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STANFORD, CALIFORNIA 94305-4085

Gravity Probe B Relativity Mission

ELECTRICAL TEST PROCEDURE (ETP) FOR GSS SPACECRAFT EMULATOR GSE

SN:

GP-B Procedure P0758 Rev -

Prepared by: William Bencze Date

RE, Gyroscope Suspension System (GSS) Group

Approved by: William Bencze Date

RE, Gyroscope Suspension System (GSS) Group

Approved by: Dorrene Ross Date

GP-B Quality Assurance

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1.0 Revision History

Rev Level	Comments/notes	Date	Revised By
-	First release of this test procedure	21-Sep-2000	WJ Bencze

2.0 Scope:

- 2.1. This procedure details the functional tests required for GSS Spacecraft Emulator Ground Support Equipment (GSE) prior to use with GSS flight hardware.
- 2.2. Successful completion of this test certifies this device as functional and safe for use with GSS flight hardware.

3.0 Reference Documents

- 3.1. Electrostatic Discharge Control Program for Protection of Electrical and Electronic Parts, Assemblies, and Equipment, MIL-STD-1686

4.0 Test Facilities

HEPL Room 127, Stanford University

5.0 QA Provisions:

- 5.1. Upon completion of this procedure, the GSS manager and the GP-B QA manager shall certify her/his concurrence that the procedure was performed and accomplished in accordance with the prescribed instructions by signing and dating his approval at the end of this procedure.

6.0 Test Personnel

This test procedure is to be conducted only by the following personnel:

- 6.1. William Bencze
- 6.2. Scott Smader
- 6.3. Lo Van Ho
- 6.4. Son Tran
- 6.5. Joseph Kilner

7.0 General Instructions

- 7.1. Redlines can be initiated by the test personnel listed in Section 6.0 and must be approved by QA.
- 7.2. Test operators shall read this procedure in its entirety and resolve any apparent ambiguities prior to beginning this test.
- 7.3. Any nonconformance or test anomaly should be reported by a Discrepancy Report. Refer to the Quality Plan, P0108, for guidance. Do not alter or break test configuration if a test failure occurs; notify quality assurance.
- 7.4. Only the following persons have the authority to exit/terminate this test or perform a retest: test operators listed in Section 6.0 and GP-B QA.

8.0 Hardware Safety Requirements:

- 8.1. This assembly is ESD sensitive; special care shall be exercised per the “Electrostatic Discharge Control Program for Protection of Electrical and Electronic Parts, Assemblies, and Equipment”, MIL-STD-1686
- 8.2. Ensure that power is removed from cable assemblies before connecting or disconnecting cable connectors.
- 8.3. Connector savers are to be used on all flight connector interfaces unless otherwise specified.
- 8.4. Examine all mating connectors before attempting to mate them. Remove any foreign particles. Look for any damaged pins or sockets. Do not force the coupling action if excessive resistance is encountered. Ensure that key-ways are aligned when mating connectors.

9.0 Test Equipment

The following support hardware, test equipment, or software will be used and the applicable information for the instruments shall be recorded below. Hand-written additions to this list may be made in the space provided.

Equipment Description	Make	Model	SN	Cal Due
1. S/C Timing/HLD emulator	GSS	NA		(this Pdoc)
2. Multimeter	Fluke			
3. Oscilloscope	Tektronix			
4. Power Supply (in SC emulator)	HP	6653A		
5. Size 1/2 DB15M breakout box	GSS	NA	001	NA
6. D-shell size 8 coax/BNC test cable	GSS	NA	001	NA
7.				
8.				
9.				
10.				

10.0 Device Under Test:

Record the serial number of the Device Undergoing Test, or DUT.

GSS Spacecraft emulator assembly	SN:	
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Test Operator:	Name:	
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Start of test:	Date:	
	Time:	

11.0 Power On:

Note: All handling of this DUT shall be performed using ESD control methods, as outlined in MIL-STD-1686. Unit shall be inspected at an ESD certified station. Wrist straps and/or heel grounding straps shall be used.

