GRAVITY PROBE B

PROCEDURE FOR

PAYLOAD VERIFICATION

(PTP) Procedure for TRE / DMA Temperature Control Verification

P0488 Rev. A

July 12, 2000

Prepared by: *Bob Farley*

Approvals:

Program Responsibility	Signature	Date
Bob Farley TRE REE		
M. Taber Payload Test Director		
GP-B System Engineering		
D. Ross GP-B Quality Assurance		
Barry Muhlfelder GP-B Payload Technical Manager		

NOTES:

Level of QA required during performance of this procedure:

__4__ Stanford QA Representative

All redlines must be approved by QA

Revision Record:

Rev	Rev Date	ECO #	Summary Description
-	10 Aug 1999	na	Original Issue
A	12 July 2000	1183	Incorporated redlines

Acronyms and Abbreviations:

Acronym / Abbreviation	**Meaning**
DMA	Detector Mount Assembly
GSE	Ground Support Equipment
TRE	Telescope Readout Electronics

Notify ONR 24 hours prior to beginning testing.

Person Contacted: _____ Date and Time: _____

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1. Scope

This procedure verifies that the TRE has been connected properly. It exercises the local closed loop temperature control for each DMA, and demonstrates step temperature changes and recovery for various servo update rates.

2. Configuration Requirements

2.1 Probe is installed in the dewar. Probe pressure <1E-5 torr. TRE mounted on dewar, with cables connected to tophat and GSE test support rack.

2.2 Dewar is cooled with liquid helium.

3. Hardware Required

3.1 Commercial test equipment

Manufacturer	Model	Serial Number	Calibr. Exp. Date

3.2 Mechanical/Electrical Special test equipment

Description	Part No.	Rev. no.	Serial No.	Certification Date
TRE Ground Support Equipment Rack	na		Unit #1	5/26/99

3.3 Tools

Description	No. Req'd

4. Software Required

4.1 Test Support Software

Test Software Name	Version No.	QA Verification
SQD362.exe. (supports two TREs).	V3.62	

5. Procedures Required

Procedure Name	Procedure No.
Procedure for TRE Aliveness Test Following Payload Insertion	P04877

6. Equipment Pretest Requirements

Procedure P04877 shall have been completed prior to this procedure.

7. Personnel Requirements

7.1 This test to be conducted only by certified personnel. Among those are Howard Demroff, Paul Ehrensberger, John Goebel, and Bob Farley.

8. Quality Assurance

8.1 Testing shall be conducted on a formal basis to approved and released procedures. The QA program office shall be notified of the start of this procedure. A Quality Assurance Representative, designated by D. Ross shall be present during the procedure and shall review any discrepancies noted and approve their disposition. Upon completion of this procedure, the QA Program Engineer, D. Ross or her designate, nominally R. Leese, will certify his concurrence that the effort was performed and accomplished in accordance with the prescribed instructions by signing and dating in the designated place(s) in this document. Discrepancies will be recorded in a D-log or as a DR per Quality Plan P0108.

9. Red-line Authority

9.1 Authority to red-line (make minor changes during execution) this procedure is given solely to the PTD or his designate and shall be approved by the QA Representative. Additionally, approval by the

Hardware Manager shall be required if, in the judgment of the PTD or QA Representative, experiment functionality may be affected.

10. Safety Requirements

10.1 Connection and disconnection shall be performed only when the equipment involved is in a powered-down state.

10.2 Connector savers are to be used on the TRE and tophat connectors.

> **Note: The mating and demating of all flight connectors must be recorded in a log. This procedure does not require removal or replacement of connector savers onto the flight connectors--they should already be in place.**

10.3 Connectors shall be inspected for contamination and for bent, damaged, or recessed pins prior to mating.

10.4 Grounded wrist straps are to be worn prior to removal of connector caps or covers and during mating/demating operations.

10.5 ESD-protective caps or covers are to be immediately installed after demating of connectors.

11. References and Applicable Documents

12. Operations

12.1 Power the GSE Test Rack and boot the computer. Change to directory **SQD3** and run program named SQD362.exe. Select MON A in the main menu, and step through the four selections in the Global menu to enable both A and B commands.

