DEIMOS
SSC Presentation: October 11, 1999
Twenty-Second Quarter

Progress on DEIMOS since our last report in June 1999 has been strong in some areas and non-existent in others, owing to continuing work on ESI. The expected freeing-up of resources that we predicted on July 1, 1999, did not occur until September, and still has not occurred in software. Areas of the project that had good manpower (though still not 100%) were camera assembly and the detector/dewar system. A comparison between predicted and achieved milestones is given in a separate budget handout.

Progress since last report:

Camera/optics:

- The replacement Element 8 was successfully coated at Coherent and returned to us.
- The doublet comprised of Elements 1 and 2 has been mounted in Body Segment 1 of the camera body. The RTV casting around Element 1 developed bubbles but, after observation, we decided to accept this and move on. The doublet was filled with optical coupling fluids three weeks ago; no leaks are evident.
- The singlet comprised of Element 3 was successfully mounted in Body Segment 2. The process was delayed by three weeks due to a mounting redesign that was triggered by irregularities in the part as received from Danco.
- Body Segments 1, 1a, and 2 were joined on a trial basis. Concentration and co-planarity look very good.
- Body Segment 3 was machined in our shop and looks excellent. The assembly of the triplet in Body Segment 3 has started with the RTV casting of Element 6. The procedure for mounting the rest of the triplet has been developed.
- Final fabrication of Body Element 4 is about to begin in our shops. This is the last body segment that needs to be fabricated.
- The camera bladders were received from the supplier with the wrong dimensions, requiring some mechanical rework on the body segments.

Detector:

- We have decided to bypass the Orbit mosaic and are proceeding directly to the MIT/LL mosaic. This has caused considerable near-term redesign of circuit boards and cable harnesses in the dewar but will save work and money in the long run.
- The final Phase II MIT/LL CCD draft was held. We got our first-choice grade A chip, plus a second chip that is cosmetically good but has marginal CTE. We now have four(?) usable epi devices on hand and expect to get 4 more in the distribution of Lots 9/10 in November. Four of these devices will later be replaced by Lot 14 devices when available.
- Luppino reports that the cause of the poor QE in the Lot 14 high-ρ devices has been diagnosed and may even be reversible on devices that are already packaged. All other parameters of that lot are satisfactory.

Dewar mechanical/thermal:

- The design of the mosaic, backplane, thermal circuit, electrical connections, and the installation of all of these into the dewar were reviewed and improved. A new backplane to hold the CCDs has been designed and prototyped. Two final backplanes are currently being fabricated to allow parallel testing of the dewar system and mounting of CCDs in the mosaic.
- Focus and X-stage actuators are being tested.

- A complete assembly of the dewar for mechanical, thermal, and flexure testing is expected late this week (Oct. 15).
- The hold time of the LN2 can was measured to be 51 hours with no dewar load. This is a bit low; we may install a mylar radiation shield if the full-up thermal tests this week warrant. Sweating is observed around the cold finger connection, but this may not be a problem in the drier air at the summit.

Mosaic:
- The microscope metrology facility for measuring CCD packages and mosaics has been tested and is ready for use. Bare packages and molybdenum pads have been measured in preparation for making a trial mosaic this week, to be used in the Oct. 15 test.
- The procedure for mosaic assembly has been designed, and the various jigs and fixtures needed are being fabricated.

Structure:
- New structural elements that support the front of DEIMOS have been fabricated and installed.
- A new support structure for the slitmask system is being completed and will soon be permanently installed. The rebuilt slitmask cassette-holder was bench tested and will be tested on DEIMOS as soon as rotation is available, later this month.
- The cable wrap is complete and is being installed.

Electronics:
- The dewar wiring harnesses and circuit boards were redesigned to accept the MIT/LL connectors and new boards are on order; they should arrive by early November.

Software:
- No progress.

Concerns:
- Over-commitment of key personnel; medical problems for other key staff. Software/testing is short-handed. We are working these issues, but we really *must* have full software support starting Nov. 1. Any further delays in that area will cause us to slip.
- The dewar is the key piece of equipment on the critical path. Unexpected thermal, or mechanical problems or delays in test-fitting the dewar into DEIMOS would add directly to the schedule. The ESI dewar was much simpler yet had serious problems.
- Unforeseen problems in complicated mechanical subassemblies such as the grating, slitmask, rotation systems.

Schedule and Budget:
- See attachment.