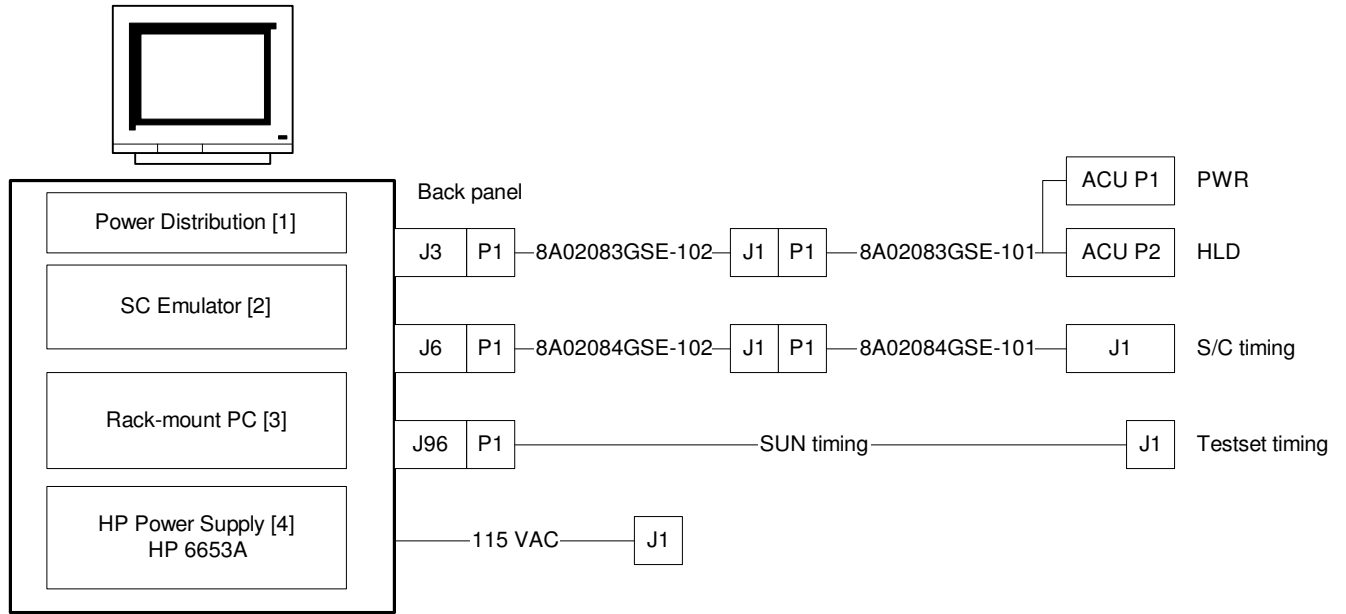


Figure 1: GSE Rack and Cables

	P/F	Notes
11.1. Turn on unit via the circuit breaker on the Power Distribution box [1]		Version:
11.2. Set current limit on HP power supply [4] to 2.0 ± 0.2 A		
11.3. Boot the PC; Run LabView GSE Control Panel from desktop.		
11.4. Record version number of LabView GSE Control Panel.		

12.0 Spacecraft Power Emulation Verification.

	P/F	Notes
12.1. Confirm that the power panel on the LabView control panel is set for DC: 28.0 V, AC: 0.0 V		
12.2. Connect the APU P1 connector on 8A02083GSE-101 to DB15 breakout box.		
12.3. Verify the four power panel control buttons indicate "OFF" (red)		
12.4. Connect multimeter negative lead to breakout box pin 14 (power return)		
12.5. Confirm that the resistance between pin 14 and pins 9, 10, 11, 12, 13 is less than 5.0 ohms.		
12.6. Click the master "ON" button.		
12.7. Click the FSU Main button to "ON"		
12.8. Using a calibrated volt meter between pins 2 and 9, adjust the master voltage level so that the meter reads 28.0 V ± 0.1 V.		
12.9. Verify the following table for the given configuration of power panel control buttons:		

FSU Main	FSU Back up	Aft	Htr	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	P/F
Off	Off	Off	Off	0	0	0	0	0	0	
ON	Off	Off	Off	28	28	0	0	0	0	
Off	ON	Off	Off	0	0	28	28	0	0	
Off	Off	ON	Off	0	0	0	0	28	0	
Off	Off	Off	ON	0	0	0	0	0	28	

All voltage tolerances: ± 0.20 V

13.0 HLD Driver Emulation Verification:

	P/F	Notes
13.1. Connect the APU P2 connector on 8A02083GSE-101 to DB15 breakout box.		
13.2. Verify that the resistance between pins 1 and 9 is less than 5.0 ohms.		
13.3. Connect the scope ground to pin 9.		
13.4. Click the power "ON" button.		
13.5. Verify the following table for the given configuration of power panel control buttons:		

HLD Transition	2	10	3	11	6	14	5	13	4	12	7	15	P/F
Htr On	P												
Htr Off		P											
HV A On			P										
HV A Off				P									
HV B On									P				
HV B Off										P			
Func A On					P								
Func A Off						P							
Func B On											P		
Func B Off												P	
Spare On							P						
Spare Off								P					

P indicates 28 V pulse; blank indicates no pulse.

14.0 Spacecraft Timing Signal Verification

	P/F	Notes
14.1. Connect scope to D-shell size 8 coax/BNC test cable. Attach cables 1-4 to channels 1-4.		
14.2. Attach test cables to J1 of cable 8A02048GSE-101		
14.3. Confirm that the following signals are available on each scope channel for the noted timing settings set via the LabView control panel		

16 fo	1	2	3	4	P/F
Off			-	-	
A	X		-	-	
B		X	-	-	
A & B	X	X	-	-	

10 Hz	1	2	3	4	P/F
Off	-	-			
A	-	-	X		
B	-	-		X	
A & B	-	-	X	X	

“-“ indicates a “don’t care” condition; “X” indicates a signal present.

15.0 Completion of procedure:

	P/F	Notes
15.1. Remove DB15 breakout box, timing test cable.		
15.2. Affix the calibration label on the next page to the face of the unit. Date, initial, and stamp the label.		


I certify that this procedure was performed in whole and that the data recorded above is complete and accurate.


Test Engineer Date


This is to certify that the information obtained under this test procedure is as represented and the documentation is completed and correct.

GSS Representative Date

Quality Assurance Date

	GSS Spacecraft Emulator	Stamp:
	Tested on: _____	
	Retest by: _____	
	By: _____	
	Per P0758 Rev _____	

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	Tested on: _____	
	Retest by: _____	
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