12.2 Power on the A Side TRE using the switch on the A side power supply.

12.3 Check the A-Side housekeeping display for both X and Y axes. Power supply voltages and Reference voltages should be within 5% of nominal values.

12.4 Navigate to the Main Menu and select MON B.

12.5 Power on the B Side TRE using the switch on the B side power supply.

12.6 Check the B-Side housekeeping display for both X and Y axes. Power supply voltages and Reference voltages should be within 5% of nominal values.

12.7 Set the control words for all four axes to 0000h.

Axis	A-side, X-Axis	A-side, Y-Axis	B-side, X-Axis	B-side, Y Axis
CONTROL	0000h	0000h	0000h	0000h
Initial & date				

QA Witness_____ Date:_____

12.8 A-Side Test

12.8.1 Set the program to record A-side data and display A-side Engineering data by selecting MON A in the main menu.

12.8.2 Set the data recording to record 30 second files CONTINUOUSLY. Do not start recording yet.

12.8.3 Select the X-Axis Controls Menu.

12.8.4 Note the displayed platform temperature and record the value: _____K.

12.8.5 Set the command temperature using the DTEMP register to control to the indicated temperature plus approximately 15 Kelvin. (The control temperature is displayed on the screen.)

12.8.6 Record the DTEMP command hexadecimal value: _____h.

12.8.7 Set the HEAT command to 0007h.

12.8.8 Navigate to the DISK menu and begin recording as setup previously in .12.8.2.

12.8.9 Record the file name displayed in dull red: _____

12.8.10 Return to the X-Axis menu and set the A-side CONTROL register to 0080h to enable local closed loop control.

12.8.11 Move to the Y-Axis menu and set the DTEMP register with the value recorded in step 12.8.6

12.8.12 Set the A-side HEAT register to 0007h and the A-side CONTROL register to 0080h.

12.8.13 Wait until the Servo Error voltage remains within .05 volts of zero, and then enter 0000h in the HEAT registers for both the Y-Axis A-side and X-Axis A-Side.

12.8.14 Wait 5 to 7 minutes.

12.8.15 Change the HEAT command to 0006h on the X-Axis A-side, and set the A-side DTEMP register to a temperature control value of approximately 70K.

12.8.16 Record the DTEMP command: _____h

12.8.17 Navigate to the Y-Axis and set the HEAT command for the A-side to 0006h, and set the A-side DTEMP command to the value recorded above.

12.8.18 Wait until the Servo Error voltage remains within .05 volts of zero, and then enter 0000h in the HEAT registers for both the Y-Axis A-side and X-Axis A-Side.

12.8.19 Wait 5 to 7 minutes.

12.8.20 Change the HEAT command to 0005h on the X-Axis A-side, and set the A-side DTEMP register to a temperature control value of approximately 80K.

12.8.21 Record the DTEMP command: _____h.

12.8.22 Navigate to the Y-Axis and set the HEAT command for the A-side to 0005h, and set the A-side DTEMP command to the value recorded above.

12.8.23 Wait until the Servo Error voltage remains within .05 volts of zero, and then enter 0000h in the HEAT registers for both the Y-Axis A-side and X-Axis A-Side.

12.8.24 Wait 5 to 7 minutes.

12.8.25 Change the HEAT command to 0005h on the X-Axis A-side, and set the A-side DTEMP register to a temperature control value of approximately 70K. Use the value recorded in step .12.8.15.

12.8.26 Navigate to the Y-Axis and set the HEAT command for the A-side to 0005h, and set the A-side DTEMP command recorded in step 12.8.15.

12.8.27 Wait until the Servo Error voltage remains within .05 volts of zero, and then enter 0000h in the HEAT registers for both the Y-Axis A-side and X-Axis A-Side.

12.8.28 Wait 5 to 7 minutes.

12.8.29 Disable the recording from the Disk menu.

12.8.30 Record the stop time and date: _____

12.8.31 Set the A-side OFFSET and A-side CLAMP registers to the values recorded in 12.11.18 of P0487 for both the X- and Y- axes.

