

## Palomar Adaptive Optics Test Plan

<b>Title</b>	<b>Laser Acquisition on science nights</b>
Version	5.1
Date released	4/4/07
Lead	A. Bouchez, M. Troy
Time requested	30 min.
Required conditions	N/A

### Purpose

Acquire LGS, focus LLT, determine LGS magnitude and spot size,

### Test procedure

1. Prepare to project laser
  - 1.1.1. Verify Space that Command has been called
  - 1.1.2. Telescope at zenith.
  - 1.1.3. Dome open.
  - 1.1.4. Mirror cover open.
  - 1.1.5. Raise windscreen.
  - 1.1.6. Spotters on station.
  - 1.1.7. Radar on and adjusted.
  - 1.1.8. ASCAM and IRCAM on and alarms reset.
  - 1.1.9. Remove the Coude block
  - 1.1.10. BTO configured for 589nm laser at zenith.
  - 1.1.11. Laser alarm system ready.
2. AO Setup
  - 2.1. Check stimulus position on HOWFS.
    - 2.1.1. Move SSMs to center stimulus on HOWFS if necessary.
  - 2.2. Configure AO to look at sky
  - 2.3. Verify LLT FSM mirror position (last good position, previous night)
  - 2.4. Confirm that best available flatmap is loaded.
  - 2.5. Set TAO to LGS mode
  - 2.6. Move LGS\_X to NGS position.
  - 2.7. Move ACQ\_Z to LGS position (9950 um)
  - 2.8. Focus LLT to last good position (or NGS focus - 300).  
*bto move llt\_focus 11780*
  - 2.9. check/set laser focus to correct value  
*bto move laser\_focus 7000 (4/4/07 UT)*
  - 2.10. Set Acq ON, integration = 2s.
  - 2.11. In an appropriate experiment directory: IDL> ao\_plot\_vid\_image
3. Project laser.
4. Move LGS to a clear location on Acq.  
*offset llt\_a +X=up; offset llt\_b +X=left*  
If LGS is not in the Acq. FOV, use ellipticity of dichroic spots (apex points to LGS).
5. Focus LLT on Na layer
  - 5.1. Manually offset LLT focus in 30um steps (*bto offset llt\_focus...*), checking FWHM with ACQVIEW Gaussian fit at each position: -30, 0, 30
6. Determine laser focus (after major laser changes)

- 6.1. Block laser, save a 2s background image using `ao_plot_vid_image`.
- 6.2. Rough focus laser spot, looking at image in acq. camera  
*bto\_control "offset laser\_focus ..." in steps of 2000*
- 6.3. *ao\_focus\_loop, 0, 2000, 7, 'laser\_focus', 'save\_name,*  
*sky='sky\_name', time=6.0*
- 6.4. *bto move laser\_focus XXX*
7. Save a final image of the LGS. Note file name below.

### **Results and conclusions**

From 5/07 run:

LGS

`acq_z = 10275`

`llt_focus = 11865`

`laser_focus = 10000`

`llt mirror = 75, 10`

