W. W. Hansen Experimental Physics Laboratory

STANFORD UNIVERSITY

STANFORD, CALIFORNIA 94305 - 4085

Bonding Telescope to Quartz Block Readiness Review Completion Certificate

P0259 Rev. –
May 19, 1998
Updted February 12, 1999

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Approved by: A. Nakashima Date
Systems Engineer

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Approved by: J. Gwo Date
Test Director

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Approved by: D. Bardas Date
Payload Integration Manager

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Approved by: R. Schultz Date
Chief SystemsEngineer

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Approved by: J. Janicki Date
Safety Engineer

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Approved by: B. Taller Date
Quality Assurance

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Approved by: J. Turneaure Date
Hardware Manager

Bonding Telescope to QB Integration Readiness Review Minutes

The Telescope to Quartz Block Bonding Readiness Review was held on 19 May 98. In attendance were:

Stanford: John Turneaure, Doron Bardas, Ben Taller, Jason Gwo, Ken Bower, John Lipa, Suwen Wang, Efrain Alcorta, Mark Sullivan

Lockheed Martin: Art Nakashima, Bob Schultz, Mike Jeung-Wesoloski, Sei Chun, Bob Farley

ONR: Ed Ingraham

Minutes and Actions are listed below

Action #1

A Traveler shall be generated for Telescope to QB bonding. This Traveler shall include the flow of all relevant procedures. Additionally, the Traveler shall include a note to notify Ed Ingraham, ONR QE, approximately 24 hrs before the actual bonding is to take place. The Traveler will also include a space for Ben Taller, Stanford QA, to sign off, indicating the Certificate of Compliance has been signed off, and the activity may proceed.
Assignee: Art, Efrain to generate Traveler. ECD: 6/5/98
A Traveler has been generated, and includes QA signoff for each event. CLOSED.

Action #2

Review the 1 arc-min (1 mil circumference) clocking measurement requirement. Possibly revise Drawing 23521 to 2 arc-min.
Assignee: John T. and Doron B. ECD: 6/5/98
CLOSED. Drawing 23521 was changed to reflect a measurement requirement of 2 arc-min.

Action #3

Revise the Requirements Verification Chart as follows:
1. Add the relevant PL spec requirement from which the decentering requirement is allocated.
2. Change typo P0020 to P0200 - several places

Assignee: Art N. ECD: 5/22/98
DONE. CLOSED.

Action #4

Add to procedures a statement to notify Safety prior to any movement of the QB or Telescope. Also include Safety on cover page. P0270, P0394, P0395, P0397, to be fixed before release. Any future procedures to include this notification. P0198, P0200 will be revised, and ECOs generated.
Assignee: Ken B. for P0397, Art N. for others. ECD: 5/29/98
P0270 Rev A, P0394, P0395, P0198 Rev A and B, P0200 Rev A and B and P0397 have all been released with required changes. CLOSED.

Action #5

Proof test the Telescope lifting GSE.
Assignee: Jason G. Doron's group to provide help in cleanroom. ECD: 6/10/98
CLOSED. Ken Bower completed proof test on 1/14/99. Documented in P0456.

Action #6

Write a procedure for checking the bond area during curing.
Assignee: Jason G. ECD: 6/10/98
P0218 includes a procedure for checking bonding. P0200 Rev B includes a table for checking the bond as it cures. It refers to P0218 for method used. CLOSED.

Action #7

Jason and Doron to evaluate chip in QB from bonding perspective - close DR 29.
Assignee: Jason G., Doron B. ECD: 6/10/98
CLOSED. DR 29 has been closed.

The target date for signing off the Certificate of Completion is 6/19/98. When these actions are completed, Art will route updated package for approval signatures.

Additional Minutes

1. Shortly before each group of procedures, the participating members, including Safety and QA, will meet to review operations.
   - Doron, Efrain, Art, John Stamets, Safety, QA, for Cleaning and Transferring QB
   - Ken, Jason, any other relevant Telescope people, Safety, QA, for Transferring Telescope
   - Ken , Jason, Efrain, Doron, Art, Safety, QA, for Bonding
2. Write a P-doc which includes evidence of original proof test, plus written statement from Safety that re-proof of Precision Manipulator is un-necessary.
   Assignee: Doron
   CLOSED. John Janicki inspected the drive mechanism and the proof test data and stated per e-mail that additional proof testing of the PM is not necessary.
3. A short Acceptance Review will be held after the Bonding is completed.
   Assignee: Art, Jason, Doron

Submitted by A. Nakashima, 5/22/98 Reviewed by D. Bardas

UPDATED 2/12/99

Note: Seven Powerpoint charts follows this page.

