

Palomar Adaptive Optics Test Plan

Title	Laser, BTO, and safety system checkout
Date	12/07/06
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)

In Coude lab:

6. Install Coude block.
7. Partially close both polar axis alignment irises.
8. Cautiously open shutter.
9. Adjust final laser mirror to center beam on M1a.
10. Adjust M1a to center beam on second iris.
11. Adjust final laser mirror and M1a to center beam on both irises.
12. Insert 660nm fold mirror and verify that alignment to irises appears identical. Repeat previous steps if necessary.
13. Close shutter.

In dome: (steps followed first night only are in red)

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

DEFAULT and zenith positions.

20. Shutter beam, send personnel to prime focus with power meter.
21. Open shutter, close BTO servo loop
22. Measure laser power at entrance to prime focus.
23. Measure laser power on LLT optical axis (before secondary).
24. Visually estimate spot size on LLT primary. Adjust laser focus stage to minimize spot on primary.
25. Shutter, return personnel to control room.
26. Measure laser power again.
27. Enable Q3 safety system.
28. Test-fire laser at zenith in dome.
29. Test-fire laser with block or power meter in beam to demonstrate Q3 interlock functionality.

Results and conclusions