

## HIRES Dewar Upgrade

Project Monthly Report – May 20/3

Progress

### **Detectors**

We have received our three science detectors. Three engineering grade detectors are mounted on the backplane and are awaiting the cold circuit hardware that is currently being gold plated.

### **Mechanical**

Construction of the electronics box is complete. All parts have been fabricated and have been assembled several times to iron out defects and tune out the components.

Steve Allen has reviewed the CCD mosaic and device orientation drawing and it has be upgraded to Revision B.

The final outstanding DSUB connector was delivered. Pave had iterated on the design and produced a product that has addressed virtually all of our earlier concerns. Their documentation has been updated to revision B as a result.

Three of the DSUB connectors are soldered to their flex circuits. The accommodating ports in the dewar lid were widened an additional .030" to clear the assembly. This was done after testing confirmed that the enlarged ports pose no threat to vacuum integrity.

A heat exchanger has been identified for use in the new footlocker. Sizing was based on 405 watts of power and a coolant supply at 0.6 gpm. The company is Lytron, the supplier of the exchanger currently in use in HIRES. A preliminary layout of the components to reside in the new footlocker has begun. Once this preliminary design is complete it will be shared with Keck for review and comment.

The shops are preparing the dewar components for surface finishing by an outside supplier. The dewar and vacuum parts will be gold plated. The aluminum electronics box components will undergo a gold alodine treatment.

### **Electronics**

The CCD Interconnect boards that reside in the dewar have been assembled and had their pinout verified with their accompanying flex circuit. The

three flex circuit/hermetic connector assemblies for each one of the CCDs have been soldered and mounted into the dewar. Considerable time was spent in the "method" of manufacturing of these assemblies. A fixture to bend and maintain a 90-degree angle in the flex circuit was made and further refined. Special assembly techniques were investigated to attach the flex to the connector while maintaining a low profile in height.

All of the boards, including spares, that reside in the electronics box have been assembled and mounted. There were some modifications to the mechanical mounting of the boards and their ease of access for removal and insertion. We saw variations in the height dimension of two different manufacturers of the same mil-spec connector used on the analog switch board and as a result those connectors were modified. The accompanying cabling from the CCD controller to the electronics box has also been made and awaits installation.

It was decided to use separate relays for switching the  $\pm 16$  volts onto the backplane of the CCD controller. This has been incorporated into the controller and will be tested this week before installing the SDSU-2 board set in it for preliminary testing of the controller.

Later this week continuity testing and basic electrical testing of the CCD signal path from the CCD controller through the electronics box and into the dewar will begin.

### **Software**

No report this month

### Issues and Concerns

No particular issues or concerns at this time.

### Schedule

The updated schedule is attached. It was adjusted to show a first light date in early February, 2004 as has been scheduled by CARA.

### Budget and Spending Profile

To the end of March the project has spent \$500,439 or 67% of the project funds not including contingency. A summary of the budget is attached as is a chart and the spending profile.

Evaluation of the budget at the end of fabrication and the start of the Assembly and Test phase, shows that we expect to exceed the project budget of \$759,485 before contingency

by about \$56,000. Of this amount, six man-weeks of effort were expended exploring the use of e2v chips in the dewar. The cost of this labor (\$17,500) was agreed to be additional to the approved project funds. Of the remaining \$38,500, \$27,500 is for manpower and \$11,000 for materials. A request to the CARA Instrument Program Manager will be made to increase the project cost by \$17,500 and to commit \$38,500 of the contingency fund. A budget sheet showing these estimates is also attached.