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Gravity Probe B Relativity Mission

PROGRAMMING PROCEDURE FOR THE
GSS AMT CARD (PWA 8A01899) FPGA DEVICE

GP-B   Procedure
P0614 Rev -

Prepared by: Joe Kilner	Date
AMT card RE.	

Approved by: William J. Bencze	Date
RE, Gyroscope Suspension System (GSS) Group	

Approved by: Dorrene Ross	Date
GP-B Quality Assurance	

1.0 Revision History

Rev Level	Comments/notes	Date	Revised By
-	First release of this procedure	20 Jan 2000	Joe Kilner

2.0 General Description

This procedure draws flight FPGA's from LMMS flight stores for programming and limited testing.

3.0 Applicable Documents

Document number	Rev	Title
26220	--	GSS AMT FPGA

4.0 Quality Assurance Notification:

4.1.   Gravity Probe B QA (Dorrene Ross) and ONR (Ed Ingraham) must be notified at least 24 hours prior to the start of this programming operation. This may take the form of direct contact, e-mail or voice-mail.

GP-B QA NOTIFICATION: ONR NOTIFICATION:

INITIALED: _____   INITIALED: _____

DATE: _____   DATE: _____

TIME: _____   TIME: _____

5.0 Parts Acquisition:

5.1.   Remove parts from LMMS stores.

5.2.   Transfer the following parts to B250 flight assembly area.

Parts are ESD sensitive. Handle per LAC3250: Protection of electrostatic-sensitive parts and assemblies.

QTY	PART NUMBER	PART NAME	P.O. NUMBER	LOT DATE CODE	LOG OUT
5 EA	5962-9215601MXC	Actel A1280A FPGA			

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6.0 Programming:

Program parts at a certified anti-static workstation.

6.1.   Load the fuse file, gssamt2r.afm, into the computer connected to the programmer if it has not already been loaded. Place it into a folder on the C drive. (For example, create a folder called 'Designs' and copy gssamt2r.afm to it.)

6.2.   Verify the Activator 2S (Stanford Tag Number 0105) is connected to the SCSI port of the personal computer (Stanford Tag No. 0456-1), and that the ACT2-176PGA adapter is installed on the Activator 2S main chassis. If unpowered, turn on the Activator 2S equipment first, then turn on the computer (or turn them on simultaneously).

6.3.   Launch the Activator 2S programming utility (APS R2-1998 for Windows, Rev 3.3.0.15) by clicking on the Actel Icon. Record the name and date of the GSS AMT FPGA fuse file below.   Open the GSS AMT FPGA fuse file from the Actel menu and load the file. To open the file, find and select the file in the box on the right side of the Actel window. Then select '*.afm' in 'List files of type' window. Finally, select the gssamt2r.afm file in the 'File name' window and click OK.

GSS AMT FPGA Fuse File Name and Date   _____

VERIFIED: _____

DATE: _____

6.4.   Insert the flight FPGA into the ACT2-176PGA adapter ZIF socket according to the orientation guidelines shown on the Actel Activator 2S chassis. Activate the ZIF socket component insertion lock to secure the FPGA's physical and electrical connection.

VERIFIED: _____

DATE: _____

6.5.   Perform an AntiFuse Shorts Test (AKA BLANK Test) on the Flight FPGA using the Actel Activator APS programming utility to verify that all the internal antifuses are programmable. Record the results in Table 6.1.

VERIFIED: _____

DATE: _____

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6.6.   Select and run the ACTIVATE function of the Actel Activator APS programming utility. When prompted, select the ARRAY FUSE option. Programming takes about 10 minutes.

6.7.   After activation is complete, perform an additional Blank Test on the programmed Flight FPGA to verify the device checksum, silicon signature and System Status (Passed). Record the results in Table 6.1 below. By convention, the OrCAD design Rev. number has been compiled into the FPGA Signature.

FPGA State	Signature	Checksum	Security	Blank Status
Pre-Activation				
Post-Activation				

Table 6.1: FPGA AntiFuse Test Results for Unit #1

VERIFIED: _____

DATE: _____

6.8.   Repeat steps 6.4 through 6.7 with the second through fifth Flight ACTEL FPGAs. Record the results in Tables 6.2 to 6.5 below.

FPGA State	Signature	Checksum	Security	Blank Status
Pre-Activation				
Post-Activation				

Table 6.2: FPGA AntiFuse Test Results for Unit #2

VERIFIED: _____

DATE: _____

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(operator, sign/date)

FPGA State	Signature	Checksum	Security	Blank Status
Pre-Activation				
Post-Activation				

Table 6.3: FPGA AntiFuse Test Results for Unit #3

VERIFIED: _____

DATE: _____

FPGA State	Signature	Checksum	Security	Blank Status
Pre-Activation				
Post-Activation				

Table 6.4: FPGA AntiFuse Test Results for Unit #4

VERIFIED: _____

DATE: _____

FPGA State	Signature	Checksum	Security	Blank Status
Pre-Activation				
Post-Activation				

Table 6.5: FPGA AntiFuse Test Results for Unit #5

VERIFIED: _____

DATE: _____

6.9.   Close the file and exit the Activator program when finished.

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6.10.   Label these FPGAs per SU Dwg. 26220. Record the serial number(s) of the FPGA's programmed below:

Unit #1 _____

Unit #2 _____

Unit #3 _____

Unit #4 _____

Unit #5 _____

GP-B QA INSPECTION: _____

DATE: _____

ONR INSPECTION: _____

DATE: _____

7.0 Parts Packaging:

7.1.   Package the FPGAs per SU Dwg 26220.

VERIFIED: _____

DATE: _____

8.0 Parts Storage:

8.1.   Return the programmed FPGAs to LMMS flight stores.

9.0 Closure of Procedure:

9.1.   GP-B QA to verify procedure is complete.

GP-B QA: _____

DATE: _____

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