DEIMOS
SSC Presentation: November 22, 1996
Major Milestones: Ninth Quarter

Optics:

- The first CaF_2 lens element cracked on the final polishing run on the first surface. Inspection at Optovac suggested that a microfracture at the bevel may have propagated along a crystal boundary. A replacement blank has been ordered at a cost of $12,000. Review of our polishing procedure with Optovac suggests that we should monitor bevels and repolish as necessary.
- A final report on collimator surface quality has been prepared. Small-scale and large-scale slope errors more than meet tolerances.
- The ORA tolerancing report for camera fabrication was received, and we are studying it.
- The aspheric surfaces on camera lens elements 7 and 8 are now in production. Surface quality is improving, but the aspheres are off center. The effect of this is being studied.
- Bids are being prepared for the tent mirror and two 6-in×8-in gratings. The advice of the Science Advisory Team is being sought on the choice of gratings.
- The test cell for containing CaF_2 and flint elements plus Dow Corning 200 fluid performed successfully when cooled to 0° C.

Structure:

- Fabrication of the undercarriage, cylinder, and drive disk at L&F is complete, and the latter two items are ready for coupling. A crew is scheduled to go to L&F in early December to assemble and test the entire system. We expect to receive the shell and undercarriage by the end of December, and a platform/mount are being constructed for our shops.
- The design of the mounts and drive system for the Nasmyth platform rails is complete.
- The Mark III grating mount design is adequately stiff. Flexure is $\pm$ 7 arcsec under rotation, for a total spectrum motion of ± 1 px at the ends of the spectrum before flexure compensation, reduced to ± 0.13 px after compensation.
- A new scheme is being developed to implement x-direction flexure compensation inside the dewar rather than by rotating the whole camera/dewar assembly.
- Slitmasks and slitmaks storage cassettes have been simplified by substituting thin, flexible outer frames. Slitmasks can now be stored in a linear LRIS-like juke-box, eliminating the need for the complicated caterpillar.

Detectors:

- Three good wafer runs were received from Orbit (two funded by non-DEIMOS sources), with over 40% of the devices passing the wafer probe test.
- The Lick thinning effort has solved all problems except the final step of removing silicon from the bond pads.
- Lincoln Labs had over 50% yield on their consortium devices. Twenty-two wafers were selected for thinning, with a potential yield of 44 devices. All 22 wafers have been thinned, boron ion-implanted, and laser annealed. We expect to see Lincoln devices by the end of the year.
- A preliminary design for the detector mosaic is nearing completion. It uses three-layer AlN sandwiches to support each 2K×4K chip, mounted by clips on a carbon-carbon substrate. Focal plane flatness will be achieved by careful contron over component thickness during fabrication.
- SDSU plans to deliver the second-generation Leach II CCD controller boards in December. Richard Stover visited Chris Stubbs at the University of Washington and found that the Macho controller is a potential substitute should the Leach model continue to slip.

- A new, lower-noise CCD preamplifier was designed and is being prototyped.

Software/Computers:

- Progress on code management and portability:
  - We acquired and tested the CVS code management system.
  - Extensive revision of the Keck Tasking Library software and instrument software directory trees.
- An overall DEIMOS keyword database schema was completed. This will enable automatic generation of source code and documentation from a central database. This has been offered to CARA for general Observatory use.
- An ideal mathematical model of DEIMOS was developed that defines the required characteristics of the mapping between pixels and spectra, as well as a method for representing this model in terms of FITS tables and header infornation.
- A questionnaire was distributed to 150 prospective DEIMOS users inquiring about preferences for IDL vs. IRAF as the DEIMOS image-processing environment. The returns ratified our present choice of IRAF by a 60-40% margin.
- Work continued on image display tools. No existing package is adequate for mosaic data, and we are considering writing our own or adopting one under development by NOAO. Doug Tody from NOAO is visiting to consult with us in December.

TV Guider:

- The basic TV layout was finalized, and final design is nearly completed. An order for a Photometrics 1K$\times$1K CCD TV was issued.