HIRES Dewar Upgrade

Project Monthly Report – Aug 20/3

Progress

Milestone

On August 14th the Engineering Mosaic was installed in the dewar system and imaged warm. All six amplifiers could be read. On August 18th the mosaic was readout cold, at about –150C. All worked as expected.

Detectors

The Engineering grade CCD mosaic has been mounted in the dewar and readout with the HIRES controller system.

Mechanical

The bulk of the footlocker has been constructed. Amco framing has been sized and assembled, along with Extren fiberglass cross bracing. The entire heat exchanger (HX)assembly has also been assembled and incorporated into the frame.

The HX has been pressure and leak tested to 60 psi. And the cooling fans have been exercised when the assembly was installed in the footlocker. The fans are well balanced, run quietly, and with neglible vibration. Plumbing components have been identfied. Parker Tru Lok fittings and teflon/stainless braided hose will be used. Locations of the fittings for the Hires hoses are being determined, then hose assembly lengths can be specified.

Panels have been sized to fit all faces of the footlocker. A grade of Poron for the panel gasket material has been identified and that material will be ordered this week.

Insulation on interial walls of footlocker is in the process of being designed and implemented by the shop. Hanging hardware has been designed, but needs verification of the size and orientiation of the existing hanging turnbuckles before the parts are sent to the shop.

Bob Kibrick's measurements during his recent visit to Keck will provided the information to locate the hydraulic and electrical connectors on existing footlocker. This will allow us to properly place them on the new unit.

Modifications to the electronics box and dewar assembly have been made so that all the sub-assemblies connected to the rear dewar lid can be mechanical connected and travel as an integral unit. This required changes to some parts to allow access to all the cap screws that fasten this complete assembly to the

dewar. This now permits the transfer of the complete unit between test bench to dewar.

The new Pave connectors are due to ship on 15th of next month.

Electronics

The electronics box was mated to the dewar and tests were made verifying the operation of all CCD clock, bias voltages, heater resistors, and temperature diodes. Final adjustments were made to both the CCD controller's power supplies and power monitor board with the electronic box mated before installation of the engineering mosaic.

The temperature diodes were calibrated and then the engineering mosaic was installed. The mosaic was cooled to approximately -150C and successful readouts of each CCD's video were made. Measurements of dark current agreed that the devices were being cooled to -150 C and the noise measurements of the three CCDs were in agreement with both the CCD lab's measurements and also with the measurements made of the same devices on the DEIMOS engineering mosaic.

The dewar has been warmed up for removal of several cold straps to allow the regulation of the mosaic's temperature to be in the -115C to -130C range and to facilitate the mounting of light source fixtures for measuring CTE and linearity. It will be cooled down again later this week and characterization of this engineering mosaic will begin next week.

Three video boards were found to have their set of quirky problems, namely baseline instability or uneven noise patterns. Only one of these video boards is currently within the CCD controller; the other two have been exchanged with either a spare or a known working board. A video board "test bench" will be made using the CCD lab's CCD controller to allow troubleshooting and repair of these three boards.

Software

Dark images from that mosaic have been successfully read out both in "single-amp" and "dual-amp" mode using the baseline DEIMOS CCD software running in the HIRES CCD controller and VME crate. The video signals from all six CCD readout amplifiers are functioning as expected. Readout noise is comparable to that measured when these same chips were installed in the DEIMOS dewar as part of an engineering mosaic, and there is no discernible fixed pattern noise.

The software that provides the temperature control for the mosaic has been customized for the HIRES dewar and is functioning correctly. Dewar temperature measurements indicate that the dewar is getting too cold (-150 C), and even with

full power applied to the heater resistors, it is still too cold (about -135 C). The dewar has been warmed up and the number of cold straps will be reduced later this week.

Initial tests of the CCD controller and VME crate hardware were conducted using the baseline DEIMOS CCD software. We have now begun the process of transitioning to the version of that software that has been customized for the HIRES upgrade CCD. The new HIRES CCD keyword library has been built on the new HIRES instrument computer (lehoula) and is currently being tested. So far it appears to be working as expected. The new CCD readout modes to support the 3-chip mosaic are also now being tested.

Work has not yet commenced on the replacement graphic user interface (GUI) for the existing HIRES exposure control tool (xpose). That work will commence in September.

Issues and Concerns

No particular issues or concerns at this time.

Schedule

The updated schedule is attached. We currently expect to be ready for a Pre-ship review on November 15th, 2003.

Budget and Spending Profile

To the end of July the project has spent $589,959 or 72% of the project cost estimate, not including contingency. A summary of the budget is attached as is a chart and the spending profile.

The accounting for this project was changed this month to reflect that it is federally funded and thus subject to a different overhead rates than were being charged previously. The sending profile has been modified to reflect these differences.