Gravity Probe B
Procedure for
Payload Verification

GSE SECTION OF ECU TRUTH TEST

P0887 Rev -

28 January, 2002

Prepared by: B. Muhlfelder

Program Responsibility	Signature	Date
B. Clarke Engineer		
B. Muhlfelder Preparer		
R. Brumley Payload Technical Manager		
D. Ross GP-B Quality Assurance		

Revision Record:

Rev	Rev Date	ECO #	Summary Description

Acronyms and Abbreviations:

Acronym / Abbreviation	Meaning
EOS	Electrostatic OverStress
ESD	ElectroStatic Discharge

1. SCOPE

This procedure provides an engineering confidence test of the herein tabulated Probe C Instrumentation cables after the probe has been installed into the flight dewar.

2. APPLICABLE DOCUMENTS

P0476 EOS/ESD Risk Mitigation Procedure

3. GENERAL REQUIREMENTS

3.1 Environmental Requirements

This procedure will be conducted in the B205 High Bay.

3.1.1. Magnetic Contamination

N/A.

3.1.2 Cleanliness Requirements

N/A.

3.2 Integration Personnel

3.2.1 Procedure Director

The Procedure Director shall be Barry Muhlfelder. He has overall responsibility for the implementation of this procedure and shall sign off the completed procedure.

3.2.2 Authorized Personnel

Bruce Clarke
Barry Muhlfelder
Dave Murray
Dave Hipkins
Chris Gray
Tom Welsh

3.3 Safety

3.3.1 General

Safety of both hardware and personnel must be maintained at all times. Probe safety notes apply to this procedure.

3.4. Quality Assurance

All assembly and testing shall be conducted on a formal basis to approved and released assembly and test procedures. A Quality Assurance representative shall review and document any discrepancy noted during this procedure and approve its disposition. A QA representative shall be present during this procedure unless otherwise indicated by the test director. Upon completion of this procedure, the QA representative will certify his/her concurrence that the effort was performed and accomplished in accordance with the prescribed instructions by signing and dating his/her approval line at the end of the procedure. D-Logs and discrepencies shall be used per the Stanford QA plan P0108.

3.5. REDLINE AUTHORITY

Any one of the following persons with QA concurrence.
B. Muhlfelder
M. Taber
D. Murray

3.6. Prerequisites

Configuration: Probe C installed in the flight dewar. Nominal LHe temperature is 4.2 K.

4. REQUIRED EQUIPMENT

Flight Hardware Configuration: Probe C installed into the flight dewar.

Ground Support Equipment

Keithley 196 ohm meter Serial number_____ recalibration due _____.
Linear Research Bridge (optional) Serial number _____ . engineering data only (no cal. required)
Note: Connector savers with a breakout box shall be used for all resistance measurements.

5. DETAILED PROCEDURE

*Notify QA 24 hours prior to starting Section 5.1*_____

Record Start Date and Time _____

5.1 Set Keithley 196 to 10^8 ohms scale (for full-scale reading) _____.

5.2 Attach breakout box to tophat connector I1. If connector saver is not present, record mates and demates in mate/demate log.

5.3 Measure the resistance of each GRT using a 4 terminal hookup. Measure the resistance-to-ground (isolation) of each cable. Optionally, use LR bridge to measure GRT resistances. Record the results in the tables below.

5.4 Repeat for tophat connectors I2, I5, and I7.

Table 1

I1 pin	ID#	Device Type	Location/Description	Polarity	Req. Resist.	Meas. Resist. DVM	Resistance to Gnd	Meas. Resist. Bridge (optional)
6	T-17Q	GRT (sense)	QB Flange	+VDC	.5-2 KΩ			
7	T-17Q	"	"	-VDC				
40	T-17Q	GRT (drive)	QB Flange	+I				
41	T-17Q	"	"	-I				
8	T-1Q	GRT (sense)	Gyro #1 spinup half	+VDC	.5-2 KΩ			
9	T-1Q	"	"	-VDC				
32	T-1Q	GRT (drive)	Gyro #1 spinup half	+I				
33	T-1Q	"	"	-I				
10	T-2Q	GRT (sense)	Gyro #2 spinup half	+VDC	.5-2 KΩ			
11	T-2Q	"	"	-VDC				
34	T-2Q	GRT (drive)	Gyro #2 spinup half	+I				
35	T-2Q	"	"	-I				
12	T-3Q	GRT (sense)	Gyro #3 spinup half	+VDC	.5-2 KΩ			
13	T-3Q	"	"	-VDC				
36	T-3Q	GRT (drive)	Gyro #3 spinup half	+I				
37	T-3Q	"	"	-I				
14	T-4Q	GRT (sense)	Gyro #4 spinup half	+VDC	.5-2 KΩ			
15	T-4Q	"	"	-VDC				
38	T-4Q	GRT (drive)	Gyro #4 spinup half	+I				
39	T-4Q	"	"	-I				
1	T-5Q	GRT (sense)	QB Aft near spider	+VDC	.5-2 KΩ			
2	T-5Q	"	"	-VDC				
42	T-5Q	GRT (drive)	QB Aft near spider	+I				
43	T-5Q	"	"	-I				
4	T-6Q	GRT (sense)	QB forward near telescope	+VDC	.5-2 KΩ			
5	T-6Q	"	"	-VDC				
44	T-6Q	GRT (drive)	QB forward near telescope	+I				
45	T-6Q	"	"	-I				

