Palomar Adaptive Optics Test Plan

Title	Laser, BTO, and safety system checkout
Date	1/5/07
Lead	A. Bouchez
Time requested	1 hr
Required conditions	Dome closed

Purpose

1. Align 589nm laser to BTO bench in Coude lab.
2. Verify that 589nm laser is aligned to BTO in dome.
3. Measure transmission of BTO, optimize laser focus (first night of run only).
4. Test BTO servo loop and Q3 safety interlock

Test procedure

Personnel required: Data room coordinator (lead), laser engineer, BTO operator, 2x dome personnel (first night only)

Setup:

1. 660nm laser must previously have been aligned to BTO, and through LLT (procedure XXX, performed on first afternoon of run).
2. Test BTO alignment by restoring zenith defaults, inserting 660nm laser, closing BTO loops on the laser, then opening servo loops.
3. LLT primary mirror cover removed and LLT ready for high power laser (visually check diagnostics bench, cables).
4. Zone 8 of safety system jumpered out for in-dome propagation.
5. Laser at **low power** (~50 mw)

Coude lab alignment:

6. Install Coude block.
7. Partially close both polar axis alignment irises.
8. Move laser_select stage to Yellow.
9. Cautiously open shutter.
10. Adjust final laser mirror to center beam on first iris.
11. Adjust M1a to center beam on second iris.
12. Insert 660nm fold mirror and verify that alignment to irises appears identical.
13. Close shutter.
14. Open both irises.

Dome alignment and transmission: (steps followed first night only are in red)

15. Remove coude block.
16. At low laser power with personnel in dome, open shutter and verify that BTO alignment looks good (check beam pattern on ceiling.)
17. Shutter beam, increase to **high power**.
18. Measure laser power at table output with thermal sensor.
19. Pass power meter to personnel in dome.
20. Open the shutter, close BTO loops on Q3. Verify loop stability. Save BTO

DEFAULT and zenith positions.
21. Shutter beam, send personnel to prime focus with power meter.
22. Open shutter, close BTO servo loop
23. Measure laser power at entrance to prime focus.
24. Measure laser power on LLT optical axis (before secondary).
25. Visually estimate spot size on LLT primary. Adjust laser focus stage to minimize spot on primary.
26. Shutter beam, return personnel to control room.
27. Measure laser power at benchn output again.
28. Enable Q3 safety system.
29. Test-fire laser at zenith in dome. Verify that Q3 interlock is not tripped.
30. Insert Coude block
31. Test-fire laser to demonstrate Q3 interlock functionality.
32. Remove Coude block

Results and conclusions