Palomar Adaptive Optics Test Plan

Title	Laser, BTO, and safety system checkout
Date	10/11/06
Lead	A. Bouchez
Time requested	2 hr
Required conditions	Dome closed

Purpose

1. Align 660nm laser to LLT.
2. Align 589nm laser to BTO.
3. Test safety systems, BTO servo loop.
4. Verify laser focus.

Previous analysis

Test procedure

Personnel required: Data room coordinator (MT), laser engineer (VV), BTO operator (JA), 2x dome personnel (AB, ??)

In prime focus with 660nm laser:

1. Align BTO to Q2 using old default position and manual offsets.
2. Verify that secondary focus is correct for AO (57.00 mm).
3. Adjust LLT top fold mirror to direct light onto FSM.
4. Close BTO servo loops to Q3, verify stability.
5. Adjust top fold mirror and Q3 b-s (with HS closed on Q3) to center beam on FSM.
6. Adjust LLT FSM and final fold mirror to align laser to LLT optical axis.

In Coude lab:

7. Override safety system zone 8. Coude block in. Laser at **low power**.
8. Cautiously open shutter.
9. Adjust final laser mirror to center beam on M1a.
10. Adjust M1a and M1b to center beam on red laser spot on Coude FSM.
11. Determine FSM position which centers beam on polar axis irises. Save as BTO default and default_zenith.
12. Test laser focus with shear plate. Adjust laser focus motor to collimate. Save default value.
13. Check that Coude diagnostics are safe (flux levels on photodiode, cameras).
14. Close shutter.

In dome:

15. Remove coude block.
16. Confirm that LLT mirror cover is off.
17. Restore BTO default_red. Check that light falls on all quad cells.
18. Offset M1 for yellow light (run laser_yellow script).
19. At low laser power with personnel in dome, open shutter and verify that BTO alignment looks good (check beam pattern on ceiling.)

20. Shutter beam, increase to high power.
21. Measure laser power at table output with thermal sensor.
22. Pass power meter to personnel in dome.
23. Open the shutter, close BTO loops on Q3. Verify loop stability. Save BTO zenith default positions.
24. Shutter beam, send personnel to prime focus with power meter.
25. Open shutter, close BTO servo loop
26. Measure laser power at entrance to prime focus.
27. Measure laser power on LLT optical axis (before secondary).
28. Visually estimate spot size on LLT primary. Adjust laser focus stage to minimize spot on primary.
29. Adjust LLT iris to be conjugate to the edge of the LLT primary.
30. Shutter, return personnel to control room.
31. Measure laser power again.
32. Enable Q3 safety system.
33. Test-fire laser at zenith in dome.
34. Test-fire laser with block in place to demonstrate Q3 interlock

Results and conclusions