

Mark Chaffey Sorted By Project

300082 - DMO Support - Wave Glider

- Completing assembly of 2nd payload box. (Week 6)
- Assembled antennas and submitted wiring to tech support. (Week 6)
- Staged the second 1U HotSpot payload with tech support for final wiring. (Week 9)
- Some minor support for the second Wave Glider HotSpot build. (Week 38)
- Turned over remaining material to DMO for building and maintaining the HotSpot. A second unit of the compact 2nd generation 1U design has been successfully built by DMO and will be operational soon. (Week 51)

901221 - Midwater Time Series

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901603 - Video TAG: Vis Ocean Chng

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901807 - Next Gen Acoustic Dorado

- Revised documentation and had tech support modify four more DSP&L LED lights to the low noise configuration. (Week 38)

902001.99 - 4K ROV Camera Development

- Much effort coordinating between optical engineer, DSP&L and Canon USA getting additional paraxial parameters to help the optical design work. (Week 6)
- Built a detailed solid model of Canon lens from demo unit dimensions. (Week 6)
- Optical engineer, DSP&L and MBARI committed to Canon lens and ordered. (Week 6)
- Ordered Sony Remote Control Panel (RCP) for camera control. (Week 6)
- Completed mature block diagram of the electrical system including telemetry and forwarded to operations for comments. (Week 6)
- Started chassis design while waiting for the camera to arrive. (Week 6)
- Built thermal model in excel that will be used to determine fan and heatsink requirements for chassis and housing. Verified with actual at-sea and design data from i2MAP. (Week 9)
- Received Sony camera module and lens. (Week 9)
- Loaded in camera 4K license package and color corrected camera output. (Week 9)
- Measured camera power dissipation and thermal properties - good news, camera came in at less power than estimated. Makes heat load design easier. (Week 9)
- Set-up baseline lens test in building G, will finish this testing Thursday. (Week 9)
- Phone conferencing with DSP&L and the optical consulting engineer weekly. (Week 9)
- Working with DSP&L and the consulting optical engineer on optical path design. Optical design was complete, however the unique glass needed for one of the lenses was unavailable so a minor revision is in the works this week. (Week 23)
- During this quarantine period I have been working on the camera chassis design which has proved to be challenging. In order to receive the full benefit of the 4K camera capabilities, the tolerances for the alignment of

the camera lens to the optical adapter and the optical adapter to the dome are very tight. This requires providing precision adjustments for lens and optical block position. The design is about 90% complete. (Week 23)

- Multiple optical domes are on order and when received will undergo qualification pressure testing with the housing dome support. (Week 23)
- Next on the schedule is the electronics and telemetry detailed design. (Week 23)
- Working toward a comprehensive design review in collaboration with DeepSea. (Week 33)
- Optical adapter design is now truly complete with new glass specifications (previous glass was not available) and the glass lenses have been quoted. (Week 33)
- Optical adapter cell detailed mechanical design is complete with all spacers, etc. and out for fabrication quote from specialty optical assembler. (Week 33)
- Chassis design is complete and I have conducted extensive thermal modeling using SolidWorks flow simulation to make sure that the camera system will meet requirements of surface operation in GOC waters. SolidWorks Flow is a powerful tool but as always, requires very careful attention to the inputs. (Week 33)
- As noted previously, 20! Domes have been received and test units have successfully passed final polishing, chemical hardening and non-reflective coating. (Week 33)
- Life cycle pressure testing of a test dome is about to begin. (Week 33)
- With chassis thermal modeling complete, the next major task is end-to-end telemetry verification testing prior to design review. (Week 33)
- Added 2x extender actuation to mechanical design. (Week 35)
- Prototyped telemetry system and confirmed that Sony camera control protocol works successfully over 5.4km of fiber. Discovered that vendor had delivered incorrect optical multiplexor part. Replacement due Sept. 10. (Week 35)
- Review preparation. (Week 35)
- Re-assembled Sony HDC-P50 camera, which was completely in parts for chassis design work. This only took 1.5 hours which proves it is entirely feasible to re-assemble the camera if it is required to be returned for factory service (Sony will no longer perform on-site service). (Week 38)
- Completed final telemetry test. Ran entire configuration over 10.8km of optical fiber verifying ability to transmit Sony RCP protocol as well as chromatic and material dispersion limits for the 12G video link. This is a major milestone and removes the last MBARI technical risk point. (Week 38)
- All mechanical design is complete but drawings need to be done for numerous parts. (Week 38)
- Working on electrical detailed design (system design has been complete for months). (Week 38)
- Completing slide deck for planned comprehensive design review in conjunction with engineering team at Deep Sea Power & Light (DSP&L). (Week 38)
- DSP&L has completed 100 cycles to 4000 meters on the first Dome test article without incident and is now moving to 7000 meter pressure cycling. (Week 38)
- Worked up slides for design review. Review is the next big milestone. (Week 40)
- Minor mechanical modifications for simplicity and manufacturing (Week 40)
- Dome design now has 1700 cycles on it at DSP&L. (Week 40)
- Adapter optics glass (5 sets) has shipped. Adapter mechanical parts are in fabrication. (Week 40)
- Revisiting connector specification in coordination with both ROV's. (Week 40)
- Substantial progress on the electrical design. (Week 40)
- Final final final decision on penetrations/connectors. (Week 41)
- Slight mechanical design modification for manufacturability. (Week 41)
- Another slight mechanical modification to maintain optical adapter to dome clearance under all conditions. (Week 41)
- Last tweaks to PDR design review materials. (Week 41)
- Working on completing detailed electrical design for μ controller PCB. (Week 41)
- Tested Canon lens servo to confirm the documented command voltage inputs. (Week 41)
- Prepared board materials. (Week 41)
- Finished with design review materials and scheduled review for Nov. 20. (Week 46)
- Completed final calibration plan for optical alignment. (Week 46)

