on getting another Wire Walker pH setup to Humboldt State
 - b. Continued work on integrating Pico pH into Spray

Week 1

1. Thom Maughan
 - a. Investigated noise on Durafet / MFET setup. Borrowed isolation transformer for water bath, recommended static mats.