12.8.32 Set the A-side CONTROL register to 1000h for both the X- and Y-axes.

12.8.33 Record the values in the table and verify the results.

Register	A-side X-axis	A-side Y-axis	Initial & Date
OFFSET			
CLAMP			
CONTROL			

QA Witness_____ Date:_____

12.9 B-side Test

12.9.1 Set the program to record B-side data and display B-side Engineering data by selecting MON B in the main menu.

12.9.2 Set the data recording to record 30 second files CONTINUOUSLY. Do not start recording yet.

12.9.3 Select the X-Axis Controls Menu.

12.9.4 Note the displayed platform temperature and record the value: _____K.

12.9.5 Set the command temperature using the B-side DTEMP register to control to the indicated temperature plus approximately 15 Kelvin. (The control temperature is displayed on the screen.)

12.9.6 Record the DTEMP command hexadecimal value: _____h.

12.9.7 Set the B-side HEAT command to 0007h.

12.9.8 Navigate to the Disk menu and ENABLE data recording.

12.9.9 Navigate to the DISK menu and begin recording as setup previously.

12.9.10 Record the file name displayed in dull red: _____

12.9.11 Return to the X-Axis menu and set the B-side CONTROL register to 0080h to enable local closed loop control.

12.9.12 Move to the Y-Axis menu and set the B-side DTEMP register with the value recorded in step 12.8.6

12.9.13 Set the B-side HEAT register to 0007h and the CONTROL register to 0080h.

12.9.14 Wait until the Servo Error voltage remains within .05 volts of zero, and then enter 0000h in the HEAT registers for both the Y-Axis B-side and X-Axis B-Side.

12.9.15 Wait 5 to 7 minutes.

12.9.16 Change the HEAT command to 0006h on the X-Axis B-side, and set the B-side DTEMP register to a temperature control value of approximately 70K.

12.9.17 Record the DTEMP command: _____h.

12.9.18 Navigate to the Y-Axis and set the HEAT command for the B-side to 0006h, and set the B-side DTEMP command to the value recorded above.

12.9.19 Wait until the Servo Error voltage remains within .05 volts of zero, and then enter 0000h in the HEAT registers for both the Y-Axis B-side and X-Axis B-Side.

12.9.20 Wait 5 to 7 minutes.

12.9.21 Change the HEAT command to 0005h on the X-Axis B-side, and set the B-side DTEMP register to a temperature control value of approximately 80K.

12.9.22 Record the DTEMP command: _____h.

12.9.23 Navigate to the Y-Axis and set the HEAT command for the B-side to 0005h, and set the B-side DTEMP command to the value recorded above.

12.9.24 Wait until the Servo Error voltage remains within .05 volts of zero, and then enter 0000h in the HEAT registers for both the Y-Axis B-side and X-Axis B-Side.

12.9.25 Wait 5 to 7 minutes.

12.9.26 Change the HEAT command to 0005h on the X-Axis B-side, and set the B-side DTEMP register to a temperature control value of approximately 70K. Use the value recorded in step .12.8.15.

12.9.27 Navigate to the Y-Axis and set the HEAT command for the B-side to 0005h, and set the B-side DTEMP command to the value recorded in step 12.8.15.

12.9.28 Wait until the Servo Error voltage remains within .05 volts of zero, and then enter 0000h in the HEAT registers for both the Y-Axis B-side and X-Axis B-Side.

12.9.29 Wait 5 to 7 minutes.

12.9.30 Disable the recording from the Disk menu.

12.9.31 Record the stop time and date: _____

12.10 Completion of testing

12.10.1 Navigate to the main menu and select Mon A.

12.10.2 Record the indicated platform temperatures for the A-side X- and Y-axes in the table below.

A-side X-axis Temp	A-side Y-axis Temp	Initials & Date
K	K	

QA Witness_____ Date:_____

12.10.3 If no further testing of the TRE / DPA is needed, return the CONTROL registers to 0000h for all of the axes as in step 12.7.

Axis	A-side, X-Axis	A-side, Y-Axis	B-side, X-Axis	B-side, Y Axis
CONTROL	0000h	0000h	0000h	0000h
Initial & date				

Turn off the TRE power supplies in the test rack.

QA Witness_____ Date:_____

12.10.4 If other tests are to be performed using the TRE / DPA units, consider this as a good starting point and proceed with the requirements of that test procedure without turning the power off.

13. Test completed.

Completed by: _____

QA Witnessed by: _____

Date: _____

Time: _____

PTD_____ Date _____

Quality Manager_____ Date _____