- Have been submitting parts to shop as drawings are complete and will accelerate this pace. (Week 46)
- Completed the camera controller schematic and have kicked off to layout. (Week 46)
- Made minor modifications to chassis to fit PCB. (Week 46)
- DSP&L partner is now pressure testing a full dome & chassis assembly with shorter barrel. 500+ cycles to date. They perform high cycle tests to look for “nibbling”, creep and other subtle pressure effects on the mechanical dome mounting system. All good so far. (Week 46)
- The Adapter optics are in assembly at Myriad Manufacturing with some delay after anodized parts came back with severe etching and pitting. Adapter metal parts are being re-manufactured. (Week 46)
- Held design review with MBARI and DeepSea engineers + scientist. (Week 48)
- Addressing two key items that came out of review 1. Confirming axial compliance matches worst case hydrostatic, thermal and manufacturing tolerance dimensional changes. 2. Re-examining thermal calculations and possible mitigation strategies based on comments (correct) that the thermal margin for 25 Deg. C water was very small. (Week 48)
- Additional factor that is being addressed relates to assembly procedure and if there is enough clearance for tools. (Week 48)
- Camera side PCB is currently in Jose’s hands for layout. Here again dimensions are tight and PCB and mechanical design are tightly integrated. (Week 48)
- Cranking out mechanical drawings and submitting to the machine shop. (Week 51)
- Working with Jose on finalizing camera PCB layout. (Week 51)
- DeepSea cutting metal on the camera housing and anticipates continuing progress, they are an exempt business and fully operational in their machine shop. (Week 51)
- Optical adapter metal parts - round 2 - are done and have successfully been anodized. This process failed with the first round of parts after too much material was etched away. (Week 51)
- Final optical assembly and the verification testing of the optical adapter was delayed after the optical house had 7 of 18 employees test positive for Covid. They are back in business but our optical engineer is postponing a visit to supervise the build until the appropriate protocols are in place to ensure his safety. (Week 51)
- All long lead parts are on order or have been received. (Week 51)
- End-to-end testing with the Shipboard video file capture system by Lonny was successful and recorded 4K x 60P progressive video for 24 hours without problems (besides using beaucoup de disk space). Alternate project name: 902001-A Disk Space Odyssey. (Week 51)

902007 - Iridium NEXT evaluation

902007 - Iridium NEXT evaluation - No activity.

Out of Office

- Planned vacation canceled - not enough water in the river. Still going to try and take a few days off in early October TBD.

Overhead

- Spending a few days on the external review presentations. Will have to spend a few more to make sure I’m ready if needed. (Week 6)
- Migrated most work to replacement workstation. (Week 40)
- Brought new (re-cycled) workstation online with excellent assistance from Doug and Jose. (Week 41)