

**LASER INTERFEROMETER GRAVITATIONAL WAVE
OBSERVATORY**

-LIGO-

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STS-2 Seismometer Chassis Test Procedure		
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Performed by: _____
 Date: _____
 Board Serial Number: _____

1. Overview

The HEPI STS-2 Seismometer Interface Chassis provides power and control channels for a single STS-2 seismometer. The chassis receives 6 differential signals from the seismometer that are sent as outputs to the AdL Anti-Alias Chassis for ultimate transmission to the ADCs. A summary of functions for the STS-2 Seismometer Interface are:

- 1.1 DC power to the remotely located STS-2 seismometer
- 1.2 Receives 6 channels of differential signals from the STS-2 seismometer
- 1.3 Interfaces analog signals to the AdL Anti-Alias Chassis by differential interface
- 1.4 Provides local front panel switches and remote PCIX based control of STS-2 functions

The function of this procedure is to check each channel from its input to the respective output, test binary controls and to verify proper DC power consumption.

2. Test Equipment

- 2.1 Power Supply capable of +/- 18 volts
- 2.2 Function generator (Stanford Research DS360 or the like)
- 2.3 Oscilloscope

3. Preliminaries

- 3.1 Perform visual inspection on board to check for missing components or solder deficiencies
- 3.2 Before connecting the power to the chassis, set power supplies to +/- 18 Volts, and then turn them off. Connect the power supplies to the chassis under test at the back panel 3-pin power connector.

4. DC Tests

- 4.1 Turn on the power supplies to the system under test and record the total current. The specification assumes all inputs are not driven and the front panel switches are clicked down.

Total Current	Specification	Observation
+18V Supply	110mA +/- 10mA	
-18V Supply	100mA +/- 10mA	
Power LEDs	Lit with equal brightness	

5. Dynamic Tests

- 5.1** The following tests verify the proper gain, for each signal channel. The test consists of applying a 100 Hz signal to test the channel gain
- 5.2** Using a function generator and an oscilloscope, enter **0.1V** p-p (**HI-Z**) sine wave on the function generator and apply to the prescribed input and observe the amplitude at the designated output (either the Anti Alias signals on J7, the on-board testpoints, or the front panel BNC). For differential outputs, use two scope probes in “differential mode” that is probe 1 minus probe 2.

STS-2 Response Data

INPUT (+, -)	OUTPUT POINTS	NOMINAL MAG (100HZ)	MEAS. MAG. (100HZ)
50 pin D-sub pin 3/36 or TP15/TP14	STS2-X, J7 pins 4&12 or TP4&TP12 & X-MON BNC	Pins 4&12: 4V p-p +/- 0.5V BNC: 2v p-p +/-0.5V	Pins 4&12: BNC:
50 pin D-sub pin 20/4 or TP15/TP14	STS2-Y, J7 pins 5&13 or TP4&TP12 & Y-MON BNC	Pins 5&13: 4V p-p +/- 0.5V BNC: 2v p-p +/-0.5V	Pins 5&13: BNC:
50 pin D-sub pin 37/21 or TP15/TP14	STS2-Z, J7 pins 6&14 or TP4&TP12 & Z-MON BNC	Pins 6&14: 4V p-p +/- 0.5V BNC: 2v p-p +/-0.5V	Pins 6&14: BNC:

- 5.3** Enter **10V** p-p (**HI-Z**) on the function generator and use only the positive output relative to GND. This requires referencing the common of the function generator to STS-2 GND.

INPUT (+, -)	OUTPUT POINTS	NOMINAL MAG (100HZ)	MEAS. MAG. (100HZ)
50 pin D-sub pin 41/GND	MASSPOS-U J7 pins 1&9 TP2&TP3 BNC U/X Pos	Pins 1&9: 20v p-p +/- 0.5v BNC: 10V +/- 0.5V	Pins 1&9: BNC:
50 pin D-sub pin 8/GND	MASSPOS-V J7 pins 2&10 TP2&TP3 BNC V/Y Pos	Pins 2&10: 20v p-p +/- 0.5V BNC: 10V +/- 0.5V	Pins 2&10: BNC:
50 pin D-sub pin 24/GND	MASSPOS-W J7 pins 3&11 TP2&TP3 BNC W/Z Pos	Pins 3&11 20v p-p +/- 0.5V BNC: 10V +/- 0.5V	Pins 3&11: BNC:

5.4 Using a piece of cable to short the indicated pins together, or by actuating the front panel switches, verify the operation of the following binary functions (**FP** indicates Front Panel, **RP** indicates Rear Panel). **For the rear panel (Binary I/O) functions to operate normally, it is necessary to have all the front panel toggle switches toggled down:**

INPUT	OUTPUT	EXPECTED RESPONSE	ACTUAL RESPONSE
CAL switch from NORM to CAL FP	CAL LED, J6	LED is lit, J6 pin 38 = 15V	
Basis switch from XYZ to UVW FP	J6 pin 22	Transition from 0 to 15V	
Period switch from 120SEC to 1SEC FP	J6 pin 6	Transition from 0 to 15V	
Push AZ button FP	AZ LED, J6	LED is lit, J6 pin 5 = 15V	
Binary I/O Interface pin 1 to 6 RP	CAL LED, J6	LED is lit, J6 pin 38 = 15V	
Binary I/O Interface Pin 2 to 7 RP	J6 pin 22 UVW	Transition from 0 to 15V	
Binary I/O Interface pin 3 to 8 RP	J6 pin 6 PERIOD	Transition from 0 to 15V	
Bin I/O Interface pin 4 to 9 RP	AZ LED, J6	LED is lit, J6 pin 5 = 15V	