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

CHECKOUT OF GMA FLIGHT WIRING HARNESS
GP-B SCIENCE MISSION PROCEDURE

P0806 Rev –

February 26, 2001

PREPARED	_____	_____
	R. Stephenson, GMA Engineer	Date
APPROVED	_____	_____
	C. Gray, GMA REE	Date
APPROVED	_____	_____
	D. Ross, Quality Assurance	Date
APPROVED	_____	_____
	B. Muhlfelder, Hardware Manager	Date

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1. SCOPE

This procedure verifies the functionality of the GMA wiring harness after installation. The ECU Engineering Unit (ECU/EU) will be used to cycle all of the GMA solenoid valves and read the pressure sensors. This ensures that the GMA, ECU/EU, and wiring harness are all ready for functional testing.

2. TEST INFORMATION

- Proper care should be taken in handling components, and their cleanliness must be preserved.
- Temperature: Room temperature
- Humidity: not critical

2.1 Cleanliness

2.1.1 Normal lab environment when components are double bagged.

2.1.2 Class 1000 clean room.

2.2 ESD precautions

None required.

ONR representative, and QA to be notified prior to beginning this procedure

2.3 Use of connector savers

Electrical connector savers will be used on the four large connections to the harness.

2.4 Personnel, QA, and Documentation

Personnel Integration and Test Director

The Test Director (TD) shall be Rick Stephenson or an alternate that he shall designate. The TD has overall responsibility for the implementation of this procedure and shall sign off the completed procedure and relevant sections within it. The GMA REE shall also sign off the completed "As-Built" procedure.

Integration Engineers and other personnel. All engineers and technicians participating in this procedure shall work under the direction of the TD who shall determine personnel that are qualified to participate in this procedure. Participants in this procedure are to be R. Stephenson and D. Vanrenen.

The test 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 (if deemed necessary) and shall review any discrepancies noted and approve their disposition. Upon completion of this procedure, the QA Manager, D. Ross or her designate, shall certify their 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. If a re-test of any or all of the hardware is necessary, the TD will determine the appropriate changes in the procedure, with the QA Manager's approval.

2.5 Red-line Authority

Authority to red-line (make minor changes during execution) this procedure is given solely to the TD or his designate, or the GMA Manager, and shall be approved by QA. Additionally, approval by the Hardware Manager shall be required, if in the judgment of the TD or QA Representative, experiment functionality may be affected.

DOCUMENTS AND EQUIPMENT

3.1 Applicable Documents

Document number	Rev	Description
26202	B	GMA Pallet Harness
8A01541-8A0145	-	GMA to ECU cables
25110	D	GMA Assembly

3.2 Test Equipment

Equipment	Model and Serial Number	Calibration
ECU Engineering Unit		1/17/01
Engineering cables from ECU to GMA Harness		
GMA "Pigtails" with Potentiometer Assembly		

3.3 Flight Parts

Description	Model and Serial Number	Comments
GMA Assembly	25110 Rev D	

4 CHECKOUT OF SOLENOID WIRING

Started on: _____

4.1 Connect ECU/EU to GMA Assembly according to drawing 25110 Rev D using engineering cables and pigtails.

4.2 Using ECU/EU, open SV1 and verify that the telemetry matches its actual state.

4.3 Record this data in Table 1.

4.4 Close SV1 and verify telemetry. Record data in Table 1.

4.5 Verify that no solenoid changes state when it has not been commanded to by the ECU/EU.

4.6 Repeat for all SV and CV solenoid valves per Table 1.

5 CHECKOUT OF PRESSURE SENSORS

Started on: _____

5.1 Read telemetry from SP1 and verify it is in proper range according to Table 2.

5.2 Record reading in Table 2.

5.3 Repeat for all SP and CP pressure sensor connections per Table 2.

6 TABLES

6.1 Table 1

Solenoid	Open	Close	Telemetry Open	Telemetry Close
SV1				
SV2				
SV3				
SV4				
SV5				
SV6				
SV7				
SV8				
SV9				
SV10				
SV11				

SV12				
SV13				
SV14				
SV15				
SV16				
SV17				
SV18				
SV19				
SV20				
SV21				
SV22				
SV23				
SV24				
CV1				
CV1A				
CV2				
CV2A				
CV3				
CV3A				
CV4				
CV5				

6.2 Table 2

Pressure Sensor	**Expected Value**	**Actual value**
SP1	1-200	
SP2	1-500	
SP3A	1-500	
SP3B	1-500	
SP4	3500-4095	
SP5	3500-4095	

Table 2 continued

SP6	3500-4095	
SP7	3500-4095	
SP8	3500-4095	
SP9	3500-4095	
CP1	1-500	
CP2	1-500	
CP3	1-500	
CP4	1-500	

7 PROCEDURE COMPLETION

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

_____ date: _____
GMA Engineer

Discrepancies if any:

Approved: _____ date: _____
C. Gray, GMA REE

Approved: _____ date: _____
QA Representative

Approved: _____ date: _____
D. Ross, QA

8 DATA BASE ENTRY

The following data shall be entered into the GP-B Data Base:

- Name, number and revision of this procedure
- Date of successful completion of procedure.