7.6 AO Acquisition Subsystem Functional Requirements

The AO acquisition system is responsible for the acquisition of natural star for the low order natural guide star wavefront sensors (LOWFS), laser guide stars for the laser guide star wavefront sensor (LGSWFS), and the acquisition of the science target on the science instrument. It is an assumption that these acquisition tasks will occur in an automatic fashion with a minimum of telescope operator input. The acquisition system will likely have a visible sensor with a response between 0.3 and 1.0 micron. Because many of the targets will have relatively small visible wavelength signatures an IR acquisition capability might be desirable.

7.6.1 Architectural Assumptions and Overall Requirements

Acquisition time:
The maximum time to acquire the science object is TBD seconds. The maximum time to acquire each of three tip tilt star on the low order wavefront sensor is TBD seconds. The maximum time to acquire the LGS on the LGSWFS is TBD seconds.

Sky background limit:
The acquisition system should be capable of working in conditions of high background such as at twilight and near a full moon. The limits for these conditions are to be determined.

Telescope pointing:
The blind telescope point must be good to TBD arc seconds. Otherwise, additional time to correct telescope pointing must be added to the acquisition requirements.

List of architectural assumptions:

Simple system:
The acquisition system will use a single detector and optical train.

Field of view:
The field of view of the acquisition sensor will be as large as the field of view past by the first stage of the Cascaded Relay.

7.6.2 Optical Requirements

These requirements are TBD.

7.6.3 Mechanical Requirements

These requirements are TBD.

7.6.4 Electronic/Electrical Requirements

These requirements are TBD.

7.6.5 Safety Requirements

These requirements are TBD.

7.6.6 Software Requirements

See interface requirements other software requirements are TBD at this time.

7.6.7 Interface Requirements

Acquisition Camera:
AO control is responsible for control of acquisition cameras, including selection of optics and setting the exposure time. AO control will determine when acquisition is successful in an automatic fashion with limited operator oversight.

7.6.8 Reliability Requirements

Downtime:
The acquisition system shall be designed to minimize downtime.

Operational readiness:
The acquisition systems shall be designed for operation on a TBD basis. The system shall be designed to be deployed at night with TBD hours of preparation for setup and calibration, so that it can support both classical and semi queue scheduled modes.
Setup and preparation times:
Daytime prep time is TBD.
Nighttime setup time is TBD.
Object setup time is TBD.

7.6.9 Spares Requirements

TBD pending results of a failure analysis of system.

7.6.10 Service and Maintenance Requirement

TBD pending results of a failure analysis of system.

7.6.11 Documentation

Standard documentation provided including:
Mechanical drawings
Electrical schematics
Optical design prescription