HIRES CCD Upgrade

Design Review

10:00 PDT - 6 August 2002

Agenda & Meeting notes

1. Preliminaries
   a. Remote site connection; note attendees
      i. Keck

Jim Bell	Grant Hill	Rich Matsuda

      ii. Lick

Dave Cowley	Dave Hilyard	Tracey Van Gundy
Barry Alcott	Steve Vogt	Richard Stover
Bob Kibrick	Chris Wright	Terry Pfister
Jerry Cabak		

   ~~b. Secretary/note taker?~~

   ~~c. Modifications/corrections to agenda~~

   ~~d. Establish lunch and other breaks~~

2. Optics - Field Flattener completed; need to coordinate and schedule the AR coating; polishing of the moly bases is underway and should be completed this week
3. Mechanical
   a. Dewar
      i. CCD & back plane
      ii. Support Spider – need to calculate thermal effects on CCD assy
      iii. Housing – questions regarding material and possibly using aluminum but stainless billet already purchased, existing dewar is stainless
      iv. Rear Lid & feedthrus – metal gasket to housing should be considered to eliminate o-ring; chamfer rear edge of lid to reduce vignetting
      v. PCB's – allow for provisions for extender board(s) in electronics box; sheet metal enclosure should provide strain relief to cable assy even when sections are removed; Need to carefully consider the arrangement of sliders that support the PC boards so that they slide in with the accurate alignment needed to achieve proper mating with the feedthru connectors on the back plate of the dewar; Also need to provide tooling for grabbing onto boards for extraction, due to the significant force required to unplug the hermetic 51-pin D-connector from its mate.
      vi. Cold finger attachment
   b. Support Frame – the plan is to accommodate the existing LN2 auto fill system
   c. Ion Pump – new Varian pump as specified by Grant and referenced in the project plan will be used; roughing pump connection needs improvement since it is prone to failure causing catastrophic loss of vacuum; Bill Mason will identify a new adaptor for us; a protective guard is needed to shield the flange from exposure to LN2 that can spill when the auto fill systems overflows the dewar on occasion;

need to work with Bill Mason to develop a means for interfacing our various sense lines (the monitor ion pump status and current) with the new-style ion pump controller.

d. Fixturing – x-ray window fixturing needed, need to be light tight

4. Electronics

   a. PCB layout(s)

   b. Feedthrus & connectors

   c. Dewar electronics – investigate possibility of solution dipping PCB's and assy's as a final cleaning; interconnect boards may be many layers to properly route circuits and isolate signals

   d. CCD controller - The replacement controller needs to provided optically-isolated digital output ports to control the cooling fan in the footlocker and the solenoid-activated valve that enables the flow of compressed air into the 50 liter LN2 reservoir (the compressed air pressurizes the reservoir so as to pump the LN2 into the dewar). The controller also needs to provide two analog inputs for monitoring the two capacitive LN2 level-sensors: one in the dewar and one in the reservoir.

   e. Electronics box

   f. VME Crate – most boards are similar to those used in Deimos; crate currently located in the electronics vault; this upgrade will require 1) a higher Ethernet throughput involving a new fiber optic, or 2) move the crate downstairs; relocating the crate seems to be the better solution; CARA will free up rack space for the crate; CARA will need to install a run of 62.5 micron fiber from the interconnect panel in the Keck-1 computer room to the feed-thru panel on the outer wall of the HIRES electronics vault on the right Nasmyth platform of Keck-1; this run needs to thread through the telescope's azimuth cable wrap.

   g. Footlocker – cooling concerns are an issue; need to calculate power of the new system; need to look at the glycol loop and the heat transfer unit; desire to increase glycol supply which is marginal already; better fans are needed for the controller; CARA will suggest vendors of fans used at the summit

5. Software – can start around Oct.; Steve Allen will be the first one to be freed up from current duties; ability to have a sequential CCD readout option significantly increases the scope of work for the project which is beyond existing budget, the electronics can be designed to allow for this permitting S/W upgrades at a later date; a decision needs to be made on this by Oct; We will study the implications of both a sequential readout option and the ability to support different length exposure times on different chips. Although implementation of such schemes is clearly beyond the budget and schedule constraints of the current project, we want to at least study the problem sufficiently to ensure that we leave enough hooks in place (in both hardware and software) to enable the future addition of such capabilities.

6. Other – CARA will be upgrading the UPS system for Keck; it is desirable to have details of the system when they are available