

## Palomar Adaptive Optics Test Plan

<b>Title</b>	<b>LGS and NGS acquisition and lock</b>
Date	9/4/06
Lead	M. Troy
Time requested	-
Required conditions	-

### Purpose

Acquire NGS and LGS, Lock all loops and be ready to perform science at this end of this procedure

### Test procedure

1. Setup
  - 1.1. This procedure assumes the LGS acquisition and characterization procedure has been executed
  - 1.2. Load co\_zero centroid offsets for HOWFS
  - 1.3. Focus acquisition camera to NGS, 'move acq\_z 14500'
  - 1.4. Focus LLT to 90 km altitude, 'bto\_control "move llt\_focus 11300'
  - 1.5. Check that laser focus is set to optimal position (4000 on 7/12/06), 'bto\_control "move laser\_focus 4000'
  - 1.6. Set chopper delay and gate on generator using PC
    - 1.6.1.1. delay value = 32000
    - 1.6.1.2. Gate value = 3998
2. Move Telescope to NGS (follow BTO slew procedure)
3. Lock AO on white light and register DM pupil
4. Move telescope to put NGS on HOWFS
5. Lock on NGS star (if a NGS lock has not been done in last ~1hr and star is bright enough)
  - 5.1. Lock TT and DM as normal and offload focus to telescope
  - 5.2. Make new telescope flat map and load
6. Pre-prepare for LOWFS lock
  - 6.1. Using TAO select LGS mode (Under the Observation menu)
  - 6.2. Focus acquisition camera to LGS, 'move acq\_z 11900'
  - 6.3. Propagate laser
  - 6.4. Center Laser on reflecting spot, using acqview (center LGS button)
  - 6.5. Set HOWFS z stage
    - 6.5.1. start lgsfoc in IDL, set Height to 90km, send HWFS stage by clicking 1-shot, WFS stage should move to 80,840um
7. Lock LOWFS
  - 7.1. Focus acquisition camera to NGS, 'move acq\_z 14500'
  - 7.2. Start up LOWFS plots, 'ao\_plot\_lo\_gui' in IDL
  - 7.3. Move LOWFS to star using acqview (send LOWFS button)
  - 7.4. Set LOWFS camera rate, 'wfs\_cam id=lo,rate=XXX'
  - 7.5. Take sky
    - 7.5.1. Move telescope 60" E
    - 7.5.2. From TAO menu take LOWFS sky CCC

- 7.5.3. Move telescope back
- 7.6. Startup pixel display, 'ao\_display\_latest\_lo\_pixel' in IDL
- 7.7. Lock, TTM using button on TAO
- 7.8. Check lock performance in plots
8. Lock HOWFS on LGS
  - 8.1. Start up LGS IDL plots (ao\_plot\_gui\_logs\_hwfp)
  - 8.2. Start Chopper
    - 8.2.1. Using Terminal window on PC
      - 8.2.1.1. Set to external reference
      - 8.2.1.2. Set to run
  - 8.3. Set WFS camera to 100Hz
  - 8.4. Take sky
    - 8.4.1. offset llt\_a 20 arcseconds
    - 8.4.2. From TAO menu take HOWFS sky
    - 8.4.3. offset llt\_a -20 arcseconds
    - 8.4.4. set log interval to avoid late messages, 'log wfp=ho, interval=10'
  - 8.5. Lock LLT
    - 8.5.1. Turn on camera to check flux, 'wfs\_cam on id=ho'
    - 8.5.2. Type "llt on"
    - 8.5.3. Check performance in GUIs
  - 8.6. Lock DM
    - 8.6.1. Click on DM button on TAO
9. Start focus offloading from LOWFS
  - 9.1. Need to write this
10. Tweak Performance
  - 10.1.1. Register DM?
  - 10.1.2. Chopper versus none
  - 10.1.3. subap min flux
  - 10.1.4. Centroid offsets
  - 10.1.5. Servo loop gains

## Results and conclusions