DEIMOS
SSC Presentation: October 5, 1998
Seventeenth Quarter

We estimate that DEIMOS at the end of 1998 will have been delayed by ESI by about two quarters. Most of that has occurred during the period since our last SSC presentation on May 11, 1998. Our reporting format is compressed as a result of the slower pace of work.

Milestones since last report:

- All camera optics (except Element 8, see below) have been successfully coated and returned from Coherent. The average reflectivity per coated surface is 1.1%. Average total camera throughput for spectroscopy is 80% including glass absorption and two clear filter surfaces. This is 95% of spec.
- Camera:
  - The ESI camera was successfully assembled; we observed this closely.
  - A detailed camera assembly plan has been developed.
  - The camera parts have been rough machined.
- Progress on DEIMOS CCDs at MIT/LL has been good. The 2 epi runs should yield from 12 to 20 science devices (we need 10). We also have a 25% share in one high-resistivity run, which could yield 6-10 devices if comparable to the epi runs (we would like to use 4 high-ρ devices for the red half of the mosaic).
- Fabrication of the control electronics is essentially complete; awaiting installation and test.
- Fabrication of the signal-chain electronics is essentially complete; awaiting first tests before shipping to CCD lab.
- The PA drive has been reworked; ready for testing.
- Cargille LL1074 was selected as the optical coupling fluid. It successfully passed all reactivity tests with RTV570, Viton O-rings, polyurethane bladder material, mylar shims, glasses, and CaF_2.
- All preparations are in place to assemble the Orbit CCD mosaic. The CCDs are packaged, the jigs and fixturing are complete, and a method for surveying focal-plane flatness using an available microscope has been worked out.
- A gift of 24 9 Gby disk drives (plus spares) was received from the Quantum Corp. (valued at $24K). These have been assembled into a 220 Gbyte RAID array to be delivered with DEIMOS. The data-reduction computer RAM was increased to 2.25 Gby. (Each DEIMOS frame is 268 Mbyte in floating point.)
- Outstanding major purchases now include only coating the front window and spectroscopy filter ($30K) and a DLT backup tape system.

Delays and concerns:

- Element 8 was broken at Coherent; its replacement cost is $30K. Polishing is going well.
- The slitmask cassette still has too much flexure and requires more rework.
- The PA drive surged and required rework (now complete).
- The first cable wrap was too short. It is being rebuilt.
- The grating slide drive was originally belt driven, then chain driven. The chain proved noisy and is being replaced with a roller chain, requiring additional rework.
- It proves difficult to counterbalance the torque of the camera mount using the grating mount, as originally planned. In the interest of cost savings, we may leave it uncompensated, which

would produce approximately ± 1 px motion of passive flexure under gravity (the total error budget for passive flexure is ± 2 px).
- Cross-talk tests have still not been performed on two CCDs running simultaneously in the test dewar. Such tests are now scheduled for this month.
- The punch-list of outstanding items is long (see attached).

Schedule and Budget:
- Our current allotted budget is \$5,498K. We estimate that we will have spent \$4,750K through September 30, 1998, leaving \$750K unspent.
- A rough analysis of schedule and budget has been carried out in preparation for this presentation. Our current preship review date is September 15, 1999, which represents a slip of 6 months from the March 1998 schedule. Most of this is due to ESI.
- We foresee a major additional budget overrun. We do not have the manpower to determine this accurately now (due to ESI) but will report in detail after ESI commissioning ends, circa Jan. 1, 1999. However, we do know it will amount to several \$100K. The above preship review date has been brought forward as far as we think prudent to minimize total cost.
- If ESI is finished on schedule, the first quarter of 1999 will be a huge quarter for DEIMOS, and current funds will be exhausted by roughly March 31, 1999.
- The causes of the budget shortfall are 1) a tendency to underestimate the amount of time needed to complete a typical task during the fabrication and assembly phase, 2) the need for unbudgeted substantial rework, and 3) the discovery that certain tasks (notably camera assembly) are more complex than foreseen. Future schedules will contain a greater cushion for these effects.