

**LASER INTERFEROMETER GRAVITATIONAL WAVE  
OBSERVATORY**

**-LIGO-**

CALIFORNIA INSTITUTE OF TECHNOLOGY  
MASSACHUSETTS INSTITUTE OF TECHNOLOGY

Document Type Technical	DCC Number LIGO-T020060-00-C	April 24, 2002
<b>SEISMIC SIGNAL REMOTE INTERFACE BOX ACCEPTANCE TEST PROCEDURE</b>		
Sander Liu		

Distribution of this draft: NSF reviewers, LIGO scientists  
This is an internal working note of the LIGO Laboratory

**California Institute of Technology**  
**LIGO Project – MS 18-33**  
**Pasadena, CA 91125**  
Phone (626) 395-2129  
Fax (626) 304-9834  
E-mail: [info@ligo.caltech.edu](mailto:info@ligo.caltech.edu)

**Massachusetts Institute of Technology**  
**LIGO Project – MS 20B-145**  
**Cambridge, MA 01239**  
Phone (617) 253-4824  
Fax (617) 253-7014  
E-mail: [info@ligo.mit.edu](mailto:info@ligo.mit.edu)

www: <http://www.ligo.caltech.edu/>

**ELECTRONIC  
COPY**

## MICRO-SEISMIC SYSTEM REMOTE INTERFACE BOX ACCEPTANCE TEST PROCEDURE

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

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

Tested By: \_\_\_\_\_

### 1.0 INTRODUCTION

The Micro-Seismic System Remote Interface Box buffers seismic signals picked up by the Streckeisen Tri-Axial Seismometer (STS-2) to provide local display and circuitries to interface with control and storage media in the control rack. Besides passing the differential X, Y, Z axes seismic signal from the Host Box directly to the Post Processor, it picks off a portion of them to generate local monitoring points. Provide capability to excite Host's Mass Position of Sensor U, V, and W from the front panel; provides power supply to the Host Box and function control for the AUTZ, CALSW, SIGSW and PERSW switches.

### 2.0 EQUIPMENT

The following equipment, or its equivalent, shall be used to perform this acceptance test:

1. Tektronix Model TDS3034 300 MHz Oscilloscope with two probes
2. Stanford Research Model DS345 Synthesized Function Generator
3. One Tenma Model DCPS 72-2082 Dual output Power Supply

### 3.0 TEST EQUIPMENT SET UP

- 3.1 All test equipment shall be properly calibrated according to manufacturer's operation manuals, where applicable, prior to use.
- 3.2 Set up the equipment as shown in Figure 1 below.

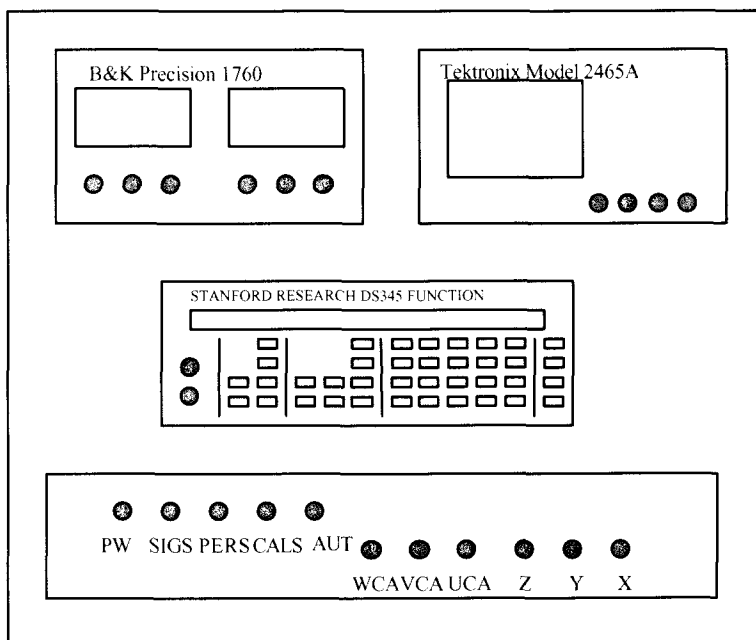


Figure 1. Remote Interface Box Test Setup

#### 4.0 TEST PROCEDURE

- 4.1 Perform visual inspection on the Unit Under Test (UUT) to make sure that it is in good order.
- 4.2 Set the power supply to + 24 Vdc.
- 4.3 With the power supply turned OFF, connect +24V to J6-7 and/or J6-14; +24V RETURN (RTN) to J6-6 and/or J6-13.
- 4.4 Turn on power to all equipment; make sure that power light on the UUT front panel is ON.
- 4.5 Allow the equipment to warm up for approximate 5 minutes then record the following:

Table 1.0 Power Supply Current

+ 24V POWER SUPPLY		
	NOMINAL	ACTUAL
+24V	200 mA	

## 5.0 SEISMIC SIGNAL TEST PROCEDURE

- 5.1 Set output of the function generator to a sine wave at 100 Hz with amplitude of 1.0 volt peak-to-peak. Sequentially apply this signal to the between pins J1-D (Signal) and J1-J (RTN) etc, measure the output amplitude between J2-A (Signal) and J2-B (RTN) as shown in Table 2.0:

Table 2.0 Seismic Signal Functionality Test

INPUT	OUTPUT	AMPLITUDE
J1-D and J1-J	J2-A and J2-B	
J1-D and J1-J	J3	
J1-C and J1-H	J2-C and J2-D	
J1-C and J1-H	J4	
J1-B and J1-G	J2-E and J2-F	
J1-B and J1-G	J5	
J1-T and J1-S	J2-G and J2-H	
J1-V and J1-S	J2-J and J2-K	
J1-U and J1-S	J2-L and J2-M	

