**Stanford University**
W.W. Hansen Experimental Physics Laboratory
Gravity Probe B Relativity Mission
Stanford, California 94305-4085

# GP-B Telescope "Measurement of Telescope Transmission" P0450 Rev -

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Prepared: _____ Date _____
Lynn Huff, Responsible Engineer

Prepared: _____ Date _____
Ken Bower, Telescope Assembly

Approved: _____ Date _____
John Lipa, Telescope Manager

Approved: _____ Date _____
Sasha Buchman, Hardware Manager

Approved: _____ Date _____
Ben Taller, Quality Assurance

# MEASUREMENT OF TELESCOPE TRANSMISSION

- for SUGP-B dwg#25091
- also use *GP-B Telescope Image Divider Assembly (IDA) General Alignment and Bonding Procedures* (SUGP-B P0282) for procedures concerning safety; personnel; work area requirements; fixture cleaning and acceptance; flight part inspection, handling, storage, and cleaning; redline authority; and sign-off and recording requirements.

CAUTION:

- The flight telescope used in this operation is heavy, delicate, and somewhat irreplaceable with multiple critical surfaces that can be easily damaged or contaminated by normal handling. Compliance with the above defined safe handling practices is critical.

CAUTION:

- If at any time during this procedure flight hardware is not live monitored, verify that all flight hardware is seismically secured and protected against airborne contamination.
- Authority to redline this procedure is given to the Telescope Responsible Engineer.

