STANFORD UNIVERSITY
W.W. HANSEN EXPERIMENTAL PHYSICS LABORATORY
GRAVITY PROBE B, RELATIVITY GYROSCOPE EXPERIMENT
STANFORD, CALIFORNIA 94305-4085

MOUNTING BRACKET INSTALLATION

GP-B SCIENCE MISSION DEWAR OPERATIONS ORDER

9 August, 1999

PREPARED _____ _____
H. Yengoyan Date

APPROVED _____ _____
M. R. Anderson, Systems Test Engr. Date

APPROVED _____ _____
M. Taber, Test Director Date

APPROVED _____ _____
J. Janicki, Safety Engineer Date

APPROVED _____ _____
D. Ross, Quality Assurance Date

APPROVED _____ _____
S. Buchman, Hardware Manager Date

1. SCOPE

This procedure provides authority to install the Mounting Brackets that will support the Forward Payload Electronic boxes during payload integration testing.

NOTE

Flight hardware, protect parts and assemblies to prevent magnetic contamination and physical damage.

2. REFERENCE DOCUMENTS

2.1. Procedures

Not applicable

2.2. Drawings

8A00631 – FWD Payload Electronics Install Drawing (GP-B), Rev. N/C

5856126 – Bracket, Front, FWD Elec Mounting (GP-B), Rev. A

5856127 – Bracket, Rear, FWD Elec Mounting (GP-B), Rev. A

5856139 – Shim, Rev. N/C

2.3. FIGURES

Not applicable

2.4. SUPPORTING DOCUMENTATION

GP-B Magnetic Control Plan, LMMS-5835031

GP-B (FIST) Preliminary Hazards Analysis, LMMS-F314446

GP-B (FIST) Safety Plan, LMMS- F314447

FIST Emergency Procedures SU/GP-B P0141

3. GENERAL REQUIREMENTS

3.1 Quality Assurance

Integration 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 her 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.

3.2 Red-line Authority

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.

3.3 Personnel

The following personnel are qualified to perform this procedure:

- Bob Ajitomi
- Haig Yengoyan
- Paul Ayres
- Tom Welsh
- Mike Taber
- Dave Murray

See section 3.1 for details on which Quality Assurance personnel are required to be notified and/or witness this procedure.

3.4 Safety

In case of any injuries obtain medical treatment: at:

LMMS **Call 117** Stanford University **Call 9-911**

3.4.1 The GP-B (FIST) Safety Plan, LMSC-F314447, discusses safety design, operating and maintenance requirements which the R&DD program office has adhered to. These requirements

should be reviewed for applicability at any facility outside of R&DD (e.g. Stanford University) where FIST hardware is operated.

3.5 Hazards Analysis

The GP-B (FIST) Preliminary Hazards Analysis, LMSC-F314446, discusses hazards inherent in R&DD-developed FIST hardware in greater detail.

4. CONFIGURATION REQUIREMENTS:

4.1 SMD mounted in SMD test stand with the work platforms and scaffolding attached.

5. HARDWARE REQUIREMENTS

The Dewar and accompanying build hardware are very delicate. Be sure to handle them with care so that they do not become damaged.

NOTE

Take all necessary precautions not to let anything physically damage the Science Mission Dewar or particulate onto its surfaces.

5.1 Hardware Required:

Qt. 7	5856126-101 Front Bracket Assembly
Qt. 7	5856127-101 Rear Bracket Assembly
Qt. 14	5856139-101 Shim
Qt. 42	NAS6303U10HX, 10-32 Bolt
Qt. 42	MS21043-3, 10-32 Locking Nut
Qt. 84	960C10, #10 Washer
Qt. 1	Feeler Gage
Qt. 1	Caliper
Qt. 1	Torque wrench 10-120 in-lbs.
Qt. 1	5856146-101 Assembly Tool, Box Mounting Template
Qt. AR	Hand tools (Alan wrenches, X-acto knife, screw drivers, etc.)

6. OPERATIONS:

Operator _____.

Date Initiated_____.

Time Initiated_____.

6.1 Configuration Requirements:

SMD mounted in SMD test stand with the work platforms and scaffolding attached.

7. NOTIFICATION

7.1 Safety Notification

Safety shall be notified 24 hours in advance prior to the start of any work performed. Record who was contacted, the date, and time below.

Contact: _____
Date and Time: _____

7.2 Quality Assurance Notification

PTD to notify the Quality Engineer 24 hours in advance prior to the start of any work performed. Record who was contacted, the date, and time below.

Contact: _____
Date and Time: _____

7.3 ONR Notification

Quality Engineer to notify ONR 24 hours in advance prior to the start of any work performed. Record who was contacted, the date, and time below.

Contact: _____
Date and Time: _____

8. INSTALLING THE MOUNTING BRACKETS

8.1 Bracket Installation

8.1.1 Select axial box locations on the dewar (Sh. 3), position a F/N 5 FWD bracket to the rib with a F/N 7 shim. Use feeler gage to adjust shim thickness to minimize the movement of the bracket per engineer's direction. Laminated shim thickness can be adjusted by "peeling" the laminates using an X-acto knife. Each laminate is .003" thick. Secure the bracket finger tight to the rib with three F/N 10 bolts and F/N 11 nuts and nine F/N 16 washers.

8.1.2 Select corresponding axial box locations on the dewar (Sh. 3), position a F/N 6 Rear bracket to the rib with a F/N 7 shim. Adjust shim thickness as described in step 10. Secure the bracket finger tight to the rib with three F/N 10 bolts and F/N 11 nuts and nine F/N 16 washers as shown in Sh 6 Zone D6.

8.1.3 At each electronic box location attach the Box mounting template (5856146-101) to the FWD and Rear brackets to align the shims and brackets properly before torquing. Shims may be placed above or below the rib as needed for alignment.

8.1.4 Torque all the 21 F/N 10 bolts to 35-45 inch-pounds. Remove the template and repeat steps 8.1.1 through 8.1.3 for each pair of brackets. Record data below:

Torque Wrench Asset Number _____
Calibration Due Date _____
Final Torque Value _____

8.1.5 Product Assurance to witness torque.

QA Witness _____

Approval of Section 8.1

Approved: _____ Date: _____
Integration Engineer

Discrepancies if any:

Approved: _____ Date: _____
PTD

Approved: _____ Date: _____
QA Representative

Approved: _____ Date: _____
Integration Manager

9. PROCEDURE COMPLETED

The results obtained in the performance of this procedure are acceptable:

Test Engineer _____ Date _____

PTD _____ Date _____

Discrepancies if any:

The information obtained under this assembly and test procedure is as represented and the documentation is complete and correct:

Integration Manager _____ Date _____

QA Representative _____ Date _____

Quality Assurance _____ Date _____