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Gravity Probe B Relativity Mission

GSS BOARD-LEVEL TEST SOFTWARE OPERATIONAL PROCEDURES

GP-B Procedure P0670 Rev -

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Date

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Date

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1.0 Revision History

Rev Level	Comments/notes	Date	Revised By
-	First release of this test procedure	7-Apr-00	S Smader

2.0 Scope:

This procedure details the steps required to send commands to a gold system test environment that is configured as described in "Configuration B" in the GSS Gold System Hardware and Software Configuration Standard, P0663.

As such, this procedure may be considered as an appendix to P0663, however, it was made a separate document for ease of maintenance.

3.0 Definition of Gold System Components

- 3.1. Gold system components (PWAs, cables) are flight equivalent electronics assemblies that have been built with 100% flight-compatible interfaces and functionality so that they may come into contact and be operated with flight components under test without risk of contamination or other types of damage. In most all cases, this has been ensured by building brassboard units from the flight designs, substituting easily available commercial-equivalent electrical components for flight devices in internal circuitry. All interfaces (connectors) are flight quality parts.
- 3.2. Gold system components are identified by a "GS" marking in their respective serial numbers.

4.0 Reference Documents

- 4.1. GSS Gold System Hardware and Software Configuration Standard, P0663.

5.0 Test Facilities

HEPL Room 127, Stanford University.

6.0 QA Provisions:

- 6.1. QA notification of this procedure is not required. Its purpose is to explain how to perform portions of board-level tests. The board-level tests themselves are reviewed by QA.
- 6.2. The software described herein is released with P0663, and as part of P0663, it is loaded onto the computers before any board testing is started.

7.0 Test Personnel

This operational procedure is for use by the following personnel:

- 7.1. William Bencze
- 7.2. Scott Smader
- 7.3. Joe Kilner
- 7.4. Lo Van Ho

8.0 General Instructions

- 8.1. Test operators shall read this procedure in its entirety and resolve any apparent ambiguities prior to beginning any tests that reference this procedure.
- 8.2. 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.

9.0 Hardware Safety Requirements:

- 9.1. These assemblies are 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
- 9.2. Ensure that power is removed from cable assemblies before connecting or disconnecting cable connectors.
- 9.3. 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.

10.0 Equipment Requirements

- 10.1. The software described in this operational procedure requires "Configuration B" as defined in GSS Gold System Hardware and Software Configuration Standard, P0663. Both "Full" and "Partial" configurations of the gold system are supported, however, if the gold system configuration is "Partial", some commands may not run as intended.
- 10.2. The Sun workstation downloads the RAD6000 in the ACU, and runs software to establish communications with the user.

11.0 Board-Level Test Software Operational Procedure

This section describes how to: log on to the workstation; load a software image into the Rad6000; start command and telemetry processing windows; issue commands; view telemetry; and end the session.

11.1. Logging on to the workstation. If you are already logged on, then skip to step 11.2.

11.1.1. gss-ts2 console login: gpbvx

11.1.2. Enter password:

11.1.3. At the logon selection menu, hit [Return] to select the default window manager.

11.2. Loading software image to the Rad6000 processor

11.2.1. Enable X-window connections: type the following command on the console window (you only need to do this once per window login session).

```
xhost +
```

11.2.2. From a command window, change the working directory to where the load image is.

```
cd /projects/gpbvx/hwQual/brdtest/bsp/pp
```

11.2.3. Execute the setup script. This script assumes the ACU is configured as RT 12 (GSS 1) on the 1553 bus.

```
source rtloader_setup
```

11.2.4. Execute the payload processor loader script:

```
sudo ploader
```

11.2.5. You will probably be asked for the gpbvx account password. Enter the password if asked.

11.2.6. Press [Return] key to accept the default parameters.

11.2.7. Cycle power to the ACU. Wait for two seconds, then

11.2.8. Press [Return] key to start the download process. Pay attention to the on-screen messages.

11.2.9. The image load takes about two minutes. If you have a performance meter running you should see the interrupt count peak during the downloading. It is done when you see the following messages:

```
PPP now restarting, wait for your prompt.
```

You may now continue with the RT processes

- 11.2.10. To verify that the image load is successful, start a telemetry display and look for changing numbers (e.g., Vehicle time in ATC PIT). If all numbers appear static, check the cable connections and re-load the image from step 2.4.

11.3. Start the command and telemetry processing windows

Type the command to start the command and telemetry processing programs.

```
startall
```

You will be asked to enter your initials, then two windows will pop up. One is the telemetry display selection window (pitView4); the other is the command sender window (cmdClient)

11.4. Issue commands

From the command sender window (cmdClient), use the cursor key to select the desired function, then press [Return] key to execute the function.

11.4.1. Send new command -

Syntax: app#, cmd#: arg1, arg2, ...

example: 14, 29 starts FMR Diagnostic command
 16, 2: 0x101, 20 writes 20 to AMT Read Trigger Delay Register

Note that you cannot send a command twice in a row. You must insert a different command in between. i.e., if you want to run FMR Diagnostic twice, you have to do the following sequence:

 14, 29 run FMR Diagnostic
 14, 1 a different command in between
 14, 29 run FMR Diagnostic again

11.4.2. Send force reject - use this option to interrupt a "hung" process.

11.4.3. Run script - select this option to enter the script mode. For more detailed info, please refer to the web page "cmdClient documentation" on the GSW_DOCS server.

11.5. View Telemetry

From the telemetry selection window (pitView4), use the cursor key to select the desired display then press [Return] key. You can select multiple displays. A new window will appear for each selection.

11.6. End the session

After you are done with your session, you should close all windows. If you leave any window running, you won't be able to load a new image to the Rad6000.

11.6.1. For telemetry displays, any key pressed in the window will close the window.

11.6.2. For command sender window, type 'q' to close the window.

11.6.3. On the main window (where you typed "startall"), type Ctrl-C to end the program.