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

GP-B SCIENCE MISSION DEWAR OPERATIONS ORDER

TRE BOX REMOVAL

P0629 Rev. A

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4 October 2000

PREPARED	H. Yengoyan / Bob Farley	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

Revision Record:

Rev	Rev Date	ECO #	Summary Description
-	9 Nov 99		Original procedure
A	3 Oct 2000	1209	Incorporated reference to connector savers Changed destination to bonded stores

1. SCOPE

This procedure provides authority to remove both Flight Telescope Readout Electronics (TRE) Assemblies from the neck of the Science Mission Dewar.

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

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:

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

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:

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. 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.

4.1 Hardware Required:

Qt. 2	8A00918-101 Rev. D TRE Assembly
Qt. 16	NAS1351N3-12 or equivalent, 10-32 SHCS, CRES, 3/4” long
Qt. 16	NAS620C10 or equivalent, #10 Flat Washer, CRES
Qt. 16	NAS1149V0363, #10 Titanium Washer
Qt. 1	8A01287-101 Rev. B, TRE B J1 to Top Hat I8 (Non-Flight Cable)
Qt. 1	8A01288-101 Rev. B, TRE A J1 to Top Hat I9 (Non-Flight Cable)
Qt. 2	8A01948GSE-101 Rev. A, TRE GSE Test Cable
Qt. 1	Torque wrench 10-120 in-lbs. (If Needed)
Qt. 1	Mili Ohm meter (If Needed)
Qt. 1	Shorting Plug, TRE-SP-I8-GSE
Qt. 1	Shorting Plug, TRE-SP-I9-GSE
Qt. AR	Hand tools (Allen wrenches, screw drivers, etc.)

5. OPERATIONS:

Operator _____.

Date Initiated_____.

Time Initiated_____.

6. NOTIFICATION

6.1 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: _____

6.2 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: _____

6.3 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: _____

7. REMOVING THE TRE BOXES AND CABLES

7.1 Removing the TRE Cables

CAUTION

The TRE Units and associated cables are ESD Sensitive. Use appropriate ESD protection when handling these items.

7.1.1 Remove NON-FLIGHT CABLE 8A01287-101 by disconnecting P1 on cable from the connector saver on J1 of TRE B. Disconnect PI8 on cable from the connector saver on I8 on TOP HAT. Install shorting plug, TRE-SP-I8-GSE on the connector saver on Tophat I8.

7.1.2 Remove NON-FLIGHT CABLE 8A01288-101 by disconnecting P1 on cable from the connector saver on J1 of TRE A. Disconnect PI9 on cable from the connector saver on I9 on TOP HAT.Install shorting plug, TRE-SP-I9-GSE on the connector saver on Tophat I9.

7.1.3 Do not remove 1 ea. TEST CABLES 8A01948GSE from Connector Panel A.

7.1.3.1 Remove cable TRE-P2 from the connector saver on TRE A-J2.

7.1.3.2 Remove cable TRE-P3 from the connector saver on TRE A-J3.

7.1.3.3 Remove cable TRE-P4 from the connector saver on TRE A-J4.

7.1.3.4 Remove cable TRE-P5 from the connector saver on TRE A-J5.

7.1.3.5 Remove cable P15 from Connector Panel A-J15.

7.1.3.6 Remove cable P17 from Connector Panel A-J17

7.1.4 Do not remove 1 ea. TEST CABLES 8A01948GSE from Connector Panel B.

7.1.4.1 Remove cable TRE-P2 from the connector saver on TRE B-J2.

7.1.4.2 Remove cable TRE-P3 from the connector saver on TRE B-J3.

7.1.4.3 Remove cable TRE-P4 from the connector saver on TRE B-J4.

7.1.4.4 Remove cable TRE-P5 from the connector saver on TRE B-J5.

7.1.4.5 Remove cable P15 from Connector Panel B-J15.

7.1.4.6 Remove cable P17 from Connector Panel B-J17.

7.1.4.7 Wrap the two cable bundles around the GSE test rack in several large loops supported on the back of the monitor cabinet.

7.1.5 After all the cables have been removed, cover the exposed TRE connector savers with caplugs as needed.

Approval of Section 7.1

Approved: _____ Date: _____
Integration Engineer

Discrepancies if any:

Approved: _____ Date: _____
QA Representative

Approved: _____ Date: _____
Integration Manager

7.2 Removing the TRE's from the Dewar

CAUTION

The TRE Units are ESD Sensitive. Use appropriate ESD protection when handling the units.

7.2.1 Two people who are properly ESD grounded are required for this operation. While one person firmly holds the F/N 2 TRE A Assy Serial # 001, a second person is to remove the eight each F/N 9 bolts and F/N 15 & 16 washers. Place the washers and screws into a labeled bag and store for future use.

7.2.2 Repeat for TRE B Serial # 002 Assy.

7.2.3 After the TRE's are removed, place each unit in protective ESD bags, and label the them as Flight so that they will not be moved or tampered with. Return the Bagged TREs and the Tophat cables to Bonded Stores adjacent to FIST Ops for storage.

Approval of Section 7.2

Approved: _____ Date: _____
Integration Engineer

Discrepancies if any:

Approved: _____ Date: _____
QA Representative

Approved: _____ Date: _____
Integration Manager

8. PROCEDURE COMPLETED

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

Integration Engineer _____ 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 _____