Table 3.7.3-9 Top Hat I1 Connector Pin-to-Pin Function List

QA _____

I2 pin#	ID#	Device Type	Location/ Description	Polarity	Req. Resistance	Meas. Resist. DVM	Resistance to Gnd	Meas. Resist. Bridge (optional)
1	T-6P	GRT (sense)	Final Filter 1&2	+VDC	.5-2 KΩ			
2	T-6P	"	"	-VDC				
21	T-6P	GRT (drive)	Final Filter 1&2	+I				
22	T-6P	"	"	-I				
4	T-7P	GRT (sense)	Final Filter 1&2	+VDC	.5-2 KΩ			
5	T-7P	"	"	-VDC				
23	T-7P	GRT (drive)	Final Filter 1&2	+I				
24	T-7P	"	"	-I				
6	T-8P	GRT (sense)	Final Filter 3&4	+VDC	.5-2 KΩ			
7	T-8P	"	"	-VDC				
25	T-8P	GRT (drive)	Final Filter 3&4	+I				
26	T-8P	"	"	-I				
8	T-9P	GRT (sense)	Final Filter 3&4	+VDC	.5-2 KΩ			
9	T-9P	"	"	-VDC				
27	T-9P	GRT (drive)	Final Filter 3&4	+I				
28	T-9P	"	"	-I				

Table 3.7.3-10 Top Hat I2 Connector Pin-to-Pin Function List

QA _____

I5 Pin Designations for Probe C Note: First pin in each pair is +v, second is –v							
I5 pin#	ID#	Device Type	Location/Description	Req. Resist.	Meas. Resist. DVM	Resistance to Gnd	Meas. Resist. Bridge (optional)
I5: 10, 11	T-10P	GRT (sense)	On QBS Finger	.5-2KΩ			
I5: 40, 41	T-10P	GRT (drive)	On QBS Finger				
I5: 12, 13	T-11P	GRT (sense)	On QBS Finger	.5-2KΩ			
I5: 42, 43	T-11P	GRT (drive)	On QBS Finger				
I5: 1, 2	T-12Q	GRT (sense)	Telescope top plate (at 325 deg)	.5-2 KΩ			
I5: 32, 33	T-12Q	GRT (drive)	Telescope top plate (at 325 deg)				
I5: 4, 5	T-13Q	GRT (sense)	Telescope top plate (at 270 deg)	.5-2KΩ			
I5: 34, 35	T-13Q	GRT (drive)	Telescope top plate (at 270 deg)				
I5: 6, 7	T-14Q	GRT (sense)	Telescope top plate (at 180 deg)	.5-2KΩ			
I5: 36, 37	T-14Q	GRT (drive)	Telescope top plate (at 180 deg)				
I5: 8, 9	T-15Q	GRT (sense)	Telescope top plate (at 125 deg)	.5-2KΩ			
I5: 38, 39	T-15Q	GRT (drive)	Telescope top plate (at 125 deg)				
I5: 21, 22	T-21Q	GRT (sense)	On (+Y) Telescope DPA	.5-2KΩ			
I5: 27, 28	T-21Q	GRT (drive)	On (+Y) Telescope DPA				

Table 3.7.3-12 Top Hat I5 Connector Pin-to-Pin Function List

I7 pin#	ID#	Device Type	Location/ Description	Polarity	Res. Req.	Meas. Resist. DVM	Resistance to Gnd	Meas. Resist. Bridge (optional)
47	T-15P	GRT (drive)	Cryo-pump	+I	.5-2KΩ			
48	T-15P	"	"	-I				
51	T-15P	GRT (sense)	Cryo-pump	+VDC				
52	T-15P	"	"	-VDC				
49	T-16P	GRT (drive)	Cryo-pump	+I	.5-2KΩ			
50	T-16P	"	"	-I				
53	T-16P	GRT (sense)	Cryo-pump	+VDC				
54	T-16P	"	"	-VDC				

Table 3.7.3-14 Top Hat I7 Connector Pin-to-Pin Function List

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6. PROCEDURE COMPLETION

Note any Dlogs or discrepencies _____

Procedure Director _____ Date _____

Engineer _____ Date _____

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

Quality Assurance _____ Date _____