

Procedure to Emergency Close the 2.5-meter Telescope

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The proper method for stowing the telescope in the event of a loss of telescope control if site power remains available. The procedure employs the use of the Wind Screen motors to "drag" the disabled telescope into a position to allow the enclosure to be closed.

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CAUTIONARY NOTES:

THIS OPERATION MUST BE DONE WITH TWO PEOPLE; STATION ONE ON THE OBSERVING DECK AND THE OTHER ON THE LOWER LEVEL. PEOPLE ON DIFFERENT LEVELS MUST BE IN COMMUNICATION WITH EACH OTHER.

Warning - there is 208 VAC in the Wind Screen box - keep hands away from the circuits.

Operating the telescope with the hardware as described will disable ALL telescope interlocks - this includes E-Stop buttons. Exercise extreme care to avoid personal injury or equipment damage.

Only those persons having a purpose and are trained may execute this procedure; see web-based [training list](#).

THIS PROCEDURE SHOULD NOT BE DONE IF WEATHER CONDITIONS EXCEED THE FOLLOWING:

ENGINEERING/OBSERVING:

Sustained wind speed > 25 MPH; wind gusts > 30 MPH

Dew point depression <= 4oF or 2oC

Dust count > 3000

ANY threat of precipitation.

Check the whiteboards in the Ops building and both levels of the 2.5-m enclosure for the current status of the telescope and any other notes which may pertain to this procedure. Be sure to indicate your planned change of status.

SAFETY WEAR: (recommended) rubber-soled shoes

EQUIPMENT INVOLVED IN THIS PROCEDURE

Altitude angle markings; Location: painted to the drive chain side of WS support structure; Purpose: these markings inform the pendent operator that the telescope has reached the 6° alt angle and is therefore safe to close the enclosure.

Azimuth angle markings; Location: northeast section of the lower level; Appearance: black wire tie glued to the stationary structure; there is a marking on the rotating floor that is labeled "121" and this needs to be lined up with the black wire tie to indicate the 121 position; the purpose of the markings inform the pendent operator that the telescope has reached the 121 azimuth angle and therefore safe to close the telescope.

Brake release valves; Location: in-line for the air supply and adjacent to each of the axis brakes for alt and az. The alt brake is directly below the west-mounted laptop computer, the az brake is in the lower level and mounted to the NE corner of the telescope concrete pier at 7 ft elevation; Appearance: 3-way brass valve with black lever handle; Purpose: to release the brake air cylinder so as to not drag the telescope against its brake when moving with the WS drives.

Emergency closing (EC) controller; Location: inside the WS control box; Appearance: - small grey metal box, 3 cables terminated with Brundy connectors, 2 extending from one end and 1 from opposite end, two toggle switches mounted to front face.

Emergency closing (EC) power supply; Location: mounted to the bottom of the WS Control Box; Appearance: 2 inch x 8 inch x 4 inch aluminium box with toggle switch, green LED and fuse holder on front face; Purpose: supplies 24 VDC to power the interlock and control relays inside the WS control box.

Wind screen (WS) control box; Location: northeast corner, lower level, enclosure mounted to the east wall at eye level; Appearance: white, 4 ft x 3 ft x 1.5 ft metal box.

Wind screen (WS) manual pendent; Location: stored directly below the WS control box; Appearance: 4 inch x 3 inch x 3 inch gray metal box, 40 ft of cable attached to

one end of box, 10 turn "pot" and amber palm push switch mounted to front face; Purpose: used to manually move one axis at a time of the WS; palm switch simulates an E-stop condition; "pot" controls the speed of the axis drive motor, i.e., the more one turns the knob the faster the motor goes, "000" reading on the "pot" is stop "neutral."

PROCEDURE: accomplish in numerical order

Preparation

1. Open the WS control box. Warning - there is 208 VAC in this box keep hands aware from circuitry.

2. Find emergency closing controller

3. Open the power switch to the WS control box by throwing the red handled lever mounted to the side of the junction box located directly below the WS control box

4. Disconnect the 2 Brundy cables located in the bottom of the WS control box labeled "24 VDC and Inhibs"

5. Connect the appropriate cable from the EC controller to the EC power supply and the other 2 cables to the 24 VDC and Inhibs connectors (connectors are different so connections can not be confused)

6. Make sure the EC controller toggle switches labled AZ and ALT are "Off"

7. Throw the WS control box power switch "close" (up)

8. Activate the on switch for the EC power supply, if not already on

9. Disconnect the az axis control brundy, left side of box 1/3 way up from bottom

10. Connect the WS manual pendent to this connector, making sure that the "pot" reads "000" and the palm switch is depressed

11. Turn on the az switch on the EC controller; this should fire up the 3-left Somitoma amps located top of box and labeled az amps

12. Disengage the az brake by turning the az brake valve to the "off" position

The telescope can now move in azimuth. Continue the procedure in sequence.

1. With one person on the observation deck, the WB clear of the hand rail, and the alt above 20°, pull up on the palm switch on the WS manual pendent to engage the system

2. Slowly turn the "pot" knob until the az begins to move, about 1/2 to 1 1/2 turns, if moving in right direction continue, if not reverse direction of "pot" and az will reverse direction

3. Continue to move az at comfortable speed until 121° markers line up, slow down when approaching markers and set the "pot" to "000" before depressing the palm switch

4. Engage the az brake by moving the az brake valve to the "on" position

5. Turn off the az switch on the EC controller

The telescope is now ready to lower alt axis. Continue the procedure in sequence

1. Make sure the palm switch on the WS manual pendent is depressed and the "pot" reads 000

2. Change the WS manual pendent connector in WS control box to ALT Axis Brundy, make sure the "pot" is at "000" and the palm switch is depressed

3. Switch on the alt switch on the EC controller, the alt amp should fire up

4. Proceed to the observation deck with the WS manual pendent and station yourself at the drive chain side of the WS, the south side when the az is at 121°

5. Disengage the alt brake by turning the alt brake valve to the "off" position

6. Standing by the south side of the telescope, check that 'pot' reads "000" then pull the palm switch

7. Turn 'pot' slowly to determine correct alt movement

8. Bring alt to 6° and slowly approach and set 'pot' to "000" and, depressing the palm switch, on alt brake

9. Disconnect and reconnect all Brundy connectors to bring system back to normal at the WS control box

10. Close hatches and enclosure

The telescope may be brought up to 30° alt stow position by using the EC system, if necessary, after enclosure is closed and telescope is secure. **Employ utmost caution in so doing because of interlock bypass condition inside the enclosure.**

END OF PROCEDURE
