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# LASER INTERFEROMETER GRAVITATIONAL WAVE OBSERVATORY

**-LIGO-**

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<b>RBS Interface Board Test Plan</b>		
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# 1 Introduction

The tests described below are required to verify the correct operation of the RBS Interface Board (D050511, Rev A). For all tests described in this procedure the input and output for each control channel are as shown in the table below.

Control Channel	Input +/-	Output +/-
1	J1-15/J1-2	Chan 1 J3-4/J3-5
2	J1-16/J1-3	Chan 2 J3-4/J3-5
3	J1-17/J1-4	Chan 3 J3-4/J3-5
4	J1-18/J1-5	Chan 4 J3-4/J3-5

For all tests described in this procedure the input and output for each strain gauge monitor channel are as shown in the table below.

Strain Gauge Channel	Input +/-	Output +/-
1	Chan 1 J3-1/J3-2	J2-1/J2-6
2	Chan 2 J3-1/J3-2	J2-2/J2-7
3	Chan 3 J3-1/J3-2	J2-3/J2-8
4	Chan 4 J3-1/J3-2	J2-4/J2-9

# 2 Test Equipment

- Dynamic Signal Analyzer
- Function Generator
- Oscilloscope
- Power supplies

# 3 Tests

## 3.1 Input Power

Record the input voltage and current in the table below. Values should be +/-10mA of the nominal values.

Supply	Nominal Current	Actual	Pass/Fail
+12 V	TBD A		
-12 V	TBD A		

Power can be applied using either the 4 pin header (P1) or the appropriate test points, TP1, TP4, TP2 for +12V, -12V and GND, respectively.

## 3.2 Control Stage 1 Response

This section will test the response of the first filter stage for each control channel of the board. The nominal response of each stage is a 2 pole, 1Hz Butterworth low pass filter. Using the dynamic signal analyzer, verify and record the response of each channel in the table below. The filter stage jumpers (P2 and P3) should be as follows:

- P2—pins 1 and 2 connected (filter label on board)
- P3—pins 2 and 3 connected (bypass label on board)

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Channel	Filter Enable	Gain/Phase at 1Hz Nom -0.5dB/ -52deg	Gain/Phase at 5Hz Nom -18.9dB/ -152deg	Gain/Phase at 50Hz Nom -58.8dB/ -177deg
1	Channel 1 P2 pin 1-2 P3 pin 2-3			
2	Channel 2 P2 pin 1-2 P3 pin 2-3			
3	Channel 3 P2 pin 1-2 P3 pin 2-3			
4	Channel 4 P2 pin 1-2 P3 pin 2-3			

A plot of the nominal response of each stage is shown in section 3.5 of this document.

### 3.3 Control Stage 2 Response

This section will test the response of the first filter stage for each control channel of the board. The nominal response of each stage is a 2 pole, 1Hz Butterworth low pass filter. Using the dynamic signal analyzer, verify and record the response of each channel in the table below. The filter stage jumpers (P2 and P3) should be as follows:

P2—pins 2 and 3 connected (bypass label on board)

P3—pins 1 and 2 connected (filter label on board)

Channel	Filter Enable	Gain/Phase at 1Hz Nom -0.5dB/ -52deg	Gain/Phase at 5Hz Nom -18.9dB/ -152deg	Gain/Phase at 50Hz Nom -58.8dB/ -177deg
1	Channel 1 P2 pin 2-3 P3 pin 1-2			
2	Channel 2 P2 pin 2-3 P3 pin 1-2			
3	Channel 3 P2 pin 2-3 P3 pin 1-2			
4	Channel 4 P2 pin 2-3 P3 pin 1-2			

A plot of the nominal response of each stage is shown in section 3.5 of this document.

### 3.4 Strain Gauge Monitor Response

This section will test the response of the filter stages for each strain gauge monitor channel of the board. The nominal response of each channel is a cascade of two pole, 1Hz Butterworth low pass filter. Using the dynamic signal analyzer, verify and record the response of each channel in the table below.

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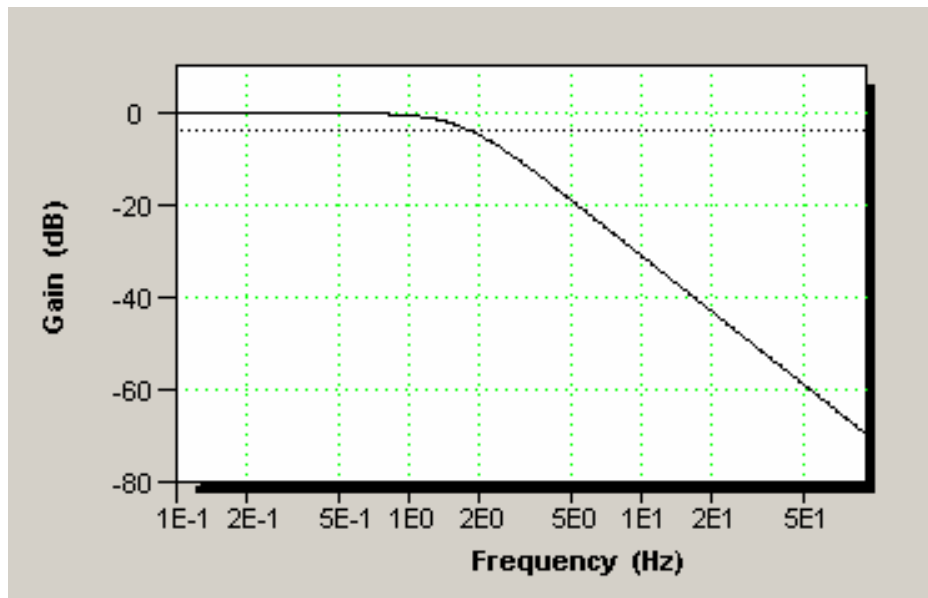
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Channel	Gain/Phase at 1Hz Nom -1dB/ -104deg	Gain/Phase at 5Hz Nom -37.8dB/ -304deg	Gain/Phase at 10Hz Nom -61.8dB/ -332deg
1			
2			
3			
4			

### 3.5 Nominal Control Filter Response

The gain response of each stage of the control filter is shown in the figure below.



The phase response of each stage of the control filter is shown in the figure below.