## 6.0 CONTROL SIGNAL TEST PROCEDURE

- 6.1 Sequentially apply a +5.0 Vdc signal through a 2.7K Ohm resistor to J2, J3, J10 and J11 and +5V RTN to J6-4 and measure the outputs amplitude at J1-E, J1-R, J1-K and J1-L with respect to J1-S. Record the condition of the corresponding LED on the front panel on Table 3.0:

Table 3.0 Control Signal Functionality Test

INPUT	OUTPUT	AMPLITUDE (>4.0 V Nominal)	LED
J6-2 AND J6-4	J1-E and J1-S		
J6-10 and J6-4	J1-K and J1-S		
J6-3 and J6-4	J1-R and J1-S		
J6-11 and J6-4	J1-L and J1-S		

## 7.0 CALIBRATION SIGNAL TEST PROCEDURE

7.1 Sequentially apply the 1.0 volt peak-peak sine wave from the generator to the inputs J7, J8 and J9, record their respective output amplitude between J1-Q (Signal) and J1-M (RTN) etc, below:

Table 4.0 Calibration Signal Functionality Test

INPUT	OUTPUT	AMPLITUDE
J7	J1-Q and J1-M	
J8	J1-N and J1-M	
J9	J1-P and J1-M	

## 8.0 HOST BOX POWER SUPPLY VERIFICATION

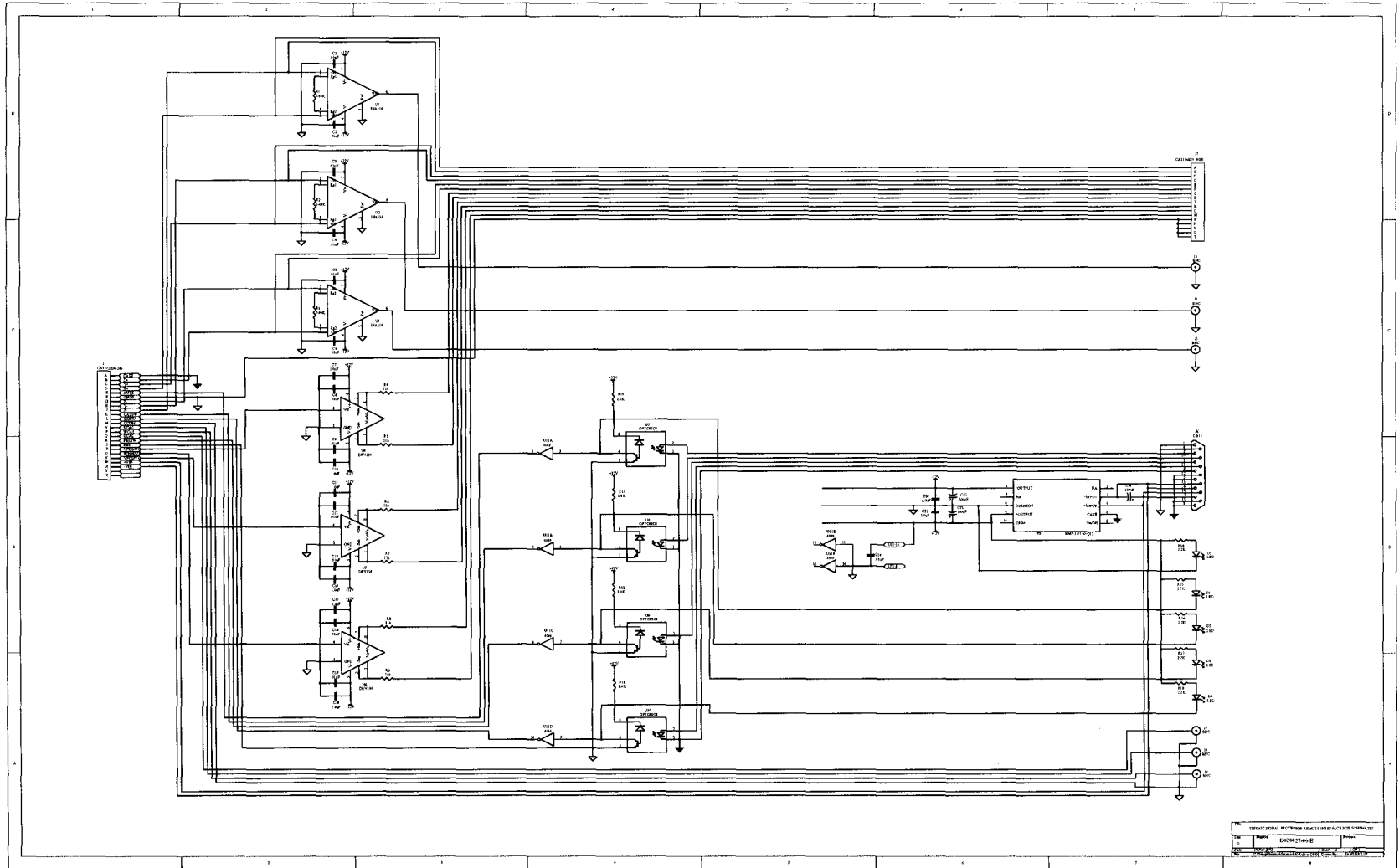
8.1 Measure the voltage between pins J1-W and J1-X (Return) and record in Table 8.0 below:

Table 5.0 Host Box Power Supply Verification

INPUT	VOLTAGE (Nominal +24V)
J1-W and J1-X	

## 9.0 CONCLUSION

This concludes the acceptance test procedure for the Seismic Signal Remote Interface Box.



DATE	REVISION	BY	CHKD
UNCLASSIFIED			
NO FORN DISSEMINATION			