Summary
Activities in this report cover most of November 2006. We continue to make steady progress on MODS.

Optics
The reference frame for the WFS covering the entire Shack-Hartmann array has been obtained. Due to a significant pupil shift on the WFS camera between an on-axis object and the edge of the field, we have chosen to align the camera for an off-axis field position where majority of guiding objects will be located. Compensation for pupil shift would be possible if the wavefront collimator lens were motorized, but implementation of this mechanism is difficult due to the lack of space in the crowded area near focal plane.

An alignment test has been developed for separate testing of MODS cameras and collimators. The cameras will be aligned on instrument in an auto-collimation mode using imaging a flat to return the beam. The cameras will first undergo laboratory tests by being illuminated by a Newtonian type parabolic collimator. The test will reveal true image quality delivered by camera in general and the corrector lenses in particular. Most of the optical components for the MODS camera and collimator alignment have been identified and ordered. Major components include precision translation stages, high quality parabolic mirror and Dobsonian mount.

Detector masks opening have been outlined and passed to proceed with mechanical design.

NTFL will start work on blue channel mirror coatings in December. They intend to protect the mirrors with a polymer film. Tests on interface between the film and coating will be done to ensure the film does not leave any residue on the coating and that it is chemically inert.

CSIRO (Australia) received dichroic blanks for coating. The vendor will begin work once our initial payment is processed and received.

Over the next month we expect to document the procedure describing WFS focusing, alignment and characterization, which is especially important for MODS2. We will also study the link between the MODS alignment test and the LBT secondary alignment. We also plan a visit to NTFL to verify blue mirror coatings quality and oversee packaging. Vendor monitoring will also continue.

Mechanical
No report.

Instrument Electronics
The grating tilt mechanisms are all wired and tested and now declared complete. One copy of the shutter wiring is complete and tested; the other three shutters will now be wired in the same manner. Two complete copies of the PCB mounting panel and a power entry panel are now complete. A second copy of the motor PCB is now complete; we need two more for MODS. The first batch of Microlynx controllers arrived; we now have 65 of the 100 ordered. The remainder are expected in December. The Wago parts should arrive in early-December. Machining of the Microlynx plastic cases is underway. We are removing the fans from the case and cutting holes to allow for feed air from the heat exchangers to be used for cooling. The Microlynx wiring is proceeding with unmodified units, which will be swapped for modified units as they become available.

Detector Systems
No report.

Software and Computer Systems
There was substantial work this month on the MDM4K system in support of the initial deployment at the MDM 1.3m telescope. There was progress on both the detector control program and several fixes to the interface software (Prospero and mdmtcs) after observers returned and allowed access to the images. Mostly minor fixes, but the more important work was an analysis of the system telemetry logs to figure out why there were problems with data transfer. The results suggest that one or both disks are showing signs of age and failing, which prompted the purchase of replacement drives. We should develop a methodology for predicting this in future MODS systems.

Work on the AGW system is nearing completion, although we are still trying to get action from Mike Lesser on fixing the LBT4 Shuttle PC that failed. We will need this for optical alignment of the blue channel in early-2007.

We are working on getting the LBT TCS simulator software up and running in our lab. This task is proving to be more difficult than it should be; we are working with the LBT programming staff to understand reasons for the difficulty.

There has been general progress on the MODS system software as well. In particular, the MODS User Interface (MUI) was enhanced with a set of instructions and various system tasks were streamlined or unnecessary tasks removed. We continued the ongoing process of documentation and other duties involving testing and evaluating instruments. Specifically, as tasks get installed and debugged, all parts of ISL are being checked to make sure all programs associated with the ISL system will function properly before other changes are made. We also produced a set of PLC Beta instructions that will be used by most of the mechanisms.

December will hopefully see the start of work on the LBT-TCS interface work, assuming that a working simulator appears in the lab. We will review the use cases for the user

interface. We have accumulated a large number of observing scenarios from local observers that include outlines of observing strategies, specific measurements, etc. We plan to check these against our existing set of use cases and see if any additions are warranted. We will also start the linux object module development for the sequencer. We will also investigate alternate solutions for providing the high level of coordination and communication between the task serves and clients that reside in the instrument.

We note that the MODS Software Project Schedule, Progress Reports, among many other documents can be found at
http://www.astronomy.ohio-state.edu/~rgonzale/modsMechSoft.html