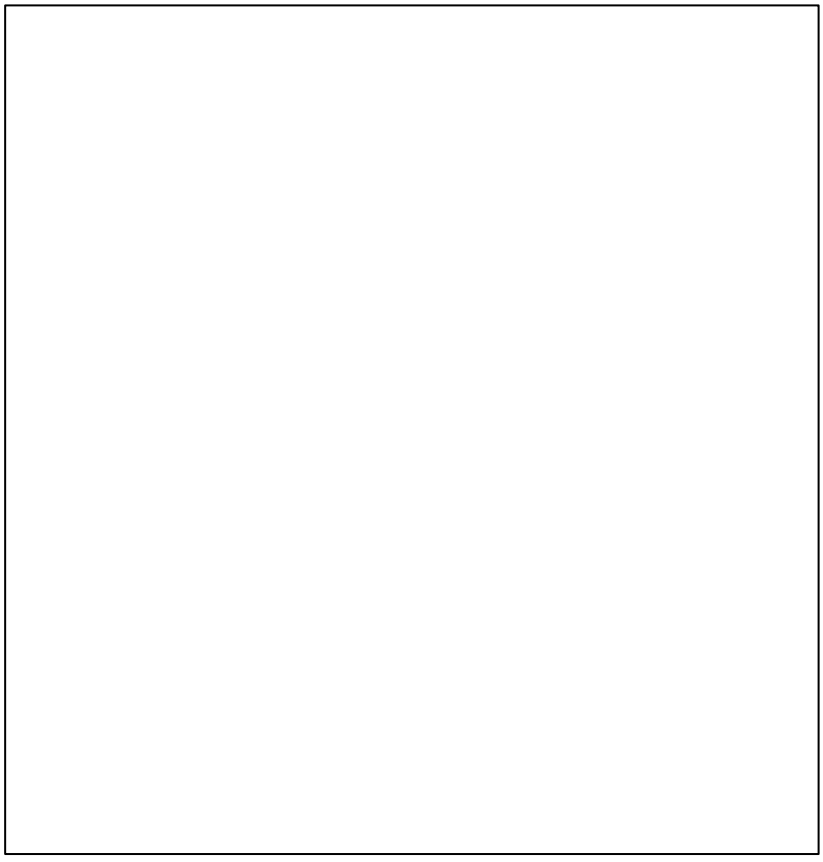

Figure 1: TRANSMISSION MEASUREMENT CONFIGURATION

1) Verify cleanliness of all fixturing.
2) Attach Detector Package Assemblies (DPAs), Channels A and B, to the Telescope per procedure P0266. The Assemblies should be equipped with all the requisite optics, but no detectors.
3) Insert the reticles and their titanium sleeves into the barrels of the DPAs.
4) Turn on the Dolan-Jenner lamp. Verify that the optical fiber is adequately attached. Place head of Photometer #2 near the back of the light source and wrap aluminum foil around it all.
5) Attach the aluminum mask to underside of the 7" autocollimator.
6) Place custom tip/tilt stage flat on the optical table near the 7" aperture autocollimator. Place the 10" diameter flat mirror on the stage.
7) Place the Telescope on the 10" mirror. *Great care should be taken to ensure that the bottom surface of the Telescope touches only areas of the mirror that are covered with Kapton tape.*
8) Slide the tip/tilt stage, mirror, and Telescope, under the 7" autocollimator. *This must be a two-person operation, with both people paying close attention to the location of the Telescope to ensure that it doesn't bump into the autocollimator supports.*
9) Tip & tilt the Telescope until the starlight is centered on its optical axis to within 5 seconds of arc.
10) Secure the Telescope to the autocollimator supports with Kapton tape. *The Telescope is now seismically secured.*
11) Wrap aluminum foil around the autocollimator supports to make it light tight. Turn off the lights in the room (except the Dolan-Jenner lamp).
12) Start a data sheet, noting the date, time, personnel present, and ambient light level inside the autocollimator supports as measured by Photometer #1.
13) Insert the custom DPA reticles into the Channel B bores (these reticles have field lenses on them that directs the light toward the photometer). Place the head of Photometer #1 (with its custom collar) in the barrel of the Channel B Primary channel.
14) Read the optical power measured by Photometer #1 and record the value as "Channel B primary, Centered, Position 0 degrees"; Read the optical power measured by Photometer #2 and record it also.
15) Repeat steps 13 & 14 with the head of Photometer #1 in the barrels of the Channel B redundant, Channel A primary, and Channel A redundant channels, recording the data with the appropriate designation.
16) Tip the Telescope so that the spot is 20 +/- 5 seconds of arc off axis into Quadrant 1.
17) Repeat steps 13-15, recording the data with the appropriate designation ("Quadrant 1" instead of "Centered")
18) Repeat steps 16-17 with the spot in Quadrants 2, 3, & 4.
19) Remove the Kapton tape from the Telescope and rotate the Telescope 90 degrees. *This must be a two-person operation, with both people paying close attention to the location of the Telescope to ensure that it doesn't bump into the autocollimator supports.*

20) Secure the Telescope to the autocollimator supports with Kapton tape. *The Telescope is now seismically secured.*
21) Repeat steps 13-18, recording the data with the appropriate designation ("Position 90 degrees").
22) Repeat steps 19-21, recording the data with the appropriate designation ("Position 180 degrees").
23) Repeat steps 19-21, recording the data with the appropriate designation ("Position 270 degrees").

24) Return the spot the centered position. Turn off the Dolan-Jenner source. Using the head of Photometer #1, measure the optical power at each of the four barrels and record the values as "Background light level".
25) Turn on the lights in the room. Turn on the Dolan-Jenner source.
26) Remove the Kapton tape from the Telescope and slide the Telescope out from under the 7" autocollimator. *This must be a two-person operation, with both people paying close attention to the location of the Telescope to ensure that it doesn't bump into the autocollimator supports.*
27) Take the Telescope to a safe area and secure it with Kapton tape. *This must be a two-person operation. The Telescope is now seismically secured.*
28) Place the 7" condenser lens under the 7" autocollimator, and place the head of Photometer #2 at its focus.
29) Turn off the room lights.
30) Read the optical power through the lens with Photometer #1 and record as "Transmission through Condenser Lens"; Read the optical power measured by Photometer #2 and record it also.
31) Turn on the room lights. Turn off the Photometers and the Dolan-Jenner lamp.
32) This completes the transmission measurement.