HIRES Dewar Upgrade

Project Monthly Report – Apr 20/3

Progress

Detectors

We have not yet received the red MIT device coming from Gerry Luppino, although it may have been sent in the last couple days.

Mechanical

Electronic box mechanical drawings are complete and shop is in the process of fabricating the parts.

Support structure for the interconnect boards were mocked up and fitted with the simulated PCBs and later with the real McCoys. Design of the hardware was improved and revised based on this study. The parts are now complete.

Drawings of the flex cable pipe assembly are complete. Production will be delayed until a reasonably accurate overall length can be determined between the electronics box and the connections at the footlocker.

All three backplanes are complete and polished. CCD lab now has the engineering grade backplane for use with the engineering CCDs that were on the DEIMOS backplane.

Optical baffle was redesigned so that one half (optical mask) would be fixed and ride with the mosaic assembly and not cause problems when roll adjustment is necessary. The original baffle was modified to accommodate and clear the mask component. The mask part is about half complete.

A room temperature cool-down test has been completed. Dewar was fit up with a dead mosaic array assembly and simulated interconnect board sub-assy. Temperature diodes were connected thru the SMA connectors to monitor CCD temperatures. The average temperature achieved on the CCDs was approximately -146° C. The hold time is about 19.5 hours in a room whose ambient temperature is 22° C.

Another cooling test was conducted in our environmental chamber where the temperature was maintained at about 0° C. The CCD temperature was about -168° C and the hold time was 24.0 hrs. We may have to trim the cold finger connections to bring the CCD temperature up to about –135°, in which case the

hold time should increase a bit. We also plan to gold coat a number of the cold circuit parts which should give a minor increase to the hold time.

The first cool-down test caused some concern with the feed-thru connectors. This was due to the fact that the ion pump was running at about 45 μAmps. It was initially believed that the micro-DSUB connectors were the cause. However, leak tests on all the SMA and DSUB connectors showed them all to be good. We now think that the high load on the pump was due to some out gassing of materials used in the interconnect board mockups that were in the dewar. The current cool-down test in the chamber is running between 4 and 6 μAmps, which is quite adequate.

In spite of the vindication of the DSUB connectors, there is still some concern with the overall quality of these parts. Once our testing is complete, we plan to discuss this issue with the supplier.

Disassembly of the dewar between cool down tests revealed an interference between the internal assembly and the cold finger. The cold finger was shortened and the mating copper component on the assembly was modified to address this problem. It is working properly now.

Next order of business is to review the results of the survey Grant Hill and John Vause performed in the Hires room for us; and on to the footlocker design.

Electronics

The design and layout of all the circuit boards is now complete and the files have been sent to the fabricators. We expect to have the boards in the next week and a half.

The SDSU-2 CCD controller set of circuit boards, including the video boards are expected to arrive this week, at which time preliminary testing will start.

Software

No report this month

Issues and Concerns

Keeping to the schedule both for delivery and testing of the CCDs. The schedule has slipped about 4 weeks due to delays in completing the design of the circuit boards, but that is now past and we will be working to catch up to the schedule. Testing is always a difficult period to predict a schedule.

Schedule

The updated schedule is attached.

Budget and Spending Profile

To the end of February the project has spent $448,355 or 59 % of the project funds not including contingency. A summary of the budget is attached, as is a chart. The spending profile is shown on an attached graph. We have now used most of the $450,000 that CARA has committed to us by purchase order, and we will soon be requesting the remainder of the project funds.