Integration Readiness Review for Bonding Telescope to Quartz Block for Science Mission May 19, 1998 Updated 2/12/99

AGENDA

- Purpose of Review A. Nakashima
- Requirements Verification A. Nakashima
- Procedures Status A. Nakashima
- QA Plan A. Nakashima
- Schedule D. Bardas
- Test Resources Status D. Bardas
  - –Quartz Block
  - –Telescope J. Gwo
  - –GSE
  - –Personnel, Facilities

Purpose of Review

- Confirm Readiness for Bonding Science Mission Telescope to Quartz Block
  - Procedures released
  - Plan to Verify Applicable Requirements
  - QA Plan
  - Flight Parts Ready
  - GSE Ready
  - Personnel and Facilities in place

Requirements Verification

Requirement Title	Requirement	Md	Ver Plan and Test Procedure
3.7.1.4.3, X-Y Location of Reticle Pattern Center	The X-Y position of the reticle pattern center with respect to a point determined by the intersection of the nominal Roll Axis with the reticle plate plane shall be measured to 0.25 mm (.010 inch). *Per Drawing 23521, decentering between Telescope and Quartz Block* *is .020 inch true position (.010 inch radius), measured to an accuracy of .001 inch in X and Y directions.*	T	Decentering will be measured after 3 days of curing, Sec 8.1, and again after 10 more days of curing, Sec 8.2 of P0200(SM).
3.7.1.4.2.1.1, Accuracy of Perpendicularity	The axes of all readout loops shall be perpendicular to the science telescope axis within the error given in Section 11.2.1 of T003. (=55 a-s). *The allocation to the Tele/QB IF wedge angle is 1 a-s, per SIA CDR charts. (This is an allocation, not a requirement.)*	S	A bond area > 80% implies wedge angle < 1 a-s, by similarity to previous experience. The bond area will be measured in Sec 7.3, 8.1, 8.2 of P0200(SM). *If bond area < 80%, debonding will be considered in 7.3.*
3.7.1.4.2.1.3, Rotation	The SG and ST readout axes shall be aligned in rotation about the z-axis with the accuracy given in Sec 11.3 of T003. (=0.02 rad, or 1.1°) *The allocation to the Tele/QB IF clocking is < 0.2°, or .013 inch circumference, per SIA CDR charts.* *The requirement per Dwg 23521 is to measure clocking to an accuracy of 1 arc-min (.001 inch circumference).*	T	Displacement of QB to T scribe marks will be measured in Sec 7.3, 8.1, and 8.2 of P0200(SM). *Requirement is on measurement accuracy, not on actual clocking displacement.*

Test Procedures and Drawings Status

- Drawing #23521, Quartz Block / Telescope Assembly - released
- P0200(SM), Bonding Telescope to Quartz Block - Revisions A and B released.
- Support Procedures
  - P0218, Bonding Procedure for Fused Quartz Components - released
  - P0198(SM), Cleaning the Quartz Block - Revisions A and B released
  - P0270, Transferring the Quartz Block from Roller Mechanism to X-Y Cart - Revision A released.
  - P0394, Transferring the QB/T Assembly from the X-Y Cart to the RM Cart - released
  - P0395, Transferring the QB/T/RMUnit from the RM Cart to the Optical Table - released
  - P0397, Transportation of Telescope Between Cleanroom Facilities - released

Quality Assurance and Safety Plan

- QA Program Office (Ben Taller or Phil Unterreiner) will be notified of start of each procedure.
- All operations to be conducted to released procedures. Redline authority for each procedure is clearly stated in procedure.
- QA representative to witness procedures, approve redlines, and review any discrepancies.
- Upon completion of each procedure, QA representative or QA engineer will certify concurrence of completion and sign approval line.
- Safety will be on review cover page of all procedures involving moving the QB or Telescope.
- Safety will be notified prior to all movement of QB or Telescope.

Personnel, Facilities

- Jason Gwo, Test Director for Bonding
- Ken Bower, Telescope Integration
- Doron Bardas, Integration Manager
- QA representative
- John Janicki, or other Safety representative
- All activity in Class 10 HEPL Cleanroom