

Procedure to Install the 2.5m Secondary Truss

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Cautionary Notes

- **This operation requires 5 people.**
 - **If the telescope runs away at any time, engage an e-stop button immediately.**
 - **The following weather conditions must be met:**
 - No threat of precipitation
 - Sustained wind speed < 35 MPH for 15 minutes
 - Wind gusts for instrument changes < 25 MPH
 - Dew point depression: $\geq 4^{\circ}\text{F}$ or 2°C
 - Dust count < 10,000 units
 - Check for condensation regularly when the dew point depression is less than 8°F or 6°C . Close the enclosure if condensation is found on rails, building skin, or the top of the doghouse.
 - Do not push the dust limit and the dew point limit at the same time. If the dust counts are near the stated limit, it is best to have a dew point depression of $> 18^{\circ}\text{F}$ or 20°C .
 - Safety wear (recommended): rubber-soled shoes, hard hat.
 - Only people trained by observatory staff may execute this procedure.
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Equipment Required

- Wind Baffle Pendant Control, located in the 2.5m enclosure.
- Spreader Bar for wind baffle counterweights, located behind the Machine shop.
- Pallet Jack, located in the 3.5m enclosure, ground level.

- Wind baffle counterweights. The large white weights should be stacked on 4"x4"x24" lumber, ready to be picked up by the pallet jack.
 - Scrap wood to protect the floor when attaching counterweights to the spreader bar.
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Initial State of Telescope

- All instruments (excluding the spectrographs) removed and safely stowed.
 - Spectrograph corrector removed and safely stowed.
 - Telescope at horizon.
 - Wind baffle frame tied to eyebolt in floor.
 - Wind baffle frame supported on the front and back (east and west) by jackscrews.
 - Wind baffle frame turnbuckled to PSS.
 - [Primary mirror installed.](#)
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Procedure

1. Engage an e-stop.
2. Move all four telescope counterweights to the top of their range (approximately number 750).
3. Remove the hard covers from the primary mirror.
4. Release the telescope's altitude pin.
5. Check the balance of the wind baffle plus telescope (the two are turnbuckled together and act as a unit):
 - A. Attach the wind baffle pendant control.
 - B. Station one person in the lower level to watch the torque reading on the wind baffle altitude motor amplifier.
 - C. Release all e-stops.
 - D. Release the altitude brake.

- E. Move the wind baffle slightly down and up. The torque reading (which is in percent) should be no higher than 60 in both directions. If it is higher, press an e-stop and re-balance the telescope.
6. Lower the wind baffle and telescope to the horizon. Monitor the torque as you go: if the reading exceeds 80, engage an E-stop and re-balance the system.
7. Engage an e-stop.
8. Support the wind baffle frame (the white, non-removable part) fore and aft (east and west) with jackscrews. Use scrap wood to protect the wind baffle frame and floor.
9. Tie the wind baffle frame to the eyebolt at the southeast corner of the fork. If the eyebolt is missing, remount it. Use a crane strap and shackle and leave enough slack for approximately 1 foot of motion.
10. Attach the wind baffle counterweights:
 - A. Rig the overhead crane with the wind baffle counterweight spreader bar. Suspend 6 foot straps from the ends of the spreader bar to attach to the counterweights. Use this setup for the following steps (with one exception that is noted).
 - B. Move the inner white wind baffle counterweight from the temporary mounting blocks at the front of the wind baffle frame to the standard location at the back. Make sure these are the inner counterweights; they should have three mounting holes, of which you only use the top, counterbored hole.
 - C. Install the middle (two holes) white wind baffle counterweights.
 - D. Install the outer (one hole) white wind baffle counterweights.
 - E. Install the two pairs of thick blue wind baffle counterweights.
 - F. Install one pair of medium-thick blue wind baffle counterweights (70-80 lb. each).
 - G. Install the one pair of thin blue wind baffle counterweights (40 lb. each). These are light enough to manipulate by hand.

- H. Remove the wind baffle counterweight mounting blocks from the front of the wind baffle frame, and stow in the base of the 3.5m enclosure.
11. Remove all rigging from the crane and raise the crane out of the way.
 12. Open the both roll-up doors and move the enclosure 6 feet east. This gives the crane the range it needs to move the truss.
 13. Roll the truss into position in front of the telescope.
 14. Rig the secondary truss to the overhead crane using a large shackle and 4 long nylon straps (load capacity of 1000 Lb. each). Connect the straps to the front corners of the truss and to the point where the conical baffle frame attaches to the truss. The crane hook should be centered between these attachment points.
 15. Raise the truss slightly off the floor.
 16. Remove the support brace from the truss.
 17. Remove the wheels from the truss
 18. Raise the truss to the correct height.
 19. Position people at each corner of the truss to guide, monitor and generally prevent it from hitting anything.
 20. With the crane, not the building, carefully move the truss westward until it is just east of its final mounting position.
 21. Attach all wires running through the truss (i.e. wires that cannot be accessed once the truss is attached to the PSS). If any wires run outside the truss, don't attach those yet.
 22. Move the truss west until it touches the PSS.
 23. Loosely screw the truss to the PSS.
 24. Insert the alignment pins.
 25. Tighten the mounting screws.
 26. If any outside wires run to the truss, attach them now.

27. Unrig the truss from the crane and stow the rigging.

28. Roll the enclosure fully westward, pin it and close (at least) the west roll-up door.

Document History

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