# **LASER INTERFEROMETER GRAVITATIONAL WAVE OBSERVATORY**

# -LIGO-

# CALIFORNIA INSTITUTE OF TECHNOLOGY

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| Document Type  Test Procedure and Results | DCC Number  **LIGO-T1400016-v1** | Date  16 January, 2014 |
| aLIGO GS-13 In-Vacuum Electronics Test Procedure | | |
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Distribution of this draft: NSF reviewers, LIGO scientists

This is an internal working note of the LIGO Laboratory

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LIGO-T1400016-v1

Performed by: \_\_\_\_\_\_\_\_\_\_\_\_\_\_

Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_

Board Serial Number: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. **Overview**

The tests described below can be used to narrow down the cause of a signal failure of an in-vacuum GS-13 geophone. One possible cause for signal failure is the aLIGO GS-13 Pre-Amp board (D050358), which is a replacement for the preamp that comes with the GS-13 Seismometers. Its job is to take in the signal from the Seismometer, and send it out as an amplified, differential signal. If that board, or the GS-13 Socket Board that serves it power (D0902011-v4), are damaged by some mechanism, one would expect a degradation or loss of signal

1. **Test Equipment**
   1. Multimeter (Fluke, or equivalent)
   2. 25-pin breakout board
2. **Tests**
   1. **Testing the power rails**
3. Turn off the power switch to the GS-13 Interface board (or the whole ISI Interface chassis, if you prefer).
4. Put a 25-pin breakout board in line with the output of the GS-13 Interface Chassis, and then turn the power back on.
5. Pins 25, 24, and 23 are GND on the board. Clip the ground lead of a Fluke multimeter onto pin 25, and read the voltage on pin 9 and then pin 22. The following table should explain the results of this test:

|  |  |  |  |
| --- | --- | --- | --- |
| Pin | Both supplies Healthy | Missing the +15V | Missing the -15V |
| Pin 9 (+Out) | 0V | -11.26V | +5.1V |
| Pin 22 (-Out) | 0V | -2.5V | +13.5V |

* 1. **Testing the output OpAmps**

**If you have determined that both voltages are present, you should now be able to read the 100 Ohm output resistor on the GS-13 Preamp if the output OpAmps are working correctly.**

1. Put the multimeter in resistance mode
2. Test the resistance between pin 25 (GND) and pin 9 (+Out). It should read right around 100 Ohms.
3. +Out resistance\_\_\_\_\_\_\_\_\_\_\_\_\_\_
4. Next test the resistance between pin 25 (GND) and pin22 (-Out). It should also read 100 Ohms.
5. -Out resistance\_\_\_\_\_\_\_\_\_\_\_\_\_\_